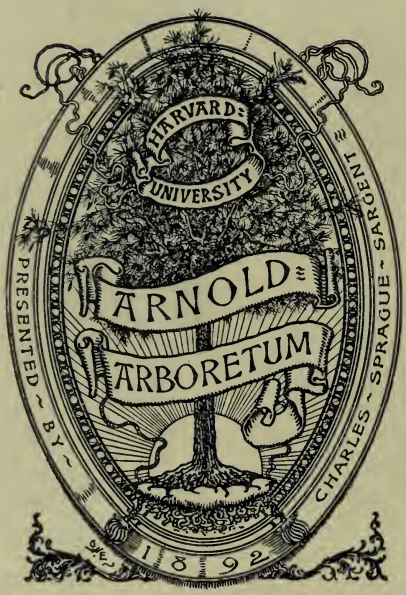

AGRICULTURAL BULLETIN

OF THE

STRAITS

FEDERATED MALAY STATES

EDITED BY

H. N. RIDLEY, M. A., F. R. S., F. L. S.,
Director of Botanic Gardens, S. S.

AND

J. B. CARRUTHERS, F. R. S. E., F. L. S.,
Director of Agriculture & Government Btoanist, F. M. S.

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No. 1.] JANUARY, 1908. [Vol. VII.

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NOTICE.

The Scientific and Technical Departments of the Imperial Institute.

His Excellency the Governor has received a despatch from the Right Hon'ble the Secretary of State for the Colonies calling attention to the advantages offered by the Imperial Institute to Merchants, Planters and others, who may wish to have samples submitted to scientific experts for opinion as to their commerical value etc. The following extracts from a Memorandum published by the Authorities of the Imperial Institute will give an idea of the work undertaken and carried on there.

"The Scientific and Technical Department of the Institute has "been established to acquire information by special enquiries and "by experimental research, technical trials and commerical valua- "tion regarding new or little known natural or manufactured "products of the various Colonies and Dependencies of the British "Empire and of Foreign Countries, and also regarding known "products procurable from new sources, and local products of "manufacture which it is desired to export. This work is carried "out with a view to the creation of new openings in trade, or the "promotion of industrial developments.

2. In an extensive and well-equipped series of Research Laboratories, a numerous staff of skilled chemists carry out the investigation of the chemical constitution and properties of new dye-stuffs, tanning materials, seeds and food-stuffs, oils, gums and resins, fibres, timbers, medicinal plants and products, with a view to their commercial utilization. Whenever necessary these materials are submitted to special scientific experts, by whom they are made the subject of particular investigation or practical tests. Reports are also obtained from technical or trade experts in regard to the probable commerical or industrial value of any such products.

3. The Federated Malay States Government has undertaken to grant a sum of £100 a year for 5 years to the Department with a view to the careful investigation and commerical development of the mineral resources of the States.

The Government Geologist is collecting specimens for chemical examination and after analysis the Imperial Institute which is in very complete touch with the principal manufacturing and other industries of the United Kingdom, will bring the specimens before manufacturers and others for trial with a view to their commercial development.

It is expected that this action will do much to help in finding a market for new products and developing the markets for those already exploited.

Planters and residents in the Straits Settlements and Federated Malay States are at liberty to send (through the Colonial Secretary at Singapore) specimens of little known or new vegetable or mineral products of the Straits Settlements or Federated Malay States for examination at the Imperial Institute by whom a report will be made, through the Colonial Secretary. Specimens should, if possible, consist of a few pounds of the material and should be accompanied by full information especially respecting the precise locality in which the material is found and the extent of its occurrence.

Attention may also be drawn to the "Bulletin of the Imperial Institute" published quarterly, which contains records of the investigations conducted at the Imperial Institute, and special articles on tropical agriculture and the commercial and industrial uses of vegetable and mineral products. Copies of this publication, price 4*s.* 6*d.* per annum (including postage), may be ordered through Messrs. KELLY & WALSH, LTD., of Singapore.

Special sample rooms have been arranged at the Imperial Institute, for the information of enquirers, in which materials which have been investigated and valued are available for reference.

Important products are also shown in the Malaya Court in the Public Galleries of the Imperial Institute.

Communications should be addressed to the Director, Imperial Institute, South Kensington, London, S. W.

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NOTES ON THE ACCLIMATIZATION OF PLANTS—*continued.*

Exotics.—Plants of all kinds have been introduced at times from every part of the world, both from temperate and tropical regions.

European plants.—A Denmark correspondent on one occasion sent a number of seeds and a couple of boxes of moorland peat containing a number of indigenous plants, such as *Maianthemun*, *Scilla*, grasses, etc. The boxes came quite open, and the plants in some cases were growing. On being attended to and watered a few grasses produced weak leaves and then disappeared. The Scilla (apparently) had protruded two leaves for some two or three inches from the bulb, during the voyage, but on arriving in Singapore made no further growth remaining stationary for some weeks, after which it perished. Meanwhile an *oxalis* with bright pink flowers made its appearance in the box and made a large clump flowering freely. This was evidently not an European species, but I failed to identify it. It did not seed. Among the seeds sent a few germinated, but the only one which developed into a plant was *Solanum nigrum*....., and this developed into a form not unlike the world-wide *S. oleraceum* which indeed is said to be specifically identical. It flowered and fruited. On another occasion a gentleman brought a collection of spring bulbs to Singapore and asked that they should be grown in the Gardens. They included Snowdrops, Crocuses, Hyacinths, Ranunculus and Tulips. Those that had begun to develop leaves on the way mostly stopped and after remaining quiescent for a time perished. The tulips behaved in a very extraordinary way emitting enormous long and broad leaves and then after some weeks perished.

European vegetables are often introduced:—Lettuce, Cress, Mustard, Watercress, Chicory and Dandelion, have all produced flowers but never a fertile fruit. Coriander (a Persian strain probably) developed into plants of four or five inches tall, flowered and

fruited. Watercress grows abundantly from cuttings, but I failed to raise it from seed. Dandelion on Penang Hill at one time established itself on the banks at an altitude of 2,000 feet from cultivated forms in the vegetable garden there. But instead of retaining the original broad-leaved form it developed into a narrow-leaved form which resembled that of the New Guinea Mountains. It seems to have now quite disappeared.

Many years ago I found *Poa annua* and *Cerastium* abundant as weeds on the Thaiping Hills about 5,000 feet but they seemed to have disappeared later.

Cultivated ornamental plants of European origin do not do as well as those of American origin. Violets in the plains produce few flowers and those nearly all cleistogamous, well-shaped open flowers are scarce. They produce capsules but never establish themselves.

Double Roses constantly show signs of reversion as a considerable number of the central petals revert to stamens. The flowers become smaller also, and I have never seen ripe fruit. The single Roses have always failed and the Sweetbriar also soon perished. Pansies, Lilies of the valley, Forget-me-not flower often once and then die. Poppies, Sweet-peas, Stocks and such flowers, germinate, grow for a short time producing only leaves, and eventually die without flowering. Sweet-peas and Nasturtiums often grow to a considerable height with extremely weak stems and flaccid leaves, before dying. With comparatively few exceptions the ordinary English garden flowers either behave like this or, if they do flower and seed, as Zinnias, Marigolds, Sunflowers, they commence to deteriorate after the first generation, the colours becoming dull, the stems weak, flowers small and seed scanty. The highly cultivated forms, doubles, etc., throw back to single ones and often go back to the duller colouring of the wild one.

When one looks at the list of the Flora of Europe one notices what very few plants are common to this region and that. There is a small number of plants introduced and established in southern Italy, Sicily, etc., brought in with rice probably, such as *Fuerina pubescens*, *Fimbristylis squarrosus*, *Imperata cylindrica*, *Setaria glauca*, *Panicum colonun*. A few more distinctly established and of wider area: *Cyperus rotundus*, *Scirpus mucronatus*, and a small number scattered over even the colder regions, *Lemna gibba*, *Wolfia ariza*, *Cynodon dactylon*, *Phragmites communis* (apparently identical with our wild reed here) and the Ferns *Pteris aquilina*, *Aspidium thelypteris*, *Trichomanes radicans*, *Hymenophyllum Tunbridgense*.

Temperate Asiatic plants again seldom thrive in the Malay Peninsula. The Japanese iris of which plants have long been in the Gardens, under every kind of treatment have remained almost stationary for twelve or fourteen years, occasionally putting on an extra leaf, but putting out no side shoots or flowers. *Hemerocallis* which flowers beautifully on the Thaiping Hills at four to five thousand

feet elevation, when brought down to the plains produces once a number of flowers, but never any more. *Camellias* are brought from Japan, with the buds more or less developed. They flower once perhaps twice, and though they do not die flower no more. *Hydrangeas, Azaleas* (though these have flowered more than once) do the same, none ever produce fruit. Japanese conifers thrive for a time under shelter but fail to stand the heavy rains. *Pinus longifolia* is the only pine which has been kept planted out for any length of time, but after many years it had not attained a height of more than four feet, and was a weedy sickly plant. *Biota orientalis* and *Cupressus pendula* have lasted many years, some of the latter for over thirty years, but have never produced fruit, nor ever looked healthy.

Few Chinese plants seem to do well, except those of the warmer parts. *Aglaia odorata, Chloranthus inconspicuns* grow to good size and flower regularly but do not fruit. The Litchi tree has grown to a very large size in Tanglin, but has never been known to flower. The Loquat grows well and flowers, but has never given a fruit. Japanese Lilies, in fact all *Liliums* will flower once, but never any more. The bulbilliferous species usually produce bulbils in place of flowers and these will grow for a time but never develop into bulbs. No off-shoots are produced from the Lilybulbs. The Lilies have a tendency to flower on very short stems, making a vegetative growth of perhaps only four or six inches tall. Frequently an imported lot simply grow a tall leafy stem and then die without flowering.

The Japanese and Chinese palms *Rhapis* and *Chamaerops* rarely if ever fruit. The only plant of *Rhapis* which has ever flowered in the Gardens was a wretched single-stemmed plant. The great clumps of *Rhapis* which grow with great ease and become very large have never fruited. *Chamaerops hystrix* can be grown for a short time in a pot but perishes when planted out.

In fact one may say that the outlying palms of the palm region the European *Chamoerops,* the Japanese and Chinese palms, the Californian and Floridan species, and the Chilian palms such as *Jubœa* are almost the only palms which will not grow here. The desert palms of Egypt and the dry parts of Africa, such as *Hyphœne* and *Borassus* are not easy to grow inland, and *Hyphœne* seems impossible. *Borassus* grows very poorly except in sandy places near the sea.

Tropical Asiatic exotics do well with the exception of the plants from peninsular India, and the Himalayas, and many have thoroughly established themselves, such are *Asystasia coromandeliana* now a regular weed all over Singapore.

Plants from the Malay Archipelago do well except the hill plants of Java, and the plants of Christmas Island, which though in some cases they have made good growth (*the Abutilons) they either

* Note.—Since writing this the Abutilons have flowered and fruited well.

flower little or not at all. Some like the *Hoya Aldrichii* have constantly failed, the local *Heptapleurum* closely allied to one of our common species has made but little growth.

The climate and soil of Christmas Island is peculiar, the position of the island being insular with a dry season, and the ground being mainly coral reef being extremely porous and dry and very rich in lime and phosphates which the soil of Singapore is poor in, so that the flora is quite xerophilous, and it is hardly to be expected that the same plants would grow under such diverse conditions.

Australian plants are mostly xerophilous and very few can be induced to grow here. The Gardens have been liberally supplied with seeds and plants of all kinds from the Australian Gardens. Upwards of 200 kinds of Eucalyptus have been tried, most on several occasions; only three species have, however, been successfully raised to trees. Of other Australian plants hardly any can be said to thrive. *Buckinghamia* is a fine large tree which flowers regularly but has never showed signs of fruiting. *Grevillea robusta*, *Davidsonia*, and a few others exist but in a weak state. The only good *Grevillea* I have seen is one in the Bishop's Garden in town, that is to say nearer the sea. A very large number were planted on a hill near the reservoir, some years ago as shade trees and for a few years looked quite healthy but nearly all have now perished or are perishing.

The Australian orchids are quite failures; many do not flower, some flower once and die away, few can be induced to do any good. The Palms on the other hand do thoroughly well. *Archontophœnix*, and *Ptychoperma Macarthuri* especially. The latter indeed is the only palm which spreads naturally and often turns up in odd parts of the Gardens, the seed being transported by birds.

Polynesian plants on the whole grow well, but comparatively few have been obtained. Many of them are sea-shore plants, and being xerophilous do not do well inland.

African plants.—The plants of the Mascarene Islands and of Western Tropical Africa thrive here, especially the plants of the Congo and Niger forest region. Some of the plants of the East coast Zanzibar have been successfully grown, and considerable additions have been made to the Gardens from Uganda and German East Africa. The central African Sansevieiras have nearly all flowered and fruited. But the very dry region species *e.g.*, *S. Ehrenbergii*, seem to make no growth. The Abyssinian plants and those of the highlands of the interior have generally failed.

Very few of the plants of Southern Africa have been successfully grown here. The Gladioli can be flowered for one or two seasons, but then perish. They have fruited, however; *Richardia aethiopica* the Calla lily, has never been induced to flower, but the more Northern *R. albomaculata* has done so, though the plants were unhappy and soon died away. *Strelitzia Reginæ*, does not flower, but *S. Nicolai* flowered once. *Ravenala Madagascariensis*, grows to a great size and the plants in the Botanic Gardens have always been

admired, but it has never shown any signs of flowering. I have seen it flowering at Peradeniya in Ceylon and fruiting on Mount Matang in Borneo at a height of about 1,000 feet.

Of *North American* plants few thrive here if one excepts some of the Southern States. Sun-flowers, *Helianthus annuus*, Artichokes *H. Tuberosus*, and other of these composites do well. Sun-flowers can be carried on through three or four generations. Artichokes flower though the plants do not develop as tall as they do in England. They produce abundance of tubers. The cultivated Zinnias and Tagetes gradually deteriorate and cease to fruit after a few years. The Californian and Floridan palms will not stand the climate, but *Zamia pumila* grows and flowers well in pots.

South American plants.—The plants of the West Indies grow readily and well, almost without exception. The Mexican plants of the hot- low country are readily grown, as are the Tropical South American plants, with the exceptions of plants from high altitudes. No Masdevallias or Sobralias, and hardly any Odontoglossums or Laelias have been induced to flower here. Miltonias, Oncidiums (a few) Cattleyas Stanhopeas, Catasetum, have been grown with some success. From temperate and subtropic South America little can be grown.

Verbenas can be grown fairly well, but do not fruit.

Herbaceous plants introduced from other countries as seed may even if the seed is good fail to germinate at all. In most cases, however, the seeds germinate and grow for a short time at least.

The opium poppy, *Papaver somniferum,* was introduced on several occasions from India. The seed germinated and grew for an inch or so and then all the plants perished, in spite of all the care taken of them. Another poppy, *P. orientale*, grew a little larger, and one about three inches tall produced a flower but then all perished. Sweet-peas are often introduced, after germinating they become drawn up with stems very thin and pale leaves, occasionally growing to a considerable height and then perishing without flowering. Occasionally plants about six inches tall produce small and wretched flowers. *Lobelia Erinus* usually germinates and produces plenty of leafy stems with irregular and often deformed leaves, and a few flowers here and there. This style of growth is due undoubtedly to the very wet climate. It is not of course caused by the rain falling on the plant, nor the ground being saturated merely, as that could be obviated by growing under glass, and restricting the water, but simply from the humidity of the air. Many plants of herbaceous or half-woody structure are directly killed by the attacks of fungi during the wet season, when not only planted out in the ground but also in pots. An especially noxious fungus of this kind appears sporadically in December, and other rainy months, in the form of a mass of mycelium covered with very small globose orange or white sclerotia; apparently commencing on decaying vegetable matter such as a rotting leaf, it attacks the plant at the collar and is fatal in a few days. A plant of *Lobelia nicotianæfolia*,

attacked by it in December commenced to show signs of damage by the lower leaves wilting and falling off. The roots were mostly destroyed and the stem at the base discoloured and decaying. It was removed, and the stem some six feet tall cut into cuttings which commenced to grow. I have failed to obtain the fruit of this fungus.

A good many plants from foreign countries flower regularly, but fail to set fruit. This may be due to a variety of causes. It is very common to find plants which flower heavily, and do not fruit at first because they are passed over and not visited by any insects. Fertilizing insects seem often to take some years before they find out and visit even conspicuous flowers. I have never seen an insect visit *Spathodea nilotica* or *Eucharis Amazonica* nor *Vanilla planifolia,* nor any of these plants to produce fruit. Yet many exotics are immediately visited by insects which can never have seen them before, and speedily fertilized, even although they are apparently more or less adapted for fertilization by other insects. *Solanum maroniense*, is a shrub or small tree commonly cultivated but which has never so far as I know been seen to fruit in the Botanic Gardens. I have seen, however, a big shrub of it at Perhentian Tinggi in Negri Sembilan, originally from the stock of the plant in the Botanic Gardens in Singapore loaded with fruit. I believe the plant is visited by one of the Acherontias, Death's Head moths, the larvæ of which feeds on the leaves, and which is abundant in Singapore.

In some tubular flowers such as *Ipomea arborea* (*I. carnea*) and *Bignonia magnifica*, large Humble-bees (*Xylocopa*) constantly visit the flowers, and obtained the honey by cutting through the base of the tube without attempting to enter the mouth of the flower and so fertilizing it. These plants have never set fruit.

It is possible that many of these exotics do not produce honey in their nectaries and so hold out no inducement to insects to visit them. The Honeysuckles, of which two species are cultivated here, (*Lonicera*) are, however, constantly visited by *Sphingidæ*, which so appreciate them that I have several times seen *Sphinx Convolvuli* dart into the house and carefully suck every flower of a bunch of honeysuckle in a vase on the table. Yet though probably every flower in the garden is visited by one or more hawk moths, the plant has never yet produced a single fruit.

In some cases certainly a flower fails to produce pollen, the anthers never dehiscing, or the pollen may be destroyed by a fall of rain. It is also occasionally at least, destroyed by the pollen-seeking insects which remove it before it can be applied to the stigma. *Clerodendron Macrosiphon,* a native of Eastern Africa has white long-tubed flowers, with long projecting stamens, and style, and is evidently intended for fertilization by a hawk-moth. The flowers are of short duration, and open early in the day, for a nocturnal flower. They are quickly visited by the small bee *Trigona*, known here as Kelulut, which carefully collects all the pollen from the projecting anthers, and effectually prevents the plant from

being fertilized later by any hawk-moth which might visit it in the evening. The mere opening of the flower too early in the day prevents its producing fruit.

Many herbaceous plants especially the European cultivated annuals, such as Zinneas, Helianthi, Tagetes fruit regularly and abundantly the first year, their offspring are inferior in strength, and dull in colouring, with often smaller flowers, or capitula, and fruiting more and more feebly each year soon die out. The climate seems to have a deteriorating effect on them.

Plants which have long been cultivated from cuttings seem also to lose their reproductive functions. *Justicia Gendaruzza,* is cultivated to a small extent in all native villages and constantly flowers, but its fruit seems to be quite unknown. *Pogostemon cablin*, the Patchouli cultivated abundantly, very rarely flowers and has never so far as I know been known to fruit. The Indigo cultivated all over Singapore from cuttings, though flowering abundantly never seems to set seed. The Lemon-grass, *Andropogon citratus*, and a species of *Pandanus,* commonly cultivated all over the East for its leaves used to flavour rice, have never been known to flower.

Uvaria purpurea, a native of Singapore and various parts of the Peninsula has long been cultivated in the Gardens and is always in flower, yet it has only produced two or three fruits, while an exotic species from Saigon, fruits annually. It seems, however, not uncommon for a shrub or tree to fruit more heavily in a new country than in its own. *Dichopsis Gutta,* for instance, flowers and fruits comparatively rarely in the Peninsula, but in Java we are informed it flowers and fruits abundantly. Many of the forest trees, too, fruit naturally very rarely, *Homalium grandiflorum* flowers very rarely, a tree in the Botanic Gardens has only flowered once in 18 years, and though it then flowered heavily I was unable to find a single fertile fruit on it. Most of the *Diptercarpeæ* fruit but once in five years.

A certain number of the forest trees and shrubs are very regular in flowering and fruiting, some having two annual flowerings, but a number must certainly flower at very rare intervals, for of many by no means rare plants I have never been able to find flowers, notably among the *Laurineæ*.

Many exotic shrubs, however, flower and fruit regularly, and in a few cases have quite established themselves in the country. *Napoleona imperialis*, of West Africa, *Cryptostegia madagascariensis, Strophanthus hispidus*, the Gustavias of Brazil, *Duranta Plumiari Franciscea eximia, Diospyros discolor*, and very many others reproduce themselves with great regularity. *Lantana mixta* and *Mimosa sepiaria, Clitonia cajanifolia* are quite established here.

Imported shrubs.—Most exotic shrubs which grow at all or survive the climate for any length of time flower sooner or later, some, such as Camellias, flower on the old wood shortly after importation, once or perhaps on the second year, then cease to flower though they may live and grow slowly for many years. The flower buds which

are practically produced in their native country alone develop, no more being produced. Japanese azaleas behave in much the same way, but some plants have continued to flower a little annually. In plants which behave in this way a strain might be obtained which would flower as nearly as well as in cold climates by careful selection. Certain shrubs after some time when well grown produce a few flowers, on new wood and then cease to flower again. *Tibouchina semidecandra*, a native of Brazil, was obtained from Kew a few years ago as a small plant. It grew strongly and attained a height of about six feet, and was propagated by cuttings, of these; two plants produced their fine flowers once or twice and then ceased to flower altogether. It has apparently done so before, for in the Herbarium is a specimen from a cultivated plant prepared by Mr. CANTLEY, but the plant had long ceased to exist in cultivation here, doubtless for the same reason.

The two abutilons of Christmas Island, raised from seed brought myself, (*A.* and *A. Listeri*) grew to a great size fully as healthily as any I saw in their native home. Both have flowered but very sparingly, much more so than in Christmas Island. The locality they inhabit is very xerophytic, and most of the local plants, ferns excepted have failed to grow at all in our wet climate.

Many exotic shrubs, however, flower very well and abundantly but never set fruit; such are *Bigonia magnifica*, *B. oequinoctialis*, *Tecoma ceramensis*, *Odontadenia speciosa*, *Mussaenda erythrophylla*, *Bougainvilleas*, *Tecoma Curtisii*, *Ipomea arborea*, *Allamanda Cathartica* (*A. schottii* and *A. williamsi* fruit regularly) and *Solanum maronieuse* which has been already mentioned the causes of these failures to fruit are not very clear. Some of the causes have already been suggested, but there are many cases in which the reasons are not obvious, as the reproductive organs are complete and healthy and the plants regularly visited by insects. A plant introduced from other countries frequently does not fruit the first year apparently because it is not visited by insects, who do not seem to find it out at first, but after a year or two it is regularly visited by insects and produces fruits.

The question next arises as to how we can acclimatize exotic plants so as to make them available for the country into which they have been introduced. We know little as yet concerning the physiology and oecology of plants of the tropics. There have been but few researches made into this subject. The facilities for this work in the British Empire are very scanty, and there are nowhere laboratories or scientists employed in researches of this kind such as are possessed by the Dutch at Buitenzorg or the Americans in Hawaii and the Philippines. Much good work on certain lines have been done in these establishments, but much of our knowledge of tropical agriculture remains in the empirical stage.

By careful selection we may obtain plants proof against the diseases which prevent their cultivation, and we may obtain strains suitable for cultivation under all classes of soil and climate. By

anatomical and physiological research we may discover why one variety develops better in one climate than another and why it produces a better product in one place than another and eventually by careful selection acclimatize a large series of plants which at present we can hardly induce to exist under special climatic conditions. This conquest over nature will entail, however, a very large amount of research, and a very big cultivation area under the hands of scientific men whose time is exclusively employed in making such investigations. The possibilities of the results, however, are enormous, and will well repay the expenditure of time and money.

H. N. R.

PLANT LIFE AND DISEASE.

A plant is a breathing feeding object with many activities or functions; it elaborates chemical compounds from the liquids it absorbs from the soil and the gases it assimilates from the air; it grows, reproduces its kind, and is sensitive to changes in its surroundings. If it cannot control its immediate conditions, it can to a great extent adapt itself to them.

Growth is probably the most dominant phenomenon we associate with plants. It is affected by soil, water, air, light and heat. For each of these factors there is a certain range within which the functions of the plant regularly proceed. For each species of plant, for example, there is a certain temperature below which it will not grow, and likewise a definite temperature above which growth ceases. Between these two extremes and near the middle is a point—the optimum point—which is the most beneficial. There is a most advantageous strength (concentration) for each of the necessary salts in the soil, and optimum points for water and each of the other factors. If every factor is at its optimum the plant is in the best position for growth; most likely this condition is never realised in nature.

Any prolonged derangement in the factors of growth usually results in a curtailment of function and this must be looked on as disease. From this point view a plant like the banana, which seldom produces seeds capable of germinating, is diseased. Disease is rather difficult to define, and for our purposes we may take it that a plant is diseased which is not growing in what we know from practice to be its normal manner.

The causes of unhealthiness may be shortly put down as due to:

(1) Derangement of any or all of the factors of growth;

(2) Attacks of parasites (plant or animal).

The question of the relation between the health of a plant and its immunity, or the contrary, from fungal attacks is decidedly not settled. It is held by many experts that fungal infection is due to

the presence in the juices of the plant of some substance which attracts the parasite. On this view infection is independent of the health of the plant, but it has been found that "susceptibility can be induced by various kinds of mechanical injury" and also by certain interferences with the normal functions such as anæsthetising or overheating the leaf. Often stem-boring insects open the way for hurtful fungi and bacteria. There is a class of fungi—the wound parasites—which can only obtain a hold on the plant when the bark has been injured. Animals frequently denude considerable areas on certain kinds of trees: tar should be liberally applied in such cases.

The interference of man with cultivated plants is to submit them to conditions different in many ways from those surrounding the plants in their wild states, and to develop them along particular lines, thus disturbing the normal equilibrium and rendering the plant more susceptible to disease. This may have a lot to do with the violent epidemic character frequently assumed by some diseases of cultivated plants.

The economic pursuit of the greater number of cultivated plants is for their ripened fruits, or for some part connected with reproduction, such as tubers and fleshy roots. This would not appear at first sight to be very harmful as the production of seed is the great feature in the life of a plant, one might truly say the aim and object of its existence. But man is not content with the quality and quantity of seed which a plant produces in its wild state. He seeks to make various modifications which leave the plant more prone to disease. The balance of a tree's functions is more disturbed where something other than the fruit is the object, such as latex in rubber-producing trees, and various unhealthy signs may make their appearance. In all trees there is a considerable power of responding to changed surrounding and repairing injuries, but some kinds possess it to a greater extent than others. Tapping rubber trees must be looked on as an injury to the tree, but the Para rubber tree (Hevea brasiliensis) appears to be far from delicate and to manifest a great plasticity in adapting itself to new conditions, but this property cannot be too far presumed upon. Enough information has not yet been collected to specify the effect of tapping on the health of the tree, but on theoretical grounds the action of many Planters in giving the tree a couple of months' rest, especially during the leafless period, is commendable and is probably necessary to restore the functions to their normal state. It is well known that tapping Rambong (Ficus elastica Roxb.) and Ceara (Manihot Glaziovii Mull-Arg.) after the manner practised on Para has had fatal results, even when the cambium remained uninjured.

In a Para tree on the inside of the cortex, the part containing the latex-vessels, there is a thin layer called the bast, which is a kind of highway along which food products elaborated in the leaf travel to the root and other parts of the tree. Inside this is another thin layer, the cambium, which has the power of growth ; it adds to the wood on the inside and to the bast on the outside, thus

increasing the thickness of the tree. When the stem is injured, *e.g.*, by animals peeling off the bark, the cambium attempts to grow over the wound and cover it up, but often not quickly enough, if the injury is of considerable area, to prevent wound-fungi, which are among the commonest parasites of stems, obtaining a lodgment.

The soil is an important factor in the health of the plant. An excess of moisture, not so much as mere moisture but because it excludes air, is highly detrimental; though the amount which can be comfortably tolerated varies with different species of plant. Equally detrimental is an excess of free acids, especially on a plant which gives off a relatively large amount of water from its leaves (transpires strongly). The roots or trees exercise great selective power, but too much of the mineral salts which are necessary to the healthy growth of a plant may prevent it thriving or set up pathological appearances. Though in this as with the amount of moisture what is one species' food is another species' poison. Just as certain species of plants can successfully withstand drought which would be fatal to others, so can particular plants grow on a soil containing a concentration of mineral salts which would stunt or kill those not accustomed to it. There are certain infectious diseases, such as the "mosaic" diseases of tobacco, and "peach yellows" in the United States, the "spike" disease of sandalwood trees in India, which are not due to fungi or bacteria, but to internal disturbances in the economy of the plant. They are generally assigned to faults in nutrition, to a surplus or deficiency of certain necessary elements in the soil; but there is considerable diversity of opinion as to the actual causes.

It has been said that a plant lives up to its privileges. It endeavours to make arrangements to meet persistent difficulties such as continual strong wind, or a loose soil in which it must make special efforts to attain a firm foothold, but it makes no preparation to meet unaccustomed attacks hence the damage done by storms of wind or hail. If coffee or sugar is cut down before the Para planted among them has got well above their level, it is sure to suffer from wind. When trees are blown down, unless the wind has been much beyond the ordinary, the soil, especially the drainage of the subsoil, and the health of the root must be investigated. When several show a tendency to topple over it is often ascribed to top heaviness, which should be assigned as a cause, if indeed it ever can be one, only when all others have been dismissed as improbable.

From the foregoing it will be seen that attention must be paid to soil and surrounding conditions and to any unnatural treatment, such as tapping, or cutting leaves, to which a tree is exposed if not alone itself but its neighbours of the same species are to be kept healthy.

Unhealthiness caused by parasites is the more dangerous. If it assume an epidemic character the monetary loss may be serious, perhaps sufficient to destroy an entire industry. These references are to parasites of a plant nature only (fungi and bacteria).

Diseases originated by insects form a very large field of inquiry coming within the scope of the Entomologist.

Fungi are the plant parasites which most often cause disease. Infection is usually by transmission from plant to plant of the seeds (spores) by the wind, but insects, birds, agricultural implements, and various other agencies co-operate. When the spore lights on the host-plant, if the moisture, wound or other condition which it requires for germination is present, it sends microscopically thin threads for a longer or shorter distance into the host, which is sometimes stimulated to excessive growth, as witches' brooms on branches or huge excrescences on stems, at others atrophy or imperfect development of parts, such as blasted fruits or distorted leaves, may result. The parasite may destroy the leaves and as a consequence the host, as a leafless plant can no longer elaborate food for itself. Without causing actual death a parasite—on root, stem or leaf—may so disarrange the economy of its host that certain functions cease production of fruits or of latex for instance.

Some fungi grow on living plants only; the bigger bulk of undesirable parasites fall within this category. Others, called saprophytes, can live on dead matter only; the greater number of these are useful, disintegrating dead plant and animal remains into a form assimilable by young plants, but many, such as those which attack timbers, are harmful. There is a third group which can exist on living or dead plants indifferently. Thus Fomes semitostus Berk is said to travel through the soil from old jungle stumps on which it grows to the young Para root, ultimately killing it.

A particular parasitic fungus can infect only one species of plant, or at least only closely allied species, but this feature is of little moment where areas square miles in extent, as in most tropical estates, are covered by the same kind of plant.

Treatment is usually most effective along lines of prevention. The object is rather to hinder further infection. As a rule satisfactory remedies can be advised only when the life-history of the plant is pretty well known. In some part of its career it may offer a vulnerable point which can be victoriously attacked. A method certain to eradicate the parasite is often impracticable on grounds of cost or applicability, but it may be cheapened and simplified as new facts are brought to light. The life of many parasites is in two stages, each on a different host. One of the hosts may be of no economic value, and its destruction may be easier as well as less costly than that of the valuable plant. Spraying with chemical mixtures is usually an efficient preventive of the further progress of leaf diseases. For root diseases, and often for advanced cases of stem disease, the total destruction of the plant is the only hope, then the soil is treated with quicklime which hastens the destruction of organic matter; if nothing is planted in the spot for a time, the fungus is starved out. As an example of another method one might cite the smut of corn, where it was found that infection came from spores which remained attached to the seed-grain and being

sown with it entered the young seedling finally travelling upon the ear and destroying the young fruit. Simple treatment of the grain with a cheap fungicide solution before sowing destroys the noxious fungal spore without injuring the germinating power of the grain. There is no universal application ; the circumstances of the case determine the mode of procedure.

Changes of season—wet to dry, warm to cold—help the destruction of fungal spores ; though most fungi have adaptations, such as specially resistent spores, to surmount this obstacle. The potato blight, which prematurely kills the leaves, winters in the tuber. The uniformly warm and moist climate, without any marked distinction into seasons, of this Peninsula is well suited to rapid spread of fungi. For this reason and on account of the large areas covered with the same species of tree the early notification of unhealthiness is important. A specimen from the diseased plant should be sent to the Department of Agriculture for investigation and advice. Usually too little material is sent ; it is better to err on the side of sending too much. Specimens should not be sent in an envelope ; certain parts sent in this way arrive too dry and shrivelled up, others get crushed ; besides it generally means too little material. Moist vegetable matter should be carefully dried and sent in a package or box. Do not send detached leaves ; send the twig and leaf together, pressed flat between sheets of newspaper. Large specimens, such as portions of roots, stems, or large fruits, should be forwarded in ventilated boxes. If it can be conveniently done it is advisable to send the root. Do not send what seems to be the most diseased part in a stem or root, but take a specimen which includes the apparent boundary between healthy and diseased tissues. An account of all observations made on the disease should be sent, will prove useful in the laboratory and may help considerably in diagnosing the disease and advising treatment.

In the main this paper is for Rubber planters, but the burden of its remarks apply equally to coconuts, coffee, sugar, rice, tapioca and the numerous other vegetable products of the Peninsula.

W. J. GALLAGHER, M. A.

THE SIGNIFICANCE OF LATEX IN PLANTS.

The following appears in the "Tropenpflanzer": A paper by Dr. HANS KNIEP appeared under the above title in "Flora" in 1905 and deserves to be known to a wider circle. On the basis of a critical examination of earlier researches in this field and supported by his own experiments, the writer attempts to show that it cannot be proved on either anatomical or physiological grounds that the laticiferous vessels are important organs for conducting or storing plastic substances, functions ascribed to them by many authors. On the contrary various experiments testify against the latex taking any considerable share in the nourishment of the plant. The facts of chemistry are also in agreement with this. The quantity of products

(rubber, gutta, resin, alkaloids, etc.) in the latex, which are unutilizable by the plant, is disproportionately higher than the so-called available food stuffs. The former are, however, no necessary waste-products of chemical change, but are formed at a great expense of organic material. Consequently it must be accepted that the plant produces them to perform a definite function. There are, in fact, proofs that the latex has a prominent oecological significance. It often does the plant good service by closing wounds. In consequence of the poisonous, corrosive and unpleasantly tasting substances it contains, it particularly protects the plant, as numerous experiments on euphorbias show, from being eaten by animals."

The last sentence is hardly applicable to the Para Rubber tree, which either because of or despite its latex is greedily attacked by animals.

W. J. G.

CAMPHOR OIL.

We extract the following from an interesting paper by VICTOR CAYLA in the October number of the "Journal d'Agriculture Tropicale."

The export of camphor oil from Formosa increased considerably and more rapidly than that of camphor from 1897 to 1901, but since then it has suffered the same fluctuations. The quantity exported in 1905 was about four-fifths that of crystallized camphor. Japan took about one-eighth of the production in 1907, but almost the half in 1901. The price in Formosa is about half that of crystallized camphor, and rose from 3 yen per picul in 1888 to 15 yen in 1905.

The oil is got from the camphor tree of Formosa and Japan, Cinnamomum Camphora Nees; it forms from two-thirds to three-fourths of the matter entering the condensing vessels in the process of extraction. The yield from a tree is variable; the more camphor oil the less crystallized camphor, as the latter is soluble in the former. The Japanese method of extraction gives more than the Chinese, and young trees more than old, and the twigs and leaves more than the trunk. Camphor oil is a mixture of pure camphor and essential oils. Formerly camphor oil was treated as valueless, but the rise in the price of camphor has drawn attention to it, and of the application of modern methods withdraws half of it as pure camphor. The remainder can be separated into a light and a heavy oil. The oil is utilized in numerous ways; it is an excellent solvent of lacquers, varnishes, gums, caoutchouc, etc., and replaces terebinth oil as a cleanser of articles, such as printing type, soiled by fatty inks. The heavy oil is of less value.

W. J. G.

A CANKER DISEASE OF HEVEA.

Herr KURT BUSSE, Deli, refers in the November number of the "Tropenpflanzer," to a canker disease of Hevea. It appears on two-year old trees, and its progress may be stopped by cutting out the diseased part and disinfecting the wound with a mixture of tar and carbolic acid. Trees treated in this way are completely healed inside three months. Herr Dr. W. BUSSE, remarks that it still remains to be seen whether trees, which have satisfactorily healed after treatment for canker, show a latex production similar to normally healthy trees. He adds that on most estates activity in combating plant-disease is manifested only when the disease is already well advanced, and recommends that all plants should be sharply examined at regular intervals for signs of disease.

W. J. G.

We have received a small paper on Vulcanisation tests with Plantation Rubber by Messrs. CLAYTON BENDLE and STEVENS—being a reprint from the "Chemical News" of July 26, 1907, No. 2487, Vol. 96, page 37. The authors show by experiment the comparative value of Plantation Rubber, and hard cure para, to the advantage of the former. As the whole paper is of great interest we hope to reproduce it in full in our next issue.

AGRICULTURAL SHOW 1908.

We would remind our readers that the Agricultural Show for this year has been fixed to take place sometime about August at Kuala Lumpur. It is important that all intending exhibitors should begin to prepare their exhibits in good time. A liberal dressing of manure around coconuts, fruit trees, etc., would be beneficial as would thinning the fruits at a later stage on those trees reserved for exhibition purposes. It would be a good thing if District Officers would issue preliminary notices in their districts calling the attention of the natives to the desirability of taking early action.

W. F.

NOTE.

Mr. H. N. RIDLEY returned from leave on the 27th instant.

W. F.

GOW, WILSON & STANTON, LIMITED—
India Rubber Market Report.

13, Rood Lane, London, E.C.

December 6th, 1907.

This was about the largest auction of Plantation Rubber that has yet been held, and the stronger tone of the market was well evidenced by the good competition that was forthcoming for all grades.

About one half of the offerings were disposed of in the room at prices generally showing an advance of from about 4*d.* to 6*d.* per lb. on last sale quotations. This is more satisfactory in view of the fact that the Bank Rate remains unchanged, and that the position in America as yet hardly admits of active business in that market.

Sheet and Biscuits were in good demand and sold readily at from about 3/11 to 4/4¼ per lb., the latter price being realised for some very fine dark Sheet from Highlands Estate, while the highest price for Biscuits, *viz.*, 4/3, was paid for some from Arapolakande and Glencorse Estates.

Crepe was rather more plentiful than other descriptions, and the quotation suffered to some extent in consequence. Some of the palest offered, *viz.*, that from Jebong, was withdrawn for higher limits, and the highest price for this grade was 4/2¾ paid for a small lot from Arapolakande.

Block continues to be less sought after than other kinds, and 66 cases of fine clear amber block from Lanadron Estate were bought in for want of competition.

Number of Packages Advertised.		Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.		
		Ceylon.	Malaya.	Totals.	No. of Pkgs. Sold.	Price.	Hard Fine Para.	Plantation.	
								Fine.	Scrap.
To-day ...	1,001	11¾	37¼	49	481	3/7⅞	3/8½	3/11 to 4/4¼	2/6 to 3/0¾
Corresponding sale last year ...	289	4	12	16¼	217	5/2¾	5/2	5/7½ to 5/8½	4/- to 4/5

Quantity of Plantation Rubber offered at Auction from 1st January to date.

—	No. of Pkgs. Offered.	Quantity in Tons.			No. of Packages Sold.	Average Price Paid.
		Ceylon.	Malaya.	Total.		
1907	14,810	186½	599¾	786¼	7,180	about 4/10¼
Same period 1906	6,116	89¼	235¾	325	3,830	5/6¼

GOW, WILSON & STANTON, LIMITED—
India Rubber Market Report.

13, ROOD LANE, LONDON, E. C.

December 28th, 1907.

The Rubber producing industry in Malaya and Ceylon continues to expand, while the price of British grown Rubber maintains its position at the top of the markets of the world.

There has recently been a very rapid increase in the cultivation of Rubber both in Malaya and Ceylon. The features of the past year having been the large opening up of both these countries with Hevea Braziliensis, and the inception of many new Companies. The potentialities of this new business are so great that it is difficult to forecast what the result may be in a few years' time. So far the soil and climate of both Malaya and Ceylon appear thoroughly well adapted to the healthy growth of Hevea Braziliensis, the species so far giving the best returns to growers, while the profits, even at recent quotations, are very satisfactory.

The Price of Rubber has, however, fallen very materially during the past year, and while the finest class of Rubber from our Eastern Dependencies was selling in January at 5/9 per lb., its value has gradually declined until in November it fell to 3/10, the lowest point reached since August, 1902. Since then there has been a slight recovery and it is now quoted at about 4/-. The highest price obtained was in the month of May, 1905, *viz.*, 6/9¾. No doubt one of the chief causes for the recent decline was the financial trouble in the United States of America, which has prevented many Houses there from filling their requirements. The fact of these difficulties coming at a time when the motor and electrical industries were quiet, further accentuated the depression.

The total quantity exported from Malaya from January 1st to the end of October, 1907, was 683 tons, and from Ceylon, 181 tons, the quantity for the previous two complete years from these places being 130 and 385 tons from the former, and 75 and 146 tons from Ceylon.

It is gratifying to see not only that manufacturers continue to take the product from our Eastern Dependencies so readily, but that they are willing to pay a much higher price than for any other kind. When Plantation was selling at 5/9, Para was worth 5/2½; to-day the highest price for Rubber from the Far East is 4/-, while that of Para is 3/5½.

There is now very little doubt that in six or seven years' time production will have increased to a large figure, but it is impossible to say whether the price will by that time have fallen to any very great extent, as the consumption of the article seems likely to increase rather than otherwise, owing to the number of uses to which Rubber is put, and to the expansion of the various classes of motor industries.

All this speaks well for the future of British grown Rubber. The reputation which it has already acquired is mainly due to its

purity and careful preparation, and if planters will continue to aim for super-excellence in these respects, and keep their working costs as low as possible, it looks as if many years of prosperity were in store for the industry.

Revised Table showing Total Quantity and Average Prices of Plantation Rubber offered at Auction during the last two years.

—	No. of Pkgs. Offered.	Quantity in Tons.			No. of Pkgs. Sold.	Average Price Paid.
		Ceylon.	Malaya.	Total.		
1907	15,380	192½	621½	814	7,388	4/9⅝
Same period 1906	6,462	98¼	250¼	348½	4,130	5/6¼

Note.—This cancels the table given in our Market Report of the 20th instant.

TO-DAY'S QUOTATIONS.

Sheet, etc.

Fine Block	none sold
Good to Fine Sheet	4/- to 4/4¼
Very Fine Biscuits	4/3
Good to Fine Biscuits	3/11 to 4/2¾

Crepe.

Very Pale	4/1 to 4/2¾
Palish to Mottled	3/6 to 4/-
Dark and Blocked	3/- to 3/4½

Unwashed Scrap.

Good	2/9 to 3/0¾
Low & Barky	1/6 to 2/5

SHIPMENTS.

Exports from 1st January to 19th October, 1907:—

From Singapore	1,116,330 lbs.
From Penang	313,228 lbs.
Total ...	1,429,558 lbs.

Exports from 1st January to 11th November—From Ceylon:—

1907	...	...	...	413,031 lbs.
1906	...	...	...	300,255 ,,
1905	...	...	...	120,091 ,,
1904	...	...	...	61,075 ,,

(The Singapore and Penang figures are taken from Statistics published by Messrs. Barlow & Co., of Singapore).

Mark.	Pkgs.	Description.	Price.
		Ceylon.	
Kumaradola	2	Good biscuits ...	4/0¾.
	1	Lump scrap ...	bought in.
G M	10	,, ,, ...	2/5 to 2/6.
Vicarton	2	Good palish biscuits (77 lbs.)	3/7½ to 4/-.
	1	Barky scrap ...	2/-.
Matang	23	Good palish to darkish crepe	3/2¼ to 3/8.
	12	Good sheet ...	4/2½.
	3	Wet pressed crepe and scrap	pt. sold 3/-.
Sorana	6	Good biscuits ...	4/2¼.
Gonakelle	1	Good biscuits ...	4/2½.
	2	Fine scrap and cuttings ...	2/7½ to 2/11.
V S	7	Good biscuits and sheet ...	4/- to 4/0¾.
KM	4	Darkish and dark crepe ...	2/4 to 3/4½.
	3	Biscuits, scrap and rejections	2/6 to 2/10.
Waharaka	2	Block & scrap ...	2/7 to 4/-.
	1	Very fine scrap ...	bought in.
Ambatenne	1	Good biscuits ...	4/2½.
	1	Scrap ...	1/6.
Densworth	2	Good biscuits ...	4/2¾.
	1	Good scrap ...	bought in.
Sunnycroft	1	Good sheet ...	4/-.
Doranakande	4	Block scrap ...	2/7.
Tallagalla	2	,, ,, ...	2/7.
MAK	9	Good biscuits ...	3/4 to 4/-.
	7	Crepe, scrap and rejections part sold ...	2/7 to 2/3-.
Taldua	2	Good biscuits ...	4/2½.
	1	Scrap ...	2/6.
Northumberland	1	Block scrap ...	2/6.
Clara	1	,, ,, ...	2/9.
K M	3	Good and medium biscuits	3/9.
Culloden	13	Very fine pale crepe ...	4/1.
	5	Fine palish and brownish ...	3/7¼/ to 4/-.

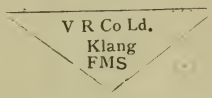
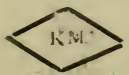
Ceylon—*Continued.*

Mark.	Pkgs.	Description.		Price.
Culloden	11	Good dark	...	3/5.
	2	Dark block	...	3/3.
Arapollakande	1	Very fine pale crepe	...	4/2¾.
	7	Fine biscuits	...	4/3.
	1	Good mottled crepe	...	3/7½.
	3	Brownish to darkish	...	3/6.
	1	Good scrap	...	3/-.
Glencorse	1	Fine biscuits	...	4/3.
	3	Good scrap and cuttings	...	2/5½ to 2/10½
Neboda	9	Good brownish to dark crepe	...	3/1½ to 3/7½.
Aberdeen	5	Very fine sheet	...	4/2.
	1	Good pressed scrap	...	2/10.
	1	Good rejections	...	2/6.
Glanrhos	14	Good sheet and biscuits part sold		3/10¼ to 4/-.
	1	Dark pressed crepe	...	bought in.
Marakona	1	Fine sheet	...	4/1¼.
Clontarf	1	Black crepe	...	bought in.
Gikiyanakande	10	Very fine pale worm	...	bought in.
	7	Brownish to darkish crepe		3/2¼ to 3/8.
Kepitagalla	12	Fine sheet	...	4/1.
	1	Rejections	...	bought in.
Suduganga	2	Fine sheet	...	4/-.
	2	Rejected sheet	...	bought in.
L B / L H	4	Fine palish worm	...	bought in.

MALAYA.

Jebong	94	Very fine pale crepe	...	bought in.
Golconda	7	Good sheet	...	4/0½.
	1	Dark block	...	3/-.
L E / Muar / Straits	66	Very fine block	...	bought in.
	54	No. 2 block	...	bought in.
E / K P K	5	Fine sheet	...	withdrawn
	1	Fine pale crepe	...	
	1	Darkish	...	
F D / P	4	Good block	...	bought in.
	2	Scrap	...	bought in.
	10	Good sheet	...	4/- to 4/2.
	1	Rejections	...	2/10.

Malaya—*Continued.*

Mark.	Pkgs.	Description.	Price.
B & D	11	Fine pale to darkish crepe	3/5 to 4/1.
	6	Good darkish to dark crepe	3/- to 3/6.
	2	Fine pale sheet ...	4/- to 4/1.
	1	Good biscuits ...	3/11.
B & D	1	Good sheet ...	4/1.
	1	Scrap ...	3/6.
Damansara	17	Fine sheet ...	4/1¾.
	2	Good dark block ...	pt. sold, 2/3.
	19	Fine palish crepe ...	bought in.
	9	Good to medium dark block part sold,	2/9 to 3/-.
S K R Co Ld.	17	Good palish crepe part sold,	3/6 to 3/10.
	7	Good dark block ...	bought in.
A G & Co.	1	Fine pale sheet ...	4/1.
	4	Dull biscuits ...	3/8.
	7	Biscuits, scrap, etc. pt. sold,	2/5 to 2/10.
Jugra	1	Darkish pressed crepe ...	2/9.
B	3	Dark block ...	bought in.
	46	Good palish and mottled crepe part sold, ...	3/7¼ to 3/7½.
	10	Dark part sold, ...	3/1¾ to 3/4¼.
E A C	15	Very fine pale crepe ...	4/0¾.
	11	Good brownish & dark crepe ...	3/5 to 3/7.
	3	Rough biscuits ...	bought in.
	3	Fine sheet ...	bought in.
	4	Good scrap ...	2/8.
	1	Good sheet ...	bought in.
	2	Good sheet part sold, ...	4/1¾.
	2	Scrap ...	bought in.
P S E	8	Fine sheet ...	4/2¼.
	3	Ball ...	bought in.
B S	18	Fine sheet ...	4/2.
Bila	19	Good scrap and rejections...	2/7½ to 3/0¾.
Linggi Plants.	41	Very fine pale and palish crepe & block ...	bought in.
	15	Dark pressed crepe and block ...	2/8.

Malaya—*Continued.*

Mark.	Pkgs.	Description.		Price.
Sungei Krudda	4	Palish scrap	...	2/10 to 2/10¼.
	11	Dark pressed crepe and scrap part sold,	...	2/4.
	1	Mottled crepe	...	3/7½.
	6	Good sheet	...	bought in.
Highlands	20	Fine sheet	...	4/3¾ to 4/4¼.
	36	Good palish to darkish crepe	...	3/3 to 3/8½.
	1	Fine block	...	3/8.
	1	Good dark block	...	3/3½.
Glenmarie	7	Good sheet & biscuits	...	4/- to 4/1.
	1	Dark pressed crepe	...	2/11.
A R / P Co.	2	Darkish to dark crepe pt. sold,		3/2½.
BNS	36	Fine sheet	...	bought in.
	1	,, (damaged)	...	bought in.
	2	Good scrap	...	bought in.
H E A	9	Fine palish crepe	...	bought in.
	3	Darkish to dark blocked crepe	...	bought in.
LABU	31	Fine pale and palish crepe...		bought in.
G F T L	2	Darker	...	bought in.
L	5	Darkish	...	bought in.
Terentang	9	Fine palish crepe	...	bought in.
Linsum	9	,,	...	bought in.
Shelford	6	Fine and medium block	...	3/3¾ to 3/4¼.

Singapore.

Abstract of Meteorological Readings for the month of November, 1907.

District.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
	Ins.	°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
Singapore	29·879	143·9	80·2	87·4	74·4	13·0	77·2	·868	...	80	N.W.	4·18	1·02
Botanic Gardens	...	...	...	...	...	...	...	..	...	...		7·83	1·02

Singapore, 5*th December*, 1907.

D. K. McDowell,

Principal Civil Medical Officer.

Penang.

Abstract of Meteorological Readings in the Criminal Prison Observatory for the month of November, 1907.

District.	Mean Barometrical Pressure at 32° Fah.	Mean Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Mean Maximum.	Mean Minimum.	Mean Range.	Mean Wet Bulb.	Mean Vapour Tension.	Mean Dew Point.	Mean Humidity.			
	Ins.	°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
Criminal Prison Observatory, Penang ...	29·877	145·4	78·3	86·9	72·8	14·1	76·2	·860	73·6	83	N.W.	17·16	3·46

Colonial Surgeon's Office,
Penang, *9th December*, 1907.

M. E. SCRIVEN,
Assistant Surgeon.

R. . DANE,
Acting Colonial Surgeon, Penang.

Malacca.

Abstract of Meteorological Readings for the month of November, 1907.

District.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
	Not Registered.	°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
Durian Daun Hospital ...		153·8	79·1	87·1	72·5	14·5	79·8	1·001	69·5	92·3	W.	7·64	2·34

Office of the Medical Officer,

Malacca, *2nd January*, 1908.

F. B. CROUCHER,

Medical Officer.

Perak.

Abstract of Meteorological Readings in the various Districts of the State for the month of November, 1907.

District.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Taiping ...	...	152	80·30	90	71	21	77·17	894	...	87	...	27·87	5·15
Kuala Kangsar ...	...	...	77·97	89	71	18	74·47	809	...	85	...	16·78	4·53
Batu Gajah ...	...	163	78·97	90	73	17	76·16	868	...	88	...	18·95	4·00
Gopeng ...	...	...	...	...	...	...	...	...	...	...	...	22·28	5·02
Ipoh ...	...	...	79·40	91	70	21	76·03	854	...	86	...	19·10	3·35
Kampar ...	...	...	78·80	89	70	19	75·48	841	...	85	..	15·65	4·50
Teluk Anson ...	...	...	79·93	91	68	23	76·42	863	...	85	...	12·87	1·88
Tapah ...	...	...	79·89	93	54	29	75·92	843	...	82	...	18·33	2·55
Parit Buntar ...	...	...	79·70	89	70	19	76·26	861	...	85	...	16.73	3·41
Bagan Serai ...	...	...	80·18	91	71	20	76·65	870	...	85	...	18·14	3·10
Selama ...	...	...	79·42	91	71	20	76·13	864	...	86	...	24·37	4·67

STATE SURGEON'S OFFICE,
TAIPING, 19*th December*, 1907.

M: J. WRIGHT,
State Surgeon, Perak.

Selangor.

Abstract of Meteorological Readings in the various Districts of the State for the month of November, 1907.

District.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension	Dew Point.	Humidity.			
	Ins.	°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
General Hospital, Kuala Lumpur	29·881	149·8	80·3	89·3	71·1	18·2	75·8	·810	72·9	78	S.W.	7·73	1·50
Pudoh Gaol Hospital ,, ...	...	...	...	...	...	...	...	...	...	...	...	7·58	1·31
District Hospital ,, ...	...	...	...	...	...	...	...	...	...	...	...	9·68	1·71
,, Klang	...	...	...	86·8	70·4	16·4	...	...	...	...	...	11·18	2·19
,, Kuala Langat	...	...	...	...	...	...	...	...	...	...	...	10·69	2·43
,, Kajang	...	...	...	83·9	75·1	8·8	...	...	...	...	...	12·11	2·39
,, Kuala Selangor	...	...	...	87·8	78·7	9·1	...	...	...	...	...	11·05	2·45
,, Kuala Kubu	...	...	...	...	...	...	...	...	...	...	...	18·97	2·74
,, Serendah	...	...	...	...	...	...	...	...	...	...	...	15·61	2·98
,, Rawang	...	...	...	88·1	71·4	16·6	...	...	...	...	...	14·01	2·46
Beri-beri Hospital, Jeram	...	...	...	...	...	...	...	...	...	...	...	9·27	1·80
Sabak Bernam	...	...	...	...	...	...	...	...	...	...	..	5·72	1·29

State Surgeon's Office,
Kuala Lumpur, 31*st December*, 1907.

A. J. McCLOSKY,
State Surgeon, Selangor.

Pahang.

Abstract of Meteorological Readings in the various Districts of the State for the month of November, 1907.

District.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
	Ins.	°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
Kuala Lipis ...	...	...	76·91	92·	68·	17·56	75·65	...	...	...	...	5·71	2·02
Raub ...	...	...	78·36	89·	67·	18·06	74·83	...	...	...	...	11·28	1·72
Bukit Fraser ...	...	...	...	...	...	...	...	...	...	...	...	14·64	2·02
Bentong ...	...	...	80·3	91·	68·	16·63	75·73	...	...	...	...	10·80	2·54
Temerloh ...	...	...	...	94·	70·	18·26	...	...	...	...	...	5·86	1·45
Pekan ...	...	...	80·0	96·	72·	18·0	76·	...	...	...	...	11·23	2·68
Kuantan ...	...	...	85·46	94·5	69·	15·80	77.26	...	...	...	...	4·38	·78
Sungei Lembing ...	...	...	...	87·	66·	...	...	...	...	...	...	14·77	2·45

State Surgeon's Office,

Raub, 28*th December*, 1907.

W. H. FRY,

State Surgeon, Pahang.

The Duff Development Company, Limited, Kelantan.

Abstract of Meteorological Readings for the month of November, 1907.

District.	Temperature.			Rainfall.	
	Maximum.	Minimum.	Range.	Total Rainfall.	Greatest Rainfall during 24 hours.
	Mean. °F	Mean. °F	Mean. °F	Inches.	Inches.
Kuala Lebir ...	84·2	72·4	11·8	15·16	2·81
Kuala Kelantan ...	80·8	72·5	8·3	23·29	5·01
Taku Plantation ...	...	...	...	13·72	2·11
Kuala Pergan ...	...	...	...	10·49	1·95

SURGEON'S OFFICE,
KUALA LEBIR, 13*th December*, 1907.

JOHN D. GIMLETTE,
Surgeon.

Singapore.

Abstract of Meteorological Readings for the month of December, 1907.

District.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
	Ins.	°F	°F	°F	°F	°F	°F	Ins.	°F	%		Ins.	Ins.
Singapore	29·887	140·2	78·7	85·9	73·2	12·7	76·5	·860	...	83	N.W.	13·53	3·14

P. C. M. O's Office,

4th January, 1908.

D. K. McDowell,

Principal Civil Medical Officer.

Penang.

Abstract of Meteorological Readings in the Criminal Prison Observatory for the month of September, 1907.

District.	Mean Barometrical Pressure at 32° Fah.	Mean Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Mean Maximum.	Mean Minimum.	Mean Range.	Mean Wet Bulb.	Mean Vapour Tension.	Mean Dew Point.	Mean Humidity.			
	Ins.	°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
Criminal Prison Observatory Penang ...	29·918	148·1	79·6	88·5	73·7	14·5	77·6	·871	76·2	79	N.W.	8·07	1·56

Colonial Surgeon's Office,
Penang, *7th October*, 1907.

M. E. SCRIVEN,
Assistant Surgeon.

A. H. KEUN,
Colonial Surgeon, Penang.

Penang.

Abstract of Meteorological Readings in the Criminal Prison Observatory for the month of December, 1907.

District.	Mean Barometrical Pressure at 32° Fah.	Mean Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Mean Maximum.	Mean Minimum.	Mean Range.	Mean Wet Bulb.	Mean Vapour Tension.	Mean Dew Point.	Mean Humidity.			
	Ins.	°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
Criminal Prison Observatory, Penang ..	29·896	143·1	78·3	86·3	73·0	13·3	76·2	·863	74·8	82	N.	7·42	2·05

COLONIAL SURGEON'S OFFICE,
PENANG, 11*th January*,, 1908.

M. E. SCRIVEN,
Assistant Surgeon.

R. DANE,
Senior Medical Officer.

Malacca.

Abstract of Meteorological Readings for the month of September, 1907.

District.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
	Ins.	°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
Durian Daun Hospital	Not Registered.	148·6	79·9	89·2	70·5	18·7	81·5	1·061	67·9	93	N. W.	10·02	3·25

COLONIAL SURGEON'S OFFICE,
MALACCA, 31*st October*, 1907.

F. B. CROUCHER,
Colonial Surgeon, Malacca.

Malacca.

Abstract of Meteorological Readings for the month of December, 1907.

District.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
		°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
Durian Daun Hospital ...	Not Registered.	149·9	78·3	86·7	73·7	12·9	79·0	·980	69·8	94·7	N.	12·31	3·33

F. B. CROUCHER,
Medical Officer, Malacca

Office of the Medical Officer,
Malacca, 17*th January*, 1908.

Perak.

Abstract of Meteorological Readings in the various Districts of the State for the month of December, 1907.

District.	Maximum in Sun.	Temperature.				Hygrometer.			Total Rainfall.	Greatest rainfall during 24 hours.
		Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Humidity.		
Taiping ...	147	80·46	90	70	20	77·13	889	86	14·10	3·53
Kuala Kangsar ...	...	78·73	89	70	29	74·77	811	82	6·50	1·76
Batu Gajah ...	155	79·28	90	72	18	76·73	886	89	9·83	2·57
Gopeng ...	...	...	...	...	...	...	...	...	5·94	1·38
Ipoh ...	...	78·51	90	70	20	75·57	847	86	8·92	2·41
Kampar ...	...	79·09	90	71	19	75·62	840	84	12·97	2·63
Teluk Anson ...	...	83·76	92	70	22	76·62	821	71	11·47	3·01
Tapah ...	..	79·85	90	70	20	75·96	845	83	11·95	2·05
Parit Buntar ...	...	80·15	89	70	19	76·14	848	82	5·35	2·98
Bagan Serai ...	...	80·31	90	70	20	76·51	864	83	6·28	3·26
Selama ...	...	80·06	91	70	21	76·20	855	83	13·10	3·17

State Surgeon's Office,

Taiping 17*th January*, 1908.

M. J. WRIGHT,

State Surgeon, Perak.

Pahang.

Abstract of Meteorological Readings in the various Districts of the State for the month of December, 1907.

District.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Kuala Lipis ...	...	...	76·93	89·	68·	15·26	74·83	...	...	...	...	13·15	2·25
Raub ...	...	..	77·03	87·	64·	15·48	76·17	...	...	...	...	7·36	1·07
Bukit Fraser ...	...	...	...	...	...	...	...	...	...	...	...	12·83	3·35
Bentong ...	...	...	79·77	90·	69·	14·29	75·12	...	..	...	...	9·28	1·75
Temerloh ...	...	...	...	93·	70·	18·25	...	...	...	...	...	9·47	1·67
Pekan ..	...	..	78·	90·	70·	9·2	75·	...	...	..	...	31·33	15·50
Kuantan ...	...	...	80·1	88·5	68·5	12·9	76·5	...	...	...	...	28·74	10·35
Sungei Lembing ...	...	...	...	86·	65·	...	...	...	...	...	...	20·92	5·02

State Surgeon's Office,
Raub, 28*th January*, 1908.

W. H. FRY,
State Surgeon, Pahang.

The Duff Development Company, Limited, Kelantan.

Abstract of Meteorological Readings for the month of December, 1907.

District.	Temperature.			Hygrometr.	
	Maximum.	Minimum.	Range.	Total Rainfall.	Greatest Rainfall during 24 hours.
	Mean. °F	Mean. °F	Mean. °F	Inches.	Inches.
Kuala Lebir ..	81·1	71·3	9·8	39·01	6·21
Kuala Kelantan ...	78·36	72·22	6·14	39·79	8·65
Kuala Pergan ...	...	...	...	27·99	4·82
Taku Plantation ...	...	...	...	35·76	6·28

Kuala Lebir, Surgeon's Office,
15*th January*, 1908.

JOHN D. GIMLETTE,
Surgeon.

PARTICULARS

OF

42 RUBBER PRODUCING COMPANIES

IN

Ceylon, The Straits Settlements, Borneo, Java, and Johore.

Company.	Situated in.	Paid-up Capital.	Number of Trees.	Years Old. 1	2	3	4	5	6 and upwards.	Secretaries.	Offices.	Directors.
		£										
Anglo-Malay Co. ...	M.	104,937	294,979	89,000	...	8,900	112,000	3,561	81,518	H. Eric Müller ...	11, Idol Lane, E. C.	Sir Frank A. Swettenham, J. E. A. Dick-Lauder, James Lloyd Anstruther, Charles Denny, Arthur Lampard and H. W. Brett.
Batu Caves Co. ...	M.	18,000	123,669	63,300	41,299	3,000	6,570	8,500	1,000	McMeekin & Co.	10, Lime St., E. C.	H. K. Rutherford, John McEwan, T. N. Christie, and Robert Williamson.
Batu Tiga (Selangor) Co.	M.	50,000	75,000	...	...	71,000	...	1,000	3,000	J. Fitzpatrick ...	147, Leadenhall St., E. C. ...	L. T. Boustead, H. W. Brett, L. Hüttenbach, and J. C. Tate.
British Borneo (Para) Co.	B.	17,850	...	Being	planted	...	...	...	...	Macdonald, Stewart & Stewart ...	102, Hope St., Glasgow ...	W. Ewing Birrell, Wm. W. Campbell, Wm. W. Maclellan and Lawrence Dougal.
Bukit Rajah Co. ...	M.	66,700	206,375	60,583	31,384	26,067	7,758	45,739	34,844	G. F. Woods ...	20, Eastcheap, E.C.	H. K. Rutherford, Norman W. Grieve, G. A. Talbot, and C. B. Rendle.
Castlefield (Klang) Estate	M.	18,000	...	Being	planted	...	...	...	...	G. Murby (protem)	4, Corbet Court, Gracechurch St., E. C. ...	Cecil De Winton, W. Arthur Addinsell, and C. B. Rendle.
Ceylon (Para) Co. ...	C.	19,250	...	Being	developed	1,417 June,	acres 1904	planted	since	Geo. Williamson & Co. ...	138, Leadenhall St., E. C. ...	R. B. Magor, W. Forsythe, W. H. Savill, and A. N. Henderson.
Cicely Estates Co. ...	M.	12,000	...	Being	planted	...	...	...	15,000	Rowe, White & Co.	4, Lloyds Avenue, E. C. ...	Dr. S. Rideal, C. F. Deane-Drake, Cecil De Winton, and H. W. Brett.
Consolidated Malay Estates ...	M.	55,000	173,463	..	...	63,300	...	6,000	13,300	Shand, Haldane & Co. ...	24, Rood Lane, E.C.	George G. Anderson, John L. Shand, Percy W. Brundrit, and A. H. Bagnall.
Federated (Selangor) Co.	M.	18,251	101,785	52,427	10,333	9,444	18,882	8,754	1,945	G. F. Woods ...	20, Eastcheap E.C.	H. K. Rutherford, A. M. White, and A. Bethune.
Golden Hope Estate ...	M.	33,250	28,000	...	Part	bearing	...	...	...	H. Eric Müller ...	11, Idol Lane, E. C.	J. Lloyd Anstruther, Arthur Lampard, and Herbert W. Brett.
Hidden Streams Syndicate	M.	3,816	...	Being	planted	...	...	...	...	Geo. Williamson & Co. ...	138, Leadenhall St., E. C. ...	C. De Winton, C. T. Sedgwick, F. W. Stillman, and A. Bethune.
Highlands and Lowlands Para Co. ...	M.	244,087	322,611	116,415	101,862	20,046		58,265	26,023	Thomas Barlow & Brother ...	38, Eastcheap ...	Sir Frank A. Swettenham, John A. Maitland, Hon. Richard Douglas Denman, and Wm. Wellington Bailey.
Inch Kenneth Estates ...	M.	15,000	135,300	...	...	Part	bearing	...	...	Greenhill & Clapperton ...	6a, George St., Edinburgh ...	David Harris, George B. Thornton, and Capt H. W. S. Kindersley.
Java Rubber and Produce Co ...	Java.	17,480	44,535	17,000	and 27,	535, of 3 to 6	which years old	15,000	are from	C. O. Nattel ...	20, Eastcheap, E.C.	Gustavus Arthur Talbot, H. K. Rutherford, and Richard Caldicott Wright.
	(A dividend at	the rate guaranteed	on this	of 4 per cent per issue by	the vendors.)	annum until December, 1909, is						
Jugra Land and Rubber Estates ...	M.	88,000	...	Being	planted	...	...	...	...	Macdonald, Stewart & Stewart ...	102, Hope St., Glasgow ..	Wm. W. Campbell, Lawrence Dougal, Wm. W. Maclellan, Sir Wm. Hood Treacher, and E. V. Carey, John Wishart. (Chairman).
Kapar Para Rubber Estates Co. ...	M.	29,802	...	(1,367	Acres	planted)	...	...	...	Nevett Oswald & Co. ...	81, Gracechurch St., E. C. ...	J. Douglas Fletcher, William Nevett and Edward S. Grigson.
Klanang Produce Co. ...	M.	22,000	...	(1,300	Acres	planted)	...	...	...	James Miller ...	36, Basinghall St., E. C. ...	Edmund Walker, E. J. Davies, and J. L. Anstruther.
Kepitigalla Rubber Estates Limited ...	C.	200,000	357,922	209,800	119,327	7,295	...	4,000	17,500	Charles L. Talbot	Crown Court, 62, Old Broad St., E. C. ...	C. Williamson Milne, Herbert Wilford Brett, Lawrence T. Boustead, John E. A. Dick-Lauder, William F. de Bois Maclaren.
Kuala Lumpur Co. ...	M.	180,000	199,044	10,897	6,809	81,664	49,064	25,299	25,311	John Gurdon ...	9, Arundel St., Strand ..	Hon. Everard Fielding, Edward Bunge, Alfred Grisar, Methold Sidney Parry, and Edward H. Tootal.
Langkon North Borneo Co.	B.	22,500	...	Being	planted	...	...	...	...	Harington G. Forbes	37, Threadneedle St., E. C. ...	Colonel Sir Augustus Fitzgeorge, The Right Hon. Lord Armstrong, Wm. C. Cowie, Colonel Arther Montgomery Harington, and Charles Ernest Morrison.
Linggi Plantations ...	M.	73,000	629,100	375,300	50,800		141,000		62,000	Guthrie & Co., Ltd.	5, Whittington Av., E. C. ...	Sir Wm. Hood Treacher, K.C.M.G., Keith F. Arbuthnot, W. Forbes Lawrie, Gilbert F. Traill, and R. F. McNair Scott.
Malacca Plantations ...	M.	260,625	485,286	108,401	39,411	114,390	126,688	3,208	66,617	J. A. H. Jackson...	4, Sun Court, Cornhill, E. C. ...	Geo. B. Dodwell, J. Malcolm Lyon, Wm. Charles Punchard, and Arther Wood Copeland.
Malay Peninsular (Johore) Rubber Concessions ...	M.	8,000	...	To	be planted		...	...	...	Arthur C. Plowman	13, Rood Lane, E.C.	George Gray Anderson, William Gow, K. Kirchberger, and A. H. Bagnall.
Matale Ceylon Co. ...	C.	28,125	87,000	...	...	...	...	...	16,000	P. E. Hervey ...	30, Mincing Lane, E. C. ...	George Hathron, H. A. Barrett, and Wm. Dunn.
Monerakelle Estates ...	C.	16,450	...	Being	planted	...	...	...	...	Robertson, Bois & Co. ...	12, Fenchurch St., E. C. ...	Alexander Bethune and Charles Gordon Bois.
Pataling Estates Syndicate	M.	20,000	130,500 (Mortgage £5,	64,000 000, at 5	22,000 per cent	5,000 per annum)		6,000	33,500	H. Eric Müller ...	11, Idol Lane, E. C.	J. L. Anstruther, H. W. Brett, F. W. Chaine, and T. Ritchie.
* Pelmadulla Co. ...	C.	25,750	256,403	146,303	93,187	11,760	4,500	...	653	McMeekin & Co.	10, Lime St., E.C.	George Gilbert Anderson, John McEwan and H. K. Rutherford.
Perak Plantations ...	M.	75,000	80,000	11,520	22,880	8,000	11,520	800	25,280	Rowe, White & Co.	4, Lloyds Avenue, E. C. ...	Keith F. Arbuthnot, Montagu J. Battye Matthew Lowden, Wm. Herbert Sinclair and Sir Wm. Erskine Ward.
Rubber Estates of Ceylon	C.	68,050	Being	planted-	there are	11,100	trees from	3 to 6	years old	Rowe, White & C.	4, Lloyds Avenue, E. C. ...	Charles E. Strachan, Theodore C. Owen, J. R. Hugh Pinckney, and T. W. Shaw.
Rubber Estates of Johore	J.	38,750	...	...	...	...	...	...	...	H. Eric Müller ...	11, Idol Lane, E. C.	Sir Frank A. Swettenham, Colonel Algernon George Durand, Edward Snape Grigson, Arthur Lampard, and Reginald Heber Macaulay.
Rubber Plantations ...	C.	55,000	288,400	150,000	85,000	40,100	6,100	7,200	9,400	T. E. Smith ...	20, Copthall Avenue E. C. ..	R. J. Hoffmann, W. Radcliffe, T. W. Wellsted, and F. A. Govett.
Sagga Co. ...	M.	6,311	...	Being	planted	...	...	...	...	Walter Smith ...	18, Laurence Pountney Lane, E. C.	J. H. Starey, George Moody Stuart, and R. N. G. Bingley.
Scottish Malay Co. ...	M.	8,750	...	To be	planted	...	...	...	...	J. A. Pattullo ...	8, Hill St., Edinburgh ...	Thomas Wedderspoon, R. Colville Bowie, and James Adam Hunter.
Selangor Co. ...	M.	29,075	...	Part bea	ring	...	...	...	...	Gibson & Anderson	124, St. Vincent St., Glasgow ...	Thomas Johnston, Hugh Neilson, and T. A. Gallie.
Shelford Estate ...	M.	65,000	102,700	18,200	48,100	18,750	1,900	5,250	10,500	Macdonald, Stewart & Stewart ...	102, Hope St., Glasgow ...	Sir John Ure Primrose, Bart., Lawrence Twentyman Boustead, Wm. W. Campbell, Lawrence Dougal, and Wm. W. Maclellan, B. H. A Hankey, W. F de Bois Maclaren.
Straits Settlements (Bertam) Co. ...	M.	150,000	46,287	26,097	4,711	4,324	800	7,135	3,220	H. Read Smith ...	16, St. Helens Place, E. C. ...	The Right Hon. Sir J. West Ridgeway, John Edward Arthur Dick-Lauder, Thomas Ritchie, George Short Barwick, George Mouat Dundas-Mouat, Sir Wm. E. Ward, and G. Dalziel.
Sungei Kapar Rubber Co.	M.	...	223,243	112,468	66,600	43,320	855	...	...	Moncrieff & Horeburgh, C. A. ...	46, Castle St., Edinburgh ...	E. A. Davidson, W. W. Bailey, A. R. Wilson Wood, and J. Maclachlan.
Sungei Way (Selangor) Co.	M.	15,670	...	Being	planted	...	...	...	...	Gibson & Anderson	124, St. Vincent St., Glasgow ...	Thomas Johnston, Thomas A. Gallie, Sir Frank A. Swettenham, and Thomas North Christie.
The Tenom (Borneo) Co.	B.	21,550	...	Being	planted	...	...	...	...	Alexander T. Forgie	22, Renfield St., Glasgow ...	Thomas Johnston, Thomas A. Gallie, Sir W. Hood Treacher, and D. M. Hannay.
Vallambrosa ...	M.	50,600	260,250	51,000	...	...	...	...	209,250	Maxtone, Graham & Sime, C. A ...	123, George St., Edinburgh ...	A. R. Wilson Wood, David Cowan, E. A. Davidson, Colonel F. D. Jeffreys, and Capt. C. B. Oldfield.
Woodend (Kelani Valley) Co. ...	C.	20,640	91,905	80,300	10,640	965	...	...	...	Taylor, Noble & Co.	Leadenhall House, 101, Leadenhall St., E. C. ...	Robert Porter, Wm. Taylor, and Charles Blair.

* A dividend at the rate of 4 per cent guaranteed by Vendor up to end of 1912.

December, 1907.

GOW, WILSON & STANTON, Limited,
13, ROOD LANE, E.C.

No. 2. FEBRUARY, 1908. [Vol. VII.

AGRICULTURAL BULLETIN
OF THE
STRAITS
AND
FEDERATED MALAY STATES.

EDITED BY
H. N. RIDLEY, M.A., F.R.S., F.L.S., F.R.H.S., F.S.A., F.R.C.I.,
Director of Botanic Gardens, S. S.
AND
J. B. CARRUTHERS, F.R.S.E., F.L.S.,
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NOTICE.

The Scientific and Technical Department of the Imperial Institute.

His Excellency the Governor has received a despatch from the Right Hon'ble the Secretary of State for the Colonies calling attention to the advantages offered by the Imperial Institute to Merchants, Planters and others, who may wish to have samples submitted to scientific experts for opinion as to their commercial value, etc. The following extracts from a Memorandum published by the Authorities of the Imperial Institute will give an idea of the work undertaken and carried on there.

"The Scientific and Technical Department of the Institute has "been established to acquire information by special enquiries and "by experimental research, technical trials and commercial valua- "tion regarding new or little known natural or manufactured pro- "ducts of the various Colonies and Dependencies of the British "Empire and of Foreign countries, and also regarding known "products procurable from new sources, and local products of "manufacture which it is desired to export. This work is carried "out with a view to the creation of new openings in trade, or the "promotion of industrial developments."

2. In an extensive and well-equipped series of Research Laboratories, a numerous staff of skilled chemists carry out the investigation of the chemical constitution and properties of new dye-stuffs, tanning materials, seeds and food-stuffs, oils, gums and resins, fibres, timbers, medicinal plants and products, with a view to their commercial utilization. Whenever necessary these materials are submitted to special scientific experts, by whom they are made the subject of particular investigation or practical tests. Reports are also obtained from technical or trade experts in regard to the probable commercial or industrial value of any such products.

3. The Federated Malay States Government has undertaken to grant a sum of £100 a year for 5 years to the Department with a view to the careful investigation and commercial development of the mineral resources of the States.

The Government Geologist is collecting specimens for chemical examination and after analysis the Imperial Institute, which is in very complete touch with the principal manufacturing and other industries of the United Kingdom, will bring the specimens before manufacturers and others for trial with a view to their commercial development.

It is expected that this action will do much to help in finding a market for new products and developing the markets for those already exploited.

Planters and residents in the Straits Settlements and Federated Malay States are at liberty to send (through the Colonial Secretary at Singapore) specimens of little known or new vegetable or mineral products of the Straits Settlements or Federated Malay States for examination at the Imperial Institute by whom a report will be made through the Colonial Secretary. Specimens should, if possible, consist of a few pounds of the material and should be accompanied by full information especially respecting the precise locality in which the material is found and the extent of its occurrence.

Attention may also be drawn to the "Bulletin of the Imperial Institute," published quarterly, which contains records of the investigations conducted at the Imperial Institute, and special articles on tropical agriculture and the commercial and industrial uses of vegetable and mineral products. Copies of this publication, price 4*s*. 4*d*. per annum (including postage), may be ordered through Messrs. Kelly & Walsh, Ltd., of Singapore.

Special sample rooms have been arranged at the Imperial Institute, for the information of inquirers, in which materials which have been investigated and valued are available for reference.

Important products are also shown in the Malaya Court in the Public Galleries of the Imperial Institute.

Communications should be addressed to the Director, Imperial Institute, South Kensington, London, S.W.

AGRICULTURAL BULLETIN

OF THE

STRAITS

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No. 2.] FEBRUARY, 1908. [Vol. VII.

An Opium Substitute.

An article on the Biak, *Mitragyne speciosa* Korth, the leaves of which are used as a substitute for opium by the Malays in the North of the Peninsula, is published by Mr. Wray in the *Journal of the Federated Malay States Museums*, December 1907, p. 53. The tree, which is also called Keton in Patani, seems to be widely distributed over the Peninsula and the Malay Archipelago. It is a Rubiacious tree with large leaves and balls of greenish-white flowers, occurring wild in the jungle and planted near villages. The leaves are picked and dried in the sun and then rubbed to powder by hand. The fibrous parts removed and the powder resulting is mixed with cold water, or infused in hot water, and the decoction drunk. The dose is 136 grains.

Another method is to dry the leaves and boil them to form an infusion which is strained, and the filtrate evaporated to a syrupy consistency. It is then either drunk with hot water or smoked much as opium is smoked. It is said to produce effects like those of opium and considered to be more deleterious. However, Mr. E. M. Holmes of the Pharmaceutical Society, failed to find any alkaloid in the leaves.

A Malay Varnish.

In the *Journal of the Federated Malay States Museums*, December 1907, p. 49. In May gives an account of a varnish known as Getah Luli obtained by the Malays from a jungle tree, *Garcinia Merguensis* Wight. The resin is collected by making small horizontal notches in the bark, by which wedge-shaped portions are removed. This is done at 5 p.m., and the resin is collected next morning early, before the little bees known as Kelueut (Trigona) can come to secure the resin to build their nests. The latex is creamy, and pale yellow. It is collected in a bamboo, then poured into a piece of cloth and

squeezed through till all the liquid is run out. To one part of the liquid latex two parts of turpentine are added, and it is boiled three times in an iron pan or brass pot. It is used for varnishing sheaths and handles of weapons.

Professor Dunstan has published an account of its chemistry in Volume III, p. 149, of the *Bulletin of the Imperial Institute*, and thinks it might prove a valuable commercial product. There seems, however, to be some difficulty in procuring a large supply. Indeed, *Garcinia Merguensis* is not a very common tree in our woods.

Proposed Rubber Exhibition in London.

As will be seen by the following extract from *Tropical Life* of December, 1907, it is proposed to hold an exhibition of rubber and all connected with it in London in 1908, and a large International one in 1909 or 1910. The Secretary writes "I think we shall have a very interesting exhibition, and numerous promises of support have already been received both from exhibitors of the raw and manufactured article, and I trust the Straits' Government will make a nice display. I might mention that your Government need not go to the expense of taking up a large amount of space, but one that would be a good advertisement for the Straits, £50 or less if you liked, the fitting up would cost you very little.

"The Exhibition opens on the 21st and closes on the 26th September (one week). Press view and dinner 19th. To this all the London Press are invited and they write up particulars of the exhibition generally. By this means the exhibitors are likely to get good notices of their exhibits. The exhibition will be well advertised, and every method adopted to bring it under the notice of the public who are interested in rubber." The list of the Executive Committee which is given below contains the names of some of the best known firms in the rubber industry.

The value of exhibitions of this nature in Europe is very great to all whose work lies in the production or manufacture of rubber, and the small cost incurred in sending the exhibits and exhibiting is amply paid for by the advertisement of the estate or factory, and it is to be hoped that the Malay Peninsula will be thoroughly well represented at this exhibition.

A Rubber Exhibition in London in 1908.

Referring to our efforts during the past two years to induce planters, manufacturers, and financiers interested in rubber to hold an exhibition in London, we are pleased to state that not only is our idea of holding a Grand International Exhibition in 1909 or 1910 meeting with considerable support, but it has been decided by an influential

committee to hold a preliminary exhibition next September, and Colonel Bosworth, the chairman, has addressed us the following letter on the subject:—

Dear Sir,—At a special meeting held recently it was decided to hold a Rubber Exhibition for one week in September, 1908, and a building in London has been secured for the purpose. Several influential friends interested in rubber in Brazil have promised their united support, and knowing you are greatly interested in the development of trade in this country generally, and in London in particular, with the rubber producing centres, I shall be glad if, whilst in no wise relaxing your efforts in connection with arranging an International India-rubber Exhibition in 1909 or 1910, you could kindly co-operate with us in the above undertaking, and induce your friends to take part in our exhibition. I believe that it would be greatly to your interest to do so, as it will help to attract attention to the importance of London as a rubber centre, and will undoubtedly assist the larger exhibition which it is proposed should be held later. The Exhibition offices are at 75 Chancery Lane, London, W.C.

I am,

Faithfully yours,

W. J. BOSWORTH,

Colonel.

Chairman, Executive Committee.

RUBBER EXHIBITION.

Executive Committee:

Colonel W. J. Bosworth, *Chairman.*

The Hon. C. S. Rolls, M.A. (Rolls-Royce, Ltd.).

Sir William J. Bell, LL.D., etc.

Sir Archibald J. Macdonald, Bt.

Alfred Du Cros, Esq.
Harvey Du Cros, Esq., Jr. } (Messrs. Dunlop).

Charles Jarrott, Esq.
W. M. Letts, Esq. } (Messrs. Jarrott & Letts).

Capt. Adrian Jones, M.V.O.

J. Hancock Nunn, Esq. (Messrs Jas. Lyne Hancock).

Capt. Frederick G. Jackson.

Charles Templey, Esq.

Thos. Donne, Esq.

RUBBER AND ALLIED TRADES' EXHIBITION.

Executive Committee:

COLONEL W. J. BOSWORTH, *Chairman.*

SIR WM. J. BELL, J.P., LL.D., etc.
The Hon. C. S. ROLLS, M.A.
ALFRED DU CROS, ESQ.
W. M. LETTS, ESQ.
J. HANCOCK NUNN, ESQ.
CHARLES TEMPLEY, ESQ.
SIR ARCHIBALD J. MACDONALD, BART
HARVEY DU CROSS, ESQ., JR
CHARLES JARROTT, ESQ.
CAPT. ADRIAN JONES, M.V.O
CAPT. FREDERICK G. JACKSON.
THOS. DONNE, ESQ.

Advisory Committee:

VISCOUNT MOUNTMORRES, Director, Institute of Commercial Research in the Tropics, Liverpool University.

SIR JOHN FURLEY, C.B., D.L.
SIR E. NOEL WALKER, K.C.M.G.
ALGERNON E. ASPINALL, ESQ., *Sec.* The West India Committee.
DR. SOSKIN, Berlin.
DR. WARBURG, Berlin.
DR. JAMIE GUTIENEZ, Consul for Colombi, Southampton.
SENOR A. ALDANA, Consul for Venezuela, Cardiff.
MONSIEUR E. THIROUX, London Editor *Le Caoutchouc et la Gutta-Percha*, Paris.
SENOR JULIO FRANK, Bahia, Brazil.
H. N. RIDLEY, ESQ., Director, Botanic Gardens, Straits Settlements.
MESSRS. GOW, WILSON & STANTON, LTD., London.
H. HAMEL SMITH, ESQ., Editor, *Tropical Life*, London.

(With power to add to their number).

Organising Manager—

A. STAINES MANDERS,

75 CHANCERY LANE, HOLBORN,
LONDON, W.C.

Telephone: 3523 CENTRAL.
Telegrams: "MALTERMASS," LONDON.

Royal Horticultural Hall.

VINCENT SQUARE, WESTMINSTER, S.W.,
21st to 26th September, 1908.

A Rubber and Allied Trades' Exhibition is being organised by an influential Committee in the interests of the industries concerned. The main object is to direct and compel public attention to the enormous advances made by the rubber producer and manufacturer during recent years. In an age of progress it is remarkable that steps have not been already taken in this direction. It is, however, impossible to delay it longer, especially in view of the extraordinary results achieved by the Ceylon Exhibition in 1906. Even since that date many important inventions and improvements have been introduced which are still unknown to prospective buyers.

This Exhibition will give the first opportunity in the Old World of enabling planter, dealer and manufacturer to bring the results of their labour before the public, and none of them can, in justice to their interests, neglect the chance of doing so.

A display of this kind is quite certain to embrace an extraordinary variety of specialities. The evolution of the most numberless articles wholly or in part made of rubber from the raw material, will constitute a source of interest not hitherto enjoyed by the public. Rubber producers in various quarters of the globe are taking a keen interest in the Exhibition, and have intimated their intention to co-operate with the Committee in every possible way, and this interest is equalled by that of Consuls and others on this side, who, by joining the Committee and in other ways, are assisting the Executive to secure a thoroughly representative and interesting display of the various kinds of rubber, including Guayale, Pinguay weed, etc., etc., so that their characteristics may be studied and compared, to enable travellers to recognise the various plants when they come across them.

No means will be neglected to secure the attendance of the class of visitors that will benefit the exhibitors, and the Committee will issue many thousands of invitations. In this connection a specially convenient and novel arrangement has been made by which *exhibitors themselves* may issue their own invitations to their customers and friends. Proofs of these invitations must, of course, be submitted to the Committee for approval, which having been obtained, exhibitors will be at liberty to send out as many as they choose, and they will afterwards pay at the rate of 20s. for every hundred tickets collected at the doors. By this means an exhibitor may, if he desire, issue, say, a thousand invitations, each of which is an advertisement, and possibly have to pay for only 300 or 400 that have been actually used.

The organizers are also making arrangements for the delivery of illustrated lectures and addresses on "Rubber, its Uses, etc.," and other cognate subjects. It is hoped that producers, as well as the trade generally, will attend such lectures and, by taking part in the discussions, contribute to the general knowledge of the various matters dealt with. Their utility is exemplified by the fact that Mr. HERBERT WRIGHT, at the Society of Arts in London, delivered such an one, and this, as well as the discussion that followed, has been published and is now a recognised text-book. There is every reason to believe that an equally favourable reception will be extended to the publication of any of the lectures delivered at the Exhibition; and rubber brokers, by taking part in the discussions and otherwise collaborating with the Committee, can greatly help to advertise London as a distributing centre, thus attracting the chief growers and dealers, and so help to develop the trade and prevent its transference elsewhere. Another feature of these lectures will be the dissipation of mistaken impressions; for instance, it has been stated that Rambong (*ficus elastica*) and Castilloa Rubbers are not appreciated in London; but as both these rubbers form excellent foundations for certain goods, the

probability is that the prejudice against them has been engendered by improper curing. The lecturers, scientists, and engineers dealing with the matter will point out the remedy and so remove a mistaken impression. The Exhibition and these lectures will also afford the first chance that has been offered for producers of Rambong, Ceara, Funtumia, Landolphias, etc., to exhibit the utility of their products when prepared on scientific principles.

Arrangements will be made for a special view on the evening of the 19th September, in order that exhibitors may be enabled to furnish particulars of their several exhibits to the Press representatives.

It is intended to arrange a club-room in the Exhibition solely for the use of the exhibitors and their friends, whilst the luncheon-room will be under the control of a first-class caterer.

There will be a telephone exchange for the convenience of exhibitors and their friends.

The Exhibition will open on Monday, the 21st September, and close on Saturday evening, the 26th September.

The Royal Horticultural Hall, Vincent Square, Westminster, is admirably adapted for the purposes of the Exhibition, and most conveniently situated, being close to the St. James' Park and Victoria Railway Stations, and to the Army and Navy Stores, whilst hundreds of omnibuses pass close to the building.

On Thursday, the 24th September, it is proposed to close the Exhibition at 6 p.m. for the purpose of holding a smoking concert for exhibitors and their friends. The arrangements for this entertainment will be carried out by a Joint Committee of exhibitors and members of the Exhibition Committee.

OPINIONS.

The Committee are indebted to their colleague, Mr. H. HAMEL SMITH, Editor of *Tropical Life*, for the following extracts from letters he has received as to the value of a Rubber Exhibition in London.

Viscount Mountmorres, Director, Institute of Commercial Research in the Tropics, Liverpool University :—

"Please call upon me for any help that I may be able to render. I will do anything I can for you to help to make the Exhibition a success. . . . . The idea of the Exhibition is an excellent one."

Dr. Jamie Gutienez, Consul for Colombi, writes :—

"I am writing my Government calling their attention to the Exhibition, and I will take part by sending various specimens."

Senor A. Aldana, Consul for Venezuela, says :—

"That he is communicating with his Government, and they will do something in the way of exhibiting."

Mr. W. D. Gibbon, Acting General European Member in the Legislative Council of Ceylon :—

"I duly received your letter of 29th inst., with July issue of *Tropical Life*. I think it is highly desirable that a Rubber Exhibition should take place in London in 1908. There is no other Government which has the same stake in the future growth of rubber as that of the British Empire. Ceylon, the Straits, South India, British North Borneo and British Africa will in a few years contribute the bulk of rubber for the world's consumption. London is, therefore, the most suitable city for such an Exhibition, where all who have interests in the growth and manufacture can visit it."

Mr. Geo. M. Crabbe, Chairman, Sabaragamouwa Planters' Association :—

"I am in receipt of yours of the 9th inst., regarding an International Rubber Exhibition at London, also the copy of *Tropical Life*, for which I thank you. I certainly think that an International Exhibition in London would be of great benefit to Ceylon, and would bring the island as a rubber-producing country more prominently before the general public."

Mr. Edgar Turner, Chairman, Planters' Association of Ceylon :—

"I thank you for the copy of *Tropical Life* and I have read the article *re* an International Rubber Exhibition in London in 1908, and think that if properly supported by the producers, manufacturers and others interested in the trade, and by their respective Governments, it would be a great success. It would not only bring the producers and those interested in rubber together, but would give the manufacturers an opportunity of showing the public the endless uses to which rubber is now put, and thereby help to increase the demand for the article."

Mr. Hodgson Bell, Chairman, Matale Planters' Association :—

"In answer to your letter *re* International Rubber Exhibition at London, for which you ask my opinion, I am strongly of the faith in the good that a well-organised exhibition will do for producer, merchant, and manufacturer."

Mr. R. L. Proudlock, Curator, Botanic Gardens, Ootacamund, India :—

"I am quite in sympathy with the idea of holding an International Rubber Exhibition in London, and shall be pleased to do what I can to interest in the matter those persons ou there who are engaged in the rubber industry.

Mr. C. C. Mee, Chairman, Kalutara Planters' Association :—

"In my opinion a Rubber Exhibition in London would prove of great benefit to the industry."

Dr. Olsson-Seffer, the Castilloa expert in Mexico, fully expressed his anxiety to see the Exhibition held in London.

Mr. J. B. Carruthers, Director of Agriculture and Government Botanist, Federated Malay States :—

"With regard to the proposal to hold an International Rubber Exhibition in London, such a show would, if properly organised, be of great use to the rubber producer."

CLASSIFICATION.

Rubber Boots, Shoes, Goloshes, Fishing Waders, Heels, and Soles, etc.
Golf, Cricket, Lawn Tennis, Football Bladders, and Athletic Goods generally.
Surgical, Chemical, Scientific and Medical Goods.
Telegraph and other Scientific Accessories.
Books, Publications, etc., of the Rubber and Allied Trades.
Waterproof Cloth, Clothing, Diving, and other Suits and Materials.
Druggist Sundries.
Mechanical Rubber Goods.
Moulded Goods of every description.
Waterproof and Bed Sheeting, Water Beds, Pillows, Bottles, Air Cushions and other Air-proof Goods, Ice Bags, etc.
Dress Shields, Webbing, Elastic Bands, Rubber Thread, etc., etc.
Stationers' and Printers' Rubber and other Requisites.
Ebonite, Vulcanite and Rubberite Goods of all kinds, also Vulcanised Goods.
Buffers for Railways and other purposes, Rubber Springs, etc.
Accessories for Carriage Fitters.
Rubber-lined Hemp, Flax and Cotton Hose.
Belting, Rubber, Gutta Percha, etc.
Cloth for Rubber Manufacturers.
Tubing, etc., etc.
Sponges, Bath Mats, Gloves, Tobacco Pouches, etc.
Cycle Tyres, Gear and Accessories.
Cables, Insulated Wires, Tapes, etc.
Chemicals of all kinds used in the Rubber Industry.
Rubber Roofing.
Rubber, etc., Steam Packings.
India-Rubber Substitutes.
Compounds of all descriptions.

Machinery and accessories used by planters, producers and manufacturers, such as :—

Rubber Preparing Machinery.
Grinding Mills, Dry Curing Machines.
Moulds, Mixers, Spreaders, Sifters.
Washing Machines, Pumps, Masticators.
Calenders, Crackers, etc., etc.
Other articles not enumerated.

NOTE.—*Very heavy* machinery cannot be accepted.

Gutta Percha and Vulcanising Appliances, Asbestos Fibre, Rope, Mattrass Cloth, Yarns, Millboard, Packing, Boiler Composition, Crude Asbestos, etc., etc.

Planters' accessories :—

Wardian Cases.
Tapping Knives, Tools, Guides, etc.
Latex Cups—
  Collectors.
  Transporters.
  Sieves.
  Pails.
Coagulators.
Coagulating Agents.
Washing Machines.
Presses.
Vacuum Driers.
Smoking Apparatus.
Packing Cases.
Cutlasses.
Pruning Knives.
Pruning Saws.
Sprayers.
Insect Pest Destroyers.
Manures.

Machinery of every description required by Planters, etc.

Crude and prepared rubber of every description. Seeds. Botanical Specimens, etc.
Other articles not enumerated.

AWARDS

A diversity of opinion exists amongst those who have been consulted as to the advisability of there being competitive sections for the various classes of goods exhibited. The Committee are in the hands of the exhibitors in this matter, and would like an expression of opinion on the point from those interested.

NOTE.—This is a preliminary prospectus. A complete issue will be published in a few weeks, giving further details, classifications, etc., also full Committee list.

Plans of Building, Space, Forms, etc., sent on application.

Offices—75, Chancery Lane, Holborn, London, W.C.

Telephone : 3523 CENTRAL.
Telegrams : "MALTERMASS," LONDON.

A few extracts from the Report of the Committee appointed by the Board of Trade to make inquiries in reference to the value of exhibition.

COMMITTEE :

Lord AIREDALE, Sir ALFRED BATEMAN, K.C.M.G. (Chairman), Sir SWIRE SMITH, Sir ISIDORE SPIELMANN, Mr. A. WILSON FOX, C.B. (Board of Trade), Mr. CHARLES A. HARRIS, C.B., C.M.G. (Colonial Office), Mr. ALGERNON LAW (Foreign Office), Mr. MALCOLM RAMSAY, C.B. (Treasury), Mr. SAMUEL J. WARING.

* * * * *

Another consideration which appears to weigh with manufacturers of standing is the unbusinesslike and undignified manner in which they are apt to be mixed up with (*a*) what they call "fakers," i.e., the paltry dealers in cheap articles of ornament and amusement which do not represent British industry; and (*b*) the general element of popular amusement which has become part of the life of the modern Exhibition are kept open less with a view to the furtherance of trade interests than with the object of attracting visitors and achieving financial success from the receipt of gate money. The number of side shows and other entertainments has, in consequence, increased to a very great extent at recent exhibitions, and it is thought by many that this has resulted in attracting, as visitors to the Exhibition, pleasure seekers, rather than serious students or possible customers. There is no doubt that, in the opinion of many manufacturers, the

changes to which we have alluded have materially diminished the value of exhibiting as a means of obtaining direct orders for their goods.

NOTE.—There will be no "faker" stands or side-shows as above-mentioned at the Rubber Exhibition, and every effort will be made to attract the class of visitors who will benefit the Exhibitors.

* * * * *

To a large extent it would appear the amount of direct benefit which may be derived from exhibiting by any particular firm is dependent on whether that firm is represented at the Exhibition by an efficient agent. In many cases, it is said, the attendants in charge of a stall at an exhibition are unable to describe the goods exhibited in a correct and intelligible manner.

* * * * *

A number of firms who, from the nature of their exhibits, can expect little or no direct return to compensate them for their outlay, still continue to exhibit at fairly frequent intervals. In doing this many have no doubt been influenced by the fear that they might lose their place in the trade if they failed to be represented at exhibitions when their competitors were showing; but there are, on the other hand, not a few who regard their expenditure on exhibitions in the light of a necessary item in their general scheme of advertisement.

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To a large extent the question which we have to decide is not whether it pays to exhibit, but whether, under modern conditions, we can afford not to exhibit. We think that the evidence which we have obtained affords convincing proof that the answer to this question is in the negative.

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It is difficult to find important arguments against exhibitions whose utility as a whole is admitted. Some criticisms in the case of special commodities based on expense and distance, and doubts whether the benefits equal the outlay, seem to be the principal, but for the most part opinions are in favour of exhibitions.

Synthetic Rubber.

As judging by the correspondence and personal enquiries at the Botanic Gardens, as to synthetic rubber, it seems that there are still a large number of people scared at this phantom, the following little article from the *India-Rubber World* may perhaps relieve their minds and cause them to understand what synthetic rubber is.

CONCERNING SYNTHETIC RUBBER.

Just why so many people think that they achieve synthetic rubber, and why so many more—rubber planters, importers, and manufacturers—are fearful that it will come and in some way upset their business, it is hard to imagine. Reviewing the year's progress in this line the pro-

ducers of rubber by artificial means have done everything but produce. Indeed, they seem to lack knowledge as to what synthesis is. It is specifically the building up of complex compounds by special reactions, whereby their component radicals are so grouped that the resulting substances are *identical in every respect with the natural article.*

The producers of so-called synthetic rubber group themselves into three classes. The first makes something of the oil substitute type that may be used in connection with india-rubber, but no particular value used alone.

They hypnotize themselves into believing that it is practically rubber.

This is not synthesis; it is silliness.

The second class begins with crude rubber, fine Para preferably, doctoring it with something like oil of wintergreen to thoroughly disguise it, and by dark and mysterious ways and sleight-of-hand performances produce for the edification of capital what they call "synthetic rubber."

This is not synthesis; it is sin.

The third class embraces honest, usually aged, scientists, who buy most of the ingredients for secret formulæ, upset all rules governing chemical reactions (not knowing at just what point the inventor slips the ace out of his sleeve), and produce "synthetic rubber."

This is not synthesis; it is senility.

Not that it is claimed that synthetic rubber will never be attained. It may be. But its first cost for years will probably make it only the plaything of the laboratory. Indeed, so far distant does the production of synthetic rubber seem, when one reviews the attempt towards its production, that it is safe to say that when it does appear the cradles of the land will also be filled synthetically. Not to hit in any way the honest seekers for this ideal product, but for the guidance of such geniuses as the one who is now in enforced retirement because of his synthetic camphor claims, and who deserves "several years" for robbing certain New Yorkers by his "synthetic rubber" claim, the following working formula is submitted:—

10 pounds Para rubber.
1 gallon benzo.
1 ounce oil of wintergreen.

Mix thoroughly and evaporate the solvent, then thoroughly mix:—

15 parts above mixture.
10 parts ignorance.
25 parts avarice.
50 parts duplicity.

Compound in secret.

(*India-Rubber World*, Vol. XXXVII, No. 4, pp. 101.)

The Malayan Ramie Company.

A company for the cultivation and preparation of Ramie has been formed in London under the title given above, and among the directors we see the names of Sir William Hood Treacher and Mr. William Meikle, both well-known names in the Malay Peninsula. The manager is Mr. E. F. Pumpin who has long made a study of the Ramie plant and visited the East in 1900, examining the conditions of growth and cultivation of the plant. He visited Indo-China and the Malay Peninsula, spending some time at the Botanic Gardens in Singapore. The Company proposes to start their plantations in Sarawak. The share capital is £25,000, divided into 25,000 shares of £1 each. With the prospectus is issued a memorandum on the cultivation and treatment of Ramie, which we give below. One would be glad to see this valuable fibre under good and successful cultivation and wish the undertaking every success.

The Malayan Ramie Company, Limited.

Memorandum referred to in the accompanying Prospectus.
22nd November, 1907.

Notes on Ramie and its Cultivation and Treatment.

Ramie is the name now generally used for the fibre obtained from certain species of *Urticacæ* (Nettle), indigenous to some tropical countries. China-grass, nettle-flax, and rhea are other names for the same fibre.

The nettle plant, the cane of which yields this fibre, is cultivated principally in the East, and there only successfully within certain well-defined geographical limits.

Although the plant appears to grow on any kind of soil in the tropics where the rainfall is sufficient, it does not grow so vigorously and successfully on stiff, clayey, nor on dry, stony lands, nor on soils standing poor in lime and potash, nor on lands which are periodically flooded. It requires a well-drained, rich, alluvial soil, and the ideal climatic conditions for its growth, both in respect of quantity and quality, are a relatively constant warm temperature, not fluctuating greatly, combined with that humid atmosphere which results from an abundant rainfall well distributed throughout the year. The Malay Peninsula, Borneo, and the Philippines are specially suitable in this respect. It requires also a regular planting and a careful and systematic cultivation, without which it will never be a paying crop.

It has been conclusively proved that Ramie, when properly cultivated under favourable conditions of climate and soil, will yield five or six crops annually of the best sort of stems for industrial

treatment. The first crop of green stems, ready for mechanical treatment, can be gathered about eight months after planting the roots; the crops then follow in quick succession, the interval between the crops being about eight weeks. It is estimated that in a well-regulated plantation under proper conditions 1½ tons of a clean quality of fibre may be obtained annually from each acre of land.

Ramie possesses such remarkable and exceptional qualities that it is considered a first-class textile. Its staple is long. It is supple, and has a silky gloss. It does not rot, which alone is a matter of great importance. It has highly absorptive properties, and has proved itself stronger than flax, hemp, jute, cotton, and such like, while as regards price it could to-day be produced and brought to market to compete advantageously with flax, hemp, and cotton.

Ramie is employed in a great variety of textiles, such as domestic napery, damask, ladies' dress goods, underclothing, lace, upholstery goods, fishing nets, sailcloths, driving belts, canvas, ropes, twine, surgical bandages, lint, and incandescent gas mantles.

Owing partly to the drawback that, until comparatively recently, effective machinery was not available for the proper extraction of the fibre, the practice, up to a few years ago, was to use hand cleaned China Ramie, or to ship to Europe for treatment dried Ramie canes, or crude bark with the pellicle still adhering. This latter course has always proved a fatal error, and has formed the overwhelming difficulty in the manufacture of Ramie in Europe, as under the most careful handling imaginable the canes and crude ribbons must, and do, arrive in a dry, brittle, and mutilated condition, with the gum necessarily so hardened that the natural difficulties attending the decortication, degumming, and combing processes are immensely increased; the result to the manufacturer—apart from the money absolutely wasted on the freight of merely useless refuse in the shape of cane wood, etc.—being a less valuable fibre at an unnecessarily high price.

With the gradual accumulation of experience the difficulties in the preparation of the fibre have been overcome. Important factors in the obtaining of this have been the introduction of the improved Decorticating Machine invented by Pierre Paulin Faure, of Limoges, and the additional process of cleaning and opening the fibre. With these machines the canes are treated at the plantation while still in a green state. Before fermentation and subsequent hardening of the gum set in, the gum is eliminated mechanically from the decorticated fibre, with the result that a soft fibre of good length and colour can be produced at a moderate cost. In this way only can the best results be obtained. In China, where the fibre is still extracted by hand labour, one Chinaman and his family can turn out only 4 to 5 lbs. of dry fibre per day of ten hours, whereas one Faure machine of the latest pattern can produce 800 lbs. of dry fibre per day of twenty-four hours—working three shifts of eight hours each—or, say, 100 tons per machine per annum.

Faure Machines are now in practical and successful operation in Bengal, Java, and the United States of America, and the fibre produced by them meets with the entire approval of the spinners, so that the mechanical extraction and preparation of Ramie can now be considered to have passed the experimental stage.

Large markets for the fibre exist in China, Japan, India, and America; and on the Continent, where Ramie spinning and weaving is an established and remunerative industry, the demand for the fibre notoriously exceeds the supply. The more important Continental Ramie mills have evinced the greatest interest in, and will eagerly welcome, any possible increase in the regular supply of uniform and fine fibre, as at present they have to a large extent to depend on irregular shipments of native-grown or wild fibre, more or less imperfectly prepared by hand. Given an assured supply of good quality fibre there is justification for the conviction that, within a very short time, the industry in this country also would acquire dimensions proportionate to its merits.

Extracts from Journals, etc.

The British Trade Journal of 1st March, 1905, quotes as follows from the report of the United States Consul at Plauen (Saxony) :—

"Ramie.—I desire to draw attention to the growing demand for Ramie in the textile industries of this country. The long, strong, and glossy fibre of this plant serves as an admirable substitute for flax, cotton, or silk, and only its present scarcity and cost prevent a largely increased consumption. If, as was so long and earnestly insisted upon by the late Professor Waterhouse, our Southern States are specially adapted for the successful cultivation of this plant, it cannot be too strongly urged that experiments in cultivating it be more widely extended. The raw material will find as ready a market in Europe as would flax fibre."

The Foreign Office Consular Report No. 3280 (page 53) states:—

"Inquiries have been made as to the quantities of Rhea, or Ramie, China could be expected to furnish annually. It is stated that, could a minimum of 100 tons per week of floss, or filasse, be guaranteed, there would be an instant conversion or alteration of present machinery to deal with it. Under the present conditions, however, it is difficult to see how even 100 tons per week could be got together, when the quantity exported is so insignificant as not to be deemed worthy of a separate classification in the Customs returns. It has also to be remembered that there is a strong home demand (China) for the fibre, which is woven into the material known as grass-cloth, and that purchasers on behalf of the native looms will inevitably compete. (Shipments of grass-cloth from Kiukiang to other ports in China amounted in value to £53,900 in 1901, £67,740 in 1902, and £98,810

in 1903.) Another competitor would be Japan; Ramie is there woven into a kind of cloth and made into kimonos for summer wear, for which its coolness and smoothness admirably adapt it."

H.M. Consul at Kiukiang (China) in his Report for 1906, states that the exports of hemp from that port during the year amounted to 149,868 cwts. (£253,396), as compared with 135,279 cwts. (£192,974) during the preceding year. Most of this is what is known as "ch'uma," or Ramie fibre. The export is increasing every year, the Japanese especially taking advantage of the opportunity offered for obtaining a useful product at a low price.

Professor Alfred F. Barker, Professor of Textile Industries at the Bradford Textile College, in his letter appearing in the *Textile Mercury* of 3rd February, 1906, says:—

"We have found no difficulties of any moment in weaving Ramie, although such are popularly supposed to exist. Of course on a tappet loom this very inelastic material hangs very loosely during the change of shed, but as Ramie is very strong the half or quarter of the warp upon which the strain is placed seems quite equal to the call made upon it."

The Textile Recorder, July, 1907:—

"Ramie Spinning on the Continent." . . . "Very marked improvement is stated to exist in the latest decorticator placed on the market by Mr. Faure, of Limoges, France, whose machine for this purpose is, up to the present, the most successful yet developed. It is reported to work cheaper, and show a much larger yield of cleaned fibre per day than its predecessors, the inventor having studied the decortication of Ramie for many years, and constructed several machines for doing this work, and the product is equal in all respects to hand-cleaned China grass."

VULCANISATION TESTS WITH PLANTATION RUBBERS.

By Clayton Beadle, F.R.Met.Soc., F.C.S., and Henry P. Stevens, M.A., Ph.D., F.C.S. of Clayton Beadle and Stevens, 15 Boro', London, S.E.

When a raw material which for many years has formed the staple of a large industry is by force of circumstances produced in new districts and by new methods, the manufacturer naturally asks himself whether his new sources of supply are suitable to his methods of manufacture. He may, of course, have no difficulty in determining

which of the products (i.e., from old or new sources) is best suited to his *existing* methods, which methods are the result of a long experience with his original sources of supply; but it becomes ultimately a question as to which product will suit him best in the long run if both are worked under the most favourable conditions.

This is the state of affairs in which the rubber industry in the course of time will find itself, or more particularly that branch of the industry which deals with the production of high-class rubber articles of which Para rubber is an important ingredient. Up to within the last three or four years the world drew its supply of raw rubber from trees growing wild in various tropical areas. Some ten years ago a beginning was made with planting—particularly in the Malay Peninsula, and later in Ceylon—chiefly with *Hevea Braziliensis*, or the Para rubber tree, but as no commercial yield of rubber is obtained until the tree reaches its fifth or sixth year the effect of this planting is only just beginning to be felt, and the imported plantation rubber at the present time only forms about one per cent. of the total production. From the large areas now in process of being opened up, this production must increase considerably in the course of the next ten or fifteen years, until eventually the plantation rubber forms a considerable proportion of the supplies to rubber manufacturers.

The properties of rubber are not only dependent upon such things as soil, locality, climate, etc., but are largely affected by the methods used in curing and preparing it for the market; and as the methods of coagulation and preparation differ radically from those used in the case of wild rubbers this consideration particularly applies to plantation rubber. Without going into any details it may be stated that in the former case the methods are primitive and indequate, except in the case of the smoked rubbers, while the planters by common-sense precautions, and in some cases by the use of simple coagulating, washing, and drying plant, have sent to this country consignments which are unequalled from the point of view of purity and general excellence. It has, however, been asserted, without apparent reason that, in spite of these desirable qualities, the plantation rubber is wanting in the "nerve" especially attributed to hard cure Para.

The object of the present paper is the discussion of a number of preliminary tests made with the plantation rubber with a view to testing its qualities and comparing it with a typical high-class rubber, such as hard cure Amazonian Para. The methods employed in valuation of rubbers as carried out by brokers and merchants would be useless for this purpose. The broker looks for adulterants, and tests the physical qualities by the general appearance, smell, and feel of the rubber. Such tests cannot, except in the roughest manner, be of any value in forming an estimate of the qualities of plantation or any other rubber from a manufacturer's standpoint. A carefully conducted chemical analysis will, however, be of some help.

It is obvious, to begin with, that the value of a crude rubber to the manufacturer will to a large extent depend upon the proportion of actual rubber substance or caoutchouc it contains (*see* Heil and Esch *Handbuch der Gummiwaren-fabrikaton*, p. 40). A crude rubber, such as hard cure Para, will contain certain substances normally present in the latex from which it was obtained; of these the most important are resin and protein or nitrogenous bodies. It may also contain extraneous substances, such as sand and dirt of all kinds, and finally it will always contain more or less water. It is usual to determine these constituents and by difference to calculate the amount of caoutchouc, there being no agreed satisfactory method of directly estimating the latter. It has been suggested that a further examination should be made of the resin and protein bodies with a view to characterising them more exactly; but, quite apart from the large amount of research work which will be necessary before this can be done, it is difficult to see what advantage will be gained except for the purpose of distinguishing the source of the rubber; in any case it is doubtful if the results would justify the additional work entailed in the analysis.

Table I gives the analysis of a typical hard cure Para and that of a plantation "block"; the latter represents the mean of numerous analysis we have made from time to time on good qualities of this product.

TABLE I.

	Hard cure Para.	Plantation "block," as imported.
Moisture	12·7	0·4
Resins	3·1	4·0
Protein	2·9	2·8
Ash	0·3	0·1
Caoutchouc (by difference) ...	81·0	92·7

It will be seen that the figures are distinctly in favour of the plantation product; the moisture is particularly low in the latter owing to its having undergone a systematic drying process. This has the great advantage that the rubber is much less likely to undergo putrefactive change during transport through hot climate—as everyone knows—moulds and bacteria must have moisture for their growth and development. The samples we have examined of properly prepared wild rubber all contained large quantities of water, such as form 10 or 12 per cent. Of course, plantation rubber which is merely air-dried, as in the form of biscuits, may contain more than one-half per cent. moisture, but the amount will not be excessive.

So far as the analyses go, the figures are in favour of the plantation, and this has found due recognition on the market, where the best dry block, crepe, and other forms have fetched a higher price than hard cure Para, practically in proportion to the percentage of real rubber that these products contain. It may, however, be questioned whether a greater difference in price is not justifiable and will be obtained in favour of plantation rubber when the advantages of a pure and regular product are better recognised and manufacturers have acquired greater experience and confidence in handling it.

As the best block, crepe, and sheet are washed in a two-roll washing machine immediately after coagulating, and then dried either in the air or in vacuum drying ovens, this treatment on the spot is becoming very general. It seems reasonable to suppose that the manufacturer in this country should be able to take this washed and dried product and use it straight away in his mixing machines without any preliminary treatment. On the other hand, all ordinary grades of wild rubber when received by the manufacturer are too impure and contain too much moisture for use right away; they have therefore first to be subjected to a washing process in which the rubber is torn to shreds, in the course of which its "nerve" is affected, and then subsequently to be submitted to a tedious drying process, and if possible storage, in order that the rubber may regain some of the physical properties it has lost on treatment. Not only is it natural to suppose that all this can be avoided by the use of rubber washed and dried on the plantation, but the loss incurred in the washing process is also avoided. This loss in the case of the best wild rubbers, such as hard-cure Para, amounts to from 13 to 17 per cent.

In order to test the value of plantation grown and plantation prepared rubbers, something more is required than chemical analysis. As for practical purposes it may be said that all rubber is vulcanised in the course of manufacture, and as the properties of vulcanised rubber are very different from the raw article, it appeared to us that the only satisfactory means of determining the value of plantation rubber was to vulcanise it, and carry out physical and chemical tests on the vulcanised product. Moreover, in order to eliminate as far as possible the effect of carrying out such vulcanisation on a laboratory instead of on a manufacturing scale, we made a number of parallel experiments with a sample of typical hard cure Para, which was treated throughout in an exactly similar manner to the plantation rubber. Not only can we test the qualities of plantation rubber in this manner but we are able to put to the test the possibility of mixing and vulcanising washed and dried plantation rubber without any preliminary treatment.

The hard cure Para was, of course, washed and dried previous to vulcanising, as no results could be got with a product containing moisture. To accomplish this, the wild rubber was cut up, soaked in luke-warm water for some time, and then disintegrated and torn up to shreds in a stream of water, after which it was dried, first in air, and

subsequently in a desiccator, where it was preserved during the course of the experiments. By these means we imitated as far as possible the methods of purification employed by manufacturers.

The masticating and mixing operations were carried out in a specially equipped machine, which was found well suited for treating small quantities for experimental purposes, and no difficulty was experienced in obtaining a thoroughly even and homogeneous mass. The machine was arranged so that it could be steam-heated and kept under proper control. As some of the experimental results obtained by Continental workers are open to criticism owing to the small amount of material used, in our experiments not less than 50 grms. of material were operated upon at a time to minimise any error due to loss of sulphur or loading to be incorporated with the rubber. Some Continental authorities have taken 5 grms. of rubber per mixing. Under such circumstances a loss of finely powdered sulphur or mineral is sure to take place; when the quantities operated on are very small the percentage loss may be considerable. Thus, 5 grms. of rubber would require, say, only 0·3 grm. of sulphur, and a loss of 0·05 grm. would reduce the percentage of sulphur incorporated with the rubber from 6 to 5 per cent.; such a difference would entirely vitiate the results. As the amount of mastication very considerably influences the nature of the product in comparative tests, the mastication and mixing was continued for the same length of time. It has been shown that prolonged mastication will increase the acetone soluble products (so-called resins) by as much as 1 per cent. This matter, however, requires further investigation. In most cases when working with plantation rubbers without the addition of mineral matter, the treatment during mastication and mixing seems to have more effect on the product than the time of vulcanisation, provided that it is kept within the usual safe limits; that is to say, it would appear that changing from two to three and four hours' vulcanisation had a smaller influence on the tensile strength of the product than a difference in treatment in mastication and mixing. These points require more experimental work, which is in progress, but will not be discussed in this paper. We shall merely deal here with the general results.

The mixture, after kneading and while still hot, was forced into an iron cylinder. The bottom of the cylinder was closed with a screw-cap, and by means of a steel plunger the mixing was compressed into a solid cylindrical block of such a size that slices could be cut off to fit into the vulcanising moulds. The moulds are of similar construction to those used on a large scale.

On a manufacturing scale it is usual to give the digester a gradual "rise"; that is to say, the temperature is never suddenly raised, but is taken up to one corresponding to a certain pressure, say, for one hour before raising it further. We have tried both slow and rapid methods with mixings containing little or no mineral, and have not found the gradual raising of the temperature to influence the strength

of the product to any very marked degree. On the other hand, care, of course, must be taken to keep the temperature within certain defined limits.

For tensile strengths much difficulty was experienced in testing small strips, owing to the tendency of the rubber to tear and rupture in the jaw, even when the ends were cut considerably wider than the middle portion. Eventually the difficulty was got over by punching small rings, which were stretched between smooth round iron hooks. The testing machine was constructed on the well-known principle used in testing cement and other materials, where a regular stream of water or shot is allowed to run into a vessel and the supply cut off automatically the moment of rupture. All figures given are the mean of at least ten tests.

Having briefly described the experimental methods employed we now proceed to give a short *résumé* of the results so far obtained.

The products prepared from plantation rubber were of a beautifully clear transparent yellow to brown shade when viewed through sheets 1 mm. thick. Those prepared from hard cure Para were much darker and less transparent. When vulcanised for a short time the surface sulphured up in the ordinary manner. In the course of our work so far we have carried out over 150 vulcanisations. We have subjected twenty separately vulcanised samples of plantation rubber containing only rubber and sulphur without mineral or other additions to tests for tensile strength and elongation at the moment of rupture, details of which are given in Table II.

Taking first the tensile strength in grms. required to rupture the rings, the average of the whole series works out to 3203, and the elongation at the moment of rupture 13·1. Of these samples, sixteen were vulcanised with 6 per cent. of sulphur, and gave an average strength of 3187 grms. and an elongation of 13·0. Three vulcanised products (K) containing 5 per cent. of sulphur were tested, and gave an average tensile strength of 3245 grms. and elongation 14, while the sample vulcanised with 8 per cent. gave a tensile strength of 3324 grms. and elongation of 12. Although the figures for tensile strength of K and X are somewhat higher than the average of the remainder (3187), we do not attach great importance to this, as this latter average is pulled down by the uniformly low results obtained with mixing Q, and due to some irregularity in the mixing process. On the other hand, it is noteworthy that K (with 5 per cent. sulphur) gives a greater elongation (14·0) than the average (13·0), while X (with 8 per cent. of sulphur) gives a smaller elongation (12·0).

We come now to vulcanising tests with fine hard cure Para. We are indebted to Mr. Devitt, jun., of the firm of Lewis and Peat, for supplying us with a quantity of a good average sample of the above, and valued early in March last at 5*s.* 1*d.* per pound. The analysis of this sample is:—

TABLE II.—*Tests on Vulcanised Plantation Rubbers.*

Vulcanisation reference number.		Sulphur, per cent.	Tensile strength, in grms.		Elongation at rupture when original = 1·0.		Elongation under a strain of 1,500 grms. when original = 1.0.	
48			3129		—		—	
49	L	6	3574	3278	13·4	13·0	8·7	8·3
62			3133		12·7		8·0	
74			2882		13·9		—	
77	Q	6	3015	2933	13·3	13.4	9·4	9·7
79			2910		13·2		9·4	
80			2927		13·1		10·2	
83			3164		12·4		8·2	
85	R	6	3263	3264	12·4	12·5	8·0	8·9
87			3366		12·7		9·5	
99			3320		13·3		8·5	
104	T	6	3168	3349	12·5	12·9	8·2	8·2
92			3499		13·1		7·9	
94			3410		12·9		8·2	
143	D2	6	3260	3120	13·4	13·4	10·2	10·4
144			2981		13·4		10·6	
101			3138		13·7		10·4	
45	K	5	3428	3245	14·3	14·0	9·5	10·1
139			3169		13·9		10·4	
110	X	8	3324	3324	12·0	12·0	7·7	7·7
Mean of all tests			3203		13·1		9·0	
Mean of L, Q, R, T, and D2			3187		13·0		8·9	

TABLE III.—*Tests on Vulcanised hard cure Para.*

Vulcanisation reference number.		Sulphur, per cent.	Tensile strength, in grms.		Elongation at rupture when original = 1·0.		Elongation under a strain of 1,500 grms. when original = 1.0.	
95			2788	3164	12·2	12·5	9·2	8·7
97	U	6	3541		12·8		8·3	
114			2646	2808	13·3	12·8	10·1	9·9
115	Y	6	2970		12·4		9·8	
124	S	6	3118	3118	12·9	12·9	9·3	9·3
Mean of all tests			3013		12·7		9·3	

given above). After washing and drying, the mixing and vulcanisation of the samples was carried out in exactly the same manner as with the plantation rubber. The results of the tests are given in Table III.

It will be seen that the average tensile strength of five vulcanisations, comprising three mixings, in all of which 6 per cent. sulphur was used, averages 3013 grms. and the elongation 12·7. Both figures are somewhat lower than those obtained with the plantation rubber. The figures, too, are more irregular. It is far from our intention to draw

rigorous conclusions from these series of tests, and we do not infer that caoutchouc in the plantation Para is superior to that in the Amazonian hard cure Para merely because in an average of a number of tests we have obtained slightly better figures with the former. It should be remembered that a certain treatment in mixing and vulcanising which would bring out the best qualities of plantation rubber might require some modification when applied to the hard cure product. On the other hand, we have avoided such objections as far as possible by varying the conditions, such as the duration and temperature of vulcanisation so as to bring out the best results in both cases.

A considerable amount of work on these lines is in progress, and we hope before long to be in position to publish the results of further tests; we think, however, that with the results so far obtained we are justified in concluding that the actual rubber or caoutchouc contained in the plantation products will prove to be at least as good if not superior to that of the Amazonian product. So far, we find that the statements frequently made in some quarters that plantation rubber is wanting in "nerve" is not justified by tests we have made on the vulcanised product obtained from the best prepared block.

We have examined the distensibility of vulcanised plantation rubber under increasing strain, and the results are plotted in the form of a curve.

As in the tensile strength tests, a sheet of rubber 1 mm. thick was cut in the form of a ring 40 mm. in diameter and 2·5 mm. wide. It was stretched vertically between smooth iron hooks, the upper one being fixed and the lower one carrying a scale pan. Two marks were made on the band, and the distance between them measured as weights were put into the pan.

We have also made some preliminary tests on sheets of block rubber containing mineral matter, two of which we give below. Mixing M consisted of 50 grms. caoutchouc, 4 grms. sulphur, 10 grms. zinc oxide, 25 grms. lithopone, and 1 grm. pitch; that is, approximately:—

Caoutchouc	...	...	...	56 per cent.
Zinc oxide	...	...	...	11 „
Lithopone	...	...	...	28 „
Pitch	...	...	...	1 „

and sulphur, 8 per cent., reckoned on the caoutchouc.

Mixing J consisted of 50 grms. of plantation block caoutchouc, 5 grms. sulphide of antimony, and 2 grms. sulphur. The results obtained are given in Table IV.

TABLE IV.—*Tests on Vulcanised Rubbers, prepared from "Block" containing Mineral Matter.*

Vulcanisation reference number.	Mixing.	Tensile strengths, in grms.	Elongation at rupture when original = 1.	Elongation under a strain of 1500 grms.,
58	M	4746	9·9	6·0
54	J	3915	11·7	6·1

The addition of mineral matter has had the effect of increasing the tensile strength while reducing the elongation. This effect is quite general within certain limits, and further tests are being carried out in which we are investigating the influence of definite quantities of mineral matters on mixings containing plantation block on the one hand and hard cure Para on the other.

Plantation Rubber by Figgis & Co.

Messrs. S. Figgis and Co., in their annual review of the India-rubber market, give the following *re* plantation rubber, which we extract verbatim :—

Manufacturers have shewn a decided preference for sheet, biscuit and crepe ; the latter should not be drawn out too thin or have visible air or steam bubbles in it, and some lots of thick crepe, nice strong rubber about $\frac{1}{8}$ of an inch thick, were much appreciated and sold well.

We think it has been profitable to planters to wash and clean the rubber thoroughly, and to prepare as large a proportion as possible of good colour—also not to send many qualities or very small lots. Block has not been in favour generally, and unless clean, resilient, hard quality can be sent, it may be better to ship as crepe.

We report our recommendations of a year ago :—

Pack it in good dry condition (excess of resin much objected to).

Into strong cases of 1 cwt. to 2 cwt. each. No paper, fullers earth, etc., to be used.

To keep different qualities and colours separate, and not to mix immature rubber with older; to send separately dirty barky pieces, and to wash out all the bark in crepe, block, and sheet.

All fine qualities should be loose crepe, sheet, or biscuit—not run into a mass.

To smoke the rubber when convenient, because "smoking" appears to increase its resiliency, but keep it as clear and yellow as possible.

Smoked rubber appears to have greater resiliency and to be more suitable for many purposes than unsmoked. "Smoking" prevents the "proteins" in rubber from decomposition, and generally from "tackiness." All fine rubber from Para is smoked.

The very serious decline in price since October is mainly due to the serious crisis in America, and the closing of many factories there. But, considering the enormous increase and general expectation of "planting" rubber in most tropical countries (coupled with the prophetic figures of immense supplies of plantation within two or three years), values were far too high. The decline will, we hope, cool many new enterprises and prevent too large extensions of planting. There is no sign of such increased demand or new uses for rubber as to warrant too rapid an increase of supply. If it becomes too large, values will suffer. We cannot expect much increase of consumption in 1908 in the present state of trade and the over-production of motors everywhere this season.

Brazil shows no sign of reducing her output, though perhaps she may do so in the next crop owing to the serious losses on this crop. Brazil exported over 41,500 tons.

There are rumours about the manufacture, by old and moneyed people who do not often put money into disasterous speculation, of what was erroneously described as synthetic rubber. We shall wateh results with curiosity (and doubt).

The lower price may retard or reduce the manufacture of "substitutes," but they are largely consumed. The manufacture of reclaimed rubber is very considerable and increasing.

Rambang and Castilloa have not been liked, and sold cheaply.

The India-Rubber Journal, volume 35, p. 40.

LEWIS & PEAT'S
REPORT ON PLANTATION GROWN RUBBER

From Ceylon, the Straits and Malay States for 1907.

6 Mincing Lane, London,
January, 1908.

It is with satisfaction that at the end of another year we are able to report a large increase in the number of manufacturers and consumers who are now using plantation rubber, and who send regular orders for all kinds as they are offered on the market. There is no doubt that this means that by degrees old prejudices are gradually being overcome, and that experience in how best to use the Rubber by manufacturers is proving to consumers the superior merits of cultivated over native kinds, and considering the purity and reliable quality of the bulk of supplies sent home for sale, we anticipate manufacturers will further adapt their plant and use plantation more and more. We have had some most satisfactory results of tests for strength brought before us, and if producers will only maintain the reputation for purity and evenness of quality, we have no fear for the future of the article, although it may be as supplies increase at lower prices.

During the year the imports of Plantation Grown Rubbers to London have amounted to about 1,100 tons, against 500 tons during 1906 and 150 tons in 1905, of which about 250 tons came from Ceylon and 750 tons from Malaya. Only comparatively small parcels have so far been sent from Southern India, Burmah, Mergui, and from Java, Sumatra and Borneo. We have good reports of the plantations in the West Indies, Honduras, Nicaragua, and parts of Mexico, but no Para has been tapped in those countries as yet and only small parcels of Castilloa have come to hand. An interesting parcel but only of a few cwts. of Para from Brazil, prepared on the Ceylon system, was sold recently at a fraction less than Eastern lots. This was from old trees, and was certainly exceptionally strong but very dark in colour. Prices show a very serious decline from the high rates ruling in 1906. This fall has taken place in sympathy with fine Para from Brazil, and has been caused chiefly by increased supplies and the financial crisis in America and the consequent temporary closing of many of the factories. At the opening sale of the year Plantation Grown Para stood at 5/8, and after touching 5/10 in March fell right away to 3/8 in November, with one rally at 6*d*. per lb. in June. At the closing sale No. 1 was selling at 3/10 after having touched 4/2 in the previous auction. As to the future we think there is little prospect of returning to the high prices ruling in 1906 and the early part of 1907, and fluctuations will be governed by the price of fine Para, of which there appears to be a large crop. At the present moment the stock of medium grades (i.e., other rubbers than Para sorts) is enormous in all centres of the trade, and until these can be worked off they will be a drag on the market. The exports of rubber from Brazil during 1906 amounted to nearly 42,000 tons, against the previous crop of 38,000 tons.

During the past year artificial rubber has been talked about a great deal, but so far nothing tangible has been forthcoming, and we do not know anyone in the rubber trade of any importance or authority who believes in the likelihood of the production of a substitute for the real article, or has seen a sample of it, and at the lower range of prices for all kinds of Rubber and the increasing supplies the danger now from this source is more remote than ever.

Biscuits and Sheets.—These forms of preparation have met with a good steady demand throughout the year. Only very small lots of very fine quality have been marketed, and have realised fancy prices for special purposes. The bulk of the shipments have been of dark amber colour, and very even both in quality and condition. There are now regular buyers particularly of sheets, and the price paid has compared very favourably with other preparations. Machine rolled sheets are liked rather better than the somewhat uneven and sometimes unsightly hand rolled.

Crepe is coming to the fore and has made great strides amongst consumers in the past year. There is a regular and increasing demand for very fine pale, in some cases almost white, and some exceedingly high prices have been paid. The good bright pale No. 1 has been

taken regularly at about the standard price at each sale of No. 1 sheets and biscuits. The lower grades of crepe, viz., the brown, mottled and dark have been very popular, and the demand has increased enormously during the twelve months. The relative prices have not been as good as were obtained in 1906. There has been a greater increase in production of this quality, it compares more closely to ordinary Amazon Para, and is used by many who are not particular as to colour. Pressed crepe has at times been most difficult to sell, and the long free or rolled-up ribbons are much more sought after.

BLOCK.—Very few planters have succeeded in producing fine clear amber block, which is wanted, and, with the exception of "Lanadron," practically all shipments have been of uneven quality, and realised less than if sent home in sheet or crepe form. Quantities of quite black block, dull, opaque and sometimes heated and soft have been catalogued and only disposed of with difficulty. Some very fine little lots of pressed biscuits and sheets have been sold, but only in extremely small quantities. Wet block has not been favourably received at all and most difficult of sale.

WORMS.—Very high prices have been paid for the best quality, and fancy prices are paid for almost white lots, such as the "Gikiyanakande," but even the produce of this estate shows a tendency to come rather darker and mottled.

CASTILLOA.—Very little sold here during the year, but shipments are increasing from the West Indies, Central and South America. The preparation has improved, and some lots have been very nearly equal to ordinary plantation biscuits. A few lots from Java and Sumatra have arrived in a very low heated condition, making them almost unsaleable. Supplies from Mexico, which promised a few years ago to come in large quantities, have up to now been very small and unimportant, and many large estates 10 to 12 years ago so far seem failures, and we hear of many estates being abandoned in certain districts.

RAMBONG.—Only small imports, but very fine lots of scrap, and especially fine crepe have been readily taken.

The closing quotations are:—

For sheets and biscuits	3/9 a 4/-	per lb.
,, Crepe	3/9 a 4/-	,,
,, Scrap	2/3 a 2/6	,,
,, Fine Para (Amazon)	3/5	,,
,, Worms	3/10 a 4/-	,,
,, Block	3/10 a 4/-	,,

The world's production of rubber during the past year was about 69,000 tons (including 42,000 Para grades), against 65,000 tons in 1906, showing an increase in production of 4,000 tons, but the consumption shows no increase and is about same as in 1906, so that

stocks on hand are several thousand tons more to-day than they were a year ago. So until a marked improvement takes place in the demand, especially in America, it is difficult to see where any advance in prices can come from, and considering the gigantic scale upon which planting in all parts of the world, including West Coast of Africa and the Congo, has been going on, it is clear production will be doubled in a very few years. Brazil at present maintains her export duty of about 25 per cent., and it is impossible to see how this can be continued much longer.

London Stock of Plantation Rubber, 31st December, 1907, 145 tons, against 78 tons last year.

	Highest.			Lowest.		
	1907.	1906.	1905.	1907.	1906.	1905.
Plantation Para ...	5/10	6/3	6/9¾	3/8	5/5	5/11
Fine Para (Amazon)	5/2	5/5	5/9	3/3¾	5/-	5/0¼

The Materials for a Flora of the Malay Peninsula.

This work was commenced by Sir George King in 1888, parts being published in the *Journal of the Royal Asiatic Society of Bengal* as they were finished. The parts dealing with Gamopetalæ and some other groups were contributed by Dr. Prain, Mr. C. B. Clarke and Mr. Gamble. In the matter of Dicotyledons the orders are finished as far as the end of the Gamopetalæ except the Verbenaceæ and Gesneraeceæ which will shortly be published by Mr. Gamble. Three volumes of the Monocotyledons were published independently in 1907 by the Director of the Botanic Gardens, Singapore. The first volume contains the Hydroclparideæ, Orchideæ and Apostasiaceæ. The second contains the Scitamineæ and other orders to the end of palms; the third from the Aroids to the grasses, completing the account of the Monocotyledons as far as is known.

These three volumes are now on sale at the Botanic Gardens, Singapore, and at Messrs. Kelly and Walsh, 32 Raffles Place, Singapore, and at the Crown Agents, Whitehall Gardens, London, at the price of 5 dollars or 15 shillings for each volume and 10 dollars or 30 shillings for the three volumes.

It is proposed to issue shortly an index to each volume.—H. N. R.

Death of Mr. A. B. Stephens.

We much regret to have to record the death of Mr. Arthur Bligh Stephens which took place in the beginning of January, at Taiping. Mr. Stephens was originally connected with planting for twenty years before he joined the Federated Malay States Government as Assistant Indian Immigration Agent, 1892. He was appointed Deputy Conservator of Forests, Perak, in 1903, and acted as Conservator of Forests during the absence of Mr. Burn-Murdoch.

Mr. Stephens frequently contributed articles to the *Bulletin*, the last being on a new form of covering for a plant house, published in the September *Bulletin*. He was much interested in horticulture and especially in the cultivation of orchids, of which he obtained many interesting species on the Thaiping Hills, including the curious Cymbidium with which I had the pleasure of associating his name, some years ago. He was fifty-three at the time of his death, and had been about 35 years in the East.—H. N. R.

CEYLON, STRAITS AND MALAY STATES
Plantation Rubber Report.

December 20th, 1907.

The following Lots, comprising about 22 tons Straits and 5½ tons Ceylon, were offered at auctions to-day and sold as follows:—

Straits and Malay States.

MARK.	PKGS.		DESCRIPTION.	PRICE PER LB.
LED	5	Cases	Darkish amber sheets, little rough ..	3/11
	1	,,	Fair virgin biscuits, little scrappy ..	2/9
	1	,,	Fair brown scrap	2/8½
	5	,,	Darkish amber sheets	3/11½
	2	,,	Brown scrap, barky	2/8½
McI	1	,,	Low black dirty pressed scrap, barky and heated	7d.
B M & Co. P	7	,,	Dark sheets, rather mouldy	bought in
	1	,,	Dark crepe	3/4
	1	,,	Pressed crepe	3/4½
	6	,,	Black pressed crepe, pt. whitish ..	bought in
	10	,,	Black and brown pressed crepe, showing slight traces of heat	3/4½
B M & Co. P P	3	,,	Rough amber sheets and biscuits, some dark and traces of heat	3/10
B & D T	1	,,	Grey and white block	3/-
	3	,,	Grey and brownish block	3/-
	1	,,	Darkish amber sheets	3/10
	2	,,	Palish amber thin sheets	3/10
Damansara Selangor	8	,,	Fair mottled crepe, some dark specky and part dull	3/9
	1	,,	Fair brown pressed crepe	3/3
	4	,,	Dark barky scrap crepe	2/8½
	3	,,	Soft black and brown barky block ..	2/2
	1	,,	Probably Rambong block, part black, part weakish	3/-
F D I	4	,,	Weak whitish and brown block ..	3/1
	1	,,	White and black blocked scrap, part very dirty	2/1¾
S K R Co. Ld.	7	,,	Fair dark block, some barky pt. sold ..	3/-
B & D K	1	,,	Mottled crepe	3/7
	2	,,	Pale crepe	3/10½

MARK.	PKGS.		DESCRIPTION.	PRICE PER LB.
L E Muar Straits.	57	„	No. 1 block	bought in
	51	„	No. 2 block	„
V R Co., Ld. Klang FMS	4	„	Fine amber sheets	„
	9	„	Brown mottled crepe	3/4½ at 3/5¾
	5	„	Dark crepe	3/4
	8	„	Block, black fair to good	3/2¾
P S E	3	„	Large reddish ball	bought in
S	3	„	Palish amber sheets, little rough ..	„
	2	„	Good pressed scrap	2/7½
	2	„	Dark scrappy pieces, rather dirty ..	2/4 subject
K M	1	„	Amber sheets, some rather dark rough ..	bought in
Bila	12	„	Good amber sheets	„
	10	„	Brown scrap, some dark ..part sold..	2/9¼
	3	„	Dark scrap	2/8
Linggi Plants	15	„	Fine pale crepe, little mottled ..	bought in
	17	„	Greyish crepe	„
	8	„	Brown crepe, some mottled	3/5¾ at 3/6¾
	15	„	Block, dark rather soft	bought in
Highland Estate	34	„	Rolled sheets	„
	15	„	Pressed mottled crepe, some dark ..	3/6 at 3/8
	28	„	Mottled crepe, some dark	3/5 at 3/8
	1	„	Brown crepe	3/–
	3	„	Block, fine	bought in
	5	„	Block, black .. ..part sold..	3/2
B N S	16	„	Dark sheets, some rough	bought in
K M A	8	„	Palish and greyish blocked crepe ..	„
			Ceylon.	
Tallagalla	2	Cases	Darkish and dark amber biscuits ..	bought in
	2	„	Brownish and whitish scrap	2/11
	2	„	Loose barky scrap	1/8½
Warriapolla	2	„	Pale amber biscuits	bought in
	1	„	Amber and darkish biscuits	„
	1	„	Brown barky scrap	2/8
Northumberland	1	„	Fair amber biscuits	3/10
K K	5	„	Dark dull crepe, soft rather barky, some black	bought in
	5	„	Black pressed crepe soft	2/– subject
	1	„	Block black, mixed little white and rather soft	2/10
	4	„	Block, dark, little white	3/– bid
Densworth	1	„	Brown barky scrap	2/8
Matang	1	„	Virgin and scrappy block, wet ..	2/3
	1	„	Blocked scrap, rather dirty and barky ..	2/3
Doranakande	4	„	Dark biscuits, rather rough	bought in
	2	„	Rough dark sheets, some black, not properly cured, wet and some stick together	„
	2	„	Ordinary brown scrap	2/8
	1	„	Dark scrap, dirty and barky	2/6
	4	„	Virgin nuggets and pieces	2/7¾
Ayr	1	„	Darkish amber biscuits, rather soft, very weak, some stuck together ..	3/10
	1	„	Large amber sheets	bought in
Waharaka	1	„	Good dark blocked worms	„
	1	„	Good dark scrap	3/2

MARK.	PKGS.		DESCRIPTION.	PRICE PER LB.
Langsland	18	„	Amber and darkish biscuits	bought in
Heatherley	3	„	Pressed brown crepe	3/5¾
Aberdeen	1	„	Good amber biscuits	bought in
	1	„	Darkish scrap	„
Glanrhos	3	„	Brown crepe	„
	6	„	Amber biscuits	„
Clontarp	2	„	Amber biscuits	„
	2	„	Brown crepe	3/6
Gikiyanakande	12	„	Good pale worms	bought in
Kepitigalla	18	„	Good to fine amber sheets	„
	6	„	Very dark sheets..	„
	2	„	Dark scrap	2/7
Ola Haloya	1	„	Fine palish small biscuits	bought in

GOW, WILSON AND STANTON, LIMITED,
India Rubber Market Report.

13, Rood Lane, London, E.C.
December 6th, 1907.

This was about the largest auction of plantation rubber that has yet been held, and the stronger tone of the market was well evidenced by the good competition that was forthcoming for all grades.

About one half of the offerings were disposed of in the room at prices generally showing an advance of from about 4d. to 6d. per lb. on last sale quotations. This is more satisfactory in view of the fact that the Bank Rate remains unchanged, and that the position in America as yet hardly admits of active business in that market.

Sheet and biscuits were in good demand and sold readily at from about 3/11 to 4/4¼ per lb., the latter price being realised for some very fine dark sheet from Highlands Estate, while the highest price for biscuits, viz., 4/3, was paid for some from Arapolakande and Glencorse Estates.

Crepe was rather more plentiful than other descriptions, and the quotation suffered to some extent in consequence. Some of the palest offered, viz., that from Jebong, was withdrawn for higher limits, and the highest price for this grade was 4/2¾ paid for a small lot from Arapolakande.

Block continues to be less sought after than other kinds, and 66 cases of fine clear amber block from Lanadron Estate were bought in for want of competition.

Number of Packages Advertised.		Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.		
		Ceylon.	Malaya.	Totals.	No. of Packages Sold.	Price.	Hard Fine Para.	Plantation. Fine.	Plantation. Scrap.
To-day	1,001	11½	37½	49	481	3/7⅞	3/8½	3/11 to 4/4¼	2/6 to 3/0¾
Corresponding Sale Last Year ...	289	4	12	16¼	217	5/2¾	5/2	5/7½ to 5/8½	4/- to 4/5

Quantity of Plantation Rubber offered at Auction from 1st January to date.

	No. of Packages Offered.	Quantity in Tons.			No. of Packages Sold.	Average Price Paid.
		Ceylon.	Malaya.	Total.		
1907	14,810	186½	599¾	786¼	7,180	about 4/10¼
Same period 1906	6,116	89¼	235¾	325	3,830	5/6¼

To-day's Quotations.

Sheet, etc.		Crepe.		Unwashed Scrap.	
Fine Block	None sold.	Very Pale	4/1 to 4/2¾	Good	2/9 to 3/0¾
Good to Fine Sheet ...	4/- to 4/4½	Palish to Mottled ...	3/6 to 4/-	Low and Barky ...	1/6 to 2/5
Very Fine Biscuits ...	4/3	Dark and Blocked ...	3/- to 3/4½		
Good to Fine Biscuits	3/11 to 4/2¾				

Shipments.

Exports from 1st January to 19th October, 1907.

From Singapore	1,116,330 lbs.
From Penang	313,228 lbs.
Total	1,429,558 lbs.

Exports from 1st January to 11th November. From Ceylon.

1907	413,031 lbs.
1906	300,255 lbs.
1905	120,091 lbs.
1904	61,075 lbs.

(The Singapore and Penang figures are taken from statistics published by Messrs. Barlow & Co., of Singapore.

Mark.	Pkgs.	Description.	Price per lb.
Kumaradola	2	Good biscuits	4/0¾
	1	Lump scrap	bought in.
G M	10	„ „	2/5 to 2/6
Vicarton	2	Good palish biscuits (77 lbs.)	3/7½ to 4/-
	1	Barky scrap	2/-
Matang	23	Good palish to darkish crepe	3/2¼ to 3/8
	12	Good sheet	4/2½
	3	Wet pressed crepe and scrap .. pt. sold..	3/-
Sorana	6	Good biscuits	4/2¼
Gonakelle	1	Good biscuits	4/2½
	2	Fine scrap and cuttings	2/7½ to 2/11
V S / K M	7	Good biscuits and sheet	4/- to 4/0¾
	4	Darkish and dark crepe	2/4 to 3/4½
	3	Biscuits, scrap and rejections	2/6 to 2/10
Waharaka	2	Block and scrap	2/7 to 2/4-
	1	Very fine scrap	bought in
Ambatenne	1	Good biscuits	4/2½
	1	Scrap	1/6
Densworth	2	Good biscuits	4/2¾
	1	Good scrap	bought in
Sunnycroft	1	Good sheet	4/-

MARK.	PKGS.	DESCRIPTION.	PRICE PER LB
Doranakande	4	Block scrap	2/7
Tallagalla	2	„ „	2/7
MAK	9	Good biscuits	3/4 to 4/–
	7	Crepe, scrap and rejections .. pt. sold ..	2/7 to 3/–
Taldua	2	Good biscuits	4/2½
	1	Scrap	2/6
Northumberland	1	Block scrap	2/6
Clara	1	„ „	2/9
KM	3	Good and medium biscuits	3/9
Culloden	13	Very fine pale crepe	4/1
	5	Fine palish and brownish	3/7¼ to 4/–
	11	Good dark	3/5
	2	Dark block	3/3
Arapolakande	1	Very fine pale crepe	4/2¾
	7	Fine biscuits	4/3
	1	Good mottled crepe	3/7½
	3	Brownish to darkish	3/6
	1	Good scrap	3/–
Glencorse	1	Fine biscuits	4/3
	3	Good scrap and cuttings	2/5½ to 2/10½
Neboda	9	Good brownish to dark crepe	3/1½ to 3/7½
Aberdeen	5	Very fine sheet	4/2
	1	Good pressed scrap	2/10
	1	Good rejections	2/6
Glanrhos	14	Good sheet and biscuits .. .. pt. sold ..	3/10½ to 4/–
	1	Dark pressed crepe	bought in
Marakona	1	Fine sheet	4/1¼
Clontarf	1	Black crepe	bought in
Gikiyanakande	10	Very fine pale worm	„ „
	7	Brownish to darkish crepe	3/2½ to 3/8
Kepitagalla	12	Fine sheet	4/1
	1	Rejections	bought in
Suduganga	2	Fine sheet	4/–
	2	Rejected sheet	bought in
L | B / L | H	4	Fine palish worm	bought in

Malaya.

Jebong	94	Very fine pale crepe	bought in
Golconda	7	Good sheet	4/0½
	1	Dark block	3/–
L E Muar Straits	66	Very fine block	bought in
	54	No. 2 block	„ „
E K K P	5	Fine sheet	withdrawn
	1	Fine pale crepe	
	1	Darkish „	

MARK.	PKGS.	DESCRIPTION.	PRICE PER LB.
F D P	4	Good block	bought in
	2	Scrap	„ „
	10	Good sheet	4/– to 4/2
	1	Rejections	2/10
B & D	11	Fine pale to darkish crepe	3/5 to 4/1
	6	Good darkish to dark crepe	3/– to 3/6
	2	Fine pale sheet	4/– to 4/1
	1	Good biscuits	3/11
	1	Good sheet	4/1
	1	Scrap	3/6
Damansara	17	Fine sheet	4/1¾
	2	Good dark block .. .. pt. sold ..	2/3
	19	Fine palish crepe	bought in
	9	Good to medium dark block .. pt. sold ..	2/9 to 3/–
S K R Co Ld.	17	Good palish crepe .. .. „ „ ..	3/6 to 3/10
	7	Good dark block	bought in
A G & Co.	1	Fine pale sheet	4/1
McI	4	Dull biscuits	3/8
S P S	7	Biscuits, scrap, etc. .. .. pt. sold ..	2/5 to 2/10
Jugra	1	Darkish pressed crepe	2/9
B	3	Dark block	bought in
V R Co., Ld. Klang FMS	46	Good palish and mottled crepe .. pt. sold ..	3/7¼ to 3/7½
	10	Dark.. .. .. .. „ ..	3/1¾ to 3/4¼
E A C	15	Very fine pale crepe	4/0¾
	11	Good brownish and dark crepe	3/5 to 3/7
	3	Rough biscuits	bought in
R R S	3	Fine sheet	bought in
	4	Good scrap	2/8
KM	1	Good sheet	bought in
	2	Good sheet .. .. .. pt. sold ..	4/1¾
E B & Co.	2	Scrap	bought in
P S E	8	Fine sheet	4/2¼
	3	Ball	bought in
B S	18	Fine sheet	4/2
Bila	19	Good scrap and rejections	2/7½ to 3/0¾
Linggi Plants	41	Very fine pale and palish crepe and block ..	bought in
	15	Dark pressed crepe and block	2/8
Sungei Krudda	4	Palish scrap	2/10 to 2/10¼
	11	Dark pressed crepe and scrap .. pt. sold ..	2/4
	1	Mottled crepe	3/7½
	6	Good sheet	bought in
Highlands	20	Fine sheet	4/3¾ to 4/4¼
	36	Good palish to darkish crepe	3/3 to 3/8½
	1	Fine block	3/8
	1	Good dark block	3/3½
Glenmarie	7	Good sheet and biscuits	4/– to 4/1
	1	Dark pressed crepe	2/11

MARK.	PKGS.	DESCRIPTION.	PRICE PER LB.
A R / P Co.	2	Darkish to dark crepe .. .. pt. sold ..	3/2½
BNS	36	Fine sheet	bought in
	1	,, ,, (damaged)	,, ,,
	2	Good scrap	bought in
H E A	9	Fine palish crepe	bought in
	3	Darkish to dark blocked crepe	bought in
Labu	31	Fine pale and palish crepe	bought in
G / F T / L	2	Darker	bought in
L	5	Darkish	bought in
Terentang	9	Fine palish crepe	bought in
Linsum	9	,, ...	bought in
Shelford	6	Fine and medium block	3/3¾ to 3/4¼

CEYLON, STRAITS AND MALAY STATES
Plantation Rubber Report.

December 6th, 1907.

The following lots, comprising about 38 tons Straits and 13 tons Ceylon, were offered at auctions to-day and sold as follows :—

Straits and Malay States.

MUAR Straits	66	Cases	No. 1 block	bought in
	54	,,	No. 2 ,, ...	,,
K K	5	Pkgs.	Palish and darkish amber sheets ..	,,
F D P	4	Cases	Wet whitish and brown block ..	,,
	10	,,	Palish and darkish amber sheets some rough	4/– at 4/1¼
	5	,,	Dark crepe mixed mottled	bought in
	1	,,	Dark pressed crepe	3/–
	1	,,	Fine pale crepe	4/1
E & D	2	Bags	Dark and mottled crepe, part sold ..	3/4
K	2	,,	Brown and mottled crepe, part heated ..	bought in
Damansara / Selangor	17	Cases	Amber and darkish sheets, some stained and mouldy externally	4/1¾

MARK.	PKGS.		DESCRIPTION.	PRICE PER LB.
	1	Bag.	Rambong block soft	bought in
S K R Co. Ltd.	2	,,	Fine pale crepe	,,
	13	,,	Mottled crepe, some darkish	3/10
	2	,,	Dull mottled crepe	3/6
	7	,,	Black block softish	bought in
McI	4	,,	Small rough dark biscuits	3/8
Jugra Estate	1	,,	Black and brown blocked crepe, part heated	2/9
B	3	Bags	Black block, fairly strong, clean and well prepared	bought in
Jebong	94	,,	Crepe, good to fine pale	,,
Golconda	7	,,	Good amber sheets	4/0½
	2	,,	Fine black block	3/-
V R Co., Ld. Klang F M S	35	,,	Fine pale crepe	bought in
	5	,,	Mottled crepe	3/7¼ at 3/7½
	6	,,	Palish and grey mottled crepe ..	3/7¼ at 3/7½
	10	,,	Dark crepe	3/1¾ at 3/4¼
E A C	15	,,	Fine pale crepe	4/0¾
	11	,,	Mottled and dark mottled crepe ..	3/5 at 3/7
	3	,,	Rough amber biscuits	4/-
K M	1	,,	Rough amber sheets	bought in
EB Co.	1	,,	Palish and darkish sheets	4/2½
P S E	8	,,	Large amber sheets	4/2¼
	3	,,	Large waxy ball	bought in
Bila	18	,,	Amber sheets	4/2
	13	,,	Brown scrap	3/- at 3/0¾
	2	,,	,, ,, dirty	2/7½
	4	,,	Scrappy virgin biscuits	2/8¼
Linggi Plants	23	,,	Good pale crepe, greyish	bought in
	1	,,	Blocked palish crepe	,,
	15	,,	Blocked brown crepe	2/8
	5	,,	Fine pale crepe	bought in
Sungei Krudda	6	,,	Brown scrap, part sold	2/10¼
	3	Pkgs.	Blocked scrap, part sold	2/4
	1	Case	Mottled crepe	3/7½
	5	Cases	Block, brown and dark	bought in
Highland Estates	20	,,	Rolled sheets	4/3¾ at 4/4¼
	2	,,	Pressed crepe, good pale	3/8½
	9	,,	Brown pressed crepe, some black ..	3/7 at 3/8
	14	,,	Thick mottled crepe	3/8 at 3/8¼
	11	,,	Brown crepe	3/4¼ at 3/7½
A R P Co. S BNS	1	,,	Darkish crepe	3/2½
	1	,,	Soft brown crepe	2/- bid
	37	,,	Large darkish amber sheets	bought in
	2	,,	Dark barky scrap	,,
H E A	10	,,	Crepe palish and darkish, some mottled ..	,,
Labu M	29	,,	Pale crepe	,,
	9	,,	Darkish and mottled crepe	,,
Damansara	19	,,	Palish and amber crepe	,,
	1	,,	Blocked and mottled crepe	,,
	5	,,	Dark blocked and mottled crepe ..	3/-
	3	,,	Brown barky block	2/9
Sheiford	4	,,	Good black block	3/4¼
	2	,,	Soft black block	3/3¾

MARK	PKGS.	DESCRIPTION.	PRICE PER LB.
		Ceylon.	
Matang	6 Cases	Mottled crepe, some dark	3/6 @ 3/8
	6 ,,	Amber crepe, some very dark ..	3/2¼ @ 3/4½
	10 ,,	Brown and mottled crepe in roll and some very dark	3/4½
	12 ,,	Fine large amber sheets, few darkish ..	4/2½
	1 ,,	White wet blocked crepe	3/–
	2 ,,	Blocked scrap	bought in
Gonakelle	1 ,,	Biscuits, darkish to fine pale	4/2¼
V S	5 ,,	Biscuits mixed colours, rather inferior, some struck together	4/–
K M	2 ,,	Sheets, mixed colours	4/0¾
	3 ,,	Soft blocked crepe, sticky	2/4
Waharaka	1 ,,	Good dark blocked worms	bought in
MAK	5 ,,	Dark biscuits	4/–
Taldua	2 ,,	Dark amber biscuits	4/2¼
	1 ,,	Brown scrap	2/6
Aberdeen	5 ,,	Fine amber sheets	4/2
	2 ,,	Brown scrap and scrappy pieces ..	2/6 @ 2/10
Linggi Plants	12 ,,	Pale crepe, little mottled	bought in
Glanrhos	11 ,,	Dark rough sheets, not properly cured ..	,,
	3 ,,	Rough darkish biscuits	3/10¼ @ 4/–
Marakona	1 ,,	Good amber sheets	4/1¼
Glanrhos	1 ,,	Soft black crepe	bought in
Gikiyankande	10 ,,	Fine pale pressed worms	,,
	3 ,,	Good brown crepe	3/8
	4 ,,	Dark crepe	3/2¼ @ 3/5¾
Glenmarie	5 ,,	Dullish amber sheets	4/1
	2 ,,	Amber sheets, mixed dark	4/–
Kepitigalla	12 ,,	Amber sheets	4/1
Suduganga	4 ,,	Amber sheets part sold	4/–
Kumaradola	3 ,,	Palish amber biscuits part sold ..	4/0¾
Culloden	13 ,,	Fine pale crepe	4/1
	4 ,,	Very thick crepe	4/–
	11 ,,	Brown and black crepe	3/5
Arapolakande	1 ,,	Fine pale crepe	4/2¾
Glencorse	1 ,,	Good amber biscuits	4/3
	2 ,,	Brown scrap	2/5½ @ 2/10½
Arapolakande	7 ,,	Good amber biscuits	4/3
	3 ,,	Brown crepe	3/2 @ 3/6
Neboda	8 ,,	Thick dark crepe	3/5¼ @ 3/7½
G M	8 ,,	Dark barky scrap, slightly heated ..	2/5
	2 ,,	Lumps and nuggets	2/6
Sorana	6 ,,	Dark amber biscuits	4/2¼

CEYLON, STRAITS AND MALAY STATES

Plantation Rubber Report.

January 10th, 1908.

The following lots, comprising about 43 tons Straits and 10½ tons Ceylon, were offered at auctions to-day and sold as follows:—

Straits and Malay Straits.

B M P La	5 Cases	Crepe	..	3/6 @ 3/8
Damansara)	2 ,,	Sheet	..	bought in
Selangor)	19 ,,	Crepe part sold at	..	3/4 @ 3/5

MAKK.	PKGS.		DESCRIPTION.	PRICE PER LB.
S. K. R. Co. Ld.	18	,, ,,	.. .. ..	3/6¼ @ 3/9
B. & D. K.	3	,, ,,	.. .. ..	3/1 @ 3/6
B. & D. H.	2	,, ,,	.. .. ..	3/6¾ @ 3/8
B. & D.	3	,, ,,	.. .. ..	3/0¼ @ 3/8
B. & D. W.	4	Pkgs. ,,	part sold at ..	3/1
B. & D. D. K.	1	Case	Rambong crepe	3/4½
B. & D. P. M.	3	Cases	Crepe	3/6 @ 3/8
B. & D.	1	,,	Sheet	3/0¼
B. & D.	6	,,	Sheet	3/9
F O P	1	,,	Scrappy block	2/1
B. & D. P. M.	1	Bag	Pressed crepe	2/1
B. M. & Co.	10	Cases	Sheet	bought in
Matang	19	,,	Crepe part sold at ..	3/5¼
R M P La	1	,,	Pressed crepe	2/2½
	7	,,	,, ,, ...	3/4 @ 4/3
L E MUAR	57	,,	Block No. 1	bought in
Straits.	51	,,	,, No. 2	,,
B. M. & Co.	7	,,	Sheet	3/8¼
P.	6	,,	Crepe	bought in
B Labu	3	Bags	Black block	,,
	11	Cases	Crepe	,,
H C	2	,,	Sheet	3/8
	2	,,	Scrap	2/3½ @ 2/8¼
V R Co. Ld. Klang F M S	18	,,	Crepe	3/7¾ bid
	2	,,	,, ...	3/5
	10	,,	,, ...	3/6¾ bid
	30	,,	,, ...	3/4½ @ 3/5½
M. A. B.	1	,,	Sheet	bought in
R. R.	17	,,	,, ...	,,
S	4	,,	Scrap	2/4½ @ 2/6¾
P. S. E.	6	,,	Sheet	3/8¾
	4	,,	Crepe	3/1

MARK.	PKGS.		DESCRIPTION.	PRICE PER LB.
K. P. C.	4	,,	Sheet	3/8½ @ 3/8½
B. R. R. Co. Ld.	17	,,	Block part sold at ..	3/0¼
	3	Pkgs.	Black block	bought in
	21	Cases	Sheet	,,
	39	,,	Crepe	,,
F. (S.) R. Co. Ld.	2	,,	Sheet	,,
	3	,,	Crepe	3/-
	1	Bag	Block	bought in
	8	Cases	,, part sold at ..	3/0¼
	5	,,	Sheet	bought in
	3	,,	Crepe	2/7½ @ 3/3¾
Jebong	6	,,	,, ...	3/10
S S B R Co. Ld.	80	,,	,, One case sold 3/10 ..	bought in
	15	,,	Sheet	,,
	5	,,	Crepe	,,
Highland Estate	24	,,	Sheet	bought in
	10	,,	Crepe	3/5 @ 3/6½
	10	,,	,, ...	3/6¾ @ 3/5½
	9	,,	,, ...	2/11 @ 3/4¼
	9	,,	,, ...	3/5½ @ 3/6¾
	7	,,	,, ...	3/4 @ 3/4½
			Ceylon.	
Sorana	12	,,	Block	bought in
Tallagalla	3	,,	,, ...	,,
M A K	2	,,	Scrap	2/9½
	1	,,	Crepe	3/4
	2	,,	Rejections	2/8
	2	,,	Biscuits	bought in
	3	Bags	Scrap low	2/- @ 2/6
D. W. K.	1	Case	Scrap	2/11¼
S. L. S.	3	,,	,, ...	2/11¼
Waharaka	1	,,	,, ...	2/6
Rangbodde	1	,,	Ceara biscuits	4/2
A. Y. R.	1	,,	Biscuit	3/8
M. A. C.	3	Pkgs.	Scrap	1/- @ 2/5
S. L.	1	Case	Crepe	3/5¾
P M	2	Cases	Block	3/8
	4	,,	Scrap	2/6 @ 2/7½
Warriapolla	1	,,	,, ...	2/3
Tallagalla	7	,,	Biscuits	3/8¼ @ 3/8½
	5	,,	Scrap	2/6 @ 2/10
Warriapolla	1	,,	Biscuits	bought in
Waharaka	1	,,	Blocked worms	,,
Ambanpitiya	2	,,	Biscuits	3/8½
Kepitigalla	26	,,	Sheet	3/8½ bid
	6	,,	Scrap	2/4¾ @ 2/7
	1	,,	Brownish and grey block	2/4
Old Haloya	1	,,	Ceara biscuits	bought in
Gikiyanakande	18	,,	Worms	,,
	4	,,	Crepe	3/6¼ bid
	1	,,	,, ...	bought in
	5	,,	,, part sold at 3/3 bid for rem. ..	2/11
A R	3	,,	,, ...	bought in
P Co	1	,,	,, ...	3/6
	3	,,	,, part sold at 3/6, 3/- bid for rem. ..	
Suduganga	3	,,	Sheet	3/7

MARK.	PKGS.		DESCRIPTION.	PRICE PER LB.
G. P. K.	7	,,	Black block	bought in
Langsland	18	,,	Biscuits	,,
Culloden	4	,,	Crepe	3/11
	8	,,	,, ...	3/6
	3	,,	,, ...	3/4¾
	2	,,	Black block	bought in
Ellakande	3	,,	Crepe	3/5 @ 3/5¾
Heatherly	2	,,	,, ...	3/6
	1	,,	,, ...	bought in
Hattangalla	2	,,	Biscuits	3/8½
	1	,,	Crepe	3/5¾
Tudugalla	10	,,	,, part sold	3/9¾
	1	,,	,, and block	bought in
	1	Bag	Sheet	,,
A. L. W.	2	Cases	Scrap	2/10
Glenesk	3	,,	,, ...	2/7 @ 2/10
Sunnycroft	1	,,	Sheet	3/8¼
	1	,,	Scrap	2/9½
Warriapolla	6	Pkgs.	Biscuits	4/1½ @ 4/1¾
	1	,,	Scrap	2/8
Clara	1	,,	Biscuits	3/8
	1	,,	Scrap	2/8

Ordinary No. 1 quality sold at about 2d. @ 3d. decline.
Scrap in good demand at 3d. advance.
Brown crepe 3d. @ 4d. dearer.

GOW, WILSON AND STANTON, LTD.,
India Rubber Market Report.

13, Rood Lane, London, E.C.

January 10th, 1908.

This, the first sale of the new year, was the largest one that has yet taken place, of plantation rubber, the quantity exceeding that offered on the 6th December, 1907, by about 4 tons.

Since the last auction of 1907, the Para market has declined to the extent of about 1½*d.* per lb., and plantation kinds generally in to-day's sale were lower to about the same extent, although in a few cases where the quality was especially fine, some higher prices were recorded. The chief instances of this were a small parcel of the finest crepe that has yet been seen (from the Malacca Rubber Plantations), which realised the highest price of the sale, viz., 4/3 per lb., while some very pale Rangbodde biscuits sold at 4/2 per lb.

The general price of sheet and biscuits was from 3/8 to 3/8¾.

Considering the quiet state of the market recently, and the heavy offerings, there was a well sustained demand for all grades of plantation rubber.

A feature that has lately been noticeable, and which was further emphasised at to-day's sale, was that the medium and lower grades of crepe were in more request than has been the case of late, and compared with other grades prices of these kinds showed some improvement. Unwashed scrap, where clean and free from bark, was also well competed for.

Number of Packages Advertised.		Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.		
		Ceylon.	Malaya.	Totals.	No. of Packages Sold.	Price.	Hard Fine Para.	Plantation. Fine.	Plantation. Scrap.
To-day	1017	11½	41¾	53¼	430	3/4⅞	3/4	3/8 to 4/3	2/7 to 3/0¼
Corresponding Sale Last Year ...	357	8¾	12⅓	21	292	5/3½	5/2½	5/6½ to 5/9½	4/– to 4/5½

Total Quantity of Plantation Rubber offered at Auction during the last two complete years.

—	No. of Packages Offered.	Quantity in Tons. Ceylon.	Malaya.	Total.	No. of Packages Sold.	Average Price Paid.
1907	15,380	192½	621½	814	7,388	4/9⅝
Same period 1906	6,462	98¼	250¼	348½	4,130	5/6¼

To-day's Quotations.

Sheet, etc.		Crepe.		Unwashed Scrap.	
Fine Block	None sold.	Exceptionally Pale ...	4/3	Fine	2/10 to 3/0¼
Good to Fine Sheet ...	3/8 to 3/9	Fine Pale	3/8 to 3/11	Good and Medium	2/7 to 2/9½
Very Fine Pale Biscuits	4/1½ to 4/2	Palish and Mottled ...	3/6 to 3/7½	Low and Barky ...	2/3 to 2/6
Fine Biscuits ...	3/8 to 3/8½	Dark, Brown and Blocked.	2/11 to 3/5		

Shipments.

Exports for first 11 months of 1907.

From Singapore ..	1,268,330 lbs.
From Penang ..	462,001 lbs.
Total ..	1,730,331 lbs.

Exports from 1st Jan. to 16th Dec. From Ceylon.

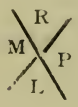
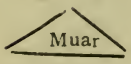
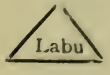
1907	502,696 lbs.
1906	303,102 lbs.
1905	140,132 lbs.
1904	67,623 lbs.

(The Singapore and Penang figures are taken from statistics published by Messrs. Barlow & Co., of Singapore).

Ceylon.

MARK.	PKGS.	DESCRIPTION.	PRICE. PER LB.
Yattewatte	1	Good biscuits and rejections	bought in
Sorana	12	Good biscuits	,,

MARK.	PKGS.	DESCRIPTION.	PRICE PER LB.
Tallagalla	10	Fine biscuits .. .. ..part sold..	3/8¼
MAK	2	Pressed scrap and rejections	2/9½
	1	Pressed crepe	3/4
	4	Rough sheet and biscuits .. ..part sold..	2/8
	3	Scrap, rejections, etc.	2/- to 2/6
D W K	1	Fine scrap	2/11¼
S L S	3	Fine scrap	2/11¼
A L W	2	Fine scrap	2/10
Glenesk	3	Good to fine scrap	2/7 to 2/10
Sunnycroft	1	Fine sheet	3/8¼
	1	Good scrap	2/9½
Warriapolla	7	Very fine biscuits .. ..part sold..	4/1½ to 4/1¾
	2	Scrap	2/3 to 2/8
Clara	1	Good biscuits	3/8
	1	Scrap	2/8
Waharaka	1	Good scrap	2/6
	1	Blocked worm	bought in
Rangbodde	1	Very fine pale Ceara biscuits	4/2
Ayr	1	Good biscuits	3/8
M A C	3	Good and medium scrap	2/5
SL FM	7	Good biscuits, scrap, etc.	2/6 to 3/8
Ambanpitiya	2	Good biscuits	3/8½
Tudugalla	10	Very fine palish crepe	3/9¾
	1	Black pressed crepe	bought in
	1	Fine block	,,
Gikiyanakande	18	Fine pale worm	,,
	9	Good brownish to black crepe	,,
Gikiyanakande	1	Fine palish crepe	bought in
A R / P CO	7	Darkish to dark pressed crepe ..part sold..	3/6
Suduganga	3	Good sheet	3/7
G P K	7	Black pressed crepe	bought in
Kepitigalla	28	Fine sheet	,,
	2	Lumps	2/4¾
	4	Good scrap	2/7
	1	Wet block	2/4
Old Haloya	1	Good Ceara biscuits	bought in
Langsland	18	Fine biscuits	,,
Culloden	4	Fine thick pale crepe	3/11
	27	Good brownish to darkish crepe	3/4¾ to 3/6
	4	Soft block	bought in
Ellakande	6	Brownish crepe	3/5 to 3/6½
Heatherley	6	Brownish crepe	3/5¾ to 3/6½
	1	Black crepe	bought in
Hattangalla	3	Good biscuits	3/8½
	3	Brown pressed crepe	3/2 to 3/5½
D M	4	Scrap and lumps	bought in
Verulapitiya	1	Good sheet	3/8¾
Welkandala	1	Good biscuits	3/8½
	2	Good brown crepe	3/6
Marakona	1	Good sheet	3/8½
Aberdeen	1	Good biscuits	3/8½
	1	Good scrap	2/8
Glanrhos	6	Good biscuits	bought in

MARK.	PKGS.	DESCRIPTION.	PRICE PER LB.
Clontarf	2	Fine biscuits	3/8½
		Malaya.	
B R R Co., Ld.	8	Good block .. .. ..part sold..	3/5
	2	Good palish crepe	3/8
	9	Darkish and dark block .. ..part sold..	3/0¼
	21	Good sheet	bought in
	39	Good block	,,
	1	Dark block	,,
F (S) R Co., Ld.	7	Good sheet	,,
	12	Good and medium block .. ..part sold..	3/0¼
	3	Pressed crepe	2/7¼
	1	Fine pale crepe	3/10
Merton	5	Good sheet	bought in
Highlands	24	Fine sheet	bought in
	44	Good palish and brown crepe	3/3¾ to 3/6¾
	2	Darkish to black crepe	2/11 to 3/-
	10	Good to fine palish and brownish crepe ..	3/6 to 3/9¾
	1	Very fine pale crepe	4/3
	1	Good Rambong crepe	3/4
Damansara	2	Fine sheet	bought in
	8	Good crepe	,,
	4	Dark crepe	3/4
	7	Good and medium block .. ..part sold..	3/3 to 3/5
S K R Co., Ld.	18	Good palish to darkish crepe	3/6¼ to 3/9
B & D	7	Darkish to dark crepe	3/1 to 3/6
	4	Good brownish to fine palish crepe	3/6¾ to 3/10¾
	3	Good sheet	3/8
	1	Good rejections	3/0¼
	1	Fine pale pressed sheet	3/7¾
	6	Fine sheet	3/9
	1	Palish block	2/1
	2	Crepe	2/1 to 3/6
B M & Co	17	Fine sheet .. .. ..part sold..	3/8¼
	6	Dark crepe	bought in
Matang	19	Good and medium crepe .. ..part sold..	3/5¼
	1	Pressed undried	2/2½
L E  Straits	57	Fine block	bought in
	51	Palish opaque block	bought in
Jebong	86	Very fine pale crepe .. ..part sold..	3/10
	15	Very fine sheet	bought in
	5	Dark crepe	,,
	11	Fine palish crepe	,,

MARK	PKGS.	DESCRIPTION	PRICE PER LB.
	2	Good sheet	3/8
	2	Good and medium scrap	2/3½ to 2/6¼
	24	Good sheet .. .. ..part sold..	3/8¾
	36	Good brownish crepe	bought in
	42	Good palish to darkish crepe ..part sold..	3/4½ to 3/5½
M A B	1	Good sheet	3/8½
	17	Good sheet	bought in
	7	Scrap and rejections	1/6 to 2/6¾
P S E	6	Fine sheet	3/8¾
	5	Dark crepe and block .. ..part sold..	3/1
K P Co. Ld.	4	Good sheet	3/8¼ to 3/8½
	1	Good sheet	3/8
	3	Good sheet .. .. ..part sold..	3/7¼
Bila	25	Good and medium sheet .. ..part sold..	3/8½ to 3/8¾
	11	Good scrap	2/9¾ to 2/11¼
	7	Sheet, rejections and scrap	2/8¼ to 2/10¾
Sungei Krudda	9	Good sheet .. .. ..part sold..	3/8 to 3/8¾
	1	Good brownish crepe	3/6¼
	2	Dark pressed crepe	bought in
	5	Fine palish to brownish crepe	3/7¼
	2	Pressed crepe	bought in
	6	Good darkish crepe	3/4¼ to 3/6¼
Linggi Plants	22	Fine palish crepe	bought in

RAINFALL IN AUGUST IN PENANG.

August from past experience being the wettest month in the year, a comparative statement of the rainfall registered at the Prison Observatory, Penang, for August from 1880 to 1907 is herewith forwarded :—

	Ins.
880	12·26
1881	5·44
1882	16·53
1883	6·09
1884	11·60
1885	14·29
1886	15·17
1887	23·39
1888	9·92
1889	8·02
1890	7·98
1891	20·96
1892	10·24
1893	18·28
1894	7·55
1895	10·44
1896	15·27
1897	19·44
1898	25·56
1899	24·08
1900	17·32
1901	11·01
1902	6·69
1903	6·51
1904	26·33
1905	4·76
1906	10·51
1907	4·68

From the above it will be seen that although there has been small records of rain for the month under review during 1881, 1883, 1888, 1889, 1890, 1899, 1894, 1903, 1904, and 1906, that for the current year has been the lowest, viz., 4·68.

M. E. SCRIVEN,
Assistant Surgeon.

PRISON OBSERVATORY,
PENANG, *17th September*, 1907.

SINGAPORE MARKET REPORT.

January, 1908.

Articles.	Quantity Sold.	Highest Price.	Lowest Price.	
	Tons.	$	$	
Coffee—Palembang	...	...	...	
Bali	...	25.50	24.50	
Liberian	...	24.50	23.50	
Copra	3,697	7.80	7.25	
Gambier	957	7.25	6.57½	
Cube Gambier, Nos. 1 & 2	180	11.25	8.50	
Gutta Percha, 1st quality	...	300.00	190.00	
Medium	...	240.00	80.00	
Lower	...	80.00	12.00	
Borneo Rubber, 1st, 2nd & 3rd	...	110.00	50.00	
Gutta Jelotong	...	5.20	4.00	
Nutmegs, No. 110's	...	23.00	22.00	
No. 80's	...	24.00	23.00	
Mace, Banda	...	88.00	80.00	
Amboyna	...	67.00	64.00	
Pepper, Black	649	13.87½	12.50	
White (Sarawak)	467	20.25	19.50	
Pearl Sago, Small	455	4.20	4.10	
Medium	25	5.40	5.00	
Large	...	...	...	
Sago Flour, No. 1	4,387	3.12½	2.91	
No. 2	362	1.25	1.25	
Flake Tapioca, Small	825	7.80	7.40	
Medium	10		7 10	Closing fair.
Pearl Tapioca, Small	338	8.50	5.30 fine	Closing fair.
Medium	534	6.90	6.50	Closing fair.
Bullet	45		8 00	Closing fair.
Tin	3,358	63.75	60.62½	

Exports Telegram to Europe and America.

Fortnight ending 15th January, 1908.

		To.	Tons.
Tin	Str Singapore & Penang ..	U. Kingdom &/or..	1,401
Do	,, do	U. S. A.	495
Do	,, do	Continent	470
Gambier ..	,, Singapore	Glasgow	—
Do	,, do	London	25
Do	,, do	Liverpool	100
Do	,, do	U.K.& or Continent	50
Cube Gambier..	,, do	United Kingdom ..	30
Black Pepper ..	,, do	do ..	—
Do ..	,, Penang	do ..	20
White Pepper ..	,, Singapore	do ..	85
Do ..	,, Penang	do ..	—
Pearl Sago ..	,, Singapore	do ..	140
Sago Flour ..	,, do	London ..	170
Do ..	,, do	Liverpool ..	650
Do ..	,, do	Glasgow ..	—
Tapioca Flake..	,, Singapore	United Kingdom ..	180
T. Pearl & Bullet	,, do	do	125
Tapioca Flour..	,, Penang	do	110
Gutta Percha ..	,, Singapore	do	—
Buffalo Hides ..	,, do	do	30
Pineapples ..	,, do	do	9,500 cases
Gambier ..	,, do	U. S. A.	400
Cube Gambier..	,, do	do	30
Black Pepper ..	,, do	do	50
Do ..	,, Penang	do	220
White Pepper ..	,, Singapore	do	—
Do ..	,, Penang	do	70
Tapioca Pearl ..	,, Singapore	do	10
Nutmegs ..	,, Singapore & Penang..	do	12
Sago Flour ..	,, Singapore	do	25
Pineapples ..	,, do	do	9,500 cases
Do ..	,, do	Continent	1,500 ,,
Gambier ..	,, do	South Continent ..	120
Do ..	,, do	North do ..	200
Cube Gambier..	,, do	Continent	50
Black Pepper ..	,, do	South Continent ..	320
Do ..	,, do	North do ..	65
Do ..	,, Penang	South do ..	20
Do ..	,, do	North do ..	30
White Pepper ..	,, Singapore	South do ..	30
Do ..	,, do	North do ..	100
Do ..	,, Penang	South do ..	5
Do ..	,, do	North do ..	—
Copra	,, Singapore & Penang..	Marseilles	1,200
Do	,, do	Odessa	—
Do	,, do	Other S. Continent	50
Do	,, do	North Continent ..	900
Sago Flour ..	,, Singapore	Continent	600
Tapioca Flake..	,, do	do	65
Do Pearl ..	,, do	do	20
Do Flake..	,, do	U. S. A.	—
Do do ..	,, Penang	U. K.	30
Do Pl.&Bul.	,, do	do	—
Do Flake..	,, do	U. S. A	10
Do Pearl ..	,, do	do	290
Do Flake..	,, do	Continent	—
Do Pearl ..	,, do	do	80

Exports Telegram to Europe and America.

Fortnight ending 15th January, 1908.

			To	Tons.
Copra	Str.	Singapore	England	100
Gambier ..	,,	do	U. S. A	—
Cube Gambier ..	,,	do	do	—
T. Flake & Pearl	,,	do	do	—
Sago flour ..	,,	do	do	—
Gambier ..	,,	do	South Continent ..	—
Copra	,,	do	Marseilles ..	—
Black Pepper ..	,,	do	South Continent ..	—
White Pepper ..	,,	do	do	—
Do ..	,,	do	U. S. A.	—
Pineapples ..	,,	do	do	—
Nutmegs ..	,,	do	do	—
Black Pepper ..	,,	do	do	—
Do ..	,,	Penang	do	—
White Pepper ..	,,	do	do	—
T. Flake & Pearl	,,	do	do	—
Nutmegs ..	,,	do	do	—
Tons Gambier ..		.. ..	.. ..	200
,, Black Pepper		.. ..	.. ..	210

Exports Telegram to Europe and America.

Fortnight ending 31st January, 1908.

		To.	Tons.
Tin	Str Singapore & Penang..	U. Kingdom &/or ..	2,126
Do	,, do	U. S. A.	488
Do	,, do	Continent	253
Gambier ..	,, Singapore	Glasgow	—
Do ..	,, do	London	125
Do ..	,, do	Liverpool	—
Do ..	,, do	U. K. &/or continent	75
Cube Gambier..	,, do	United Kingdom ..	30
Black Pepper ..	,, do	do ..	5
Do ..	,, Penang	do ..	30
White Pepper ..	,, Singapore	do ..	85
Do ..	,, Penang	do ..	—
Pearl Sago ..	,, Singapore	do ..	150
Sago Flour ..	,, do	London	330
Do ..	,, do	Liverpool	—
Do ..	,, do	Glasgow	—
Tapioca Flake..	,, Singapore	United Kingdom ..	310
T. Prl. & Bult.	,, do	do ..	170
Tapioca Flour..	,, Penang	do ..	100
Gutta Percha ..	,, Singapore	do ..	5
Buffalo Hides ..	,, do	do ..	—
Pineapples ..	,, do	do ..	9,750
Gambier ..	,, do	U. S. A.	525
Cube Gambier..	,, do	do	35
Black Pepper ..	,, do	do	95
Do ..	,, Penang	do	100
White Pepper ..	,, Singapore	do	15
Do ..	,, Penang	do	—
Tapioca Pearl ..	,, Singapore	do	110
Nutmegs ..	,, Singapore & Penang..	do	9
Sago Flour ..	,, Singapore	do	400
Pineapples ..	,, do	do	10,750 cases
Do ..	,, do	Continent	2,250 ,,
Gambier ..	,, do	South Continent ..	50
Do ..	,, do	North Continent ..	325
Cube Gambier..	,, do	Continent	70
Black Pepper ..	,, do	South Continent ..	180
Do ..	,, do	North do ..	140
Do ..	,, Penang	South do ..	80
Do ..	,, do	North do ..	30
White Pepper ..	,, Singapore	South do ..	10
Do ..	,, do	North do ..	100
Do ..	,, Penang	South do ..	—
Do ..	,, do	North do ..	10
Copra	,, Singapore & Penang..	Marseilles	1,450
Do	,, do ..	Odessa	1,600
Do	,, do ..	Other S. Continent	500
Do	,, do ..	North Continent...	1,000
Sago Flour ..	,, Singapore	Continent	750
Tapioca Flake ..	,, do	do	210
Do Pearl ..	,, do	do	30
Do Flake ..	,, do	U. S. A.	—
Do do ..	,, Penang	U. K.	60
Do Pl. & But.	,, do	do	210
Do Flake..	,, do	U. S. A.	—
Do Pearl ..	,, do	do	450
Do Flake..	,, do	Continent	10
Do Pearl ..	,, do	do	220

Exports Telegram to Europe and America.

Fortnight ending 31*st January*, 1908.

		To	Tons.
Copra	Str Singapore	England	260
Gambier ..	,, do	U. S. A.	—
Cube Gambier..	,, do	do	—
T. Flake & Pearl	,, do	do	—
Sago flour ..	,, do	do	—
Gambier ..	,, do	South Continent ..	—
Copra	,, do	Marseilles	—
Black Pepper ..	,, do	South Continent ..	—
White Pepper ..	,, do	do	—
Do ..	,, do	U. S. A.	—
Pineapples ..	,, do	do	—
Nutmegs ..	,, do	do	—
Black Pepper ..	,, do	do	—
Do ..	,, Penang	do	—
White Pepper ..	,, do	do	—
T. Flake & Pearl	,, do	do	—
Nutmegs ..	,, do	do	—
Tons Gambier..	.. ..	.. .. ..	650
,, Black Pepper			550

No. 3.] MARCH, 1908. [Vol. VII.

AGRICULTURAL BULLETIN

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EDITED BY

H. N. RIDLEY, M.A., F.R.S., F.L.S., F.R.H.S., F.R.C.I.,
Director of Botanic Gardens, S. S.,

AND

J. B. CARRUTHERS, F.R.S.E., F.L.S.,
Director of Agriculture & Government Botanist, F. M. S.

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NOTICE.

The Scientific and Technical Departments of the Imperial Institute.

His Excellency the Governor has received a despatch from the Right Hon'ble the Secretary of State for the Colonies calling attention to the advantages offered by the Imperial Institute to Merchants, Planters and others, who may wish to have samples submitted to scientific experts for opinion as to their commerical value etc. The following extracts from a Memorandum published by the Authorities of the Imperial Institute will give an idea of the work undertaken and carried on there.

"The Scientific and Technical Department of the Institute has "been established to acquire information by special enquiries and "by experimental research, technical trials and commerical valua- "tion regarding new or little known natural or manufactured "products of the various Colonies and Dependencies of the British "Empire and of Foreign Countries, and also regarding known "products procurable from new sources, and local products of "manufacture which it is desired to export. This work is carried "out with a view to the creation of new openings in trade, or the "promotion of industrial developments.

2. In an extensive and well-equipped series of Research Laboratories, a numerous staff of skilled chemists carry out the investigation of the chemical constitution and properties of new dye-stuffs, tanning materials, seeds and food-stuffs, oils, gums and resins, fibres, timbers, medicinal plants and products, with a view to their commercial utilization. Whenever necessary these materials are submitted to special scientific experts, by whom they are made the subject of particular investigation or practical tests. Reports are also obtained from technical or trade experts in regard to the probable commerical or industrial value of any such products.

3. The Federated Malay States Government has undertaken to grant a sum of £100 a year for 5 years to the Department with a view to the careful investigation and commerical development of the mineral resources of the States.

The Government Geologist is collecting specimens for chemical examination and after analysis the Imperial Institute which is in very complete touch with the principal manufacturing and other industries of the United Kingdom, will bring the specimens before manufacturers and others for trial with a view to their commercial development.

It is expected that this action will do much to help in finding a market for new products and developing the markets for those already exploited.

Planters and residents in the Straits Settlements and Federated Malay States are at liberty to send (through the Colonial Secretary at Singapore) specimens of little known or new vegetable or mineral products of the Straits Settlements or Federated Malay States for examination at the Imperial Institute by whom a report will be made, through the Colonial Secretary. Specimens should, if possible, consist of a few pounds of the material and should be accompanied by full information especially respecting the precise locality in which the material is found and the extent of its occurrence.

Attention may also be drawn to the "Bulletin of the Imperial Institute" published quarterly, which contains records of the investigations conducted at the Imperial Institute, and special articles on tropical agriculture and the commercial and industrial uses of vegetable and mineral products. Copies of this publication, price 4*s.* 6*d.* per annum (including postage), may be ordered through Messrs. KELLY & WALSH, LTD., of Singapore.

Special sample rooms have been arranged at the Imperial Institute, for the information of enquirers, in which materials which have been investigated and valued are available for reference.

Important products are also shown in the Malaya Court in the Public Galleries of the Imperial Institute.

Communications should be addressed to the Director, Imperial Institute, South Kensington, London, S. W.

AGRICULTURAL BULLETIN

OF THE

STRAITS

AND

FEDERATED MALAY STATES.

No. 3.] MARCH, 1908. [Vol. VII.

A NEW RUBBER TREE IN TONKIN.

Rubber-vines (apocynaceous) have been hitherto the only known wild rubber-producing plants in Tonkin, and are not a success culturally. Hevea, Ceara rubber and Ficus elastica have been tried. The first is encouraging but it is too soon to speak of its success, the other two practically failures so the discovery of a new rubber tree indigenous to the country is hailed with joy in Tonkin. It is a species of *Bleekrodia,* one of the Urticaceæ. The latex contains a high proportion of rubber probably better than Hevea. The rubber is extremely full of nerve, and resistant, and very adhesive and according to specialists cannot be distinguished from the best classes of Para Rubber.

The tree exists in great quantities, as much as 40 per cent of the trees in some parts of the forests, in Backau, Baolac, and Caobang.

This information is published in "le Caoutchouc and la Gutta Percha," January 15, 1908, on the authority of M. Marcel Dubard.

H. N. R.

TWO RUBBER PESTS.

In the Journal of the Federated Malay States Museums, Mr. L. Wray records two insects attacking Para Rubber, one a caterpillar and the other the troublesome beetle *Astychus chrysochloris,* formerly known as an enemy to Liberian Coffee of which it devoured the leaves.

The caterpillar is described thus:—"General colour above black, minutely spotted and lined with white, sides with a bright yellow waved line starting from just behind the third pair of legs and continuing to the tail. There are some conspicuous white spots on the shoulders and on the last segment but one of the body. Head and legs bright reddish brown, prolegs black largely spotted with

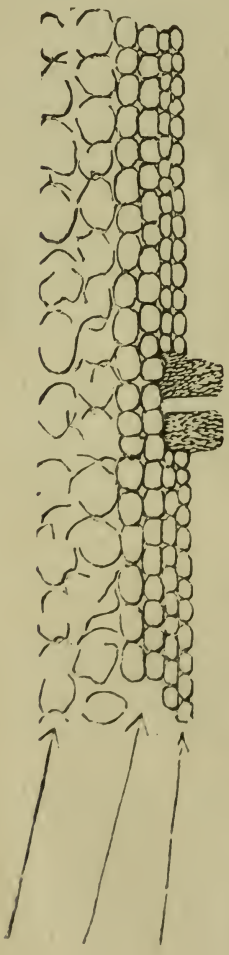
pale reddish brown beneath black largely spotted with dull yellow. The largest specimen was some inch and a half long." The group to which the caterpillar belonged is not stated, presumably it was that of a Noctuid moth. The caterpillars were found to be numerous on secondary jungle near the rubber fields. They were destroyed by spraying with Paris Green in water.

H. N. R.

REPORT ON DISEASED RUBBER TREES FORWARDED FROM PUAK.

These saplings had the appearance of having been gnawed at by some insect pest, but a close microscopic examination failed to identify any such source of trouble.

Thin sections of the stem and roots, when examined microscopically, presented an appearance shown in sketch.



LONGITUDINAL SECTION.

The bark cells have undergone disintegration, and in some cases the cambium layer has been eaten into.

Whilst the removal of bark from young trees is in itself highly undesirable, anything tending to reduce the vitality of the cambium layer must be viewed with grave suspicion.

Experiments were set in progress with the object of detecting any fungi associated with the diseased parts. Cultures were prepared by inoculation therefrom on prepared and sterlized potatoes and on Agar-Agar nutrient media.

Within 24 hours vigorous growths appeared on the latter, and on the second day a similar activity was demonstrated on the potatoes.

From these mixtures of fungi, the individual organisms were separated, and pure cultures prepared. In almost every case one sporiferous bacillus predominated.

Every precaution was taken during inoculation to avoid contamination from without, but it must not be overlooked that any soil is copiously supplied with organisms, many beneficial, and a few harmful, and also that the organisms separated in the above experiments may have been the sequence to, rather than the initial cause of the trouble.

It has been proved that the healthy rubber tree is self—protective against most insect pests, but no similar state of affairs has yet been shown to exist for fungi.

Coincident with the above experiments, others were in progress where sterilized media were inoculated with the bark of healthy rubber trees (sent from Sungei Tengah Estate), and whilst in some cases no fungoid growths appeared within 48 hours, in no case was the vitality so pronounced, nor did the same organisms predominate.

Besides the sporiferous bacillus mentioned above, a white thread-like fungus was separated, which bore a strong resemblance to a fungus (*Helicobasidium*) which has been described as attacking the roots of rubber trees and spreading from tree to tree by strands of mycelium in the soil.

The life history of this organism was followed as far as possible, and the results fully justified the apprehensions of its capabilities.

I regret that through lack of the necessary literature, I am unable to complete the identification of the fungi.

That so many trees should have showed signs of disease at one time, seems to point to trouble in the nursery rather than on the Estate, for disease, however rapidly spread, takes time. One diseased sapling in the nursery is more than capable of furnishing sufficient germs to inoculate all others.

When a germ finds conditions unsuited for its growth, it very frequently forms spores which are probably the most retentive form of life known. On the return of favourable conditions the spore germinates into the vegetative form which again multiplies.

The advantages of a marked dry and wet season are here very apparent. During the dry season the fungi are likely to revert to spores and become inactive. When the wet season comes the fungi again become active, but during the interval the tree has regained any lost vitality, and so is better fitted to withstand further attacks.

In the absence of a comparatively dry spell the tree would obviously be deprived of this period of recuperation.

To sum up, the site of the nursery might be changed with advantage. The affected area ought certainly to be trenched, and means taken to prevent, if possible, further propagation of the disease which at this season of the year is much more likely to spread by the agency of the soil, than by that of the wind.

In making new nurseries there seems no reason why the seeds should not be planted at greater intervals apart than has hitherto been the practice. The Puak soil is undoubtedly a poor one, and it stands to reason that, if you wish to produce strong healthy plants, capable of resisting the attacks of this disease, you must give them more room and air to compensate for the poverty of the soil.

I should also judge that the vitality of a plant at the end of a prolonged spell of either wet or dry weather is at a low ebb, and, although if planted out on an estate where the soil is rich, it would probably grow, still if it is in a diseased condition on leaving the nursery and is planted in a soil capable of affording it but little nourishment, the combination of these adverse factors is probably more than the tree can contend with.

It would therefore appear that in planting out these diseased saplings too much care cannot be taken to observe their state of vitality with a view to transplanting them when this is at its greatest, or at any rate to avoid doing so, when it is at its lowest ebb.

EWING SMITH.

Bau. *18th February, 1908.*

EXTERMINATION OF RATS IN PADDY FIELDS.

The destruction of paddy in the Kuala Kangsar district was reported to the Department of Agriculture on the 7th January last. Enemies other than rats were suspected and a careful examination in the laboratory of material forwarded by the Assistant District Officer, Kuala Kangsar, failed to find the presence of any plant or animal parasite. A personal examination forced me to agree with the Assistant District Officer that the damage was due to the rats alone.

The Director of Agriculture suggested experiments with carbon bisulphide. These were carried out at Kuala Kangsar on the 10th, 11th and 12th of February.

Carbon bisulphide is a liquid substance with an unpleasant smell. It vaporises fairly quickly in air. Its vapour is a strong poison, and has a comparatively low ignition point, said to be 248° F.; mixed with air it forms an explosive compound if heated sufficiently. The vapour is heavier than air so that it goes downwards and will penetrate to the deepest part of a rat's tunnel.

The method of application was to close the two ends of the tunnel, drive a hole into it near one end with a sharp stick, drop in a plug of cotton wool soaked with carbon bisulphide and close the hole thus made. The carbon bisulphide on the cotton wool would evaporate, diffuse through the tunnel and poison all rats in it. Owing to the hardness of the ground it was mostly found impossible to bore a hole in the way mentioned; instead the plug of cotton wool was pushed as far as possible with the hand or a stick into the tunnel, the end being immediately and quickly closed with a little earth; this method was found to be as good as boring a hole, besides being much simpler. The plug of cotton wool was, as a rule, nearly as large as an egg: it was quickly saturated with the liquid and at once put in the tunnel.

The experiments were carried out from 4.30 P. M. to dark and from daylight to 9 or 9.30 A. M. These, as I afterwards learned from the owners of the fields, were not good hours as the rats were then for the most part out in the field. They are all in their burrows from 10 a. m. to 4 P. M. and as this is the proper time to apply carbon bisulphide, I did not do so as I had the liquid in a tin, and did not care to risk a metal vessel to a continuously

strong sun. The ground was cracked, but, as far as I could find, a tunnel nowhere had connection with the outside world by a crack, still they may have in a few instances allowed the escape of some of the poisonous fumes which, however, move but slowly upwards. The holes were difficult to find: several appear to have been abandoned ones, and the two ends could not always be identified. However the experiments were highly successful. Thus in the first hole poisoned on Monday afternoon (10th February) and opened about 8 A. M. next morning ten dead rats were found. In others varying numbers 8 to 10, including nests of young ones, were turned out. In all cases the rats were quite dead, not partially suffocated. How long they survive I cannot say, but this is not of practical interest. In no instance do they appear to have made an effort to get out of the tunnels, though some were intentionally closed with very little clay. The young rats were found in various parts of the tunnel; the older ones in its deepest part. The relative number of full-grown rats was small owing to the time of day at which the holes were poisoned.

The physical conformation of paddy fields renders the application of carbon bisulphide very feasible, which in or about houses, or in grain fields at home, for example, where the holes are scattered, would be difficult. In the paddy fields the tunnels are confined to the batas, and mostly to the place where three or four batas meet.

I do not know if the bata running in one direction, that of the slope of the field, are usually higher and thicker than those running at right angles, but in the field in which the experiments were carried out, the bigger batas run from East to West the direction of the slope, while those running North and South were mostly smaller and lower and contained comparatively few tunnels.

The tunnels vary up to nine feet in length, they run longitudinally in the direction of the batas, and seldom as low as the level of the paddy area. In most cases there is an offshoot in which the nests appear to be made. This is often below the level of the paddy area, but many have been formed after the surface water was taken off. Each tunnel has two openings. One by which the animal usually enters and leaves, this is the one through which the earth taken out of the tunnel was carried; the other is much smaller, sometimes difficult to find, and, with European rats, at any rate, used as an entrance and exit in emergencies. Both these holes must be closed when carbon bisulphide is applied. I believe it is sufficient to put saturated cotton wool in the larger one, I think the carbon bisulphide put in at one end will slowly diffuse from the middle of the tunnel up to the other end.

The depredations were reported too late in the paddy season for any definite action other than experiment to be undertaken. With the view of starting a definite plan of campaign early next paddy season I may be permitted to review the means at our disposal to exterminate rats.

There are:—

(1) Natural Enemies.
(2) Food Poisons.
(3) Virus Remedies.
(4) Carbon Bisulphide.

Natural Enemies.—I have been able to gather but little information on this point. The life history and habits of the native rat are poorly known. The natives could not tell me with any certainty where the animal goes when it leaves the paddy fields; probably it migrates to the houses and to the jungle, the paddy field being its main breeding-ground. In the course of the experiments I turned out two nests containing eight and nine respectively, which were less than nine days old. It would be useful to know more about its breeding habits. The best known natural enemy is the mongoose. There appear to be very few carnivorous birds in the Peninsula which attack rats. At any rate the natural enemies seem to be ineffective, and as we do not know much about them nothing can be done to encourage them.

Food Poisons.—There are several of this class, but phosphorus or arsenic is the usual effective agent in all. There are many objections against them. They may poison natural enemies of rats, or domestic animals, and it is undesirable to put them at all in the hands of native peoples. Besides the rat has its choice, it may refuse to eat them, and probably will do so when they are put in rice fields. I have not yet been able to carry out experiments on this point. As exterminators they are, for our purposes, only less useless than the natural enemies.

Virus Remedies.—The "Liverpool" Virus has got a good repute at home, so has the "Danyzs," the Pasteur Institute Virus. There is another called "Ratin," possibly "Liverpool" is a new name for it. They are apparently contagious diseases due to a definite organism. As far as I can gather viruses have been a failure out here. The organism may have died on account of the time that elapses from its despatch until it is received here, or it may have succumbed to the heat of a tropical sea voyage, or it may be that the race of rats in this country are immune to these viruses. They have the advantage that there is no danger and little trouble in their application, and that the rats have little choice of escape once a few have been infected.

I should like to have more information as to how the "Liverpool" virus, for example, works in grain fields at home. It must be applied on cubes of bread which may be quite effective about buildings, where rats eat all sorts of garbage, but may be of less efficiency in paddy fields.

I hope to give these remedies a fair trial immediately and to be in a position to report definitely on them before the beginning of the next paddy season.

Carbon Bisulphide.—As already pointed out this has much to recommend it, particularly its effectiveness. The rat has no option: it is not a matter of taking or leaving bread. The animal will succumb if it is in the hole.

To obtain good results the applications should begin as soon as the rats enter the fields, which the Malays tell me is about a month after the plants are put out. The batas should be as few as are consistent with the slope of the ground; they should be kept clean of grass and weeds so that holes may be readily seen. An examination should be made twice a week, or oftener, and every hole treated as described above. After the first two weeks or so the number of holes found will be very few, and with a little trouble the vermin should be entirely exterminated. Carbon bisulphide delivered at Port Swettenham, costs 60 cents a pound. I believe a pound should do an acre, but I can make no definite statement. The amount will depend on how little is wasted, the number of batas, and the number of tunnels in them.

The disadvantages are:—

(1) Its volatility. If care is not exercised much may be lost into the air.

(2) It must be handled carefully. The vessel contained it should not be struck heavy blows or knocked about, and should not be exposed for long to the direct rays of the sun.

Perhaps the Penghulu or some responsible person could be charged with the custody of the liquid, and the superintendence of its application. I think 2 lb. tins would be a suitable size to use. Only one of these should be supplied each time. The tin could be surrounded with sawdust in a thick-sided wooden box, and fixed in so that it could not fall out. With these precautions and with a suitable cork, which we should be able to devise, there would be no danger, except in cases of extreme negligence.

When further experiments have been made directions as to how to apply it will be prepared. Perhaps a number of Penghulus could be collected at suitable centres and demonstrations given by a qualified man from the Department of Agriculture.

W. J. GALLAGHER.

NOTE.—Re Danysz Virus *see* "Agricultural Blletin" v. 373 (Ed.)

P. P. A.

ANNUAL GENERAL MEETING.

At the first annual general meeting of the Perak Planters' Association, held on Friday afternoon last, 14th instant, at the Ipoh Club, the following Members were present: Messrs. W. DUNCAN (in the chair) C. L. GIBSON, JOHN I. PHILIPS, C. V. STEPHENS,

Alma Baker, H. W. Metcalfe, H. E. Darby, E. H. F. Day, G. S. Averay-Jones, W. H. Tylden Pattinson, W. P. Rutledge, H. Sperling, Maurice Maude, Edwin Philips, F. M. Pearse, B. C. N. Knight and H. S. Whiteside (Secretary); Visitor, Mr. A. Robins.

After a short speech from the Chairman, reviewing the events of the past year, referring to the better understanding now existing amongst planters, and touching upon the Tamil Fund Bill, which he believed was acceptable to the general body of planters in Perak, the meeting passed to the first item upon the Agenda, namely, to receive and pass the Report and accounts for the financial year ending 31st December last, and to fix the subscription for the current year.

The Secretary read the report and presented the accounts, which were passed subject to audit by two honorary auditors to be selected. The subscription for the current year was, on the motion of the Chairman, seconded by Mr. B. C. N. Knight, fixed at $20 per member.

The next item being the election of officers for the current year, the retiring Chairman, Mr. W. Duncan, said that he did not offer himself for re-election, as he would shortly be proceeding Home on leave. He suggested that the Hon. John Turner should continue as heretofore, as President of the Association, his position as a Member of the Straits Legislative Council rendering him of particular value in this position, while for the post of Vice-President and Chairman he begged leave to suggest Mr. C. L. Gibson, who had shown from the first a keenness of interest in planting matters generally and in those of the Association in particular, which peculiarly fitted him for the position. On the motion of the retiring Chairman, seconded by Mr. John I. Philips, Mr. C. L. Gibson was unanimously elected. Mr. Gibson, after thanking the meeting, proposed a vote of thanks to the retiring Chairman for his excellent services. This was seconded by Mr. C. V. Stephens, and passed unanimously.

The election of the Committee then took place, the following gentlemen being selected: Krian, Messrs. T. Boyd and D. Ritchie; Taiping, B. C. N. Knight, E. Lauder Watson; Kuala Kangsar, E. R. Salisbury, E. H. F. Day; Kinta, Eric Maxwell, John I. Philips; Batang Padang, C. V. Stephens, H. E. Darby; Lower Perak, Dell, Lachlan.

Mr. H. S. Whiteside was unanimously re-elected to the post of Secretary for the current year.

Mr. C. L. Gibson then brought up for discussion a motion, of which notice had been given on the Agenda, on the subject of discharging tickets for all coolies, tindals, and mandors, both Tamils and Javanese, which it was proposed to add to the Rules of the Association. He said that the matter was one of vital interest to planters, and it was time, in his opinion, that a move was made towards introducing the practice. Working out the details of the scheme might give considerable trouble, but from his information

he believed that all planters were in favour of it. Let them consider what might be done. Unity of action, however, was absolutely necessary if the scheme was to be a success. The planters' interests in this matter were one throughout. They must ask Government, and the miners through the Chamber of Mines, to joint hands with them. They should discuss the matter first and then circularise them. Government would probably be ready to meet them in any reasonable scheme that might be put forward. He was merely giving a rough idea of the scheme. Printed tickets of a form to be decided should be issued to all coolies now employed, to include all, whether indentured or free. Contractors should have one ticket only stating the number of men in their gangs. He would suggest that the necessity of some such scheme would be thoroughly demonstrated if returns of bolters from all estates could be sent in every month.

The Chairman supported the idea, and mentioned that he himself gave discharge tickets to all indentured coolies. The weak point, however, was that other employers who did not adopt the scheme would always be ready to take on coolies without tickets.

Mr. DAY asked if it was any use going on with the scheme if Government were not willing to lend their support. Mr. GIBSON replied that he thought that Government would help them if they made a definite move. Mr. DAY pointed out the difficulties in their way unless both Government and the miners jointed in.

Mr. GIBSON then put his resolution as follows:—"That, subject to the co-operation of Government and the miners, Members of this Association pledge themselves to give discharge tickets to all coolies, tindals and mandores, Tamil and Javanese, when honestly leaving their employ or being paid off, and not to engage any Tamil or Javanese who cannot produce such discharge tickets." This was seconded by Mr. B. C. N. KNIGHT, and carried *nem con.*

Mr. GIBSON then proposed for discussion a further resolution running as follows: "That in view of the fact that a large proportion of the present classes of labour being sent over from Java is very unsatisfactory and very costly, Government be asked if they could intervene and assist the planter in securing a suitable class of coolie, possibly by appointing a Superintendent of Emigrants to reside in Java, holding a position similar to that of the present Superintendent of Emigrants, Negapatam, or in such other way as may seem best to Government."

The Chairman said personally he did not see that it could be done. Java was not, like India, British territory, and the Government would not have the right to station an agent in Java.

Mr. GIBSON suggested that Government should be approached to see if anything could be done by friendly arrangement with the Dutch authorities so as to rectify the present crying evils. The coolies being sent over were getting worse and worse in physique, anæmic and consumptive, many of them opium-smokers, while the majority were the sweepings of the towns, not agricultural labourers,

and appeared never to have seen a mamoty or changkol in their lives. In Sumatra they had a short way of dealing with such—they simply sent them back at the expense of the recruiting agents. Here we had no check on them. He had complained to the Penang agents, who repudiated responsibility. Meanwhile, too, their price was rising, and had risen from $45 to over $60 per head. His last lot cost him, landed on the estate, $67 a man. The system of making advances also needed correction, whereas the Tamil coolie landed with a few annas only in his possession, the Javanese had $10 or more, with which they could watch their opportunity to bolt. They would not bolt as they so often did within a few days of landing if they had not this money in their pocket. Their inferior physical condition was due to absence of proper medical supervision. If we could not have our own Medical Officer stationed in Java we might perhaps have one over here to reject the unfit and send them back.

Mr. GIBSON then put his original motion, which was seconded by the Chairman. Mr. DAY proposed as an amendment that the P. A. M. be asked to send a representative to Java to enquire into the cost of recruiting and to see if it is not possible to obtain absolutely healthy coolies. This was seconded, *pro forma* by Mr. T. N. PEARSE, and, on being put to the meeting, was declared lost. Mr. GIBSON'S motion was then put and carried with one dissentient.

The question of reduction of wages then came up for discussion, and the Secretary read a number of letters both from heads of Government Departments and planters in answer to the circular recently sent out on the subject. After the letters had been read the Chairman said that it appeared from what they had heard, that Government refused to commit itself, though it was obvious that there was a pretty general consensus of opinion in favour of reduction. It was absolutely necessary to check the rise of wages. He remembered the time, not so long ago, when we were turning away labour at 18 cents a day. We had to consider what was a fair day's wages under present conditions. He quite realised the difficulties pointed out by writers of the letters, both official and otherwise, of obtaining labourers in certain places or for certain work, except at high rates, but he thought those employers whose labour worked under normal conditions might reduce.

Mr. KNIGHT said that if we reduced wages to 30 cents we should be down to the level of Ceylon wages, and the result would be that more coolies would go to Ceylon, instead of coming here. The higher rate paid here was their inducement to come—35 cents would not be so drastic.

Mr. DAY agreed with Mr. KNIGHT and pointed out that if 35 cents were fixed the coolie would be getting about the same number of dollar cents as the Ceylon coolie got rupee cents, as could be shown by check rolls. The coolie in Malaya would still have the benefit of exchange, and could still remit more from here than from Ceylon. It was absolutely necessary to preserve some inducement, Ceylon

being so much nearer the coolie's home than we were. If we reduced to 30 cents that advantage would be lost.

Mr. C. V. STEPHENS then proposed that the following be embodied in a circular and sent round to planters for consideration :— "That, subject to Government falling into line generally, the rate of wages of Tamilmen be fixed at 35 cents per day of eight working hours where normal conditions prevail, and at a maximum of 40 cents for exceptional and approved estates, and that of women at 25 cents and 30 cents respectively." Mr. B. C. KNIGHT seconded and the motion was carried.

Further discussion of the subject was postponed to the next meeting, which, as previously announced, will be held in Taiping.

The usual vote of thanks to the Chair terminated proceedings.

"TIMES OF MALAYA," 19*th February*, 1908.

ANNUAL REVIEW OF THE INDIA-RUBBER MARKET, 1907.

BY S. FIGGIS AND CO.

As regards plantation rubber grown in Ceylon and British Malaya (Federated States, Perak, Malacca, Johore, Straits), Sumatra, Java, etc., the supply has increased more rapidly and planting has gone on to a greater extent than was anticipated. We estimate from Ceylon 230 tons against 160 tons in 1906 and 70 tons in 1905; and from Malaya 780 tons against 350 tons in 1906 and 75 tons in 1905. The rubber as a whole has been well prepared, but the imports of late show a larger proportion of common than previously. The average price per pound shows a great reduction, owing to the very serious decline since October, caused by the great crisis in America. Manufacturers have shown a decided preference for sheet, biscuit and crêpe. The latter should not be drawn out too thin or have visible air or steam bubbles in it, and some lots of thick crêpe, nice strong rubber about $\frac{1}{6}$th inch thick, were much appreciated and sold well. We think it has been profitable to planters to wash and clean the rubber thoroughly, and to prepare as large a proportion as possible of good colour—also not to send many qualities or very small lots. Block has not been in favour generally, and unless clean resilient hard quality can be sent, it may be better to ship as crêpe.

We repeat our recommendations of a year ago: Pack it in good dry condition (excess of resin much objected to). Into strong cases of 1 cwt. to 2 cwt. each. No paper, fuller's-earth, etc., to be used. Keeping different qualities and colours separate, and not to mix immature rubber with older; to send separately dirty barky pieces, and to wash out all the bark in crêpe, block and sheet. All fine qualities should be loose crêpe, sheet or biscuit—not run to a mass. To smoke the rubber when convenient, because "smoking" appears to increase its resiliency, but keep it as clear and yellow as possible.

Our London charges are very small. Besides the merchants' or agents' commission there is only brokerage half per cent. All samples are paid for, and the only deduction is discount two and a half per cent. Draft (on all rubber) half per cent. Planters get these back in the higher prices obtained. Smoked rubber appears to have greater resiliency and to be more suitable for many purposes than unsmoked. "Smoking" prevents the "proteins" in rubber from decomposition, and generally from "tackiness." All fine rubber from Para is smoked.

The very serious decline in price since October is mainly due to the serious crisis in America and the closing of many factories there. But, considering the enormous increase and general expectation of "planting" rubber in most tropical countries (coupled with the prophetic figures of immense supplies of plantation within two or three years), values were far too high. The decline will, we hope, cool many new enterprises, and prevent too large extension of planting. There is no sign of such increased demand or new uses for rubber as to warrant too rapid an increase of supply.* If it becomes too large values will suffer. We cannot expect much increase of consumption in 1908 in the present state of trade and the over-production of motors everywhere this season.

Brazil shows no sign of reducing her output, though perhaps she may do so in the next crop owing to the serious losses on this crop. Brazil exported over 41,500 tons. There are rumours about the manufacture, by old and monied people who do not often put money into disastrous speculation, of what was erroneously described as synthetic rubber. We shall watch results with curiosity (and doubt). The lower price may retard or reduce the manufacture of "substitutes," but they are largely consumed. The manufacture of reclaimed rubber is very considerable, and increasing. Rambong and Castilloa have not been liked, and sold cheaply.†

Last January we quoted fine sheet, biscuits, and crêpe 5s. 6d. to 5s. 8d., brown and dark ditto 4s. 9d. to 5s. 4d. Prices advanced to middle of March, declined to 5s. for fine by end of May; rose 6d. to 7d., but subsequently fell again to 5s. in September, and seriously declined during the last three months with the financial crisis in America. To-day's quotations are for fine, 3s. 11d., dark and brown 3s. 5d., fine hard Para, 3s. 5d.

* We cannot altogether agree with this, if Messrs. FIGGIS mean that there are signs of an over-supply of rubber. Lower prices would certainly reduce the Brazilian output of uncultivated rubber, which is most costly to obtain; at the same time they would still show a fair margin over cost of production with the cultivated article. Then, again, if a temporary excess has caused a drop, it is generally believed that when the financial upset that emanated, in the United States has passed away, a better all-round demand will be experienced. Certainly, if prices remain low, the consumption will greatly increase, many more industries being able to include rubber, or a larger proportion of it, than when fine Para is over 4s. or 5s. per lb.

† This dislike must surely be due either to the rubber having been badly prepared, or to those handling the rubber not having obtained machinery from those few engineers who have made a speciality of plant for handling Castilloa or *Ficus elastica* (Rambong or Assam rubbers. —ED. Tropical Life).

The world's supply in 1907 was nearly 69,000 tons, as against 65,000 tons in 1906, and consumption nearly the same as 1906, say about 66,000 tons.

Of rubber planted we estimate in the East over 350,000 acres. Ceylon, 150,000 in 1907-08 against 100,000 in 1906-07; Malaya, Malacca, etc., (containing about 14,000,000 trees, not 1,000,000 tapped in 1907), 100,000 in 1907-08 against 90,000 in 1906-07; Borneo, 11,000 in 1907-08 against 8,000 in 1906-07; Dutch East Indies, Java, Sumatra, etc., 70,000 in 1907-08 against 25,000 in 1906-07.

Mexico, Nicaragua and Honduras have been planting and are increasing—probably by now 20,000 acres planted; also Colombia, Ecuador, Bolivia and Peru.

India is more rapidly extending, and has probably about 25,000 acres planted. Some in Burmah and Mergui: the Philippines (small as yet), Samoa, Hawaii, and beginning in New Guinea and other islands, Queensland and Seychelles. The West Coast of Africa is hard at work with plantations, and more progress has been made in the Congo region and German West Africa, also in British East Africa, Uganda, and the West Indies, probably 2,000 acres.

Brazil exported in 1907 about 41,500 tons against 38,000 tons in 1906, and Manicoba has increased, also Guayule from Mexico, which has gone freely into use in America and the Continent. Prices of Guayule are very much lower and quality greatly improved; probably 3,000 tons were made.

The demand for fine Brazil, Bolivian, Peruvian and (wild) medium rubber has been excellent till the last month or two, when the serious crisis in America, the closing of several of her factories, very dear money, several failures and increased stocks, have led to a natural reaction from the too high prices of the last four years, and to a rapid and very serious fall in values at the close. Mediums are very abundant and most difficult to sell recently, because at the relative low prices many manufacturers prefer fine Para. Most descriptions show a decline of 1*s.* to 1*s.* 3*d.* for the year. The trade in England has been excellent; France good; Germany fair; Russia rather poor (owing to an open winter); America good till November The world's supply of 69,000 tons, against 65,000 tons in 1906, has not been consumed, and we begin with rather increased stocks everywhere. The motor trade may decline somewhat; several of the companies are not prosperous, and we must not rely on increased consumption in 1908. The year's decline in price is on Para. Fine about 1*s.* 9½*d.* per lb., Negrohead 1*s.* 1½*d.*, Caucho ball 1*s.* 6*d.* (but the latter was artificially high a year ago owing to speculation), and the supply this year has greatly increased. We had less of slab, much more of tails, which are not liked and sell at low prices relatively. The supply of mediums is large, but West Coast African has declined, viz., about 17,000 tons, against 17,200 tons in 1906 and 17,500 tons in 1905.

This year's crop was well selected generally. All fine should be cut and carefully selected before shipment. Caucho ball increased greatly again and of useful quality. Bolivia increased considerably. Mollendo sent about as previous year. Venezuela *via* Orinoco more. Ceara and Manicoba abundant and cheap. Pernambuco and Assare moderate supply but sold cheaply. Mattogrosso crop was much less, and quality not so good. Mangabeira, from Santos and Bahia, fairly abundant and cheap.

Central America: Values and supplies have declined. Mexico moderate supply. Colombia small lots, and part poor, undesirable quality. Ecuador was fair quality, also Nicaragua. We had a few lots of Plantation from these countries, and estimate 20,000 acres planted there. West Coast African (total in tons about), 17,000 (1907); 17,200 (1906); 17,500 (1905); 18,000 (1904); including Benguela and Mossamedes, 1,700 (1907); 1,450 (1906); 1,650 (1905); 1,600 (1904). Loanda, 900 (1907); 700 (1906); 800 (1905); 950 (1904); Congo, French Congo and Soudan, 6,000 (1907); 5,900 (1906); 5,650 (1905); 5,800 (1904). Qualities have somewhat improved, but prices are rather low for Niger, Gold Coast, Accra and Lagos. Good qualities from the Cameroons, Sierra Leone, Gaboon and Conakry have been in eager demand at high prices relatively. Values declined 8*d.* to 1*s.* 4*d.* per lb. according to description. The French Congo and Soudan, mostly from Senegal *via* Bordeaux, sold fairly; about 1,200 tons, against 1,300 tons in 1906, 1,250 tons in 1905. Liverpool imports West Coast African 3,740 tons, against 4,770 tons in 1906, and 4,700 tons in 1905. Antwerp imports, mostly from Congo, 5,000 tons, against 5,700 tons.

East Coast African: Zanzibar, etc., has largely increased; prices show a decline for the year of nearly 1*s.* 3*d.* per lb.; quality has been fair. Nyassaland was less. Mombassa and Lamu increased. Uganda not a great increase, and prices poor. Abyssinian supply is increasing, quality middling. Madagascar again increased, but shows only about 1*s.* per lb. fall. Niggers have continued to come of very poor quality, and sold cheaply. Rangoon more and cheap Assam rather decreased. Penang about the same, and sold steadily until recently. Supply of Java was small, but planting is going on freely, and we may expect increased supplies. Borneo increased and sold well. Tonkin and French Cochin China did not increase, and sold rather badly. New Guinea sent us none. Pontianak has been abundant and fairly high.

Review of Para Prices for 1907.

We began 1907 with price for fine hard 5*s.* 2½*d.*, soft 5*s.* 0½*d.*, Negrohead scrappy 4*s.* 1½*d.*, Cameta 3*s.* 1½*d.*, Caucho ball 4*s.* 3½*d.* By the end of March the latter had declined to 3*s.* 7½*d.*, Negrohead 3*s.* 10*d.*, fine hard 4*s.* 11*d.* In June prices were lower again, 4*s.* 7*d.* fine hard, but there was a large business and activity for American account in July, when hard sold at 4*s.* 11*d.*, Negrohead 3*s.* 11½*d.*, Cameta 3*s.* 2*d.*, ball 3*s.* 10¼*d.* The market became quiet and declined in September to 4*s.* 5*d.*, 3*s.* 10*d.*, 2*s.* 7½*d.*, and 3*s.* 7¼*d.* relatively. Prices declined a further 4*d.* per lb. by end of October

and after some recovery fell seriously in November—hard fine selling down to 3*s.* 4*d.*, fine soft 3*s.*, scrappy 2*s.* 8¾., Cameta 1*s.* 10¼*d.*, ball 2*s.* 7*d.* In early December there was a recovery of 4*d.* in fine, 2*d.* per lb. on other qualities, but at the close our quotations are lower—fine hard 3*s.* 5*d.*, soft 3*s.* 2*d.*, Negrohead scrappy 2*s.* 10*d.*, Cameta 2*s.* 0½*d.*, Island (scarce) about 2*s.*, Caucho ball 2*s.* 9*d.*, showing a fall in value for the twelve months of 1*s.* 9½*d.* on fine, 1*s.* 1½*d.* on Negrohead. Soft cure has been abundant, and during recent months the value receded from the former difference of 2*d.* on hard, to 4*d.*, whilst soft entrefine has been most difficult of sale at a serious reduction. Balata was in regular supply. Sheet advanced to 2*s.* 6½*d.*, but closes at 2*s.* 2½*d.* Block was up to 1*s.* 11*d.*, closing at 1*s.* 6½*d.* Gutta-percha sold slowly during the year at moderate prices.

The price of fine hard Para since our last weekly report has tended downwards, from 3*s.* 5½*d.* for week ending December 27th to 3*s.* 5*d.* on January 3rd, and 3*s.* 4*d.* on January 10th.

At the auctions on the last date considerable supplies were brought forward, but a very small part sold. Good sheets and pale crêpe Plantation were 2*d.* per lb. lower. Fair to fine Malay sheet sold at 3*s.* 7¼*d.* to 3*s.* 9*d.*, and crêpe at 3*s.* 8*d.* to 4*s.* 10¾*d.*: 40 lb. very fine white, however, realised 4*s.* 3*d.* Superior pale Ceylon biscuits fetched 4*s.* 1½*d.* to 4*s.* 2*d.*, and fair to good sheets and biscuits, 3*s.* 7*d.* to 3*s.* 8¾*d.* Fine pale crêpe sold up to 3*s.* 11*d.*

Rubber statistics for the month of December (in tons) :—

	Para.	Caucho	1907.	1906.	1905.	1904.
Receipts at Para ...	2,250	310 =	2,560 agst.	2,610	3,270	3,390
Shipments to Europe ...	1,320	260 =	1,580 ,,	1,090	1,460	1,110
,, America ...	890	10 =	900 ,,	1,970	1,540	2,685

Crop statistics, June 30 to December 31 :—

	Para.	Caucho.	1907.	1906.	1905.	1904.
Para Receipts { 1907 ...	12,540	1,700	14,240	14,720	14,690	13,310
Para Receipts { 1906 ...	13,360	1,360				
,, Shipts., Europe	6,710	1,480	8,190	6,630	8,324	5,905
,, ,, America	5,510	200	5,710	7,820	5,845	7,400

"TROPICAL LIFE," *January, 1908.*

Annual Report on the Botanic Gardens of the Colony for 1907.

Singapore.

Staff.

The Director went on nine months' leave from April 22nd, and Mr. FOX came from Penang to act in his absence on April 26th, Mr. R. DERRY replacing him in Penang. Mr. C. B. KLOSS, who was temporarily acting during the absence of the Assistant Superintendent in 1903, acted in a similar capacity from August to November 30th. The Artist Mr. C. DE ALWIS ceased work at the end of the year. There was a good deal of sickness among the coolies during the year, Diarrhœa, Fever and Beri-beri.

Visitors.

There was the usual number of ordinary visitors to the Gardens during the year, and among others, SIR NATHANIEL NATHAN, Dr. TREUB (Buitenzorg), Mr. KELWAY BAMBER (Ceylon), Mr. T. S. BURROUGHES, the Hon'ble STANIFORTH SMITH, Director of Agriculture for Papua, Messrs. A. BRIZON and DUCHEMIN from Saigon, Dr. H. BRENIER (Sous-directeur de l'agriculture), Hanoi, and Professor J. PONCHAT, (Professeur d'agriculture and M. THIBAUDEAU), Administrateur de Hanoi, Tonkin, and many planters and others interested in agriculture.

Roads and Drives.

An extra vote of one thousand dollars allowed of a good deal of repairs and re-making of roads and drains. The long road from the main entrance to the Band-stand was re-metalled. The road from Office entrance to the Band-stand re-metalled. The roads on both sides of the Office and from the old aviary to the main road were re-metalled. The road behind the Band-stand leading to the Potting-shed was patched and repaired.

A new drain was built on four sides of the Garden Office leading to a tank for storage of water, and another on both sides of the road below the Band-stand leading to the plant houses was made. Guttering was supplied to the Garden Office.

Buildings.

The quarters of the Clerk and Foremen-Gardeners, and those of the Watchmen were re-attaped. A new store was built in the Economic Gardens, and new quarters for the Carpenters were built near the Godown. Two new latrines were built in the Cooly Lines. Old wooden stages for Orchids were replaced by bricks. The remainder of the old aviary buildings was cleared away, the ground dug and planted up and the old monkey cage repaired, painted and converted into a shelter. Repairs were also made to the ventilators of the Herbarium building.

The long proposed scheme for supplying water from the well and lake to various parts of the Garden was definitely commenced. A two horse-power oil engine was erected and a tank for the water was put up in the Garden jungle. The work was not finished by the end of the year. This will be an immense improvement to the Garden. The cost was paid from the money obtained by the sale of rubber made during the experiments.

New and Noteworthy Plants.

The following were among the most interesting plants which flowered or fruited for the first time in the Gardens:—

Heptapleurum tomentosum.—(Selangor).
Dendrocolla pardalis.—(Sarawak).
Schismatoglottis nervosus.—(Sarawak).
Curculigo racemosa.—(Sarawak).
Impatiens sp.—A very pretty dark pink balsam (Sumatra).
Scutellaria javanensis (Java).
Statice sinensis.
Lobelia nicotianæfolia.—(Ceylon).
Palicourea garcenioides.
Bryonopsis laciniosa.
Randia sp.—Shrub with white flowers. (Madagascar).
Begonia Kewensis.
Clerodendron sp.—(*Cl. disparifolium* of Kew, but not the plant of the Malay Peninsula known by that name).
Gomphia decora.
Passiflora ambigua.
Calyptrogyne sarapiguensis.—(S. America).
Marcgraavia umbellata developed several bunches of buds, which however never opened.
Dendrocalamus pendulus.—Both the big clumps of this splendid Bamboo began to flower and die at the end of the year.
Cola acuminata.—Fruited heavily in the Economic Gardens for the first time, a batch of seedlings was raised.
Dichopsis oblongifolia.—Fruited heavily in the Economic Gardens and also in the Garden jungle.

Camoensia maxima, produced fruit for the first time. A species of Canthium received some years ago from Uganda, under the name of *Matagonda* "Edible fruit" fruited this year. It is a shrub with small green flowers, and little round yellow fruit. It does not appear to be a very valuable addition to our stock of dessert fruit.

Plants and Seeds Received.

During the year there were 7,535 plants and 358 packets of seeds received, the donors being Messrs. E. L. HOLMES, Professor SARGENT, Dr. SCHLECHTER, A. D. MACHADO, J. D'A. PEREIRA, L. BOEHMER & Co., H. DREER, F. GLAZEBROOK, H. ENG WATT, C. CURTIS, CARTER & Co., DAMMAN & Co., T. D. TAITE, Hon'ble W. J. NAPIER, H. CANNELL & SONS, C. B. KLOSS, ST. V. B. DOWN, J. C. HARVEY, M. HERB, JAMES VEITCH & SONS, Mr. T. W. BROWN, Mr. VALENTINE KNIGHT, Mr. BEAUCLERK,

Mr. LYON, Mr. WEBERBOUR, and the Botanic Gardens of Kew, Grenada, Taiping, Manila, Buitenzorg, Washington, Rangoon, Ceylon, Calcutta, Sydney, British Guiana, Trinidad, Seychelles, Honolulu, Berlin, Durban, Congo, Hongkong, Cairo, Nogent sur Marne and the Arnold Arboretum.

Plants and Seeds sent out.

Excluding Para Rubber seeds and plants, 2,491 plants and 236 packets of seeds (ornamental and foliage) were sent out. The recipients were Messrs. C. CURTIS, H. ENG WATT, ST. V. B. DOWN, Dr. SEFFER, Dr. SCHLECHTER, H. DREER, A. D. MACHADO, MISS GAGE BROWN, Mr. MARINER, BOEHMER & Co., V. KNIGHT, S. BIDI & Co., A. M. BURN-MURDOCH, Mr. BEAUCLERK, Mr. LYON and the Botanic Gardens of Rangoon, Buitenzorg, Penang, Lagos, Natal, Brisbane, Ceylon, Trinidad, Hongkong, Kew, Jamaica, Calcutta, Madras, Trivandrum, Queensland, Honolulu and Sydney. Plants were also supplied to Government House Domain, General Hospital, Hospital Grounds at Labuan, Chief Police Officer's quarters, Municipal Roads and Reservoir and Military Gardens at Tanglin and Blakan Mati. This does not of course include the plants and seeds sold.

Herbarium.

Except a short trip during the Easter Holidays to Johore made by the Director, it was impossible to make any botanical expeditions. A collection of 234 specimens from Southern India was made by the Clerk Mr. J. S. ISAAC when on leave, and presented to the Herbarium; 100 specimens of Philippine plants were received from Mr. COPELAND of Manila, 25 specimens from Bintang Island from Mr. C. B. KLOSS and 84 specimens from the Botanic Gardens of Buitenzorg.

Three packets of specimens were sent to the British Museum, two to Dr. BECCARI, three packets to Prince ROLAND BUONAPARTE and 93 fungi in alcohol, with drawings made by the Artist, to Kew. The account of these fungi, the first collection of Agaricini sent from the Peninsula, are described in the "Kew Bulletin" and contain a considerable number of new species.

The whole Herbarium was re-poisoned, a work which occupied four men for four months, and used 50 gallons of Methylated Spirits and Corrosive Sublimate. This was considered necessary as on one morning it was found that the termites had during the night invaded the building and had carried tunnels almost into the cabinets. As there are a large number of types and cotypes of different species of plants in the collection the loss of which would be irreparable, the assistance of the Public Works Department was called in to minimize the risk of the destruction of the building and its more valuable contents, by painting the vulnerable parts of the building with Jodelite.

Publications.

Three volumes on the Monocotyledons of the Malay Peninsula by the Director were published during the year, forming part of the series of the "Materials for a Flora of the Malay Peninsula" which are being published under the direction of Sir GEORGE KING.

The "Agricultural Bulletin" was published monthly as usual.

Library.

During the year 76 monthly, five weekly and three quarterly publications of other establishments, 158 books, annual reports and pamphlets were received. Nearly all these are obtained in exchange for the "Bulletin" and Gardens Reports.

The Agricultural Show.

This Show was held in Kuala Kangsar this year, and the Superintendent Mr. W. Fox represented the Settlement at it. Comparatively few exhibits were sent from Singapore.

REVENUE AND EXPENDITURE FOR THE YEAR 1907.

"Upkeep of Botanic Gardens."

REVENUE.

	$	c.	$	c.
By balance in Bank on 1st January, 1907	1,875	74	...	
Government Grant for the year 1907	8,000	00	...	
By sale of Economic Plants and Seeds	6,312	63	...	
By sale of Ornamental Plants and Seeds	1,030	27	17,218	64

(A sum of $1,420.55 for the sale of Economic Plants and Seeds, supplied during the year not collected up to 31st December).

EXPENDITURE.

	$	c.	$	c.
Wages	6,656	29	...	
Bills	8,022	94	14,679	23
Balance in Bank on 31st December ...			2,539	41

Inspection of Coconut Trees.

Notices were served on 174 persons but no prosecutions were necessary. Three hundred and forty-five trees and forty stumps were destroyed and fifty piles of rubbish likely to contain beetles. The beetles can perhaps hardly be stated to be quite extinct in the Island, but they have become pretty scarce nowadays and the destruction of trees by them now is quite insignificant. Care will have to be taken in the future to prevent their return.

	$	c.
Amount allowed in the Estimate to carry out this Ordinance	210	00
Amount Expended on transport ...	204	08
Balance ...	5	92

ECONOMIC GARDENS.

A small store was erected in the Economic Gardens in place of the old wooden shed which was in use for so many years.

The Municipality in making a new road in the neighbourhood asked to be allowed to take soil from the hill opposite in the arboretum to fill up a swamp. This was permitted on condition of the hill being levelled and turfed. The excavations necessary were very unsightly for some time but by the end of the year they were filled in and levelled, and will shortly be turfed.

The Garden was kept up in a very good condition as well as could be expected, considering for the greater part of the year, the European staff was reduced to the Assistant only. The export of plants and seeds of economic interest was greater than usual, not only in Para Rubber, but in other products, a matter of satisfaction as it shows that the agriculture of the tropical English colonies is not being confined to Rubber only.

There was a demand for seeds of the Oil Palm (*Elaeisguineensis*) due to an article in the "Agricultural Bulletin" of this year pointing out the value of this plant in cultivation. Fibre plants were also in great request and though the cultivation of these has been slowly making its way in the Peninsula, still there are signs of its really playing an important part in the local cultivation in the near future.

Catch crops for rubber as represented by Ground-nut, Citronella and Lemon-grass, were in demand. Camphor seedlings were taken for trial in several of the Estates in the Federated Malay States. Fruit trees were required also largely for the Federated Malay States, where the supply of fruit is by no means what could be desired.

The Para Rubber seed crop was the biggest on record, viz., 410,600 of which 405,600 seeds and 13,100 seedlings were disposed of. The Gutta Percha fruited well and 1,380 seeds were sent to Mauritius, but travelled very badly. Of *Willughbeia firma*, 18 seedlings were sold. Besides these 100,000 Rubber seeds were purchased, packed and sent to British New Guinea.

Fibre plants were sold as follows:—Ramie 3,170, Sanseviera 10,000, Manila Hemp 130, Mauritius Hemp 150 and of Fruit trees various kinds 1,700 plants and 12,000 seeds.

A big sending of Coconuts to Lagos was 3,000 nuts in crates, and requiring 30 carts to convey them to the docks.

Of Tapioca 300 plants, Coffee 125, Citronella 160, Lemon-grass 250, Camphor 750, Cocoa 160, Nutmeg 172, Oil Palm 3,030 seeds, Ground-nuts 50 lbs. seeds.

The greater part of these seeds and plants were supplied to the Federated Malay States and Johore, chiefly to Selangor and Perak. Of other Colonies, Lagos, British New Guinea, Southern Nigeria, and the Caroline Islands were the chief recipients.

The total export of plants and seeds this year was:—

Economic Plants	...	...	18,085
Ornamental Plants	...	...	6,744 = 24,829
Economic Plant Seeds	...	...	525,310

Ornamental Plant Seeds (sold and exchanged) 558 Packets.

This export entailed a very large amount of labour and correspondence. An extra seed boy to collect seed was employed, and a larger number of men than usual were required to gather the large crop of rubber seeds. When the Gutta Percha trees were fruiting, the fruit bats attacked the fruit in such numbers that it was with difficulty that any of the crop was saved at all. The lower part of the best tree was covered with cloth and nets, lights were put in the tree and a Tamil Batcatcher employed.

Experimental Rubber Tapping.

During the absence of the Director, Mr. FOX the Superintendent from Penang Gardens carried on the researches as to growth and returns of the Rubber trees, though for the whole nine months he was required to do the whole work of the two Gardens single-handed. The records were carefully kept, and the report will be shortly completed. The rubber prepared during the experiments was sold locally and fetched $3.194.32. Part of the money obtained by the sale of the rubber was utilized in installing a water supply to the Botanic Gardens, which has long been needed, and which was otherwise unprocurable. This installation cost five thousand dollars.

Summary.

Considering that the Staff was this year reduced by the Director's absence for over eight months to Mr. FOX assisted by the Clerk Mr. J. S. ISAAC, the amount of work executed was very great. The Gardens were kept in good order and many improvements made, the export of seeds and plants and correspondence exceptionally large, and a considerable amount of experimental research carried on, and the "Agricultural Bulletin" published monthly, all this work could not have been effected but by great energy and industry on the part of the Assistant and of the Clerk.

H. N. RIDLEY,

Director of Gardens, Straits Settlements.

Penang.

Staff.

1. The Gardens were in charge of the Collector of Land Revenue with the assistance of MOHAMED HANIFF, Garden Overseer, up to March 26th, when Mr. FOX (Superintendent) returned from leave. Mr. FOX only remained up to April 23rd, when he proceeded to Singapore to act for the Director of Gardens, and was replaced on

the following day by the writer, Assistant Superintendent, Botanic Gardens, Singapore, who remained in charge of the Gardens for the remainder of the year.

MOHAMED HANIFF was on leave for three months from the 17th June, this being his first leave after 18 years' service.

The check roll shows much broken time, due to Fever and acute Diarrhœa, but equally or possibly more, to slight feverish symptoms which disincline a cooly to turn out without the incentive of mustering on the spot, and this is unavoidable as the lines have been placed one mile distant from the Gardens with the object of obtaining good sanitation.

The Year's Work.

2. Despite these changes a large programme of work has been carried out, an important item of which was the increased maintenance and renewal of stock consequent on large sales of palms and general decorative plants. This will be better understood if I say that the revenue collected by sales amounted to $1,111.24, which constitutes a record in the revenue return of these gardens. The highest returns previously recorded were $974 in 1897, and $1,014 in 1894.

3. Inadequate accommodation has always been the drawback to the maintenance and renewal of stock but on the representation of Mr. FOX an acre of land has been purchased at the Garden entrance and this difficulty will disappear. It will now be possible to maintain small lots of fruit trees and other useful economic plants. In this direction the most notable additions include *Palaquium oblongifolium*, or getah taban, raised from seeds obtained within the Garden, and although only three trees fruited the crop was exceptionally heavy; and although 3,670 seeds sold to the Conservator of Forests, and 500 seeds to the Government of Mauritius, a batch of 1,550 seedlings was reserved for the Gardens. *Hevea braziliensis* practically failed as a seed-crop, 4,700 seeds were sold and 250 seedlings raised. Other additions include 200 nutmegs, 300 durians, and a few mangosteens. Of other economics of which specimens only were received the following may be cited:—West Indian Bread-nut (*Artocarpus nucifera*), Australian fodder grass (*Paspalum dilatatum*), ten species of Bow string Hemp, *Sanseviera* (species), Bornean Lemon (Citrus sp), *Eugenia uniflora*, *Eugenia braziliensis*, *Anona reticulata*, *Psidium guava* (Trinidad), and some good varieties of bananas and pineapples.

Free Issues.

4. Trees and shrubs were supplied free to the Supreme Court grounds, District Hospital Government Quarters, and Residency; the latter also received a miscellaneous selection of pot plants. A small lot of seeds was given to the Pulau Tikus College.

Exchanges.

5. Plants were supplied free to:—

Botanic Gardens, Rangoon	...	2 cases miscellaneous Ferns
Botanic Gardens, Singapore	...	1 plant Amorphophallus Titanum
German Consul, Padang	...	1 case of Palms
Mr. Tong Takin, Kwala Lumpur		6 Adiantums
Mr. Beauclerk do.	...	1 box of Cannas

Received in exchange from:—

Plantations Department, Perak	...	20 packets of Seeds
Do., do.	...	48 Ferns and Bulbs
Botanic Gardens, Jamaica	...	1 packet of seeds Cyphomandra betacea
Do., Ceylon	...	1 do. do.
Do., Calcutta	...	4 do. Palms
Do., Trinidad	...	1 do.
Do., Singapore	...	4 do. and 341 plants
Do., Rangoon	...	4 do.
Agricultural Department, Honolulu		54 do.
Commissioner, Honolulu	...	40 packets of Seeds
Messrs. Damman, Naples	...	23 do.
Messrs. Herb, do.	...	26 do.
Messrs. Cooper, Nurseries, Victoria		34 do.
E. C. Ollenbach Esq.	...	6 Phalæ nopsis
C. Curtis Esq. ...	...	1 packet of seeds and 25 Bulbs
Dr. Wright, Perak ...	...	20 Bulbs, Caladiums
W. Allen Esq., Rangoon	..	11 Orchids
W. Beauclerk Esq., Java	...	46 Orchids
Mr. Mohammed Haniff (Overseer)		Ferns, Orchids and Aroids, several cases
Mr. Tong Takim ...	...	29 Caladiums tubers
D. Logan Esq. ...	...	25 seeds, Spondias lutea
J. Irving Esq. ...	...	1 packet of seeds
The Residency ...	....	7 plants
Mr. Cerutti ...	...	1 lot Rose-cuttings

From the Royal Botanic Gardens, Kew, a wardian case of 50 plants of (Manicoba) Ceara Rubber, said to be a superior variety, was received and these have been planted at Tasek Glugor Forest Reserve in Province Wellesley.

6. Some new ferns and palms were added to the Garden collections from the Botanic Gardens, Singapore, and several flowering or decorative plants. The collection of Caladiums was enriched by some new choice varieties. From the German Consul at Padang the gigantic terrestrial aroid (*Amorphophallus Titanum*) has been received. The collection of Cannas is large and includes many novelties and made a fine display during the latter months of the year.

7. A sum of $129.24 has been expended in the purchase of plants and seeds. This is a very small amount compared with the

receipts and it should be mentioned that it is not as easy now as formerly to obtain new plants, particularly novelties, by exchange, owing to the preference for temperate rather than tropical plants in home gardens. To obtain new varieties a small sum must be expended for which an assured return may be expected. New plants if novelties are much in demand.

Routine.

8. During the absence of the Superintendent for one year, the garden was kept in good order and the general appearance maintained. There remained, however, some urgent arrears which have now been carried out. All the South American Cattleyas, the beautiful Orchids so much admired, were losing their vigour and these have been repotted and are making new growths. In the other plant houses all the pot-plants have been repotted, rearranged, and represent care and culture.

Improvements.

9. The Penang Garden is now 25 years old and when first commenced it contained many interesting indigenous specimens of trees and palms which have been preserved, while the groups and specimens since planted have made so much growth that the time has arrived for some landscape effects. Some years ago the waterfall was the most striking natural feature of the garden, but latterly it was not easy to view from any part of the garden, and escaped the notice of most visitors. The best view of it which is from the Band-stand has been improved by the removal and pruning of superfluous foliage. The waterfall itself is considerably overgrown and if permission can be obtained it should be recleared during the next dry weather.

The most important landscape effect has, however, been obtained by opening a vista from a point on the main drive near the entrance to the garden looking across the stream towards the plant nurseries. The two cascades over the stream are brought prominently into view and a long border of brilliant coloured Cannas between the cascades of water furnishes a pleasing picture. Some other flower-beds have been added and the general appearance of this part of the garden has been made brighter. The work involved the removal of a huge clump of the common and rather formidable bamboo (*Bambusa spinosa*). This species grows into an almost impenetrable mass which is difficult to destroy (unless by fire which cannot be used in a public garden) so that the task of removing it proved an arduous one.

The main drive already referred to has been slightly improved by reducing an ugly bend.

10. By far the largest undertaking however has been the commencement of converting the ravine running from the circular road to the swimming bath into a natural rockery for the reception of the large collection of Aroids and certain shade-loving Palms.

It will perhaps be well to explain here that this so-called bath is really the Garden reservoir, which supplies the plant sheds and nurseries with water through one-inch iron pipes, and that since the club swimming bath started at Tanjong Bungah the Garden bath has fallen into almost entire disuse. The reservoir is essentially necessary and must be maintained, but the Garden funds would not stand the cost of renewing the dilapidated buildings (dressing-rooms, etc.,) which were so very occasionally used and the opportunity was therefore taken to utilize the ravine for the purpose stated. When completed (considering the richness of Aroids in the Malayan flora) a most interesting and valuable collection of these plants will be permanently established for study or enjoyment in a cool retreat. Several species of epiphytic Aroids already abound on trees growing in the ravine ; others have been planted. In building the rockery, the bed of the stream has been contoured so as to form a feature of the work. Of the Aroids planted which include duplicates of all our Anthuriums, Alocasias, Amorphophallus, Spathiphyllum, Dieffenbachia, Schismatoglottis, Homalomena, Aglaonema, Philodendron, Pothos, Schizocasia and Caladiums all have grown well.

At the time of writing the plants of *Spathiphyllum cannæfolium* furnish a nice display of white flower-spathes which are deliciously fragrant in the mornings and evenings. A little time must elapse before the Anthuriums represent their best ; but those specimens which have flowered exhibit more perfect and better coloured spathes under the natural shade than is ever obtained with pot-plants under artificial shade.

Aquatic Aroids and the "Keladi" or Colocasias and Xanthosomas are not yet provided for.

Upkeep and Buildings.

11. The dam across the reservoir was found to be leaky. The faces have been re-cemented and a new hardwood water gate provided. The reservoir has also been thoroughly cleaned and the accumulated wash-sand removed.

The bertam chicks on the iron or No. 1 plant house have been entirely renewed. Many of the posts and beams of No. 3 plant house have been renewed and painted, and the whole roof renewed with split nibongs.

The circular drive from the Aroid ravine as far as the Band-stand or a distance of 200 yards has been re-metalled with 3 inches of granite by the Public Works Department. The same department has also renewed the two rustic bridges crossing the stream near the fern rockery.

Library and Herbarium.

12. For the former the usual periodicals have been purchased or received from other Botanical and Agricultural Establishments. Mr. WRIGHT'S Cantor lecture on Para Rubber was purchased, and Volume IX, Part II of the Annals of Calcutta Botanic Garden,

containing descriptions and drawings of the Orchids of North-West Himalaya presented. Various volumes of periodicals and journals have been bound.

The Herbarium building although repaired is still very unsatisfactory. During the latter part of the year the excessive damp and consequent mould on the specimens has been very troublesome, but with the aid of charcoal fires in chatties the Herbarium has been kept as dry as possible. Something however must be done, or the life of the Herbarium will not be a long one, and considering the cramped space for Office and Library, and the urgent need of a room suitable for a store for tools, seeds, bulbs, rubber, and other specimens, this need would be met by converting the Herbarium into a store and erecting a new one on arches instead of a ground-floor on sloping ground. A space of 30 by 20 feet would suffice for a herbarium.

Owing to arrears and pressure of work, I was not able to suggest any collecting trips, but the garden Overseer paid a visit to the Singapore Gardens and obtained eleven cases of miscellaneous plants, all desirable additions to this garden.

Rubber Notes.

13. Including the trees at the old experimental nursery on the hill there are 43 Para trees in the garden; of these seventeen are over three feet in girth, nineteen over and seven under two feet. I had expected there were more. In the absence of MOHAMED HANIFF it was necessary to train a man to tap and 21 trees were tapped and 35 lbs. of Rubber obtained. Now that a man can tap without injury, this work will proceed better although the drying process is difficult and long, through smoking being necessary owing to the damp situation of the garden. The old Para tree supplied two pounds of dry Rubber making the grand total from this tree 37 lbs. 13½ ozs All the Rubber is not yet dry enough for sale.

Governor's Hill Bungalow Garden.

14. The labour band has been very unsatisfactory, but thanks to the energy of the Overseer in charge (Mr. FERNANDO), the grounds have been maintained in good order.

The Rainfall amounted to inches 124·17 of which amount 57·41 inches fell in the three months of September, October, November, or an average of 19 inches. As might be expected in such inclement weather the vegetable supply fails but improves with the dry season, when unfortunately the want of a water supply is a serious drawback.

A few introductions such as Lima and Runner beans are promising and a few seedlings of the Tree Tomato (*Cyphomandra betacea*) have been raised.

Vegetables are no longer supplied free, and since last September a sum of $15.37 has been collected for supplies to Government Bungalow. This amount is included in the Waterfall Garden

Return. A sum of $51.89 was expended in the purchase of new roses, which arrived in perfect condition and will be planted when established. Flower and vegetable seeds cost $25.22.

Coconut Trees Preservation.

15. The number of notices issued in connection with infected trees and manure not properly stored amounted to 755.

Fortunately for this Settlement beetles are the only pest and the dreaded Bud-Rot has not appeared; but the area to be inspected is far too large for one Inspector, and a Sub-Inspector is allowed for next year.

There were nine prosecutions in Penang and four in Province Wellesley. The fines inflicted amounting to $15.50 only. I strongly think this leniency will result in more unnecessary work for the Inspectors and the real work of inspection will fall into arrears. It may not seem a serious breach of the Ordinance for a small foot bridge or fence of coconut stems to be used and in solitary instances there would not be any danger of maintaining breeding grounds for the beetles, but if every one so utilized their fallen stems (and this is done in Province Wellesley far too much) an additional danger in this direction would exist, as the attention of the Inspectors would be divided between unburied stems and standing trees.

General.

16. I attended the Agri-Horticultural Show held at Kwala Kangsar in August and took charge of the Penang exhibits. There were 122 exhibitors and 700 entries in 168 classes. The Settlement was very successful and carried off 48 first prizes, 24 second prizes, 7 third prizes, and 3 exhibits were highly commended.

Excepting horticulture (plants and flowers) all the large divisions were well represented, and while there is a general consensus of opinion as to the educational and other advantages of such shows, there does not appear to be any probability of a higher or other standard forthcoming. To effect a change in the present practice of agriculture I suggest that the best prospect of improvement lies in the encouragement and assistance of school gardens as is done in the West Indies and Ceylon. Without such early teaching the market gardener will fail to realize that quality may be made or modified by selection and varied cultivation, and the small coconut planter will proceed on the same lines as hitherto, waiting years for a crop instead of being profitably engaged in cultivating as catch crops, citronella or lemon-grass oils, improving his property and at the same time assisting to build up a large oil industry. A larger demand for vegetable oils seems probable and the countries best equipped will be naturally the first to reap the benefit. An Agricultural Show would determine whether the oil was purer or a vegetable more succulent; to the observant it would most likely indicate the direction in which improvement might be expected, but first of all the methods of agriculture as now practised must be altered, and I cannot conceive how such alteration can be effected except in the way suggested.

17. Appendices * are attached showing Revenue and Expenditure of the Waterfall Gardens, Governor's Hill Bungalow grounds, Transport and Personal Allowance, Coconut Trees Preservation; and * Returns of the work done under the Coconut Trees Preservation, and the Rainfall recorded at the Hill, Fort, and Prison.

R. DERRY,

Acting Superintendent of Forests and Gardens.

22nd January, 1908.

Return of Rainfall for the Criminal Prison, Fort Cornwallis, and Government Hill during the year, 1907.—(Contributed.)

MONTHS.	Prison.	Fort.	Government Hill.
January	1·54	1·79	3·89
February	80	1·12	1·18
March	6·34	6·50	7·69
April	1·43	1·10	2·34
May	5·94	5·96	10·51
June	4·18	5·81	11·97
July	8·10	5·80	14·73
August	4·68	3·82	5·88
September ...	8·07	10·23	15·96
October	12·63	6·45	19·71
November ...	17·16	11·95	21·74
December ...	7·42	6·50	8·57
Total ...	78·29	67·03	124·17

* Not printed.

COMPARATIVE STATEMENT OF CULTIVATED RUBBER EXPORTED FROM THE FEDERATED MALAY STATES DURING THE YEARS 1908 AND 1907.

——	Exported during Jan., 1908.	Previously.	Total export during 1908.	Export during similar period of previous year.	Increase.
	lbs.	lbs.	lbs.	lbs.	lbs.
Perak	36,646	...	36,646	11,665	24,981
Selangor	134,781	...	134,781	91,650	43,131
Negri Sembilan ...	71,136	...	71,136	32,920	38,216
Pahang	...	...	...	nil.	...
Total ...	242,563*	...	242,563	136,235	106,328

* Excluding Pahang export for the month of January, 1908.

KUALA LUMPUR,
14th February, 1908.

J. R. O. ALDWORTH,
Commissioner of Trade and Customs.

GOW, WILSON & STANTON, LIMITED— India Rubber Market Report.

13, ROOD LANE, LONDON, E. C.

February 7th, 1908.

The offerings were on a rather smaller scale than has lately been the case, and the finest grades of Crepe and Sheet were not very strongly represented. Orders for these were rather scarce, but the medium and lower grades of Crepe were again well competed for, and realized firm to, in some cases, slightly dearer prices than at the last auction; the finer kinds of Crepe, however, together with Biscuits and Sheet, showed a slight decline on last sale quotations.

The most attractive parcel in the sale consisted of some very fine pale and even Biscuits from Warriapolla, which realized 3/7¾ per lb.

Number of Packages Advertised.		Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.		
		Ceylon.	Malaya.	Totals.	No. of Pkgs. Sold.	Price.	Hard Fine Para.	Plantation.	
								Fine.	Scrap.
To-day ...	739	10¾	28½	39¼	404	3/2⅛	3/1	3/5 to 3/7¾	2/1 to 2/6¼
Corresponding sale last year ...	362	7½	13¼	20¾	226	5/5	5/2¼	5/8¾ to 5/10½	4/3¼ to 4/7½

TO-DAY'S QUOTATIONS.

SHEET, ETC.

Good to Fine Sheet	3/6 to 3/6¾
Very Fine Pale Biscuits	3/7¾
Good to Fine Biscuits	3/5 to 3/6¾

CREPE.

Fine Palish and Pale	3/5¼ to 3/6¾
Medium and Brown	3/- to 3/4¾
Dark and Block	2/5 to 2/10

UNWASHED SCRAP.

Fine	2/5 to 2/6¼
Good and Medium	1/10 to 2/1

SHIPMENTS.

Exports from 1st January to 25th December, 1907:—

From Singapore	... 617 tons.
From Penang	... 236 ,,
Total ...	853 tons.

Exports from 1st January to 31st December, from Ceylon:—

1907	... 248 tons.
1906	... 146 ,,
1905	... 75 ,,
1904	... 34 ,,
1903	... 18 ,,

(The Singapore and Penang figures are taken from Statistics published by Messrs. BARLOW & Co., of Singapore.)

CEYLON.

MARK.	PKGS.	DESCRIPTION.	PRICE.
Culloden	25	Crepe	... 3/3½ to 3/5¾.
	3	Block	... 2/7.
Ellakande	1	Crepe	... 3/4¾.
Heatherley	3	,,	... 3/- to 3/4.
Nikakotua	9	,,	... 3/3¼.
Halgolle	7	Scrap and Cuttings	... 1/10 to 2/5¾.
Katugastota	2	Scrap and Cuttings	... 2/5 to 2/5¼.

Ceylon.—*Continued.*

Mark.	Pkgs.	Description.	Price.
Arapolakande	9	Fine biscuits ...	3/6½ to 3/6¾.
	5	Crepe ...	3/3¼ to 3/4.
	1	Black block ...	2/7.
Sirigalla	1	Biscuits ...	bought in.
Kahagalla	1	Worm ...	bought in.
	2	Good crepe ...	3/5¼.
	8	Dark crepe	pt. sold, 3/2 to 3/2½.
Maddegedera	4	Good scrap ...	2/5¾.
New Rasagalla	1	Good scrap ...	2/6.
Polatagama	7	Fine biscuits ...	bought in.
	2	Crepe ...	pt. sold, 3/4½.
Tudugalla	7	Fine crepe ...	bought in.
Kumaradola	1	Dark block ...	bought in.
Elston	5	Biscuits ...	bought in.
	3	Scrap ...	2/5 to 2/6¼.
Hapugastenne	5	Scrap ...	2/4 to 2/5½.
Kumbukkan	3	Biscuits ...	3/6¾.
	2	Scrap and pieces ...	2/3½ to 2/5¼.
	1	Block ...	bought in.
Dangan	4	Biscuits ...	3/6.
Tallagalla	7	Biscuits ...	pt. sold, 3/6.
	6	Scrap ...	2/3 to 2/6.
	1	Black crepe ...	bought in.
Sorana	4	Biscuits ...	3/5 to 3/6.
	1	Biscuits ...	bought in.
	7	Crepe, scrap & rejections part sold,	2/10¾ to 3/4.
G D J	6	Black crepe ...	2/9.
	3	Biscuits ...	bought in.
	2	Scrap ...	2/- to 2/5¼.
N P	1	Biscuits ...	bought in.
	1	Scrap ...	2/3½.
Sunnycroft	2	Sheet ...	3/3.
Ballacadua	3	Pressed crepe ...	2/6.
Northumberland	1	Fine biscuits ...	3/6.
Waharaka	2	Biscuits ...	3/5.
	1	Scrap ...	2/5½.
Warriapolla	5	Very fine pale and palish biscuits pt. sold, ...	3/6½ to 3/7¾.
	2	Good scrap ...	2/4 to 2/5.
Aberdeen	4	Fine biscuits ...	bought in.
	3	Scrap and rejections pt. sold,	2/3 to 2/5¼.
Glanrhos	5	Biscuits ...	bought in.
	2	Black block ...	bought in.
	5	Crepe ...	bought in.
	1	Sheet ...	bought in.
Verulapitiya	1	Dull sheet ...	bought in.

MALAYA.

Mark.	Pkgs.	Description.		Price.
P S E	7	Fine sheet	...	bought in.
	5	Crepe	...	3/- to 3/4.
	3	Ball	...	bought in.
V R Co Ld. Klang FMS	16	Sheet.	...	bought in.
	20	Crepe part sold,	...	3/4½.
	37	Dark crepe part sold,	...	3/4 to 3/4½.
	3	Dark block	...	2/5 to 2/7.
R S R	11	Sheet	...	bought in.
	9	Rejections	...	2/1 to 2/5½.
No Mark	3	Crepe	...	3/3.
Terentang	5	Crepe	...	3/1¼ to 3/3.
Linsum	5	„	...	3/0½.
Pataling	2	Black crepe	...	2/10.
Batu Tiga	7	Sheet part sold,	...	3/6.
	1	Crepe	...	3/1¼.
Linggi Plants	19	Crepe	...	3/2.
	63	Fine crepe	...	3/4¼ to 3/6.
	12	Dark „	...	3/1½ to 3/3.
	4	Block	...	2/6.
W E W S	3	Sheet & scrap	...	2/9½.
G E H & S	1	„ „	...	bought in.
Highlands	23	Sheet	...	bought in.
	20	Crepe	...	3/3 to 3/5½.
C M R E Ld.	27	Crepe part sold,	...	3/5 to 3/6¼.
Damansara	19	Good pressed crepe	...	bought in.
	10	Dark pressed crepe and block	...	bought in.
	9	Scrap	...	bought in.
	9	Sheet	...	bought in.
	5	Crepe	...	bought in.
	6	Pressed crepe and block	...	bought in.
	3	Dark block	...	bought in.
Beverlac	5	Crepe	...	3/3¼.
	2	Scrap	...	2/6¼.
	2	Block	...	bought in.
Shelford	4	Block	...	bought in.
S S B R Co Ld.	7	Sheet	...	bought in.
	6	Crepe	...	bought in.
Merton	3	Sheet	...	3/6.
	1	Crepe	...	3/3.
B R R Co. Ld.	28	Block	...	bought in.
	5	Crepe	...	bought in.
	19	Sheet		part sold, 3/6.

Malaya.—*Continued.*

Mark.	Pkgs.	Description.		Price.
F (S) R Co. Ld.	16	Sheet	...	bought in.
	7	Crepe	...	3/1¼ to 3/4¾.
S K R Co. Ld.	16	Crepe	...	3/5¼.
	5	Block	...	2/8.
B M & Co.	2	Fine pressed sheet	...	3/6.
	2	Scrap	...	2/6.
	2	Rejections	part sold,	2/4½.
B & D	14	Biscuits, sheet and crepe	...	2/- to 3/6¾.
R R LED	7	Sheet	...	bought in.
R R CW	1	Biscuits	...	bought in.
	2	Good scrap & rejections	...	pt. sold, 2/4.
S D RA	1	Good rejections	...	2/6.
	2	Scrap	...	2/1 to 2/6.
R R S	1	Scrap	...	2/-
L & P	1	Block	...	3/0½.
R M P LTD	7	Good and medium crepe	...	3/3 to 3/6.
Sungei Krudda	7	Crepe	...	bought in.
	1	Dark block	...	bought in.

JAVA.

Sengon	4	Pressed sheet	...	bought in.
	4	Blocked scrap	part sold,	1/10.

Penang.

Abstract of Meteorological Readings in the Criminal Prison Observatory for the month of January, 1908.

District.	Mean Barometrical Pressure at 32° Fah.	Mean Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Mean Maximum.	Mean Minimum.	Mean Range.	Mean Wet Bulb.	Mean Vapour Tension.	Mean Dew Point.	Mean Humidity.			
	Ins.	°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
Criminal Prison Observatory, Penang ...	29·922	152·1	82·7	90·7	73·0	17·7	73·9	·841	68·1	79	N.E.	2·40	·76

M. E. SCRIVEN,
Assistant Surgeon.

S. LUCY,
Senior Medical Officer, Penang.

13th February, 1908.

Selangor.

Abstract of Meteorological Readings in the various Districts of the State for the month of December, 1907.

District.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
	Ins.	°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
General Hospital, Kuala Lumpur	29·877	137·0	78·9	89·3	70·2	19·1	75·8	0·828	73·7	84	S.W.	18·92	3·65
Pudoh Gaol Hospital ,, ...	...	...	...	...	...	...	...	...	...	...	...	19·85	3·43
District Hospital ,, ...	...	...	...	...	...	...	...	...	...	...	...	15·65	2·11
,, Klang	...	...	...	85·8	69·9	15·9	...	...	...	...	...	13·97	3·50
,, Kuala Langat	...	...	...	...	...	...	...	...	...	...	...	15·52	3·50
,, Kajang	...	...	...	83·3	75·0	8·3	...	...	...	...	...	13·55	2·17
,, Kuala Selangor	...	...	...	88·3	78·7	9·6	...	...	...	...	...	11·92	3·77
,, Kuala Kubu	...	...	...	...	...	...	...	...	...	...	...	15·85	3·77
,, Serendah	...	...	...	...	...	...	...	...	...	...	...	15·12	2·80
,, Rawang	...	...	...	87·5	71·1	16·4	...	...	...	...	...	13·93	3·22
Beri-beri Hospital, Jeram	...	...	...	...	...	...	...	...	...	...	...	12·14	1·80
Sabak Bernam	...	...	...	...	...	...	...	...	...	...	..	4·85	1·02

State Surgeon's Office,
Kuala Lumpur, *February*, 1908.

A. J. McCLOSKY,
State Surgeon, Selangor.

Selangor.

Abstract of Meteorological Readings in the various Districts of the State for the month of January, 1908.

District.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
	Ins.	°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
General Hospital, Kuala Lumpur	29·875	147·2	80·9	90·5	71·1	19·4	76·6	0·839	73·8	79	N. W.	7·71	5·20
Pudoh Gaol Hospital ,, ...	...	...	...	...	...	...	...	...	...	...	...	6·20	4·94
District Hospital ,, ...	...	...	...	...	...	...	...	...	...	...	...	6·92	2·55
,, Klang	...	...	...	86·6	70·4	16·2	...	...	...	...	...	4·54	1·30
,, Kuala Langat	...	...	...	...	...	...	...	...	...	...	...	3·46	0·81
,, Kajang	...	...	...	85·9	75·2	10·7	...	...	...	...	...	4·12	1·33
,, Kuala Selangor	...	...	...	...	...	...	...	...	...	...	...	4·77	1·78
,, Kuala Kubu	...	...	...	...	...	...	...	...	...	...	...	6·00	1·50
,, Serendah	...	...	...	..	...	...	...	...	...	...	...	3·78	0·79
,, Rawang	...	...	...	91·2	71·4	19·8	...	...	...	...	...	4·62	1·20
Beri-beri Hospital, Jeram	...	...	...	...	...	...	...	...	...	...	...	5·70	1·35
Sabak Bernam	...	...	...	...	...	...	...	...	...	...	...	3·21	0·80

A. J. McCLOSKY,

State Surgeon, Selangor.

State Surgeon's Office,

Kuala Lumpur, 28*th February*, 1908.

Perak.

Abstract of Meteorological Readings in the various Districts of the State for the month of January, 1908.

District.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Taiping ..	...	152	81·67	92	69	23	77·76	896	...	83	...	12·20	3·72
Kuala Kangsar ...	...	...	80·28	93	68	25	75·03	800	...	77	...	5·59	2·12
Batu Gajah ...	...	159	80·51	91	70	21	76·90	878	...	85	...	12·01	2·84
Gopeng ...	...	...	80·93	91	70	21	76·73	864	...	81	...	9·95	1·56
Ipoh ...	.	...	81·69	92	67	25	76·60	848	...	78	...	8·54	1·81
Kampar ...	...	...	80·16	91	68	23	75·92	841	...	81	..	10·91	1·61
Teluk Anson ...	...	...	81·08	92	70	22	76·29	844	...	79	...	8·62	1·70
Tapah ...	...	...	81·03	91	64	27	76·03	831	...	78	...	9·68	2·61
Parit Buntar ...	...	...	81·22	91	69	22	76·33	843	...	79	...	6·33	2·28
Bagan Serai ...	...	...	81·52	91	70	21	76·69	856	...	79	...	1·87	·74
Selama ...	...	...	81·41	93	70	23	76·04	827	...	77	...	9·59	2·45

STATE SURGEON'S OFFICE,
TAIPING, *27th February*, 1908.

M. J. WRIGHT,
State Surgeon, Perak.

Pahang.

Abstract of Meteorological Readings in the various Districts of the State for the month of January, 1908.

District.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
	Ins.	°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
Kuala Lipis ...	...	...	77·09	93·	68·	17·4	74·22	...	...	...	...	12·99	4·60
Raub ...	...	...	79·61	90·	67·	17·9	74·51	...	...	...	...	5·74	2·43
Bukit Fraser ...	...	...	...	...	...		...	...	...	...	...	8·58	1·54
Bentong ...	...	...	79·29	91·	68·	16·0	76·67	...	...	...	...	10·15	3·04
Temerloh ...	...	...	...	95·	70·	18·1	...	...	...	...	...	2·15	1·02
Pekan ...	...	...	80·	90·	69·	12·7	75·	...	...	...	...	3·84	1·24
Kuantan ...	...	...	83·5	90·	69·	15·16	76·5	...	...	...	...	3·42	1·00
Sungei Lembing ...	...	...	...	86·	65·	...	...	...	...	...	...	8·62	3·70

State Surgeon's Office,

Raub, 25*th February*, 1908.

The Duff Development Company, Limited, Kelantan.

Abstract of Meteorological Readings for the month of January, 1908.

District.	Temperature.			Rainfall	
	Maximum.	Minimum.	Range.	Total Rainfall.	Greatest Rainfall during 24 hours.
	Mean. °F	Mean. °F	Mean. °F	Inches.	Inches.
Kuala Lebir ...	85·4	71·3	13·9	8·69	5·36
Kuala Kelantan ...	81·3	72·4	14·9	5·35	2·29
Kuala Pergan ...	...	...	...	9·12	4·73
Taku Plantation ...	...	...	...	9·29	5·50

Surgeon's Office,

Kuala Lebir, 21*st February*, 1908.

JOHN D. GIMLETTE,

Surgeon.

No. 4.] APRIL, 1908. [Vol. VI.

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AGRICULTURAL BULLETIN

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No. 7.] APRIL, 1908. Vol. VI

HELICONIAS.

The beautiful plants known as Heliconias so commonly cultivated in tropical gardens belong to the large order of *Scitamineae*, and to the section *Musaceae*. The genus is largely represented in America, between thirty and forty kinds being known, but there are also several species, and those among the most popular in cultivation which occur from the Polynesian islands as far west as Amboina. By some extraordinary error these, or most of these Asiatic species, have been considered by Schumann (in the Pflanzenreich, Musaceae, page 36) as escaped forms of the utterly dissimilar *H. Bihai*, L. of the West Indies. Nicholson, in the Gardener's Dictionary supplement, boldly says that *H. aureostriata* and other species well known in cultivation are not Heliconias at all but till more is known of them had better be left among the plants of this genus.

Nearly all the ornamental Asiatic and Polynesian species in cultivation have flowered in the Singapore Botanic Gardens and prove to be utterly different from *H. Bihai*, L. and very distinct species. The whole genus may be said to be in a distinctly chaotic state, and the descriptions as published in the Pflanzenreich are too meagre for the most part for any one to identify the species. A few species have been flowered in the Kew Conservatories and are figured in the Botanical Magazine. These are chiefly Brazilian or West Indian species. Unfortunately, however, the whole of the literature on these plants is not accessible to me here, and many of the Asiatic species have been introduced without accurate localities being given, having been treated apparently always as forms of *H. Bihai* and simply all lumped together.

Heliconias have always been favourite plants for cultivation here, and used to form a very conspicuous feature of our Horticultural exhibitions, the most popular being the beautiful *H. illustris*, Bull., (commonly known here as *H. rubrostriata*) and *H. aureostriata*. The plants are readily propagated by breaking up the clump, and taking off shoots in the same way as is done for bananas. Occasionally they produce ripe seed but that is not very common. They are cultivated as pot-plants, in good soil or in shady spots on lawns where they

often form magnificent clumps. They do not usually grow well if exposed to full sun. Like bananas they require a rich soil, and do not succeed in stiff clay or poor soil, becoming dwarfed and shabby looking. They seem to be remarkably free from pests of any kind, even that troublesome banana pest, the butterfly *Erionota thrax*, the caterpillars of which roll up and destroy the leaves of bananas and palms, does not attack them.

The Asiatic Species.

In the case of most of the Heliconias from the Polynesian and Malay region, the plants having been introduced as cultivated plants, few or no actual localities have been recorded so that at present we are ignorant of their place of origin. Mr. Baker in a paper on these plants in the Annals of Botany states that he has seen specimens from various localities such as New Caledonia, Solomon islands, etc., but the unfortunate error which attributed all these distinct species to cultivated forms of the Brazilian *H. Bihai* has prevented his localising or identifying the species he had at hand.

The following is a list of what I presume to be Asiatic species but they can only be properly worked up and systematised in Europe where there are localised specimens, original drawings, and the literature of the species in different museums.

Asiatic Species.

Heliconia indica, Lam. Loc.	uncertain
H. buccinata, Roxb.	Amboina
Heliconiopsis Amboinensis, Miq.	
H. austro-caledonica, Vieill....	New Caledonia
H. aureo-striata, Bull.	uncertain
H. illustris, Bull.	uncertain
H. rubro-striata, Hort.	
H. triumphans, Lind.	Sumatra
H. spectabilis, Lind.	South Seas
H. Micholitzii, Ridl.	New Ireland
H. viridis, Nicholson	Polynesia

Possibly also *H. striata*, Veitch.

H. BUCCINATA, Roxb. is described as an immense beautiful bush leaves 2 to 4 feet long and one foot broad, petiole 3 to 6 feet long, inflorescence compound of 6 to 10 branches with 6 to 10 smooth bracts, flowers pale, yellow, Amboina.

This plant was cultivated in the Calcutta Gardens in 1798, and is identified by Roxburgh with a plant described and figured by Rumph Herb. Amboin V. 141, t. 62 fig. 2, under the name of *Folium buccinatum asperum*. Rumph describes three species in Amboina under the names of *latifolium* or *rubrum*, *album* and *asperum* he gives as an Amboinese name Rind. Ruin and Riin; *latifolium* being Rind Mera; *album* Rind Puteh; and *asperum*, Rind Laki. Of the red one he says the leaves and leafstalks become red when grown in the

shade. This may be one of the red leaved ones we cultivate, but the description is too incomplete.

H. AUREO-STRIATA, Bull. A tufted plant, about 5 feet tall. Leaves elliptic acute, base oblique not decurrent, 2 feet—2½ feet long by 8-10 inches wide, nerves $\frac{3}{10}$ inch apart, when young green streaked transversely with yellow, adults plain light green dull, petiole 1½-2 feet long green. Inflorescence of three or four bracts on a short peduncle, all glabrous. Bracts long acuminate rather narrow the lowest one 7 inches long including the rather narrow leaf like portion, upper ones 6 inches green. Flowers fairly numerous. Bracteole lanceolate acuminate pale green 3 inches long. Ovary narrowed into pedicel in flower 1 inch long with pedicel, orange. Perianth 1¼ inch long curved orange at base passing into white sepals lanceolate acuminate acute. Stamens long. Anthers linear acuminate. Staminode ovate. Fruit ½ inch long, obconic 3 angled, orange. Native country not known.

H. ILLUSTRIS, Bull. *H. rubro-striata*, Hort. A large tufted plant, with stems flattened 4 feet tall, 3 inches wide green, petiole 2 feet long and 1 inch thick, reddish to pink or plain green, blade 5 feet long 8 inches across oblong, narrowed at the base so as to be shortly decurrent on the petiole above dark green above with a coppery lustre beneath, midrib channelled on the upper surface pink, edge of blade red, nerves conspicuous ½ an inch apart elevated on the upper surface; young leaves elliptic rather abruptly rounded and only shortly decurrent, dark green with numerous and close rose pink or often white streaks above midrib green almost disappearing before the tip, back of leaf bright rose pink with green streaks. Inflorescence about 8 or 9 inches long, rachis green finely pubescent. Boat shaped bracts 4-5, the lowest tipped with an ovate acute blade resembling the leaf in colour, the others with or without a small blade, green pubescent tipped red 7-6 inches long. Flowers numerous in each bract. Bracteole lanceolate acuminate acute 3 inches long Flowers shortly pedicelled, pedicel thick white glabrous ¼ of an inch long, ovary as long flattened on the inner side yellowish, red in the upper part. Sepal greenish to creamy yellow base and apex red, lanceolate acuminate acute 2 inches long. Petals narrower and shorter similarly colored. Stamens white connate at the base. Staminode ½ an inch long lanceolate rather broad channelled. Fruit red ¼ inch long.

H. SPECTABILIS, Lind. Ill. Hort. 1892 Pl. 156. Whole plant about 12 feet tall. Leaves linear oblong acute, narrowed to base, margins undulate, nerves about 1-1½ inch apart conspicuous midrib thick coppery red, beneath, deep purple above, occasionally turning green 4 foot 10 inches long 11 inches wide, petiole sheathing for nearly all its length long green or yellowish mottled and dotted with greyish green. Inflorescence 8 inches long, rachis flexuous velvety pubescent. Bracts 6 lanceolate acuminate pubescent ribbed when dry, olivaceous passing into red 6 inches long one inch deep, distant from each other one inch. Flowers numerous, pedicels ¾ inch long glabrous. Prerianth 1½ inch long curved acuminate greenish and red. Sepals ⅝ inch wide. Filament of stamen rather stout, anther linear, staminode oblong truncate ½ long. Introduced in 1891 by Linden from "Asia."

H. MICHOLITZII, n. sp. A very large plant forming large tufts, stems 2 feet or more tall 3 inches acros spale-green marbled with grey. Leaves plain green, blade about three feet long, 11 inches across. Inflorescence 12 inches long, peduncle hairy about 6 inches long. Bracts 4 or 5 green edged with pink glabrous 6 inches long 1 inch wide lanceolate acuminate. Rachis yellow dotted with green ½ inch through. Flowers 14 or more in each bract. Bracteoles long acuminate white. Pedicels long. Sepals and petals lanceolate acute fuscous brown ; Base of sepal pubescent, above glabrous. Stamens slender, anthers linear. Staminode ovate apiculate fuscous. Fruit pear-shaped bluntly 3 angled, apex truncate, orange ½ inch long, pedicel ½ inch long flattened.

New Ireland. Introduced by Micholitz (Distrib. number H. B. S. 7,274). I thought at first this might be *H. buccinata*, Roxb, of Amboina but that as much longer branched inflorescences, a hairy rachis, and if Rumph's description of his *Folium buccinatum asperum* is the same thing as Roxburgh states, it has the stems wrinkled and rough like a shark's skin ; none of which characters the New Ireland plant possesses.

AMERICAN SPECIES IN CULTIVATION HERE.

H. BIHAI, L. Is commonly cultivated here, and is very conspicuous from its large smooth scarlet bracts and greenish white flowers. The typical plant is said to be about 18 feet tall, and *H. humilis*, Jacq. much smaller. There does not seem to be any other difference between the two species, and Mr. Baker suggests that *H. humilis* is only a variety of *H. Bihai*. The plant grown commonly in Singapore is about 6 feet tall and would therefore belong to the variety *humilis*.

H. AURANTIACA, Ghiesb. *H. brevispatha*, Hook. A dwarf species with rather narrow green leaves and orange coloured flowers, has long been in cultivation here but seldom flowers. It is a native of Mexico.

H. METALLICA, Planch. Bot. Mag. 5315. A species of Heliconia which has very long been in cultivation here is I suppose this plant. The leaves are dark shining green and purple beneath when young, leaves of older plants losing this purple tint. The flowers are borne on a long slender peduncle about 6 feet from the ground, and the rachis is zigzag, the bracts are narrow and pale green, the flowers scarlet crimson with green tips. In the figure given of the plant in the Botanical Magazine the rachis is given quite straight and erect and the bracts dark green, otherwise the plant is quite similar, *H. metallica* was introduced from Sierra Nevada, Santa Martha by Planchon and Linden in 1856.

There are a good many more species of Heliconias in South America which would be welcome additions to our gardens here, if they were procurable.

H. N. RIDLEY.

TAPPING EXPERIMENTS ON RAMBONG AND PARA.

Professor Dr. A. Weberbauer records in the last December number of the "*Tropenpflanzer*" some interesting experiments he made in Camerun on the tapping of certain species of rubber bearing plants. We abstract his remarks on Ficus elastica (Rambong) and Hevea Braziliensis (Para).

In tapping Ficus elastica he used the ordinary tapping knife ("die Kaeuflichen Kautschukmesser"). In the outer layer of bark, which contains little or no latex, a groove was cut to the depth at which the first drops of latex show themselves, then with an ordinary penknife a deep cut was made in the bottom of the groove. The author claims that wounds in the cambium, which cannot always be avoided, will heal more quickly, if caused by the sharp pocket knife than by the ordinary coarser tapping knife.

The weights given are those of well-dried rubber.

In the first experiment two trees with stems of about equal girth were taken.

In (a) a cut of 16 centimetres (about 6½ inches) was made in a sloping direction.

In (b) the cut was 22 centimetres (about 8¾ inches) and parallel with the axis of the stem, that is vertical in the case of an upright growing tree. The yield from (a) was 2·1 grams (1000 grams=2⅕ lbs.) from (b) 1·2 grams; so that the sloping cut, though shorter than the other, yielded nearly twice as much rubber.

In another experiment six cuts were made on the same branch and on succeeding days, except that a clear day intervened between the second and third. All cuts were made at right angles to the long axis of the branch, which grew horizontally. The time of day, 9 to 12 o'clock, was much the same in each case, and so was the weather. The first cut yielded 12·47 grams; The second, close to but behind No. 1 on the same side of the stem, gave 0·87 grams; The third, on the same side as No. 2. and about 4 inches distant from it, yielded 2·03 grams; The fourth was on the same side as No. 3 and distant about 8 inches, the yield was 2·20 grams. The fifth was on the opposite side to the previous ones and lay under the first: it yielded 8·80 grams. The sixth was on the same side of the stem as the fifth but 16 inches distant from it: yield 2·26 grams.

The first cut gave more than double as much rubber as the three others together which were on the same side of the branch. The farther the cuts are from each other the greater is the yield. On the opposite side of the stem, the fifth cut gave nearly four times as much latex as the sixth, though the distance between them was relatively large. Therefore if Ficus elastica is tapped with sloping cuts, and if a good number of these are made in a short time, they should, if they lie on the same side of a stem or a branch, be made considerable distances apart, otherwise there is only a useless injuring of the tree. In his

fifth and sixth experiments the author found that if the time between two tappings is lengthened (to three weeks or a month) the distance between the cuts may be lessened. It would perhaps, have been more valuable if more trees had been tapped in each experiment.

The author made a number of experiments on Hevea braziliensis. He applied the spiral and the herringbone methods, and short sloping separated cuts, but none vertical: his object was not so much to compare different methods of tapping as to see whether Para yielded paying quantities of latex in Kamerun, which has been doubted.

The sloping cuts gave somewhat the best results. The method was as follows:—The tapping-knife and pen-knife were used exactly as in the Rambong experiments.

Six sloping cuts, each 4 inches long, were made at equal distances apart (and presumably at the same level) round the stem. Every cut was parallel with and 2 inches from that of the previous day, so that after 28 days the surface of the tree exhibited 6 vertical rows of sloping cuts, 28 parallel cuts in each row, and the rows separated by 6 stripes of untouched bark. The author does not state the width of each groove. Not much can be deduced from the figures given. Only three trees, one for each method, were experimented on, and the periods during which they were tapped do not agree.

There are things against the practicability of the separated sloping cut. It would be interesting to know if less bark is used up, and if it renews more quickly than is the case with the almost universal herringbone method.

W. J. GALLAGHER.

IPECACUANHA.

A good deal of interest has been from time to time raised by the question of the possibility of the cultivation of the Ipecacuanha plant in this country. The drug is an expensive one and there is a steady demand for it, being as it is one of the few known remedies for dysentery. For many years it has been cultivated with some success by Mr. W. W. Bailey, formerly at Pengerang Estate, Johor and later in Highlands and Lowlands estate in Selangor. No one else seems to have been very successful with it in any part of the world.

In cultivation it is by no means an easy plant to deal with, and though it has been often tried at the Botanic Gardens, Singapore, it never seems to thrive well, probably on account of the dampness of the island. I have found it very sensitive to rapid changes of weather. In hot dry weather it suffers much from the dryness of the air, and heat and heavy rainstorms are also fatal to it.

An article on Johor Ipecacuanha has recently been published by Mr. E. M. Holmes in the Pharmaceutical Journal (January 18th 1908) p. 54, which is of considerable interest and from which I quote. "For many years past Ipecacuanha root has been cultivated in the Malay states and imported into this country under the name of Johor

Ipecacuanha, but the exact form of the plant under cultivation and the particular district in which it is grown are not stated in text books. Some of the Johor root was examined by Mr. F. Ransom and reported to be practically as rich in alkaloid as that received from Brazil. As the attempts to grow Ipecacuanha in India and elsewhere on a commercial scale failed it became a point of some interest to determine the particular form or variety of the plant that succeeded so well in the Straits Settlements." Specimens of the plant were received by Mr. Holmes from Mr. Wray and Mr. Pfenningwerth. Mr. Holmes goes on to point out that two forms of the plant were known in 1871 when Prof. J. M. Balfour in an article read before the Botanical Society of Edinburgh described them as cultivated in Edinburgh Botanic Gardens. One, originally sent by Mr. Mackay of Liége to Sir W. Hooker, had a shrubby stem, firm leaves not undulate at the edge, with a short style. The other sent from Rio de Janeiro, was herbaceous, with thinner leaves undulated and fringed with hairs. The flowers were not seen but were probably long styled. The Selangor plant has firm leaves, oblong lanceolate (rather than oval as in Mackay's plant) slightly scabrous, and the stamens and style equal in length. This plant is therefore distinct from either of the other two. The plants formerly cultivated in the Singapore gardens and obtained from Kew were certainly herbaceous. Ipecacuanha seems to have been first introduced to the Straits Settlements by Murton in 1875. The plants were brought from Ceylon. But whether the Selangor, or called as they were at first, the Johor plants, were derived from these or obtained elsewhere I cannot say.

"Mr. Pfenningwerth states that the cultivation is very slow work. The plant seems to grow well but does not produce root in abundance. The first crop off fresh soil is a fairly good one but on trying to raise a second, it invariably turns out very poor, although all kinds of manure have been tried to enrich the land but without apparently restoring to the soil the necessary ingredients for luxuriant growth." He then quotes from Mr. Macnab, as to the growth of the plant. "The stem is of slow growth and although cuttings root freely in five or six weeks when inserted in white sand kept somewhat moist, very few cuttings are obtainable so that propagation from sections of the rhizome even if only one sixteenth of an inch thick give the best results. These can be readily propagated if placed in a horizontal position over the surface of a pot prepared with drainage and white sand and kept moist and placed in a warm propagating bed under a hand glass. In a few weeks the root cuttings begin to swell, and show signs of budding chiefly on the upper edge of the cut surface. These leaf buds are first nourished by the sap in the cut rhizome but as they begin to elongate some filmy roots are protruded from the under surface. When this is the case the root sections may be cut into as many pieces as there are buds and each potted separately in open free fibrous soil with a slight mixture of sand. In Brazil the Poayero or collector of Ipecacuanha root when he pulls up the roots breaks them at certain points leaving sufficient of the thickend rhizome to produce young plants and fills the holes whence the plants have been pulled, so that in 3 or 4 years, the plants may recover their growth. The plant flowers in February and

March so that by pulling up plants at that time of the year reproduction by seed is prevented." "I have been recently informed by Mr. F. Ransom that the percentage of alkaloid in Selangor Ipecacuanha is now less than when the drug was first imported. This may of course be due to impoverishment of the soil or to collection at a different period of the year or more probably from plants of different age, but Mr. Ransom's conclusion does not appear to be shared by other chemists who have examined the root: so that different samples probably vary in quality and activity." (I would suggest that if Mr. Ransom's conclusion is correct another cause may be constant propagation from cuttings. Plants propagated continuously from cuttings for a large number of years are very at apt to deteriorate. H. N. R.)

COMBRETUM SUNDAICUM.

In the same number of the Pharmaceutical Journal is an article by Mr. E. F. Harrison on the constituents of *Combretum sundaicum* the much talked of Chinese anti-opium drug. Mr. Harrison has submitted both the raw and roasted drug as prepared by the Chinese to elaborate chemical analysis. The treatment showed the existence of no alkaloid. A green resin was obtained, and tannin was also found, as has been done by other chemists.

The story of this drug has already been detailed in the Bulletin. There seems no reason to suppose it has any special properties, but several chemists are still at work investigating it thoroughly.

H. N. Ridley.

FUNTUMIA ELASTICA FRUITING IN PEKAK.

Mr. A. D. Machado sends a parcel of seed of *Funtumia elastica* from trees growing on the Kamuning estate. This is the first occurrence we believe of this tree having fruited here. Has any one else fruited it? Mr. Machado's plants were sent as seed from the Government of the Congo Free State in March 1905, and he says are flourishing trees and seem full of rubbers *Funtumia* has long been introduced here, but seems generally to grow slowly and to be subject to the attacks of the caterpillar of *Caprinia Conchylalis* as has been recorded before. One is glad to hear it is doing better in some parts of the peninsula. Curiously I find a plant of *Funtumia Africana* in the Gardens just fruiting also for the first time.

H. N. Ridley.

A FURTHER NOTE ON CRENOTHRIX.

It is not uncommon when digging in low-lying soil to come upon a blue clay of rather firm texture, and very wet. This clay is permeated by rootlets of grasses and other plants, which on decaying leave tubes in the clay, which are usually filled with water. These tubes in

fact seem to form small water conduits, and the current of water apparently enlarges them to some extent. The water adopts these passages before the roots are quite decayed, and probably also during life. These passages are lined with a coating of ferruginous slime and I have had an opportunity of examining some of this taken from a depth of about two feet in the Botanic Gardens. The slimy ferrugineous lining is composed of the zoogloea form of *Crenothrix* with abundance of the free swimming spores as well, simple and dividing. This plant seems only to occur on the old root passages and on the roots themselves less abundantly. I do not see it however on living roots. Indeed the clay and root are so closely in apposition that there is but little room for its growth. The development of this iron-depositing Alga in the water channels through the clay is certainly to a large extent the origin of our laterite. The alga does not apparently require light for its growth at least in the bacterial form, as it is in these cases quite subterranean. At what depth it can live I have no means of knowing at present. This would probably depend on the waterflow. In light or sandy soils the root tubes would probably fall in when the roots decayed away, and not serving as water-passages the alga would not be able to grow there, so that in such soils one does not get the iron oxide deposit. In the case of springs permeating the stiff clay soils, and producing at their mouths a large growth of *Crenothrix* as is the case near the garden lake as described in a previous paper, no cleaning of the pond or pool at their mouth would prevent this as the plant is growing at considerable depth in the soil through which the spring flows.

H. N. Ridley.

CURIOUS ROOT-DEVELOPMENT OF ALBIZZIA.

In the Singapore Botanic Gardens a tree of *Aleurites moluccanus* was growing in an open spot, and from one side emitted a stout root lying close to the surface of the soil. This root after going in a northern direction curved east and grew towards an oil palm at a distance of about 20 feet. On arriving at the palm it ascended in a spiral round the trunk till it reached the top, a height of about twelve feet. The root where it started to ascend the palm, was about 1½ inches through. The oil palm was at one time covered with ferns *Thamnopteris* and *Polypodium*, growing on the soil held by the leaf bases on the trunk.

Albizzia is a very strong rooter sending its roots to a long distance, but I think it is unusual to find so large a root of a tree climbing spirally upwards.

Ascending roots occur in Mangroves, *Rhizophora* etc., and in *Grâmmatophyllum*, but these are short and specially modified rootlets used in aerating the plant, and the para rubber often sends rootlets upwards on old stumps or pieces of wood, or even beneath partially detached fragments of its own bark, but I do not ever remember to have seen such an exceptional development of ascending roots in any tree as in this Albizzia.

H. N. Ridley.

INTERNATIONAL RUBBER EXHIBITION.

LONDON, SEPTEMBER 1908.

I am requested by the Committee of the above Exhibition to say, that, when it is intended that a collective Exhibit representing any one producing Centre is made, it will greatly facilitate the arranging of the spaces and positions, if the committee appointed in your country to attend to the arrangements for the Exhibits, could possibly *CABLE* the size of the space they are likely to require, as we are receiving so many applications from those interested in the raw as well as the manufactured articles, and the committee wish to reserve the centre of the hall and other important positions for Exhibits from the Rubber Producing Countries.

Our cable address is—MALTERMASS LONDON, and we use the ABC' 5th edition, and Lieber's Codes; or cable may be sent in ordinary text whichever is the most convenient. If a cable comes to hand and reads—fifteen fifteen, I will understand that you wish a space 15 X 15 reserved, or smaller, or larger as the case may be.

Another reason for my requesting you to kindly cable is, that if the applications continue to come to hand at the rate we are now receiving them, it is probable we shall have to engage a larger building that has just been offered. This will not affect the dates, but the time the Exhibition will remain open may be slightly extended.

You will notice we have the support of the rubber producers in London, and since the Prospectus which is going foward to you by this mail was printed, a further large number of well known gentleman have signified their intention of assisting the undertaking, and its success so far as London is concerned is assured. We are now waiting for, and trust to receive the unanimous support of the producing countries.

Yours truly,
A Staines Manders,
Organising Manager.

Space rates— Central position —6/— per square foot (no further charges.

The Exhibition will be open daily from 11 a.m. till 10 p.m.

Exhibition Offices,
75, Chancery Lane (Holborn)
London W.C.

NOTES FOR EXHIBITORS.

Rates for Space.

Fitted Stands (5 by 3), walls and back, counter covered with cloth, lock-up cupboard, draw blinds for closing down at night, fire proof muslin roof, and name sign on top. A very attractive Stand-

white, blue and gold; including space £8 0 0

Do., do. Corner position (2 frontages) ... 9 0 0

Fitted Stands (6 by 3) side walls, plain counter covered with cloth, name sign at top £7 0 0

Do., do. Corner position (2 frontages ... 8 5 0

Spaces (6 by 6) including loan of very attractive Stand, 10 ft. 6 in. high, painted white enamel, picked out in gold, coloured side walls and back, counter covered in cloth, white enamel painted base, panelled, together with name sign white, or other coloured back, and metal letters, including erection (illustrations on application)... £12 12 0

Do., do. Corner positions, two frontages and two counters £13 13 0

Do., do. 7 ft. frontage and 7 ft. deep 15 0 0

Do., do. 8 ft. frontage and 6 ft. deep 15 0 0

Do., do. Corner position ... 16 10 0

Floor spaces, Exhibitors to fit their own Stands, from 7 10 0

Do., Special positions from 20 0 0

Wall space, only for Diagrams, Attractive Signs, Photographs, etc. ... ... 2/6 per sq. ft.

CATALOGUE.—Reasonable description of Exhibits will be inserted in the Catalogue free.

PRESS VIEW.—This will take place on the evening of Saturday, 19th September.

The Exhibition will be officially opened on Monday, 21st Sept., at noon.

Exhibitors and friends Smoke Night Reunion, 24th September.

Club Room for Exhibitors and friends.

The Exhibition will be open daily from 11 a.m. to 10 p.m.

Plans of Spaces, Rules and Regulations and Application Form for space sent on application to

A. STAINES MANDERS, *Manager*,
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Telegrams: "MALTERMASS," London.

SINGAPORE MARKET REPORT.

February, 1908.

ARTICLES.	Quantity sold.	Highest price.	Lowest price.	
	Tons.	$	$	
Coffee-Palembang ...	...	...	...	
Bali	...	27.00	25.00	
Liberian ...	99	24.00	23.00	
Copra	3,340	7.60	6.20	
Gambier	310	7.25	7.00	
Cube Gambier, Nos. 1 & 2...	87	11.25	10.25	
Gutta Percha, 1st quality...	...	300.00	240.00	
Medium ...	...	240.00	80.00	
Lower ...	...	80.00	12.00	
Borneo Rubber, 1, 2 & 3 ...	...	110.00	45.00	
Gutta Jelotong ...	...	5.50	3.90	
Nutmegs, No. 110's	...	25.50	22.00	
No. 80's	...	27.50	24.00	
Mace, Banda ...	...	93.00	84.00	
Amboyna ...	...	70.00	62.00	
Black Pepper	1,267	14.50	13.50	
White Pepper (Sarawak) ...	287	21.25	20.00	
Pearl Sago, Small ...	...	4.10	3.90	Closing fair.
Medium ...	250	5.15	4.80	
Large	27	...	...	
Sago Flour, No. 1 ...	2,251	3.18½	3.00	
No. 2	110	1.32½	1.30	
Tapioca Flake, Small ...	372	7.40	7.00	Closing fair.
Medium ...	...	7.10		
Pearl, Small ...	154	8.00 Penang	5.20	
Medium ...	238	6.75	6.35	
Bullet ...	15	8.50		
Tin	1,830	66.50	62.62½	

EXPORTS TELEGRAM TO EUROPE AND AMERICA.

Fortnight ending 15th February, 1908.

Wired at 5 p.m. on 17th March, 1908.

					Tons.
Tin	Str.	Singapore & Penang	to U. Kingdom &/or		2,075
Do.	,,	do.	U. S. A.		367
Do.	,,	do.	Continent		630
Gambier	,,	Singapore	Glasgow		...
Do.	,,	do.	London		200
Do.	,,	do.	Liverpool		75
Do.	,,	do.	U. K. &/or Continent		50
Cube Gambier	,,	do.	United Kingdom		90
Black Pepper	,,	do.	do.		15
Do.	,,	Penang	do.		50
White Pepper	,,	Singapore	do.		30
Do.	,,	Penang	do.		...
Pearl Sago	,,	Singapore	do.		75
Sago Flour	,,	do.	London		...
Do.	,,	do.	Liverpool		750
Do.	,,	do.	Glasgow		...
Tapioca Flake	,,	Singapore	United Kingdom		270
T. Pearl & Bullet	,,	do.	do.		160
Tapioca Flour	,,	Penang	do.		100
Gutta Percha	,,	Singapore	do.		10
Buffalo Hides	,,	do.	do.		45
Pineapples	,,	do.	do.	cases	49,750
Gambier	,,	do.	U. S. A.		260
Cube Gambier	,,	do.	do.		...
Black Pepper	,,	do.	do.		100
Do.	,,	Penang	do.		...
White Pepper	,,	Singapore	do.		20
Do.	,,	Penang	do.		...
Tapioca Pearl	,,	Singapore	do.		45
Nutmegs	,,	Singapore & Penang	do.		...
Sago Flour	,,	Singapore	do.		...
Pineapples	,,	do.	do.		...
Do.	,,	do.	Continent	cases	1,500
Gambier	,,	do.	South Continent		160
Do.	,,	do.	North Continent		75
Cube Gambier	,,	do.	Continent		10
Black Pepper	,,	do.	South Continent		340
Do.	,,	do.	North do.		230
Do.	,,	Penang	South do.		30
Do.	,,	do.	North do.		70
White Pepper	,,	Singapore	South do.		15
Do.	,,	do.	North do.		160
Do.	,,	Penang	South do.		100
Do.	,,	do.	North do.		5
Copra	,,	Singapore & Penang	Marseilles		900
Do.	,,	do.	Odessa		360
Do.	,,	do.	Other South Continent		100
Do.	,,	do.	North Continent		220
Sago Flour	,,	Singapore	Continent		1,500
Tapioca Flake	,,	do.	do.		225
Do. Pearl	,,	do.	do.		30
Do. Flake	,,	do.	U. S. A.		...
Do. do.	,,	Penang	U. K.		30
Do. Pearl & Bullet	,,	do.	do.		100
Do. Flake	,,	do.	U. S. A.		...
Do. Pearl	,,	do.	do.		...
Do. Flake	,,	do.	Continent		30
Do. Pearl	,,	do.	do.		260
Copra	,,	Singapore	England		

Gambier	,,	do.	U. S. A.	Tons.
Cube Gambier	,,	do.	do.	
T. Flake & Pearl	Str.	Singapore	U. A. S.	
Sago Flour	,,	do.	do.	
Gambier	,,	do.	South Continent.	
Cobra	,,	do.	Marseilles	
Black Pepper	,,	do.	South Continent	
White Pepper	,,	do.	do.	
Do.	,,	do.	U. A. S.	
Pineapples	,,	do.	do.	
Nutmegs	,,	do.	do.	
Black Pepper	,,	do.	do.	
Do.	,,	Penang	do.	
White Pepper	,,	do.	do.	
T. Flake & Pearl	,,	do.	do.	
Nutmegs	,,	do.	do.	
tons Gambier				50
,, Black Pepper				475

EXPORTS TELEGRAM TO EUROPE AND AMERICA.

Fortnight ending 29th February, 1908.

Wired at 6 p m. on 2nd March, 1908.

				Tons.
Tin	Str.	Singapore & Penang	to U. Kingdom &/or	1,875
Do.	,,	do.	U. S. A.	177
Do	,,	do.	Continent	275
Gambier	,,	Singapore	Glasgow	...
Do.	,,	do.	London	100
Do.	,,	do.	Liverpool	...
Do.	,,	do.	U. K. &/or Continent	50
Cube Gambier	,,	do.	United Kingdom	15
Black Pepper	,,	do.	,, do.	5
Do.	,,	Penang	,, do.	150
White Pepper	,,	Singapore	,, do.	150
Do.	,,	Penang	,, do.	...
Pearl Sago	,,	Singapore	,, do.	50
Sago Flour	,,	do.	London	270
Do.	,,	do.	Liverpool	...
Do.	,,	do.	Glasgow	...
Tapioca Flake	,,	Singapore	United Kingdom	180
T. Pearl & Bullet	,,	do.	,, do.	...
Tapioca Flour	,,	Penang	,, do.	120
Gutta Percha	,,	Singapore	,, do.	...
Buffalo Hides	,,	do.	,, do.	...
Pineapples	,,	do.	,, do.	cases 9,000
Gambier	,,	do.	,, U. S. A.	600
Cube Gambier	,,	do.	,, do.	75
Black Pepper	,,	do.	,, do.	550
Do.	,,	Penang	,, do.	...
White Pepper	,,	Singapore	,, do.	20
Do.	,,	Penang	,, do.	...
Tapioca Pearl	,,	Singapore	,, do.	160
Nutmegs	,,	Singapore & Penang	,, do.	27
Sago Flour	,,	Singapore	,, do.	65
Pineapples	,,	do.	,, do.	cases 12250
Do.	,,	do.	Continent	4,000
Gambier	,,	do.	South Continent	...
Do.	,,	do.	North Continent	225
Cube Gambier	,,	do.	Continent	30
Black Pepper	,,	do.	South Continent	130
Do.	,,	do.	North do.	210

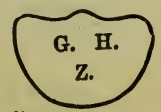
Do.	,,	Penang	South	do.	20
Do.	,,	do.	North	do.	50
White Pepper	,,	Singapore	South	do.	5
Do.	,,	do.	North	do.	85
Do.	,,	Penang	South	do.	5
					Tons.
White Pepper	Str.	Penang	North Continent		20
Copra	,,	Singapore & Penang	Marseilles		840
Do.	,,	do.	Odessa		1,000
Do.	,,	do.	Other South Continent		100
Do.	,,	do.	North Continent		260
Sago Flour	,,	Singapore	Continent		340
Tapioca Flake	,,	do.	do.		25
Do. Pearl	,,	do.	do.		5
Do. Flake	,,	do.	U. S. A.	...	
Do. do.	,,	Penang	U. K.		20
Do. Pearl & Bullet	,,	do.	do.		100
Do. Flake	,,	do.	U. S. A.	...	
Do. Pearl	,,	do.	do.	...	
Do. Flake	,,	do.	Continent		20
Do. Pearl	,,	do.	do.		70
Copra	,,	Singapore	England		50
Gambier	,,	do.	U. S. A.		
Cube Gambier	,,	do.	do.		
T Flake & Pearl	,,	do.	do.		
Sago Flour	,,	do.	do.		
Gambier	,,	do.	South Continent		
Copra	,,	do.	Marseilles		
Black Pepper	,,	do	South Continent		
White Pepper	,,	do.	do.		
Do.	,,	do.	U. S. A.		
Pineapples	,,	do.	do.		
Nutmegs	,,	do.	do.		
Black Pepper	,,	do.	do.		
Do.	,,	Peneng	do.		
White Pepper	,,	do.	do.		
T. Flake & Pearl	,,	do.	do.		
Nutmegs	,,	do.	do.		
tons Gambier					200
,, Black Pepper					500

CEYLON, STRAITS & MALAY STATES PLANTATION RUBBER REPORT.

February 21st, 1908.

The following Lots, comprising about 35½ Tons Straits and 12 Tons Ceylon, were offered at Auctions to-day and sold as follows:—

STRAITS & MALAY STATES.

Mark.	Pkgs.	Description.		Price.
Ayer Angat	8	Crepe	...	bought in
Linsum	25	,,	...	bought in
Terentang	19	,,	3 sold ...	2/11 & 2/11½
	11	,,	4 sold ...	3/-
Pataling	18	,,	14 sold ...	3/-
M. B. T. C. L. C.	10	Sheets	...	bought in

	3	Scrap		...	bought in
	18	Sheets		...	withdrawn
S. P.	6	Biscuits		...	withdrawn
	9	Crepe		...	withdrawn
	2	Block		...	withdrawn
S. P. S.	5	Scrap		...	withdrawn
	2	Virgin		...	withdrawn
B. & D.	22	Sheets		...	bought in
S. P. S.	4	Scrap	3 sold	...	1/9
Matang	8	Sheets		...	bought in
	6	Crepe		...	bought in
L. E. MUAR	53	No. 1 Block		...	bought in
	15	No. 2 Block		...	bought in
S. & D.	11	Sheets		...	bought in
	3	Scrap		...	bought in
	2	Sheets		...	bought in
	6	Scrap		...	2/-
	3	Sheets		...	bought in
Damansara	2	Biscuits		...	bought in
Selangor	35	Crepe		...	bought in
	2	Sheets		...	bought in
K. P. C.	3	Sheets		...	bought in
Beaumont Estate	5	Crepe		...	2/8½ at 2/10¼
V. R. Co., Ltd. Klang F.M.S.	22	Sheets		...	bought in
	68	Crepe	41 sold	...	2/7¼ at 3/4½
	7	Sheets		...	bought in
	5	Crepe		...	2/10 at 2/11¼
R. S. R.	2	Crepe		...	2/3½
	1	Sheets		...	bought in
Jebong	59	Crepe		...	bought in
Golconda	22	Sheets		...	bought in
	4	Block		...	bought in
S. S. B. R. Co., Ltd.	3	Crepe		...	bought in
	13	Sheets		...	bought in

Highland Estate	24	Sheets		...	bought in
	21	Crepe	part sold	...	2/10½ at 3/0½
B. R. R. Co., Ltd.	33	Sheets		...	bought in
	15	Block		...	bought in
	11	Crepe	4 sold	...	3/1¼
		CEYLON.			
Kumbukkan	2	Biscuits		...	bought in
Kepitigalla	36	Sheets		...	bought in
L. | E. / L. | H. R.	5	Crepe		...	bought in
L. | B. / L. | H.	4	Worms		...	bought in
Fatipawa	10	Crepe	7 sold	...	2/10 at 2/11
Palli	6	Biscuits	5 sold	...	2/1
Rosebury	1	Sheets		...	bought in
	4	Scrap		...	1/11½ at 2/
	2	Biscuits		...	2/- and 2/42½
Ambanpitiya	2	Biscuits		...	bought in
	1	Scrap		...	1/11½
Sunnycroft	1	Sheets		...	bought in
	1	Biscuits		...	bought in
U. S.	4	Scrap		...	bought in
Ayr	3	Biscuits		...	bought in
	1	Sheets		...	bought in
Rangbodde	1	Biscuit		..	3/1
L. B. & Co.	4	Sheets		...	bought in
	1	Bag Biscuit		...	bought in
	2	Scrap		...	bought in
C. D. J.	3	Biscuits		...	bought in
N. P.	1	,,		...	bought in
Warriapolla	1	,,		...	2/11
Culloden	17	Crepe	part sold	...	2/7 at 3/0¾
Ellakande	3	,,	2 sold	...	2/11
Heatherly	8	,,		...	3/— at 3/0¼
Hakaketua	8	,,		...	2/9½
Hattangalla	2	Biscuits		...	bought in
	3	Crepe	2 sold	...	2/10½
Arapolakande	11	Biscuits		...	bought in
	3	Crepe		...	2/10¾ at 2/11¾
Fandamaran	14	Sheets		...	bought in
	9	Crepe	4 sold	...	2/7¾ at 2/11¾
Langsland	16	Biscuits		...	bought in
Polatagama	11	,,		...	bought in
	1	Crepe		...	bought in
Kumarado	5	Biscuits		..	bought in
	1	Scrap		...	2/3¼
	2	Biscuits		...	2/10 bid
	2	,,		...	2/10 bid

GWO, WILSON & STANTON, Limited—

India Rubber Market Report.

13, Rood Lane, London, E.C.

March, 6th 1908.

Fairly large quantities of Plantation Rubber have changed hands since the last auction at somewhat improved sates, and the offerings to-day were on a much smaller scale than has lately been the case Competition was more general for all grades than it has been for some time past.

In consequence, a large proportion of the sale was disposed of in the room at rates showing an irregular advance of from 2*d.* to 4*d.* per lb. on last sale quotations.

The finest lot consisted of some very pale even biscuits from Warriapolla estate, which met with brisk competition, and realised 3/9¼ to 3/10 per lb.—the highest figures obtained for Plantation Rubber since the earlier part of January.

All grades of loose crepe were again in request, brown and medium kinds being especially sought after. Very dark and black block and pressed sorts continue to be somewhat neglected. Orders for loose scrap were fairly plentiful.

Number of Packages Advertised.		Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.		
		Ceylon.	Malaya.	Total.	No. of Packages Sold.	Price.	Hard Fine Para.	Plantation. Fine.	Plantation. Scrap.
To-day	682	12	23¾	35¾	480	3/3	3/1½	3/3 to 3/10	1/7 to 2/6
Corresponding Sale Last Year	649	8	29¾	37¾	562	5/5½	5/1¼	5/8 to 5/10	3/9 to 4/8

TO-DAY'S QUOTATIONS.

Sheet and Biscuits		Crepe and Block.		Unwashed Scrap.	
Good to Fine Sheet.	3/3 to 3/5	Fine Pale ...	3/6¼		
Very Fine Pale Biscuits.	3/9¼ to 3/10	Fine Palish...	3/4⅜ to 3/5⅜	Good to Fine	2/4½ to 2/6
Good to Fine Biscuits.	3/3 to 3/5½	Brown and Medium.	2/11 to 3/4½	Low and Medium.	2/- to 2/3
Good to Fine Worm.	3/- to 3/2½	Dark ...	2/7 to 2 10⅜		

SHIPMENTS.—

Annual Exports of Plantation Rubber From Malaya and Ceylon.

	Singapore. Tons.	Penang. Tons.	Ceylon. Tons.	Total. Tons.
1903	—	—	18	—
1904	—	. .	34	—
1905	83	47	75	205
1906	327	58	146	531
1907	649	287	248	1,184

The Singapore and Penang figures for 1904 and 1903 are not optainable. The shipments from these ports are taken from statistics published by Messrs. Barlow & Co., Singapore.

In the figures for 1907 given in our last report, the Penang shipments were not complete. The above represents the total exports.

PARA STATISTICS.—

Receipts at Para for February.

	1908 Tons	1907 Tons	1206 Tons	1105 Tons
February	5,340	5,060	3,920	4,400

TOTAL CROP RECEIPTS.—

From July to end of February.

1907-08.	1906-7.	1905-6.	1904-5.
24,455 tons	23,490 tons	24,320 tons	22,250 tons

EXPORTS FROM CEYLON.—

1st January to 10th February.

1908 ... 11 tons 1907 ... 15 tons 1906 ... 14½ tons 1905 ... tons

Particulars and Prices as follows :—

CEYLON.

MARK.	PKGS.	DESCRIPTION.	PRICE.
Clara	1	Good biscuits ...	3/3
	1	Scrap ...	2/5
Doranakande	9	Biscuits and Sheet ...	3/1 to 3/3½
	7	Scrap and retions ...	2/- to 2/4½
M. A. C.	1	Lumps ...	2/3¼
	4	Scrap ...	bought in
Dolahena	1	Scrap and retions ...	2/-
G. D. J.	6	Black pressed crepe ...	2/5½
Sunnycroft	1	Good sheet ...	3/3½
	1	Good scrap ...	2/5½
Sorana	4	Fine biscuits ...	3/4¾ to 3/5
	1	Good scrap ...	2/6
Tallagalla	3	Fine biscuits ...	3/5
	2	Scrap ...	2/3½ to 2/5½
Warriapolla	6	Very fine pale biscuits ...	3/9¼ to 3/10
	6	Good crap ...	2/1 to 2/6
Palli	6	Good biscuits ...	3/2
	1	Black crepe ...	bought in
	1	Biscuits ...	3/-
	1	Scrap (heated) ...	1/-
	3	Good biscuits ...	3/3 to 3/4
Heatherley	4	Good pressed crepe ...	3/4¼
	2	Black pressed crepe ...	2/10 to 2/11½
Culloden	9	Good pressed crepe ...	3/4¼
	4	Darkish pressed crepe ...	3/5¾
	5	Dark pressed crepe pt. sold	2/7
Hattangalla	2	Palish and darkish pressed crepe	3/2½ to 3/3¾
	1	Black ...	2/10¾
	3	Biscuits ...	3/6¾
Neboda	11	Fine thick crepe ...	3/6¼
	3	Darkish to black pressed crepe	2/6½ to 3½
Nikakotua	5	Brown pressed crepe ...	3/1½
	7	Very fine sheet ...	3/5¼
V. S.	20	Good to fine scrap and rejections	bought in
	2	Block ...	bought in
	2	Pressed crepe ...	bought in
	1	Rough biscuits ...	bought in
Arapolakande	17	Fine biscuits ...	3/5¼
	6	Palish and brownish crepe...	3/2 to 4/5¼
	2	Black block ...	bought in
Kahagalla	6	Fine pale worm ...	bought in
	1	Darkish ...	bought in
	2	Black crepe ...	bought in

Halwatura	10	Fine pale worm	...	bought in
Delwita	5	Dark worm	...	3/2¾
	1	Scrap	...	2/3
Alupolla	1	Amber worm	...	bought in
	1	Scrap	...	2/4
Edengoda	4	Biscuits	...	3/4½
	1	Scrap	...	2/3
Rasagalla	4	Biscuits	...	3/4½
Galatura	5	Scrap	...	2/3 to 2 4½
Medampe	3	Biscuits	...	3/4½
	1	Scrap	...	2/6
	1	Block	..	bought in
Dea Ella	2	Biscuits	...	bought in
	1	Scrap	...	2/4½

MALAYA.

MARK.	PKGS.	DESCRIPTION		PRICE.
B. & D.	2	Good sheet (41 lbs.)	...	3/- to 3/2
	1	Pres ed sheet	..	3/1
	1	Cuttings	...	2/4½
	2	Fine crepe	.	3/5
	2	Sheet and cuttings	...	2/10½ to 3/2½
	3	Darkish crepe	...	2/11 to 3/3¼
B. & D.	6	Srepe, scrap etc.	...	2/3 to 3/4
	10	Fine crepe	...	3/5
E. L. & Co.	8	Good sheet	...	3/3 to 3/4¼
	4	Good crepe	...	3/4¼
	5	Darkish	...	3/- to 3/2¼
	2	Worm	...	3/-
	4	Good sheet	...	with drawn
	1	Ball Scrap	...	with drawn
	2	Rejection and scrap	...	with drawn
B. & D.				
	3	Scrap block	...	bought in
Matang	1	Dark crepe	...	2/7
	1	Scrap	...	1/7
Damansara	2	Fine pressed crepe	...	3/4
	8	Good & dark block pt sold.		3/1¼
	1	Rough biscuits	...	3/2
L. E.	80	Palish opaque block	...	bought in
Straits.				
Highlands Est.	13	Fine sheet	...	bought in
	11	Good pressed crepe	...	3/2¾ to 3/4¼
	19	Dark crepe pt. sold	...	3/0¾ to 3/2¼
B. R. R. Co. Ltd.	53	Fine sheet	...	3/3 ½

	9	Palish crepe ...	3/5½
B. R. R. Co. Ltd.	4	Pressed crepe ...	3/1½ to 3 3
	16	Darkish and pressed crepe...	2/10¾ to 3/2¾
	5	Good and medium block ...	bought in
	1	Pressed crepe ..	bought in
	9	Good to fine block ...	bought in
	22	Fine sheet ...	3 4½
	14	Fine palish crepe ...	3/5½ to 3 5¾
	47	Palish to dark crepe ...	3 0¾ to 3 4
P. S. E.	9	Fine sheet ...	3/5¼
C. M. R. E. Ltd.	27	Good crepe pt. sold ...	3/3¼ to 3 4½
Yam Seng	12	Fine sheet ...	3/5
	5	Rejections and scrap ...	2/6 to 2 6¼
Shelford	6	Pressed crepe ...	bought in
Damansara	4	Dark block ...	bought in

JAVA.

Mark.	Pkgs.	Description.	Price.
Sengon	9	Pressed sheet ...	2/10½ to 2 11¼

WITH LEWIS AND PEAT'S COMPLIMENTS.

Ceylon, Straits and Malay States Plantation Rubber Report.

March, 6th 1908.

The following Lots, comprising about 23 Tons Straits and 1 1½ Tons Ceylon, were offered at Auctions to-day and sold as follows:—

Straits and Malay States.

Mark.	Quantity.	Description	Price per lb.
B. & D.	6	Cases Sheets ...	2 4½ at 3 2
	3	,, Scrap ...	2 4 at 2/5¼
	1	,, Biscuits ...	2 8½
R. M. P. LTD.	8	,, Crepe 4 sold ...	3 5
E. L. & Co.	8	,, Sheets ...	3 3 at 3 4¼
	9	,, Crepe ...	2 2¼ at 3 4½
	2	Pkgs. Worms ...	3 -
S. K. R. Co. Ltd.	28	Cases Crepe ...	3 - at 3 4¾
W. L. P.	9	,, Crepe ...	3 4 at 3 5
E. K. K. P.	2	,, Sheet not offered ...	
	1	,, Ball ,, ,, ...	

B. & D.				
F. D. P.	3	,,	Scrap ...	bought in
Damansara } Selangor }	3	,,	Block ...	bought in
	7	,,	Crepe ...	3|1½ at 3|4
L. E. MUAR	70	,,	No. 2 Block ..	bought in
B. R. R. Co. Ltd.	53	,,	Sheets ...	3|½
	32	Pkgs.	Crepe ...	2 11 at 3|5½
	3	,,	Block ...	bought in
Highland Estate	13	Cases	Sheets ...	bought in
	30	,,	Crepe ..	3|0¾ at 3|1½
A.	1	,,	Biscuits ...	3|4¼
B.	2	,,	,, ...	3|3
V. R. Co., Ltd. Klang S.M.S.	22	,,	Sheets ...	3 4½
	60	,,	Crepe ...	3|0¾ at 3|5¾
P. S. E.	9	,,	Sheets ...	3|5¼
C M R E Ltd.	27	,,	Crepe ...	3|4½ and 3|5
Yam Seng	12	,,	Sheets ...	3|5
	3	,,	Scrap ...	2|6
Shelford	6	,,	Crepe ...	bought in
Damansara	4	,,	Block ...	bought in
B. & D.	6	,,	Crepe ...	2|6 at 3|5

Ceylon.

Mark.	Quantity.	Description.	Price per lb.
Clara	1	Case Biscuits ...	3 3
	1	,, Scrap ...	2|5
Doranakande	9	Cases Biscuits ..	3|1 at 3|3½
	2	,, Sheets ...	3|1 at 3|2
	5	,, Scrap ...	2|- at 2|5
	4	,, ,, ...	bought in
C. D. S.	6	,, Crepe ...	2|5½
Sunnycroft	1	,, Sheets ...	3|3½
	1	,, Scrap ...	2|5½
Sorana	4	,, Biscuits ...	3|4¾ and 3|5
	1	,, Scrap ...	2|6
Tallagalla	1	,, Biscuits ...	3|5
	2	,, Scrap ...	2|5½ at 2|5½
Warriapolla	8	Pkgs. ,, ...	2|1 at 2|6
	5	,, Biscuits ...	3|- 10
Densworth	2	,, , ...	not offered
	1	,, Scrap ...	,,
Ambatenne	3	,, ,, ...	,,
	2	,, Biscuits ...	,,
Heatherly	6	Cases Crepe ...	2|10 at 3 4¼

Culloden	18	,,	,,	... 2|7 at 3|4¼
Neboda	14	,,	,,	... 2 6½ at 3|5¼
Hattangala	3	,,	Biscuits	... 3|4¾
	2	,,	Crepe	... 2|10¾ at 3|3¾
	7	,,	Sheets	... 3|5¼
V. S.	19	,,	Scrap	... bought in
	2	Pkgs.	Block	... bought in
	2	Cases	Crepe	... bought in
Arapolakande	17	,,	Biscuits	... 3|5½
	8	,,	Crepe	... 3|2 at 3|4¼
Kalagalla	7	,,	Worms	... 3 2½
	2	,,	Crepe	... bought in
Halwatura	10	,,	Worms	... 3|2½
Delwita	5	,,	,,	... 3|2¾
Alupolla	1	,,	,,	... bought in
Edengoda	4	,,	Biscuits	... 3|4½
Rasagal a	4	,,	,,	... 3|4½
Galatura	5	,,	Scrap	... 2|3 at 2|4½
Edengoda	1	,,	,,	... 2|3
Delwita	1	,,	,,	... 2|4
Alupolla	1	,,	,,	... 2|4¼
Madampe	3	,,	Biscuits	... 3|4½
	1	,,	Scrap	... 2|6
Dea Ella	2	,,	Biscuits	... 3|3¼ bid
	1	,,	Scrap	... 2|4½

Especially noticeable was the sale of 5 cases very fine pale "Warriapolla" Biscuits at 3/10 per lb.

To-day's price of fine hard para is 3/2 per lb.

Penang.

Abstract of Meteorological Readings in Criminal Prison Observatory for the month of February, 1908.

District.	Mean Barometrical Pressure at 32° Fah.	Mean Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Mean Maximum.	Mean Minimum.	Mean Range.	Mean Wet Bulb.	Mean Vapour Tension.	Mean Dew Point.	Mean Humidity.			
	Ins.	°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
Criminal Prison Observatory ...	29·888	156·3	82·1	91·3	73·8	17·5	76·5	842	73·0	77	N.W.	3·72	·95

Senior Medical Office,
12th March, 1908.

S. LUCY,
Acting Senior Medical Officer, Penang.

Perak.

Abstract of Metereological Readings in Perak for the month of February, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Taiping	...	152	81·85	92	70	22	77·92	·902	...	83	...	23·52	5·23
Kuala Kangsar	...	...	81 02	94	70	24	75·23	·801	...	75	...	5·58	1·84
Batu Gajah	...	160	80·18	92	72	20	76·79	·878	...	86	...	7·01	1·20
Gopeng	...	...	79 68	91	68	23	76·06	·854	...	84	...	6·25	1·46
Ipoh	...	...	30·37	92	69	23	75·45	·817	...	78	...	6·65	3·28
Kampar	...	...	79·44	92	68	24	75·51	·831	...	82	...	11·29	2·12
Teluk Anson...	...	...	81·11	92	69	23	76·84	·866	...	81	...	10 57	2·02
Tapah	...	...	80·74	93	66	27	75·69	·823	...	78	...	9·24	1·61
Tarit Buntar...	...	...	81·03	90	71	19	76·72	·863	...	81	...	5·23	1·05
Bagan Serai	...	...	81·44	91	70	21	76·87	·864	...	80	...	5·83	1·91
Selama	...	...	81·55	93	70	23	76·74	·856	...	79	...	11·23	2·20

STATE SURGEON'S OFFICE,

Taiping, 20th March 1908.

M. J. WRIGHT,

State Surgeon, Perak.

Selangor.

Abstract of Meteorological Readings in the various Districts of the State for the month of February, 1908.

DISTRICT.	Mean Barometrical Pressure at 32o Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
General Hospital, Kuala Lumpur ...	29·883	149·6	80·8	90·1	70·6	19·5	75·6	0·807	72·9	77	Calm.	14 01	3·60
FudohGaol Hospital ,, ...	...	...	...	...	...	...	...	...	...	...	...	9.38	1·59
District Hospital ,, ..	...	...	...	...	...	...	...	...	...	...	...	8·96	1·90
,, Klang	...	...	87·3	70 3	17·0	..	...	...	...	...	...	6·41	2·69
,, Kuala Langat ...	...	...	...	...	...	...	..	...	...	...	...	4·21	1 69
,, Kajang	...	...	85·4	74·8	10·6	...	...	...	...	...	...	9·19	2 63
,, Kuala Selangor ...	...	...	...	...	...	...	...	...	...	...	...	7·51	3·11
,, Kuala Kubu ...	...	...	...	...	...	...	...	...	...	...	...	3·40	1·25
,, Serendah	...	...	...	...	...	...	...	...	...	...	..	11·39	3·40
,, Rawang	...	..	91·5	70·6	20 9	...	...	...	...	...	...	12·09	2·58
Beri-beri Hospital, Jeram	...	...	...	...	...	..	...	...	...	...	...	2·63	0·80
Sabak Bernam	..	...	...	...	...	..	...	...	...	...	...	4·44	1·50
... ...	...	...	...	...	...	...	...	...	...	...	...	...	...
... ...	...	...	...	...	..	.	...	...	...	...	...	...	...

STATE SURGEON'S OFFICE,
Kuala Lumpur, 23rd March 1908.

E. A. O. TRAVERS,
State Surgeon, Selangor

Pahang.

Abstract of Meteorological Readings in the various Districts of the State for the month of February, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fan.	Maximum in Sun.	Temperature.				Hygrometeer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Kuala Lipis	...	...	76·85	93	67	17·20	74·46	...	...	...	...	4·43	1·65
Raub	...	...	77.65	89	66	16·58	73·24	...	...	...	...	5·80	1·46
Bukit Fraser	...	...	...	...	...	...	...	...	...	...	..	5·75	0·94
Bentong	...	...	78 65	92	69	15·82	74·62	...	...	...	...	9·33	1·46
Temerloh	...	...	...	94	70	17·31	...	...	...	...	...	5·13	1·32
Pekan	...	...	79·00	89	69	12·04	75·00	...	...	...	...	22·54	6·85
Kuantan	...	..	81·06	90	67	13·02	75-05	...	...	...	...	15·61	4·75

STATE SURGEON'S OFFICE,

Raub, 27th March 1908.

W. H. FRY,

State Surgeon, Pahang.

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NOTES ON TERMES GESTROI AND OTHER SPECIES OF TERMITES FOUND ON RUBBER ESTATES IN THE F. M. S.

By H. E. Pratt.

General.

Termites or as they are popularly known "White Ants" are really very far removed from the true ants, being more nearly allied to the primitive insects of this epoch, and resembling ants merely in their remarkable social organization.

Up to the present time some 150 species of Termites have been described from various parts of the world, but of these comparatively few have been studied with any degree of completeness. That this should be so seems mainly attributable to two causes *viz*: their cryptic habits, and the multiplicity of individuals and number of castes existing among a single species, thus rendering any careful and exhaustive observations on their life histories a very long and arduous task.

Considerable knowledge of termite life has been gained since certain species came into prominence as pests to agriculture, tea and cocoa having suffered considerably in Ceylon and the Philippines respectively. Besides being destructive to living tissue, termites are deservedly feared on account of the enormous amount of damage wrought by them to wooden structures of almost every description.

The insidious way in which termites invade houses, riddling the planks of the floor, supports to the house and the furniture, and leaving behind them but a mere outer shell, will be familiar to many of those people who have resided in the tropics.

Besides however being the cause of this destruction they are responsible for the advent of a species of small ant (Camponotus, sp.) which utilizes the vacated burrows of termites to make its nest, and becomes in a very short space of time an unmitigated nuisance in the house.

All the older houses in Kuala Lumpor are constructed almost entirely of wood, and it may safely be said that few if any of these are free from the insidious work of termites.

It is outside the scope of this paper to discuss those species which are of domestic importance, and all observations made concern *Termes gestroi* only, a species as far as I know not yet found in houses, but which attacks among other trees the cultivated Para, and Rambong rubber. (*Hevea braziliensis* and *Ficus elastica*). As much confusion however exists among the planters here relative to the difference obtaining between the various species of Termites and their habits, and since the ability to distinguish *Terme gestroi is of great importance*, a short account of the several species found on Rubber Estates, together with description of the various castes found in the Termitaria will be of much practical use.

A great deal of the existing confusion has probably been introduced by the common belief that *T. gestroi* confines its attacks to living wood, and that no other species of Termite is to be found on the trunk of Para Rubber trees.

This idea is not only erroneous but very misleading. *Termes gestroi* attacks both living and dead wood, the latter in all stages of decay, and other species of Termites are to be found on rubber trees.

Previously the mere fact of finding a species of termite in dead wood was considered by most planters to be a sufficient criterion to conclude that it would not attack rubber, and on the other hand any Termite runs found on a Rubber tree were imagined to contain *Termes gestroi*, the tree being dealt with accordingly.

But in the first instance the termite found in the dead wood may have been *T. gestroi*, and in the second case the runs on the rubber tree may have contained only species which was devouring the waste bark and doing no harm whatever. The importance of distinguishing *T. gestroi* from any of the others is thus evident.

On page 161 is given a short description of the soldier of *T. gestroi* which it is believed will be of use to those who wish to identify this pest.

Of the different castes found within the Termitaria (termite nest) it is of importance to those whom it concerns from an economic point of view to be acquainted with at least the soldier and worker, especially the former as the distinction between species applies only to this caste.

The number of castes contained within the nest of any species of Termite often differs according to the species. The maximum number present is King, Queen, Soldier, Worker, adult males and females, and undifferentiated males and females.

It is here only necessary to mention that the soldier of *T. gestroi* may be distinguished by its larger head, which is usually chitinized (hardened), and by its possessing a pair of powerful mandibles.

Towards the latter end of the year a certain number of individuals reach maturity, vacate their nests, and form what are known as swarms. This nuptial flight which with most species here takes place between September and December is to provide additional nests with Queens or to form new colonies.

The structure of the Termites nest usually differs according to the species by which it are constructed. A series of those collected may be seen at the agricultural department in Kuala Lumpor.

The Commoner Species of Termites met with on Rubber Plantations.

By enumerating the commoner kinds of termites found on Estates some idea of the number of species which may be present and doing no harm will be gained. It is this fact which it is necessary to impress as I feel sure that many thousands of dollars are yearly expended in destroying species which are either beneficial, or of no economic importance to the planter.

The following key taken from Haviland's paper on Termites, although perhaps technical may be of use to some in discriminating between the species, but as other species are harmless, for all practical purposes it is only necessary to be able to recognise *T. gestroi.*

Key.

(I) Lobes of the thorax projecting over the underparts, head large and broad with powerful mandibles; legs projecting beyond the apex of the abdomen.
Fungus growers.

(1) General colour blackish above ... *Termes carbonarius.*
(2) General colour pale with rufous head
(*a*) Size larger; antennae with 11 segments ... ... *T. Malayanus.*
(*b*) Size smaller; antennae with 15 segments ... ... *T. pallidus.*

(II) Lobes of the thorax projecting but slightly over the underparts; head with a large foramen (hole) secreting milky fluid; mandibles fairly long but slender, outline of body oblong, head rufous, abdomen white, sometimes grey from intestinal contents ... *T. gestroi.*

(III) Lobes of the thorax not projecting, species usually of small size; abdomen arched.

(1) With slender mandibles; abdomen sulphur yellow ... ... *T. sulphureus.*
(2) Mandibles rudimentary; with a conical projection on head; general colour blackish brown.
(*a*) Head much swollen ... ... *T. lacessitus.*
(*b*) Head but slightly swollen ... *T. unbrinus.*

These names will be unfamiliar to many and it will be as well to apply popular names to some species.

Termes gestroi may be designated "The Rubber Termite" *T. Malayanus* "The Malay Termite" *T. sulphureus*, "The Headmound or Yellow Termite" *T. umbrinus*, "The Black Termite."

By this means a further interest may be taken in these insects as long technical names are seldom committed to memory.

The following which agrees entirely with my own observation is an account of those species found on rubber estates given by Robinson in his report on *T. gestroi* as affecting para rubber.

Termes Carbonarius.

"This is one of the largest species of termites and is by no means uncommon both in jungle country in land overgrown with lalang and on abandoned tapioca estates, where it forms nests four or five feet high. It occasionally attacks coconuts, but does not do any serious damage, being more of a nuisance from the nips the powerful mandibles of the soldiers can inflict on the coolies plucking the nuts."

"When the plantations are allowed to grow up in grass, the termites do not seem to ascend the trees."

Termes Malayanus.

"The species constructs globular honey-combed masses of comminuted woody fibre, and cultivates a species of fungus thereon, on which the young are fed. There is not the slightest evidence that this species does any harm to living plants, and much to the contrary, and it is a very moot point as to whether the money spent in eradicating their nests might not be better employed in other directions. Should however, the nests be destroyed care should be taken that the whole mound is thoroughly levelled and the earth will broken up and exposed to the sun. It is of no use capturing the King and Queen, as the community possesses the power of rapidly replacing them by special treatment of certain larval forms.

The lenticular chambers seen on the sides of road-cuttings, etc., are in the majority of instances young communities or colonies from a larger mound either of this or a closely allied species."

Termes Pallidus.

"A very much smaller species generally found nesting in the outer shell of the mounds of the preceding species. It is also a fungus grower and appears to be equally harmless."

Termes Sulphureus.

"A small species readily recognized by its arched abdomen, which is coloured pale primrose yellow. The nest of old and undisturbed communities are roughly cylindrical, tapering somewhat at the summit. Large nests are four or five feet in height and rather less in diameter, and are composed of a blackish grey material, more honey combed and with far less earthy matter than that forming the nests of *T. Malayanus*, and often excessively hard. The species is commoner on hills than on flat land and is not injurious."

Termes Lacessitus.

"Occasionally seen on the trunks of para rubber and Rambong but not doing any damage. Nest of papery material, usually in trees and shrubs in secondary jungle. A species of no economic importance."

Termes Umbrinus.

"This species nests in the stumps of dead trees and is often seen on the march in enormous numbers, frequently travelling a distance of two or three hundred yards in columns a couple of inches wide. It apparently feeds on dead leaves, twigs, etc., and is occasionally seen in houses situated near the jungle but does not do any harm."

Means of Distinguishing Termes Gestroi.

A somewhat crude means of distinguishing *T. gestroi* from many of the other species of Termites is to press the abdomen of the soldier slightly or irritate its body in some way; a white milky fluid will then be exuded from the front and top part of the head, at the same time it will attack its aggressor most voraciously with its madibles. Although *T. gestroi* is by no means the only species which exudes milky fluid from the anterior part of the head the discharge of this combined with the close association this species has with rubber trees will be sufficient to identify it.

It is of importance that all planters should be able to recognise the soldier. To the unaided eye the chief difference between the soldier and the other castes of this species is in the head and its appendages i.e. by the latter possessing a pair of elongate slender mandibles. In *T. gestroi* the colour of the abdomen varies according to the nature of the food it has been devouring, but generally it is of a white or slightly creamy colour, sometimes grey; the head is red brown.

It is also much more active and certainly more daring than the majority of species.

General Observations on Termes Gestroi.

The damage caused by *T. gestroi* to para rubber trees of practically all ages (9 months and upwards) has deservedly earned for this pest the reputation of being the planter's most serious enemy here. Its insidious method of attack, cryptic habits, prolificness, and rapid completion of its destructive work render it one of the most difficult pests to deal with. Towards the latter end of this year (1907) I discovered at Kuala Selangor for the first time the Queen of this species. It was contained within a small royal cell, and surrounded by many thousands of eggs, young, soldiers, and workers. Along the edge of the parit (open drain) where the Queen was found some 15-20 rubber trees about 8-9 years old had been destroyed by *gestroi*. All of these trees were carefully examined, and in each case it was found that the burrows leading away from them terminated at the main nest, the individuals of which were thus responsible for the destruction of at least 15 large trees.

It will be fully realized how useless it would be to treat separately these trees, merely by digging around their bases and so exposing the

roots, and perhaps applying a poison which would in all probability lose its noxious properties after a few hours exposure.

The nest itself was about two feet in diameter, and constructed round a concealed stump, which had been buried by the earth removed from the drain.

This main nest was tracked down by following the burrows which always ramify in many directions from attacked Rubber trees. The burrows on flat alluvial land are situated from 1-2 feet below the surface; they are coated with a thin layer of red substance, are constructed horizontally, fairly broad and about ¼ inch high, thus forming a passage into which a thick paper knife or a microscope slide could be easily inserted.

Within these burrows soldiers and workers are often present, and when near a large nest young will usually be found. Occasionally large open spaces are met with, but these are never lenticular in shape such as are formed by several other species. Such spaces are constructed in the same general plan as the burrows but extend over a greater portion of ground; the distance between floor and roof is about ¼ inch.

Ramifying from the spaces are burrows which usually present marked differences in size, those leading to subsidiary nests being the larger ones, the smaller terminating in small dead stumps. Thus if tracking these burrows the smaller ones should be left alone as being of little importance and the larger ones followed which in most cases lead to subsidiary nests.

These are always, as far as my own investigations go, constructed around or inside old stumps, buried trees, or within fallen trees on the surface of the ground. The buried stumps and trees are often rotten but *T. gestroi* has no aversion to trees in this condition. The subsidiary nests often contain thousands of individuals and from the former thre issue many burrows one or more of which may encircle rubber trees.

When this happens the encircled tree is often entirely unaffected by the presence of the ants in their enclosed tunnel, which ultimately connects with other nests.

That some young rubber trees are attacked and others left alone appears to me to be attributable to the lack or presence of food other than living wood.

Indications and Method of Attack of Termes Gestroi.

In most insect diseases affecting cultivated plants there occur evidences of the presence of the pest even is the earliest stages, the disease being treated accordingly, thus preventing or at least minimizing the chance of its spreading or becoming serious.

With *Gestroi* attack on rubber trees such evidences are often entirely absent until the damage done is beyond redemption. In such cases the tree is either blown down or falls, when its hollow trunk shows that it has been attacked by *Gestroi*. In the majority of instances trees which are attacked from below in this manner or impossible to cure since one cannot detect that they are in any way unhealthy owing to the absolute lack of any external signs of disease

Such a cryptic method of destruction applies chiefly to trees between the age of 9 months and 3½ years ; older trees which take a longer time to devour eventually show some signs of decay. Young trees also in some instances present obvious signs of attack by their trunks becoming incased with mud, and in a few cases latex is seen to exude from small holes made by *Termes gestroi.*

Older trees which are affected may often be detected by this latter indication. Latex either exuding from small holes and trickling down the trunk, or large lumps of latex coagulated on the exterior of the tree, or latex coagulated and resting behind the bark are almost invariably indications that *Termes gestroi* is at work. It has been mentioned to me by several planters that it is their belief the large excrescences (spheroblasts) prevalent in some trees are due to termites. This idea however is erroneous ; the warts having nothing to do with Termite attack. The " White Ant Coolies " in an Estate informed the Superintendent that they were able to detect a hollow tree by the sound produced when the tree was struck with an axe. I am anable to verify this statement and do not believe that such a method would enable any one to detect a hollow tree unless the whole of the interior had been devoured leaving but a mere outer shell. Whether *Termes gestroi* attacks trees from the inside or from the outside appears to have given rise to some discussion. Any boring insect must necessarily in the first instance enter from the outside, but the question seems to have arisen whether they first make their way to the centre of the tree, and from there work outwards, or whether the commence from the outside and work towards the centre. I have made careful observation on this point, and it is obvious to me that *Termese gestroi* does not confine itself to one or the other of these methods, but carries on its destructive work from both the outside and the inside. There is however very little importance in this question as far as preventative measures are concerned.

No special place is selected by *T. gestroi* for effecting an entrance into the rubber tree. The lateral roots are much favoured for making their approach burrows, and these latter are often to be found just under the bark of the former, especially with older trees is this the case and ought to prove a useful means of locating the burrows. Occasionally the tunnels go straight to the tap root into which *Termes gestroi* eventually makes its way.

Although *Termes gestroi* does not always make its initial attack from below ground this method is undoubtedly commoner that the one in which the tree becomes encased with mud and is attacked from above ground.

It may perhaps be imagined that the reverse of this is the case because the majority of affected trees are in the first instance discovered by the presence of an outer casing of mud.

Usually however this mud encasement is what might be termed a secondary attack for if the earth be removed from the roots it will be seen that the Termite has been at work for some considerable time, and probably the roots have already been devoured, or the tree may even be hollowed out. The appearance of *T. gestroi* above ground is in most instances attributable to a series of heavy rains, and when these

rains occur is the best time to search for attacked trees as their presence is then made apparent by the mud encasement.

Mr. Robinson in his report in *T. gestroi* says " the damage is caused not so much by the actual death of the tree, for in many cases the living tissues are perfectly sound but from a weakening of the trunk and tap root added to the natural brittleness of the wood rendering then unable to resist the slightest wind pressure " My observations corroborate this and I have found in some cases that besides wind pressure, rain will often cause diseased trees to fall, due to the increased weight of the foliage.

Age of Tree when Attacked.

According to Mr. Robinson it is very rare for any material damage to be done to para rubber before the age of 3½ years. My experience however has been very different and Mr. Robinson's statement may I think be accounted for by the fact that when his investigations were conducted comparatively little land had been taken up for the purpose of planting rubber, young plantations being rare.

On nearly 40 estates in different parts of the Peninsula which I have visited during the last 18 months I find that trees are attacked very commonly, and with very disastrous effects, at any age from 6 months upwards, sometimes the stumps before sprouting being killed.

The time occupied by *Gestroi* in killing trees of 18 months is very short. The roots are almost invariably the subject of attack, being hollowed out from the apex to within about an inch from the surface of the ground, making the tree's hold so fragile that it is remarkable how they remain upright and show no signs of weakness or decay.

Propping Fallen Trees.

A common practice among planters is to prop up young trees which have fallen through *Gestroi* attack. Such a procedure is undoubtedly prompted by the fear of losing 18 months growth, but it must be taken into consideration that such trees are very liable to be continully attacked and thus prove a source of danger to other trees.

On one estate which I visited during 1907 trees of the age of 8-9 years were treated in this way, the top having been cut off to within 10 feet of the ground.

Inside an area of 50 acres some 40 trees had received this treatment and no less than 70 per cent of the trees within this area were attacked by *Gestroi*. Without exception those trees which had been propped if were riddled by *Gestroi*, and must I maintain have been a factor aiding the mutiplication of this serious pest.

As long as such a practice is continued any reduction in the numbers of this pest cannot resonably be expected, besides which each estate that becomes so infected is a dangerous neighbour.

Native Trees Attacked.

Several native trees suffer very considerably from the attacks of *Termes gestroi*. Of these Kumpas (Kumpasia malaccensis) and the several species of Meranti (Shorea) appear to be the favoured woods. Coconut, Kapok cotton (Eriodendron) and several species of mango are also frequently killed by *Gestroi*.

Some two and a half years ago a small coconut plantation was destroyed at Kwala Selangor on account of its harbouring numerous coconut beetles. The trees were cut up and burnt, and the stumps destroyed, the roots being left. I found on digging in this land which was covered with lalang that these roots still contained living *Gestroi*.

Six Eriodendron planted by the side of a parit were also killed by the rubber termite. Their burrows were followed and found to lead to an old Meranti stump felled some 8-10 years ago, certainly long before the cotton trees were planted, and the former was to all appearances directly responsible for the infection of the latter trees.

Influence of Draining.

It has been stated that deep draining encourages *T. gestroi* in account of it affording a greater depth of land for this insect to burrow in. The slightest acquaintance with the habits of this pest however is sufficient to show that such an argument is fallacious. The runs of *T. gestroi* are never found more than 4 feet below the surface of the ground (sometimes only an inch) even in estates where the main drains are 9 feet deep and cross drains as much as 5 feet.

In badly drained damp places such as often occur between the hills in the Batu Tiga district, *Termes gestroi* has been met with in abundance; instances such is this are common, and are sufficient to prove that deep draining does not aid this pest in its destructive work.

Nature of the Soil as Affecting the Abundance of Termes Gestroi.

The influence the soil has upon the prevalence of *T. Gestroi* appears to be somewhat undecided. My own observations support the general idea viz: that heavy clay soils are the most affected.

Some replies however received in answer to a circular letter sent to each estate in the F. M. S. in connection with this subject are in opposition to this generally accepted idea. The following extracts of two letters received are cases in point "These (*Termes gestroi*) are certainly becoming a menace. I find they are by far most active on dry friable soils which are kept free of insects; where the soil is a stiff clay, fairly damp, and carrying grass and jungle there are hardly any white ants, while where the soil is like a garden mould well drained and no weeds they are very plentiful."

In the other received, "On dry flat land, where the soil is purely of a sandy nature the majority of damage has been done." Several other letters confirm these statements. Other planters find peaty soil to encourage *Gestroi*, while the majority are of opinion that clay soils are the more favourable to it.

At Kwala Selangor where most of my investigations were conducted the subsoil is of a greyish blue clay, and white ants are plentiful. Rubber trees planted along the edges of a drain appear to be especially favourable to *Gestroi*. I cannot account satisfactorily for this fact, unless it is that *Gestroi* has a partiality for earth removed from a drain.

It thus appears that the nature of the soil has but little influence on the prevalence of *Gestroi*, for although nearly all estates with a clay subsoil are more or less troubled, it must be borne in mind that

such a soil is characteristic of the coast lands in the F. M. S. the looser soils being in the minority.

Influence of Lalang.

A common belief among planters is that *T. gestroi* does not live in lalang land; this however is not entirely correct, but it is not difficult to see how how such an opinion has originated. Most of the land which is at present covered with lalang was felled many years ago, and the fallen trees have already been devoured by various insects, thus leaving no food for Gestroi to exist on, they must therefore either die or gradually make their way to other places which would account for their absence at the present time.

That they have no dislike to lalang land is evidenced by their presence among many Malay kampongs, which are usually overgrown with lalang and other weeds, but owing to the presence of Mango, Coconut trees, etc., *T. gestroi* has a means of sustenance.

Importance of Examining Dead Wood.

The most important point in connection with the present abundance of *T. gestroi* and which has been practically overlooked is the fact that it attacks dead as well as living wood. At Kuala Selangor which is low lying jungle *Termes gestroi* in its natural state in very common. This is evidenced by the number of Kumpas and Meranti trees that are attacked as may easily be seen when virgin jungle is felled. I have also found under natural conditions old stumps riddled with *gestroi* and large nests of the same species beneath the ground.

When such land is felled *T. gestroi* is already among the fallen trees, and the natural conditions which previously existed are altered and rendered more favourable to the multiplication of this insect.

As pointed out by Mr. Robinson *T. gestroi* does not enter an estate from the jungle, for if they did the trees at the edge of the jungle would suffer to a greater extent than those in the centre of the plantation. They are therefore bred within the estate.

The Rubber termite does not immediately attack the Para rubber tree but first devours such dead wood to which it has no aversion.

In this way *T. gestroi* has on old estates and is becoming in new estates a formidable pest. The fact that it is among the dead wood and rapidly multiplying has up to the present time been ignored; it is only when the rubber trees are being attacked that any measures are taken against its ravages. The dead wood may have become full of *gestroi* but even then no attention is directed to it, the attacked rubber trees being treated by perhaps digging around their roots and applying lime. Such a treatment to any single tree when there is a constant supply of T. *gestroi* from an adjacent stump or trunk must necessarily be a very temporary and practically useless measure against its attacks.

On a young estate if a careful examination he made of fallen logs, stumps, and bridges over drains, many of these will be found to be full of *gestroi*. If young trees are attacked any old logs or stumps in the vicinity must be examined as they are in nearly all instances directly responsible for the infection of the living tree.

This does not apply to trees of five years or upwards for on such estates the fallen forest trees have either already been devoured or have completely rotted away, *Termes gestroi* being thus forced to confine its attacks to the Para rubber.

It may perhaps be argued that when the trees are burnt the Termites are destroyed. A certain number undoubtedly are but many of those contained within the trunks of trees and those below the ground remain untouched.

Except where stated the foregoing remarks apply only to young plantations (up to the ages of 4 years) as in the older ones the conditions are totally changed and any methods of eradication which will be suggested for young estates do not necessarily apply to those containing trees of 5 years or upwards.

Methods to be Employed Against Termes Gestroi.

The only chemical with which any degree of success has been obtained in other parts of the world is Carbon Bisulphide.

This insecticide is however most difficult to obtain in this country, and its prohibitive cost excludes it general use especially over any great area.

Attention to remedial or rather preventative measures should therefore be directed elsewhere for the present.

My own observations made on young estates have firmly convinced me that the only remunerative method to be employed against the ravages of *T. gestroi*, is to follow up their burrows and so ascertain the position of the nests. There as heretofore stated will be found either in or around buried stumps, or contained within the fallen trees lying on the surface of the ground.

Such trees must be destroyed.

There are only a few native trees which are attacked and acquaintance should be made with these. The most important are Kumpas, Meranti and Pulai.

On freshly felled land I would not advise the destruction of the Kumpas, Meranti, and Pulai trees in the first instance as they subsequently afford means of locating *T. gestroi* and should then be completely destroyed together with the ants. Trees lying on the ground are easily detected if attacked, and before doing away with these trees, the burrows leading away from them must be followed up and disturbed.

This method would not require more coolies than are at present employed in making daily inspections of the rubber trees, and would as has been shown be far more effective, if not a final treatment.

Young trees which are attacked by *gestroi* and show no external signs of disease are often discovered by following the burrows of *T. gestroi* issuing from dead trees. Treating the former trees at an early stage of the disease, conbined with destruction of the source of their infection is sufficient to prevented further attacks (at all events from the same source) and in all probability will save a considerable area any becoming badly infected.

On the majority of estates in the F. M. S. on certain number of coolies have their work confined to repelling the attacks of *Termes gestroi*.

These coolies are however not aware that only one kind of Termite attacks rubber, nor are they acquainted with the burrows of this species.

That Tamil coolies are capable of distinguishing *T. gestroi* and its burrows has been proved to me at Kawla Selangor, for on explaining to them by a series of practical demonstrations the several differences, they were not only very clever in discovering the burrows and following them, but were able to recognise *T. gestroi* at a glance.

By far the most difficult question is to deal effectively with this serious pest in old estates. Here the roots of the large trees hinder coolies endeavouring to discover the burrows to such an extent as to place this method beyond practical use on estates with a heavy clay soil. In the lighter soils however I have found that the burrows may be satisfactorily followed.

With old trees the method at present taken against the ravages of *T. gestroi* is to expose the roots and apply various poisons.

A large series of experiments were conducted in the Kuala Kangsa district on trees about 9 years old. The results of these experiments show it is only by systematically and persistently repelling the attacks of this insect that any measure of success can be attained.

Where these experiments were conducted small localized areas were severely troubled with *T. gestroi*, and about 12 coolies were daily employed in examining the trees.

Among many other insecticides tried were various mixtures of Kerosene applied to the roots and exterior of the tree, and on one occasion an application of kerosene emulsion made as follows repelled the attacks for nearly 6 weeks.

Kerosene	1 gall.
Water	1 gall.
Soap	½ lb.

Boil the water and dissolve soap in this. While boiling hot add to Kerosene slowly, churning meanwhile; continue to mix thoroughly for at least 5 minutes. Dilute with 6 galls. water before using.

This method although the most satisfactory yet discovered is not entirely satisfactory, as it tends to make those termites which escape, burrow into the interior of the tree by way of the unexposed roots, and further its application is not invariably successful.

The fault usually lies in not removing sufficient earth from the roots. I would advise that the earth be removed within a five foot radius, and to a depth varying proportionately with the depth to which the tap root extends.

A tree dealt with in the above manner naturally has its hold in the ground considerably weakened, and the roots should not be allowed to remain unexposed for more than a week, during which time a daily inspection must be made.

Such a treatment must be immediately repeated if heavy rain falls soon after the mixture is applied.

Hollow trees must be dealt with by boring into their trunks until the hollow portion is reached.

By way of the hole thus formed force six ounces of calcium carbide (the amount of course varies according to the age and condition of the tree, the amount suggested being the maximum) into the hollow portion ; close the entrance by means of a cork or cement and apply a little tar over the wound after it is stopped up. The advantage of a plug is that it is easily pulled out if the treatment has to be repeated.

Coolies should not be allowed to remove the mud-encasements of *T. gestroi* with a stick or parang as they do not kill the ants and are liable to cut into the tree. A coconut brush or some such implement is for more effective if rubbed down the bark. Gales of wind are often the cause of trees splitting down the centre between two large branches, or branches are liable to break off. It is advisable in such cases to apply tar to the wound. Trees blown down by the wind must not be propped up, but destroyed. Those trees which have a tendency to fall hould be supported in the side towards which they are leaning.

Patent White Ant Mixture.

There are several patent "White Ant" insecticides placed in the market here. Those which have been experimented with are "Street's liquid white ant cure" "Atlas preserver" and "Anticide."

A Lower Perak planter states he has obtained most satisfactory results with the former mixture.

His method of application was precisely the same as mine (applied to the roots and outside of the trees) except that a larger variety of experiments were tried by me, and the strength of the "ant cure" was varied to a greater extent.

The results of my own experiments were not successful, for while the attacks were repelled for a few days, the termites returned as soon as the noxious elements of this insecticide had disappeared. It is a very corrosive mixture and must be applied with care if used, although its application I maintain is useless while the burrows remain undisturbed. The results obtained from "Atlas preserver" and "Anticide" (the latter is composed to a large extent of Cyanide) have not been favourable.

To the planting community in general from whom I have received generous assistance while investigating this disease, I would offer my thanks. To a few planters in particular my thanks are especially due but as the appearance of their names is usually taken to mean that their estates are the most affected a public acknowledgement is undesirable.

H. E. Pratt.

SOME DISEASES OF RUBBER PLANTS.

We extract the following notes from a long and important pamphlet by Dr. Ch. Bernard. "Sur quelques maladies des Plantes à Caoutchouc."* Though written for Java the advice given is equally of value to planters in this Peninsula.

* Bulletin du Departement de l' Agriculture aux Indes Neerlandaises No. XII, (Phytopathologie III). Buitenzorg, 1907.

The special part, in which the pests of *Hevea braziliensis* (Para), *Ficus elastica* (Rambong), *Castilloa elastica*, *Kickxia elastica*, and *Manihot Glaziovii* (Ceara) are detailed one by one is preceded by an interesting introduction in which the author advances some general considerations on plant disease, and complains incidentally of the bad condition in which material sent in for identification is received. He says that during the past two years planters have frequently sent to the Department of Agriculture at Buitenzorg specimens of rubber plants attacked by diseases more or less serious. Unhappily the material, being for the most part badly packed and having been for a greater or less time in over-heated waggons or in store-rooms, arrived in such a bad state that it was impossible to make a serious examination of it or to give the real cause of the injury done; the humid warm atmosphere which surrounded the plants favoured the devolopment of a crowd of organisms among which it was impossible to distinguish the originator of the disease.

"It is necessary in the first place to give a few recommendations which may appear common-place, or at least elementary, but on which it is nevertheless good to insist and which are important to keep before one's mind when occupied with plant disease.

It is not necessary, I think, to delay long on questions pertaining to soil, drainage or manure. I have occasionally seen a soil, excellent in outward appearances, which at a depth of a foot or so changed its constitution and became for example clayey and damp. This may be serious in the case of plants with a tap root such as Hevea; when the root reaches the wet layer of soil, it will be in a condition to rot and to become a source of disease. Enough account is not always taken of the richness of the soil in nutritive substances. I have been able to demonstrate several instances of plants becoming the prey of various parasites, because the soil having been previously exhausted by long cultivation the plants were debilitated and had not the force to resist their enemies.

I wish to insist on a knowledge of the importance of proper surveillance and of the immediate notification to competent persons of the least appearance of unhealthiness among the plants, whether it may appear serious or mild. This recommendation is important for rubber plants. Their cultivation is not yet very extensive in Java, or at least has only developed within the last few years; but as it has made remarkable progress it is necessary to give it the greatest attention. It is much easier to protect a cultivation in the way of formation against its enemies, than to save old plants from parasites which have multiplied at their convenience on account of special circumstances.

Diseases of *Hevea braziliensis*.

(*a*). *Corticium javanicum*, Zimm. This appears to be the most important disease of Hevea. The parasite is well known from the havoc it has caused among coffee, where it attacks the stems and fruits. Zimmermann, who discovered it on Hevea, attached great importance to it, and proved that it is a true parasite which kills the branches which it attacks. During the past two years I have studied several cases where the parasite brought about the death of the plant.

Corticium javanicum is a parasite of the bark of the branches and trunk. On Hevea it appears generally on the base of a lower branch or on the trunk hardly as high as the first branches. Trees of various ages are attacked, leading to death, in trees of $1\frac{1}{2}$—$2\frac{1}{2}$ years old especially. The first appearance of the parasite is a little rosy or nearly whitish spot on the bark. The spot extends, thickens, takes on a more vivid rose tint, cracks in a characteristic manner, and finally surrounds the branch or trunk attacked. The bark may be crushed with slight pressure of the finger, and big lumps raised off with the finger nail. Observation of the microscopic and macroscopic characters and the results of infection experiments on young Hevea plants prove that the fungus is the same as the parasite which damages coffee plants. Abundant rain and humidity of the atmosphere favour the extension of the fungus.

The relative abundance of the disease depends too on the age of the plants and the local conditions of soil and air; some places are more widely affected than others. It is certain that it is contagious; very often the parasite was noticed to pass from coffee, on which it was abundant, to Hevea planted in the same ground. The remedy is to cut off the infected parts. The débris should not be carried through the plantation, as contamination may take place, but should be carefully burned on the spot. Of course it is necessary to tar the wound made and all others that may be noticed. In all cases where this procedure has been carefully followed it has given good results.

(*b*). White Fungus of the Roots. This disease appears to be at least as dangerous as the preceding. Plants of different ages, especially from 1 to 2 years, apparently in excellent health, begin to brown at the top, the leaves dry up, become yellow, and fall shortly after. As a planter remarked to the author it is difficult to say at this stage whether it is really disease or only normal leaf-fall. But at a slightly older stage a wound made in the stem yields only a scanty flow of latex, later still the flow ceases completely. A few days later the plant is evidently dead. We notice at once that the external symptons are very striking. The diminution of water in the plant is the first phenomenon, it manifests itself exteriorly by desiccation of the tenderest parts—the top of the stem and the young leaves; later it is the conveyance of nourishment which is changed, and we see that the elaborated substances like the latex are less abundant. The fungus forms more or less developed cords of a felty consistency, tough elastic and often very thick. At first the cords are are always met on the taproot, which is destroyed and the solidity of the tree so damaged that it is blown over by a puff of wind a little beyond the ordinary. Among young plants the disease has nearly always fatal results. It is all the more serious because, as in most root diseases, it is not noticed until it is too late to apply efficacious measures. In from 10 to 15 days after one is convinced that disease is present the tree dies.

Neither in the field nor on cultures of good material made in a moist chamber and on various nutritive media, in the laboratory, have I been able to find reproductive organs which would enable me to determine to which group the fungus belongs.

As in all cases of root disease there is hardly an efficacious remedy. Watering the soil with disinfectant will injure the plants and the remedy may be worse than the disease. On the contrary improving the conditions of cultivation, especially the drainage where the soil is moist, is of the first importance. The diseased plants must be pulled up and burned, the infected spots must be worked over several times with lime, and Hevea must not be again planted before the soil is certainly disinfected. The disease rarely shows itself on plants put in a virgin soil, but on the contrary always in those planted in an exhausted soil. (It is very common on trees in virgin soil in the F. M. S. Transl). The infected areas may be with advantage isolated from the rest by trenches in which lime is scattered. When the disease is suspected the soil should be doused frequently with a solution of lime in water. This cheap procedure is very effective because it renders the soil alkaline which condition is not favourable to the growth of fungi.

(*c*). *Fusicladium*, sp: Black Canker. Material showing a black canker of the stem has been several times sent in for examination. The fungus appears to belong to the genus Fusicladium. The disease, which is not yet serious, occurs on the cut ends of branches or stems left by pruning. The leaves fade, dry up, become yellow, and fall off; the flow of latex diminishes rapidly, and soon ceases totally; in a few days the plant is dead. Sometimes only the higher parts die and new branches come out below." Cryptogamic parasites of less importance mentioned by the author are

(*d*). *Pestalozzia Palmarum* which has been frequently noticed on the leaves of Hevea.

(*e*). *Stilbella Hevea*, (Zimm.) Bern. According to Zimmerman this is probably not a parasite and the other thinks it of little importance as far as *Hevea* is concerned. The author goes on to comment on (*f*) lalang, (*g*) piercing insects on young nursery plants, (*h*) boring insects, (*i*) white ants (termites), (*k*) red ants, and (*l.m.n.*) other pests such as caterpillars and pigs.

White ants in Java are not, the author says, directly injurious, and do not generally attack healthy vigorous plants. He recommends sprinkling the base of the trunk on which they appear with Solignum.

Among the enemies of *Ficus elastica* (Rambong) the author gives "lalang" the first place mentioning Zimmerman's opinion that there is only one real cryptogamic parasite of *Ficus elastica*, namely *Nectria gigantospora*, and this the author has not met.

Certain areas on a Ficus plantation were suffering from a disease of an unknown nature. All the plants over a considerable area had an unhealthy appearance; the yellow withered leaves were rapidly dropping off. An examination of the unhealthy specimens failed to discover in the leaves, branches or stem a parasite to which the disease could be attributed. The defective turgescence of the leaves and their premature fall are rather the appearances which characterise a plant weakened by unfavourable conditions of existence. On all the areas attacked lalang had reached a good development, and it was clear that this undesirable plant was the origin of the trouble. When lalang is abundant it not only exhausts the soil of nutritive materials but

prevents its aeration. In proof of lalang being the cause of the trouble the grass was carefully taken out of a certain diseased area; the trees in it recovered rapidly, their leaves ceasing to yellow and fall off. On the contrary a neighbouring lalang covered plot which had received no treatment continued to exhibit symptoms of enfeeblement. Certain animal enemies are referred to, but none appear to be serious.

The author then treats of the enemies of *Castilloa elastica*, *Kicksia elastica* and *Manihot Glaziovii*.

W. J. GALLAGHER.

ON SOME VEGETABLE FATS NATIVE TO SARAWAK.

At the present time the natives of Sarawak employ for cookery and other purposes a number of vegetable fats whose origin has been somewhat doubtful or unknown. However during March of this year there has been placed on the market large quantities of the seeds which provide some of the more valuable fats referred to and I have made this an occasion to acquire precise knowledge respecting the seeds and the trees which produce them. In the Kuching bazaar three kinds of fatty seeds are now to be found, known to the Chinaman as Engkabang chantong, Engkabang asu and Engkabang changai which are all destined for export: in Singapore—according to Mr. Ridley—they become known under the generic term of Engkawang or Tengkawang.

Engkabang chantong (a Chinese perversion of the Malay jantong?) is the Engkabang par excellence having fruits much larger than either of the others and commanding a much higher price in the market. The intact fruit is roughly speaking heart-shaped and may reach a length of three inches or more: it is provided with five leathery wings (two short ones and three wider and longer ones which are about four inches in length) which give it the appearance of a shuttlecock: in the bazaar one can obtain only the fat-bearing seed and this is broken up. If the surface of the seed be indented with the finger nail a thick oil oozes out, an indication of the high percentage of fat contained in the Engkabangs. By a simple process the Dyaks extract from the seeds a yellowish white solid fat much esteemed by them as well as by the Malays to whom pig fat is detestable.

Their method of extraction is as follows:—the seed after drying is thoroughly pounded up, then it is steamed over boiling water and when sufficiently hot the mass is put into a rotan bag which is subjected to considerable pressure in a simple press: the oily liquid which oozes out is run off into bamboos where it solidifies. The tree which bears this valuable fruit is a Shorea (*S. Ghysbertiana*). It is widely distributed in Sarawak being common in the lowland jungles of the interior. In some parts e. g. the Saribas, it has been much planted by natives, the localities chosen being invariably in the vicinity of small rivers. The trees attain a large size and instead of climbing for the fruit the native prefers to allow the crop to fall to the ground below where it is more easy to collect. During February and March of this year

there has been a very good fruiting season but unfortunately such years of plenty are not frequent. Apparently these Engkabangs (the two mentioned hereafter included) have their fruiting season all at the same time but the interval of fruiting—in quantity at any rate—is usually five, six, seven, or even more years. From a study of the trade returns published in the Sarawak Gazette I find that Engkabang seeds were exported in the following years: Feb. to Sept. 1903 a particularly good season, the large quantity of 25,000 piculs being exported :—April 1897 a poor season : Oct. 1895 March 1896 a moderate season. In other years small quantities are exported, a fact which, considering the very great local demand, would indicate that Engkabangs fruit more frequently than is ordinarily supposed.

According to native evidence their is some considerable variation in the size of the ripe fruit and perhaps by suitable selection and cultivation a good fruiting strain could be produced.

In the Kuching bazaar the market price is now five dollars per picul for the seeds: they come mostly from the Rejang river and some also from Lundu, Sadong and upper Sarawak.

Engkabang Asu. This is a smaller fruit being not much more than an inch long: its three larger wings however reach a length of six inches. The tree is common in lowland jungles but is not planted by natives. It is known to Sea Dyaks as Engkabang rambai or buah lijan. Botanically it is a Shorea (*S. Pinanga*, Scheff.)

Engkabang changai is still smaller and the five wings of the fruit are only about $\frac{3}{4}$ inch long. To Sea Dyaks it is known as Enteglam or Teglam and I believe this is also synonymous with Engkabang terindak (Malay) and Engkabang tanggoi (sea Dyak). The oil of teglam is perhaps the most esteemed of all amongst natives, partly because it will keep for years in good condition. The tree is planted by sea Dyaks. It also is a Dipterocarp—*Isoptera borneensis*. In the market these two latter kinds of Engkabang appear mixed up together the mixture now selling for $2.80 per picul: it comes from the Rejang district, Lundu, Upper Sarawak and Saribas.

There appear to be one or two other jungle Dipterocarps (e.g. Brabutus or Mirabutus) whose fruits are occasionally sought after but they are not so acceptable as the large Engkabang or the Teglam.

The order of *Sapotaccae* has in Sarawak only one kind of fat producing tree well known to natives and this is the Katio or Kachiau or Ising. The tree grows fairly commonly near the Nipa palms in the tidal swamps of the Saribas and Kalaka districts where the fruit is much sought after. The fruit which is small in size has not been put on the market the natives consuming the whole supply. Under pressure the seeds yield a pale yellow liquid oil which has an odour of bitter almonds. It is much esteemed by natives and the oil is valued at one dollar per gantang. Botanically it is *Bassia Motleyana*.

Another species of Bassia called Katio Antu is used for the same purpose but is not so much valued the fat being rather bitter. The tree grows further inland than the Katio proper. It is known to natives that a number of other Sapotaceous trees produce fatty fruits but only occasionally is the fat extracted, such is the case with the niato minyak which has an oil like Katio, the niato rian, the niato babi and

the jangkar etc., (various species of Palaquium and Payena, some of them producing good gutta percha) : the only reason assigned for their neglect of these fruits is that the trees grow on dry land, away from the mud, where the fruits when fallen are picked up by wild pigs! An oil much used amongst Sea Dyaks is that of the kapayang (*Pangium edule*) a tree which is cultivated by natives throughout the country. The oil is prepared in much the same way as that of Engkabang but great care is taken to wash the seed well in water in order dissolve out the poison. Thus prepared it looks very like coconut oil and is used for purposes of cookery and of dyeing.

According to Mr. C. T. Brooks the Land Dyaks utilise for cookery purposes the oil which they extract from the seed of an Anacardiaceous tree, *Pentaspadon Motleyi*. The fat is not used by other natives probably because they are not satisfied with the quantity obtainable from this source. It may be mentioned that another oil which they extract from the pericarp and from the bark of the same tree is considered a valuable remedy for skin diseases (kurap). The native names for this tree are Emplanjau, Pladju or Empit.

One of the most expensive native oils is the Balong. This is a solid fat, crystalline in appearance, possessing a powerful and pleasing odour like that of Methyl salicylate. It is produced from the seeds of a tree belonging to the Laurineae (a *Litsaea* I think) of which I have seen no specimens. It grows only in the upriver districts and is well known on the Saribas river. To extract the fat the seeds are treated in the same way as those of the Engkabang.

Finally it may be stated that the seeds which are occasionally employed for the extraction of fat are almost innumerable. The Dyaks seem to be able to squeeze out an oil from the most unpromising material. Amongst the better known of these we may mention various species of Nephelium (Serait or seriut, and Mujou, and the Dabai a *Canarium*.

JOHN HEWITT.

CHEMICAL EXAMINATION OF BRUCEA SUMATRANA.

We have received from Messrs. Burroughs and Welcome Laboratories two pamphlets by Drs. F. B. Power and A. W. Salway, and Mr. W. Thomas, giving the results of chemical examination of the barks of *Brucea sumatrana* and bark and fruits of *B. antedlysenterica*, the latter plant being a native of Africa.

The bark of *B. sumatrana* was analyzed by Mr. Thomas, who writes, "A quantity of the bark of this species of Brucea was obtained through the kindness of Mr. H. N. Ridley, Director of the Botanic Gardens, of the Straits Settlements, Singapore. Its collection was attended with considerable difficulty, for as stated in a communication from Mr. Ridley to Messrs. Burroughs Welcome & Co., of London the plant is a tender shrub the stems of which are barely an inch in diameter and the bark not easily removed. It was also noted that although the bark is distinctly less bitter it is much less so than the

fruit, and therefore probably contains less of the bitter principle. The bark was in their strips of a light brown colour externally and paler on the inner surface. In the analysis there was found butyric and formic acid and behenic acid.

The author concludes that in view of the difficulty of obtaining any quantity of the bark of Brucea Sumatrana and the fact that it contains a much smaller proportion of bitter principles than the fruit it would appear that the latter is to be preferred for medicinal use. This would certainly be so as the bark of the shrub in very thin and adheres so closely to the wood that it is very troublesome to scrape it off.

In examining the fruit of the Abyssinian *Brucea antidysenterica* Dr. Power and Dr. Salway find that the constituents of this species are very similar to that of *Brucea sumatrana* and it may consequently he assumed that the two species possess similar medical properties. The bitter principles appear however to be contained in relatively larger amount in the fruit of *Brucea sumatrana* than in that of the Abyssinian species, and in view of the difficulty experienced in collecting the fruit of the latter it is not probable that it will acquire a very extended use.

"It may finally be noted that the Pharmacopaea Nederlandiea. (Editio quarta 1905) has given official recognition to the fruit of *Brucea sumatrana*, Roxb. which is described under the title of Fructus Bruceae and it is there stated that in the Dutch East Indies this is known among other names as "biji makasar" and "tambara maridgi."

It seems therefore from these two papers that the seed of our local species is better either than its bark or the fruits of the African one, and fortunately it is very easy to grow from seed, and fruits heavily in a short time. If a sufficient demand for the fruits could be found. *Brucea sumatrana* would be an excellent catch crop for rubber. The seeds need only be planted two or three feet apart in situs, and no manuring, or other cultivation is necessary. When the fruit commences to ripen it is gathered and simply dried. Each plant will produce about of a pound of dried fruit per year.

H. N. R.

FIVE SEEDED HEVEA FRUIT.

Mr. Lowther Kemp sends two samples of five-seeded fruit of *Hevea braziliensis* from the Sioni Rubber estate forwarded by Mr. E. A. B. Brown the manager. Normally as is well known the *Euphorbiaceae* have three-seeded capsules, whence at one time they were known as *Tricocci*, but occasionally we get abnormalities of this kind.

We have met with fruit of Hevea with two, four and five seeds. Some trees are very irregular in this matter, and one tree in the Singapore Botanic Gardens produced quite a large proportion of four and five seeded capsules on several occasions.

H. N. R.

LALLANG GRASS POSSESSING GOOD PAPER-MAKING QUALITIES FOUND ON RUBBER PLANTATIONS.

By Clayton Beadle.

Lallang (or lalang) grass has come to my notice, more particularly during the last few years, on account of the clearing of rubber estates in the Malay Peninsula from this grass for the purposes of the plantations of rubber trees. It is, of course, regarded by the planter merely as a weed which has to be eradicated. It probably is not known to planters that the utilisation of this grass prior to the introduction of rubber trees formed the subject of a concession fifteen years ago. The idea of cultivating this grass, or even collecting or harvesting it, as a source of profit to the rubber planter would no doubt be scouted; in fact, catch crops generally may be set aside as being hardly worthy of consideration, at least for the present.

But it is as well to look ahead, and the time may come in the East when such products as Lallang grass can with advantage be turned to good account. The East will no doubt grow, in fact is growing, as a field for the papermaker. The utilisation of bamboo as a papermaking material in British Burma is receiving serious consideration at the hands of the Government. I do not wish to suggest that the time has yet come to consider the utilisation of Lallang in the same direction, but the time may come when such a material will have to be used to meet the increasing demands. All I seek to do in this article is to place on record that which has already been attempted in this direction.

The Johore Malay Peninsular Papermaking Concession was granted by H. H. the Sultan with the object of utilising Lallang grass for the manufacture of all classes of paper, and in 1902 a pamphlet was published containing a synopsis of this Concession, with reports of the experiments made. The opinions expressed, as set forth in this pamphlet, would lead one to conclude that this grass is superior to esparto as a papermaking material. The date of the granting of the Concession was February 20th, 1891, wherein H. H. the Sultan of Johore conveyed "to the Concessionaire, or to whomsoever he may assign it, a monopoly to utilise for the manufacture of paper, Lallang Grass and all fibrous plants that are indigenous or can be cultivated in the territory of Johore for the term of fifty-five years, free of rent, taxes or import duty of any kind, in consideration of establishing the papermaking industry in the territory, and turning Lallang Grass, known as the pest of the country, into a valuable commercial product." The concession also covered the right to make use of any clay suitable for paper manufacture, "of which class of clay there is abundance throughout the territory." The Concession provided for "grants of 5,000 acres of Government land to be taken up in blocks, not exceeding 1,000 acres each, for the cultivation of the plantain tree, or other fibrous plants or grasses (other than Lallang) that could be utilised in the manufacture of paper; a grant of 50 acres of land as a factory

site, and also a site of sufficient area for the construction of a wharf or jetty at deep water to admit of ocean-going vessels loading and discharging in event of the factory not being erected close to the sea. The whole of the above were granted for the full term of the Concession free of rent, or taxes of any kind whatsoever, and every facility was to be afforded by the Government of Johore to secure a sufficient and permanent supply of clear soft water, such as is required for papermaking. All machinery, tools, chemicals, or materials of any kind whatsoever, required for the construction of buildings, or in the manufacture of paper or half-stuff were to be admitted into the territory free of import duty during term of the Concession." The Concession also stipulated "that not less than 1,000 tons of paper or half-stuff, or both shall be manufactured per annum after the third year from date of the Concession. The fourth year the Concessionaire must pay to the Government of Johore a royalty of one dollar per ton on all paper or half-stuff manufactured; the fifth year two dollars per ton and the sixth and subsequent years, three dollars per ton."

The Lallang grass grows in wild luxuriance on all cleared uncultivated lands throughout the territory, and is procurable in great abundance on the banks of the river, thus reducing the cost of freight to a minimum. The rivers of the territory may be divided into three watersheds: The Southern, in which the first factory was to have been erected four or five miles to the west of the city of Johore, being then the most populous; the Western is the next in importance, draining the large and populous district of Muar, in which there is a railway constructed (at the time of granting the concession there was in this district 20,000 acres under banana (Musa Paradisiaca) cultivation, and this material, under the very favourable local circumstances, it was thought could be worked up into a raw material of considerable value for papermaking); and the third watershed drains the East coast of the territory. The two latter watersheds were regarded of great importance, as available for disposing of to subsidiary companies if deemed advisable. The cost of cutting and delivering the Lallang at the proposed factory from the waste lands comprised in the Southern watershed was estimated at less than 10s. per ton, but the Concessionaire, when submitting this statement, preferred to estimate it at 15s. per ton.

From estimates obtained at the time, the cost of a complete mill, fitted with all the modern appliances and capable of turning out 3,000 tons per annum of "air-dry" bleached half-stuff, would not exceed £8,000. The freight and erection of the machinery, wharf, buildings, fresh water supply, etc., etc., it was thought would be amply covered by allowing an extra £6,000.

Lallang, it was claimed, could be delivered at a factory in Johore in large quantities for one-sixth the price that esparto then commanded in Great Britain, and for one-third the cost of straw in India or China. The cost for boiling and bleaching is about the same as for treating esparto, and the establishment of the industry under the terms of concession was regarded as possessing the following advantages:—Unlimited quantity of fine clay for loading (free); a monopoly of all fibrous materials their territory produces, adaptable for

the manufacture of paper, including banana, and with a grant of 5,000 acres of land for cultivating fibrous plants, free of rent or taxation; cheaper labour; complete immunity from import duty, rent or taxes, and no inland carriage freight; a large market for the consumption of the material produced in the Straits Settlements, the Eastern Archipelago and Australia.

(*Papermakers' Journal.*)

AGRI-HORTICULTURAL SHOW, 1908.

10TH, 11TH AND 12TH AUGUST.

SPACE FOR TRADE EXHIBITS.

SIR,

I am directed by the General Purposes Committee of the Agri-Horticultural Show, which is to be held on the Malay Settlement Padang, Kuala Lumpor, on above dates, to inform you that a limited amount of space will be reserved for Trade Exhibits.

The building set aside for such exhibits will be an attap shed, 50 feet wide, with a path 10 feet wide running down the centre, leaving 20 feet on either side for exhibits.

A rental at the rate of $2 per foot run for the interior space 20 feet wide will be charged. Applications for space, with full particulars as to nature of exhibits, accompanied by a cheque covering the amount due as rent for the space applied for, should be made to the undersigned not later than 1st June.

All articles for sale must have the prices clearly marked on them.

The Committee reserves the right to refuse any application which is considered unsuitable, and in the event of the space applied for not being granted the money deposited will be returned.

Applicants will be informed not later than 15th June whether their applications have been approved.

I am, Sir,

Your obedient servant,

J. W. CAMPBELL,

Honorary Secretary.

NOTICE ABOUT TRANSPORTATION.

KUALA LUMPUR, 5TH MAY, 1908.

SIR,

In connection with the forthcoming Agri-Horticultural Show, I have the houour to inform you that My Committee has decided to allow

a sum not exceeding $300 for the actual Transport Expenses of Exhibitors and their exhibits coming from Singapore.

Free transport can be had between Port Swettenham and Kuala Lumpur.

I have the honour to be, Sir,

Your obedient servant,

J. W. CAMPBELL,

Hon. Secretary, Agri-Horticultural Show.

INTERNATIONAL RUBBER AND ALLIED TRADES EXHIBITION.

Olympia, London, 14th to 20th September, 1908.

NOTICE, PLEASE READ CAREFULLY.—

Exhibits from a distance should be despatched at an early date so that there will be no doubt about their arrival in time for the Exhibition. Do not leave them until the last day. Arrangements will be made for their acceptance at Olympia on and after 5th September.

Please instruct your Forwarding or Shipping Agents to deliver all goods to the building, through their London Agents, *Carriage Paid;* otherwise they cannot be accepted by the receiving clerks.

Write your name clearly on each label and see that it is well pasted on package. It is also advisable to have your name written or printed on the package as well. Please see that all goods are well and securely packed.

The committee of the Motor Club, (which has one of the largest Club Houses in London at the corner of Coventry and Whitcomb Streets, close to Piccadilly Circus), have most kindly consented to make visitors to London taking part in this Exhibition during the month of September next, Hon. Members of the Club. All that is necessary is to send name and address on arrival in London, to me, so that I can notify the secretary of the Motor Club who will then issue the usual notice.

Please send description of exhibit for insertion in the catalogue, as early as possible. See that names, and other matter, are plainly written as, on account of the distance, it will be impossible to send proof for correction.

Tropical Plants, Trees, Gums, &c.—Please send full particulars and Botanical names.

With each sample exhibit of raw rubber please send the name of the plantation on which it is produced, and if it is being shown in block, biscuit, &c.

Note to visitors to London—Addison Road Station on the Underground Railway adjoins the Olympia, or it may be reached by Piccadilly Tube (Baron's Court Station) thence a few minutes' walk; or by Tube (Central London Railway) to Shepherd's Bush, thence by 'bus or a short walk to the building.

The Offices at 75, Chancery Lane will be closed from the 7th to 30th September, and all business will be conducted from Olympia.

A. STAINES MANDERS,
Manager.

RE AWARDS AND COMPETITIONS.

An erroneous impression, judging by correspondence I have received, has evidently got abroad, regarding the above, so may I briefly explain the position.

1. The Committee think that in this first exhibition it would not be advisable that they should take upon themselves the arranging of rubber competitions for the whole world.

2. They suggest that each country, if they wish to do so, arrange competitions amongst the producers of their own country.

3. Should any producing country wish to arrange for any special prize to be competed for, they are at liberty to do so, and the London Committee is prepared to supply handsome diplomas to exhibitors to whom an award of the following order is made.

Diploma of Honour (highest)
Diploma of Gold Medal
do. of Silver Medal
do. of Bronze Medal
do. of Honourable mention.

But they do not supply medals, just diplomas. If required, they will secure for the committees in other countries, who arrange the awards, to procure medals for them at cost price viz.—Medals made of Composition to represent Gold, Silver and Bronze. The Diploma of Honour would be a Star.

4. The London Committee supply the diplomas free.

5. The Committee has had interviews with numerous experts in London, growers &c., and their opinion generally is, that the competitions should be between producers in each country separately, and that the awards as suggested should meet the case.

NOTE :—Should you desire to have competitions, please arrange for judging.

KINDLY NOTE.

On account of the enormous number of applications for space received, my Committee has found that the Royal Horticultural Hall will be far too small, and has had to secure the Olympia. The exhibition will now be open for two weeks instead of one from the 14th to 26th September.

Applications for space should be made at once. Cost 6/- per square foot ; no other charges.

Please cable requirements—Code A.B.C. 5th Ed. used. Cable address, Maltermass London.

SINGAPORE MARKET REPORT.

April, 1908.

ARTICLES.	Quantity sold.	Highest price.	Lowest price.	
	Tons.	$	$	
Coffee Palembang ...	...	...	...	
Bali	...	27.00	27.00	
Liberian ...	67	24.00	23.00	
Copra	3,450	6.82	6.10	
Gambier	467	7.25	6.95	
Cube Gambier, Nos. 1 & 2...	200	11.50	10.25	
Gutta Percha, 1st quality...	...	300.00	240.00	
Medium ...	...	240.00	80.00	
Lower ...	...	180.00	12.00	
Borneo Rubber, 1, 2 & 3 ...	...	110.00	44.00	
Gutta Jelotong	...	5.12½	3.70	
Nutmegs, No. 110's ...	...	25.50	21.50	
No. 80's ...	...	27.50	23.50	
Mace, Banda	...	88.00	74.00	
Amboyna ...	...	70.00	64.00	
Black Pepper	1,934	13.75	12.00	
White Pepper (Sarawak) ...	252	21.75	20.75	
Pearl Sago, Small ...	315	4.00	3.85	Closing fair.
Medium ...	59	4.50	4.50	
Large	...	...	...	
Sago Flour, No. 1 ...	3,508	3.06	2.89	
No. 2	308	1.27½	1.05	
Flake Tapioca, Small ...	680	7.60	6.85	Closing fair.
Medium ...	...	...	...	
Pearl Tapioca, Small ...	436	5.50 Penang	5.20	
Medium ...	428	7.20	6.60	
Bullet ...	55	8.25	7.75	
Tin	3,236	73.37	64.37½	

EXPORTS TELEGRAM TO EUROPE AND AMERICA.

Fortnight ending 15th March, 1908.

Wired at 6-55 p.m. on 16th March, 1908.

				Tons.
Tin	Str.	Singapore & Penang	to U. Kingdom &/or	1,650
Do.	,,	do.	U. S. A.	267
Do.	,,	do.	Continent	500
Gambier	,,	Singapore	Glasgow	...
Do.	,,	do.	London	50
Do.	,,	do.	Liverpool	225
Do.	,,	do.	U. K. &/or Continent	25
Cube Gambier	,,	do.	United Kingdom	45
Black Pepper	,,	do.	do.	25
Do.	,,	Penang	do.	230
White Pepper	,,	Singapore	do.	260
Do.	,,	Penang	do.	...
Pearl Sago	,,	Singapore	do.	75
Sago Flour	,,	do.	London	50
Do.	,,	do.	Liverpool	750
Do.	,,	do.	Glasgow	50
Tapioca Flake	,,	do.	United Kingdom	160
T. Pearl & Bullet	,,	do.	do.	210
Tapioca Flour	,,	Penang	do.	50
Gutta Percha	,,	Singapore	do.	35
Buffalo Hides	,,	do.	do.	65
Pineapples	,,	do.	do.	cases 38,000
Gambier	,,	do.	U. S. A.	225
Cube Gambier	,,	do.	do.	...
Black Pepper	,,	do.	do.	110
Do.	,,	Penang	do.	170
White Pepper	,,	Singapore	do.	15
Do.	,,	Penang	do.	...
Tapioca Pearl	,,	Singapore	do.	110
Nutmegs	,,	Singapore & Penang	do.	30
Sago Flour	,,	Singapore	do.	200
Pineapples	,,	do.	do.	cases 7,250
Do.	,,	do.	Continent	1,000
Gambier	,,	do.	South Continent	85
Do.	,,	do.	North Continent	250
Cube Gambier	,,	do.	Continent	55
Black Pepper	,,	do.	South Continent	400
Do.	,,	do.	North do.	375
Do.	,,	Penang	South do.	30
Do.	,,	do.	North do.	10
White Pepper	,,	Singapore	South do.	10
Do.	,,	do.	North do.	55
Do.	,,	Penang	South do.	5
Do.	,,	do.	North do.	..
Copra	,,	Singapore & Penang	Marseilles	1,100
Do.	,,	do.	Odessa	150
Do.	,,	do.	Other South Continent	420
Do.	,,	do.	North Continent	1,025
Sago Flour	,,	Singapore	Continent	1,050
Tapioca Flake	,,	do.	do.	85
Do. Pearl	,,	do.	do.	20
Do. Flake	,,	do.	U. S. A.	...
Do. do.	,,	Penang	U. K.	160
Do. Pearl & Bullet	,,	do.	do.	140
Do. Flake	,,	do.	U. S. A.	50
Do. Pearl	,,	do.	do.	400
Do. Flake	,,	do.	Continent	20
Do. Pearl	,,	do.	do.	160
Copra	,,	Singapore	England	300

EXPORTS TELEGRAM TO EUROPE AND AMERICA.

Fortnight ending 31st March, 1908.

Wired at 5-20 p.m. on 1st April, 1908.

					Tons.
Tin	Str.	Singapore & Penang	to	U. Kingdom &/or	1,735
Do.	,,	do.		U. S. A.	280
Do.	,,	do.		Continent	270
Gambier	,,	Singapore		Glasgow	...
Do.	,,	do.		London	...
Do.	,,	do.		Liverpool	...
Do.	,,	do.		U. K. &/or Continent	50
Cube Gambier	,,	do.		United Kingdom	10
Black Pepper	,,	do.	,,	do.	10
Do.	,,	Penang	,,	do.	60
White Pepper	,,	Singapore	,,	do.	80
Do.	,,	Penang	,,	do.	...
Pearl Sago	,,	Singapore	,,	do.	35
Sago Flour	,,	do.		London	150
Do.	,,	do.		Liverpool	220
Do.	,,	do.		Glasgow	...
Tapioca Flake	,,	Singapore		United Kingdom	140
T. Pearl & Bullet	,,	do.	,,	do.	110
Tapioca Flour	,,	Penang	,,	do.	90
Gutta Percha	,,	Singapore	,,	do.	15
Buffalo Hides	,,	do.	,,	do.	10
Pineapples	,,	do.	,,	do.	9,250
Gambier	,,	do.	,,	U. S. A.	...
Cube Gambier	,,	do.	,,	do.	15
Black Pepper	,,	do.	,,	do.	...
Do.	,,	Penang	,,	do.	20
White Pepper	,,	Singapore	,,	do.	...
Do.	,,	Penang	,,	do.	30
Tapioca Pearl	,,	Singapore	,,	do.	10
Nutmegs	,,	Singapore & Penang	,,	do.	10
Sago Flour	,,	Singapore	,,	do.	...
Pineapples	,,	do.	,,	do.	200
Do.	,,	do.		Continent	800
Gambier	,,	do.		South Continent	25
Do.	,,	do.		North Continent	75
Cube Gambier	,,	do.		Continent	20
Black Pepper	,,	do.		South Continent	50
Do.	,,	do.		North do.	240
Gambier	,,	do.		U. S. A.	..
Cube Gambier	,,	do.		do.	..
T. Flake & Pear	,,	do.		do.	...
Sago Flour	,,	do.		do.	...
Gambier	,,	do.		South Continent,	..
Copra	,,	do.		Marseilles	...
Black Pepper	,,	do.		South Continent	...
White Pepper	,,	do.		do.	...
Do.	,,	do.		U. A. S.	...
Pineapples	,,	do.		do.	..
Nutmegs	,,	do.		do.	...
Black Pepper	,,	do.		do.	..
Do.	,,	Penang		do.	..
White Pepper	,,	do.		do.	...
T. Flake & Pearl	,,	do.		do.	...
Nutmegs	,,	do.		do.	...
tons Gambier					200
,, Black Pepper					825

				Tons.
Black Pepper	Str.	Penang	South Continent	10
Do.	,,	do.	North do.	...
White Pepper	,,	Singapore	South do.	10
Do.	,,	do.	North do.	35
Do.	,,	Penang	South do.	10
Do.	,,	do.	North do.	5
Copra	,,	Singapore & Penang	Marseilles	400
Do.	,,	do.	Odessa	620
Do.	,,	do.	Other South Continent	500
Do.	,,	do.	North Continent	320
Sago Flour	,,	Singapore	Continent	550
Tapioca Flake	,,	do.	do.	60
Do. Pearl	,,	do.	do.	...
Do. Flake	,,	do.	U. S. A.	...
Do. do.	,,	Penang	U. K.	20
Do. Pearl & Bullet	,,	do.	do.	100
Do. Flake	,,	do.	U. S. A.	...
Do. Pearl	,,	do.	do.	575
Do. Flake	,,	do.	Continent	10
Do. Pearl	,,	do.	do.	160
Copra	,,	Singapore	England	...
Gambier	,,	do.	U. S. A.	...
Cube Gambier	,,	do.	do.	...
T. Flake & Pearl	,,	do.	do.	...
Sago Flour	,,	do.	do.	...
Gambier	,,	do.	South Continent	...
Copra	,,	do.	Marseilles	..
Black Pepper	,,	do.	South Continent	...
White Pepper	,,	do.	do.	...
Do.	,,	do.	U. S. A.	..
Pineapples	,,	do.	do.	
Nutmegs	,,	do.	do.	...
Black Pepper	,,	do.	do.	...
Do.	,,	Penang	do.	...
White Pepper	,,	do.	do,	..
T. Flake & Pearl	,,	do.	do.	...
Nutmegs	,,	do.	do.	...
tons Gambier				250
,, Black Pepper				1,000

CEYLON, STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

March 20th, 1908.

The following Lots, comprising about 40 Tons Straits and 20½ Tons Ceylon, were offered at Auctions to-day and sold as follows:—

STRAITS AND MALAY STATES.

Mark.	Pkgs.	Description.	Price.
Highland	8	Cases Rolled Sheets ...	bought in
Estate	23	,, Crepe ...	,,
	1	,, ,, ...	,,
Simpang	1	,, ,, ...	,,
Pataling	17	,, ,, ..	,,
Linggi	9	,, ,, ...	,,

Mark.	Pkgs.	Description.			Price.
	8	Cases Sheets		.	bought in
S. P.	13	,, ,,		...	,,
	4	,, Biscuits		...	,,
Sungei Krudda	29	,, Crepe		..	,,
	4	,, Sheets		...	,,
Glanrhos	28	,, Crepe		...	,,
	3	,, Biscuits		...	3/3¾ at 3/4
Linggi Plant's Ltd.	1	,, Crepe		...	bought in
B. R. R. Co., Ltd.	29	,, Sheets		...	,,
	14	,, Crepe		...	,,
N. H. R. Co., Ltd.	6	,, Sheets		...	,,
	2	,, Crepe		...	,,
	4	,, Block		...	,,
F. S. R. Co., Ltd.	13	,, Sheets		...	,,
	4	,, Crepe		...	,,
C. M. R. E., Ltd.	50	,, Crepe		...	,,
K. B. L.	3	,, Crepe		...	,,
P. P. R. E. J. B., Shelford.	10	,, Sheets		...	3/4 bid
	4	,, Crepe		...	bought in
Damansara	13	,, Crepe		...	,,
V. R. Co., Ltd. Klang F.M.S.	20	,, Sheets		...	3/5
	83	,, Crepe	19 sold	...	3/1½ at 3/7½
S. R. Co.	33	,, Sheets		...	bought in
	37	,, Crepe		...	,,
R. S. R.	13	,, Sheets	11 sold	...	3/5, 3/5¼
	9	,, Crepe	6 sold	...	3/-
Perhentian	14	,, Sheets		...	bought in
Tinggi Estate	16	,, Crepe		...	,,
B. & D. F. D. P.	19	,, Sheets		...	2/8 at 3/5¾
B. & D.	5	,, Crepe		...	bought in
	7	,, Sheets		...	,,
Matang	32	,, Crepe		...	,,
	5	,, Scrap		...	,,
B. M. & Co., Ltd.	10	,, Sheets		...	,,
H. T. P.	5	,, Scrap		...	,,
L. E. MUAR	53	,, Block No. 1		...	,,
M. B. E.	17	,, ,, No. 2		...	,,

Mark.	Pkgs.	Description.		Price.
R. M. P. Ltd.	7	Cases Crepe	...	3/4½ at 3/5½
S. K. R. Co., Ltd.	21	,, Crepe	..	bought in
	5	,, Scrap Crepe	...	bought in
Damansara Selangor	1	,, Block	...	2/5
B. & D.	3	,, Scrap	...	1/3
F. D. P.				
S. S. B. R. Co., Ltd.	3	,, Sheets	...	3/5¼
	3	,, Crepe	...	bought in
Golconda	1	,, Biscuits	...	3/4½ bid
	6	,, Crepe	...	bought in
	2	,, Sheet	...	3/5
Jebong	4	,, Crepe	...	bought in
S. & D.	4	,, ,,	..	,,
B. R.				

CEYLON.

New Rasagalla	2	Pkgs Scrap	..	bought in
Gikiyanakande	17	Cases Worms	...	,,
	11	,, Crepe	...	,,
Kepitigalla	32	,, Sheets	...	,,
	8	,, Scrap	...	,,
Suduganga	2	,, Biscuits	...	,,
Old Haloya	2	,, ,,	...	,,
W. L. P.	23	,, Crepe	...	,,
L. | B. L. | H.	1	,, Scrap	...	,,
G. D. J.	13	,, Crepe	..	,,
Aberdeen	4	,, Sheets	...	,,
	1	,, Scrap	...	,,
G. H. Z.	8	,, Biscuits	...	,,
P. W.				
Clontarp	2	,, ,,	...	3/3¼
Glanrhos	9	,, ,, 6 sold	...	3/3⅜ at 3/4
	26	,, Crepe	...	bought in
Welkandala	2	,, Biscuits	...	,,
	1	,, Crepe	...	,,
Ambaganga	2	,, Sheets	...	,,
	2	,, Biscuits	...	,,
	2	,, Block	...	,,
Dangan	4	,, Biscuits	...	3/4¾
	2	,, Scrap	...	1/9 & 2/4

Mark.	Pkgs.	Description.			Price.
Kahagalla	12	Cases Crepe		...	bought in
Galatura	4	,, Scrap		...	,,
Kayigam	8	,, Biscuits		...	3/5
D. M.	2	,, Biscuits		...	bought in
C. B. E. C.	10	,, Crepe		...	,,
Ellakande	1	,, ,,		...	3/-
Culloden	14	,, ,,		...	3/-
Ingoya	11	,, Sheets		...	bought in
B. S.	9	,, Biscuits	2 sold	...	3/5
Ingoya	23	,, Blocked Sheet		...	bought in
	7	,, ,, Scrap		...	2/4 at 2/6
Glenoorse	2	,, Biscuits		...	3/5 bid
	2	,, Scrap		...	2/2at 2/5½
D. G. H. & Co.	25	,, Crepe		...	bought in
	3	,, Biscuits		...	,,
G. D. J.	36	,, Crepe		...	,,
Taldua	5	,, Biscuits		...	3/5 at 3/5¼
	3	,, Scrap	1 sold	...	2/5
Y. G.	2	,, Scrap		...	2/4
Waharaka	2	,, Biscuits		...	3/5
Ayr	1	,, Sheets		..	3/5¼
Sunnycroft	1	,, ,,		...	3/5
Clara	1	,, Biscuits		...	3/5
	1	,, Scrap		...	2/5
Rangbodde	1	,, Biscuits		...	3/8
Doranakande	2	,, Sheets		...	3/3
R. S. R.	10	Pkgs. Scrap		...	2/5 2/5¼
	1	Cases Biscuits		...	3/5½
	4	,, Scrap		...	bought in
Ambatenne	1	,, Biscuits		...	3/-
	1	,, Scrap		..	2/6
Elston	1	,, Biscuits		...	3/5
	4	,, Scrap	2 sold	...	2/7¾
Kumaradola	3	,, Biscuits	2 sold	...	3/5
	2	,, Scrap		...	21¼ at 2/4¼
Tudugalla	6	,, Crepe		...	bought in

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THE CULTIVATION OF PEPPER IN SARAWAK.

By J. Hewitt.

For many years the cultivation of the *Piper nigrum* has been one of the staple industries of Borneo: it was mentioned by the earliest European travellers as a valuable product of the country, and by the end of the eighteenth century the spice was so much cultivated that there were said to be in Brunei no less than 30,000 Chinamen of whom the majority were pepper planters.

The vine is not however indigenous to Borneo and it must have been introduced at an early date by Chinamen or possibly by Indians. Of late years at any rate the industry is entirely in the hands of the Chinaman whom nature has endowed with a temperament particularly suitable for this kind of agriculture. For the successful growing of pepper it is desirable that each individual vine should receive constant and careful attention and accordingly the celestial husbandman pets and cares for his vines as if they were his children.

With such an essential to success, pepper growing does not commend itself to the native of Borneo whose "forte" lies rather with fruit trees.

The chief pepper growing district of this country is in Upper Sarawak, but pepper gardens are also found on the Rejang and Batang Lupar rivers and in fact in the neighbourhood of any port, provided that suitable land can be obtained.

The site usually chosen for a garden is on sloping ground which can be well drained, and they appear to pay as much attention to the facilities for draining as to the quality of the soil. In fact, the soil of an average pepper garden in Upper Sarawak is a stiff yellow clay of poor quality. Nevertheless, the Chinaman wherever possible chooses a soil which experience has shewn to be most productive and in Upper Sarawak for instance he has followed the porphyry dykes: a sandy soil is usually avoided.

Before entering into details concerning its cultivation perhaps it will be well to mention very briefly a few of the obvious features of this well known plant.

The stem is climbing, becoming stout and shrubby and reaching a height of ten feet or more: the branches are rooting at the rodes: the simple leaves are glabrous, petioled and coriaceous, in size 5-7 inches by 2-5 ins., the upper leaves being unequal sided: the flowers are minute on numerous spikes several inches long: the fruit is small round berries which are red when ripe.

In most pepper gardens there are to be found two varieties of vine the small—leaved and the large—leaved. The former, being more fruitful is preferred before the large leaved variety of which there may be only a few representatives in a garden. On the large—leaved vine, many of the leaves are quite like those of the other variety but some few are considerably larger. Presumably, cuttings from small leaved vines always yield vines of that variety, so that if the pepper gardeners seriously attempted it, they could exclude the less fruitful form altogether.

Most gardens contain one or two representatives of a third kind of vine, the so called male. This is indistinguishable from the small leaved vine until the fruiting season when the 'male' produces only a small quantity of fruit.

I have not been able to examine the flower spikes of these 'male' vines but presumably such would be found to be unisexual, the male flowers predominating. The flower spike of an ordinary vine is made up of numerous hermaphrodite flowers each consisting of an ovary capped by three tiny stigmas, and a pair of small stamens: the stigmas ripen before the anthers.

Some gardeners look with favour on the 'male' vines and one man told me that in case a garden had no 'male' it was customary to grow a Sireh (Piper betle) vine to act as such! However this may be it certainly is usual to find at least one Sireh vine in each pepper garden.

For the following information relating to the methods employed by Chinese agriculturalists in Upper Sarawak, I am indebted to Mr. Gerald Dalton of Busan who for several years has resided in the midst of the pepper growing area.

Position.—The best position for a garden is a plain gently sloping towards the east and sheltered on either side.

Preparation of the Ground. It usually happens that the land he has chosen is covered with jungle and this has to be felled and burned. The destruction of the jungle trees is complete, even the stumps and roots being unearthed after the general conflagration is over: these stumps are collected into heaps and used in making the burnt earth hereafter described. Then the ground is lined out and sticks are placed at proper intervals, 6 ft. by 6 ft. apart to mark the positions of the future vines, drains being allowed for where necessary. The ground is now left for a month or two to dry, meanwhile being kept free from weeds: during this time good drains are made all round. After this the ground in the immediate neighbourhood of the sticks is well hoed to the depth of a foot and is then piled up to form small mounds around

the sticks to a height of about 18 ins.: to these mounds is carried the burnt earth obtained from the burning of the stumps. The garden is now ready for planting.

Planting. The pepper vine is invariably propagated by cuttings obtained from the terminal shoots of young vines which are only about five or six feet high and from 1½ to 2½ years old. The cuttings are from 1½ to 2 ft. long and are planted straight out, nurseries being unnecessary. Usually they are arranged in the soil at an angle of about 45° and are pointed to the East: some five or six internodes should be covered by soil, the lowest one being about six inches deep: the top of the cutting leans against the stick. Above, protection from the sun's rays is afforded by a covering of fern leaves or grass, one to each cutting, and this protection is continued for several months, until in fact the young plant has attained a fair hold. Planting is usually performed in January during the wet monsoon.

Treatment of Vines. Within a week or so of being planted, each vine receives a first application of burnt earth, a few handfuls, and afterwards this is applied regularly every four months.

Whenever it becomes necessary, the young shoots are tied to the stick with soft bark or twine. After six months or more these temporary supports are replaced by the permanent posts which are of the hardest wood obtainable and of the dimensions 12 feet long by 4 ins. or more square. This post is fixed vertically two feet deep in the centre of each mound and the vine is transferred to the post.

Three main shoots only are allowed to climb up the post and these are tied to their support at every internode. Formerly it was customary to pull down the main shoot and to coil it spirally round the post so as to obtain a more bushy vine: nowadays this is no longer practised.

About this time the flower spikes may appear in which case they should be at once picked off. It is the custom of the pepper gardeners to prevent sporadic fruiting, which is liable to occur almost any time in the life of the vine, and thus to concentrate on the proper annual crop. When the vines are about a year old, all those from which cuttings are to be taken are pruned so as to leave one main shoot only. This is allowed to grow for six months or more and is then cut off: this is the cutting which is ordinarily employed in planting. After this, around the roots of each vine a quantity (half a catty) of prawn refuse is spread: the valuable manure is applied in preparation for the first fruiting. In the ordinary course of events fruiting occurs during the succeeding year and now the gardeners are particularly busy with weeding, draining, the regular application of burnt earth, and with spraying operations. Judicious pruning is also necessary for producing bushy vines: by the time it has reached the top of its post a vine has been pruned at least three times. When the vine is from 2¼ to 2½ years old the first crop is over, the yield being estimated at from 1 to 1½ catties of white pepper per vine (four to six catties of green pepper). By the end of another year, the vine being 3½ years old, the plant has reached the top of its ten ft. post and is considered to be full grown: the crop of that year is estimated at three catties per vine. In each year the fruiting period extends over some months, the main crop being produc-

ed between August and December. Each season, when fruiting is nearly over, a catty of prawn refuse is supplied to the roots of each vine; this is the manure for the next season's crop. The average life of a vine is from 10 to 12 years, but this depends very much on the care bestowed on its cultivations.

Crop. In a well conducted garden the fruiting vines are covered with fruit spikes and each spike is thick with many well formed berries. As everybody knows, the white pepper and black pepper of commerce are products to the same vine, the difference between them depending simply on after treatment of the picked berries. Botanically speaking, black pepper is the entire fruit whilst white pepper is the seed only. When preparing white pepper the spikes of fruit are picked off just as they are turning red: the berries are loosened from the spike stalk by pressing underfoot. These berries are collected and tied up in large bags which with their contents are allowed to soak in water for a week or ten days. It is usual to arrange for running water which receives the full heat of the sun as the decomposition of the skin on the pepper corns is thereby accelerated. When the skins have become sufficiently loose, the pepper is put into tubs where it is stamped underfoot and well washed until all the skins and stalks have been removed. Finally, the pepper corns which remain are spread out on mats and dried in the sun: the product is now ready for the market.

In making black pepper, the fruit is picked before it is ripe, earlier than would be the case if white pepper were the object. It is then spread out on mats to dry in the sun, and as it dries, the skin of the pepper corn turns black: afterwards it is rubbed by hand so as to separate the berries from the stalks which latter are winnowed out. A better method of preparing the article is to boil the fresh berries in water for a short time and then dry them as above. In this way the skins are rendered tougher and the skins have a more uniform colour.

Insecticides. The spikes of flowers and of fruits of the pepper vine are the victims of insect attack and to prevent partial or even etire loss of the crop it is absolutely necessary to resort to insecticides. The Chinaman always employs for this purpose a watery extract of crushed 'tuba' (Derris elliptica) and strong tobacco. This is applied to the flowers from a syringe and it proves very effective: the smell of the tobacco clings to the garden for several days. The proportions commonly adopted are one catty of 'Tuba,' one catty of Tobacco, and five gallons of water: such a quantity would be sufficient for ten vines. It is usual to apply the insecticide three times, at intervals of a week or more, while the fruit is setting. This insecticide although excellent for its purpose is comparatively expensive: in 1907 the price of 'Tuba' was 8-12 cents per catty and of tobacco 35 cents per catty.

Labour. It usually happens that the man in charge of a pepper garden is also the owner—it is often heavily mortgaged—and this man may be sufficient for a small garden. However, as already mentioned the pepper vine requires much personal care and it is found that one coolie cannot properly deal with more than 400 vines. In gardens of 1,000 vines or more it is the costom to employ one or two "Sinkehs" (indentured coolies) who cost from $30 to $60 each for the year not

counting food and clothing. With a good gardener to look after them their work is better and cheaper than that of the ordinary free coolie who works for a monthly wage.

The foregoing represents in brief outline the unvarying routine of a Chinaman's pepper garden. When the price of pepper was high it was possible to make large profits, but at the present day with an abnormally low price for the product, it is difficult for the average gardener to pay his way. So depressed is the industry that hundreds of gardens have been completely abandoned of late years and only those are likely to continue who, having a little capital of their own, can afford to run the concern unassisted by the merchant money lender.

At the present time (1908) the price of pepper in Kuching is $17 per picul whereas a few years ago it had reached a price of more than $60 per picul. (The exchange value of the dollar was then only about $\frac{3}{5}$ of the present dollar).

Considering the magnitude of the pepper industry it is somewhat unfortunate that so little has been attempted in the way of possible improvements in the methods of working. It is very unlikely that the Chinese agriculturist will care to experiment with western novelties, but nevertheless it would seem quite possible that some appreciable reductions in the cost could be effected; and thereby an industry which is threatened almost with extinction could be considerably resuscitated. The Chinese gardener is at present obliged to endure unnecessary expense in his insecticide and apparently also in the manure. The costly item of the insecticide is Tobacco and so far, a satisfactory substitute has not appeared. Very recently, a series of interesting experiments have been conducted by Mr. R. E. Hose of Busau in the hope of providing cheaper insecticides, and artificial manures, but the results are as yet inconclusive. These experiments have certainly proved the excellence of the Chinaman's insecticide and although it will no doubt be possible to replace it by a cheaper one, nevertheless, the problem is by no means easy, as the pepper vine is very sensitive, quickly dropping its leaves if subjected to drastic treatment. At any rate an improvement can be effected by the use of a better spraying apparatus, the one used by the Chinaman being a comparatively coarse syringe.

As regards the manurial treatment, we are here presented with a question of some interest. I have previously mentioned that each vine should be supplied at regular intervals with certain amounts of prawn dust and burnt earth, and that the soil is ordinarily of poor quality: yet not infrequently does it happen that a gardener unable to afford prawn dust manures his vines with burnt earth only and for years good crops have thus been obtained. To the pepper grower, burnt earth is of primary importance and it is considered to be an absolute essential. The method of preparing it is simple but it requires sound judgment and care to produce burnt earth of the best quality. In one corner of his garden, the labourer spreads out a quantity of brushwood and over this some logs of wood cut from the jungle; on the top of this comes another layer of brushwood and over the whole is heaped up a large quantity of soil. The heap is fired

from below and after some days or weeks when the burning has ceased, it is broken up and after the unburnt pieces of wood and charcoal are removed—the gardener considers that charcoal in the proximity of pepper roots fosters fungoid disease—the whole is mixed up together. Thus is produced burnt earth which varies much in quality according to (1) the kind of soil used to produce it, and (2) the nature of the combustions. The soil preferred for this purpose is a mixture of jungle soil rich in humus, and ordinary yellow clay of the garden : if jungle soil only be used, it often acts as a complete damper. During the burning, it is most important that the combustion shall be slow and that the earth as a whole shall not be overheated as baked earth is useless. If the top or sides fall in during the burning the aperture must be filled up lest the burning be accelerated.

Thus prepared it is obvious that the soil which is in the immediate neighbourhood of the burning logs becomes quite overburnt, and the most valuable part of the heap is the black middle stratum. Wherein lies the indisputable virtue of burnt earth is somewhat doubtful, but one may expect it to possess several points of superiority over unburnt earth viz.

(1) in the absence of living organisms, fungi bacteria, etc.
(2) in the presence of wood ashes.
(3) in the presence of the products of the incomplete combustion of the wood.
(4) in the presence of the products of partial decomposition of the organic matter contained in the jungle soil itself.
(5) in the increased porosity of the product. So far as I know, no experiments have been undertaken to elucidate this problem.

The manure proper of the pepper gardener is prawn refuse and this is excellent. It is rich in organic matter, in phosphates and in Calcium salts and moreover has a great advantage over ordinary chemical manures in that it is not too easily soluble and is not liable to be entirely dissolved by the first shower of tropical rain. Nevertheless, it is expensive and the supply is not unlimited.

An account of pepper cultivation would not be complete without some mention of diseases resulting from insect ravages and other causes. Very formidable pests are certain small plant bugs which attack the flowers and the setting fruit. When the flower spikes appear, there may be seen flying about the vines a number of small black insects each armed with a long spine on the back and one on either shoulder; these settle on the flowers and feed thereon. The insects belongs to the *Membracidae* and is a species of *Centrotus*. Another plant bug, but one much more sluggish is a small black flattened creature which crawls along the spike destroying the flowers. It is one of the *Tingididae* and is called *Elasmognathus Hewitti*. Still another flower-eating creature belonging to the same order is a small flattened insect, green in colour, its sides fringed with tiny spines. This is an immature form whose adult I have not seen : it may be a *Centrocnemis*. This pest is very sluggish, but it is a serious one.

Another insect, a destructive Coccid, attacks the young setting fruit. It appears in numbers on the fruit spike as small but stout soft bodied creatures covered with a white fluff, and on their attack, the flower spike withers and blackens : the whole of the berries on a spike may thus be destroyed. This insect is attended on by colonies of Ants (Cremastogaster rogenhoferi) which probably are responsible for the spreading of the Coccid. The four pests just mentioned are always a menace to the pepper grower and his only remedy, quite an effectual one, is the insecticide already mentioned. The insects are all indigenous and no doubt they find a happy feeding ground on the abandoned vines.

It occasionally happens that the pepper leaves are attacked by caterpillars, but I have only once met a case : this caterpillar, belonging to a *Limacodid* moth, was a green oval disc beset laterally with hairy processes, and covered all over with irritant hairs. A more destructive caterpillar is one which bores the stem penetrating at the base of a petiole. Subsequently the stem withers up and part or the whole of a vine may be destroyed.

The roots are also subject to the attacks of insects : not infrequently, certain white ants commit ravages on the root system and the plant may suffer considerably. Occasionally too, some damage is done to the roots by the presence of large fat grubs, dirty white in colour and sparsely covered with short brown hairs : these burrow in the ground and by their movements disturb the delicate vine roots though they do not appear to feed thereon. The large grubs are larvae of a stag-horn (Dynastid) beetle and may be those of Oryctes rhinoceros, the well known coconut beetle. An application of limewater to the neighbourhood of the roots is considered effectual in driving away the intruder. The most serious disease from which the roots are apt to suffer is of rather obscure cause though most probably it is to be attributed entirely to the action of fungi. The symptoms are a serious shedding of the leaves usually throughout a well defined area of the vine which is in relation with the fibro-vascular bundles coming from the affected part of the root. A clever gardener can usually guess which part of the root system is damaged and he proceeds to remove the earth so as to explore the sickly area. Then he scrapes or cuts away the blackened tissue and allows the cut surface to dry directly exposed to the sun's rays. Afterwards he replaces the earth and the vine usually recovers. This disease is more likely to occur in the damp parts of a pepper garden. The roots of pepper appear to be specially sensitive to water, and prolonged rains sometimes bring about the rotting just mentioned. Drought also is prejudicial and may cause the leaves to drop off.

JOHN HEWITT.

PATCHOULI.

(*Pogostemon Patchouli*, var. *suavis*, Hk. f.=*P. Cablin*, Benth.)

Patchouli has already been the subject of several articles in the *Kew Bulletin*. The earliest notice [K.B. 1888, p. 71] deals mainly

with the source of commercial Patchouli; the second [K.B. 1888, p. 133] and third [K.B. 1889, p. 135] are chiefly concerned with the cultivation of the plant and the trade in Patchouli; the latest [K.B. 1902, p. 11] discusses the identity and range of distribution of another plant, *Microtoena cymosa*, Prain, which has the same odour as the Patchouli of commerce.

In the first of these notices of Patchouli is given the text of a letter [K.B. 1888, p. 73] addressed by Kew to the Government of India on 30th January, 1888, in which the information then available and the points still requiring elucidation are clearly and precisely put.

As the letter states the true Patchouli plant is free from ambiguity; it is the *Pogostemon Patchouli* described and figured by Sir William Hooker in the Kew Journal of Botany, vol. i., p. 328, t. 11, from cultivated specimens. This stands in the Flora of British India, vol. iv., p. 634, as *P. Patchouli*, var. *suavis*. The letter further records an opinion expressed by Professor D. Oliver that it is doubtful whether this particular form, which is the economic plant of commerce, be indigenous in any part of India. This opinion has, since 1888, been fully confirmed. The economic Patchouli plant, which is abundantly cultivated in the Straits Settlements, almost exclusively by Chinese immigrants, is an exotic so far as India is concerned. The plant occurs in the chief Botanic Gardens in India and Ceylon, but in private gardens, whether native or European, it is practically unknown. It was introduced to the Royal Botanic Garden at Calcutta is 1834, when Dr. Wallich received plants from Mr. G. Porter, then in charge of the Botanic Garden at Penang. At Calcutta the plant has never flowered, though descendants of the original plants, vegetatively propagated, still exist and thrive there. It has never flowered in the Botanic Garden at Saharanpur, where it was introduced from Calcutta. At the Royal Botanic Garden, Peradeniya, Dr. Trimen informed the writer it had not flowered during his directorship, and there was no record of its having flowered before his arrival in Ceylon. At Singapore, according to Mr. Hullett, no one had ever heard of its flowering; the evidence adduced by Mr. Wray [K.B. 1889, p. 136] points to its never having flowered at Penang or in Perak during the preceding 30 years. There are specimens at Kew which show that this plant is, or has been in cultivation in Java and in Mauritius; in these islands also it appears never to flower. But there is no definite record of its cultivation on a commercial scale anywhere save in Penang and Perak.

There was no evidence in the Kew Herbarium in 1888, and there still is none, of the existence of any form of *Pogostemon Patchouli*, scented or scentless, in the Khasia or Assam region. The same was then and still is true of the Calcutta Herbarium. But the same is still true, as regards both Herbaria, of China, so that the additional suggestion made in 1888 by Professor Oliver, that the Patchouli plant of commerce may have originated in China, still lacks confirmation. Such a suggestion, seeing that the Patchouli plant of commerce is cultivated by the Chinese in the Straits Settlements, was certainly an extremely natural one to make. It now seems unlikely, however, that it may ever be confirmed. Not only has no *Pogostemon* with the Patchouli odour been reported from China; we are now aware that, though

Patchouli is well known in China, the Chinese Patchouli plant is neither the Patchouli plant of commerce nor the Indian Patchouli plant, but is the plant with the Patchouli odour alluded to in the Kew Bulletin for 1888 as occurring in Khasia and Assam.

This latter plant, *Microtoena cymosa*, Prain, has been already dealt with [K.B. 1902, p. 11], and it is only necessary to repeat here that it is a Chinese species which seems to have spread southward, as a cultivated plant, to Manipur and the Khasia Hills in Assam and to the Shan States of Burma and Siam. There is, indeed, an isolated record of its having reached Java, not improbably as an importation by Chinese settlers; its cultivation there has not, however, persisted, and there is no indication that it ever reached Sumatra, Borneo or the Malay Peninsula.

It was pointed out [K.B. 1888, p. 74] that if this plant has the true odour it may have a commercial use in India. We know now that it possesses the distinctive odour in as marked a degree as the Patchouli plant of commerce itself. We know besides that though it is not now used commercially in India there was a time when this was the source of the Patchapat sold in the Calcutta market, in contradistinction to the market of Bombay, where at one time the Patchapat offered for sale was derived from a cultivated state of *Pogostemon Heyneanus*. In both markets, however, the Patchapat—Patchouli leaf—formerly sold has now been almost if not quite replaced by the leaf of the Patchouli plant of commerce, imported from the Straits Settlements. The cultivation of *Microtoena cymosa* lingers still in native gardens in the Khasia Hills, where its product is locally used; and that of *Pogostemon Heyneanus* is similarly continued in native gardens throughout the Indian Peninsula from the Concan and Berar southward to Coimbatore.

This latter possibility was fully anticipated in the earliest notice of Patchouli in this Bulletin [K.B. 1888, p. 74]. The scented cultivated form in question differs from the feral states of the plant, mentioned in the same place as being of common occurrence in the Western Peninsula of India from Bombay southward, chiefly in having leaves that are of a slightly thicker consistence. These feral states, of which there are two, both extending to Ceylon, are not clearly indigenous in any part of India. One form, much more frequently met with than the other, was described by Bentham in 1830 as *Pogostemon Heyneanus*—he had used the name for the first time [Wall. Cat. Lith. 1532] two years previously. The other form was later distinguished by Bentham as *P. Heyneanus*, var. B.

The more plentiful of the two forms is not, however, confined to India and Ceylon. It is not uncommon in Java, Sumatra, and Borneo; in the Malay Peninsula it has been collected in almost every province. So far it does not seem to have been recorded from any Malay locality to the east of Borneo, but what may be another form of the speciesa occurs in the Southern Shan states of Burma, side by side with the Chinese *Microtoena cymosa*, and the commoner Indian and Malayan form has more recently been found in the Philippine island of Mindanao, though as yet nowhere else in that group. When the nature

of its habitat has been noted, whether in India, Malaya, or the Philippines, the records are very uniform; it is stated to occur in exposed sunny waste places; in waste ground near villages; at or near cleared camping grounds; near sites of abandoned dwellings; or in native gardens. The form that occurs in native gardens in India and Ceylon is also met with in gardens in Java; the same form has also been collected in Tonkin. So far, however, it has not been reported from Sumatra, the Malay Peninsula, or Borneo.

Though the name Patchapat—Patchouli leaf—is probably applied indifferently in Indian bazaars to any leaf that has the characteristic Patchouli odour, there is no doubt that in Indian gardens in which the plant is grown the vernacular names Patchouli and Patcha are applied exclusively to the *scented cultivated state* of *P. Heyneanus*, with leaves rather thicker than those of the wild plant. The name *P. Patchouli*, which was first applied to *P. Heyneanus* by Dalzell and Gibson [Flor. Bomb. Addend. p. 66] in 1861, and was subsequently adopted in the Flora of British India, vol. iv., p. 633, is on this account very appropriate. Unfortunately, however, the name *P. Patchouli* connot be employed for the plant to which the vernacular term Patchouli is alone applied; first, because the Indian plant known to the natives as Patchouli or Patcha had already been named *P. Heyneanus* in 1828; again, because the name *P. Patchouly*, which was used by Pelletier for the first time in 1844, was not applied by him to the plant known in the Indian vernaculars as Patchouli, but was given to the Patchouli of commerce, which is not an Indian plant at all.

This Patchouli of commerce, as already explained, stands in the Flora of British India as *Pogostemon Patchouli*, var. *suavis*. Now, however, that fuller material is available, it is found that the two Pogostemons which possess the Patchouli odour, viz.:—*P. Heyneanus*, Benth., or *P. Patchouli*, Dalz. and Gibs., the cultivated plant known in Indian native gardens as Patchouli, and *P. Patchouli*, var. *suavis*, the Patchouli of commerce, are even more distinct than they were thought to be when the account of the genus *Pogostemon* was drawn up for the Flora of British India. They admit of being treated as specifically separable. In *P. Heyneanus* the leaves are much thinner and are sparingly puberulous, are almost smooth; the flowers, which are freely produced in all the countries in which the plant has been found, are in small whorls less than half an inch across, separated by distinct interspaces throughout the spikes in which they are arranged; the corolla is glabrous outside except for a few hairs on the margin of the lower lip. In the Patchouli plant of commerce the leaves are thicker and firmer, and are densely pubescent, especially beneath; the flowers, which are freely produced only in the Philippines but which have occasionally been met with also in European cultivated specimens, are in larger whorls, three-quarters of an inch across, which are contiguous throughout the spikes in which they are arranged, or have only the lowest whorl separated by an interspace from the rest of the spike; the corolla is uniformly pubescent outside.

The Patchouli plant of commerce has been differently named by different authors. Tenore, who flowered it in Italy in 1847, described

t [Giorn. Bot. Ital., vol. ii., p. 56] as *P. suavis*. Sir William Hooker, who had received a plant of *P. suavis*, Ten., which flowerd at Kew in 1849, described it as *P. Patchouli*, under the impression that it was in reality identical with the plant described by Pelletier, with whom it had flowered in France in 1844, as *P. Patchouli* [Mem. Soc. Sc. Orleans, vol. v., p. 277, t. 7]. The identity of *P. suavis*, Ten., with *P. Patchouly*, Pellet., was not admitted in the Flora of British India, and in that work it has been suggested that the plant to which Pelletier's description applies is the cultivated plant to which the Indian vernacular name Patchouli belongs, rather than the plant which yields the Patchouli of commerce. Now, however, that better material of the Patchouli plant of commerce has reached Kew from the Philippines, where it is sometimes grown in gardens, and where, as Merrill has recently ascertained, it is oftener wild, and is undoubtedly indigenous, it is found that Sir William Hooker's conclusions are certainly right. His identification of *P. suavis*, Ten., with *P. Patchouly*, Pellet., and his treatment of this plant as a quite distinct species, must both be sustained.

We are, however, fortunately relieved of the necessity of using for the Patchouli of commerce the name *P. Patchouly*, applied to it by Pelletier. In the Philippines, where the plant is native, it bears the vernacular name Cablan. This name was taken up by Blanco, who described the plant for the first time under the name *Mentha Cablin*. The plant was duly transferred by Bentham to its proper genus as *Pogostemon Cablin*. Bentham has thus provided a name for the Patchouli of commerce which has the double advantage of being botanically admissible and at the same time free from ambiguity.

So far then as Patchouli is concerned one or two points appear still to be obscure. It is not clear where the plant known to the natives of India as Patchouli or Patcha is indigenous, though on the whole it is probably a native of the western portion of the Indian Peninsula, as suggested in the *Kew Bulletin* for 1888, p. 74. Nor is it clear when the wild Philippine species, which is the source of the Patchouli of commerce, first began to be cultivated, or how this plant should have found its way into the hands of the Chinese immigrants who cultivate it in the Straits Settlements.

Two adulterants are mentioned by Wray [K. B. 1889, p. 137] as being added to commercial Patchouli. One of these, Perpulut, elsewhere [K. B. 1888, p. 71] termed Bupulut, is correctly given as *Urena lobata*, Linn. The other, Ruku, is stated to be *Ocimum Basilicum*, Linn., var. *pilosum*, Benth. To some extent this plant does appear to be so employed. But the name Ruku, as a rule, is not applied to *O. Basilicum*, but to *Hyptis graveolens*, Poit. In pointing out this minor error in an article so valuable as that of Wray, it has to be added that the mistake is one for which Wray is not responsible, but is the result of imperfect diagnosis of the samples of detached leaves and fruiting calyces of Ruku supplied for identification.

(Kew Bulletin 1908, No. 2, page 78.)

(Note on above. Mr. Wray is quite correct in calling *Ocimum basilicum*, Ruku, or more correctly Ruku-Ruku. The *Hyptis Graeoens* is not called Ruku, but Selasih.)

H. N. R.

AGRICULTURAL DEPARTMENT OF THE MEDAN EXHIBITION.

Medan, March 1908.

The Subcommission for agricultural-machineries-tools-and means of transport for the exhibition, which is to be held at Medan from the 29th August to the 6th September 1908 herewith begs to inform, that the opportunity for sending in everything, relative to this department both direct and indirect, will be facilitated as much as possible, so that all kinds of machineries and tools, which are used in agriculture and in preparing its produce and of means of transport in general will be received with great satisfaction.

Although we do not intend to give a complete summary of all products of agriculture, which we expect to receive, we mention such as :

Tobacco, Rubber, Coffee, Cocoanuts, Rice, Maize, Gambier, Pepper, Vanilla, Kapok, Cassava, Groundnuts, Nutmegs, and Mace, Sirih, Indigo, Tea, China, Cacao Coca, Arrowroot, Areng and Sagopalm produce, Cotton, Rameh, Jute and all other kinds of fibrins, Gum, Benzoin, Getah Percha, Dragonsblood, Wax, Oils and Greases, Potatoes, Vegetables, fresh, dried and preserved Fruits, Rattan, Bamboo, and various kinds of Wood.

Photos, drawings and models are welcome, if the objects themselves can not be sent.

We herewith beg to take into consideration the different conditions, that have been fixed for the exhibition articles by the committee.

In order to be able to arrange for space, we ask you to inform the *Secretary* DR. L. P. DE BUSSY, if you wish to exhibit and if so what you intend to send, to build or to lay out.

The conditions for participating in the exhibition have been fixed by the committee as follows :

1. Space will be given free of cost to exhibitors, their travelling expenses will not be refunded in case they come to Medan themselves.

2. If the owners are unable to come themselves, their articles will be taken care of by the exhibition committee and sold without any commission for the price fixed by the exhibitors.

3. Cost of transport of the goods will be for account of the exhibitors; the Committee only refunds the expenses for returning unsold goods.

4. The goods to be returned will be packed carefully, the Committee is responsible for damage or spoiling of the goods during the exhibition or by returning these. Exhibitors are kindly requested to state the value of the objects for fire insurance etc.

5. Everything to be exhibited must be in Medan on the 15th of August 1908, adressed to "*The Committee for the Medan Exhibition.*" The ultimate date for sending in living animals or goods liable to spoil will be given later on.

6. A reduction of 50% on the freight will be asked by the Government Railways, The Deli Railway Company and the Koninklyke Paketvaart My, on goods sent to or from the exhibition.

7. Sellers are requested to quote their prices, so, that eventually further orders can be executed at the fixed prices, free Medan.

8. Participators are invited in their own interest to advise what they intend to exhibite as soon as possible.

9. Gold, Silver and Bronze Medals, Certificates as also Money prizes will be offered for the finest lots in the different divisions.

The Subcommission for Agricultural machineries.

DR J. G. C. VRIENS, *President.*

E. GOLDENBERG.

C. M. H. SIEGMUND.

DR. L. P. DE BUSSY, *Secretary.*

PLANTERS' ASSOCIATION OF MALAYA.

Report for 1907.

TO THE MEMBERS, PLANTERS' ASSOCIATION OF MALAYA.

GENTLEMEN,—

In submitting to you herewith the first report of this Association, I would first and foremost congratulate you on the formation of the Association itself.

The pressing need for such an organization, to comprise the planting interests of the whole Peninsula, has been felt for a long time. The last attempt to carry out this object under the auspices of an existing Association was made on January 24th, 1907, when the United Planters' Association of the F. M. S. altered its constitution so as to enable it to carry out this object.

This effort however did not meet with any favour outside its own membership, and after a good many further pourparlers it was at last decided at a Conference of the U. P. A., M. P. A. A., P. P. A. and Johore P. A., held at Ipoh on October 19th, 1907 that a new body be organized. The U. P. A. thereupon voluntarily dissolved itself, and on December 1st, 1907, the new "Planters' Association of Malaya" started on its career.

The time since elapsed is a short one, but even during that short period this Association has amply proved its *raison d'etre.*

Hospitals.—Under the Rules which were gazetted in November, 1906, in connection with the Indian Immigration Enactment of 1904, the minimum hospital accommodation required was fixed at 5 % of the

labour force employed. This resulted in very great opposition from estates situated in healthy situations where the percentage of sickness rarely exceeds 2 % of the labour force, and probably as a result of representations that were made in December, 1907, the Principal Medical Officer was asked by the High Commissioner to make an extended tour through the districts that were chiefly interested. This was done, and though no copy of the report has been received hitherto, your Association has reason to believe that their representations were favourably considered.

Immigration Fund.—The Bill as formulated by the Immigration Committee was fully discussed by your Association after it had been read a second time in the Legislative Council, and while recognising the general utility and wide scope of the scheme, it was generally felt that old-established estates were unfairly treated as compared with their younger rivals, and an amendment was passed asking Government to consider the Bill as framed to be subject to revision after it had been in operation one year.

It is to be regretted that your Association is not afforded more opportunity for the discussion of important matters affecting the planting community before they become law.

Sunday Names.—At a meeting held on January 19th, 1908, it was unanimously resolved that all Sunday names should be stopped from July 1st, 1908. This is one direct result of the Immigration Bill, and it is to be hoped that the fixing of a maximum rate of wages, which has already been discussed, will shortly become an accomplished fact.

Opponents to the Labour Cess hardly realise how far-reaching the present scheme is.

Quit-rent.—The absurdly high rates charged by the F. M. S. Government for the alienation of land were once more made the subject of strong representations. As a result, these charges have been since reduced by one-half in the case of land intended for the cultivation of products other than rubber. However much this may be welcomed as a step in the right direction, this Association ought in no way to relax its endeavours to get these rates further reduced to a figure which would induce capitalists to invest largely in coconuts and similar agricultural produce, the margin of profits on which is very small.

Loans.—The limit of $1,000,000 laid down by H. E. the High Commissioner in instituting this liberal and enlightened policy was reached early in the year; but I am glad to be able to report that our prayer for an extension has since been granted to the extent of another half million.

General.—This Association has to deplore a serious loss through the death of Mr. A. W. Hodson.

The Association at the end of the year was constituted as follows :—

1. *Malay Peninsula Agricultural Association*, with 84 Members and the following 8 Representatives :—Hon. John Turner (*Chairman*), Alex Crawford, Esq., T. N. Symons, Esq., R. G. Palmer, Esq., Geo. Stothard, Esq., D. Douglas, Esq., D. Ritchie, Esq., and Messrs. Kennedy & Co. (*Secretaries*).

2. *Perak Planters' Association*, with 47 Members and the following 6 Representatives :—William Duncan, Esq., (*Chairman*), Thos. Boyd, Esq., B. C. N. Knight, Esq., Gordon Brown, Esq., Eric Maxwell, Esq., and Mr. H. S. Whiteside (*Secretary*).

3. *Negri Sembilan Planters' Association*, with 22 Members and the following 4 Representatives :—C. M. Cumming, Esq., (*Chairman*), J. A. Macgregor, Esq., N. S. Mansergh, Esq., F. M. Porcher, Esq., and J. B. Douglas, Esq., (*Hon. Secretary*).

4. *Johore Planters' Association*, with 17 Members and the following 4 Representatives :—R. F. Pears. Esq. (*Chairman*), A. L. Buyers, Esq., A. H. Malet, Esq., and W. N. Gawler, Esq.(*Hon. Secretary*).

5. *Kuala Lumpor District Planters' Association*, with 21 Members and the following 4 Representatives :—F. G. Harvey, Esq. (*Chairman*), E. A. B. Brown, Esq., E. H. Bratt, Esq., and H. C. E. Zacharias, Esq. (*Hon. Secretary*).

6. *Kuala Selangor District Planters' Association*, with 26 Members and the following 4 Representatives :—Thos. More, Esq. (*Chairman*), A. B. Milne, Esq., J. Hunter, Esq., and A. Irving, Esq. (*Hon. Secretary*).

7. *Klang District Planters' Association*, with 19 Members and the following 4 Representatives :—E. B. Prior, Esq. (*Chairman*), J. Gibson, Esq., R. W. Harrison, Esq., and W. H. Trotter, Esq. (*Hon. Secretary*).

8. *Kapar District Planters' Association*, with 14 Members and the following 4 Representatives :—H. M. Darby, Esq. (*Chairman*), E. W. Harvey, Esq., C. T. Hamerton, Esq., and G. V. L. Scott, Esq. (*Hon. Secretary*).

9. *Batu Tiga District Planters' Association*, with 15 Members and the following 4 Representatives :—C. Henly, Esq. (*Chairman*), H. R. Quartley, Esq., A. G. Corbetta, Esq., and H. L. Jarvis, Esq. (*Hon. Secretary*).

10. *Kuala Langat District Planters' Association*, with 10 Members and the following 4 Representatives :—C. E. S. Baxendale, Esq. (*Chairman*), Dr. Laidlaw, M. M. Glennie, Esq., and E. Macfayden, Esq. (*Hon. Secretary*).

Statistics.—Census returns have been received from 183 estates, a synopsis of which is appended. The only serious omissions are the Ulu Langat, Pahang and Malacca Districts, the estates of which were not represented on this Association during the past year. That however even these figures are still far from being comprehensive is aptly illustrated by the Rubber Crop Returns, which in our statistics show as only 752½ tons for the whole Peninsula, whilst the official figures for exports from the F. M. S. alone are as follows :—

	1906. Tons.		1907. Tons.
Perak	67	...	114
Selangor	304	...	535
Negri Sembilan	88	...	236
Total ...	459	...	885

R. W. HARRISON, *Chairman.*

LABOUR RETURNS.

	TAMILS.				OTHER INDIANS.				CHINESE				JAVANESE.				MALAYS.				OTHER NATIVES OF MALAYSIA.				OTHERS.				GRAND TOTAL.	Total Number of Estates.
	Males.	Females.	Children.	Total.	Males.	Females.	Children.	Total.	Males.	Females.	Children.	Total.	Males.	Females.	Children.	Total.	Males.	Females.	Children.	Total.	Males.	Females.	Children.	Total.	Males.	Females.	Children.	Total.		
Perak ..	8,656	2,531	1,272	12,459	54	8	2	64	2,901	23	18	2,942	1,539	768	58	2,365	771	79	91	941	10	..	..	10	4	5	8	17	18,798	58
Province Wellesley	3,256	682	202	4,140	17	..	..	17	1,672	..	..	1,672	660	360	..	1,020	300	..	..	300	..	..	..	..	71	49	..	120	7,269	7
Batu Tiga ..	3,151	838	373	4,362	2	..	..	2	725	..	..	725	396	5	1	402	40	..	..	40	39	13	4	56	..	..	..	..	5,587	11
K. Selangor ..	3,790	718	366	4,874	8	1	..	9	60	..	..	60	361	3	..	364	136	..	..	136	18	20	18	56	..	..	..	..	5,499	22
K. Lumpor ..	3,084	929	359	4,372	1	..	..	1	461	..	..	461	387	28	4	419	54	..	..	54	10	..	..	10	..	..	..	..	5,317	23
N. Sembilan ..	1,716	433	170	2,319	5	1	..	6	1,333	..	..	1,333	393	150	..	543	219	10	..	229	..	..	..	..	..	..	..	..	4,430	14
Johore ..	1,088	301	114	1,503	29	..	..	29	2,531	..	..	2,531	1,484	337	82	1,903	736	5	10	751	173	..	..	173	6	..	..	6	6,896	15
Klang ..	3,071	810	406	4,287	107	40	50	197	179	1	1	181	595	88	3	686	84	..	..	84	134	32	31	197	56	..	..	56	5,688	13
Kapar ..	3,082	760	718	4,560	..	..	..	..	3	..	..	3	20	..	..	20	1	..	..	1	37	..	..	37	9	..	..	9	4,630	10
K. Langat ..	1,403	177	136	1,716	2	..	..	2	103	..	..	103	66	..	..	66	38	..	..	38	3	..	..	3	..	..	..	..	1,928	10
TOTAL ..	32,297	8,179	4,116	44,592	225	50	52	327	9,968	24	19	10,011	5,901	1,739	148	7,788	2,379	94	101	2,574	424	65	53	542	146	54	8	208	66,042	183

ACREAGE RETURNS.

	SUGAR.			COCONUTS.			COFFEE.			RUBBER			OTHER PRODUCTS.			TOTALS.			NUMBER OF ESTATES.
	In Bearing.	Not in Bearing.	Total Acreage.	In Fearing.	Not in Bearing.	Total Bearing.	In Bearing.	Not in Bearing.	Total Acreage.	In Bearing.	Not in Bearing.	Total Acreage.	In Bearing.	Not in Bearing.	Total Acreage.	Cultivated Acres.	Uncultivated Acres.	Total Acreage.	
Johore ..	..	..	..	..	7½	7½	..	..	..	610	5,191	5,801	15	811¼	826¼	6,634¾	65,426¾	72,061½	15
Batu Tiga ..	..	..	..	..	..	..	..	..	..	2,247	7,439½	9,686½	..	..	..	9,686½	10,126¼	19,812¾	11
Perak ..	4,207	745	4,952	452	4,181	4,633	299	92	391	1,419	32,504½	33,923½	285½	326	611½	45,511	69,005	114,516	58
Province Wellesley	3,778	118	3,896	904	1,526	2,430	..	..	..	385	6,115	6,500	4,160	140	4,300	17,126	28,294	45,420	7
Kapar ..	..	..	..	71½	..	71½	596	..	596	3,257¾	7,664½	10,922½	27	13½	40½	11,630¼	6,835	18,465¼	10
Kuala Langat ..	..	..	..	818	400	1,218	245	375	620	219	3,449	3,668	..	10	10	5,516	7,490½	13,006½	10
Kuala Lumpur ..	..	..	..	4½	..	4½	452	475	927	1,653	9,278½	10,931½	..	..	..	11,863	15,160½	27,023½	23
Kuala Selangor ..	..	..	..	152	..	152	127	..	127	92	11,516½	11,608½	..	..	..	11,887½	20,280¼	32,167¾	22
Negri Sembilan ..	..	..	..	8	37	45	248	..	248	1,540½	9,109½	10,650	20	6	26	10,969	26,902½	37,871½	14
Kalang ..	..	..	..	20	71	91	30	..	30	1,555½	7,295½	8,851	..	10	10	8,982	27,820½	36,802½	13
Total ..	7,985	863	8,848	2,430	6,222½	8,652½	1,997	942	2,939	12,978¾	99,563½	111,344¼	4,507½	1,316¾	5,824¼	139,806	277,341¼	417,147¼	183

CROP RETURNS.

	CROP, 1907.					ESTIMATED CROP, 1908.				
	Rubber.	Coffee.	Coconuts.	Sugar.	Other Products.	Rubber.	Coffee.	Coconuts.	Sugar.	Other Products.
	Cwts.	Pikuls.	Nuts.	Pikuls.	Pikuls.	Cwts.	Pikuls.	Nuts.	Pikuls.	Pikuls.
Kapar ..	4,154	4,615	230,015	..		5,283	2,500	220,000	..	..
K. Langat ..	289	598	323,852	..	..	342	700	1,250,000	..	..
K. Lumpor ..	1,325½	440	..	..	..	1,665	450	..	..	..
Klang ..	1,873¼	2,643	16,513	..	..	2,229¾	475	21,000	..	..
K. Selangor ..	104	180	..	..	..	83	200	..	..	..
N. Sembilan ..	1,671	578½	500	..	..	2,614	1,040	700	..	..
Johore ..	1,024	..	..	..	..	1,509	..	..	..	..
Batu Tiga ..	2,163	718	..	..	..	3,027 1/2	610	..	..	..
Province Wellesley ..	570 1/2	..	37,700	108,849	10,000*	720	..	418,500	113,565	23,000 *
Perak ..	1,867	499	557,861	162,153	82†	2,345	360	673,000	142,500	80†
Total ..	15,041¼	11,271 1/2	1,166,441	271,002	10,082	19,818¼	7,335	2,583,200	256,065	23,080

* Tapioca. † Pepper.

Balance Sheet per March 31st, 1908.

LIABILITIES.				ASSETS.				
		$	c.		$	c.	$	c.
Benevolent Fund	...	939	30	Cash in Office ...	130	81		
Balance of Assets over Liabilities	...	746	42	Cash in Bank ...	1,311	11	1,441	92
				Subscription due by K. Langat D. P. A.			140	00
				Exhibitions			7	90
				Library			95	90
		$1,685	72				$1,685	72

Revenue Account for Four Months ended March 31st, 1908.

Dr. *Cr.*

		$	c.		$	c.
To General Charges	...	63	58	By Contributions from Constituent Associations	1,610	00
,, Secretary ...	...	800	00			
,, Balance of Revenue over Expenditure		6	42			
		74				
		$1,610	00		$1,610	00

I have examined the Accounts of the Planters' Association of Malaya for the four months ended 31st March, 1908, and have found same correct. I hereby certify that the foregoing Balance Sheet and Revenue Account show respectively a true and correct statement of the Association's affairs as at 31st March, 1908, and the result of the Secretary's intromissions for the period under review.

H. C. E. ZACHARIAS,
Secretary.

KUALA LUMPOR,
13th April, 1908.

for GUNN & Co.,
R. M. NEILL,
Chartered Accountant.

Minutes of Annual General Meeting.

Held at 11.15 a.m. on April 28th, 1908, at the Masonic Hall, Kuala Lumpor.

Present: For the M. P. A. A.—Messrs. T. N. Symon, D. Douglas, A. Crawford, D. Ritchie, G. Stothard, R. G. Palmer, by their proxy Mr. W. Duncan.

For the Perak P. A.—Messrs. H. E. Darby, C. L. Gibson, C. Alma Baker, H. S. Whiteside.

For the Kuala Lumpor D. P. A.—Messrs. F. G. Harvey,E. B. Skinner, A. J. Fox, H. C. E. Zacharias.

For the Kuala Selangor D. P. A.—Messrs. A. Irving, Edgar Smith, Thos. More, J. A. Hunter.

For the Kapar D. P. A.—Messrs. H. M. Darby, C. T.Hamerton.

For the Klang D. P. A.—Messrs. Jno. Gibson, R. W. Harrison, A. B. Lake, J. Whitham.

For the Batu Tiga D. P. A.—Messrs. C. Henly, P. W. Parkinson, H. L. Jarvis.

For the Langat D. P. A.—Mr. E. Macfadyen.

For the Negri Sembilan P. A.—Messrs. N. S. Mansergh, J. B. Douglas, J. L. de P. Power, G. W. Hingston, by their proxyJ. L. de P. Power.

For the Johore P. A.—Messrs. W. Buyers, A. H. Malet,W. N. Gawler, and several visitors. In the Chair: Mr. R. W. Harrison, Chairman.

I. The notice convening the meeting having been read, the minutes are taken as read, confirmed and signed.

II. The following correspondence *re* Recruiting Licenses is read

The Supt. of Indian Immigrants.

Penang, January 24th 1908.

Sir,

The wording of two of the rules made under the Indian Immigration Funds Enactment was the subject of some discussion at the last meeting of this Association.

1. At present Kangany recruiting licenses are only obtainable from you, Sir, although your duties may at any time call you away from Penang. In that case, a Kangany might be kept a week in Penang, waiting to obtain your signature; and I may add, that such a case has just happened.

But even if the Kangany should find you in office the day he arrives in Penang, the fact remains, that you may refuse to ratify the license pending further enquiries; which of course would again mean delay of a week at the least.

The present system seems to be rather cumbersome and leading to a great deal of waste of time and money on the part of the employer or his Kangany, whilst it would be decidedly in the interests of recruiting, to do away with all delays and stoppages at intermediate stations and permit the Kangany to proceed straight from his estate to his village in southern India.

The members of my Association feel, that such a result could readily be achieved, if you delegated the powers vested in you in this respect to all your assistant superintendents; and I was accordingly instructed to submit to you the following resolution which was passed unanimously, viz:

"That all Assistant Superintendents of Immigrants be authorised to issue recruiting "licenses."

2. The other point raised was "that carters, woodcutters and scavengers be included in the schedule of the rules made under this enactment."

I have, etc.

(Sgd.) H. C. E. ZACHARIAS,

Secretary.

No. P. O. L. 100/08. *Penang, 27th January, 1908.*

SIR,

I have the honour to acknowledge receipt of your letter dated January 24th on the subject of the issue of Kangany Licenses.

2. I would point out in reply that the rules under which these licences are issued only came into force on January 1st last and that at the date of the recent meeting of the Planters' Association there had only been one opportunity of sending Kanganies to India namely by the boat that left Penang on January 4th.

3. I am of opinion, therefore, that it is too soon yet to judge whether any alteration is required in the rules.

4. I would take this opportunity of pointing out that one hundred and seventy licenses have been registered between January 1st and January 27th although delay has occurred in a few cases through the omission of the employer to fill in the required particulars. In one case a Kangany who did not know the European name of his employer presented two licenses made out on obsolete forms, unsigned by the employer and with the name of the estate omitted.

5. Blank forms for licenses can be obtained from the Assistant Superintendent of Immigrants, Klang, as well as from the Penang office, and if employers will only be at the pains to ensure that the licenses are properly filled in I do not think it will be found that there is undue delay in registration.

I have, etc.

(Sgd.) L. H. CLAYTON,

S. of I. S. S. & F. M. S.

Mr. Parkinson said it was ridiculous to have to send all the way to Penang for these licenses. Surely the deputy should have the powers of the superintendent of issuing these licenses. Another grievance was, that all coolies coming over under the old passes were charged $10.00 passage money.

Mr. A. B. Lake said it was not necessary to send Kanganies to Penang; it was merely a question of waiting for return of a letter to Penang.

Mr. J. Gibson confirmed Mr. Parkinson's experience *re* $10.00 charge, and said that on discovering this, he had immediately written to cancel all old licenses.

Mr. E. B. Skinner said similar charges had been made in the case of some of his coolies, but on Government being approached, a refund had been made in every single case.

III. *Re* § 8 of last meeting, Mr. Zacharias said that Mr. Douglas' resolution was founded on a case of which he had promised to send details. This he had not done.

Mr. Lake explained that the sample was tampered with in transit and so the case fell through.

IV. The following correspondence *re* Sunday Names is read:

THE GEN. MANAGER, F. M. S. R.

SIR, *Kuala Lumpor, January 24th 1908*

I have the honour to inform you that the following resolution has been passed by my Association at their last meeting, viz:

"That no Sunday Names be given to any coolies taken on as from the 1st prox., but that Sunday Names be continued up to July 1st, 1908, in the case of all coolies employed on the 31st inst."

Inviting your kind support of this scheme, which obviously can only be carried through if the employers of labour are unanimous.

I have, etc.

(Sgd.) H. C. E. ZACHARIAS,
Secretary.

NO. G. M. R. 478/08. *28th January, 1908.*

SIR,

I have the honour to acknowledge receipt of your letter dated 24th January on the subject of Sunday Names for coolies and to state that I have issued instructions that similar action is to be taken on the railways in Malaya.

I have, etc.

(Sgd.) A. H. ALSTON,
for G. M. RLYS.

The Secretary stated that a similar letter had been written to the Director P. W., F. M. S., but that so far no reply had been received.

Mr. Skinner asked whether all the estates bound themselves to abolish Sunday Names, and whether those who did not approve of this

policy must withdraw from this Association. Personally, he absolutely disapproved of this step, which the Association had resolved upon, and all estates under his direction would stand out in any case.

Mr. Parkinson suggested that proper notices should be printed in Tamil and posted in all coolie lines. If the estates did it individually the action resolved upon would lack force.

Mr. C. L. Gibson said that similar notices had already been circulated in Perak and that all Sunday Names had been stopped there since March 31st. He knew of no objections to the new order of things raised anywhere in Perak by the coolies.

Mr. Macfadyen informed the meeting that he also had stopped all Sunday Names on his estate since March 31st.

Mr. Power said that in Negri Sembilan the coolies had been told of the impending measure, but that no definite steps had been taken, as the planters there wished first to make sure of the Government Departments.

Mr. C. L. Gibson knew that in Krian the Perak P. W. D. continued to pay Sunday Names.

Mr. Harrison regretted that Mr. Skinner stood out on this question, but he did not think that they could expect absolute unanimity, and under their rules they could not debar any estate from membership for such a reason. He hoped that Mr. Skinner would fall in line, but if he were unable, he trusted they would still have his valuable co-operation in other matters.

Mr. Macfadyen suggested that the secretary should get a definite reply from the D. P. W.

After some further discussion Mr. Parkinson proposed and Mr. A. J. Fox seconded that the notices referred to be issued to all managers of estates and to the interested Government Departments. Carried.

V. Hospital Rules. The following letter from the Rubber Growers' Association is read :

SIR, *7th January, 1908.*

I am directed to refer to your letter of the 5th December 1907, on the subject of the Government requirements under the Hospitals Enactment and to say, with reference thereto, that a meeting of the Malaya section of this Association was held here yesterday when it was unanimously resolved :—

"That this Association endorses the resolution of the Planters' "Association of Malaya to plead for an amendment of the Hospital "Enactment so as to give discretionary power to the respective British "Resident (or Resident Councillor), to base the specific Hospitals "accommodation in each case on actual requirements only and not on a "fixed 5% basis, as adopted at their meeting of the 1st December, 1907.

And

"That the Rubber Growers' Association await the result of the "representations of the Planters' Association before taking action in "the matter."

Yours faithfully,
(Sgd.) C. TAYLOR,
Secretary.

The Secretary also informs the Meeting that the following notification appeared in the Selangor Government Gazette of April 10th, 1908:

"INDIAN IMMIGRATION ENACTMENT 1904."

Amendment of Rules Under Section 56.

In exercise of the powers vested in him by "The Indian Immigration Enactment, 1904," the Resident, with the approval of the Resident-General, hereby amends Rule 1, made under section 56 of the said Enactment, and published in the Gazette on the 12th day of April 1907, by the addition of the following words:

"Provided that the Hospital accommodation to be provided may be reduced to not less than two beds for every 100 immigrants if the written permission of the Superintendent of Immigrants is obtained. This permission shall be revocable and shall not be given except in the case of estates where the health of the immigrants has been exceptionally good for the preceding three years."

Proposed by Mr. J. Gibson and seconded by Mr. H. M. Darby that the thanks of the Association be expressed to Government for acceding to their request in this matter. Carried.

VI. The following correspondence *re* taxes on land is read:

THE RESIDENT-GENERAL, F. M. S.,

SIR, Kuala Lumpor, *January 24th 1908.*

I have the honour to inform you that I have been instructed to submit to you the following resolution, which was passed unanimously at the last meeting of this Association, viz.

"That this Association views with grave concern the present "policy of Government in taxing the land at a figure which prohibits "the cultivation of any product other than rubber and urges Gov-"ernment to encourage the cultivation of other products—particularly "coconuts for which the lowlands of Selangor and Perak are eminently "suitable by fixing premium and quit rent charges at a figure suffi-"ciently low to render such cultivation possible."

I would add that this Association has been informed by the Hon. J. Turner that the quit rent on products other than rubber is to be reduced by one half; but while welcoming such a measure as a step in the right direction, the Members of this Association feel that the concession promised does by no means go far enough.

I have, etc.

(Sgd.) H. C. E. ZACHARIAS,

Secretary.

No. 562/1908. *1st February, 1908.*

SIR,

In reply to your letter of the 24th January, I am directed to inform you that the Acting-Resident-General is not prepared to recommend a further reduction of Quit Rent on land alienated for the cultivation of products other than rubber.

2. He will, however, submit your letter to the consideration of his Excellency the High Commissioner.

I have, etc.,

(Sgd.) E. C. H. WOLFF,

For Federal Secretary.

No. 562/1908. *25th February 1908.*

SIR,

In continuation of my letter of even number dated the 1st February, 1908, I am directed to inform you that His Excellency the High Commissioner is of opinion that the question of any further reduction of quit rent of lands cultivated with products other than rubber may stand over for the present.

I have, etc.,

(Sgd.) E. L. BROCKMAN,

Federal Secretary.

VII. The Secretary presents the accounts as audited by Messrs. Gunn & Co.

Proposed by Mr. J. Gibson, seconded by Mr. H. M. Darby, and carried unanimously, that the accounts be passed.

VIII. The annual report having been read by the secretary, Mr. Harrison thought they could congratulate themselves on the formation of this central body. The report before them contained already the record of some fairly useful work. All the more was it to be regretted, that in their early history friction should have arisen between them and the Rubber Growers' Association in London, and he instanced two occasions, on which the latter body had been directly antagonistic to themselves, viz., the Indian Immigration Fund Enactment and the Employee Circular of the R. G. A. In their letter to Lord Elgin on the Immigration Cess they had practically ignored the existence of the P. A. M. With regard to the famous circular, he regretted that so much prominence had been given to it. He could not but think it was never intended seriously. He had conversations with various gentlemen largely interested in the industry, and they all condemned the circular. At a time when the tide of prosperity showed signs of turning, it was important that all interested in rubber should work hand in hand. The interests of those on the spot and those in England were identical. The R. G. A.'s letter to Lord Elgin stated that the men on the spot were paying more attention to their own interests than to those of their employers. Such a statement ought never to have been made. The fall in rubber values was anticipated here sooner than it was in London, and action was taken to reduce expenditure and curtail extension forced upon us. The fall is the best thing that could have happened. It has made us put our house in order and realize that such enormous profits could not continue. Though the rubber industry is not likely to give those returns which

some people foretold in prospectuses, it still promises to be the most successful form of tropical agriculture ever taken up in any British Colony. It is to be hoped that the differences will be quickly healed, and that all will work together for the common good. The main bone of contention is the Immigration Cess, which first started the friction. I am a Member of the Immigration Committee and I am prepared to stand or fall by the Committee's action. I am confident that the Cess will soon be acknowledged to be the best step ever taken in connection with labour in the F. M. S. (Applause.) I thank the Government for acceding to our request *re* the Hospitals. With regard to the loans, H. E. the High Commissioner has sanctioned another $500,000 and most of this has been applied for, but loans are being made very slowly. In a bad time like this the Government should come to the assistance of the planter.

Mr. Harrison thereupon moved the adoption of the report, which was seconded by Mr. C. L. Gibson and carried unanimously.

IX. Mr. Harrison then vacates the Chair, which is filled pro-tem by Mr. C. L. Gibson. Mr. Gibson pays a fitting tribute to the splendid work done by their first Chairman during a particularly trying time, and moves a vote of thanks which is passed by acclamation.

Mr. Zacharias having been similarly honoured, both gentlemen suitably responded.

The ballot for Chairman and Secretary for the current year is then taken;

Mr. Harrison	...	polling	30	
Mr. F. G. Harvey	...	,,	1	
Mr. C. L. Gibson	...	,,	1	
Hon. J. Turner	...	,,	1	
Abstentions ...	...	,,	2	
			35	Voters present.
and Mr. Zacharias	...	polling	32	
Mr. H. M. Darby	...	,,	1	
Abstentions ...	...	,,	2	
			35	Voters present.

The result is announced by Mr. C. L. Gibson amidst applause, Mr. Harrison thereupon re-occupying the Chair.

X. "The Agricultural Bulletin." Mr. Zacharias read out the correspondence on this subject with Mr. Ridley, in which the latter stated that if the Association contributed $1,000, he could supply 300 copies monthly to the Association, containing the minutes of their meetings, etc.

Mr. Carruthers as an Editor of the Bulletin, having spoken on the subject, recommending adoption of the course advocated by Mr. Ridley, it is suggested by Messrs. Parkinson and Darby, that the Minutes be printed separately, as hitherto, in addition to their publication in the Bulletin.

After some general discussion on the subject, the matter is left to the Chairman.

XI. The London Rubber Exhibition. The Secretary reads out the following correspondence :—

MALTERMASS LONDON.

Enorme=1,000 sq. feet.

Additato=This is only approximate; more exact information follows by next mail.

London, W. C., February, 1908.

DEAR SIR,

I beg to acknowledge receipt of your cable to-day as per following; Enorme Additato, which I read, 1,000 square feet. This amount will be reserved, and of course, we will avait receipt of your letter to know exactly the size that you will require.

I might mention this Exhibition is receiving such support in all directions that it is possible we may have to move to the Olympia, providing that building is not let in the meantime. It is open and we have the refusal of it. Of course we took the best building that could be obtained at the time, considering it would be large enough for the purpose of this undertaking, but we shall advise you by cable, or probably you will see it in your local newspapers, if we decide to move, as I shall advise the London correspondents at once.

My committee wish that British Possessions shall have the Premier positions and we likewise trust that exhibits will stand out to show the progress the Colonies have made in reference to the Rubber Producing Industry.

Thanking you and the committee for the support they have given the first Rubber Exhibition held in Europe.

I am, etc.,

(Sgd.) A. STAINES MANDERS,

Organising Manager,

London, W. C., 20th March, 1908.

DEAR SIR,

Since my last communication to you, on account of the overwhelming number of applications for space, my Committee have had to arrange for a larger building, and consequently, they have secured the great Olympia, the main hall, offices and conference rooms, which gives an area of about 140,000 to 160,000 square feet of space.

I am sending you by this post a plan which gives the position of Malay States on the left hand side of the main avenue, facing the main entrance, the other corner is for Ceylon. My Committee trust that your Association, assisted, I hope, by the Government, will be making a very fine display, as you will occupy one of the two premier positions in the buildings. I should be glad, if you have not already advised me by letter, if you could kindly cable me the exact amount of space you are likely to require. Your cable said approximately 1,000 square feet,

so I have reserved 1,500 but in case you require it I could arrange to increase this to 2,000.

Labels and all general instructions will follow, and probably by the incoming mail I shall receive advise from you to which I can reply by next.

Reuter's Telegraph Company advise me that they cabled out to Malaya full particulars, so that you will probably have heard long before this reaches you that we are going to Olympia.

In great haste,

Yours, etc.

(Sgd.) A. STAINES MANDERS,

Manager.

A. STAINES MANDERS, Esq.,

London, March 4th, 1908.

DEAR SIR,

Your favour of January 31st was duly received and as desired I cabled you a reply as soon as I had been able to consult on the subject with our Chairman and the Director of Agriculture, F. M. S.

At the last Exhibition in Ceylon, the exhibits from the Malay Peninsula covered an area of 100 ft by 10 ft. and as an indication of our maximum requirements, I gave you these measurements.

As however we are still quite in the dark, this figure must only be considered quite provisional until I am able to judge what response I am likely to receive from our members, whom I am now circularizing.

I have written to the London Rubber Growers' Association by the same mail, enquiring what attitude they are taking in the matter. The space provisionally booked by us, is of course meant for all Malayan Exhibitors, whether exhibiting as members of this or of the Rubber Growers' Association, whether on their own or on behalf of the Governments of the F. M. S. and Straits Settlements.

The question of awards is likewise one which will distinctly influence prospective exhibitors and I think that an attractive list of prizes with a strong Committee of Judges would go far to stimulate competition.

Our next General Meeting will be held shortly, when I shall be in a better position to give you some definite information on the whole subject.

In the meantime,

Yours faithfully,

(Sgd.) H. C. E. ZACHARIAS,

Secretary.

London, W. C., 2nd April, 1908.

DEAR SIR,

I thank you for your letter of the 6th of March and hope to send you new Plan showing the marking out of the space in Olympia. You will see the positions I have reserved for the Federated Malay States

and Ceylon on each side of the main Avenue at the entrance. You may have 1,000 square feet or more, but I hope you will make as large a display as possible as my Committee are anxious that the Colonies will make a show that will far exceed that of Foreign countries; there is every indication of Mexico, Brazil and the Dutch Colonies making fine displays, while many of the other countries have signified their intention of being well represented.

We understand that Ceylon is going in for something big, and no doubt you can arrange to work your exhibit on the space I have suggested. I notice that at Ceylon you had 100 x 10, but you will understand that this is hardly possible in a building in London on account of the requirements of the London County Council, as you would have to make certain avenues and passages. If I knew the nature of the exhibit I could probably suggest a stand which could either be built cheaply or hired. For the Ceylon Association in London, I proposed a room so that the in—and outside could be used for exhibiting products, photos, &c., and a considerable quantity of raw rubber could be displayed on shelves on the outside of the walls, and any other products you are sending. You could have, say three doors, one in front and one on either side, so that the people can walk round; then you could have chairs for them to sit down and an office for your representative if you wish; still, you may have some other idea.

Re your Association—I note you are asking them what they are doing regarding the Exhibition, but I might say that they are giving their united support.

Re Awards and Competition. This is a matter that was discussed at a meeting held at the Chamber of Commerce at which many of the leading planters were present, and it was thought advisable that each country should arrange its own Competitions; not competitive competitions against other countries as the method of treatment is so different, and to-day Edgar Turner, Esq., J. P. of Ceylon, endorsed this. My Committeee will supply handsome diplomas which will represent the nature of the award. For instance—Diploma of Honor, Diploma of Gold Medal, Silver, Bronze, Hon. Mention, Highly Commended &c., but no medals would be given. This would not be possible as you can quite understand that the expenses in connection with an exhibition of this kind, are very high, and no Government grant is made to undertakings of this description in London. All incidental expenses have to be guaranteed by private gentlemen, where —as in Ceylon the Government found the money that was required. We would arrange to get very handsome medals at manufacturers' cost if the committees of the exhibitors who received the diplomas wished, but the diploma is the principal thing; it can be hung up and and shown, where a medal is put away, but the award stands the same.

In reference to Judging—the London Association and Committee could see that the judges were gentlemen of high repute.

It will greatly facilitate my work if you will kindly cable me as early as possible, the amount of space you require; the 1,000 is reserved.

I shall shortly be sending you labels for fixing to the exhibits you are sending, also season and single admission tickets so that you may

issue them to residents and Exhibitors who may be visiting England during the Exhibition.

Your truly,

(Sgd.) A. STAINES MANDERS.

THE SECRETARY,
RUBBER GROWERS' ASSOCIATION,
London E. C.

DEAR SIR,

LONDON EXHIBITION 1908.

As we are anxious to take concerted action with you in this matter, I shall be glad to hear what attitude your Association is taking, and any other points connected with the subject deserving of our joint consideration : expecially the question of awards.

Mr. Manders, the exhibition manager, sent us a number of letters and circulars, the last of which I replied to as a per copy enclosed for your guidance.

Awaiting with interest the favor of your reply,

Yours faithfully,

(Sgd.) H. C. E. ZACHARIAS,

Secretary

DEAR SIR, London, E. C., *April 2nd, 1908.*

LONDON RUBBER EXHIBITION.

We have yours of the 6th altimo and beg to say that this Association will give you every assistance in its power with regard to your exhibits.

The Advisory Committee came to the conclusion that it would be a mistake to give awards. The object as far as the planting community is concerned, is to bring " plantation rubber" before the notice of the world and not with a view of any individual or estate benefitting in the way of advertisement. If every grower of rubber in the F. M. S., and Ceylon desired to compete, Olympia would simply appear as a large show room of samples. Your Association will, therefore, at once see the decision is a wise and necessary one.

What we have suggested to Ceylon we would take the liberty of suggesting to your Association, viz., That the Government be asked to receive exhibits from all desiring to send to the exhibition. These to be sent to some central place, say Singapore, to be selected from by a committee. You would thus obtain the best possible exhibits your country can show.

Should you wish this Association to arrange about show table stands, &c., it will be necessary for your Association to remit funds here.

Yours faithfully,

(Sgd.) C. TAYLOR,

Secretary.

The Secretary also reports that he has sent out circulars to all members, with the result that he had so far received 60 replies, 17 of which are in the affirmative and asking in the aggregate for about 200 square feet of space.

Mr. J. B. Carruthers, who had been specially invited to attend the meeting, said that the Government was prepared to do its share in making the exhibit worthy of the object, and had voted £350. Personally he would be only too glad to give every assistance in his power.

A suggestion of Mr. Lake's is then accepted to ask that all prominent planters from Malaya, at home on leave, be added to the Advisory Board of the Exhibition.

Mr. J. Gibson then proposes, Mr. Lake seconds and it is carried unanimously, that a local committee be formed, consisting of Messrs. Harrison, Parkinson, F. G. Harvey, C. L. Gibson and Zacharias, with power to add to their number, and with full authority to act for the whole Association in this matter.

The secretary submitted, that with £350 from Government, £100 from exhibitors, and possibly £200 from Johore, there remained about $2,500 to be found.

Mr. Macfadyen was afraid that if this sum was placed on the estimates, it would break up the Association, and suggested that it be raised separately.

Mr. J. Gibson said that it should be raised by voluntary subscription, and Mr. Harvey suggested $10 (voluntary) from each estate.

Mr. Zacharias said that a small sum was wanted to enable the committee to get started.

Mr. Parkinson suggested $500.

Mr. Macfadyen: I propose as an amendment, 50.

Mr. Harvey: Dollars or cents?

Mr. Macfadyen finding no seconder, it was then formally proposed by Mr. Parkinson, seconded by Mr. Hunter and carried unanimously, that the Association contribute $500 towards the cost of the Exhibition, and that voluntary subscriptions of from $10 to $20 be invited from every estate in the Peninsula.

XII. The estimates for the current year are then submitted.

An item of $600 appearing as Secretary's allowance for office, clerical assistance &c., is on the motion of Mr. Macfadyen, seconded by Mr. Parkinson, eliminated.

Mr. Malet then proposes, Mr. Fox seconds, and it is carried unanimously, that the subscription for the current year be fixed at $100 per representative.

The estimates are declared passed as follows:—

ESTIMATES FOR 1908-09.

EXPENDITURE.		REVENUE.	
To London Exhibition ...	500	By Balance from last year ...	700
,, Agricultural Bulletin ...	1,000	"47 Representatives at $100.	4,700
,, Secretary	2,400		
,, General Charges	300		
,, Surplus	1,200		
	$5,400		$5,400

XIII. The following correspondence *re* Loans to Planters is read.

THE RESIDENT-GENERAL, F. M. S., *29th February 1908.*
Kuala Lumpor.

SIR,

LOANS TO PLANTERS.

I understand that the limit, outlined by H. E. the Governor in instituting this liberal policy, has now been reached and that, pending further instructions, no more loans are to be issued at present.

I feel certain that H. E.'s intention in mentioning the sum in question—which I believe was originally fixed at $500,000—was not to lay down a hard and fast limit, but rather meant tentatively. This interpretation is further borne out by the fact that H. E. subsequently doubled the original limit, and planters in general have no doubt so understood his circular.

Many places then having been opened up, the owners believing that they had a Government loan ready to fall back upon, when needed, would now find themselves in sore straits, if this enlightened and generous policy was suddenly discontinued.

It is needless for me to point out, how hard such a stoppage of Government Loans would hit the Planters just at present, when there is a depression in all financial circles, consequent on the recent crisis in the United States of America.

Trusting that the planters will have your valued support in representing this matter to his Excellency,

I have, etc.,
(Sgd.) R. W. HARRISON,
Chairman.

No. 1908/08. *7th March, 1908.*

SIR,

I am directed by the Resident-General to acknowledge the receipt of your letter of the 29th ultimo, regarding the stoppage of Government loans to planters, the limit of which has already been reached. The High Commissioner has approved of the limit being extended to one and a half million dollars.

2. His Excellency is not, however, disposed to approve of any of the extensions being allotted to companies unless in very exceptional circumstances.

3. Advances will accordingly be made as before up to the extended limit to individual planters.

I have, etc.,

(Sgd.) E. L. BROCKMAN,

Federal Secretary.

XIV. It is resolved that the following matters stand over until the next meeting:

a. Constitution of Benevolent Fund.

b. Motion forwarded by Kuala Langat D. P. A.:

"That Government be requested to prohibit the sale to Tamils by the spirit licensees of liquors other than unadulterated toddy and beer."

c. Motions forwarded by Kapar D. P. A.:

1. "That from July 1st, all coolies should have rice issued to them in three separate issues during the month, two gantangs each issue. That in the event of a coolie failing to work more than one day in ten (one working day), without sufficient reason, he forfeits one issue of rice."

2. That the standard rate of wages be 27 cents, and the maximum wage for any work 30 cents, this only to be given to coolies working 24 days in the month, and at the discretion of the employers."

d. Motion forwarded by Kuala Selangor D. P. A.:

That this Association is of opinion that it would be desirable to fix the hours for cooly labor from 6 a.m. to 4 p.m. with one hour off in the middle of the day, and that a uniform rate of pay of 27 cents for men and 20 cents for women be observed."

e. Motion forwarded by Kuala Selangor D. P. A.:

"That any member not a Delegate, bringing forward an original motion be allowed to speak to the same at P. A. M. Meetings."

XV. The secretary reports that the proposal of Mr. C. E. S. Baxendale *re* duty on coffee has been withdrawn.

XVI. Mr. Macfadyen informs the meeting that a meeting of planters has been held that day to consider a memorandum, with had been drawn up as a reply to the recent R. G. A. Employee Circular, and that the following resolution has been carried:

"That the memorandum be forwarded to the Chairman of the Planters' Association of Malaya, and that he be asked to forward it to Rubber Growers' Association as an expression of general opinion among local planters with the request that the Rubber Growers' Association will consider the advisability of withdrawing or amending the recent proposals."

Proposed by Mr. J. Gibson and seconded by Mr. Fox that discussion be deferred until the next meeting, so as to give every member an opportunity of voting thereon; but that the Chairman be authorized to write to the R. G. A. in the meantime, informing them of the steps so far taken in the matter.

XVII. The next meeting is then fixed for Tuesday, May 19th, at 3 p.m. at the Masonic Hall, Kuala Lumpur.

The Meeting terminates at 2 p.m.

H. C. E. ZACHARIAS,
Secretary.

KUALA SELANGOR DISTRICT PLANTERS' ASSOCIATION.

Second Annual Report for the year ending February 29th, 1908.

GENTLEMAN,

Your Committee have pleasure in submitting to you the second annual report on the working of your association.

Meetings.—During the year four general and three special general meetings were held. The attendance was, on the whole, good, but owing to the considerable distances which separate most of the estates in the district, it is no easy matter to obtain through representations at all meetings.

Membership.—This now consists of 26 estates as against 24 for the preceding year.

Constitution.—The constitution of your association has had to be somewhat altered owing to the dissolution of the U. P. A., and the establishment of the P. A. M. in its place. Delegates have been appointed to the latter association in precisely the same manner in which they were to the former.

Labour.—The number of Tamil coolies, at present employed on Estates in the district is, as far as can be ascertained, 5284. Owing to the depression in the rubber industry during the latter half of the year, opening work was much curtailed and the anticipated increase of population was not fully realised.

Communications.—Motor bus and telephone services have been established in the district. It is a matter for congratulation that your association has been mainly instrumental in obtaining this concession from Government. The bridge across the river at Klang is in course of construction and when this is completed it will still further facilitate our communications with the outside world. Government has been approached with a view to the establishment of Post Offices at Jeram and Batang Berjuntai but in both instances they have been refused. Your committee has reason to believe that steps are being taken to establish a P. O. at Kapar, which is a step in the right direction, but it is to be hoped that during the coming year something may be done for those residing on the Rawang Road.

Hospitals.—The building of estate hospitals has been insisted on by Government and all the estates in the district have therefore been divided into groups, for each of which a hospital is being erected. It was

decided that the question of administration of estate hospitals was one that could not very well be taken up as an association matter, as private interests are involved. Your committee would however urge that estate managers work as much as possible in concert, in order that expenses may be reduced to the lowest figure possible.

Policing the District.—Representations were made to Government *re* the insufficiency of the policing of the district but so far no steps have been taken to better it. There can be no question that there is much room for improvement in this respect and as the district is developing so rapidly it may not be too much to expect that an European inspector may be appointed to it during the coming year.

Tamil Immigration Bill.—Your association expressed the strongest disapproval of the poll tax which it was proposed to levy on all Tamil coolies employed in the country. This has, however, become a *fait accompli* and our coolies are now subject to a taxation of $5 per head per annum. As a set off against this, coolies recruited in India are granted free passages which it is hoped will induce a greater influx of labour than we have experienced hitherto.

Sunday Names.—An excellent move has been made towards the reduction of working expenses on estates by the deleting of Sunday names. This measure comes into full force from July 1st next, and it will act as a further set off against the poll tax previously mentioned.

Cultivation.—The following is a table showing the cultivated area and the acreage of land held by Europeans in this District. This includes estates which are not on the membership of your association and is therefore a thoroughly comprehensive statement.

Para Rubber.													
Under 1 year.	Under 2 years.	Under 3 years.	Under 4 years.	Under 5 years.	In bearing.	Total.	Rambong.	Coffee.	Chuts.	Rubber and Coffee.	Other Products.	Uncultivated.	Total Area.
8,357	3,476	778	...	60	35	12,706	127	...	382	165	...	23,286	36,666

Finance.—Owing to the dissolution of the U. P. A., and the refunding of all subscriptions and entrance fees for the current year by that body, the financial position of your association is a strong one, as shown by the statement of accounts herewith attached.

General.—Taken as a whole the objects attained by your association during the year under review, may, we venture to think, be deemed satisfactory. It must be borne in mind that as an organisation, we are still in our infancy, but we have already been able to fully justify our existence, and it is to be hoped that by the full co-operation of all members we may continue to progress to our mutual advantage.

(Sgd.) Thomas More,
Chairman

STATEMENT OF EXPENDITURE AND RECEIPT.

From February 28th, 1907 to 29th, 1908.

EXPENDITURE.	$	cts.	RECEIPTS.	$	cts.
Subscription of the P. A. M.	140	00	Balance brought forward ..	62	54
Stationery and Postage. etc.	36	41	Subscriptions from 26 Estates ..	466	95
			Entrance fees from 2 Estates ..	50	00
	176	41			
Balance of Receipts over Expenditure	403	08			
	579	49		579	49

BALANCE SHEET.

As on February 29th, 1908.

	Liabilities. $	cts.	Assets. $	cts.
Cash in Chartered Bank of India, Australia and China			348	26
Cash in hand			54	82
Balance as per Expenditure and Receipts Account	403	08		
	403	08	403	08

BATU TIGA DISTRICT PLANTERS' ASSOCIATION.

H. N. RIDLEY, ESQ.,
Botanic Gardens,
Singapore.

Batu Tiga,
Selangor F. M. S.
May 1st, 1908.

DEAR SIR,

I have been informed by Mr. Zacharias, that you will publish minutes, and other matter, in the Bulletin, so beg to enclose copy of our annual report, and give below a short account of the Meeting. I also enclose list of Members in my Association, to whom I shall be obliged if you will send copies of the "Bulletin."

Yours faithfully,
H. L. JARVIS,
Hon. Secretary.

B. T. D. P. A.

The Annual General Meeting of the above Association, was held in the Rest House, Batu Tiga, on March 25th at 4 p.m. The report (enclosed) was passed, and the result of voting for the new officers was as follows;—

Chairman ... Mr. H. F. Browell. *Com :* Messrs. P. W. Parkinson
Hon. Secretary Mr. H. L. Jarvis. H. C. Quartly,
and C. Henly.

Delegates to P. A. M. ... Messrs. H. F. Browell, H. L. Jarvis, P. W. Parkinson, and C. Henly.

Present at the Meeting. Messrs. C. Henly (*Chairman*), H. L. Jarvis, (*Hon. Secretary*), H. C. Quartley, H. E. G. Solbe, J. W. Craib, and H. F. Browell.

H. L. JARVIS.
Hon. Secretary.

Report for 1907-1908.

GENTLEMEN,

Your Committee have the honour to submit for your consideration the First Annual Report of the Batu Tiga District Planters Association.

MEETINGS.

Since the formation of this Association there have been one general, and two committee meetings. Your four delegates to the P. A. M. have attended the two meetings held since the formation of that body, voting amongst other things for the abolition of Sunday Names, and are glad to report that all Sunday names will be done away with from July 1st.

HOSPITALS.

This matter has engaged a great deal of attention during the year, and has been taken up in a very whole-hearted manner by your sister Association,—the Batu Tiga Estates Hospital Ass'n. The whole set of buildings,—wards, kitchens, dressers, bungalows, etc., etc., are now nearly ready for occupation, and were very favourably commented on by the Resident General, who recently visited them.

LABOUR.

The number of coolies arriving from the coast has, on most estates, been short of requirements, but it is thought that the Government Immigrant Scheme will prove a great help in furnishing estates with sufficient labour.

GENERAL.

In all, 13 estates have enrolled in the Association, with a total of close on 20,000 Acres.

(Signed) C. HENLY,
Chairman.

BALANCE SHEET.

LIABILITIES.	$	cts.	ASSETS.	$	cts.
To Subscription P.A.M.	140	00	By Members Subs.	180	00
Books, and stationary	35	90			
Postages	1	50			
Balance in hand	2	60			
	$180	00		$180	00

(Signed) H. L. JARVIS. *Hon. Secretary.*

KAPAR DISTRICT PLANTERS ASSOCIATION.

MINUTES OF GENERAL MEETING.

First quarterly meeting held at Sementa School on Friday April, 3rd. *Present:*—H. M. Darby, (*Chairman*) W. R. G. Hickey, C. T. Hamarton, E. C. Wakefield, C. R. Hamerton, C. R. Kinder, H. G. Graham, R. W. Wilson, M. Sharpe Smith, P. M. Coke, Boothby and N. C. S. Bosanquet.

The notice calling the meeting was taken as read.

1. Proposed by Mr. C. T. Hamerton and seconded by Mr. Graham that the minutes of the last meeting be passed, carried.

2. The annual report was readby the chairman, and on the motion of the chairman seconded by Mr. Wilson, adopted.

3. After some discussion in Committee, the following rules proposed by Mr. Darby and seconded by Mr. Hickey were passed.

(*a*) That from July 1st all coolies should have rice issued to them in three separate issues during the month, two gantangs each issue. That in the event of a cooly failing to work more than one working day in ten, without sufficient reason, he forfeit one issue of rice.

(*b*) That the standard rate of wages for coolies be 27 cents and the maximum wage for any work, 30 cents, this only to be given to coolies working 24 days in the month, and at the discretion of his employer.

Election of officers. Mr. Hickey proposes a vote of thanks to Mr. Darby for his work on behalf of the Association during the past year, and that he continue to occupy the chair during the coming year, Mr. Hamerton seconds.

4. On Mr. Darby resuming the chair, the following gentlemen were elected on to the Committee: Mr. W. R. G. Hickey, Mr. C. T. Hamerton, W. R. Wilson, Mr. N. C. S. Bosanquet (*Hon. Secretary*).

The chairman, Messrs. Hickey, Hamerton and the Hon. Secretary were elected as delegates to the P. A. M.

The meeting closed with a vote of thanks to the chair at 5.23 p.m.

N. C. S. BOSANQUET,

Hon. Secretary.

SECOND ANNUAL REPORT.

GENTLEMEN,

Your Committee have pleasure in submitting to you their Report on the work done by the Association during the past year ending February 29th, 1908.

During this period four ordinary General Meetings and three special General Meetings were held.

Membership. This has been increased by two new Estates having joined the Association during the year and one individual member, while one individual member resigned. The total membership now being Estates 16, individual members 2 (26 votes). Your Committee record with regret the sudden death of your Honorary Secretary, Mr. C. N. Brockwell, who had done excellent work for your Association. Your sympathy with his bereaved relatives has been conveyed to them.

Committee. The undermentioned gentlemen were elected on April 19th, 1907, as your Committee: Mr. H. M. Darby, Chairman, C. N. Brockwell, Secretary, with Messrs. Hamerton, Harvey, and Hickey. On the untimely death of Mr. Brockwell, Mr. G. V. L. Scott was elected secretary and continued to act until the end of the year.

Bridge over the River at Klang. Your Committee are pleased to note that very satisfactory progress is being made with this bridge, and it is expected to be completed by the end of the year.

Water supply for the Kapar and Sungei Binjai Roads. Your Committee regret that this matter has been delayed owing to the death of the surveyor in whose hands the survey of the pipe line was placed. The survey had been practically completed, but the plans could not be found after his death, so your Committee decided to have the line resurveyed. This work has been given to Mr. W. J. Grove, Surveyor, who is resurveying the pipe-line and will give full plans of this and a general scheme for a water supply for putting before Government. The cost of this including the monies paid on account of the unfinished survey, will be about $1,500 which is to be met by an Assessment to be paid by those Estates which will benefit by the scheme. It is hoped that the plans will be ready by the middle of April.

Land Rents. His Excellency the Governor has now been pleased to reduce the rents on lands for cultivation other than rubber, under the Land Enactment of 1906, from $4 to $2.

Shop Houses at Kapar. In continuance of this subject from last year a letter has been received from the District Officer, Klang, that all further shop houses at Kapar will be built on the town-site as requested by your Association. Your Committee also note with satisfaction that the town of Kapar has been placed under the control of the Klang Sanitary Board.

Post Office at Kapar. In accordance with a resolution passed at a meeting of your Association on November 21st, 1907, your Secretary wrote to the Superintendent Posts and Telegraphs on this subject and a reply has been received to the effect that a Postal and Money Order Office is to be built at Kapar during the current year.

U. P. A. M. P. This Association was formed at a meeting held in Kuala Lumpor, but it is to be regretted that one or two other

Planters' Associations did not see their way to join it. However after a great deal of correspondence it was unanimously decided at a meeting of planters held at Ipoh on October 19th, 1907, to form an Association to consist of delegates from all District Associations in the Malay Peninsula to be called the Planters' Association of Malaya. At a subsequent meeting held in Kuala Lumpor on December 1st, 1907, this was confirmed and the U. P. A. of M. P. was dissolved and the P. A. M. formed with Mr. R. W. Harrison Chairman and Mr. Zacharias as Secretary; your Association being represented by your Chairman and Secretary and Messrs. Harvey and Hamerton. Your Committee trust that the formation of such a very strong body to watch the interests of the whole planting community will be received with satisfaction by the Association.

Estate Hospital Accommodation. With reference to the number of beds to be provided which was fixed at 4 per cent of the number of coolies employed, the Managers of several Estates were notified by the District Surgeon that 2 per cent of beds would be sufficient for the Estates in this District. However the Superintendent of Immigrants wrote that the 4 per cent of beds were to be provided. The matter was eventually left to the decision of the Inspector General of Hospitals, Straits Settlements, who visited and reported on the matter; however no official report of the decision of the Inspector General of Hospitals has yet been received by your committee but it is believed that a differential scale for the number of beds necessary is to be recommended. Two hospitals are being erected in your district, one at Bukit Rajah Estate to accommodate coolies of the east end of the district and one near the 9th mile on the Kapar Road to accommodate coolies of the west end of the district. This latter includes three Estates in the Kuala Selangor Association District. The erection of thi hospital is in the hands of a committee appointed by your Associations consisting of your Chairman, Messrs. Harrison, Hickey, Harvey, Hamerton and Scott. An agreement has been drawn up and a copy is being sent to each Estate contributing to the hospital. The funds for the erection of the building are being raised by an assessment of $1.50 per acre on the opened area of the Estates. The erection of the buildings is now well in hand and the whole of the work is estimated to be completed by the 25th of June, 1908. The appointment of medical attendance is receiving the attention of your Hospital Committee.

Tamil Immigration Fund Bill. This Bill has been tentatively put in force by Government on the recommendation of the Immigration Committee for the purpose of providing free passages for Tamil coolies from India to this country. The Government is providing a sum of $320,000 for three years, while the planter is to be taxed at the rate of $1.25 per quarter for each labourer over 14 years of age in his employment. Your Committee consider that this is a very unfair tax on the older properties which have already an ample labour force. At a meeting of planters held at Kuala Lumpor on September 2nd, 1907, to protest against this unfair taxation an amendment was passed and forwarded to Government, asking that the tax should only be imposed upon the coolies actually recruited during any year whether locally or from India. The amendment was not accepted by Govern-

ment, who decided to bring in this bill, to be tried as a temporary measure for one year, on the full terms, to see if it was workable, and your Committee are of opinion that further steps should be taken to have the tax made more equitable before the end of the year.

Sluice Gates. This matter has been taken up by the Government and gates are being erected at the outlets in the district, the properties interested paying a 6 per cent assessment on the cost of the gates. However the gates which have already been erected are not working satisfactorily and this matter is under the consideration of your Committee.

Labour. 1. Labour has been sufficient during the past year and there seems to have been no difficulty in recruiting new coolies. The total force in the district now is about 6,000 coolies against 4,729 at this time last year. The Estates in this district have suffered great loss through crimping, or, rather by their coolies being induced to give notice to leave to go elsewhere for higher wages. If this sort of thing could be stopped the labour force would not be so unsettled, and the necessity for heavy yearly recruiting would almost be done away with.

2. Sunday Names. It was unanimously passed at a meeting of the Planters' Association of Malaya held at Kuala Lumpor on January 19th, 1908, that Sunday Names should be abolished as from the 12th February 1908, the date of the commencement of giving free passages under the Tamil Immigration Fund Bill, on all coolies coming into the country, and no Sunday Names to be given to any cooly after the first July 1908. Your committee further recommends that a maximum rate of wages be paid in this district and that, as far as possible, coolies should be paid according to the work they are able to do, as per the circular issued or 1st March, 1908, and printed herein. It is hoped that the members of your Association will combine in this matter, and so help to reduce the cost of labour which has, owing to competition, increased very much during the last year or two.

CIRCULAR OF LABOUR.

DEAR SIR,

I am instructed by my Committee to advise you that the different points of the above subject were discussed at the last meeting of the committee held on January 30, 1908, particulars of which are given below, to enable you to consider them before they are discussed at the next general meeting of your Association.

1. *Sunday Names.* Referring to the resolution passed at the last General Meeting of your Association, it was unanimously decided at the meeting of the Planters' Association of Malaya, held at Kuala Lumpor on January 19th last, that no Sunday Names be given to any coolies arriving in the country after the 12th of February, 1908, because their passages would be paid for after that date under the Tamil Immigration Fund Bill, and that Sunday names to all coolies employed previous to that date would cease to be given after July 1st, 1908.

2. *Hours of Labour.* This matter was also brought up at the meeting of the Planters' Association of Malaya as above. It any action is taken in this matter your Committee suggests that in this district the future working hours of coolies should be from 6 a.m. to 4 p.m., with one hour off in the middle of the day from 11.30 to 12.30

3. *Rate of Wages.* Your Committee suggests that the maximum rate of wages in this District be 30 cents per day for good coolies on any work, working 24 days per month, and that other inferior coolies be paid at lesser rates according to the value of the work they do and the number of days they work during the month.

H. M. DARBY, *Chairman and Ag. Secretary.*

VALLAMBROSA ESTATE, *March 1st 1908.*

Cultivation and Crops. The extension of cultivated areas has not been so large this year as last, and what has been opened up has been planted in rubber. The yield of rubber has everywhere been very satisfactory and estimates have been exceeded. The output of coffee and copra has decreased owing to certain areas going out of cultivation.

Finance. Attached hereto is a statement of expenditure and receipts for the year, and balance sheet showing a balance of assets over liabilities on the 29th February, 1908. The large balance in hand is due to the change of the constitution of the parent Association. A larger number of Estates are now contributing to the cost of that Association than formerly, so that the subscriptions to it were not as heavy as anticipated.

H. M. DARBY, *Chairman.*

STATEMENT OF EXPENDITURE AND RECEIPTS.
From March 1st 1907 to February, 29th 1908.

EXPENDITURE.			RECEIPTS.		
	$	cts.		$	cts.
Stationery and printing	22	20	Subscriptions ...	625	96
Postages	7	23	To Motor Bus ...		
Motor Bus Service subscription ...	150	00	Service subscription	150	00
			Refund from P. A. M.	90	53
Sub: to P. A. M. for 4 months 1907-08	140	00			
General Expenses ...	86	40			
Total Expenditure ...	405	83			
Balance of receipts over expenditure ...	460	66			
Total ...	866	49	Total ...	866	49

BALANCE SHEET.

As on 29th February, 1908.

	Liabilities.	Assets.
Cash in Chartered Bank of I. A. C.		460 66
Balance as per expenditure and receipts a/c ...	460 66	
Total ...	460 66	460 66

G. V. L. SCOTT, *Secretary.*

FUNGUS INSIDE A BAMBOO.

While cutting dead stems of a Bamboo in the Botanic Gardens Singapore, one joint of a dead but not rotten culm was found to be lined inside with a leathery mass of a kaki colour. The hollow space was completely covered by a tube of this substance $\frac{1}{8}$ of an inch or more thick, firm and leathery-and detached like a cylinder exactly fitting the hollow of the Bamboo. A small specimen of a *Polystictus* was found growing on the outside of a bamboo on the clump, and this and the mat of mycelium inside were sent to Kew.

Mr. G. Massee reports on the specimens. "The fungus is *Polystictus occidentalis*, Klotsch. and the mycelium belongs to it as proved by examination of specimens in the herbarium. *P. occidentalis* is cosmopolitan in the warmer regious, notwithstanding its specific name."

MATERIALS FOR A FLORA OF THE MALAY PENINSULA.

The Indexes to the three volumes of Monocotyledons of the Malay peninsula are now printed and can be had free by purchasers of the volumes on application to the Editor.

H. N. RIDLEY.

SINGAPORE MARKET REPORT.

April, 1908.

ARTICLES.	Quantity sold.	Highest price.	Lowest price.	
	Tons.	$	$	
Coffee Palembang ...	...	...	...	
Bali	...	23.00	21.50-3%	
Liberian ...	93	23.00	22.50	
Copra	2,663	6.80	6.20	
Gambier	1,627	6.95	6.80	
Gambier Cube, Nos. 1 & 2 ...	75	12.25	10.25	
Gutta Percha, 1st quality ...	...	300.00	240.00	
Medium ...	...	240.00	80.00	
Lower ...	...	80.00	12.00	
Borneo Rubber, 1, 2 & 3 ...	...	108.00	40.00	
Gutta Jelotong	...	4.75	3.70	
Nutmegs, 110's ...	...	21.75	20.50	
80's ...	...	23.25	22.50	
Mace, Amboyna ...	...	64.00	60.00	
Banda ...	...	78.00	70.00	
Black Pepper	1,490	12.25	11.00	
White Pepper (Sarawak) ...	309	20.75	19.10	
Pearl Sago, Small ...	200	4.05	4.00	
Medium ...	...	4.50	4.50	
Large	...	...	...	
Sago Flour, No. 1 ...	2,484	3.08	2.90	
No. 2	380	1.10	1.07½	
Tapioca Flake, Small ...	489	7.60	7.25	Closing fair.
Medium ...	...	...	...	
Pearl, Small ...	251	6.00 Penang	5.80	
Medium ...	417	7.00	6.80	
Bullet ...	20	8.12½	7.75	
Tin	1,637	5.37	71.50	

EXPORTS TELEGRAM TO EUROPE AND AMERICA.

Fortnight ending 30th April, 1908.

Wired at 4 p.m. on 1st May, 1908.

				Tons.
Tin	Str.	Singapore & Penang	to U. Kingdom &/or	1,000
Do.	,,	do.	U. S. A.	268
Do.	,,	do.	Continent	185
Gambier	,,	Singapore	Glasgow	...
Do.	,,	do.	London	25
Do.	,,	do.	Liverpool	75
Do.	,,	do.	U. K. &/or Continent	25
Cube Gambier	,,	do.	United Kingdom	...
Black Pepper	,,	do.	do.	15
Do.	,,	Penang	do.	120
White Pepper	,,	Singapore	do.	55
Do.	,,	Penang	do.	..
Pearl Sago	,,	Singapore	do.	60
Sago Flour	,,	do.	London	100
Do.	,,	do.	Liverpool	625
Do.	,,	do.	Glasgow	...
Tapioca Flake	,,	do.	United Kingdom	150
T. Pearl & Bullet	,,	do.	do.	130
Tapioca Flour	,,	Penang	do.	90
Gutta Percha	,,	Singapore	do.	10
Buffalo Hides	,,	do.	do.	5
Pineapples	,,	do.	do.	cases 11,300
Gambier	,,	do.	U. S. A.	550
Cube Gambier	,,	do.	do.	170
Black Pepper	,,	do.	do.	90
Do.	,,	Penang	do.	40
White Pepper	,,	Singapore	do.	90
Do.	,,	Penang	do.	20
Tapioca Pearl	,,	Singapore	do.	130
Nutmegs	,,	Singapore & Penang	do.	19
Sago Flour	,,	Singapore	do.	375
Pineapples	,,	do.	do.	cases 3,000
Do.	,,	do.	Continent	2,000
Gambier	,,	do.	South Continent	...
Do.	,,	do.	North Continent	430
Cube Gambier	,,	do.	Continent	15
Black Pepper	,,	do.	South Continent	85
Do.	,,	do.	North do.	360
Do.	,,	Penang	South do.	10
Do.	,,	do.	North do.	...
White Pepper	,,	Singapore	South do.	...
Do.	,,	do.	North do.	40
Do.	,,	Penang	South do.	...
Do.	,,	do.	North do.	20
Copra	,,	Singapore & Penang	Marseilles	700
Do.	,,	do.	Odessa	...
Do.	,,	do.	Other South Continent	150
Do.	,,	do.	North Continent	600
Sago Flour	,,	Singapore	Continent	260
Tapioca Flake	,,	do.	do.	25
Do. Pearl	,,	do.	do.	25
Do. Flake	,,	do.	U. S. A.	...
Do. do.	,,	Penang	U. K.	160
Do. Pearl & Bullet	,,	do.	do.	100
Do. Flake	,,	do.	U. S. A.	50
Do. Pearl	,,	do.	do.	370
Do. Flake	,,	do.	Continent	...
Do. Pearl	,,	do.	do.	40
Copra	,,	Singapore	England	340

Gambier	Str.	Singapore	U. S. A.	...
Cube Gambier	,,	do.	do.	...
T. Flake & Pearl	,,	do.	do.	...
Sago Flour	,,	do.	do.	...
Gambier	,,	do.	South Continent	...
Copra	,,	do.	Marseilles	..
Black Pepper	,,	do.	South Continent	...
White Pepper	,,	do.	do.	...
Do.	,,	do.	U. S. A.	...
Pineapples	,,	do.	do.	..
Nutmegs	,,	do.	do.	...
Black Pepper	,,	do.	do.	...
Do.	,,	Penang	do.	..
White Pepper	,,	do.	do,	...
T. Flake & Pearl	,,	do.	do.	...
Nutmegs	,,	do.	do,	...
tons Gambier				950
,, Black Pepper				460

EXPORTS TELEGRAM TO EUROPE AND AMERICA.

Fortnight ending 15th April, 1908.

Wired at 4 p.m. on 16th May, 1908.

					Tons.
Tin	Str.	Singapore & Penang	to	U. Kingdom &/or	1,095
Do.	,,	do.		U. S. A.	355
Do.	,,	do.		Continent	420
Gambier	,,	Singapore		Glasgow	...
Do.	,,	do.		London	250
Do.	,,	do.		Liverpool	160
Do.	,,	do.		U. K. &/or Continent	125
Cube Gambier	,,	do.		United Kingdom	20
Black Pepper	,,	do.	,,	do.	5
Do.	,,	Penang	,,	do.	20
White Pepper	,,	Singapore	,,	do.	95
Do.	,,	Penang	,,	do.	...
Pearl Sago	,,	Singapore	,,	do.	110
Sago Flour	,,	do.		London	350
Do.	,,	do.		Liverpool	450
Do.	,,	do.		Glasgow	175
Tapioca Flake	,,	Singapore		United Kingdom	250
T. Pearl & Bullet	,,	do.	,,	do.	90
Tapioca Flour	,,	Penang	,,	do.	70
Gutta Percha	,,	Singapore	,,	do.	15
Buffalo Hides	,,	do.	,,	do.	65
Pineapples	,,	do.	,,	do.	14,500
Gambier	,,	do.	,,	U. S. A.	300
Cube Gambier	,,	do.	,,	do.	110
Black Pepper	,,	do.	,,	do.	650
Do.	,,	Penang	,,	do.	...
White Pepper	,,	Singapore	,,	do.	130
Do.	,,	Penang	,,	do.	...
Tapioca Pearl	,,	Singapore	,,	do.	270
Nutmegs	,,	Singapore & Penang	,,	do.	21
Sago Flour	,,	Singapore	,,	do.	350
Pineapples	,,	do.	,,	do.	3,500
Do.	,,	do.		Continent	1,250
Gambier	,,	do.		South Continent	140
Do.	,,	do.		North Continent	225
Cube Gambier	,,	do.		Continent	50
Black Pepper	,,	do.		South Continent	350

Do.	Str.	Singapore	North Continent	65
Do.	,,	Penang	South do.	40
Do.	,,	do.	North do.	...
White Pepper	,,	Singapore	South do.	25
Do.	,,	do.	North do.	25
Do.	,,	Penang	South do.	20
Do.	,,	do.	North do.	5
Copra	,,	Singapore & Penang	Marseilles	1,250
Do.	,,	do.	Odessa	680
Do.	,,	do.	Other South Continent	150
Do.	,,	do.	North Continent	740
Sago Flour	,,	Singapore	Continent	1,300
Tapioca Flake	,,	do.	do.	140
Do. Pearl	,,	do.	do.	40
Do. Flake	,,	do.	U. S. A.	...
Do. do.	,,	Penang	U. K.	60
Do. Pearl & Bullet	,,	do.	do.	60
Do. Flake	,,	do.	U. S. A.	...
Do. Pearl	,,	do.	do.	...
Do. Flake	,,	do.	Continent	...
Do. Pearl	,,	do.	do.	70
Copra	,,	Singapore	England	...
Gambier	,,	do.	U. S. A.	..
Cube Gambier	,,	do.	do.	..
T. Flake & Pearl	,,	do.	do.	...
Sago Flour	,,	do.	do.	..
Gambier	,,	do.	South Continent	..
Copra	,,	do.	Marseilles	...
Black Pepper	,,	do.	South Continent	...
White Pepper	,,	do.	do.	...
Do.	,,	do.	U. A. S.	...
Pineapples	,,	do.	do.	..
Nutmegs	,,	do.	do.	...
Black Pepper	,,	do.	do.	..
Do.	,,	Penang	do.	..
White Pepper	,,	do.	do.	...
T. Flake & Pearl	,,	do.	do.	...
Nutmegs	,,	do.	do.	..
tons Gambier				750
,, Black Pepper				1,075

GOW, WILSON & STANTON, Limited—

India Rubber Market Report.

13 & 23, Rood Lane, London, E.C.

April, 3rd 1908.

The offerings were smaller than at the last Auction by about 17 tons, and following the rather better demand noticeable during the last few days, there was more competition for most descriptions. A large proportion of the sale changed hands in the room at an irregular advance of about 1d. per lb. on prices ruling at the previous sale.

Another very fine parcel of pale biscuits from Warriapolla realised the highest price of the day, viz., 4/- per lb.; this represents a premium of 4d. per lb. over the next highest quotation, viz., 3/8 per lb. for a small lot of Vallambrosa pale crepe.

There was again good enquiry for all grades of crepe, excepting the darkest, which was rather neglected.

Number of Packages Advertised.		Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.		
		Ceylon.	Malaya.	Totals.	No. of Packages Sold.	Price.	Hard Fine Para.	Plantation. Fine.	Plantation. Scrap.
To-day	832	11	32¼	43¼	530	3/2¼	3/3	3/4 to 4/-	1/- to 2/7¼
Corresponding Sale Last Year	557	9¾	16⅓	26	240	5/4¼	4/11	5/7 to 5/10½	4/1 to 4/6¾

TO-DAY'S QUOTATIONS.

Sheet and Biscuits.		Crepe and Block.		Unwashed Scrap.	
Good to Fine Sheet.	3/4¼ to 3/6½	Fine Pale ...	3/8		
Very Fine Pale Biscuits.	4/-	Fine Palish...	3/5 to 3/7	Good to Fine	2/2 to 2/7¼
Good to Fine Biscuits.	3/4 to 3/6½	Brown and Medium.	2/10 to 3/4½	Low and Medium.	1/- to 1/4½

PARA STATISTICS.—

Receipts at Para for March.

1908	1907	1906	1905
Tons	Tons	Tons	Tons
4,200 ...	... 5,975 ...	... 3,700 ...	... 5,000

TOTAL CROP RECEIPTS.—

From July to March.

1907-08.	1906-7.	1905-6.	1904-5.
18,655 tons ...	29,455 tons ...	28,020 tons ...	27,250 tons

PLANTATION EXPORTS.

CEYLON.—1st January to 9th March.

1908	1907	1906	1905
58½ tons	32 tons	22½ tons	8¼ tons

MALAYA.—1st January to 22nd February.

	Singapore.	Penang.	Total.
1908	132⅔ tons ...	44⅓ tons ...	177 tons
1907	74½ tons ...	4¼ tons ...	78¾ tons

Particulars and Prices as follows :—

CEYLON.

Mark.	Pkgs.	Description.	Price.
Medampe	3	Biscuits ...	3/6½
	1	Scrap ...	2/4
	1	Block ...	bought in
Dea Ella	2	Biscuits ...	3/5 to 3/6¼
	2	Scrap ...	bought in
Pallagodda	7	Scrap and lumps ...	pt. sold 1/4½
Kumbukkan	2	Biscuits ...	3/6½
D. B. M.	1	Biscuits (4 lbs.) ...	2/9
	4	Scrap ...	bought in
D. G. H. & Co.	5	Crepe ...	2/10 to 3/4
	21	Darkish to black crepe ...	pt. sold, 2/4
	1	Sheet ...	3/4
	32	Scrap and rejections ...	2/3 to 2/11
	4	Biscuits (small quantities) .	2/10 to 3/1½
Ambatenne	3	Fine biscuits ...	3/6½
	2	Good to fine scrap ...	2/4¾ to 2/7
M. A. K.	3	Biscuits and sheet ...	3/4¼ to 3/5½
	2	Rejections ...	2/3 to 2/9¼
	10	Black crepe ...	bought in
Hilton	1	Fine biscuits ...	3/6½
Clara	2	Biscuits ...	3- to 3/6½
Doranakande	5	Biscuits ...	3/4¼ to 3/6
	7	Fine Scrap ...	2/7¼
	9	Good scrap and rejections .	2/6 to 2/7¼
Ayr	2	Fine biscuits and sheet ...	3/6
Ballacadua	6	Crepe ...	3/2¾
Tallagalla	2	Biscuits ...	3/6
	4	Scrap ...	2/4 to 2/7¼
Warriapolla	5	Very fine pale biscuits ...	4-
	2	Darker ...	3/6½
	5	Scrap and cuttings ...	1/6 to 3-
G. D. J. Blackhill	36	Crepe ...	bought in
Mudumana	1	Pressed sheet ...	3/6
	4	Scrap ...	2/2¾
	2	Good scrap and rejections ...	2/2¾ to 2/3
C. W. M. & Co.	6	Darkish crepe ...	3/-
Culloden	12	Brownish crepe ...	3/2¾ to 3/4¾
	5	Black crepe ...	bought in
Heatherley	2	Crepe ...	3/3½
Nikakotua	9	,,	3/3 to 3/3½
Hattangalla	2	Fine biscuits ...	3/6
	2	Crepe ..	3/4¼
Arapolakande	10	Fine biscuits ...	3/6 to 3/6½
	4	Crepe ...	2/11 to 3/3½
Woodend	1	Biscuits ...	3/5
Glencorse	3	Fine biscuits ...	3/5½ to 3/6
	3	Good to fine scrap ...	2/4 to 2/7

Comparative statement of cultivated rubber exported from the Federated Malay States during the years 1908 and 1907.

	Exported during March, 1908.	Previously.	Total export during 1908.	Export during similar period of previous year.	Increase.
	lbs.	lbs.	lbs.	lbs.	lbs.
Perak ...	31,986	71,241	103,227	53,515	49,712
Selangor ...	131,814	272,142	403,956	277,872	126,084
Negri Sembilan ...	88,338	125,012	213,350	90,945	122,405
Pahang ...		nil		nil.	
Total ...	252,138*	468,395	720,233	422,332	298,201

* Excluding Pahang export for March.

KUALA LUMPOR, J. R. O. ALDWORTH,

14th April, 1908. *Commissioner of Trade and Customs.*

GOW, WILSON & STANTON, Limited—

India Rubber Market Report.

13 25, ROOD LANE, LONDON, E. C.

April 24th, 1908.

The offerings were again on a fairly modereat scale although there has been a three week's interval, on accound of the holidays, since the last sale took place.

There has been a stronger tone noticeable in the market during the last few days, and prices at the auction showed an irregular advance of about Ib. per lb. on last sale quotations. The better grades of Crepe

and Sheet were mostly well competed for, but Block and the darkest kinds of Crepe were again somewhat difficult to quit.

Number of Packages Advertised.		Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.		
		Ceylon.	Malaya.	Total.	No of Packages Sold.	Price	Hard Fine Para.	Plantation. Fine.	Plantation. Scrap.
To-day	326	9½	33½	43	355	3/3⅝	3/5	3/6 to 3/8½	1/- to 2/8
Corresponding Sale Last Year	862	11½	34¾	46¼	379	5/4½	4/10½	5/6 to 5/11	1/- to 2/-

To-Day's Quotations.

Sheet and Biscuts.		Crepe and Block.		Unwashed Scrap.	
		Fine Pale ...	3/8½		
Good to Fine Sheet.	3/5½ to 3/7¼	Fine Palish ...	3/5⅕ to 3/7¼	Good to Fine	2/4 to 2/8
Good to Fine Biscuits.	3/5 to 3/7	Dark and Medium.	2/6 to 3/5	Law and Medium.	1/- to 2/-

Plantation Exports.

Ceylon.—*1st January to 16th March.*

	Tons.
1908	62
1907	33
1906	24

Malaya.—*1st January to 17th March.*

	Singapore. Tons.	Penang Tons.	Total. Tons.
1908	215¾	89¾	305½
1907	93¼	6¾	100

PARTICULARS AND PRICES OF TO-DAY'S SALE.

CEYLON.

MARK.	PKGS.	DESCRIPTION.	PRICE.
Kahagalla	3	Fine crepe ...	3/6
	4	Black ,, ...	bought in
Galatura	4	Scrap ...	bought in
Kumbukkan	5	Biscuits ...	bought in
	2	Scrap & lumps ...	2/4 to 2/7 ¾
Yattewatte	1	Dark biscuits ...	bought in
Ellakande	7	Fine crepe ...	3/7¾
	2	Brown ,, ...	3/3
Heatherley	3	,, ,, ...	3/2½
	1	Black ,, ...	2/6
Nikakotua	6	Crepe ...	3/2 to 3/5½
Ingoya	8	Biscuits and sheet ...	3/6 to 3/6½
	10	Blocked sheet ...	3/5¾
	4	,, scrap ...	1/8 to 2/3½
Langsland	8	Biscuits ...	3/6½ to 3/6¾
	2	Scrap ...	1/10¾
Glendon	2	Biscuits ...	3/6½
Palli	11	Very fine biscuits and sheet	3/6½ to 3/7
Densworth	2	Biscuits (small quantity) ...	3/4 to 3/5
	2	Scrap ...	pt. sold, 2/3
Imboolpittiya	1	Sheet ...	3/6
	1	Scrap ...	bought in
New Peradeniya	1	Biscuits ...	3/6
	1	Scrap ...	2/4½
Tallagalla	2	Dark biscuits ...	3/5½
	2	Scrap ...	2/4 to 2/8
Clara	1	Biscuits ...	3/6
	1	Fine scrap ...	2/5
	1	Lumps ...	2/7
Waharaka	2	Biscuits ...	3/6
Gonakelle	1	Fine biscuits ...	3/7
	1	,, scrap ...	2/7
	1	Lumps ...	3/6¾
Ayr	1	Sheet ...	3/4¼
S. L.	2	Biscuits ...	pt. sold 2/6
	9	Scrap & lumps ...	bought in
Sunnycroft	1	Sheet ...	bought in
D. G. H. & Co.	2	Sheet & biscuits ...	3/4
	1	Fine scrap ...	3/6to3/6½
D. G. H. & Co.	1	Lumps ...	2/6
	20	Dark to black crepe ...	2/6¼
D. B. M.	2	Dark scrap ...	bought in
Werriapolla	1	Scrap ...	bought in
Elston	4	Biscuits ...	8d.
	3	Fine scrap and rejections ...	2/6 to 2/7
Kumaradola	2	Biscuits ...	bought in
	1	Rejections ...	bought in
Tudugalla	15	Good to fine crepe ...	bought in
Panawatte	2	Biscuits ...	bought in
Polatagama	4	,, ...	bought in
Udupolla	3	Fine biscuits ...	bought in
	2	Lace & cuttings ...	bought in
Veralupitiya	1	Sheet ...	bought in
Glanrhos	10	Good to fine sheet ...	bought in
Ambaganga	2	Sheet ...	bought in
	2	Block and rejections ...	bought in

MALAYA.

Mark.	Pkgs.	Descriptions.	Price.
C. M. R. E. Ltd.	32	Good to fine crepe	... pt. sold 3/30
Shelford	8	Good and dark crepe	... bought in
B. R.R. Co. Ld.	28	Good and medium crepe	... pt. sold 3/5
	13	Dark crepe	... bought in
	41	Fine sheet	... bought in
F. (S) R. Co. Ld.	17	Good and dark crepe	... bought in
Highlands Est.	13	Fine sheet	... bought in
	11	Good and medium crepe	... bought in
	12	Darkish to black crepe	pt. sold 3/-to 3/0¼
	2	Fine sheet	... 3/6¾
V. R. Co., Ld.	27	Good to fine crepe	... 3/3½ to 37/¼
Klang	29	Mottled to dark crepe	... 2/10¼ to 3/2
F. M. S.	40	Fine thick crepe	... 3/5¼
K. P. C.	21	Sheet	... 3/6½ to 3/6¾
	1	Scrap	... 2/5⅓
K. P. C.	3	Good and dark crepe	... 2/6 to 3/4
	5	Dark crepe	... 2/11 to 3/-
	9	Scrap and rejections	... 2/- to 2/6
P. S. E.	5	Sheet	... 3/6¼
	10	Dark crepe	... 2/1¼
S. B	8	Very fine sheet	... 3/7¼
P. R.	4	Scrap	... 1/7¼ to 2/4½
R. S. R.	25	Sheet	... 3/5⅛ to 3/6½
	7	Scrap and rejections	... 22 to 2|4
E. Muar Straits	81	Fine block	... bought in
B. E. Straits	15	No. 2 block	... bought in
B. R. E.	1	Rambong	... bought in
D. & D.	4	Dark crepe	... baught in
	3	Good to fine crepe	... 3|2½ to 34
	1	Dark sheet	... bought in
	3	Fine sheet	... 3|6½
B. D.	13	Crepe, rejections, scrap, etc.	2|6½ to 3|6
	1	Block	... bought in
B. M. & Co. Ld.	10	Sheet	... bought in
Perhentian	14	Sheet	. bought in
Tinggi	16	Dark crepe	... bought in
S. S. B. R. Co. Ld	22	Darkish to dark crepe	... 3|- to 3|2
	7	Sheet	... bought in
Golconda	9	Darkish to dark crepe	... bought in
	2	Scrap	... 1|- to 1|11
Jebong	5	Good to fine crepe	... bought in
R.	5	Fine sheet	... bought in
	1	Crepe	... bought in
	1	Dark crepe (heated)	... 1|-
Bila	22	Good to fine sheet	... pt. sold 3|7
	6	Fine scrap	... bought in
	1	Dark crepe	... bought in
Sunnige Krudda	15	Good crepe	... bought in
	1	Block	... bought in

JAVA.

Mark.	Pkgs.	Descriptions.	Price.
Rasir	1	Fine sheet	... bought in
Oetjing	2	Scrap	.. 2|1¾

CEYLON, STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

April 3rd, 1908.

The following Lots, comprising about 30¾ Tons Straits and 12¼ Tons Ceylon, were offered at Auctions to-day and sold as follows :—

STRAITS AND MALAY STATES.

Mark.	Pkgs.	Description.		Price.
C. M R. E., Ltd.	39	Cases Crepe	9 sold ...	3/3½ at 3/7
Damansara	6	,, Sheets	4 sold ...	3/6¼
	21	,, Crepe	7 sold ...	3/0½
	1	,, Block	...	bought in
Yam Seng	6	,, Sheets	...	,,
	1	,, Scrap	...	2/5½
Shelford	6	,, Sheets	...	bought in
Merton	7	,, Biscuits	...	,,
	1	,, Crepe	...	3/1¾
F. S. R. Co., Ltd.	4	,, Sheets	...	bought in
	1	,, Crepe	...	,,
N. H. R. Co., Ltd.	1	,, ,,	...	3/-
B. R. R. Co., Ltd.	9	,, ,,	...	3/0¾ at 3/½
	37	,, ,,	...	3/0¾ at 3/3¾
D.	2	,, Block	...	3/6¾
	13	,, Sheets	...	3/6½
R. M. P. Ltd.	6	,, Crepe	...	3/2 at 3/3
B. & D.	8	,, Sheet	...	3/6½
F. D. P.				
S. K. R. Co., Ltd.	12	,, Crepe	...	3/3¾ at 3/6
R. R. S. & D.	10	,, Sheets	...	3/6¼
	5	,, Scrap	...	2/5¼
R. R. L. E. D.	3	,, Sheets	...	3/6
R. S. L. E. D.	3	,, Scrap	...	1/- at 2/6¼
S. R R. A. G.	1	,, Biscuits	...	2/9½
R. R. C. W.	3	Pkgs. Biscuits	...	2/8 at 3/-

Mark.	Pkgs.	Description.			Price.
Perhentian }	14	Cases Sheets		...	3/6¾ at bid
Tinggi Estate }	16	,, Crepe		...	bought in
B. & D.	4	,, Sheets		...	3/4
	6	Pkgs. Crepe		...	2/6, at 3/1½
Matang	26	Cases Crepe		...	2/1 at 3/5
B. M. & Co., Ltd.	10	,, Sheets		...	bought in
	3	,, Scrap		...	2/7¼
L. E. MUAR	51	,, Block No. 1		...	bought in
Highland Estate	7	,, Sheets		...	3/6¼
	32	,, Crepe		...	3/0¼ at 3/4¼
V. R. Co., Ltd. Klang F.M.S.	66	,, Sheets	45 sold	...	2/8¾ at 3/8
K. P. Co., Ltd.	11	,, Sheets	9 sold	...	3/5¾
Matang	8	,, Crepe		...	2/11 at 3/4½
	4	,, Scrap		...	bought in
	13	,, Sheets		...	3/5¾
P. S. E. K. M. P. R.	17	,, Sheets		...	3/5¼
	2	,, Sheets		...	bought in
R. S. S.	6	,, Sheets		...	bought in
S. R. R.	6	,, Sheets		...	
	5	,, Scrap		...	3/6
					2/4 at 2/6
T. A. & Co.	7	,, Crepe		...	bought in
	5	,, Scrap		..	,,
Beverlac	1	,, Sheets		...	,,
	8	,, Crepe		...	,,
Madampe	3	,, Biscuits		...	3/6½
	1	,, Scrap		...	2/4
Dea Ella	2	,, Biscuits		...	3/5 at 3/6½
	2	,, Scrap		...	2/- bid
Pallagodda	7	,, Scrap	5 sold	...	1/4½
Kumbukkan	2	,, Biscuits		...	3/6½
C. W. M. & Co.	6	,, Crepe		...	3/-
D. B. M.	1	Bag. Biscuits		...	2/9
	4	Cases Scrap		...	2/5 bid
D. G. H. & Co.	26	,, Crepe		..	2/10 at 3/4
	8	Pkgs Sheets		...	2/10¼ at 3/4
	3	Cases Biscuits		.	3/0½
	16	,, Scrap		...	2/1 at 2/7
Ambatenne	3	,, Biscuits		...	3/6½
	2	,, Scrap		...	2/4¾ at 2/7
M. A. K.	5	Pkgs. Biscuits		...	2/3 at 2/5¼

Mark.	Pkgs	Description.		Price.
Hylton	1	Case ,,	...	3/6½
Clara	2	Cases ,,	...	3/- at 3/6½
Doranakande	5	,, ,,	...	3/4¼ at 3/6
	7	,, Sheets	...	2/7¼
	9	,, Scrap	...	2/7¼
Ayr	1	,, Biscuits	...	3/6
	1	,, Sheet	...	3/6
Ballacadua	6	,, Crepe	...	3/2¾
Tallagalla	2	,, Biscuits	...	3/6
	4	,, Scrap	...	2/4 at 2/7¼
Warriapolla	7	,, Biscuits	...	3/- at 4/-
	4	,, Scrap	...	2/2 at 2/7
D. G. H. & Co Elkadua	1	,, Biscuits	...	bought in
G. D. J. Blackhill	36	,, Crepe	..	,,
V. S.	4	,, Scrap	...	2/2¾
M. A. K.	10	,, Crepe	...	bought in
Culloden	14	,, Crepe	...	3/2at3/4¾
Heatherley	2	,, Crepe	...	3/3½
Nikakotua	9	,, Crepe	...	3/3 at 3/3½
Hattangalla	2	,, Biscuits	...	3/6½
	2	,, Crepe	..	3/4¼
Arapolakande	10	,, Biscuits	...	3/6 at 3/6½
	4	,, Crepe	...	2/11 at 3/3½
Woodend	1	,, Biscuits	..	3/5
Culloden	3	,, Crepe	...	bought in
Glencorse	3	,, Biscuits	...	3/5½ at 3/6
		,, Scrap		2/4at 2/7

Plantation Rubber in London for March :—

Stock.

Imported Delivered 1908, 1907 and 1906.

118 Tons, 91 Tons, 805 Tons, 108 Tons and 36 Tons.

To-day's price of FINE HARD on the spot is 3/2¾

MALAYA.

Mark.	Pkgs.	Description.		Price.
C. M. R. E. Ltd.	39	Good to fine crepe	pt.	sold 3/3½ to 3/7
Damansara	6	Sheet	...	pt sold 3/6¼
	9	Good to fine crepe	...	bought in
	12	Darkish to dark crepe	...	pt. sold 3/0½
	1	Block	..	bought in
T. A. & Co.	7	Rambong crepe	...	bought in
	5	,, scrap	...	bought in

Mark.	Pkgs.	Description.		Price.
Beverlac	1	Sheet	...	bought in
	8	Darkish to black crepe	...	bought in
Yam Seng	6	Fine sheet	...	bought in
	2	Scrap and rejections	...	2/5½
Shelford	6	Sheet	...	bought in
Merton	7	,,	...	bought in
	2	Crepe and sheet	...	pt. sold 3/1¾
F. (S) R. Co. Ltd.	4	Sheet	...	bought in
	1	Dark crepe	...	bought in
N. H. R. Co. Ltd.	1	,, ,,	...	3/-
B. R. R. Co. Ltd.	6	Good crepe	...	pt. sold 3/3½
	7	Dark crepe	...	3/0¾
	23	Fine crepe	...	3/3¼
	18	Darkish to dark	...	2/8 to 3/2½
	2	Block	...	3/6¾
	1	Rambong scrape	...	2/2½
	13	Sheet	...	3/6½
	1	Rough biscuits	...	(20 lbs.) 2/9
R. M. P. Ltd.	6	Brown crepe	...	3/2 to 3/3
B. & D.	9	Fine sheet	...	3/6½
S. K. R. Co. Ltd.	12	Good to fine crepe	...	3/3¾ to 3/6
	3	Biscuits	...	3/- to 3/3
	1	Crepe	...	3/1½
	4	Scrap and rejections	...	2/6
	7	Fine sheet	...	3/6¼
	5	Scrap and rejections	...	1/3 to2/5¼
	6	Fine sheet	...	3/5½ to 3/6
	9	Scrap and rejections	...	1/- to 2/8¼
Perhentian	14	Sheet	...	3/6¼
Tinggi	16	Darkish crepe	...	bought in
B. & D.	1	Palish crepe	...	3/4
K. T.	10	Pressed sheet and crepe	...	2,6 to 3/1½
Matang	14	Crepe	...	3/4¼ to 3/5
	11	Darkish crepe	...	3/1 to 3/1½
	1	Block	...	2/1
B. M. & Co. Ltd.	11	Sheet	...	bought in
	3	Scrap and rejections	...	2/7½
L. E. MUAR	51	Fine block	...	bought in
Highlands Est.	10	Fine sheet	...	3/6¼
	29	Good to fine crepe	...	3/1 to 3/4¼
V. R. Co., Ltd. Klang F.M.S.	9	Darkish to dark	...	3/3¼
	1	Block	...	2/8
	21	Fine sheet	...	bought in
	20	Good to fine crepe	...	3/3½ to 3/8
	25	Darkish to dark	...	2/8¾ to 3/2½
K. P. Co. Ltd.	11	Fine sheet	...	3/5¾
	1	Crepe	...	bought in
Metang	3	Good crepe	...	3/4½
	9	Darkish to dark crepe	...	pt. sold 2/11
	13	Fine sheet	...	3/5¾
P.S. E.	17	Sheet	...	bought in
	8	Sheet	...	bought in
	1	Scrap	...	2/3
	6	Sheet	...	bought in
	5	Scrap and rejections	...	2/4 to 2/6

JAVA.

Mark.	Pkgs.	Description.	Price.
Tjidjeroek	7	Pressed sheet and block	... bought in
	1	Scrap	... bought in

CEYLON STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

April 24th 1908.

The following Lots comprising about 30½ Tons Straits and 12¼ Tons Ceylon, were offered at Auctions to-day and sold as follows:—

STRAITS AND MASAYA STATES

Mark.	Pkgs.	Description.	Price.
C. M. R. E. Ltd.	34	Pkgs. Crepe	... 3/3 at 3/7½ bid 3 Cases sold at 3/3
Shelford	8	Cases Crepe	... 2/7 at 3/2 bid
B. R. R. Co., Ltd.	37	,, Crepe	... 3/1 at 3/5 bid 10 Cases sold at 3/5
	41	,, Sheets	... 2/10 at 3/6 bid
F. (S). R. Co.. Ltd.	17	,, Crepe	... 3/- at 3/5 bid
Highland	13	,, Sheets	... 3/6½ bid
Estate	23	,, Crepe	... 3/- at 3/5 bid
V. R. Co., Ltd. Klang F.M.S.	27	,, Sheets	... 3/6¾
	68	,, Crepe	.. 2/10¼ at 3/7¼
K. P. C.	9	,, Sheets	... 3/6 at 3/6¾
Beaumont	1	,, Scrap	... 2/5½
	3	,, Crepe	... 2/6 at 3/4
K. P. Co., Ltd.	12	,, Sheets	... 3/6½
	5	,, Crepe	... 2/11 at 3/-
	8	,, Scrap	... 2/- at 2/6
P. S. E.	5	,, Sheets	... 3/6½
	10	,, Crepe	... 2/11¼
S. B. P. R. & Co.	4	,, Sheets	... 3/2¼
	2	,, Scrap	... 1/10 at 2/4
S. R. R.	25	,, Sheets	... 3/6½ at 6¾
S. R.	7	,, Scrap	... 2/2 at 2/4
S. B. P. R. & Co.	6	,, Sheets	... 3/7¼
	2	,, Scrap	... 2/4½
L. E. MUAR	81	,, Block No. 1	... bought in

Mark.	Pkgs.	Description.		Price.
M. B.	15	Cases Block No. 2	...	bought in
E. B. & D.	14	,, Crepe	...	2/6½ at 3/6
	6	,, Sheets	...	2/8 at 3/6¾
	3	,, Scrap	...	2/3¾ at 2/4½
B. M. & Co., Ltd.	10	,, Sheets	...	3/5 at 3/6½ bid
Perhentian	14	,, Sheets	...	3/6½ bid
Tinggi Estate	16	,, Crepe	...	3/1 bid
S. S. B. R. Co., Ltd.	22	,, ,,	...	3/- at 3/2
	7	,, Sheets	...	bought in
Golconda	9	,, Crepe	...	,, ,,
	2	,, Scrap	...	1/11
Jebong	5	,, Crepe	...	3/6 bid
R.	5	,, Sheets	...	3/6¾ bid
London	2	Pkgs. Crepe	...	bought in
R. 14				
S. P.	22	Cases Sheets	...	3/6½ at 3/7
Bila	6	,, Scrap	...	2/5½ at 2/6
R. P.	1	,, Crepe	...	bought in
X. X. XL.				
Sungei Krudda	16	,, Crepe	...	3/6¼ bid for 14 Cases.
Kahagalla	7	,, Crepe	...	2/3 at 3/6 b'd
Galatura	4	,, Scrap	...	2/1½ bid
Kumbukkan	2	,, Biscuits	...	3/6 bid
	2	,, Scrap	...	2/4 at 2/7¾
	3	,, Biscuits	...	3/6 bid
Yattewatte	1	,, Biscuit	...	3/6 bid
Ellakande	9	,, Crepe	...	3/3 at 3/7¾
Heatherly	4	,, ,,	...	2/2¼ at 2/6
Nikakotua	6	,, ,,	...	3/2 at 3/5½
Ingoya	5	,, Biscuits	...	3/6 at 3/6½
	14	,, Block	...	1/8½ at 3/5¾
	3	,, Sheets	...	3/1
Langsland	8	,, Biscuits	...	3/6½ at 3/6¾
	2	,, Scrap	...	1/10¾
Glendon	2	,, Biscuits	...	3/6⅓
Palli	9	,, ,,	...	3/6¼
	2	,, Sheets	...	3/7
Densworth	2	Pkgs. Biscuits	...	3/4 at 3/5
	2	Cases Scrap 1 sold	...	2/3
Imboolpittia	1	,, Sheets	...	3/6
	1	Bag. Scrap	...	2/4
New Peradeniya	1	Case Biscuits	...	3/5
	1	Bag. Scrap	...	2/4⅓
Tallagalla	3	Cases Biscuits	..	2/8 at 3/5½
	1	,, Scrap	...	2/4
Clara	1	,, Biscuits	...	2/6
	2	,, Scrap	...	2/5 at 2/7
Waharaka	2	,, Biscuits	...	3/6
Gonakelle	1	,, ,,	...	3/7
	1	,, Scrap	...	2/6
Ayr	1	,, Sheets	...	3/6¾
S. L.	2	,, Bisuits	...	3/4¼
	9	,, Scrap 1 sold	...	2/6,rem2/4 bid
Sunnycroft	1	,, Sheets	...	3/4

Mark.	Pkgs.	Description.		Price.
D. G. H. & Co.	29	,, Crepe	...	2/9 at 3/1 bid
D. G. H. & Co.	2	,, Biscuits	...	3/6 at 3/9½
	1	,, Scrap	...	2/6
D. B. M.	2	,, ,,	...	1/6
Kumaradola	1	,, Biscuits	...	3/6 bid
Elston	3	,, ,,	...	3/6 bid
	2	,, Scrap	...	2/6, 2/7
Udapolla	3	,, Biscuits	...	3/6
	1	,, Lace	...	bought in
	1	,, Worms	...	,, ,,
Veralupitiya	11	,, Sheets	...	,, ,,
Glanrhos	0	,, Biscuits	...	,, ,,
Ambanganga	3	,, Sheets	...	,, ,,
Palawatte	2	,, Biscuits	...	3/6¼ bid
Tudugalla	15	,, Crepe	...	32/½ at 3/7 bid
Polatagama	4	,, Biscuits	...	3/6¼ bid

To-day's price of FINE HARD is 3/5 per lb.

Perak.

Abstract of Meteorological Readings in Perak for the month of March, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Taipeng	...	151	82·01	94	71	23	78·09	909	...	83	...	15·57	3·30
Kuala Kangsar ...	...	...	81·71	94	71	23	75·38	827	...	73	...	7·29	2·54
Batu Gajah	...	160	81·37	92	73	19	77·40	887	...	83	...	6·44	1·50
Gopeng	...	...	81·12	92	70	22	77·14	881	...	83	...	9·23	2·35
Ipoh	...	...	81·87	94	70	24	76·69	850	...	78	...	7·22	1·80
Kampar	...	...	80·56	93	68	25	76·33	852	...	81	...	11·09	2·38
Teluk Anson ...	...	...	81·42	93	70	23	76·91	865	...	80	...	7·59	1·20
Tapah	...	...	81·75	93	76	17	76·41	846	...	77	...	11·64	2·05
Parit Buntar ...	...	...	82·29	92	71	21	77·43	877	...	80	...	7·84	1·47
Bagan Serai ...	...	...	82·34	92	70	22	77·33	871	...	79	...	7·25	3·24
Selama	...	...	83·26	94	72	22	78·06	894	...	78	...	11·71	2·44

STATE SURGEON'S OFFICE,

Taipeng, 22nd April, 1908.

M. J. WRIGHT,

State Surgeon, Perak.

Perak.

Abstract of Meteorological Readings in Perak for the month of April, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Taipeng	...	152	82·24	93	71	22	78·54	926	...	84	...	17·57	3·50
Kuala Kangsar ...	...	...	82 12	94	65	29	76·05	818	...	75	...	8·62	1 90
Batu Gajah	...	157	81·61	93	71	22	77·98	908	...	84	...	10·62	1.90
Gopeng	...	...	84·62	93	70	23	77·74	859	...	72	...	13·48	2·78
Ipoh	...	...	81·97	94	72	22	77·44	880	...	81	...	7·18	1·70
Kampar	...	...	81·45	93	69	24	77·69	900	...	84	...	15·86	2·23
Teluk Anson... ...	...	...	81 69	93	70	23	76·84	859	...	79	...	13·92	3·75
Tapah	...	...	82·82	93	71	22	77·16	860	...	77	...	9·96	1·90
Parit Buntar... ...	...	...	82·29	91	71	20	78 02	903	...	82	...	15·60	4·25
Bagan Serai	...	...	83·02	92	71	21	78·36	910	...	80	...	14·75	2·94
Selama	...	...	82·43	93	72	21	78·02	902	...	81	...	11·57	2·04

STATE SURGEON'S OFFICE,

Taipeng, 14th May, 1908.

M. J. WRIGHT,

State Surgeon, Perak

Pahang.

Abstract of Meteorological Readings in the various Districts of the State for the month of March, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Kuala Lipi ...	...	...	79·35	94	69	19·10	76·55	...	...	...	...	2·71	·59
Raub ...	...	...	79·38	90	70	18·09	74·69	...	...	...	...	6·76	1·55
Bukit Fraser ...	...	...	...	...	...	...	...	...	...	...	..	8·62	1·37
Bentong ...	...	...	79·29	93	69	17·59	75·19	...	...	...	...	9·52	2·72
Temerloh ...	...	...	...	93	70	17·5	...	...	...	...	...	3·84	1·30
Pekan ...	...	...	81	91	70	14·1	76	...	...	...	...	8·31	2·85
Kuantan ...	...	...	84·6	89·5	68	14·7	76·5	...	...	...	...	7·30	3·40
Sungei Lembing ...	...	...	...	87	66	...	...	...	...	...	...	9·71	3·92

STATE SURGEON'S OFFICE,

Raub, 22nd April, 1908.

W. H. FRY,

State Surgeon, Pahang.

Kelantan.

Abstract of Meteorological Readings in Kelantan for the month of April, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
				Means F°	Means F°	Means F°						Inches	Inches
Kuala Lebar	...	...	...	92°.26	73°.7	18°.56	...	...	...	...	...	1.83	65
Taku Estate	...	...	...	...	...	...	...	...	...	...	...	2.40	58
Kuala Pergan	...	...	...	...	...	...	...	...	...	...	...	7.72	3.16
Kuala Kelantan	...	...	...	85°.90	73°.36	12°.53	...	...	...	...	...	4.32	2.10

STATE SURGEON'S OFFICE,
Kelantan, 9th May, 1908.

JOHN D. GIMLETTE,
State Surgeon, Kelantan

Kelantan.

Abstract of Meteorological Readings in Kelantan for the month of March, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
				Means F°	Means F°	Means						Inches	Inches
Kuala Lebar	...	...	...	88.5	72°.3	16°.2	...	...	...	...	...	3.44	1.47
Taku Estate	...	...	...	...	...	...	...	...	...	...	...	5.74	2.01
Kuala Kelantan	...	...	...	82.87	72.71	10 16	...	...	...	...	...	1.61	1.07
,, Pergan	...	...	...	...	...	...	...	...	...	...	...	3.46	1.12

STATE SURGEON'S OFFICE,
Kelantan, 8th May, 1908.

JOHN D. GIMLETTE,
State Surgeon, Kelantan.

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No. 7.] JULY, 1908. [Vol. VII.

Agricultural Bulletin

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STRAITS

AND

FEDERATED MALAY STATES.

EDITED BY

H. N. RIDLEY, M.A., F.R.S., F.L.S., F.R.H.S.,
Director of Botanic Gardens, S. S.

AND

J. B. CARRUTHERS, F.R.S.E., F.L.S.,
Director of Agriculture & Government Botanist, F.M.S.

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AGRICULTURAL BULLETIN

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No. 7.] JULY, 1908. [Vol. VII.

BIG RUBBER TREES IN THE BOTANIC GARDENS.

Plate I.

By H. N. Ridley.

In the year 1894, the forest inspector J. Goodenough planted some rubber seedlings in a wood behind his house in the Botanic Gardens. This wood is on the slope of a hill running down to the main road and rather steep. It had been planted up by Mr. Cantley about 1884 with *Albizzia moluccana*, *Eugenia grandis* and *pseudosubtilis* and other trees and had additions in the form of various trees of the character of Belukar jungle. The wood was very thick as there was a good deal of under-growth too. The soil is a stiff clay. The rubber trees were quite forgotten for about ten years, and when found were crowded up with other trees, but had made surprisingly rapid growth. Three were on the top of the hill where it was a little flatter and at a distance of 8 feet, and 18 feet respectively apart. The tallest No. 1277 was measured a few days ago. It had grown considerably higher than the surrounding trees and was conspicuous from afar. Its height was found to be no less than a hundred feet, while in girth at three feet from the ground it measured 72 inches. The stem is smooth and straight without a branch for a considerable height. The other two were less tall, one having lost a portion of the top (No. 1276). It measured, at three feet from the ground 60 inches. The third gave a measurement of 79 inches.

On the slope the trees lessen in girth in proportion to the steepness of the hill, the slopes of which show signs of a strong rush of water during rains. The whole wood is full of seedlings from these trees, although for some years past it has been the custom for the seed collectors to gather up the fallen seeds.

The usual height given for a full grown para rubber tree is 70 feet, and the tall tree (No. 1277) is certainly the record in height, and yet it is but fourteen years of age. This is a most instructive

experiment. The trees are grown in a thick wood of lofty trees, on a stiff and poor clay soil. They have cost nothing more than the mere puting of the seedlings into the ground, except that when they were rediscovered some trees which were pressing against them were knocked down. They are grown under absolutely natural conditions, just as one sees them in photographs of the trees of the Amazons, and they are fully twice as large as trees of the same age grown in the open with careful and expensive felling and clearing and weeding, and are reproducing themselves naturally, through the wood.

The trees have been tapped, and gave good returns of rubber.

These trees are still growing. The following are their measurements for the past few years.

Registered No. of trees.	Girth in 1904.	Girth in 1905.	Girth in 1906.	Girth in 1907.	Girth in 1908.	AGE 14 YEARS.
	ins.	ins.	ins.	ins.	ins.	
1272	$38\frac{1}{2}$	$40\frac{1}{2}$	$42\frac{5}{7}$	$44\frac{5}{7}$	48	Slope.
1273	31	32	$34\frac{3}{4}$	$36\frac{5}{7}$	38	Slope.
1275	24	$24\frac{1}{2}$	26	27	28	Slope.
1276	$53\frac{3}{4}$	$57\frac{7}{8}$	58	$59\frac{1}{2}$	60	Top of Hill.
1277	$60\frac{1}{2}$	$62\frac{7}{8}$	$65\frac{3}{8}$	$68\frac{1}{2}$	72	,, 100 feet tall.
1278	34	35	$35\frac{5}{8}$	$36\frac{7}{8}$	38	Slope.
1279	$34\frac{1}{4}$	$36\frac{1}{2}$	38	40	41	Slope.
1280	$33\frac{1}{2}$	$36\frac{7}{8}$	$41\frac{3}{8}$	42	$42\frac{1}{2}$	Slope.
1281	$62\frac{3}{8}$	$68\frac{1}{8}$	$71\frac{3}{8}$	$75\frac{1}{2}$	79	Top of Hill.

Average growth in girth at three feet from the ground of big trees in four years 2·06, 2·87, 4·06. The ordinary growth in girth of big trees in general is about 2 inches a year. Younger trees seem to grow faster.

The second record tree in the gardens is one of those which was among the lot first brought to Singapore No. 2. Its height is less being 54 feet, its girth at three feet from the ground is 120 inches. Mr. Herbert Wright who lately saw this tree and measured it affirms that it is the biggest tree in girth recorded, wild or cultivated. Its age is 30 years.

The seven trees first received in 1877, were first planted in the Botanic Gardens by Murton, and on the founding of the Economic Gardens in 1880 by Mr. Cantley were transferred to their present

position. This tree was evidently topped at about four feet from the ground and threw out three branches, which are now to great size. It is grown in the open in low swampy soil. It gave fourteen pounds of rubber on being tapped by the spiral system and would probably have given more under any other system of tapping.

The growth of this tree in the last few years in girth has been:

1904	$109\frac{1}{2}$
1905	$111\frac{3}{4}$
1906	$113\frac{3}{4}$ inches
1907	
1908	120 inches.

H. N. R.

BEE CULTURE.

The honey or hive bee (*Apis mellifica*) is of great value to the Agriculturist and Horticulturist in Europe because of the important part it performs in the conveyence of pollen from flower to flower and thereby securing by cross fertilization the production of healthy seeds. The presence of the honey bee in Malaya is equally important to the Agriculturalist and for this reason planters and others would be well advised to encourage the cultivation of honey on their states and gardens. Often we hear of crops of seed being poor and partly failing. This is probably due in some measure to the improper fertilization of the flowers by insects and when we remember that the honey bees perform by far the most important part in cross-fertilization it appears surprising that so little thought is given to these little creatures.

The honey bees are a numerous group of insects with a general similarity of aspect and agreeing in many of their social customs. Of the several species found wild in the Malay Peninsula the small *Apis indica* is the only one which lends itself to domestication.

It is somewhat smaller than the European species but in appearance and colour is almost identical. It is found in India and China and most parts of the east. All the honey-bees have the habit of building cells for the storing of eggs and larvae. They also collect the pollen and nectar from flowers and plants and feed themselves and their larvae on a mixture of these substances. A colony of bees is comprised of males or drones, perfect females or Queens and undeveloped females generally called workers.

The Queen (generally one in each nest) is the largest and is easily recognised by its long graceful body. The drone is of an intermediate size and is thick and clumsy looking. The worker is the smaller of the three and is well known to everyone. The function of the drone is to impregnate the Queen and here its functions cease and it is killed off by the workers. The Queen's share of the work of the hive is confined to laying eggs. The bulk of the work falls to the workers who collect food, attend to the young brood, etc., etc. Should a queen leave the hive with a swarm the workers have the power of producing a new queen from one of the undeveloped female larvae by enlarging its

cell and giving it extra food. At the period of swarming the oldest queen in the hive leads off the swarm and the younger queens that are still in the cells are not allowed to escape until the swarm is ready to depart on its quest for a new home, thus preventing a fatal contest between rival queens. When a queen has led a swarm from the nest she does not as a rule make a long flight and the swarm is generally found hanging to a branch of some tree or bush not far distant from its original home.

The swarming takes place almost any time between April and September and the size of the swarm varies according to the strength of the hive. A strong swarm is generally about the size of a man's head. When it is desired to collect a swarm the following method should be adopted. An empty basket or small wooden box should be placed over the swarm mouth downwards and the bees should be gently brushed into the receptacle by the hand or a small twig gently and upwards. In this manner the queen bee will be quickly in the basket or box and the worker bees quickly follow of their own accord. Care should be taken to handle the insects as gently as possible and if this is done they remain in a perfectly good temper; but the slightest roughness or nervousness will rouse the bees at once. A hive should in the meantime be prepared for their reception. A wooden kerosene oil case is a very suitable size and is easily converted into a hive by cutting a few small holes on one of the under edges to allow the bees to freely enter and leave. The floor of the hive should have a small platform projecting to enable the laden bees to alight before crawling into the hive. A few air holes should be bored in the box and a sloping span roof of overlapping boards should be placed over the hive to exclude rain. A small door at one end of the hive will be found very useful. Square frames of $\frac{1}{2}$ inch wood should be made to fit into the hive to carry the combs. Not more than three frames should be put into a new hive to commence with. If possible a small piece of comb should be attached to the upper inside edge of the centre frame to act as a guide and on this foundation the bees will commence to build their comb. When the hive has been thus prepared it is ready for the reception of the new swarm. In introducing the bees to the hive the same process should be gone through as used in collecting the bees from the tree or bush. When the bees have been in the hive for about two weeks the frames should be taken out and examined and the most forward comb should be kept in the centre of the hive with the less forward frames on either side and as close together as will allow the bees to work round the combs. As the strength of the hive increases the number of frames should be increased, always taking care to keep the most forward combs in the centre. If this system is followed the bees will always be able to cover the combs and protect them from ants and other enemies.

It will be found that the upper part of each comb is reserved for storing honey and the lower part for breeding cells principally, so that it is not necessary to follow the practice in vogue in Europe of having a layer of queen proof zinc between the honey and breeding combs, although this system may easily be adopted if desired. The best quality of honey is made during the months of June, July and August. That made during the preceeding months is thinner and of poorer

quality. As soon as the combs are filled and sealed they should be removed and the honey should be run off and bottled. Honey will not keep in the comb in this climate. From the month of September to March the bees are more or less inactive and during this period the hives should be examined and if necessary feeding should be given in the form of sugar and water in order that the hives may remain strong and healthy for the following season. It is always a good plan to place combs that have been emptied near the hives so that the bees may use them for feeding and building purposes. It will be seen that the methods adopted in Singapore differ in many ways from those practiced it Europe but after studying the social customs of *Apis indica* for many years it has been found that the above method is the only one whereby success is assured.

Bee-keeping whether taken up as a hobby or as a means of making money is at all times a delightful and engrossing study and as has already been shewn is of considerable importance to the agriculturist whose aim is to produce healthy seed and vigorous plants. Works that give much information on bees and beekeeping are Cheshire's "Beekeeping, its science and practice" and Kirkby and Spences' "Introduction to Entomology," these two books I would recommend to any one who wishes to make a study of the science.

I am deeply indebted to Father Gex., Mission Etrangeres Singapore, for much of this information. He is an enthusiastic beekeeper and visitors to the Agri-horticultural Show in Singapore in 1906 will remember with pleasure his excellent exhibit of honey. His exhibition of bees at work was a revelation to hundreds of visitors.

T. W. Main.

NUTMEG CULTIVATION IN SINGAPORE.

I have had nutmeg trees growing for the last 12 years. They have been cleaned and manured occasionally, and are a moderate success. My best tree is about 20 feet high and 22 feet broad, and has usually a few hundred nuts on it. I am now in a position to give the trees constant personal attention, and am confident of good results. The trees should be pruned, otherwise they grow too much to wood, and the stems cleaned. The land should be weeded, and the ground loosened under the trees. Care must be taken not to injure the roots. Manure should be spread close to the stem, and allowed to work its way in.

Young trees should be shaded, by planting bananas between. One occasionally comes accross a nut divided into two parts, as in Jordan Almonds.

Sandy soil is unsuitable, and stagnant water about the roots is injurious.

Plants are raised from fresh seed, which do not rattle in the shell when shaken, and planted in a nursery, an inch below the surface, and a foot apart. They take about six weeks to germinate, and should be watered daily.

The trees are planted 25 feet apart. They are male and female, and the former predominate, 10 per cent of male trees is sufficient. It is recommended to plant 2 trees in a hole—2 feet distant—and when the flowers appear, the male can be removed.

A crop may be expected after 7 years, and there are usually three crops in the year. The ripe nut takes 6 months to grow from the flower. Some of my trees are sickly, but that is owing to neglect, or to having a Durian tree, with its long roots, near them. A fungus is to be found on the leaves of some trees, but it does not appear to be injurious.

Slugs will eat the mace, if the fruit is not picked up daily.

Half my nutmegs I sell unripe to the Chinese, who make preserves of them. Excellent jelly is made of the skins.

R. LITTLE.

A FURTHER USE FOR THE COCONUT.

The fruit of the coconut is made into copra, which is the chief ingredient of soap, &c. It is also made into sweetmeats, &c. The husk or coir is made into rope and mats, and used for mattresses and furniture.

No extensive use has hitherto been made of the shell. It is proposed to send it to Europe, for button manufacture. Buttons are already made out of it, on a small scale, by the natives, and they command a ready sale.

Glass buttons are chiefly made in Bohemia. Pearl buttons are almost exclusively a Vienna product, but shirt buttons are made chiefly in Birmingham, which is also the seat of the metal button trade. The most extensive kind of button manufacture is that of the Parisian and Berlin novelties.

R. LITTLE.

A PLEA FOR VEGETABLE CULTIVATION.

Tobacco may be grown in Sumatra, and wheat in Manitoba, without manure, but in England, Australia and New Zealand, manure is essential for successful vegetable growing. Such being the case, it is not to be wondered at, that the cultivation of English vegetables with little or no manure, has hitherto not been successful in Singapore.

On referring to books of gardening, I find for lettuces, for example, that 2 cwt. stable manure, should be applied to a bed 16½′ x 16½′, and about 2 lbs., of nitrate of soda, or sulphate of ammonia. Also liquid manure, during the growth of the plants. I visited a house recently, in which a lady of the house, had sown a square yard of lettuces, and they were doing splendidly.

In England, there is a tomato farm that covers 30 acres. This year the number under cultivation is 380,000. In British Columbia a grower obtained $1,000 gold last year from a single acre of tomatos. I have purchased a tin of English vegetable seeds, and hope to give the result of my experience.

It would be interesting, if some of my neighbours would go and do likewise.

R. Little.

WHERE PARA TREES WILL NOT GROW.

By Herbert Wright.

There is a general impression, especially among persons who have not lived in the tropics, that all para rubber trees require is occasional tropical heat. It is certainly little less than wonderful to see how many trees thrive in the tropics where the soil is of the poorest, but where there is a high temperature and plenty of water. Heat alone is not, however, sufficient to ensure continuous growth. A high temperature of 75 degs. to 85 degs. F. (average) is favourable to the cultivation of Hevea brasiliensis; but this alone would be of no value to rubber planters, even though they possessed the richest alluvial or volcanic soils in the world. There are many areas where para rubber trees will not grow, though a temperature of 100 degs. F., and over, may often be registered. Relative uniformity in temperature, absence of frost and drought, and minimum seasonal changes are almost absolutely necessary for the successful cultivation of para rubber trees in non-irrigable, tropical lands.

The difficulty with which vegetation grows, in spite of the advantages of high atmospheric temperatures, in the coastal regions of the area through which we are now passing is obvious to everyone; to east and west are extensive tracts of sandy deserts and salt-crusted pools; hardly a speck of green is to be seen for miles, except in the immediate vicinity of water. The natural vegetation, visible to the traveller on board as the steamer passes from Suez into the Red Sea, is miserably poor; here and there are tufts of stunted, coarse grass and general herbage, suggestive of more than three acres being required to feed one cow. Further inland, where conditions for plant growth appear to be more favourable, one might imagine it possible to come across laticiferous shrubs similar in habit to the Mexican guayule; but even they are absent from the immense tracts of flat, open country before us.

Approaching the Rubber Zone.

To those armchair rubber experts whose knowledge is confined to synopses of what others have done in the tropics, and who have actually wished their friends to believe in the successful cultivation of tropical species in sub-temperate zones, I would commend the course through which the writer is now passing. We arrived at Aden after having spent a few perspiring nights in the Red Sea. The change in climate has been very instructive. If you want to make a city rubber expert realise the differences between the hot damp air in the tropics and that in middle Europe, and thereby impress him with a knowledge of the climatic conditions under which para rubber trees can be, and are really successfully grown, send him to a sun-burnt, barren land. He will feel convinced that he is approaching the rubber zone even though he may designate his imaginary destination otherwise. He will be

assuredly impressed with the fact that there is a marked difference between the climate in Sicily and that in the true rubber zone. He will thenceforth pay more attention to questions of rainfall, temperature and humidity—factors he previously ignored in his otherwise satisfactory prospectuses. I have very distinct recollections of one illuminating prospectus in which the profitable cultivation of Hevea brasiliensis was fore-casted in an area over 25 degrees from the equator, where the rainfall was about 30 inches and the air "keen, dry, with occasional frosts." Even to-day there is deplorable laxity displayed in many documents appertaining to the cultivation of rubber-yielding species in African and American territories; many rubber investors do not appear to know that for each species there is a limited range of climatic factors under which each plant can be grown. Even in the small but productive island of Ceylon there are very many districts where it would be impossible to profitably cultivate any of the rubber plants now known to the scientific and commercial worlds: yet Para, Ceara, Castilloa, Rambong, Funtumia, Hancornia, and other rubber trees are known, and vines of Landolphia, Clitandra, Forsteronia, Cryptostegia, Urceola, Parameria and others capable of yielding, in their own and similar districts, paying quantities of rubber, abound in the tropics. The Para rubber plant, known for its hardy characteristics and power of adaptation, can only be grown over a small area in Ceylon. There are already indications that many parties in other countries, have over-estimated the possibility with Hevea brasiliensis, some few having been bold enough to advise that their planted properties shall be partly abandoned, even though the estates are in the middle of the rubber zone and are occupied with Para trees several years old. It is hoped that the mistakes of the past will not be repeated; they would be impossible if investors would exercise due caution before supplying capital for propositions similar to those referred to.

(From my eastern tour by Herbert Wright, India Rubber Journal, May 4th 1908).

(*India Rubber Journal, May 1908.*)

RUBBER PLANTS FROM CUTTINGS.

The following interesting letter from a planter in Tavoy, Burmah, appears in a recent issue of the "Ceylon Observer":—

DEAR SIR,—The following may prove interesting:—(i) After my planting in June I went over the remaining 10,000 or so plants (Para rubber) in the nurseries and pruned all the "double headers" there were, leaving one stem to each root stock. Most of these were cut off just below the ground level. A number of plants, too, with twisted roots were cut down below the twist, hoping they would send up a shoot from the root left, which, I may say, they have done. I obtained 509 cuttings, about 250 of which had small fibrous roots, but none had very much root development. These were all put down in a nursery near the bungalow and carefully looked after. This occurred in August last. Now in March I find I have 393 established plants all looking well. (ii) Also in August last a family of porcupines raided me, and in three

nights bit off, and otherwise destroyed, 715 two-year old plants put out in the previous June. Supplying was done at once, and one or two of my men brought to the bungalow a lot of the bitten off stems. These were left lying in a heap for seven or eight days when I bethought me, in a spare moment, of sticking them in the nursery, too, to see if they would succeed as cuttings. These, too, were well looked after and watered as required. Altogether 85 stems were put in, having first had their gnawed and bitten ends cut off clean with a sharp knife. Now in March I find I have 56 of these alive and well and looking as if they had thoroughly rooted themselves. The shoots they have thrown up (pruned off to one each) are vigorous and in full growth.

How often one's best efforts result in failure and things more or less carelessly done and under adverse circumstances prove successful!

I am sorry that in the first experiment I did not count exactly how many of the cuttings had small fibrous roots and how many had none, but to the best of my recollection certainly not more than 50 per cent were, more or less, generally less, rooted.

J. G. F. MARSHALL.

(*India Rubber Journal, May 1908.*)

RUBBER PLANTING IN THE WEST INDIES.

Rubber planting on an experimental scale, was begun in suitable localities in the West Indies several years ago, and a remunerative, if at present somewhat small, industry is gradually being developed in more than one colony, notably in Trinidad and Tobago. The Central American rubber (*Castilloa elastica*) is the kind which has received most attention, since it is apparent that it is well suited to the natural conditions prevailing in this part of the world, and moreover, is well adapted to serve as a shade tree in and around cacao plantations. Para rubber (*Hevea brasiliensis*) is also being planted and is almost everywhere regarded with favour. For practical purposes, it may be said that planters in the West Indian Islands are limiting their attention to these two varieties. In British Guiana, probably more than one species of *Sapium* are found, which have been proved to yield a good supply of valuable rubber. In that colony, therefore while experiments are undertaken with *Castilloa and Hevea*, it is possible that the best returns may be obtained from the cultivation of the native rubbers in preference to other kinds.

Considering the great and continually increasing number of uses to which rubber is applied in every-day life, it is manifest that the market for the raw product is in no danger of falling off to an appreciable extent. The rapid displacement of horse traffic by motor vehicles, that has taken place of late years, has alone brought about an enormous and permanent increase in the demand for rubber, while its peculiar physical properties are continually creating fresh uses for it in the arts and industries.

The world's supply of wild rubber, the chief sources of which are the Amazonas district of Brazil, Mexico, and other parts of Central America, and Africa, is being exploited as rapidly as collectors can get

it on the market, and since the natural rate of replenishment is far less rapid than the present rate of collection, it is obvious that exhaustion of the wild supply must sooner or later come about.

It was lately pointed out in one of the leading rubber journals that the danger of an appreciable fall, under ordinary circumstances, in the prices of rubber was improbable, since, assuming such a drop to take place temporarily, the product would at once be available for a large number of uses for which the present price is prohibitory, and for which more or less inefficient substitutes have now to be found. Such an enhanced demand would, of course, tend again to put up the price, until a natural equilibrium was one more established.

Another point to which attention may be drawn in considering the prospects of plantation rubber is the fact that while the demand is universal, the area of production is a comparatively limited one, since all the commercial rubber-yielding plants flourish only within the tropics. In this respect rubber differs from sugar. The demand for the latter article is universal also, but production is carried on in temperate as well as in tropical regions, and the supply is limited only by considerations of profit. Even within the tropics, it is only in suitable districts that rubber cultivation can be carried on, and it would appear that in the future, dealers will have to look chiefly to the Malay States, Ceylon, Northern and Western Brazil, Central America, a portion of the West Coast of Africa, and it may be hoped, the West Indies, for the supply of plantation rubber which will be needed to replace the annual out-put now obtained from wild sources.

It is evident from the above considerations that estate owners and others who may be debating the prospects of rubber culture, need have no fear as to the ultimately profitable nature of the industry, provided of course, due judgement is exercised in the selection of the variety grown, in planting only on suitable soils, and in the actual planting aperations and after management.

As regards the present status of the rubber industry in the West Indies, Trinidad and Tobago are the islands in which the greatest advance has been made. More than a year ago there were thirty-three estates engaged in rubber production in Trinidad, and shipments were taking place in fairly large quantities. Prices varying from 4s. 3d. to 5s. 3d. were reported for Castilloa sheet rubber. The Castilloa tree appears to do very well in Trinidad, the conditions of soil and climate being congenial. About ten estates are also planting Para rubber as well. In Jamaica, too, many planters are now seriously taking up rubber cultivation, Para and Castilloa being the kinds receiving chief attention.

The rubber industry is likely to become prominent in British Guiana in the near future. The colony possesses large tracts of land well suited to the requirements of Para and Castilloa, while it is fortunate is possessing quick-growing native species of *Sapium*, which are reported to be very hardy, and to give good returns of rubber two or three years earlier than Castilloa, and three or four years earlier than Para trees. Different varieties of rubber are being experimentally grown at the Onderneeming Farm School, and have been under observation for some years. The Combined Court of British Guiana has

voted the funds for the upkeep of a rubber Experiment Station in the North-West district. It is stated that many applications for land for rubber-planting purposes have been received since the conditions under which such land may be leased have been settled.

In St. Lucia, there are some few hundred Castilloa trees, chiefly planted through cacao estates, and from nine to twelve years old. Tappings of some of the older trees have been undertaken with satisfactory results, and about two years ago samples of St. Lucia rubber were valued at 5s. per lb. in London.

Castilloa is also regarded as the best rubber tree for cultivation in Dominica. The trees grow well and can be expected to yield good rubber in eight to ten years from the time of planting. The fact that sheet rubber from Dominica was valued at 5s. 7d. to 5s. 9d. per lb. in London in 1906 indicates that no doubt need be entertained as to whether a product of high quality can be produced in the island. Samples of Para rubber, the first produced in Dominica, were forwarded to London in 1907, together with further specimens of Castilloa. Both were favourably reported upon, but the Para samples were adjudged the best.

Agricultural News VII, 156 page 113.

A DISEASE OF CLOVES.

The clove tree which was cultivated to a considerable extent in Singapore at the same time as the nutmeg, seems to have been abandoned as a cultivation about the same time viz., in 1860, when the nutmeg disease practically exterminated the plantations. I find no record however of any disease of the clove at that time, but it is probable that the fungus described in this paper was the real cause of its death, or abandonment of cultivation. Till lately there were in old gardens a good many of the old nutmeg trees dating from the great cultivations of before 1860, but these are now nearly all gone. I do not however know of any large and old clove trees left of anything like that date. It may be doubted whether the clove tree lives at least in Singapore to such an age as the nutmeg. A very old tree on the bandstand in the Singapore Botanic Gardens, has been gradually dying for some years and though but little of it is left it still produces fruit on the remaining branches. This tree though in poor soil and exposed to full sun does not seem to be badly affected by the red spot fungus which I am about to describe, though the disease can be seen here and there on the tree.

The clove tree is not liable to many diseases as far as I have yet seen. A borer caterpillar is troublesome in Penang, and I have seen trees killed by a vicious underground mycelium of some fungus, in Malacca, but none of these seem as serious as the red spot fungus, which is not only capable of eventually killing a tree but is very persistent in its attacks, recurring again and again.

It appears to the naked eye as a dark red spot visible on both surfaces, from about 1/20 of an inch across, gradually spreading till it attains a diameter of 1/5 of an inch or more. It is of irregular outline

but more or less rounded. The spots are irregularly scattered over the leaf, but usually more near the edge than elsewhere and they frequently run into each other.

The leaf is often attacked when just opened and before it has attained its full green colouring. Indeed I am inclined to think that the attack commonly commences in the bud. After a time the centre of the spot becomes hard and black and the oil glands swollen and protuberant. At length on the under, more rarely the upper, surface of the leaf from the blackened spot can be seen with a lens fine white hairs like a mildew.

On examination with the microscope these are seen to be fine filaments (Sporophores) bearing at the apex a number 3 to 9 short arms all nearly equal. At the apex of each, at first abruptly decurved then spreading, is a yellow sporangirum which doubtless produces one or more spores which drifted about by the wind attack other parts of the plant.

The life history of this plant has not yet been worked out but it appears to be one of the *Peronosporeae*. In any case it is a most injurious pest, destroying the leaves as soon or before they emerge from the bud stage.

Indeed I have seen a tree of about 12 or 14 feet tall quite killed by the attacks of this fungus. Every bud as it appeared was destroyed, and when the terminal bud of a branch was gone and the lateral buds extruded they were killed in like manner.

It is I believe also this fungus which kills the seedlings in great quantities by destroying the bud.

Some trees in the Botanic Gardens were badly affected by this fungus and the treatment of washing them with Bordeaux mixture was tried with marked success. The mixture was syringed on to the trees with a bamboo squirt till the foliage was very conspicuously blue. At the next putting forth of leaves it was noticed that the young leaves which came out were not attacked by the fungus while the trees that were not syringed were as bad as before, the leaves being all spotted with the fungus and many buds blackened and dead.

The worst attacked trees are those on bad stiff yellow clay soil exposed to full sun.

A tree growing close under a large para rubber tree was but little damaged though the fungus was present. This tree however appears to be overshaded as though quite an old tree, it has as far as I have known never flowered. The soil it grows in is better and richer than that in which a tree about 50 yards away is growing and which is in a bad state from the attacks of this fungus. There can be no doubt that the best treatment for this pest is the destruction of its spores by the aid of the Bordeaux mixture of copper sulphate and lime with which the trees should be well sprayed. As the spores of the fungus are chiefly produced on the lower side of the leaf, the tree should be sprayed from below upwards. Infected leaves on the ground should be sprayed and swept away and burnt and the trees well manured.

Seedlings which are often killed apparently by this fungus should be carefully sprayed with a weak solution of the Bordeaux mixture and should be grown at a distance from the infected trees.

H. N. Ridley.

BANANA FIBRE.

In the Bulletin of 1907 (Vol. vi p. 420) a simple fibre machine invented by M. Duchemin for dealing with banana and other fibres was described and figured. The inventor who has been making investigations into the fibres of French Indo-China, has recently passed through Singapore on his return to France with samples of the results of his work, with the Defibrateur. He has devoted some time to the fibre from the sheaths of the common eating banana, and has produced an excellent and clean fibre from the form known here as Pisang Batu, one of the varieties of *Musa sapientum* which produces seeds, and a finer and more silky fibre from the "Chinese banana" (probably *Musa cavendeshii*). The fibre of this latter is a good deal shorter than that of the common banana, as the stem is much shorter. The stems are first crushed and allowed to ferment for some days, than subjected to the Defibrateur and washed.

From this fibre in combination with local grown cotton a very strong and useful cloth was made, which took dyes very well. The whole of the work was effected by natives, from the preparation of the fibre to the weaving of the cloth and the results were excellent. A cloth of banana fibre and silk was also made and of sanseviera fibre and cotton.

M. Duchemin pointed out that nothing was lost of the banana stem by taking out the fibre, for the pulp and waste could be used to feed pigs with after the fibre was extracted just as well as before. For as in Singapore the natives of Annam use the stems of the banana as pig food.

In a country like ours where there are great numbers of banana stems available, and simply running to waste, it would certainly be worth while to utilise this fibre which could be prepared at little cost, and if not perhaps the finest fibre in the world is a good and useful one for strong and cheap cloths.

H. N. R.

ANOTHER COCONUT BEETLE.

While examining the shoots of coconut palms on an estate in Singapore, where the black beetle *oryctes rhinoceros* had proved very destructive, specimens of another beetle of quite a different group of the order were found in tunnels made by the rhinoceros beetle in the palm bud. These were large beetles belonging to the group of *Elateridae* popularly known as click-beetles. The insect is an inch and a half long, and half an inch across the shoulders of the elytra. The head is rather large, the thorax square, and the wing-cases widest at the top and tapering towards the tip of the body. The whole insect is blackish brown, covered with short appressed yellow hairs, easily rubbed off. The wing-cases are marked with lines of impressed dots towards the tip. The abdomen was black and covered with the short hairs like the upper surface. The legs golden hairy and the rather slender antennae dull red brown and hairless. On the under side of the thorax projects towards the abdomen a long peg, which fits into a notch in

the abdomen, and by bending itself so that the tip of the spine rests on the edge of the cavity and then relaxing its muscles so that it slips into the hollowed space, the beetle can spring into the air, making a click as it does so. Hence the popular name of click-beetle.

These beetles were very active when caught, and attempted to spring away in this manner.

The larvae, popularly known as wire-worms, are slender hard wiry caterpillars of a dark brown colour and usually here at least live in decaying wood, but many species live under ground on roots of grasses and other herbaceous plants often doing much harm.

The mandor of the estate told me that he knows the beetle and it was harmless to the coconuts. It appeared to have simply invaded the burrows of the *Oryctes* in search of the sweet juice of the palm-cabbage. Indeed its jaws and paws do not look powerful enough for it to cut its way into the palm-shoot in the way that the rhinoceras beetle does. Two living specimens and the body of a dead one were found in the palms, so that it appears to live for some time at least in the bud. The specimens have been sent to the British Museum for identification.

H. N. R.

KABONG SUGAR.

A sugar locally known as Gula Kabong is obtained from the saecharine juice of the sugar palm, *Arenga saecharifera*, an extremely useful, interesting and graceful palm common all over the peninsula. The sugar is sold in the local markets, generally in small round cakes, and is not unlike the sugar commonly know as Gula Malacca which is obtained from the coconut palm, *Cocos nucifera*, but, is sweeter and darker in colour. The market price varies but may be roughly stated at from 10 cents to 15 cents per $\frac{1}{2}$lb. The following Malayan method of collecting the juice and manufacturing the sugar may be of interest to our readers.

The juice is obtained by cutting the male inflorescence which branches out from the crown of the palm. It is said that the juice from the female inflorescence is not suitable for sugar making and is never used. Palms of from 8 to 10 years old are said to yield the best sugar. Plants of this age are selected by the Malays but it is quite possible that younger palms will give quite as good results.

The male spike or inflorescence which grows in a pendulous manner is first cleaned round and then tied up in a perpendicular fashion for a period of two or three days. Each morning the spike is gently tapped with a piece of wood, a process which is said to increase the flow of juice when the spike is cut. As soon as the flowers begin to drop the inflorescence is cut off close to where branching commences and a poultice of boiled ground rice with the addition of a little of the ground tuber of Gadong, *Discorea demonum* is bound round the cut surface.

This poultice is removed after three days and a further inch or so of the end of the spike is cut away. A bamboo pipe is then suspended under the cut to collect the sap. The first three or four pints of

juice collected is not considered of the correct quality for making sugar and is not used. Previous to suspending the bamboo pipe to collect the sap it is fumigated over a smoke fire and a small piece of lime is placed within, both operations being to prevent the saecharine juice from fermenting while being collected in the pipe. As the juice is collected it is boiled in a pan for about an hour and constantly stirred. It is then poured into small shallow moulds and allowed to harden and it is in this state that it is bought in the markets.

Other useful articles manufactured from the Kabong palm are, rope from the fibre which covers the stem, walking sticks from the split stem and brushes from the stiffer fibre and the young fruits are preserved in sugar and sold as a sweetmeat. A very good sago is manufactured from the medulla of the stem so it can be seen that there is scarcely a part of this useful palm that cannot be used for some purpose by the native.

T. W. Main.

POISONS EXCRETED BY PLANT ROOTS.

It has always been a popular idea that certain plants such as bananas and tapioca poison the ground they have grown on, but no important evidence to show this has till now been brought forward. We have just received an article entitled a note on a Toxic substance excreted by the roots of plants, by Mr. F. Fletcher, Deputy Director of Agriculture, Bombay Presidency. The article is published in the memoirs of the Department of Agriculture in India" April 1908, II No. 3. The subject is of the utmost importance to all planters, and though this article is only a first glimpse of a new and most valuable line of research it contains in a few pages some most important facts and conclusions. The experiments were made by growing various plants viz., cotton, sorghum, cajanus, sesamum, wheat and gram in water and experimenting with the water in which the roots of the seedlings had been growing.

Evidence was obtained first that the toxin excreted by the different plants was identical but varied in amount, gram and sesamum being the worst. "It was at first thought that the toxic matter might be an albumose or similar substance. The solutions all gave negative results however. The fact that tannic acid precipitated and corrected the toxic material suggested the presence of an alkaloid. It is interesting to note that leaves containing tannic acid are systematically used as manure in the spice gardens and rice fields of Canara and that the cultivator's opinion as to the manurial value of the leaves of any particular variety of tree corresponds apparently to the amount of tannic acid contained in the leaf."

In old pepper and gambier growing days in Singapore it used to be the custom here to mulch the pepper with the old gambier leaves after they had been boiled and though much of the tannic had been extracted, there was a good deal left in the roughly boiled leaves.

"That it is not the ash constituents of these leaves that produce the manurial effect is obvious from the fact that if the leaves be burnt and the ashes applied to pepper, the pepper vine is killed."

The amount of this alkaloid given out by the roots is not inconsiderable. Sesamum in its early stages of growth appears to excrete a greater amount of material than it builds upon its own substance."

The bearing of these observations on the question of rotation of crops is obvious.

"The question may, however, be put why cotton, for instance, which grows so feebly near sorghum grows at least as well if not better, after sorghum than after cotton. From experiments now in progress it appears that this is explicable as follows:—

When cotton is growing near sorghum the roots of the latter exude the toxic substance into the soil in large quantities. This spreads rapidly through the soil into the subsoil especially during the rainy season, and neighbouring cotton plants are not protected by the fact that their tap roots go down far below the zone in which the sorghum roots are situated. When cotton follows sorghum, however, the condition of affairs is different; the toxic substance remaining, at the time of harvesting, in the roots of the previous sorghum crop is now being given out slowly in the course of the decay of these roots,* and is held entangled in the organic matter of the roots, largely in the zone of soil in which the roots of sorghum spread. Each crop thus fouls the soil for a crop of the same variety, whose roots will take the same course as a previous crop, more than for a crop whose roots spread in another layer of the soil.

The precipitation of the toxic substance by most of the mineral manures in common use indicates the manner in which many manures act in increasing crop yields."

ACALYPHA FRUTICOSA FORSK.

This plant is a low shrub, bushy in shape with wiry branches, the leaves alternate coriaceous ovate obovate or lanceolate narrowed at the base to a short petiole, crenate, blunt, strongly nerved quite glabrous ½ to 2 inches long and from ¼ to 1 inch wide. Very variable in size and shape They are glandular at the back and aromatic when rubbed. The flower spikes are slender yellow and pubescent, one or two inches long covered with very small male flowers with one, two or three female flowers at the base. The female flowers are enclosed in several three toothed bracts, and are about ⅛ inch across. Sepals 3 ovate ciliate. Styles strongly fringed and ovary covered with long hairs. It only seems to occur on the east coast of the peninsula where I found it at Pekan in open sandy spots. Mr. Rostado got it at Bundi in Tringanu and Capt. Macgill sends it from Bagan, Kelantan. Rostado gives the name as "Tĕ hutan" Capt. Macgill as "Te'Kampong" as opposed to Te Kadai; and the latter says that the Malays dry the leaves and drink the hot infusion like tea as a beverage and also for heated body and bowel complaints, and kidney trouble, known as Badang panas, "Sakit P'rut" and "Ayer Kinching Kuning."

* "That the roots of sorghum and other crops exert an extraordinary toxic effect when mixed with soil in which plants are then grown has been proved by the writer in a set of pot experiments."

In Watt's Dictionary of Economic products, it is stated that the leaves are much esteemed by native practitioners who prescribe them as a grateful stomachic in dyspeptic affectives and cholora; they are besides considered as an attenuant and alterative and are accordingly administered when it is necessary to correct the habit." The dose of the infusion of the leaves is half a tea-cup-full twice a day.

The plant is widely dispersed from Africa through India to Ceylon, Siam and the Moluccas.

H. N. R.

MINUTES OF A GENERAL MEETING OF THE PLANTERS' ASSOCIATION OF MALAYA.

Held at 3 p.m., on May 19th, 1908, at the Masonic Hall, Kuala Lumpor.

Present. For the Perak P. A., Mr. C. L. Gibson. For the Kuala Lumpor D. P. A.: Mr. F. G. Harvey, Mr. E. B. Skinner, Mr. C. Burn-Murdoch and Mr. A. J. Fox. For the Kuala Selangor D. P. A: Mr. Edgar Smith and Mr. J. Hunter. For the Kapar D. P. A.: Mr. H. M. Darby and Mr. C. T. Hamerton. For the Klang D. P. A.: Mr. John Gibson, Mr. J. Whitham, Mr. R. W. Harrison and Mr. A. B. Lake. For the Batu Tiga D. P. A.: Mr. H. F. Browell, Mr. H. L. Jarvis and Mr. P. W. Parkinson. For the Kuala Langat D. P. A.: Mr. R. W. Munro and Mr. E. Macfadyen. Chairman: Mr. R. W. Harrison. Secretary (Acting): Mr. R. M. Neill.

I. The minutes of the previous meeting are taken as read and passed.

II. The Acting Secretary reads the following correspondence *re* Recruiting Licenses:—

Johore, 5th May, 1908.

DEAR SIR,

Referring to the discussion at the meeting of the Planters' Association of Malaya, held at Kuala Lumpor on the 26th ult., *re* signing of Kanganies' licenses by Mr. Clayton, at Penang, it may perhaps be of interest to some of those concerned to know that I have just received a license, signed by Mr. Clayton, which was sent direct to him for signature by the Superintendent of Indian Immigrants, Johore Bahru, and without my having to make any application to Penang at all. This is most convenient, and I feel sure that were it generally known planters would not trouble themselves any more about this matter.

I am, etc.,

(Sgd.) ARNOLD H. MALET.

Batu Caves, May 13th, 1908

DEAR SIR,

At the last meeting of the Planters' Association of Malaya, in Kuala Lumpor, Mr. Skinner stated with regard to coolies recruited under old licenses, that on applying to the Superintendent of Immigrants he was refunded $10 a head, the passage money they had been charged coming over from Negapatam.

Acting on this information I sent in an application for eight coolies' steamer fare who had been recruited and sent over under old licenses. I beg to attach reply received. It seems curious that some fares should be refunded and some not.

I am, etc.,

(Sgd.) A. J. FOX, *Manager.*

(ENCLOSURE.)

SIR, *Penang, 29th April, 1908.*

I have the honour to acknowledge receipt of your letter, dated April 27th, on the subject of free passages.

2. Free passages can only be issued according to the rules made by the Immigration Committee and published in November last.

3. A copy of these rules is enclosed, from which you will see that licenses granted by the Residents before the end of 1907 can only be recognised up till March 31, 1908.

4. If therefore you have Kanganies now in India recruiting for you under old licenses, it would be well for you to obtain new licenses for them as soon as possible. If you have not full particulars of the descriptions of these men, you should forward to me licenses filled in as far as possible which I can send on to India.

5. The next meeting of the Immigration Committe will be held in about 2 months time and I will bring this question up then, but by that time I imagine all Kanganies will have been provided with proper licenses.

I have, etc.,

(Sgd.) L. H. CLAYTON,

Superintendent of Immigrants,

Straits Settlements & F. M. S.

The question of a refund in the case of coolies coming over under the old licenses and having to pay $10 passage money was further discussed.

Mr. E. B. Skinner pointed out that they had not got a very strong case, as they had been given warning in a notice which appeared in the local press.

Various delegates stated that in answer to their application for a refund they had been informed that their request would be submitted to the Immigration Committee.

Finally, Mr. Gibson suggested that the Chairman be asked to use his influence to obtain these refunds.

III. The Acting Secretary reads the following letter from the Director, Public Works, *re* Sunday names :—

Kuala Lumpor, 2nd May 1908.

D. P. W. No. 757/08.

SIR,

In reply to your letter of April 29th, I have the honour to inform you that the proposals contained in your former letter, dated January 24h, have been adopted so far as Public Works coolies are concerned.

I regret that you were not informed sooner of the action taken.

I have, etc.,
(Sgd). J. TRUMP.

The Acting Secretary also reports that he has issued the Tamil Notices decided upon at the last meeting.

IV. The Chairman stated that he had received an offer from " In Tinland " to print their official Minutes, &c., free of charge. The meeting decided that the Secretary write to the Editor thanking him for his offer pointing out at the same time that, as they had already arranged with the Agricultural Bulletin, the offer could not be accepted.

V. *Benevolent Fund.*—The Acting Secretary reads out the following suggestions received :—

From *Batu Tiga D. P. A.*—

That the Rules of the Ceylon Planters' Benevolent Fund be obtained, and a Committee be formed from the P. A. M. to draft a scheme to be submitted to the General Meeting in April.

From *Johore P. A.*—

(1.) The formation of a Committee of Management similar to that of Masonic Benevolent Associations.
(2.) Voluntary subscriptions.
(3.) Each subscription of (say) $10 to entitle the subscriber to one vote.
(4.) Cases for help to be recommended by the Committee of Management and voted for by the subscribers to the Fund.

From *Kuala Selangor D. P. A.*—

That Trustees be appointed to administer the Fund and that these should consist of the Chairmen of the various District Associations.

Further, that the Fund be added to on every possible opportunity, either through the medium of the P. A. M. or District Associations, in accordance with the conditions of their finances.

From *Negri Sembilan P. A.*—

That the Funds for the "Planters' Benevolent Fund" be kept by the P. A. M. appearing on the books of the Association, and that the Funds bear interest at current rates.

Mr. J. Gibson proposed that the rules of the Ceylon Planters' Benevolent Fund be obtained and placed before the next meeting.

Mr. Edgar Smith seconded.

Mr. E. Macfadyen proposed as an amendment that Messrs. J. Gibson, H. M. Darby and A. B. Lake be appointed a sub-committee, with power to add to their number, to consider the rules of the Ceylon Planters' Benevolent Fund and to prepare a report to be presented to the next meeting.

The amendment was carried.

VI. The Chairman states that the following motion had been withdrawn until the next meeting:—

Motion forwarded by K. Langat D. P. A. :—"That Government be requested to prohibit the sale to Tamils by spirit licences of liquors other than unadulterated toddy and beer."

VII. The question of the Planters' Memorandum in reply to the proposals of the Rubber Growers' Association then came before the meeting.

Mr. E. Macfadyen proposed that the following resolution be forwarded to the Rubber Growers' Association :—

"Having been requested to forward to the Rubber Growers' Association the enclosed Memorandum, and having satisfied ourselves of the representative character of the meetings at which it has been drawn up and the complete unanimity with which it has been adopted by those meetings, this Association herewith forwards the Memorandum in question and urges upon the R. G. A. the advisability of reconsidering the proposals referred to."

The resolution was put to the meeting and carried unanimously.

The Secretary was instructed to send fifty copies of the Memorandum with copy of the resolution to the R. G. A. by this week's mail.

VIII. The Chairman announces that the following motions forwarded by the Kapar D. P. A. had been withdrawn :—

(1.) "That from July 1st all coolies should have rice issued them in three separate issues during the month, two gantangs each issue. That in the event of a coolie failing to work more than one day in ten (one working day,) without sufficient reason, he forfeit one issue of rice.

(2.) "That the standard rate of wages be 27 cents, and the maximum wage for any work 30 cents, this only to be given to coolies working 24 days in the month, and at the discretion of the employers."

IX. The meeting then discussed a motion forwarded by the Kuala Selangor D. P. A. :—

"That this Association is of opinion that it would be desirable to fix the hours for cooly labour from 6 a. m. to 4 p. m. with one hour off in the middle of the day, and that a uniform rate of pay of 27 cents for men and 20 cents for women be observed."

Mr. J. Hunter said that the Members of the Kuala Selangor D. P. A. had unanimously agreed as to the desirability of a uniform rate of wage and uniform hours of work. Some of those with whom he had discussed the question thought that two hours' interval in the middle of the day would be better, working hours thus being from 6 to 11 and 1 to 5. He had neighbours paying 33 cents for Tamil coolies. It was against all principle and they should agree to some uniform rate for all Selangor.

Mr. Edgar Smith seconded the resolution and urged the necessity of an official hour for knocking off work.

Mr. A. B. Lake opposed the resolution. The meeting had to deal with the interests of the whole of Malaya, not of Selangor only. At the meeting held on January 19th a motion brought forward by Mr. Pears of Johore had shown that a hard and fast rule was impossible. It was essentially a matter for the District Associations.

Mr. H. M. Darby agreed with Mr. Lake. There was a great difference between the various districts in Selangor, and estates in unhealthy districts could not expect to get labour at the same rates as those more advantageously situated.

Mr. C. L. Gibson said it was outside the object of the P. A. M. to interfere with matters which concerned the District Associations. The P. A. M. had been formed, so to speak, for Imperial purposes, and questions like the one under discussion were for the District Associations. Even if carried, such a resolution could not be binding, as was shown the other day when Mr. Skinner stood out on the question of Sunday names.

Mr. J. Gibson :—This is the parent Association. The District Associations as children ask advice of the parent. It is necessary to stop the enticing away of labour by estates just over the boundary.

Mr. Hunter :—If the resolution is confirmed by the P. A. M., our hands will be strengthened.

Mr. H. F. Browell :—This Association can only express its sympathy and regret that some planters should pay higher wages than their neighbours.

Mr. Hunter :—In Ceylon the same rate of wages applies throughout.

Mr. Skinner :—A Labour Commission is now studying the system, which has been found very unsatisfactory.

The resolution was then put to the meeting and lost.

X. The next business was the discussion of a motion forwarded by the Kuala Selangor D. P. A. :—

"That any Member not a Delegate bringing forward an original motion be allowed to speak to the same at P. A. M. meetings."

Mr. Hunter, in supporting this motion, pointed out that a Member of a District Association might get a resolution carried at a meeting of his Association. On the resolution coming before the P. A. M.

it would be spoken to by one of the Delegates from the particular Association. This Delegate might be against the resolution and not wish to bring it forward. He therefore proposed that the original proposer of such a resolution should be allowed to speak to his resolution when it came before the P. A. M.

Mr. Skinner thought the idea a very good one, but believed the rules of the P. A. M. were against it.

Mr. A. B. Lake thought it would necessitate rather a drastic change in the rules. He preferred an annual general meeting at which any one might speak. Some of the Members were apt to forget that they had an Association and this had been the case during the latter days of the U. P. A.

Mr. R. W. Harrison was inclined to agree with Mr. Lake on the question of an annual general meeting.

Mr. E. Macfadyen said that when the Association was formed there was a strong difference of opinion on this question. Most of Selangor were in favour of it, but others were against it. Such a change at so early a date might make the Perak planters feel that we were going back on our arrangement that the P. A. M. should be a Committee and not an Association.

Mr. C. L. Gibson:—Speaking for myself, I shall be glad to support the proposal and will bring it forward at a meeting of the Perak Planters' Association and take their opinion.

Finally it was decided that Mr. Hunter should withdraw his resolution and at the next meeting bring forward a proposal to change the rules according to his resolution with the alternative of an annual general meeting.

XI. *London Rubber Exhibition.*—Mr. R. W. Harrison stated that, prior to the meeting, the Rubber Exhibition Committee had met and discussed matters, and he now proposed that Government be asked to appoint Mr. J. B. Carruthers, the Director of Agriculture, to act as Commissioner for the S. S. and F. M. S. at the forthcoming Rubber Exhibition.

Mr. Parkinson seconded, and the Resolution was carried.

XII. The next meeting is fixed for 8 a. m. on July 19th 1908, at Ipoh.

The meeting then terminated at 5 p. m.

H. C. E. ZACHARIAS,

Secretary.

EXPERIMENTS WITH RUBBER SEEDS.

The Effect of Tapping on Seeds.

Seeds from Tapped Trees Better Germinators.

A circular has been issued by Mr. H. F. Macmillan, the Peradeniya Curator, and Mr. T. Petch, Government Mycologist, giving the results of experiments carried out as to the weight and germinative capacity of rubber seed. The circular says:—

In order to obtain some reliable data as to the weight of Hevea seed, its loss of weight and germinative capacity on keeping, and how far the latter might be deduced from the separation of the cotyledons, a series of germination tests was instituted.....The seed at Peradeniya was collected from (A) a group of trees, about twenty years old, which have never been tapped, and (B) a group of trees, about thirty years old, which were tapped regularly in 1905 (when 29 lb., of dry rubber were taken from eight trees in three months), occasionally in 1906, and not at all in 1907. Presumably A are the descendants of B; if not, both groups are descended from the Henaratgoda trees. 1,000 seeds were collected from each group. Each thousand was divided into ten lots of 100, which were weighed separately. One lot from each thousand was planted on September 14th; on September 21st the remaining eighteen lots were re-weighed, and one more from each thousand was planted; and the process was repeated each week until all were planted. Planting the seed is a departure from the usual method of testing germination, but it was adopted in this case in order to avoid the attacks of fungi, insects, rats, squirrels, &c. As far as possible, the treatment, *i.e.*, depth and kind of soil, amount of water, &c., was the same for all.

The tables give the weights (in grams) of 100 seeds on the date of collection and at each subsequent re-weighing. For example, lot 4 consists of 100 seeds, weighing 394 grams when collected on September 16th; left in open dishes in the laboratory, they dried to 3,695 grams on September 21st, 341 grams on September 28th, and 3,325 grams on October 5th, they were planted in October 5th. It was found that when they were kept in tall glass cylinders they turned mouldly in a few days. Lots 3 to 7 were collected and weighed on September 16th, and lots 8 to 10 on September 18th. It was impossible to gather 1,000 seeds from these eight trees on the same day. Lot 10 was sacrificed for another object after six weeks' drying, as it was obvious that nothing would result from a germination test. It will be seen that the seeds lose weight rapidly during the first fortnight, and then more gradually till about the sixth week. After six weeks their weight is approximately constant *at Peradeniya*, but, as will be seen later, further drying occurs if they are transferred to a drier atmosphere. The loss of weight in lot 7 after about six weeks' exposure is 16.6 per cent.; in lot 8, 18.8 per cent.; in lot 9, 18.6 per cent.; and in lot 10, 16.5 per cent; or an average loss of 17.6 per cent. This loss is practically all water, which condenses on the sides when the seeds are kept in glass cylinders.

The original weight of the thousand seeds given above is 4,035 grams; another thousand from the same trees weighed when fresh 4,122.5 grams; and a third thousand 4,223 grams. This gives an average of 4,126·83 grams; or, in other words, 1,000 fresh seeds from untapped trees weigh 91 lb. This agrees exactly with the result obtained by Mr. Carruthers five years ago from fresh seeds from untapped trees at Peradeniya.

The kernels and shells of 100 fresh seeds were weighed separately, and this was repeated with 100 seeds which had been drying for six weeks, with the following results:—

	Fresh seed.	*Dried seed.*
Original weight ...	454 grams	... 408·5 grams
Weight when dried ...	...	... 341 grams
Weight of shells ...	159·7 grams = 35·2 per cent	... 154·5 = 45·3 per cent.
Weight of kernels ...	294·3 grams = 64·8 per cent	... 186·5 = 54·7 per cent.

The loss of weight, therefore, takes place almost entirely from the kernel. The kernel is enclosed in a brittle shell, but there is a circular patch, about 3 mm. in diameter, at one end of the seed, over which the shell is not developed, and water can evaporate quite easily through this patch.

The thousand seeds from group B weighed when fresh 3,511·5 grams; another thousand from the same trees weighed 3,500 grams; and a third thousand 3,611 grams. The average weight is 3,540·8 grams; or 1,000 fresh seeds from tapped trees weigh 7·8 lbs. But these are the trees from which Mr. Carruthers obtained his seed in 1902. We have, therefore, the following result for group B:—

1902 ... Untapped trees ... Weight of 1,000 seeds = 9·1 lb.
1905 ... Trees tapped ... ...
1907 ... ... Weight of 1,000 seeds = 7·8 lb.

If this had been the only group experimented with in 1907, it would have been doubtful whether the diminution in weight was not merely the effect of a bad season; but, fortunately, we know that the weight of 1,000 seeds from untapped trees (group A) in 1907 was 9·1 lb., exactly the same as that found by Mr. Carruthers for group B before they were tapped. We are forced to conclude, therefore, that the general opinion that tapping affects the seed is correct. Rough results obtained by planters show that the loss of weight is not due to the increased age of the trees. One planter states that 1,000 seeds from his trees (15 years old) formerly weighed 10 lbs., but now they average 7 lbs., having diminished 1 lb., each year during tapping.

The loss of weight after drying for six weeks was 19·8 per cent in lot 7,20·5 per cent in lot 8, 21·8 per cent in lot 9, and 18·3 per cent in lot 10, or an average loss of 20·1 per cent. Thus, the loss of weight is greater than that in the case of seeds from untapped trees.

100 seeds—original weight 339 grams—weighed 277 grams after drying for six weeks; of this, the shells weighed 117 grams, or 42·2 per cent, and the kernels 159·5 grams, or 57·8 per cent.

It was quite obvious that the seeds of the tapped trees were smaller than those from the untapped. The latter averaged 2·5 cm. in length,

while the former averaged 2·2 cm. and some of them were only 1·9 cm. The volumes of two lots were found by placing them in graduated cylinders, filling up to a known volume with sand, and then deducting the volume of the sand. 100 fresh seeds from untapped trees weighing 411·5 grams had a volume of 594 cubic centimetres while 100 seeds from tapped trees weighing 353 grams had a volume of only 411 cc. Thus, the volume of the latter is only about two-thirds that of the former. But the decrease in volume is greater than the decrease in weight, and from the figures last given the density of the "untapped" seeds is 69, while the density of "tapped" seed is 86. As, however, the seeds of tapped trees lose more weight on drying, this increased density is probably due to an increased content of water. The method of determining the density is only a rough one, no account being taken of the air in the seed.

The experiment, therefore, shows that the seeds from tapped trees are smaller, weigh less per 1,000 seeds are actually denser, but lose more weight in drying, than those from untapped trees.

The Germination Tests.

Turning now to the actual germination tests, the second part of each table gives the percentage germination, and the time of germination of each of the lots. In lots 1 and 2 of both series several seeds were dull brown, without the usual mottled outer layer. This layer is formed last of all in the fruit and its absence may evidently be taken as a sign that the seed has fallen before maturity, since none of these brown seeds germinated. Unfortunately an unusually large proportion of brown seed occurred in the, first hundred, and this spoils the percentage germination of the sample, though it does not affect the comparison to any extent.

In series A seeds kept for four weeks did not germinate, and those kept for three weeks showed only 3 per cent germination, beginning after twenty-four days (they were kept for six weeks longer.) Practically the seeds from untapped trees were worthless if kept longer than two weeks. In series B seeds kept for five weeks did not germinate, but those kept for four weeks showed 28 per cent germination, beginning after seventeen days. Both in percentage, germination and time of germination the seeds from tapped trees are better throughout. But it must be pointed out that these results deal with germination only, and they give no information whatever as to the quality of the trees which would result from the two sets of seeds. Indeed, the earlier germination of series B, after the first week, might indicate a precocity which is undesirable. An instance of this precocity is recorded in the Agricultural Bulletin of the Straits, &c., Vol. VI., p. 176, where Mr. Ridley states that he was shown "a little lot of trees of 3½ years old, which had already commenced fruiting, and also seedlings coming away nicely from the trees." The details given above show that one or two factors have been overlooked in the published estimates of the return to be obtained by extracting oil from Hevea seed. Wright states (2nd edition, p. 155): "The 500 old trees at Henaratgoda and Peradeniya produce annually about 200,000 seeds, equal approximately to one ton by weight." This assumes that 1,000

seeds weigh 11 lb., whereas from tapped trees they will only weigh about 8 lb., when fresh.

Carruthers (Agric. Bull. Straits, November 1907) again bases his estimate on the weight of the fresh seeds from untapped trees, taking the weight of 1,000 seeds as 9·1 lb. He states that the kernel is 60 per cent of the total weight of the seed, and, therefore, 414,400 seeds will yield a ton of kernels.

But the figures of the present experiments show that the weight of 1000 seeds from tapped trees is 7·8 lb., and that these may be expected to lose at least 20 per cent in drying. The kernel is 57·8 per cent of the total weight of the dry seed in Ceylon, but there is a further loss during transit to England, for the Director of the Imperial Institute states, "the kernels constitute about 50 per cent by weight of the whole seeds, and yield 42·3 per cent of oil. The husk and kernel together yield 20 per cent of oil." It is evident from these figures that "about" must mean "less than."

Taking the weight of 1000 seeds as 8 lb., the loss of weight on drying as 20 per cent, and the kernel as 50 per cent of the whole seed, then—

1 ton = 280,000 fresh seeds.
= 350 000 dried seeds.
= 700,000 kernels.

This estimate is rather too favourable on each point, but accepting it, and assuming that the kernels sell for £10 per ton, then the gross return per 1,000 seeds is 21·5 rupee-cents. Out of this must be met the cost of collecting, decorticating, and freight.

Times of Ceylon,
June 1st 1908.

RUBBER IN JAVA.

Growth Good Quality; Good Labour Cheap.

Java compared with Ceylon and the Straits interview with Mr. C. E. Welldon as follows:

The P. & O. s.s. "India" had amongst her passengers this evening Mr. and Mrs. C. E. Welldon and family, who are going home for a short holiday. Mr. Welldon came to the Island in 1873, and is therefore a planter of 35 years experience. He has gradually mounted the planting ladder until he became Acting General Manager of the C. P. P. Co. When he comes back to the Island at the end of the year or at the beginning of 1909 he will go back to his old post of East Holyrood. A *Times of Ceylon* representative had a brief chat with Mr. Welldon this afternoon just before he went on board.

Asked at the outset as to what he thought of rubber in Java during his recent visit to that Island Mr. Welldon replied:—"I should say four years old rubber in Java and the Straits is equal to five and 5½ years old in Ceylon. Of course that applies to estates in the Straits which have good soil; given inferior soil in the Straits, and then Java leaps ahead."

Price of Labour.

"Java has the better of the Straits and Ceylon in regard to labour?"

"From what I could see Java will be paying a 7 per cent dividend when the Straits are only covering expenses. This will be the result of the cheapness of Java's local labour which draws on an average 4½ to 5d. sterling daily and that after 2,000 acres have been opened in one district in one year, and consequently caused an advance in the rate of wages. That wage, 30 Ceylon cents, as you will see, is rather less than the Ceylon wage, and placing the Straits pay at 35 dollar cents, or 58 Ceylon cents, you will see that Java stands first again."

"What about consumption and the prospects in the future?"

"About 70,000 tons is the present consumption, and the present price tends to increase the uses to which it is put. The area opened in cultivated rubber is, say, 400,000 acres allowing one ton for every ten acres, i.e., at the rate of 224 lbs., per acre per annum, we have only 40,000 tons. When present opened land all gives 224 lbs., per acre per annum—and this may never be obtained, for land has been planted in the F.M.S., Java, Ceylon and India, which is unsuitable for rubber —we have to displace 40,000 tons of wild rubber. Plantation rubber now commands 4d. per lb., more than wild rubber and as plantation gets cheaper the demand for wild rubber will not increase, as the demand for inferior tea and coffee has not increased. The tendency is always to buy the purer article. If rubber falls to 2s. per lb. I expect it will be placed on board for one shilling when estates are in full bearing. We have, therefore, a margin of 224 shillings per acre. We can bring our rubber into bearing for £35 per acre even in the Straits, so that at 2s. a lb., we should earn 30 per cent. Diseases may come on; bark may renew more slowly: wild rubber may show large profits at 1s. 6d. per lb., that is to say, 6d. per lb., below the price we put on the cultivated article; but still I cannot look on rubber as likely to yield anything but a handsome profits to the man whose rubber cost him £35 per acre, for many years to come."

"What did you think of the growth of rubber in the Straits?"

"I only visited some estates near Klang, I am sorry to say, but I thought Straits rubber at four years equal to Ceylon and South India (at 5½) and on account of the soil and being able to constantly tap, as you have no droughts, the Straits and Java yields should exceed the yield of Ceylon and South India."

Quality of Java Rubber.

"Can you say anything about the quality of rubber in Java?"

"At present there is no Para rubber being shipped from Java, but, looking at the soil, there is no reason to anticipate—especially when we take into consideration the price being obtained for the rambong of which there is a good quality and quantity, and rambong in Java is much finer than the product I have seen in the Straits—that there will be anything wrong with the quality of the rubber. A large acreage has been, and is being, opened in Para. The product, is however, still in its infancy, and very little has been done regarding the

providing of machinery to cure it, but they are looking ahead and have already got one Government expert on the spot, and four others, as assistants, will arrive there shortly. The gentlemen will study the local conditions from the scientific point of view and give the planters the benefit of their knowledge. I may mention that I saw no Para rubber over three years in age."

"They will be tapping in another 12 months then?"

"It will be a pity if they do. The longer they delay tapping in my opinion the better will be the results. Java labour will be the cheapest of all producing countries; rent is much less, and the health better than Ceylon and the Straits. I would, however, suggest that Java companies should plant for each acre of rubber one acre of coconuts. They would then be on a still better footing."

Ceara Rubber.

Asked his opinion of Ceara rubber, Mr. Welldon said:—"What I say regarding Ceara applies to Ceylon. It has been found that we have got an inferior kind of that rubber in Ceylon. There are five kinds of Ceara, and Ceylon at the ouset got the fourth quality. Now she is getting the third, and finds that the third is yielding better than the fourth. The first two kinds have still to come to the island, and it is known that they are better-yielding trees, and give a better quality of rubber. When they come the result will probably be an increase in the acreage grown in districts like Anuradhapura and Trincomalie, because Ceara grows best in a dry climate such as is experienced in these localities."

Labour in the Straits.

"Did anything impress you while in the Straits, such as the outlook for labour or the standard of superintendent."

"The labour arrangements are excellent, and the outlook regarding labour is better than the outlook in Ceylon. Superintendents, according to Mr. Val. Carey, are very bad, but the estates I saw were in good order and the work was well done. During my stay there I visited Bukit Rajah, Harpenden, Beverlac, Kapar, North Hummock, Ayer Kuning, Tremelbye and a few others. I think that, perhaps, Mr. Carey's pen ran away with him, as leading Visiting Agents also told me the picture was an exaggerated one. We have sent very good men from Ceylon, but, when the demand became excessive, owing to large acreages being opened, the Straits probably took a few men they would not have taken had the rush been absent and had they had their choice of men."

Times of Ceylon, May 28th 1908.

RUBBER COAGULATION.

A New Process Described.

Whatever may be the differences of opinion between manufacturers as to the value of the different species of crude rubber available in the world's markets, they are certainly unanimous in pronouncing the

native-prepared product of the Para rubber tree the best of all grades of rubber, but as the method is not only very expensive and exceedingly tedious, but also harmful to the health of the operators, the inventor of the Da Costa coagulating plant thought of devising a means of doing mechanically all that is now done by hand in the rubber forests of Brazil. This plant, which is the result of practical experiments and tests by Mr. Da Costa, and is made by Messrs. David Bridge & Co., the well-known Rubber Engineers of Castleton, Manchester, needs no chemicals whatsoever, so long as tropical forest woods are available for heating the boiler, as well as green foliage of palms for generating smoke in the boiler furnace.

The coagulating and smoking by means of this plant is the simplest of all operations in the rubber industry, and may be performed by any inexperienced hand, the process being as follows:—

The latex, being brought from the field, is strained if it is found to contain mechanical impurities, and then poured into the coagulating tanks. Steam is meanwhile being raised to about 30 to 35 lb. in the boiler, forest woods alone being used for fuel. On to the burning wood in the furnace are then thrown green palm leaves, nuts, or any green twigs of tropical trees, the distillation of which produce acetic acid, whilst the fumes of the green foliage would be found to contain creosote to some extent. These fumes are accumulated in a special receptacle after being cleared of cinders, &c.. and are then forced into the coagulating tanks by a steam injector.

The force of the steam violently agitates the latex, and during this operation every particle of it is reached by the smoke. In about ten minutes or rather more if the quantities to be dealt with are very large, caoutchone globules coagulate and separate from the lyes and rise in the surface,

The coagulate substance, after being allowed to cool off in the tanks, is afterwards taken to a small press and turned out in the shape of flat block rubber. These, in their turn, are then re-blocked into club form, and after being dried, either in a stove or vacuum, are ready for shipment. If the flat blocks are only lightly compressed into the form of cubes, whilst still being sufficiently air-tight in the centre to prevent discoloration setting in, they can be easily torn asunder by the manufacturers and used in their machines, without the extra labour of previously cutting them into convenient sizes.

Rubber prepared in this way retains all the native elements, as regards resiliency and tensile strength, of fine hard native Para, and will last as long as the wild rubber—if kept in a crude state, for years.

It is claimed for this coagulating plant, therefore, that it not only has the advantages of dispensing with the assistance of chemical agents in a liquid form but also allows the producer to send to the market the only preparation that satisfies all the rubber manufacturers' requirements at the various mannfacturing centres throughout the world. In addition to this, the inventor claims that it also possesses the unique property of being the only apparatus which can convert the latex of the *Castilloa elasteca* into a rubber of equal market value, appearance. and colour, to that of the best Para sort exported from Brazil.— *Tropical Life.*

RUBBER CULTIVATED IN F. M. S. IN 1907 & 1908.

A Comparative Statement of Cultivated Rubber Exported from the Federated Malay States During the Years 1907 and 1908.

——	Exported during May, 1908.	Previously.	Total export during 1908.	Export during similar period of previous year.	Increase.
	lbs.	lbs.	lbs.	lbs.	lbs.
Perak	27,139	137,507	164,946	85.354	79,592
Selangor	135,597	551,730	687,327	483,521	203,806
Negri Sembilan	17,868	275,943	293,811	172,368	121,443
Pahang		nil		nil	
Total ...	180,905*	965,180	1,146,084	741,243	404,841

*Excluding Pahang export for May.

KUALA LUMPUR, J. R. O. ALDWORTH,

15th June, 1908. *Commissioner of Trade and Customs.*

AGRI-HORTICULTURAL SHOW OF 1908

The show this year will be held at Kuala Lumpor, and we may hope it will be as good as those on previous occasions.

Prizes are offered as before for all sorts of vegetable products, cattle poultry and articles of Malay art and industry. There will also be horse competitions.

His Excellency Sir John Anderson offers the Governor's cup for the best exhibit in the Agricultural and Horticultural classes, and cups and medals are offered for rubber and other products.

We append the notices of date and regulations for exhibitors.

H. N. R.

The fifth joint Annual Agri-Horticultural Show of the Malay Peninsula, 1908. Will be held at Kuala Lumpor, dated 10th, 11th, and 12th August.

The Opening Ceremony, on August 10th, 11 a.m.

Show opens August 10th, 11 a.m., 11th, 7 a.m., 12th, 7 a.m., Close 6 p.m. Admission $1, 50 cts., 20 cts.

RULES FOR EXHIBITORS.

1. All exhibits must be the *bona fide* property of residents in the Malay Peninsula, and (unless otherwise specified in the catalogue) must have been grown or manufactured by the exhibitor in the Peninsula.

2. The Committee will appoint Judges, from whose decision there shall be no appeal. They may withhold a prize when they are of opinion that there is not sufficient merit to justify an award, and may recommend special prizes for any exhibit not contained in the schedule. No exhibitor shall be awarded two prizes in any class.

3. The Committee reserve the right to refuse or exclude any entries or exhibits, and the arrangement of the exhibits shall be subject to their direction. The Committee does not hold itself responsible for exhibitor's expenses.

4. Exhibitors desiring free transport by Railway must give notice through a District Officer or direct to the Hon. Secretary, who will provide them with a free pass for themselves and their exhibits. A reduction of 25 per cent off the usual freight will be made by the Straits Steamship Company on all *bona fide* exhibits.

5. All entries must reach the Hon. Secretary at least seven days before the Show (Monday, 3rd August.)

6. Exhibitors in Division C must provide for the care and maintenance of their own exhibits, and will only be permitted to remove their animals from the Show grounds on obtaining an order of removal from the Hon. Secretary.

7. No exhibit (except live animals) may be removed from the ground before 7 a.m. on the 13th August.

8. All reasonable care will be taken to provide for the safety of exhibits sent to the Show, but the Committee does not hold itself responsible for the loss of, or damage to, any exhibit, either in transit or during exhibition. Provision will be made for keeping articles of value under lock and key at night.

9. Government exhibits shall not be eligible for prizes in any class.

10. All exhibits, with the exception of those in Division B, must be in the Show yard not later than 6 p.m. on Sunday, the 9th August.

AGRICULTURE IN KELANTAN.

Mr. W. A. Graham's latest report on the State of Kelantan has the following:—

A large number of inquiries concerning land for rubber planting were received during the year. These led to further negotiations with many parties, some of which resulted in the taking up of land, while several applications were pending at the end of the year. The area of land taken up amounted to 14,000 acres of which 8,000 are situated within the Duff Company's concession. An arrangement was arrived at by which the Duff Company, although all its rights as now defined terminate with the year 1940, was enabled to enter into negotiations possible rubber planters for long leases, the Government agreeing, under conditions, to recognise such leases as may not have expired at the date when the Company's rights cease. The soil and climate of Kelantan have been reported on as very suitable for rubber planting and land is being leased to planters on exceptionally easy conditions. Rubber already planted is all doing well and the young trees compare favourably with

those of the other Malay States. The padi crop for the year 1324 was an exceptionally good one as is fully testified by the large amount of padi exported and the low price of rice which has obtained locally since the crop was reaped. A large area of new padi land was opened up and it seems that this form of agriculture is about to develop extensively under the new condition of Government. Although more copra was manufactured than during last year, the coconut crop was not up to the average, and this seems to have been the case elsewhere judging by the high prices which were paid in Singapore for copra. The number of young coconut trees planted was less than at any time during the past three years, available land being now all required for rubber. The planting of rubber has quite caught the fancy of the Malay cultivator. Stories of the large profits to be secured from rubber and of the great areas which are being devoted to this form of agriculture in the Federated Malay States, have reached Kelantan, with the result that everybody who has a piece of land lying fallow now wishes to see it covered with Para rubber trees as soon as possible. For this purpose a considerable number of seeds and young plants have been imported from Singapore and from the Perak State. Seeds were preferred, the plants supplied by the rubber estates being too highly priced to suit Malay ideas, but lately large numbers of young plants have been brought into the State for sale by Chinese growers and these, being much cheaper than the plants formerly obtainable, have come very much into demand. What will be the outcome of these small plantations it is difficult to foretell. The possibility is that many of them will come to nothing, but it is also clear that in a few years' time there will be a considerable number of trees in the State of tappable size though probably of slightly inferior rubber producing quality owing to want of sufficient care during the early stages of growth. There should however be a regular supply of rubber and if the price of the article is maintained there should be a good opening for a rubber buying agency to take the produce of the lands off the Malays.—*Times of Malaya*,

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DISTILLED SPIRITS INDUSTRY IN THE PHILIPPINES.

By Daniel T. Brown, *Internal Revenue Agent.*

The manufacture of distilled spirits in these islands is to-day in a healthy and thriving condition. The industry is not a big one, nor is it a new one. As far back as the year 1712 the Governor of the Islands, Don Martin de Urzua, we find, had a monopoly of the business of distilling spirits from the sap of the *nipa* palm and the sap of the *coco* palm, and farmed it out for the sum of P10,000.00. Since these early times there have been many steps in its development, the latest and greatest stride forward being the regulation and control of the industry by the present Government, as provided by the Internal Revenue Law of 1904. This law has put the business on a stable foundation. During the year 1905 there were removed from the distilleries for domestic consumption over 5,000,000 proof liters; in

1906 over 7,000,000 proof liters were removed and from January to June 30 of the present year taxes have been paid on 4,380,486 proof liters by ninety-one of the ninety-five registered distillers.

Three years ago no accurate statement could be obtained by the Government not even from the distillers as to the annual output of spirits, as the law repealed by the new internal revenue law imposed a tax on the capacity of distilling machines and not upon what was produced. By some the output was estimated at 50,000,000 proof liters and others, amongst whom were distillers, confidently asserted that the normal annual consumption was 42,000,000 proof liters.

The government upon investigation soon ascertained that the normal annual consumption is 10,000,000 proof liters—so the present year is nearly a normal one.

Agriculture in the Islands is closely connected with the distilling industry. When agriculture has fully regained its former prosperity it will show itself on the records of distillers, as prosperity in European countries and in America is felt by brewers and distillers and in the national treasuries. The native, before he enters his rice fields to wallow in mire up to his knees, and the hemp strippers, before beginning their labourious work, like to fortify themselves with a glass of *vino*. A large portion of the liquors manufactured in Manila and in the provinces is distributed throughout the archipelago, and bartered for domestic products, chiefly the staples hemp and copra. The business has always been lucrative and important.

The prime materials from which spirits are manufactured here are the sap of the nipa palm, the sap of the coco palm, sugar, corn and rice, by far the most valuable and important being the sap from the nipa palm, "tuba" as it is called. The bulk of the spirits is now distilled from the nipa tuba. Tuba is much cheaper than sugar, and in consequence there is but little original distillation from sugar being carried on. A good quality of rum is taken from sugar in one of the provinces in which sugar cane is cultivated, but the output is not large. When "tuba" is out of season some distillers use sugar or molasses to a limited extent for a few months each year. Rice and a mixture of sugar and boiled rice are used to a limited extent, but the total amount of spirits manufactured from all grains is not large. The coco "tuba" gives a quality of spirits resembling closely the nipa alcohol but no distillation on a large scale is attempted. Distillation from tuba de coco has always been carried on by the primitive caua, and now the modern caua is being used in this branch of the industry as well as by owners of small nipa lands, the product being used almost entirely for consumption as a beverage.

The nipa palm regions, called *nipales*, are limited to belts of swamp land along the coast where conditions of soil, etc., are favourable. The nipa palm is useful for fortifying swamp-land standing in salt water and unfit for any other cultivation. The palm is most productive when planted on such land.

The provinces in the order of their importance for the nipa palm are as follows: Bulacan, Pangasinan, Pampanga, Cagayan, Capiz, Surigao and Samar. The exact area of the nipa lands is not yet known.

The collection of the tuba in the nipales is done by means of bamboo receptacles attached to the stalk from which the fruit has been cut. A thin slice is cut from the stalk, the bamboo joint fastened and left to receive the juice which oozes or drips into it. These are collected twice daily, transported by "banca" to the distillery and their contents allowed to ferment before being put into the still.

A hectare of nipa palms during the season produces 4000 liters of sap or tuba. Distillers who own nipa lands manufacture spirits from tuba taken from their lands and buy from others and (under the old methods) from 10 liters of tuba obtain one liter of proof spirits.

Distillation is carried on by stills of direct heat antiquated type, and up to recently there were in use throughout the provinces several hundred small primitive stills, called *cauas*. The owners of cauas, however, are gradually abandoning their crude and expensive methods and are installing a small modern apparatus of local invention which has been designed specially in the interests of the small owners of nipales.

Over the fireplace, which is built of stones and mud, is placed an open boiler upon which a hogshead minus the heads is seated, and on the upper end of the hogshead is another open boiler which constitutes the condenser. A piece of bamboo leads through the hogshead at a short distance below the upper boiler; the part of the bamboo within the hogshead being cut in the form of a gutter to receive the spirit as it drops from the surface of the condenser.

By means of the derrick-like arrangement the hogshead is swung sufficiently clear of the boiler to allow introduction of the charge of tuba. After being replaced the joint is banked with rags and clay to retain the steam. The upper boiler is filled with cold water and the fire started. Wet steam, carrying with it alcohol, is generated, rises in the hogshead, strikes the cool surface of the upper boiler, condenses and trickles down to the middle and drops into the bamboo gutter and flows to the receiving jar outside. This apparatus requires that boiling be kept up for two or three hours. With a *caua* such as that shown in the photo, a low proof spirit is produced, very little being over 50 per cent.

Such a process of distillation is wasteful. Government control of the manufacture of spirits has revolutionized this branch of the industry. Methods of manufacture and commercial customs in the Philippine Islands being radically different from the customs in vogue in the United States, the system of excise taxation and the regulations for the control of the spirit distilling industry have been devised to meet conditions.

By grouping a number of *cauas* in one distillery it has been possible in one or two cases to comply with the regulations, but the 450 *cauas* which have been in operation are disappearing, and their owners adopting modern methods, and installing the small modern still known as the "modern *caua*." Fifty of these machines have been installed or are being installed in their place in the various provinces.

These modern cauas, with copper coil, are made in Manila and are peculiarly constructed with a view to retaining the weedy taste so popular with the consumers of *vino de nipa* and *vino de coco*. These

stills have a daily capacity of 1,000 gauge liters, and from them can be obtained 100 per cent more proof spirits than from the *cana*. Besides there is great fuel economy.

In the city of Manila there are five distilleries which manufacture spirits from original distillation. Sugar and native corn are the prime materials, but no considerable quantities of spirits are so produced. It is often the case that the Manila distiller manufactures spirits from sugar or corn for special purposes only.

The crude alcohol distilled in the provinces, which runs in grade from 80 to 90 per cent is shipped under bond to Manila in large quantities to the distillers, who all have rectifying establishments in connection with their distilling plants. The Manila distiller finds it more profitable to use the provincial alcohol. There are also four separate rectifying establishments in the city of Manila which also use the crude alcohol from the provinces. And all of the Manila manufacturers engage in the compounding or mixing of liquors.

The types of machines used by the large manufacturers in the city of Manila and in distilleries in the provinces are: Savalle Fils (Paris), Revere-Dubois (Bruxelles), Egrot, E. Barbet.

The alcohol produced by the modern *cana* is consumed as a beverage almost entirely, but the bulk of all other spirits produced in the islands after rectification is used in the manufature of liquors.

The following are the principal products of the distilleries:—

Anisado.	Curacao.
Gin.	Benedictine.
Carabanchel.	Marasquino.
Blackberry brandy.	Creme de Menthe.
Moscatel.	Chartreuse.
Vermouth.	Tinto Seco.
Sherry.	Tinto Dulce.
Rum.	Anis.
Punch.	Unrectified alcohol.
Cognac.	Rectified alcohol.

Anisado, 60 per cent proof, the common drink, is offered by one of the leading distilleries at the wholesale price of P 3.00 per arroba of 16 liters ; and gin 85 per cent proof at P5.20 per arroba. Fine rectified alcohol 184 per cent proof is being offered at P8.40 per arroba, and an arroba of industrial alcohol 167 per cent proof may be had at P7.30.

All of the foregoing imitation liquors are inferior to the genuine article imported from Europe or America, and are sold at much lower prices. In the favour of the natives anisado is far in the lead, due probably to the pleasant odor and lasting flavor of the anise seed. The essence of the anise is the cheapest and most plentiful in the Orient. The liquor is made by mixing sugar and the essence with rectified alcohol, the proportion of each being a trade secret. Each manufacturer has his special formula. Anisado is put upon the market in grades which vary from 50 per cent to 75 per cent proof. Large shipments are made from Manila in all provinces, and the business is a most profitable one for manufacturer and dealer,

Next in popularity is the domestic gin, a liquor superior to anisado and more expensive, the cost of production being greater and it is used generally by the better classes.

The excise tax on alcohol is 20 centavos per proof liter, a modest tax, and one which it has been demonstrated the industry is able to bear. A liter of anisado, sixty proof, paying here 12 centavos, would pay in the United States 55 centavos. And compared to Porto Rico the tax collected here is only about one-third.

(*Manila Daily Bulletin November 3, 1907.*)

PLANTING IN CALIFORNIA.

DEAR MR. RIDLEY,

We all know that Americans are past masters in the art of advertising their country and the innumerable, well set-up booklets and leaflets which are sown broadcast to reveal to the uninitiated that the beauties and resources of California are among the best of their kind.

The glowing descriptions of climate, soil and variety of products are enough to make one's mouth water to be the happy owner of a homestead in that favoured corner of "God's own country."

The following experiences of our friend F—,(a tenderfoot they would call him over there), a man of great resource, and wide range of knowledge, and as keen a planter as ever lived, may interest some readers of the Agricultural Bulletin, by showing that in those privileged lands, life is not all cushioned with ease, and that, there, as elsewhere, the order of the day is hard work, often made harder by the insane speeding-up, which prevents a man from giving the best that is in him, because quantity goes before quality.

There are his own words:

"It will be hard to get a job as manager or assistant-manager on any "plantation here in California. In nearly every plantation, the owners "do their own work as managers and work on the orchards themselves. "I am now on an orange and lemon ranch very busy pruning and "picking the lemons. It is hard work: the hours are from 6 to 5 with "an interval of 1 hour for lunch. Lemon pays very well; the fruit is "paid wholesale 4 to 5 cents a pound against 1 cent sometime ago.

"But without having plenty of money it would not do to start a "planting enterprise here. Even with money, success is not always "assured. A big company planted some 1,500 acres hereabouts, with "lemons a few years ago and found after a while that the soil in some "places was unsuitable and, besides, they had some dry years and "could not get enough water for irrigation and so had to let 800 acres "die out to keep the rest alive. Some of their dead orchards are "situated close to our place.

"By Jove, do you know, I find that I liked the Straits better than "I thought. The trouble was that the climate there did not suit me. "This should be a better country and so it is. But it all depends. "If there is a dry winter here in Southern California, it just paralyses "things. Irrigation is good enough where water can be had and

" where the product pays for it, but generally speaking, all depends on " the heavy winter rains. To grow grain and hay, the farmer must " have rain at least during a couple of months in the year. The com- " ing year threatens to be a dry one, and the effects are already being " felt. I am told here, that if we get no rain in another month or so, " people will be sleeping on blankets in the streets of the cities and " stealing away on trains going north. A lively prospect isn't it ?

" At present, however, irrigation is going on full speed; furrows " are ploughed winding down the hill sides and circling about on the " flats, and water is led about everywhere from wooden or cemented " drains built on the higher levels. There are men going about with " hoes all day, re-directing the water where it overflows and it runs " day and night.

" An enormous amount of water is expended, yet it is not like " rain. You only see streaks of water wet the soil on both sides of " them; in between there are wide belts of dry, dusty earth. I sup- " pose the water soaks better through below the surface and reaches " the roots somehow.

" The ranch I am working on employs 20 Europeans and Americans " and as many Japs. The latter make good workmen and are employ- " ed at pruning and picking. They get $1.60 a day. The white hands " get $1.75.

" No grass or weeds are allowed about the estate: the soil is being " cultivated and harrowed continually. It is a peculiar soil called " adobe (accent on *o* and the *e* pronounced as French *i*), which is found " in places all over California. It is a brown mineral earth very fine " and sticky when wet: it bakes in the sun and in nurseries the beds " are often covered with shavings or sawdust until the young plants " are well up into the air. If left without water it hardens and cracks.

" I am disappointed to find so little really good soil here, it seems " to be either adobe, granitic loam, gravel or sand.

" People use little manure hereabouts. Everybody is grabbing, " but in the long run they will find out their mistake. It is nonsense " to say, as some people do, that California soil needs no manure. It " cannot do without it.

" On our ranch straw and spoilt cattle fodder has been used for " improving the soil. They grow also a small leaved plant, alfalfa, " part of which they sell. The rest is given as fodder to the horses. " Some plantations are manured now and again by sowing peas or " other leguminous plants, and ploughing them under, when they have " grown to a certain maturity.

" On this ranch we are also using a kind of seed, indigenous to " South Africa which produces a tuber that acts as excellent manure. " The seed was sown all over the orchards last year and it paid so well " that it has just been done again for the second time. I shall send you " a sample of the seed when a fresh lot comes, in September. It is " called fenugreek.

" April 8th. Since I wrote you last I have sat at a watchmakers' bench " for 3 months and have not felt particularly well. I was sacked from " the old ranch because I could not run fast enough to please the owner. " People all say I am too particular in my work. They want a lot of

" work done, never mind the quality. The same thing happened at the " watchmaker's. I did my work too well, I was told, and they could " not afford to keep me."

" So I packed up my things and made tracks for a sanatorium up " in the mountains, 15 miles from S. D., lived in a tent, roamed about in " old rags and bathed in the sun and in the river, feeding on milk, fruit " and self-baked bread. Had a grand time for a few days, and came " back with a tanned skin and a determination to do something under " the open sky and not to return to a stuffy workshop. I have taken " up a planting job again, this time on a strawberry and loganberry " ranch.

" I am feeling very well. The climate here is fine, the cool nights " seem to brace me up, sleeping as I do with my windows opened. I " am working like a nigger and am very tired after the days' work; yet " I find I have put on 3 lb. in weight. Thus, I have gained something " after all, and am therefore actually getting on. If my purse would " only put on weight also ! "

I shall stop here as I am afraid I have already trespassed too much on your good will. As you see, our friend has a pretty fund of philosophy to draw upon; that hard work and a keen brain should pull him through; don't you think?

I am Dear Sir, Yours Faithfully,

E. MATHIEV.

FRUITING OF SCIADOPITYS VERTICILLATA.

Last year among a collection of conifers obtained from Japan for the Botanic Gardens, Singapore was a pot plant of the umbrella pine, *Sciadopitys verticillata*. It was about two feet tall, and of very good shape. Rather to the surprise of all it produced a perfectly fertile cone from which were obtained four seeds which on being planted germinated and are now being cultivated. The plant itself perished soon after. It seems probable that it was a marcot or cutting and not a seedling. It is very unusual for any of these Japanese conifers to fruit here, and still less to produce fertile seed.

At about the same time a *Cryptomeria Japanica* produced a cone, but this was barren, and produced no seed, *Cupressus funebris*, *Biota orientalis* and other conifers long cultivated and planted out in the gardens have never yet produced flowers.

H. N. RIDLEY.

INTERNATIONAL RUBBER EXHIBITION.

Exhibition Offices, 22nd May 1908.

Kindly allow me to impress upon Exhibitors the necessity of despatching all Exhibits so that they will reach London in good time, as we wish everything to be ready for the Press View on Saturday 12th September,

Please send Catalogue matter early, *very urgent*. Advertisements for Catalogue £6-6-0 ordinary pages; £7-7-0 special positions at back of, or facing reading matter. Please advise Exhibitors and Advertisers that all copy must be legibly written; no responsibility.

PLEASE READ CAREFULLY.

Exhibits from a distance should be despatched at an early date so that there will be no doubt about their arrival in time for the Exhibition. Do not leave them until the last day. Arrangements will be made for their acceptance at Olympia on and after 5th September.

Please instruct your Forwarding or Shipping Agents to deliver all goods to the building, through their London Agents, *Carriage Paid*; otherwise they cannot be accepted by the receiving clerks.

Write your name clearly on each label and see that it is well pasted on package. It is also advisable to have your name written or printed on the package as well. Please see that all goods are well and securely packed.

The Committee of the Motor Club, (which has one of the largest Club Houses in London at the corner of Coventry and Whitcomb Streets, close to Piccadilly Circus), have most kindly consented to make visitors to London taking part in this Exhibition during the month of September next, Hon. Members of the Club. All that is necessary is, to send name and address on arrival in London, to me, so that I can notify the Secretary of the Motor Club who will then issue the usual notice.

Please send description of Exhibit for insertion in the CATALOGUE, as early as possible. See that names, and other matter, are plainly written as, on account of the distance, it will be impossible to send proof for correction.

Tropical Plants, Trees, Gums, &c.—Please send full particulars and Botanical names.

With each sample Exhibit of Raw Rubber please send the name of the Plantation on which it is produced, and if it is being shown in block, biscuit, &c.

Note to visitors to London.—Addison Road Station on the Underground Railway adjoins the Olympia, or it may be reached by Piccadilly Tube (Baron's Court Station) thence a few minutes' walk; or by Tube (Central London Railway) to Shepherd's Bush, thence by 'bus, or a short walk to the building.

The Offices at 75, Chancery Lane will be closed from the 7th to 30th September, and all business will be conducted from Olympia.

A. STAINES MANDERS, *Manager*.

PARA RUBBER TREES IN GOVERNMENT GARDEN AT TENOM.

The yield of one and three quarters pounds of rubber per tree in 12 months' tapping of trees between 5 and 6½ years old (at the termination of these experiments) is extremely satisfactory and so is the work of the tapping coolie who took on an average 16 cuts to remove

one inch of bark: most of this tapping was done with an ordinary farrier's knife and some with a "safety" tapping knife, both simple instruments devoid of adjusting apparatus and so "fool proof."

The trees were tapped every alternate day for one year without any rest except on such days as rain fell or the tapper was sick: they seem none the worse for this treatment and have yielded 20,849 seed as against 11,591 the previous year.

Seed is harvested at Tenom from August to November and if the weather is favourable, again in January and February.

In connection with the question of seed I might here mention as a matter of interest that a tree on Sapong Estate has flowered when just 20 months old.

Wounds from the "Y" tapping seem to heal much more quickly and evenly than those from "half herring bone" (all were done by the same coolie) probably the extra irritation from the three cuts of the latter prevented the regular healing of the wounds.

There is practically no difference in yield per tree by either method of tapping but the "half herring bone" system has required the excision of 189 square inches of cortex for each pound of dry rubber obtained whereas the "Y" system only requires the excision of 147 square inches to obtain the same amount.

This year's experiment will be the comparison of 50 trees tapped on the "V" system against 50 trees tapped on "┐" system.

One hundred and fifty five (155) Para rubber trees in Government experimental Gardens at Tenom were planted, not before December 1900 nor after July 1902 (exact date is uncertain as no records were kept). The plants have been uncared for and allowed to grow as they liked with the result that about one quarter of them have two or three stems; this lowers considerably the average girth as in these calculations each separate stem is regarded as a separate tree: even then we get an average girth at five to six and a half years old of twenty one inches at three feet from the ground, and the average increase in the girth during the last twelve months (ending 31st July, 1907) is four and three quarter inches (Singapore Botanic Garden records an average of 3½ inches).

Number of trees tapped.	Average girth at three feet from ground.	Method of tapping	How often tapped	Yield of dry rubber in 12 months.	Pounds per tree per annum.	Average square inches excised. Per tree	Per tree per tapping.	1 lb. of rubber requires excision of square inches of cortex.	Pounds per tree per tapping.	No. of tappings in months.	Total square inches excised.	Thickness of each excision.
30	24 inch.	Y	Every alternate day for 12 months.	lbs 1¾	lbs. 1¾	287,4	1.64	1407	0.011	159	7,834	1 —inch. 15
30	21¼ inch.	Half herring bone.		lbs. 53½	lbs. 58½	338.1	2.14	189	0.0113	158	10,141	1 —inch. 18

FRANK E. LEASE,

(N. Borneo Official Gazette June 1st, 1908.) *Manager Sapong Estate.*

KUALA SELANGOR PLANTERS' ASSOCIATION.

Minutes of Meeting.

Appended are the minutes of the last meeting of the Kuala Selangor District Planters' Association. The Hon. Secretary explains that the delay in forwarding them has been due to his absence:—

A Committee meeting of the Kuala Selangor Planters' Association was held at the Club on the 6th inst. at 10.45 a.m., followed by a special general meeting at noon and an ordinary general meeting at 12.30 p.m. The following were present:—

Messrs. T. More, R. A. Clark, J. Murray, R. H. Ransom, J. Bligh-Orr, C. G. Trotter, G. Poste, H. Fanconnier, F. P. Vaughan, J. Andonin and A. Irving (Chairman and acting Hon. Sec.)

At the special general meeting the altered Rules of the Association were read and passed unanimously.

At the general meeting, Mr. Murray proposed and Mr. More seconded, that the minutes of previous meeting be taken as read and confirmed. This was carried unanimously.

The Chairman read the correspondence.

Toddy Shops.

Mr. R. A. Clark's resolution *re* toddy shops was withdrawn on the District Officer explaining that the renewal of licenses to sell toddy can be refused on application being made to him.

Telephone Fees.

Mr. Murray proposes that as the Government regret that they cannot abolish the present telephone trunk fees to Kalang and Kuala Lumpor, that the Honorary Secretary be instructed to write and request that the fees be reduced; this was seconded by Mr. Andonin and carried unanimously.

European Police Inspector.

The Chairman proposed, and it was unanimously agreed to, that a strongly-worded petition be forwarded to Government in connection with the establishment of a resident European Police Inspector at Kuala Selangor.

Mr. Fanconnier supported.

Pests.

The Honorary Secretary was instructed to write to the Government "that in view of the damage done to private and Government property by a herd of elephants in the district, the Government be requested either to capture or destroy the herd. Carried.

Edgar Smith, *Hon. Secretary.*

GOW, WILSON & STANTON, Limited—

India Rubber Market Report.

13 & 23 Rood Lane, London, E.C.

May 8th 1908.

Since the last auction we have had a decidedly more active market, and prices have advanced for all kinds.

The offerings to-day were on a larger scale than usual, and a good proportion found buyers in the room at an advance of from 3d. to 5d. per lb. on last sale rates.

All grades were well competed for, and although a rather large proportion of the sale consisted of medium crepe, this was readily absorbed.

The highest price of the auction was again realised for a parcel of pale biscuits from Warriapola, which sold at 4/3½ per lb., and the highest price for Crepe, viz., 4/0¾ per lb., was obtained for some from Consolidated Malay Rubber Estates.

More particulars have been forthcoming as to the extent of the financial disorganisation in Para, which is likely to affect Rubber collection up the rivers for some considerable time, and this appears to have had a stimulating effect upon the market. As will be seen from the Para statistics given below, this year's figures for April show a falling off of over 1,000 tons, and nearly 2,000 tons for the total crop to date when compared with the same periods last year. The quantities, however, are still in excess of the two previous years.

Number of Packages Advertised.		Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.		
		Ceylon.	Malaya.	Totals.	No of Packages Sold.	Price	Hard Fine Para.	Plantation. Fine.	Plantation. Scrap.
To-day	1230	10¾	52½	63¼	754	3/8½	3/9	3/11 to 4/3½	2/6 to 3/-
Corresponding Sale Last Year	357	5	13	18	158	5/4½	4/9½	5/6 to 5/8¼	3/9 to 4/5½

To-Day's Quotations.

Sheet and Biscuts.		Crepe and Block.		Unwashed Scrap.	
Good to Fine Sheet.	3/11½ to 4/0¼	Fine Pale ...	3/10 to 4/0¾		
Good to Fine Biscuits.	3/11 to 4/-	Fine Palish	3/7½ to 3/9	Good to Fine	2/7½ to 3/-
Very Fine Biscuits.	4/1¼ to 4/3½	Dark and Medium.	2/4 to 3/7	Low and Medium.	2/1 to 2/6
		Fine Block	4/1		

Para Statistics.

Receipts at Para for April.

1908	1907	1906	1905
Tons	Tons	Tons	Tons
3,350 ...	... 4,490 ...	... 2,500 ...	... 2,130

Totals Crop Receipts July to April.

1907-8.	1906-7.	1905-6.	1904-5.
32,045 tons ...	33,955 tons ..	30,520 tons ...	29,380 tons

Plantation Exports.

Ceylon.—*1st January to 6th April.*

	Tons.
1908	70
1907	43⅓
1906	27
1905	53¾

Malaya.—*1st January to 17th March.*

	Singapore. Tons.	Penang Tons.	Totals. Tons.
1908	215¾	89¾	305½
1907	93¼	6¾	100

Particulars and Prices of To-Day's Sale.

CEYLON.

Mark.	Pkgs.	Description.	Price.
Culloden	5	Very fine thick crepe	... 3/10¼
Glanrhos	3	Biscuits	... 3/11¾
T.	11	Scrap & rejections	... pt. sold 2/5½
	25	Sheet & biscuits	... 3/10 to 3/11¾
Rangalla	1	Fine biscuits	... 4/1¼
	1	Rejections	... 2/6
Halwatura	10	Fine palish worm	... bought in

Mark.	Pkgs.	Description.	Price.
Delwita	3	Dark worm	... 3/7½
Kahagalla	3	Good to fine crepe	... boughtin
	1	Black crepe	... bought in
Edengoda	1	,, ,,	... bought in
Dangan	3	Biscuits	... 3/11½
	2	Scrap	... 2/8¼ to 2/11
Yattewatte	1	Dark biscuits	... bought in
Merton	3	Sheet	... 3/11½
Mak	5	Crepe	... bought in
	1	Biscuits	... bought in
	1	Scrap	... bought in
D. G. H. & Co.	6	Biscuits	... 3/11½
	3	Scrap	... 2/9½
	24	Black crepe	pt. sold, 2/4 to 2/7
	2	Rambong crepe	... bought in
	2	Crepe	... 2/11¼
	2	Scrap	... 2/11¼
Warriapolla	4	Very fine pale biscuits	... 4/3½
	1	Darker	... 3/10
	4	Scrap	pt. sold 2/4 to 2/8
Clara	1	Biscuits	... 3/11½
Northumberland	1	Biscuits	... 3/11½
	1	Scrap	... 2/9
Doranakande	4	Biscuits	... 3/11
	2	Sheet	... bought in
Doranakande	5	Good to fine scrap	... 3/-
	2	Rejections	... 2/10
S. L.	8	Good scrap	... 2/6
D. B. M.	2	Earthy	... bought in
Kumaradola	1	Rejections	... 3/-
Tudugalla	9	Brown pressed crepe	... 3/6
	5	Fine crepe	... 4/-
	4	Darkish crepe	... pt. sold, 3/7¼
Gikiyanakande	9	Fine worm	... bought in
	19	Brownish and dark crepe	... 2/10 to 3/6¾
	1	Good crepe	... 3/10½
Yatipawa	8	Brown crepe	... 3/4
C. L.	1	Palish worm	... bought in
	14	Brownish to dark pressed crepe	pt. sold 3/7
	8	Dark crepe	... bought in
	3	Rejections	... boughtin
G. D. J.	13	Dark crepe	... boughtin

MALAYA.

Highlands Est.	16	Fine sheet	... bought in
	5	Palish crepe	... 3/7½ to 3/9
	18	Darkish to dark crepe	... 3/- to 3/7½
V. R. Co., Ld.	8	Good to fine thick crepe	... 3/8 to 3/9
Klang	5	Good to fine crepe	... 3/7½ to 3/11¼
F. M. S.	44	Mottled to dark crepe	... 2/11¾ to 3/6½
K.	15	Good to very fine sheet	... 3/11½ to 4/0¼
	8	Darkish crepe	... 3/7¼ to 3/7½
J.	1	Rejections	... 3/9
S. R. Co., Ld.	60	Darkish pressed crepe	... bought in
	52	Sheet	... pt. sold 3/11½
	1	Block	... bought in
	1	Palish crepe	... 3/7½
P. S. E.	12	Sheet	... 3/11½
	4	Dark crepe	... 3/2
	1	Biscuits	... 3/11

Mark.	Pkgs.	Description.	Price.
	1	Scrap	... 2/5
S.	2	Fine sheet	... 4/-
	3	Scrap	... 2/3
O. G. S.	3	Sheet	... 3/11¾
	1	Rejections	... 2/9½
V. S.	1	Biscuits	... bought in
Linggi Plants.	18	Dark pressed crepe	... pt. sold 2/8
	2	Pale block	... 3/4
Bila	10	Sheet	... 4/0¼
	3	Dark pressed crepe	... pt. sold 3/4
	1	Rejections	.. 2/9½
Sungei Krudda	18	Sheet	... 3/11½
C. M. R. E. Ltd.	7	Fine pale crepe	.. 4/0¾
	28	Good mottled & dark crepe	pt. sold 3/7 to 3/9
Damansara	8	Fine sheet	... 4/-
	12	Fine pressed crepe	... 3/8¼
	11	Dark ,,	... 2/10½ to 3/4¼
Shelford	8	Good to dark pressed crepe	... pt. sold 3/4
F. (S) R. Co., Ltd.	11	Sheet	... bought in
	13	Good to dark crepe	pt. sold 3/1 to 3/8¼
B. R. R. Co., Ltd.	46	Fine sheet	... 3/11½ to 3/11¾
	43	Good to dark crepe	... 3/0¼ to 3/8½
	1	Block	... bought in
S. K. R. Co., Ltd.	45	Palish crepe	... 3/10½ to 3/11¼
	17	Brownish crepe	... 3/2½ to 3/7¼
E. K. K. P.	3	Sheet	... 3/11¾
	2	Sheet and rejections	... 2/6¾
B. M. & Co., Ltd.	5	Sheet	... 3/11½
	2	Rejections	... 2/10
	2	Scrap	... 2/10
M. R. P. Ltd.	6	Fine palish crepe	... 3/10 to 4/-
D. R. E.	11	Rambong	... bought in
Perhentian	27	Sheet	... 3/6 to 3/11½
Tingi	32	Dark crepe	... pt. sold 3/4
B. & D.	1	Fine sheet	... 3/11½
S. & D.	15	,, ,,	... 3/11½ to 3/11¾
	5	Scrap	... 2/10½ to 2/11½
R. A. G.	3	Scrap & rejection	... 2/1 to 2/10½
Matang	12	Fine sheet	... 3/11½
	13	Good & medium crepe	... 3/2 to 3/7
	1	Palish crepe	... 3/8½
L. E. D.	3	Sheet	... 3/11½
	2	Good scrap	... 2/10¼
B. C.	4	Rough to very fine sheet	... 4/- (fine)
	1	Crepe	... bought in
M. B. E. Straits L. E.	15	No. to 2 block	... bought in
Muar Straits	47	Fine block	... 4/1
B. M. & Co., Ltd.	10	Sheet	... pt. sold 3/11½
S. S. B. R. Co., Ltd.	25	Darkish to dark crepe	... bought in
	10	Fine sheet	... 3/11½
Golconda	11	Palish to dark crepe	... 3/- to 3/6
Jebong	10	Darkish crepe	... 3/3
Kepong	1	,, ,,	... 3/3
Simpang	1	Dark crepe	... bought in
Ayer Angat	11	Darkish crepe	... pt. sold 3/7¼
Terentang	28	Darkish to dark crepe	... bought in
L. A. R.& P. C.	2	Dark crepe	... bought in
G. & Co., Ltd.	2	,, ,,	... bought in
H. G.	1	Scrap	... bought in
B. N.	5	Good crepe	... bought in
L. A. B. U. M.	3	,, ,,	... 3/9
Pataling	2	Black crepe	... bought in

Mark.	Pkgs.	Description.	Price.
A. M. R. Co.	46	Brownish crepe	... bought in
	1	Black ,,	... bought in
		JAVA.	
Pasir Oetjing	1	Pressed sheet	... bought in
	2	Scrap	... 2/0½

GOW, WILSON & STANTON, Limited—

India Rubber Market Report.

13 & 23, Rood Lane, London, E.C.

May, 22nd 1908.

The offerings were smaller than at last auction by nearly 500 packages, and all descriptions met with a good demand at prices showing an advance of from 1d. to 3d. per lb., on last sale quotations.

There has been a strong enquiry privately for Plantation kinds and a large business has been done. In consequence of this, to-day's offerings hardly came up to expectations either in quantity or quality.

The finest lot catalogued was 2 cases of very pale Crepe from The Consolidated Malay Rubber Estates, Ltd., for which 4/4½ per lb., was offered after the auction. This was the highest quotation of the day.

Number of Packages Advertised.		Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.		
		Ceylon.	Malaya.	Totals.	No. of Packages Sold.	Price.	Hard Fine Para.	Plantation. Fine.	Plantation. Scrap.
To-day	751	10½	26½	37	381	3/8/¾	3/10½	4/1 to 4/4½	2/5 to 3/-
Corresponding Sale Last Year	709	7½	28	35¼	265	52 ⅜	4/8¾	5/4 to 5/7	3/7½ to 4/3

To-Day's Quotations.

Sheet and Biscuits.		Crepe and Block.		Unwashed Scrap.	
Good to Fine Sheet.	4/2¼ to 4/2½	Fine Pale ...	4/2½ to 4/4½	Good to Fine	2/9 to 3/-
		Fine Palish...	3/8½ to 4/-		
Good to Fine Biscuits.	4/1 to 4/3	Dark and Medium.	3/4 to 3/7	Low and Medium.	2/5/ to 2/8¼
		Dark Block...	2/11 to 30¼		

Para Statistics.

Liverpool Imports and Stocks.—*1st January to 30th April.*

IMPORTS.		* STOCKS at 30th APRIL.	
1908	7,595 tons	1908	3,783 tons
1907	5,445 tons	1907	1,917 tons
1906	4,866 tons	1906	1,752 tons

*Excluding those in Dealers hands.

Plantation Exports.

Ceylon 1st January to 27th April.		Malaya.—1st January to 31st March.			
			Singapore.	Penang.	Total.
1908	93 tons	1908 ...	239 tons ...	110 tons ...	349 tons
1907	65½ tons	1907 ...	160 tons ...	14 tons ...	174 tons
1906	38½ tons				
1905	14¼ tons				

Particulars and Prices of To-Day's Sale.

CEYLON.

Mark.	Pkgs.	Description.		Price.
Galphele	5	Good thick crepe	pt. sold ...	3/7
	3	Block	...	bought in
Goonambil	3	Fine biscuits	...	bought in
	1	Scrap	...	bought in
Koswana	1	Biscuits and scrap	...	bought in
New Rasagalla	2	Scrap	pt. sold ...	bought in
Hopewell	1	Dark scrap	...	bought in
Wavena	2	Scrap	...	2/8¼
Craighead	1	,,	..	bought in
Yattewatte	1	Dark rejected biscuit	...	2/11
Gikiyanakande	6	Good crepe	...	3/7¾ to 38½
	1	Dark	...	bought in
C. L.	1	Worm	...	bought in
	1	Dark pressed worm	...	3/8½
Taldua	7	Biscuits	...	3/4
	2	Worm	...	4/2
	3	Dark worm	...	/9 to 4/-

Mark.	Pkgs.	Description.		Price.
	2	Scrap	...	2/9 to 2/11
Ayr	3	Fine biscuits and sheet	...	4/2¼
	4	Scrap	...	2/3 to 2/6¾
M. A. K.	1	Rejected biscuits	..	2/7
	5	Black crepe	...	bought in
D. G. H. & Co.	5	Biscuits	...	3/6 to 4/0¾
	2	Block	...	bought in
	3	Scrap and rejections	...	2/5½ to 3/0¼
	2	Rambong	...	bought in
	4	Crepe	...	3/1 to 3/5¾
	3	Dark crepe	...	bought in
J. C. & Co.	3	Biscuits	...	4/1 to 4/1¾
	2	Dark crepe	...	bought in
	3	Fine to dark scrap	...	2/- to 2/10½
J. C. & Co.	3	Good to black crepe	...	bought in
C. P. H. & Co.	5	Sheet,and biscuits	pt. sold ...	4/1 to 4/1½
	6	Crepe	...	2/8 to 2/11½
	9	Scrap	...	4/2½
Ambatenne	1	Biscuits	...	2/11¾
	1	Fine Scrap	...	1/6 to 3/-
	2	Dark scrap and rejections	...	4/2
Densworth	1	Dark biscuits	...	4/2
D. B.	2	Biscuits	...	bought in
	1	Scrap	...	bought in
	1	Block	...	bought in
Warriapolla	1	Scrap	...	bought in
D. B. M.	2	,,	...	1/6

MALAYA.

Mark.	Pkgs.	Descriptions.		Price.
C. M. R. E. Ltd.	40	Good to very fine crepe	pt. sold ...	3/9½ to 4/2½
	26	Darkish to dark crepe	...	bought in
Shelford	3	Good crepe	...	bought in
	5	Dark crepe	...	bought in
F. (S) R. Co., Ltd.	10	Sheet	...	bought in
	7	Good to dark crepe	pt. sold ...	3/3 to 3/6
S. R. Co., Ltd.	15	Sheet	...	4/2¼
	10	Good crepe	pt. sold ...	3/10¾
	44	Dark ,,	...	bought in
V. R. Co., Ltd.	3	Good to fine thick crepe	...	3/11
Klang	17	Good and medium crepe	...	3/7 to/3/10¾
F. M. S.	17	Dark crepe	...	3/4 to 3/5½
	51	Block	...	bought in
S. R. & Co.	25	Dark crepe	...	bought in
	1	Block	...	2/11
P. S. E.	14	Fine sheet	...	4/2½
S.	10	Sheet	...	4/2¼
	1	,, (rejected)	...	bought in
	5	Fine to dark scrap	...	2/5 to 2/11
Linggi Plants.	11	Fine crepe	...	4/3¼
	37	Good to dark crepe	pt. sold ...	3/6 to 3/8½
	50	Dark crepe	...	bought in
Sundry Marks	1	,,	...	bought in
	2	Good crepe	...	bought in
	2	Good scrap	...	2/7
	6	Sheet	...	bought in
	4	Crepe	...	bought in
	1	Dark crepe	...	bought in
S. P.	2	Crepe	...	3/4
	2	Block	...	2/9½ to 3/0¼

Mark.	Pkgs.	Description.	Price.
	5	Dark Crepe pt. iald ...	2/9
	3	Fine to dark Rambong (pressed)...	bought in
J. C.			
F. B.	2	Block ...	2/9
B. P.			
Perhentian Tinggi	8	Good to fine crepe ...	4/2 to 4/2¾
	18	Dark crepe ...	2/10 to 3/5½
S. K. R. Co., Ltd.	1	Fine crepe ...	4/2¼
B. & D.	2	Good crepe ...	4/-
	10	Good to dark crepe pt. sold ...	3/7 to 3/10
B. & D.	3	Sheet (loose and pressed) ...	3/10 to 4/2½
	2	Scrap ...	2/5½ to 2/6½
	1	Crepe ...	3/2
R. M. P. Ltd.	2	Darkish crepe ...	3/8 to 3/9¾
	4	Good to fine crepe ...	4/- to 4/1½
D. R. E.	21	Fine to dark Rambong ...	2/9 to 2/10¼
B. C.	1	Crepe ...	bought in
	1	Rejection ...	bought in
B. M. & Co., Ld.	1	Dark sheet ...	bought in
Damansara	11	Dark crepe ...	bought in

CEYLON, STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

May 8th, 1908.

The following Lots, comprising about 52½ Tons Straits and 9½ Tons Ceylon, were offered at Auctions to-day and sold as follows :—

STRAITS AND MALAY STATES.

Mark.	Pkgs.	Description.	Price.
Highland	16	Cases Sheets ...	bought in
Estate	19	,, Crepe ...	3/5½ at 3/9
V. R. Co., Ltd. Kalang F.M.S.	57	,, Crepe ...	2/11¾ at 3/11¼
K.	15	,, Sheets ...	3/9 at 4/0¼
	8	,, Crepe ...	3/7¼ at 7½
J.	1	,, Sheets ...	3/9
S. R. Co.	61	,, Crepe ...	bought in
	52	,, Sheets 19 sold ...	3/11½
P. S. E.	12	,, Sheets ...	3/11½
	4	Bales Scrap ...	3/2
S.	2	Cases Sheets ...	4/-
R. R.	3	,, Scrap ...	2/3
O. G. S.	3	,, Sheets ...	3/11¾
Linggi Plants Ltd.	20	,, Crepe part sold ..	2/8 at 3/7¾
R.	10	,, Sheets ...	3/8 at 4/0¼
S. P.	3	,, Crepe 1 sold ...	3/4

Mark.	Pkgs.	Description.		Price
Bila				
Sungei Krudda	18	Cases Sheets	...	3/11½
T.	4	,, Scrap	...	2/5½
C. M. R. E. Ltd.	33	,, Crepe most sold	...	3/7 at 4/0¾
Damansara	8	,, Sheets	...	4/-
	23	,, Crepe	...	2/10½ at 3/4¾
Shelford	8	,, Crepe 2 sold	...	3/4
F. S. R. Co., Ltd.	11	,, Sheets	...	3/10¾ bid
	13	,, Crepe part sold	...	3/1 at 3/8½
B. R. R. Co., Ltd.	46	,, Sheets ,,	...	3/11½ at 3/11¾
	43	,, Crepe	...	3/0¼ at 3/8½
S. K. R. Co., Ltd.	62	,, Crepe	...	3/2½ at 3/11¼
E.				
K. K.	3	,, Sheets	...	3/11¾
P.				
B. M. Co, Ld.	15	,, Sheets part sold	...	3/11½
M.	2	Pkgs. Scrap	...	2/10
R. P.	6	Cases Crepe	...	3/10 at 4/-
Ltd.				
S.	7	,, Crepe	...	bought in
D. R. E.	3	,, Scrap	...	,,
Ltd.				
Perhentian	27	,, Sheets	...	3/6 at 3/11½
Tinggi Estate	31	,, Crepe part sold	...	3/4 at 3/6
B. & D.	1	,, Sheets	...	3/11½
N. V. S.				
S. & D.	15	,, Sheets	...	3/11½ at 3/11¾
	5	,, Scrap	..	2/10½ at 2/11¼
Matang	12	,, Sheets	...	3/11½
	14	Pkgs. Crepe	...	3/2 at 3/8½
L. E. D.	3	,, Sheets	...	3/11½
	2	,, Scrap	...	2/10¼
B. C.	3	,, Sheets	...	4/-
M. B.				
E.	15	,, Block No. 2	...	bought in
L. E.				
M.U.A.R.	47	,, Block No. 1	...	,,
S. S. B. R. Co., Ltd.	25	,, Crepe	...	,,
	10	,, Sheets	...	3/11½
Golconda	11	Cases Crepe	...	3/- at 3/6
R. A. B.	10	,, ,,	...	3/3
Damansara	7	,, ,,	...	bought in
A. M. R. Co.	17	,, ,,	...	3/11 at 4/-
Tarentang	35	,, ,, 5 sold	...	3/11½
Ayer Angat	10	,, ,,	...	bought in
B. N.	5	,, ,,	...	3/9
Linggi	9	,, ,,	...	bought in
Pataling	2	,, ,,	...	,,
A. M. R. C.	40	,, ,,	...	,,
		CEYLON.		
Culloden	5	Cases Crepe	...	3/10¾
Glanrhos	3	,, Biscuits	...	3/11¾

Mark.	Pkgs.		Description.		Price.
T.	19	,,	Sheets & Biscuits	...	3/10 at 3/11¾
	3	,,	Scrap 1 sold	...	2/10¼
Rangalla	1	,,	Biscuits	...	4/1¼
Halwatura	10	,,	Worms	...	bought in
Delwila	3	,,	Worms	...	3/7½
Kahagalla	4	,,	Crepe	...	bought in
Edengoda	1	,,	Crepe	...	,,
Dangan	3	,,	Biscuits	...	3/11½
Merton	3	,,	Sheets	...	3/11½
M. A. K.	5	,,	Crepe	...	bought in
D. G. H. & Co.	6	,,	Biscuits	...	3/11½
	24	,,	Crepe	...	bought in
	3	,,	Scrap	...	,,
Warriapolla	5	,,	Biscuits	...	3/10 at 4/3½
	3	Pkgs.	Scrap	...	2/4 at 2/8
Doranakande	4	Cases	Biscuits	...	3/11
	2	,,	Sheets	...	3/6
	7	,,	Scrap	...	2/10 at 3/-
S. L.	8	,,	Scrap	...	2/6
Tudugalla	18	,,	Crepe	...	3/6 at 4/-
Gikiyanakande	20	,,	,, part sold	...	2/10 at 31/0½
	9	,,	Worms	...	bought in
C. L.	21	,,	Crepe ,,	...	3/7
	2	,,	Worms	...	bought in
G. D. J.	13	,,	Crepe	...	,,

The price of FINE HARD to-day is 3/9 per lb.

(*Lewis and Peat*)

CEYLON, STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

May 22nd, 1908.

The following Lots, comprising about 27½ Tons Straits and 13 Tons Ceylon, were offered at Auctions to-day and sold as follows:—

Straits and Malay States.

Mark.	Pkgs	Description.		Price.
Linggi	50	Cases Crepe	...	bought in
L.	1	,, ,,	...	,,
P. & C. L.	2	,, ,,	...	,,
O. & O.	4	,, ,,	...	,,
G. O. V.	1	,, ,,	...	,,
L. A. R. C.	4	,, Sheets	...	4/2/
S. P.	4	,, Crepe	...	2/9 at 3/4
	2	,, Block	...	2/9/ at 2/11¼
	1	,, Rambong	...	bought in
C. M. R. E. Ltd.	66	,, Crepe	...	3/9/ at 4/2½

Mark.	Pkgs.	Description.		Price.
Shelford	8	Cases Crepe	part sold ...	bought in
S R. Co. Ltd.	15	,, Sheets	...	4/2¼
S. R. Co.	54	,, Crepe	...	3/9 at 3/10¾
V. R. Co. Klang	37	,, ,,	...	3/4 at 3/11
F. M. S.	44	,, Block	...	bought in
S. R. & Co.	25	,, Crepe	...	3/5¼ bid
P. S. E.	31	,, Sheets	14 sold ...	4/2½
K. P. Co., Ltd.	7	,, Block	...	bought in
B. R. R. Co. Ltd.	13	,, Crepe	...	3/6¾ at 3/7¾
Linggi Plants	33	,, ,,	...	3/6 at/4/3¼
Linggi Plants Ltd.	15	,, ,,	...	bought in
Perhentian	8	,, Sheets	...	2/10 at 4/2¾
Tinggi Estate	20	Pkgs. Crepe	...	2/10 at 3/5½
B. & D.	13	Cases Crepe	...	2/7 at 4·/
	3	,, Sheets	...	3/10 at 4/2½
	3	Pkgs. Scrap	...	2/5½
R. M. P. Ltd.	6	Cases Crepe	...	3/9 at 4/1½
Taldua	7	,, Biscuits	...	4/- at 4/2
	5	,, Worms	...	3/9 at 4/-
	2	,, Scrap	...	bought in
Yattewatte	1	,, Biscuits	...	,,
S. D. R. E. Ltd.	11	,, Rambong	...	,,
B. C.	1	,, ,,	...	,,
B. M. Co., Ltd.	1	,, Sheets	...	,,
Damansara Selangor	11	,, Crepe	..	,,
No Mark	25	Bags. Block	...	,,
F. S. R. Co. Ltd.	10	,, Sheets	...	4/1 bid
	7	,, Crepe	5 sold ...	3/3 at 3/6
Gikiyanakande	7	Cases Crepe	...	3/7¾ at 3/8½
C. L.	2	,, Worms	..	3/4 at 3/8½
Galphele	5	,, Crepe	3 sold ...	3/7
	3	,, Block	...	bought in
Goonambil	3	Pkgs. Biscuits	...	,,
New Rasagalla	2	,, Scrap	...	2/9 bid
T.	11	,, Sheets	...	4/2¼ at 4/2¾
	13	,, Biscuits	..	4/1¼ at 4/2¾
	79	,, Crepe	part sold ...	2/6 at 3/8¼
	5	,, Scrap	...	2/6 at 2/7¾
Taldua	7	,, Biscuits	...	4/2
	5	,, Worms	...	3/9 at 4/-
	2	,, Scrap	...	2/9 at 2/11
Ayr	2	,, Biscuits	...	4/2¼
	1	,, Sheet	...	42/¼
M. A. K.	4	,, Scrap	..	2/3 at 2/6¾
	6	Pgks Biscuits	...	3/- at 4/1
D. G. H. Co.	9	,, Crepe	...	3/0¼ at 3/5¾
	1	Case Scrap	...	2/5½
J. C. & Co. Ltd.	5	,, Crepe	...	bought in
	3	,, Biscuits	...	4/1 at 4/1¾
	2	,, Scrap	...	2/10½
C. P. H. Co.	3	,, Sheets	...	4/1½
	1	,, Biscuits	...	4/1
	7	,, Crepe	...	bought in
	9	,, Scrap	...	2/8 at 2/9½
Ambatenne	1	,, Biscuits	...	4/2½
	2	,, Scrap	...	1/6 at 2/11¾
M. A. K.	5	,, Crepe	...	bought in
D. B. M.	2	,, Scrap	...	1/6

Kelantan.

Abstract of Meteorological Readings in Kelantan for the month of May, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
				Means F°	Means F°	Means F°						Inches	Inches
Kuala Lebir	...	...	...	91°.09	72°.0	16°.98	...	...	...	...	...	9.85	2.21
Kuala Kelantan	...	...	...	85°.84	73°.9	11°.93	...	...	...	...	...	4.27	1.34
Taku Plantation	...	...	...	...	...	...	...	...	...	...	...	9.93	1.40
Kuala Pergan	...	...	...	...	...	...	...	...	...	...	...	8.48	1.83

STATE SURGEON'S OFFICE,
Kelantan, 12th June, 1908.

JOHN D. GIMLETTE,
State Surgeon, Kelantan.

Perak.

Abstract of Meteorological Readings in Perak for the month of May, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Taipeng	...	151	82·35	92	72	20	78·23	911	...	82	...	13·12	3·50
Kuala Kangsar ...	...	...	82·29	93	70	23	75·96	813	...	73	...	6·84	1·53
Batu Gajah	...	158	80·18	92	73	19	77·37	906	...	88	...	5·68	1·55
Gopeng	...	...	81·31	91	70	21	76·46	852	...	79	...	10·59	2·66
Ipoh	...	...	79·76	93	72	21	75·87	840	...	82	...	6·93	1·70
Kampar	...	...	81·61	93	71	22	77·16	871	...	81	...	5·56	·88
Teluk Anson ...	...	...	81·72	93	70	23	76·89	864	...	79	...	10·35	1·40
Tapah	...	...	81·93	93	71	22	76·69	850	...	78	...	11·53	2·87
Parit Buntar ...	...	...	82·17	91	72	19	77·91	900	...	82	...	11·72	3·07
Bagan Serai ...	...	...	82·51	91	72	19	78·02	899	...	81	...	8·05	3·38
Selama	...	...	81·90	92	73	19	77·89	902	...	83	...	13·53	2·50

STATE SURGEON'S OFFICE,

Taipeng, 20th June, 1908.

M. J. WRIGHT,

State Surgeon, Perak.

Pahang.

Abstract of Meteorological Readings in the various Districts of the State for the month of April, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Kuala Lipis ...	...	...	79·8	93	69	19·8	77·04	...	...	...	...	5·45	1.85
Raub ...	...	...	80·6	93	68	19·8	74·96	...	...	...	...	6·60	1·86
Bukit Fraser ...	...	...	...	...	...	...	...	...	...	...	..	10·51	1·61
Bentong ...	...	...	82·2	94	70	18·5	77·93	...	...	...	...	5·06	·15
Temerloh ...	...	...	...	95	70	19·2	...	...	...	...	...	3·13	·80
Pekan ...	...	...	83	93	72	15·4	78	...	...	...	...	5·59	1·55
Kuantan ...	...	...	84·9	92·5	69	16·8	78·1	...	...	...	...	3·65	2·20
Sungei Lembing ...	...	...	...	89	68	...	...	...	...	...	...	7·50	1·37

STATE SURGEON'S OFFICE,

Raub, 22nd June, 1908.

W. H. FRY,

State Surgeon, Pahang.

Selangor.

Abstract of Meteorological Readings in the various Districts of the State for the month of March, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum	Temperature.				Hygrometer.				Prevaling Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum	Minimum	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
General Hospital, K. Lumpor	29.880	143.9	80.2	89.8	70.8	19.0	76.8	0.820	73.5	79	S. W.	10.10	2.67
Pudoh Gaol „ „	...	...	...	...	...	...	...	...	...	...	...	9.12	1.78
District Hospital „	...	...	...	...	...	...	...	...	...	...	...	9.02	1.30
„ Klang	...	...	...	87.8	70.8	17.0	...	...	...	...	...	6.37	1.32
„ Kuala Langat	...	...	...	...	...	...	...	...	...	...	...	3.13	0.94
„ Kajang	...	...	...	87.9	76.1	11.8	...	...	...	...	...	5.69	1.68
„ Kuala Selangor	...	...	...	...	...	...	...	...	...	...	...	9.04	2.17
„ Kuala Kubu	...	...	...	...	...	...	...	...	...	...	...	6.87	1.68
„ Serendah	...	...	...	91.0	71.0	20.0	...	...	...	...	...	6.23	1.05
„ Rawang	...	...	...	91.9	71.1	20.8	...	...	...	...	...	7.74	1.10
Beri-beri Hospital, Jeram	...	...	...	...	...	...	...	...	...	...	...	10.13	3.03
Sabak Bernam.	...	...	...	...	...	...	...	...	...	...	...	6.47	1.30

STATE SURGEON'S OFFICE,
Kuala Lumpor, 26th May, 1908.

E. A. O. TRAVERS,
State Surgeon, Selangor.

Selangor.

Abstract of Meteorological Readings in the various Districts of the State for the month of April, 1908.

DISTRICT.	Mean Barometrical Pressure at 32 Fah.	Maximum in Sun.	Temperature				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
General Hospital, K. Lumpor	29.872	144.2	81.1	91.2	73.1	18.1	76.7	0.833	73.7	75	S. W.	7.25	1.40
Pudoh Gaol Hospital ,,	...	...	...	...	...	...	...	...	...	...	...	6.85	1.33
District Hospital ,,	...	...	...	...	...	...	...	...	...	...	..	5.83	1.05
,, Klang	...	...	...	88.7	71.1	17.6	...	...	...	...	...	3.49	2.04
,, Kuala Langat	...	...	...	...	...	...	..	...	...	...	...	6.04	2.25
,, Kajang	...	...	...	88.6	77.2	11.4	...	...	...	...	...	5.02	1.67
,, Kuala Selangor	...	...	...	88.6	76.2	12.4	...	...	...	...	...	1.01	0.29
,, Kuala Kubu	...	...	...	93.2	72.2	21.0	...	...	...	...	...	16.74	6.40
,, Serendah	...	...	...	91.8	71.5	20.3	...	...	...	...	...	9.29	3.40
,, Rawang	...	...	...	91.5	72.8	18.7	...	...	...	...	...	8.24	1.60
Beri-beri Hospital, Jeram	...	...	...	...	...	...	...	...	...	...	...	0.38	0.12
Sabak Bernam	...	...	...	...	...	...	...	...	...	...	...	5.64	0.96

STATE SURGEON'S OFFICE,
Kuala Lumpor, 28th May, 1908.

E. A. O. TRAVERS,
State Surgeon, Selangor.

Selangor.

Abstract of Meteorological Readings in the various Districts of the State for the month of May, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Valpour Tension.	Dew Point.	Humidity.			
General Hospital, K. Lumpor	29.883	147.7	80.8	90.5	72.1	18.4	76.3	0.820	73.2	78	S. W.	6.42	2.15
Pudoh Gaol ,, ,,	...	...	...	...	...	...	...	...	...	...	...	5.58	1.84
District Hospital ,,	...	...	...	...	...	...	...	...	...	...	...	4.83	1.84
,, Klang	...	...	...	...	...	...	...	...	...	...	...	9.32	3.85
,, Kuala Langat	...	...	...	...	...	...	...	...	...	...	...	4.08	1.12
,, Kajang	...	...	...	87.8	77.4	10.4	...	...	...	...	...	7.25	1.98
,, Kuala Selangor	...	...	...	88.3	75.2	13.1	...	..	...	...	...	2.51	0.96
,, Kuala Kubu	...	...	...	93.0	72.5	20.5	...	...	...	...	...	5.16	0.76
,, Serendah	...	...	...	91.7	72.2	19.5	...	...	...	...	...	8.43	3.85
,, Rawang	...	...	...	91.2	72.9	18.3	...	...	...	...	...	5.19	1.37
Seri-beri Hospital, Jeram	...	...	...	...	...	...	...	..	...	...	...	3.71	1.33
Babak Bernam	...	...	...	...	...	...	...	...	...	...	...	2.60	1.30

STATE SURGEON'S OFFICE,
Kuala Lumpor, 20th June, 1908.

E. A. O. TRAVERS,
State Surgeon, Selangor.

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Agricultural Bulletin

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STRAITS

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FEDERATED MALAY STATES.

EDITED BY

H. N. RIDLEY, M.A., F.R.S., F.L.S., F.R.H.S.,
Director of Botanic Gardens, S. S.

AND

J. B. CARRUTHERS, F.R.S.E., F.L.S.,
Director of Agriculture & Government Botanist, F.M.S.

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ORNAMENTAL TREES AND SHRUBS.

Effective landscape gardening is an art which is only acquired by considerable study, taste and judgment on the part of the persons engaged in its excution.

The art has reference chiefly to the laying out of extensive grounds and large estates and the arrangement and planting of trees and shrubs in such a manner as to produce the best effect. Although the gardens surrounding the majority of houses and bungalows in this country are not large enough to allow of landscape gardening in the true sense of the word still the principles of the art can be applied in the arrangement of flowering trees and shrubs and other ornamental plants.

For example tall trees and shrubs should be kept in the back ground with smaller subjects in the foreground and so arranged as not to obstruct the view. Again straight lines should be avoided where possible and all attempts at formality should be guarded against. This applies more to large grounds as it is understood that in a small garden the formal style of gardening must of necessity be introduced.

In planning a garden, be it large or small, definite ideas are necessary and no attempt should be made unless the utmost forethought has been given and the results calculated to prove tolerably certain, in fact a rough sketch of the grounds should be prepared and the work of making the garden guided thereby. A climate like ours offers so many advantages for effective and ornamental gardening and the number of ornamental and flowering trees and shrubs is so great that the work of making a beautiful garden is comparatively easy. It is therefore surprising that in one's travels one sees so very few well arranged and effective gardens. This may be due to a lack of interest in horticulture which is unfortunate in the sight of the true lover of plants and flowers and also from a hygienic stand point as an hour's gardening in the cool of the morning is a most enjoyable and healthful exercise, or it may be due to giving too much initiative to the native gardener whose knowledge extends to the cutting of the grass on the lawn but his ideas of general gardening are of an extremely rudimentary kind.

There are no hard and fast rules that one can lay down in forming a pleasure garden therefore the selection of trees and shrubs should be very carefully done as so much depends on individual requirements, locality, nature of the land, surrounding scenery and many other points which have to be constantly kept in view. Plants which are known not to succeed in the locality should be given special provisions such as soil and position and should not be given permanent positions until it has been proved that they will succeed under such conditions.

Great care should be taken not to overcrowd the garden with tall growing trees as they soon form a dense thicket and apart from excluding the air and light from the house, ruin the smaller shrubs and plants underneath.

This should however always be performed with due regard to shade and local conditions. One of the features of a well proportioned garden should be an open expanse of grass lawn and this should not be sacrificed by the inclusion of too many single plants or beds. A few beds carefully placed, of bright flowering or ornamental shrubs should, where possible, be introduced on the lawns. These when judiciously selected are always a feature of a well arranged garden and have the advantage of lasting for a considerable time without requiring renewing. In fact I would recommend shrubs for beds in preference to flowering annuals which are always objects of pity in this climate and last so short a time. Another very important point in arranging a garden is the blending of colours and shades and great care should be taken in selecting positions that plants are not in combination or close together whose colours clash.

Considerable care should also be taken in planting that each tree or shrub receives the position most suited to its requirements. Certain flowering shrubs require full sun, others require partial shade, whilst to be successfully grown most foliage trees and shrubs should be given full sun; but these are matters which can only be learnt by constant observations and experiments. Planting should be conducted so as to prove effective at all seasons. A very effective arrangement is to have a border of mixed flowering and foliage shrubs, and a position for such can be obtained in most gardens, for example, in front of a strip of jungle, or along a boundary fence or wall or by the side of a carriage drive. To get the best effect the border should not be too wide, but this will depend on the length of the border, the size of the garden and the amount of space available in front.

In selecting plants for a border of this kind care should be taken to plant the taller subjects at the back and the dwarfer growers in the foreground. Here again the danger of clashing shades and colours should be avoided. A border is in many cases to be recommended especially in a comparatively small space as it prevents the necessity of cutting up the lawn in front into small beds which is not always to be advised where space is limited and it should always be borne in mind that good gardening depends on the judgment exercised in the first instance by disposing of the material and space at hand to the best advantage.

The foregoing must only be taken as a few general remarks on the selecting and arranging of trees and shrubs to the best advantage.

Peculiarities abound in almost every case and can only be dealt with individually.

It is my intention, for the purposes of this paper, to divide Ornamental and Flowering Trees and Shrubs into four sections, namely:—(*a*) Flowering Shrubs, (*b*) Flowering Climbing Shrubs, (*c*) Ornamental foliage Shrubs and (*d*) Flowering Trees; but before proceeding further it will be advisable here to give some instructions on their general cultivation.

Propagation.

It may be taken as a general rule that all or nearly all of our flowering shrubs can be propagated from cuttings, but as each individual will be dealt with further on it is not here necessary to enter into peculiarities. The majority of the trees dealt with in this article are propagated from seeds.

This is the most satisfactory method of tree propagation but in cases where seeds are not available cuttings may be used. It should, however, be borne in mind that cuttings are not so satisfactory and are not to be recommended for tree propagation.

When only a few plants are required the cuttings or seeds may be inserted in boxes or pots of well drained sandy soil, but if a large supply is required it is advisable to make a few nursery beds in some shaded corner of the garden—but not under trees where the heavy drip would spoil the chances of success. The beds should be thrown up above the level of the surrounding ground and if possible on a gentle slope. To insure proper drainage a small trench should be cut round each bed to carry off superfluous water and the beds may be of any length but not more than four feet wide to enable them to be worked with ease.

Cuttings should be taken, in the majority of cases, from well ripened wood and will vary in length from six to twelve inches according to the nature of the plant.

It should be taken as a rule that each cutting should contain at least four joints or nodes. It is generally thought amongst amateur gardeners that a cutting should contain a growing point but this is a mistake. If shoots or branches are cut up into lengths and inserted three parts under the ground one or more of the dormant buds at the joints or nodes will develop and shoots will be thrown out therefrom. Roots will also develop from the nodes.

Cuttings require to be of different degrees of firmness and a proper knowledge of the peculiarities of different plants must be acquired from experience before successful propagation can be practiced; but the amateur will obtain quite good results if he follows the rule of interesting cuttings of well ripened wood of the previous season's growth. Where cuttings absolutely fail resort can be made to seeds, layering or one of the other methods of propagation known to most people. Plants raised from cuttings are ready for planting out in from one to three months according to the kind. Plants from seeds take longer as a rule.

In sowing seeds care should be taken that they are not covered too deeply. A good rule to follow is to cover them with a thickness of soil equal to the diameter of the seed. Very small seed should be sown in shallow boxes or pans and covered very lightly with very fine soil. In

many cases a gentle watering is all that is necessary. A watering can with a very fine rose should be used.

It is not necessary here to go into the various other methods of propagation as it will be found in practice that all or nearly all the plants hereafter mentioned can be propagated by one or other of the methods already mentioned.

Preparation of Soil and Planting.

The soil in which it is intended to plant should be carefully examined as regards its composition and physical properties in order to asertain its capabilities for cultivation, the kinds of plants best suited to it and the means by which it can be made more fertile. The amount of organic matter or humus in the soil greatly affects its value and also its capacity for absorbing and retaining water, although in a climate like ours the latter is probably not of so much importance. A light sandy soil will require more manure and vegetable matter than a heavy clayey one and in forming beds or borders or planting out trees these matters should be considered. If the subterranean water is near the surface substances are apt to be formed in the soil that are injurious to the plants. In these instances drainage is necessary to prevent the water from accumulating and doing damage in this way. In preparing beds the soil should be dug out to a depth of two feet and a quantity of broken bricks or old lime rubbish should be placed on the bottom as drainage, if the soil is of a wet nature. If the ground is naturally dry and sandy it will be beneficial to introduce some humus in the form of rotten leaf mould or well decayed cow manure.

This should be well mixed with the soil and the bed should be allowed to stand for a few days and again well turned over before planting. These remarks apply in an equal degree to the formation of borders or positions for single plants or trees. Care should be taken that the surface of beds and borders is considerably above the surrounding level otherwise water collects and they become waterlogged and sour.

A space of two or three feet round the base of trees should be kept surface tilled and free from grass and weeds, and occasionally mulched with well decayed manure, this induces the young feeding roots to the surface, admits air and keeps the soil sweet. One generally finds that the gardener carefully sweeps up and burns every dead leaf he can find in the garden. This is a mistake and should not be encouraged. A pit should be dug in some out of the way corner of the garden and all dead leaves should be thrown into it and turned over periodically. This rubbish will soon decay and forms excellent manure either for mixing with the soil or for top dressing.

Planting is of the greatest importance and the methods vary considerably in detail according to the different plants and the manner in which their roots are naturally disposed. Some are deep others shallow rooting but the following general method may be followed in planting most kinds of trees and shrubs. The special details attending the management of individual plants can only be given in dealing with their cultivation separately.

The holes for the reception of shrubs or trees should be prepared before hand. The requisite depth and breadth depends on the quantity and length of the roots but sufficient space should be allowed to spread them at full length and to work easily all round. The soil on the bottom of the hole should be well broken up and raised slightly in the centre under the base of the plant. Care should be taken that the holes are not too deep. More plants fail through deep planting than is generally realized. Once the roots are arranged the hole may be filled care to work the soil well amongst the roots.

The soil should be well trodden round the roots to render the plant firm. All young trees that are more than three or four feet high should be securely staked as soon as planted. The value of staking in connection with newly planted trees cannot be over estimated as, when properly executed, it prevents the tree from rocking in the wind and in taking thereby damaging the roots.

When a single stake is likely to be required for permanently supporting a tree it is a safe plan to insert it at the time of planting otherwise the chances are that the stake is driven in just where the best roots are situated and thereby causing them injury. A tie should be made near the base and another near the top of the stem. A small piece of thick cloth, felt or carpet should be wound round the stem where the ties take place to prevent the string from cutting in and injuring the bark. As soon as possible after planting all young trees or shrubs should be well watered and shaded from the direct rays of the sun. Planting should be done in the evening or on dull wet days and never during midday or dry hot weather. It will sometimes be necessary to place some kind of guard round newly planted trees.

Fancy iron guards can be purchased but these are expensive and not always easily procurable. A very serviceable guard can be made very cheaply by driving in three posts round the plant in a triangular fashion and nailing them together by a few rows of rails. They should be high enough to prevent cattle from damaging the trees.

Pruning.

The work of pruning is one of the most important in gardening and is essential where trees and shrubs have to be subjected to artificial treatment in a limited space as in the majority of small gardens.

There are several objects in pruning such as the thinning and removing of superfluous shoots, dead and decayed branches, the removal of central branches to admit air and light and the training of plants into proper shape.

Some authorities recommend the free use of the pruning knife while others advocate a moderate system; but my advice to beginners is to be guided by the subject under treatment.

The rate of growth and many other circumstances will have to be considered, always keeping in view the object aimed at, which in most cases will be to keep the shrubs or trees within bounds at the same time preserving a symmetrical and well balanced plant. In training young trees it is important that a strong centre shoot or "leader" is maintained and that all weak and misplaced branches are removed with a view to preserving a pyramidal shape.

Young trees are disposed to produce long vigorous lateral branches at the expense of the leading shoots.

These branches should be pruned back consistently with the vigor and size of the tree and so direct the sap into the leader which will cause it to develop more rapidly.

In many young trees suckers are thrown up from the base of the stem, these should be carefully removed on appearance. Large branches should be carefully removed close to the main trunk and all cuts should be made clean and tarred over to prevent decay. Before planting trees and shrubs the root system should be carefully examined and all broken or damaged roots should be cut out and long unnecessary ones shortened. A well balanced root and branch system should be aimed at and this is often accomplished by a slight root pruning which encourages the formation of fibrous feeding rootlets. When a severe pruning of branches becomes necessary, as if often the case in most gardens, it should be performed during the wet season. The tools necessary in every garden are, a good strong, sharp pruning knife, a small hand saw, a pair of secators and a small axe.

Flowering Shrubs.

This is the most extensive and to me the most attractive section of our garden plants. The variety is large and varied and a splendid selection is so easily made that one is surprised to find that only a few of the commoner sorts are found in gardens. In the embellishment of the garden flowering shrubs play a most important part; indeed, take these away and more than half the beauty is gone. Some are best planted in clumps by themselves, others are seen to the best advantage as isolated specimens.

In selecting sites the habit of the plant must be considered if the full effect is desired. Flowering shrubs should never be planted under the shade of trees if proper development is to be attained. Shrubberies if properly arranged and planted will give a show of flowers during the whole year. Considerable judgment is necessary in planting shrubberies to prevent overcrowding and formality. Here again a knowledge of the habit of each individual plant is necessary. The following list contains all the best and showiest of our flowering shrubs and no difficulty should be experienced in obtaining plants of each kind. All or nearly all are easily propagated by cuttings and no difficulty should be found in raising stocks of each.

Allamandas. A genus of elegant plants admirably adapted to be grown as shrubs although they are also grown with good effect as climbers. Their large funnel shaped flowers are striking and attractive and all the species of the genus are of easy culture. To obtain the best results as shrubs the plants should be massed together in beds or clumps and periodically pruned to keep them shrubby and within bounds.

Pruning also increases their floriferousness. A very good effect is obtained by allowing the plants to climb over trees. The bright yellow flowers peeping through the foliage are very striking. Allamandas thrive best when planted in a rather sandy soil and kept well manured,

Planted in full sun they soon give a liberal display of flowers which is kept up more or less all the year round. Propagation is easily effected by cuttings of young ripened wood.

The following are the best species for garden purposes :—

Allamanda Schottii. Is perhaps the largest flowered and strongest grower of the group. The flowers are large yellow with the throat beautifully striped with rich brown. The leaves are oblong, acuminated and arranged in whorls of four, quite glabrous. A native of Brazil. Given good soil and position this plant soon forms large bold masses and flowers freely.

Allamanda neriifolia. Is a South American species of more shrubby habit. Flowers golden yellow streaked with orange, bell shaped, tube wide and about one inch long, borne on many flowered panicles. Leaves oblong, acuminate, on short petioles and glabrous. A very free flowering and useful kind.

Allamanda grandiflora. Is a fine blooming sort from Brazil with large bright yellow flowers and shiny foliage. This is one of the best for climbing or, if kept pruned, for bedding purposes.

Allamanda Williamsii. Is a variety of *cathartica* resembling grandiflora but of more bushy and upright habit.

Allamanda violacea. Is a Brazilian species and as far as I know the only species having purple flowers. It is of upright growth and shrubby habit and owing to its distinct coloured flowers should be more widely grown. In constitution it is not so robust as its confréres and requires more careful treatment.

All the Allamandas are easily propagated by cuttings or ripened shoots inserted in almost any kind of soil.

Acalypha Sanderi. Is a striking and ornamental shrub probably introduced here from Amboina. It is often met with under the name of *Acalypha hispida.*

The flowers are bright red in drooping tassel-like spikes from one foot to eighteen inches long. The leaves are light green, large and luxuriant. As a shrub this plant will reach a height of ten or fifteen feet. If periodically pruned and kept dwarf it is one of our finest plants for ornamental bedding. As a pot plant it cannot be beaten.

Cuttings should be made, preferably from the ends of shoots, from well ripened wood and inserted in sandy soil. They root readily and soon form good sized plants.

Beloperone oblongata. Is a pretty shrub with rosy-purple flowers in axillary spikes and oblong-lanceolate opposite leaves. It is of easy culture and can be used for any purpose and in any position. Propagated by cuttings of half ripe shoots.

Bignonia magnifica. Is a magnificent shrub from Columbia with large flowers varying from delicate mauve to rich purplish crimson with a splash of primrose in the throat. The inflorescence is a large branching panicle. The leaves are broadly ovate and opposite. Correctly speaking this plant belongs to the climbing section but can also be grown as a shrub in large bold masses when it is seen to the best

advantage. It is a vigorous grower and requires frequent prunings to keep it in bounds. Cutting back the long shoots increases the amount of flowers. It is easily propagated by cuttings.

Bougainvillæa glabra. Belongs to a genus of plants popular by reason of their brilliant bracts which envelop the flowers. This species has panicled inflorescences producing cordate-ovate acute rosy bracts arranged in threes. The leaves are bright green and smooth.

Bougainvillæ glabra var sanderiana. Is a very floriferous variety of dwarfer habit.

Bougainvillæa speciosa. Has larger bracts of a delicate lilac rose produced in immense panicles but in other respects resembles *B. glabra.* All the kinds mentioned are natives of Brazil and are well known to almost every one. As climbers they are equally effective but require a good sunny position and good soil to produce the desired effect. Propagated by cuttings.

Brunfelsia Americana. Is a West Indian shrub useful for borders or shrubberies. The flowers are solitary, sweet scented and change with age from yellow to white. The leaves are obovate, elliptic and acuminated.

Brunfelsia eximia. Has large purple flowers and dark green oblong-lanceolate foliage.

Brunfelsia latifolia. Is a useful species for edging borders or beds. The flowers are at first a beautiful violet blue ultimately becoming almost white. Height from two to three feet.

The Brunfelsias are all easily propagated by cuttings, or by seeds when available.

Cassia sieberiana. Is a tropical African species of this large genus. The flowers, as is the case with most of the Cassias, are bright yellow and produced on axilliary and terminal many flowered racemes. The leaves are dark green and pinnate each leaf possessing from four to six pairs of pinnæ. Planted in an open situation with plenty of sun this shrub flowers heavily and is quite attractive. All the Cassias are easily propagated by seeds.

Congea tomentosa. Is a well known useful shrub with showy bright pink bracts. The flowers are not showy and are borne on terminal panicles and surrounded by the bracts. There is a variety *azureus* with bluish bracts but it is not so effective as the type. The Congeas are of a straggly habit and are best grown in masses. They are easily propagated by cuttings.

Clerodendron fallax. Is one of the best of the shrubby Clerodendrons and a very useful and effective plant for bedding. The flowers are bright scarlet on terminal erect many flowered panicles from one foot to eighteen inches long. The leaves are very large, dark green and cordate-ovate and slightly downy.

Clerodendron squamatum. Resembles the above in habit and flower but the foliage is glabrous.

Clerodendron Minahassæ. Belongs to the same section but has yellowish-white flowers arranged in broad terminal cymose panicles.

These are the best of the shrubby kinds and are easily propagated by cuttings of the stems from six to nine inches long inserted in sandy soil. Stems which have flowered should be cut down to make room for the young shoots that are thrown up from the root. In this a succession of flower can be had all the year round. These plants are seen to the best advantage when grown close together in beds or groups.

Clerodendron macrosiphon. Should not be omitted from the number. It is a close growing dwarf shrub producing immense numbers of white tubular flowers and an excellent plant for many purposes.

Cryptostegia grandiflora. Is a African shrub of a rambling nature. The branches are scandent and sparsely leaved. The flowers are large and reddish-purple in colour with a campanulately funnel-shaped corolla. When given good soil and pruned to induce branching it forms a not unsightly shrub; but would be probably at its best as a climber. Propagated from seeds or by cuttings.

Duranta Plumieri. Is a handsome West Indian shrub, often forming a small tree, with pretty blue flowers borne in great profusion in racemes towards the ends of the branches. The stems are spinose. There is a white variety which is even prettier than the type and when in fruit is laden with amber coloured berries which give it an extremely ornamental appearance. Propagation is by seeds or cuttings of ripe wood.

Duranta Ellisia. Resembles *Plumieri* in habit and foliage. The flowers are white in erect terminal racemes. The fruits are golden yellow and very attractive.

Erythoxylon coca. The "Coca-leaf" of South America is a shrub recommended for its graceful habit and profusion of small bright scarlet fruits. It is seen to the best advantage when grown as isolated specimens. The seeds germinate freely if sown in shallow pans or pots of light soil.

Fagrea auriculata. Is a Malay epiphytal shrub with very large funnel-shaped flowers, white when they first open, turning to yellow. The leaves are coriaceous broad, cuneate-oblong, acute, veiny and very large and dark green. An ornamental and striking shrub suited to places where plant room can be afforded.

Gardenia florida is perhaps the best of the true *Gardenias* for general garden use. This plant is known to many as the "Cape Jessamine." The flowers are white and very sweet scented and are almost terminal, solitary and sessile.

There are several other species such as *grandiflora, nitida* and *radicans* well worthy of cultivation. They are propagated by cuttings but plants make slow growth when young.

Galphimia glauca. Is a neat little Mexican shrub with large terminal racemes of small yellow flowers. It is a change from the usual run of golden shrubs and is well adapted for bed or pot culture. The plant is an upright fair-sized shrub with small leaves. Cuttings of well ripened wood soon root in sandy soil.

The *Hibiscus* is a genus of the most useful and ornamental of our Garden shrubs. They are familiar to every one by the name of

"Shoeflowers" and need very little description here. The type of the numerous garden forms is *Hibiscus rosa siuensis* and is easily distinguished by its large single scarlet flowers. The number of garden varieties is large and range in shades in singles and doubles from deep scarlet to yellow buffs and whites. The plants vary in habit from upright compact shrubs to weeping scraggly bushes. The uses of this section of *Hibiscus* are endless. For forming hedges they cannot be beaten or for shrubberies, beds, borders or as isolated specimens.

There are several other species of Hibiscus worthy of mention; one of the best known being the extremely pretty

Hibiscus mutabilis. A Chinese form of distinct appearance. The flowers are large and double resembling giant hollyhocks. The foliage is large and downy, the stems are erect and produced from the base of the plant. To produce the best effect this plant should be planted closely together in beds, its upright compact habit suiting it for this purpose. A continual supply of flowers can be had by cutting out the old stems as they finish flowering and allowing the younger stems to take their places.

Hibiscus malviviscus. Is a Chilian species quite unlike any of its congeners in appearance. The flowers are small, scarlet and twisted and the foliage is small, contracted and sparsely disposed. When properly grown it forms quite an attractive little shrub but is seen at its best when two or three plants are planted close together.

The Hibiscuses are extremely easy of culture and propagate readily by cuttings.

Hamelia patens. Is a South American free flowering shrub with brownish red flowers tinged with yellow disposed in terminal pedunculate umbels. The leaves are ovate, oblong and pubescent. A useful plant for bed or border, flowers freely and is not exacting as to soil or position. Propagates readily from cuttings.

The Ixoras form a genus of ornamental and in some cases extremely handsome shrubs or small trees, natives for the most part of tropical Asia, Africa and the Pacific Islands. The flowers are scarlet, pink, yellow or white and arranged in terminal corymbs. The plants are increased by cuttings of well ripened shoots which in most cases root readily. A good rich loam is best suited for their culture and occasional dressings of manure are beneficial.

The best species for garden decoration are as follows:—

Ixora macrothyrsa. A plant from the South Sea Islands often met with in gardens under the name of *Ixora Duffii.* The flowers are deep red in immense trusses and the leaves are large and dark green.

Ixora coccinea. Has bright red flowers disposed in very large heads, or corymbs which are umbellate. A handsome shrub from the East Indies.

Ixora coccinea var. Bandhuca. Is a form of the latter with a contracted habit but worth growing as a dwarf kind.

Ixora coccinea superba. Is a handsome Javanese variety with deeper coloured flowers and broader and thicker petals and of more vigorous habit than the type.

Ixora fulgens. Has orange scarlet flowers in dense corymbs and linear-lanceolate leaves. A most desirable dwarf species from Java varying in height from three to four feet.

Ixora javanica. As the name denotes is also a Javanese species. The flowers are orange in dense corymbs on rather long peduncles. A most distinct and desirable plant with oval-oblong acuminated leaves.

Ixora barbata. Flowers white in terminal corymbs, and glossy dark green foliage.

Ixora odorata. Has pure white flowers turning to yellow in very large terminal divided panicles.

There are numbers of varieties and garden hybrids of the above and other species, many of them are exceedingly fine but unfortunately they are rarely met with in the east.

Jatropha integerrima. Is a Cuban shrub with sub-cymose racemes of red flowers. A very showy plant seen at its best when grown as a specimen in a tub or planted out. Propagated by cuttings or ripened shoots. The shoots require frequent stopping if bushy shrubs are desired.

Kopsia fruticosa. Belongs to a small genus of shrubs, natives for the most part of the Malay Archipelago. This is the best known of the group and is a beautiful flowering shrub. Plants thrive best in a good loamy soil and are best adapted for isolated positions on the lawn or other open position. The flowers are a beautiful pale pink, sweet scented and borne in terminal corymbs. Cuttings of half ripened shoots root readily.

Largerstroelmia indica. Is a Chinese shrub of very handsome appearance. The flowers are bright pink, large and in many flowered panicles The leaves are roundish-ovate, acute and glabrous. When given good conditions this shrub reaches a height of from 6′ to 10′. Propagated mostly by cuttings of firm wood and by seeds when available.

Malpighia coccifera. Is a well known shrub plentiful in Chinese gardens all over the peninsula. The Chinese train it into all kinds of fantastic shapes such as representatives of animals, birds, houses, etc. I do not recommend it for this purpose. As a naturally grown shrub it is very effective and soon grows into quite a large bush. The flowers are pale bluish or pink in colour and of an uncommon shape. The foliage is very small, spiny and glossy green resembling those of boxwood. Plants of this Malpighia are equally attractive grown in pots or tubs. Propagated easily by cuttings of side shoots. Care should be taken in removing the small leaves from cuttings otherwise the bark may be damaged causing the cutting to decay.

Mussænda erythrophylla. Is undoubtedly one of the most handsome garden shrubs we possess.

Its beauty is not in the flowers, which are inconspicuous, but in the large brilliant scarlet floral leaves which are formed by the enlargement of one of the calyx segments. These bracts are large, from three to four inches in diameter, and roundish-ovate. The leaves are large, ovate, bright green and covered with a silky pubescence.

An ideal shrub for growing together in beds or for pots if induced to branch sufficiently. It is easily propagated by cuttings and likes a rich loamy soil. Native of the Congo.

Mussaenda luteola. Is a much smaller growing species from Tropical Africa well suited for massing or bedding purposes. The flowers are small and yellow with an orange centre and not attractive. Like the foregoing species the beauty is in the bract formed calycine leaf which is about one inch long and pure white turning to a bright sulphur colour when older. Large plants are not effective. Small shrubs grown closely together make the best show. Easily propagated by cuttings of ripened wood.

There are several others of this genus but not to be compared with the two mentioned. *Macrophylla* has large white bracts but is of poor habit and requires very careful training to make it an attractive species.

Nerium Oleander. Is a well known upright growing shrub, native of Southern Europe where it is common everywhere.

It is known better as the common Olenader and is a useful garden shrub from 6′ to 14′ in height. Propagated by cuttings.

Petrea volubilis. Is strictly speaking a climber but can also be grown as a graceful drooping shrub.

It is popularly known as the "Purple Wreath" in allusion to the flowers being produced on enlongated wreath-like racemes from six to eight inches long. There is a more arborescent species known as *Petrea erecta* which is equally handsome. They are of easy culture and propagate readily by cuttings.

Plumbago capensis. Is a useful and attractive shrub from the Cape of Good Hope. It has flowers of a beautiful wedgwood blue borne on short terminal spikes. The leaves are oblong, obtuse and entire. As a pot or tub plant or planted in beds it is equally pretty and the flowers are a shade rarely met with in gardens. Plants can be increased by division of the root shoots or suckers.

Plumbago rosea. Is an East Indian species with rosy scarlet flowers in long terminal spikes and of dwarfer habit than *capensis.* A desirable species for general garden use.

Propagated by cuttings or root suckers.

Plumeria lutea. And *P. rubbra* are tropical American shrubs or small trees with sweet scented flowers and thick swollen like stems. The flowers are yellow and red respectively. Plants from four to five feet high are quite ornamental. Terminal shoots root readily in light soil.

Roupellia grata. Is a pretty plant from Sierra Leone which is correctly a climber but like a great many others adapts itself to circumstances and can be grown equally well as a bush. If the long twining shoots are kept cut back it grows into quite a nice bush and is very ornamental. The flowers are white tinged with pink, funnel shaped and very fragrant. The foliage is glossy and dark green. Cuttings of young wood root freely in a shady position.

Wormia suffruticosa. A Singapore shrub with handsome foliage and bright yellow star like flowers. The blooms are three inches in

diameter round and flat. The leaves are large broad and oval, nine inches to one foot long on long petioles.

This is an excellent shrub for wet situations and forms large symmetrical clumps. It is seen at its best on the edge of a lake or river. Propagated by suckers which are produced freely round the base of the plant.

Climbing Shrubs.

By climbing shrubs is meant climbing or twining plants of a woody nature valuable for their flowers and foliage.

The number of plants belonging to this section is not so large as that of the preceding section but nevertheless some of our finest garden flowers are found amongst the climbers.

I will not attempt to give more than a few of the best and easiest to cultivate. The hints already given on propagation and general cultivation will also suit this class.

Antigonon leptopus. Is a slender stemmed Mexican climber familiar in every garden as the "Honolulu Creeper." One of the most useful of all our climbers and equally at home in any position. The flowers are numerous in racemes ending in a branched tendril. The outer three sepals are of a beautiful rose colour, the centre is of much deeper tint. The bracts are bright pink. The leaves are alternate, cordate and petiolate. There is a white flowered variety which is very effective grown in conjunction with the type. They are readily propagated by seeds which are generally produced in abundance.

The different species of *Allamanda* make excellent climbers but as they have already been dealt with in the preceding section a passing reference is all that is necessary here.

Bignonia magnifica. Is amongst the most handsome of our climbing plants and has already been described as a shrub for which purpose it is admirably adapted, although it is naturally of a climbing nature.

The *Bougainvillaeas* Are perhaps the most popular climbers we possess. They delight to ramble over trees. In such positions they are displayed to the best advantage. They are well adapted for training over arches or up pillars. For description and culture see preceding section.

Camoensia maxima. Is a handsome climber first introduced from Angola. It is probably the largest flowered leguminous plant known. The flowers are creamy white from nine inches to one foot in length in short axilliary racemes. The foliage is large and dark green.

Plants thrive well if planted in a rich loamy mould and trained over an arch or pergola. Naturally a rank grower and requires to be cut back to induce it to flower freely. Propagated by well ripened, short, lateral shoots taken with a slight heel of older wood.

Clerodendron scandens. Is a useful plant for training as a climber on fences or trellises. The flowers are white and produced in corymbs along the current years's shoots. The leaves are cordate-ovate, acuminate, entire and downy. The old wood should be occasionally pruned.

Clerodendron splendens. Is à species from Sierra Leone with scarlet flowers in terminal corymbose panicles but in other respects similar to *scandens.*

Clerodendron Thomsonæ. Is the most handsome of this genus, and hails from old Calabar. The flowers are bright crimson disposed in terminal panicles with pure white calyces. The leaves are ovate, acuminate, smooth, dark green and opposite. On account of its brilliant flowers and the freedom with which they are produced this is the most desirable of the group.

There is a useful variety known as Balfouriae with crimson flowers and large calyces which contrasts well with those already mentioned.

Dipladenia Harrisii. Is a West Indian plant and the most deserving of cultivation amongst our garden climbers. I know of no other to equal it in beauty of foliage and flower. Probably known to many people as *Odontadenia speciosa.* The flowers are large, funnel shaped, bright yellow shaded with orange and sweet scented. The leaves are large, oblong-ovate and dark green. Unfortunately this is not an easy plant to propagate by cuttings and seeds are never produced in this country ; but with a little care cuttings will occasionally root in light sandy soil. Young lateral shoots taken with a slight heel of older wood should be selected for cuttings.

Porana volubilis. The "Bridal creeper" is a pretty Indian climber of good habit and vigorous constitution admirably adapted for training over verandahs or pillars. The flowers are small and white and produced in dense panicles of pendulus habit. The leaves are small, cordate and dark green.

Thunbergia grandiflora var. alba. Is the most showy of the climbing Thunbergias. The flowers are pure white and very large. It is not so floriferous as the type which has violet flowers, but a most desirable plant. Propagated by cuttings.

Amongst the *Tecomas,* or " Trumpet Creepers " are many showy and useful climbers. Three of the best for general garden work are. *Tecoma grandiflora,* a Chinese species with large scarlet flowers in terminal panicles, *Tecoma amboinensis* from Amboyna with orange-red flowers three to four inches long produced in axillary racemes and *Tecoma jasminioides* an Australian climber having white flowers streaked with red in the throat. Propagation is effected by root-cuttings or by layering.

Stephanotis floribunda. Is a very beautiful and popular plant because of its fragrant pure white waxy blossoms which are produced freely in large bunches.

It is popularly known as the "Cluster Wax Flower" or the " Madagascar Jasmine." Plants thrive best when planted in wooden tubs and trained over a wooden trellis in a rather shaded position. Cuttings of young shoots taken with a heel of older wood root readily in sandy soil. The plant seldom fruits in this country.

Foliage Shrubs.

No garden is complete without a collection of ornamental foliage shrubs and the number and variety obtainable is large enough to enable every possessor of a garden to make a selection to his liking. The part that ornamental foliage shrubs play in the decoration of our gardens is an important one. Take them away and the result is dullness in the extreme.

The judicious use of flowering and foliage plants in combination gives a handsome and lasting effect with a minimum of upkeep. The instructions given in the earlier part of this article regarding general cultivation are equally applicable in this section. The undermentioned shrubs only are those most worthy of cultivation.

The *Acalyphas* are a set of ornamental and variegated leaved shrubs containing many handsome forms. They are all of easy culture and increase readily by cuttings.

Acalypha Godseffiana. A dwarf bushy shrub from New Guinea with ovate-lanceolate, shining green leaves with creamy-white margins.

Acalypha Macafeeana. Is a garden hybrid having large red leaves blotched with crimson.

Acalypha macrophylla. Another very handsome shrub with very large cordate ovate, russet brown leaves blotched with paler spots.

Acalypha marginata. Is a Fiji Islands species with large, hairy, ovate, acuminate, brown leaves with a distinct margin of rosy carmine.

Acalypha obovata. From Polynesia forms a very ornamental foliage plant when well grown. The leaves are medium-sized, obovate, green with creamy edges when young, changing with age to olive green with pink margins and finally assuming a deep bronzy shade.

Acalypha triumphans. Has large cordate, toothed, acute leaves variegated with deep crimson, green, and brown.

Acalypha Wilkesiana. Is a New Hebrides species having curiously blotched red and crimson leaves. There is a variety of this with rosy carmine margins to the leaves.

Acalypha torta. Leaves dark olive, tinted green, margins cut into blunt, oblong segments, edged with white. Remarkable for its curious contorted foliage. Numerous other varieties and hybrids are found in gardens under different names in each, probably in most cases slight variations of those already described.

The *Croton.* Is the most useful and decorative shrub we possess. The number of varieties obtainable is almost endless and the beauty of their highly coloured foliage makes them popular everywhere. They are in the first rank as pot plants, for table decoration or in collections of other plants. Larger specimens are admirably adapted for growing in tubs, and planted in the open ground in beds or borders they are unsurpassed in beauty.

The majority of the innumerable forms now in existance may be referred to *Croton pictum* correctly *Codiœum pictum* to which section of euphorbiaceæ the crotons rightly belong.

Scarcely more than three or four species exist and about these all the so called crotons may be grouped as seedling forms or sports. Upwards of one hundred and thirty garden varieties have been described from time to time and the number is constantly being added to. I will not endeavour here to do more than describe a very few of the commoner varieties easily procurable in the Peninsula.

Crotons are easily propagated by cuttings of ripened wood. Shoots with growing points should be selected and inserted singly in sandy soil in three inch pots and kept well watered in a shady place until roots are emitted and then gradually exposed to the full sun. Full sun light at all times is necessary to bring out the full colours of the leaves. When planted in shady positions the leaves rapidly become green.

Crotons are apt to grow tall and lanky and if bushy plants are required for planting out they should be occasionally pinched back when young in order to induce them to branch freely. Crotons are displayed to the best advantage when planted not too closely together, in beds or in clumps in shrubberies.

Many varieties make excellent hedges if properly trained.

Croton albicans. Leaves broad-lanceolate twelve to fifteen inches long, two to three inches broad; ground colour dark shining green, beautifully variegated with ivory white.

Croton angustissimum. Leaves drooping, linear, twelve to eighteen inches long $\frac{1}{4}$ inch broad channelled, apex bluntish; dark green, margins and mid rib shining yellow.

Croton Baron Frank Seilliere. Leaves close together, leathery, 10 to 15 inches long and from $2\frac{1}{2}$ inches to 3 inches wide gracefully curved, bright green, light pink underneath in older leaves; the nerves and petiole are pale yellow and ivory white.

Croton elegans. Leaves six inches long, $\frac{1}{2}$ inch broad, linear lanceolate, obtuse at the apex, upper surface dark green midrib crimson or yellowish, margins slightly pink, lower surface dull green mottled with purple.

Croton eburneum. Leaves elliptical-lanceolate, slightly recurred, 6 inches long $1\frac{1}{2}$ inches in breadth, deep green with a broad central band of clear ivory or creamy white running out halfway to the margins with projections at the bases of the principal veins.

Croton illustris. Leaves green deeply mottled with golden yellow, the centre bar yellow and the variegation irregularly distributed, sometimes the points are wholly golden; mostly three-lobed on purplish petioles, base oblong, succeeded by two lateral alternate lobes having a forked appearance. An extremely distinct and attractive plant.

Croton Macfarlanei. Leaves linear-lanceolate, pendulous, arched 9 inches to 12 inches long, 1 inch broad, dark fiery crimson when mature; young leaves rich yellow blotched irregularly with dark green.

Croton nevilliæ. Leaves oblong-lanceolate olive green when young, barred and marked with yellow, when mature the yellow changes to a crimson, shaded with orange, dark green and suffused with a metallic hue.

Croton Queen Victoria. Leaves oblong-lanceolate, 9 inches to 12 inches long, 2 inches broad, rich golden yellow richly mottled with green; midrib and veins rich magenta changing to crimson; margins unevenly banded with carmine often extending to the midrib.

Croton recurvifolium. A very distinct broad leaved variety of dense habit with recurved foliage. The midribs and veins which are crimson, bordered with yellow, are sunk, giving the upper surface of the leaves a waved appearance. The variegation is well marked, and the contrast of the different tints to the deep olive green ground colour is very pleasing.

Croton Bruce Findlay. A bold and handsome plant. Leaves large, oblong-ovate, freely variegated with yellow on the lines of the midrib and veins.

Croton caudatum-tortile. Leaves long, 18 inches to 2 feet, ½ inch broad, pendulous and curiously twisted; olive-green with a yellow central band and a crimson midrib; others almost wholly yellow, becoming suffused with crimson; others variously blotched and spotted.

Croton magnificent. Leaves ovate-lanceolate, 6 inches to 9 inches long 2 inches to 3 inches broad, having a central variegation of golden yellow when young; with maturity the margins become deep olive green, while the midrib and primary veins, with a narrow band on each side of the midrib assume a bright carmine.

Croton Nestor. Leaves lanceolate, bright green, variegated with yellow and whitish, the variegation forms a broad central stripe, the midrib bright magenta-crimson.

Croton triumphans. Leaves oblong, deep green, with a golden line on each side of the midrib; primary veins also golden running into a net work of the same colour towards the point; costa rich crimson; when matured the leaves become rich greenish-bronze, and the costa an intense rosy crimson.

Croton Williamsii. One of the handsomest. Leaves obovate-oblong 12 inches to 15 inches long, 3 inches to 4 inches broad; edges undulated; when young, irregularly banded with yellow, and midrib and primary veins of a magenta colour; as they become more mature, this magenta changes to a rich violet-crimson.

Croton superbiens. Leaves oblong, acute, rounded at the base; colouring exceedingly rich and unique; in the least coloured condition they are green with clouded yellowish markings; as they mature the green deepens, the yellow brightens, and the coppery-red veinings and markings are brought out; subsequently, the green becomes blackish-bronze, while all the pale portions become coppery, the veins and costa being crimson.

Croton medium-variegatum. Leaves oblong, obtuse, acuminate, 4 inches to 5 inches long, 1 inch to 1½ inch wide, margins golden, sinuous; upper surface dark green, midrib and secondary veins golden yellow; under surface dull pale green.

Croton multicolor. Leaves of irregular form, in a young state light green, with yellow tracings, but in a matured state dark green, blotched

with yellow, deep orange and crimson; midrib red, secondary veins yellowish.

Croton interruptum. Leaves linear-lanceolate, tapering at the base, acute or obtuse at the apex, twisted spirally from the middle, upper surface dark purplish-green, midrib crimson; under surface purplish, midrib crimson.

Croton lancifolium. Leaves narrow-lanceolate, 9 inches to 15 inches long 1½ inch broad, dark green; midrib, margin, and primary veins pale yellow, eventually becoming reticulated with bright rosy-pink. An upright distinct kind.

Croton beauty. Leaves lanceolate, variegated golden yellow, the ground-colour eventually becoming a deep bronze, while the yellow variegations change to a deep rosy crimson.

Croton Prince of Wales. Leaves pendulous, arching, twisted, almost entirely pale yellow, margined and mottled with bright carmine, edges beautifully undulated; midrib and petiole bright magenta.

Croton Jubilee. Leaves ten to fifteen inches long, two inches broad, lanceolate, acuminate, with a broad central stripe, cross veins and a narrow margin of golden yellow, which colour changes with maturity to a fiery crimson.

These are a few of the best kinds for general use. There are a great many others principally hybrids and sports, all possessing garden names but probably in most cases slight variations of one or other of those described.

Another class of shrubs worthy of cultivation is the variegated foliage section of Eranthemum. Many handsome plants are included in this section. The following selection contains all the best sorts in cultivation.

Eranthemum albo-marginatum. Leaves oblong-elliptic, four to six inches long, two to three inches broad, broadly margined with white and irregularly mottled with grey.

Eranthemum atropurpureum. Leaves oblong, ovate, three inches to four inches long, two inches broad, dark lurid purple.

Eranthemum Eldorado. Leaves yellow, mottled and veined with green.

Eranthemum Moorei. A very curious and distinct species with leaves of a pale sap green softening off to a bright canary yellow.

Eranthemum reticulatum. Leaves ovate, lanceolate, green with a net work of gold.

Eranthemum tricolor. Leaves oblong-ovate, olive green, blotched irregularly with greyish-purple and salmony-pink, tints varied.

Eranthemums are easily propagated by cutting of young shoots, grow quickly and soon form large plants. To obtain bushy specimens, young plants should be occasionally cut back to induce branching. Plant in sunny positions in order to develop the bright colours of the leaves. All the kinds mentioned are Polynesian.

Excœcaria bicolor. Is a small leaved shrub native of the *Malay islands.* The leaves are deep purple underneath and pale green above. Very ornamental and easily grown from cuttings.

Panax fruticosum var. Victoriæ Is an ornamental shrub from the South Pacific Islands. The leaves are finely variegated, pinnate, the lateral leaflets forked; the upper or terminal ones larger, simple, ovate, and toothed, and having the borders prettily margined with white. A distinct variegated shrub.

Panax sambucifolius. Leaves pinnate or bipinnate, leaflets, elliptic or lanceolate, pale green. If this shrub is cut back occasionally the foliage assumes a bright golden yellow colour.

Panax aureum. Resembles Victoriæ, but the variegation is yellow instead of white. A West Indian shrub.

Panax Balfouri. Is a handsome shrub from New Caledonia. The leaves are large and round, dark green, blotched and margined with white.

This genus is of very easy culture and all the species mentioned propagate readily by cuttings.

Flowering Trees.

Most tropical countries are fortunate in possessing a number of very useful and ornamental flowering trees and as fine a collection of these as can be desired are obtainable in Malaya. Many private gardens are not large enough to allow of tree planting to any extent but even the smallest should find room for a few of the more showy kinds. A certain number of trees are necessary for shade in every garden and these should be selected with due regard to position, space, habit of growth and beauty of flower and foliage. No matter how large the garden may be trees should never be planted too closely together.

A few carefully disposed, well grown specimens will impart a park like appearance to the garden and give the best effect. In some instances it will be thought necessary to plant closely in order to shut out some unsightly view or building; but a few trees well chosen and carefully placed will have the desired effect without spoiling the beauty of the garden. When planting shade trees on the sides of roads care should be taken to select those of good foliage and height together with beauty of flower. The proper distance to plant apart will depend on the length of the road or drive and the habit and size of the tree being used. When space is available no tree should be planted at less than six feet from the edge of the road.

The instructions given for planting, pruning and general cultivation should be followed here.

The following list comprises all our best trees noted for their beauty of flower and foliage and best suited for general garden use.

Amherstia nobilis. Is a tree of great magnificence, native of Burmah attaining a height of from thirty to forty feet. The flowers which are borne on long pendulous racemes are of a fine vermillion colour diversified with yellow spots. Unfortunately the flowers are short

lived lasting but a few days in perfection during which period however no tree presents a more striking aspect.

The leaves are large impari-pinnate having six to eight pairs of leaflets. This tree delights in a rich loamy soil and is propagated by seeds or cuttings of young shoots. An ideal tree for a lawn or other isolated position.

Brownea Ariza. A Columbian tree attaining a height of from twenty to forty feet and producing large globular drooping heads of rich scarlet flowers. The leaves are pinnate, usually with six or eight pairs of pinnœ which are oblong-lanceolate and acute.

Brownea coccinea. Another species of this ornamental genus has fascicles of scarlet flowers, and leaves with two or three pairs of ovate-oblong acuminated leaflets.

The tree is of graceful weeping habit and from twelve to twenty feet high. Propagated by cuttings. Venezuela.

Brownea grandiceps. Is probably the largest tree of the genus and hails from Caraccas. The flowers are red in dense capitate spikes. The leaves have generally from ten to twelve pairs of oblong-lanceolate leaflets ending in a long cuspidate acumen. In its native home this tree reaches a height of sixty feet.

There are several other handsome species of Brownea not commonly met with in gardens and rather difficult to obtain. The three species described above are the best of the set and easily propagated by cuttings of ripened shoots, and occasionally by seeds.

Calophyllum inophyllum. Is a medium sized tree of good habit found in most parts of the tropics of the Old World. The flowers are white, very sweet scented and borne on loose axillary racemes. The foliage is large, somewhat coriaceous and a deep glossy green. This is a good subject for planting in open situations.

Cassia fistula. Is the most handsome of all the Cassias and one of our very best flowering trees. The flowers are large, bright golden yellow and produced on long pendulous racemes.

When in flower the tree reminds one of a Laburnum when viewed from a distance. The leaves are pinnate, large and deep green. The seed pods are from one foot to eighteen inches long, cylindrical, dark brown when ripe and very ornamental.

The flowers are produced before the leaves.

A good rich loamy soil suits it best and it should always be planted in conspicuous positions. It never forms a very large tree and is easily propagated by seeds which are produced in abundance.

Cassia multijuga. Has a spreading slightly weeping habit and attains a height of from fifteen to twenty feet. The flowers are yellow and produced in terminal upright racemes. The foliage is small and light green. A tree well suited for lawns and other open positions.

Cassia siamea. Is a large Malay tree fifty feet in height with pale yellow flowers produced on long upright branching racemes. A very useful tree for positions where something tall is required.

Cassia braziliensis. Is a Brazilian species with rose coloured flowers well worth growing. The Cassias are all of easy culture and propagate quickly by seeds.

Erythrina Corallodendron. Commonly known as the "Coral Tree," is a native of the West Indies. It forms a small tree six to fifteen feet high with a prickly stem. The flowers are large, deep scarlet, in long racemes appearing when the leaves have fallen.

The leaves are trifoliate, leaflets broad rhomboid-ovate, acute.

Propagation is easily effected by cuttings of stems or branches.

Erythrina indica. Has flowers of a splendid scarlet colour, and leaflet broadly ovate, acute, glabrous. There is a variety of this species with white flowers. Both are East Indian plants.

Erythrina indica var. marmorata. Is a handsome variety from Polynesia having large, broad leaves spotted and blotched with white in a very effective manner.

Erythrina indica var. Parcelli. Is perhaps the most striking of the Erythrinas. The flowers are large and scarlet in long racemes appearing after the leaves have fallen. The leaves are alterate, leaflets three, with a yellow variation along the main veins, sometimes more diffused and forming a band one inch wide. All these varieties are readily propagated by cuttings of the stems or branches.

Jacaranda mimosæfolia. Is a handsome Brazilian small tree fifteen to twenty feet high. The flowers are blue and drooping on large erect, terminal, pyramidal panicles. The leaves are rather long and bipinnate, each pinnæ hearing numerous small oval-oblong, trapezoid, mucronate, downy leaflets. In habit and appearance the tree resembles one of the fine leaved Acacias.

Propagated by seeds or cuttings of ripened wood.

Jonesia asoka. Or more correctly *Saraca indica* is a small bushy tree resembling the Browneas. The flowers are arranged in bushy heads and are a very rich orange colour with much exserted stamens, which are crimson. The leaves are opposite and pinnate with three to five pairs of leaflets. India. Young plants are easily raised from seed.

Saraca taipengensis. Is a much superior tree, native of Perak. The flowers are small and yellow and are produced in very large globular heads on the stems and branches. The foliage is pinnate, large and deep green. The long flat seed pods are purple and very attractive. This is a handsome shapely tree well suited for lawns. Propagated by seeds or cuttings.

Lagerstromia reginæ. "The Queen's Flower" is one of our most handsome native trees. It is found in Malaya and as far as China. It varies in height from twenty to forty feet, often less. The flowers are a beautiful rose colour, changing to purple in the evening, from two to three inches in diameter on terminal upright panicles.

One of our most ornamental garden trees and easily propagated by seeds or cuttings.

Michelia champaca. Known as "Champaca" is a large tree, native of India and Java. The flowers are large, yellow, double and sweetly

scented during the morning. The leaves are ovate-oblong, acute and acuminated with silky spathes and peduncles. Propagated by seeds in which are freely produced in large clusters.

Peltophorum ferrugineum. Is a tree well worth growing for its peculiar beauty when in flower. The blossoms are bright yellow and produced in upright panicles. The peduncles are covered with a dark brownish hair which gives the tree a striking appearance. The leaves are pinnate and dark green. Native of Malacca.

Ptetrocarpus indicus. The tree well known locally as "Pokok Sena," and found all over the Peninsula planted as a road side shade tree for which purpose it is admirably adapted, being a quick grower, giving ample shade, and not to exacting as to soil requirements. Trees often attain a height of one hundred feet and, if given sufficient space have a wonderful spread of foliage.

The flowers are small, yellow and produced in great profusion on simple or branched axillary racemes. A tree in full flower is a beautiful sight the leaves being completely hidden by the flowers which are very sweet scented. Propagated by seed which is produced in great abundance. An East Indian tree.

Poinciana regia. Is without a doubt the most gorgeous tree we possess. It is probably better known to most readers as "The Flame of the Forest" or "Flamboyant." The flowers are bright scarlet in loose racemes, petals orbicular, spreading, reflexed, tapering into long claws. The upper petal is dashed with red and white. The leaves are long, feathery and abundantly pinnate. The fruit or seed pods are one foot or more in length, two to three inches broad and dark brown when ripe. The tree is branched with a flat crown and from twenty to thirty feet high. A magnificent tree from Madagascar.

Spathodea campanulata. Is a tall vigorous tropical African tree often reaching a height of fifty or sixty feet. Common everywhere in the Peninsula and largely grown as a road-side shade tree but for which purpose it is not suited owing to its soft brittle timber. The flowers are orange colour in short terminal spikes; calyx long, spathe-like, tomentose corolla campanulate three inches long and as many broad.

The leaves are pinnate; leaflets petiolate and entire, when in flower this tree is extremely handsome. Propagation is very easy by cuttings. Quite large branches root freely.

To obtain plants of the kinds herein mentioned and to carry out the few suggestions offered, need not entail a great expenditure of money. Seeds or plants of most are procurable at the Botonic Gardens, Singapore.

I have not intended to go into the niceties of cultivation of any particular class or individual plant, but rather to give a few elementary hints on general cultivation and the names and a rough description of some of the most ornamental of or trees and shrubs.

T. W. Main.

GERMINATION OF PARA-RUBBER SEED.

The subject of the germination of the seeds of the Para rubber is studied by Mr. Vernet in " Le Contchou et la Gutta percha" of May 1908 page 1945, who has made a series of experiments on the growth of the seedling.

He put a hundred fresh seeds in a basin of earth with the micropyle end upwards and the hilum downwards, covered them with a wet cloth and watered it daily.

In his first experiment, the first seed pushed out its rootlet at the end of seven days, the last on the thirty-third day. The greatest number germinated between the 10th and 27th days. Ninety one per cent germinated. Occasionally seeds germinate in the capsule and if this goes on for some time the stalk and rootlet become twisted and the plant is spoiled.

He then made some experiments with however only 20 seeds by putting them in powdered charcoal in a hermetically sealed box, for periods of from 1 to 40 days, then germinating them as before.

The check experiment out of 20 seeds gave 18 germinations. Those enclosed in the box of charcoal for 6, 10, 12, and 14 days gave a germination of 80 per cent. After 16 days 70 per cent, 18 days 50 per cent 20 days 55 per cent, 20 days 25 per cent, 29 days 30 per cent, 35 days 25 per cent, and 40 days 20 per cent.

From this he concludes that dry charcoal is a bad perservative. In damp charcoal after 7 days he found the seeds had germinated and they are apt to be spoilt on the way if sent packed up thus.

He recommends that the seeds should be packed in hermetically sealed vessels after being exposed for 24 hours to the air to get rid of the moisture on them. The boxes should be small in order to prevent heating. The small boxes should be packed in strong cases to protect them against variations of temperature.

He does not give the dimensions of the hermetically sealed cases, but unless they were very small the danger from heating would be excessive, and some packing material is certainly requisite. Seeds do not so far as I have seen heat with a sufficient supply of any packing material such as charcoal, but as a rule without any they heat and are spoiled in a couple of days. M. Vernet does not seem to have seen the accounts of packing and export of seeds published in the Bulletin.

We have not yet found a superior packing material to the charcoal of rice husks for long distance sendings. In using powdered charcoal for packing much depends on the amount and equal distrubution of the moisture in it. It must not be too much or too little, and charcoal powder is not easy to damp equally all through, but very good results have been obtained by its use for long distance travelling. The only really reliable experiments in this direction are to be made by actually sending seed through the post freight. The rise and fall of temperature while passing through hot and cold regions may affect a case even hermetically sealed, as also may the rise of temperature in the hold of the ship.

As an example of the effects of alteration of temperature in a hermetically sealed case, may be cited the fact that many years ago I commenced sending home dried plants for herbarium specimens in a

sealed up tin-lined case. The plants were quite dry ere being put in, and even the packets were taken hot from the fire. On arrival when the case was opened, they were found to be quite wet and nearly spoiled. This was evidently due to the condensation of the water enclosed in the damp air of the tropics due to the arrival of the case in a cold climate with the consequent lowering of temperature. Packed in wooden cases which seemed to absorb the moisture to a large extent no such damping effects were found. The packing, charcoal, rice dust etc., acts probably in the same way in the case of rubber seed packing.

The article continues giving an account of the germination of the seed, and illustrating the bad effects of wrong planting with figures of curvature of the radicle even into a complete circle. The causes of these malformation are putting the seed down wrong way up, so that the root has to make a curve to reach the soil, and too hard soil at the point at which the rootlet attempts to enter the ground. Most planters realise perhaps that the correct placing of the seed in the first instance is of the utmost importance to avoid this root curvature, which if overlooked may cause a permanent curve in the tap-root. A tree of any kind in which this occurs will grow for a considerable time but its growth usually after a few years is checked and the tree remains stunted for a few years more when it dies. This is most commonly seen in plants grown too long in pots, where the tap-root confined in a short space bends on itself. But I have seen fine young Para rubber plants taken from the nursery in which the tap-root had curved into a thickened club like bend, undoubtedly from the carelessness of the cooly who had put down the seed. The trees about 7 feet tall were otherwise healthy and good looking but were really useless and only fit for the rubbish heap.

Nothing of course can be done when the bend is as usual in these cases close to the base of the stem, especially after the root has hardened and become woody.

The second cause cited by M. Vernet that of the root's being protruded at a point where the soil is too hard, and it cannot penetrate is also due to carelessness in planting, for the seed beds should be dug over to such an extent that there is no hard ground or stones to turn the root tip from a good straight descent.

Vernet suggests that when the soil is clayey the ground over the seeds should be covered with a layer of lalang grass to prevent it from being baked by the sun. It is really better to shade in the ordinary way with attaps in this case as snails, crickets and other objectionable insects find this straw shading very suitable as resting places during the heat of the day, and are apt to attack the seedlings as they grow.

The business-like planter is usually careful about his seed beds and such suggestions are perhaps not necessary for him, but there are would-be planters who never seem to think it is necessary to take any trouble about seed planting because Para rubber seed germinates and grows so readily. I have seen more than one nursery in which the seeds were thrown anyhow on to a hot bed of sand in full sun, with no shade and no turning over of the soil, with the natural result of a complete failure.

H. N. R.

FRUITS IN PORTO RICO.

The following notes are taken from the Report of the Porto Rico Agricultural Station for 1907.

"Barbados Cherry (*Malpighia glabra*). This fruit is proving of considerable merit for making jellies and has the advantage that it bears several crops each year. On the station grounds the trees thus far have borne one heavy and two light crops during the year."

The Barbados Cherry, is a small but rather pretty tree with pink flowers and a fruit resembling a small whiteheart cherry. It grows well here but never fruits heavily. Perhaps it might do better in dryer parts of the peninsula.

"Otaheite goose-berry. (*Phyllanthus disticha*). This fruit has also been shown to produce a very excellent deep wine colored jelly and like the Barbados cherry produces abundant crops several times during the year thus making a very valuable household tree."

Phyllanthus disticha is the tree known here has Poko Malakka and the town of Malacca takes its name from this tree. It is a fairly large and handsome tree with fine feathery foliage, and a red stem. The fruits are globular about half an inch through with a large stone inside. The flesh is acid and green. It is occasionally used in curries here but is not very commonly so used. A native tree here it fruits very heavily and the ground is often strewed with its fruits. It is one of the fruits that it is quite neglected here and certainly might be used in making preserves.

"*Anona cherimolia* has fruited during the year, while the fruits were small they were of excellent quality." The cherimoyer a native of Peru has frequently been introduced to the Straits Settlements, but has never grown a single fruit, indeed it is said never to have fruited in Java or elsewhere in the east, which is regrettable as it is perhaps the best of all Anonas.

"Rose-Apple. *Eugenia jambos*. A new use has been found for this fruit. When mixed with other fruits in making jellies or preserves it is found that it gives to the product a delicate rose flavour that is very agreeable."

This jambu is the white one with narrow leaves and white flowers. It grows very well in the Straits Settlements and flowers well, but seldom fruits, so much so that fruits imported from Rhio are quite expensive. The commonly grown Jambus here viz. *Eugenia Malaccense*, Jambu Bol, and *Eugenia aquar*, Jambu Ayer Mawer, possess too little of the rose water flavour to be used in this way. The Jambu bol is however preserved in syrup and colored red with Hibiscus flowers makes a popular, but rather flavourless preserve.

H. N. R.

SIZE OF RUBBER-SEED.

The Ceylon circular on the effect of tapping on seeds by Messrs. Macmillan and Petch is very interesting, especially as it does not seem to be borne out at all by the phenomena here. It is stated that it is obvious that the seeds of the tapped trees were smaller than those of untapped trees. Now the seeds from the trees in the Singapore Botanic

Gardens vary considerably. We have trees that before they were tapped produced ridiculously small but quite good seed, and trees that were younger and had never been tapped produced very large seed. The size of the seed of the oldest trees, which certainly have not been heavily tapped, though for some years they were occasionally tapped are decidedly small. But the amount of tapping they had about once in five or six years could hardly so affect them. Further small-seeded trees as far as has been seen keep true whatever the season may be and regardless of whether they have been tapped or not. The earlier years of fruiting trees seem always to produce large seed, with the exceptions of the specially small seeded trees, all of which however that I know of are over 20 years old.

I am more inclined to think that with trees of normal size average seed the early fruiting gives large seed, getting a little smaller in later years, while some trees give small seed from the start.

H. N. R.

COCA-LEAVES.

ERYTHROXYLON COCA.

The Coca plant is a small bushy shrub growing to about 6 or 8 feet tall with very bright yellow green leaves, and small white flowers followed by little scarlet drapes, oblong in shape. It is a native of South America where in Peru the dried leaves have been for very many years used as a stimulant by the natives. From the leaves the drug cocaine is prepared and used as an anaesthetic chiefly in eye and tooth diseases.

The plant has long been in cultivation in Singapore in the Botanic Gardens and has also been supplied to a number of planters of whom Mr. Machado of Kamuning estate was one. He has lately prepared a sample of the leaves and submitted them to examination and analysis at the Imperial Institute and sends the following report on their use and value.

The Coca plant is remarkably easy to cultivate, growing very readily from seed of which it produces a great abundance. The seeds are sown in nursery beds, after the red pulp has been washed off them and germinate in twelve days. The young plants are planted out in fairly good soil at about the distance of six feet apart. They will grow almost any where but stiff clay soil exposed to hot sun seems to suit them best. The bushes grow for many years, before they need renewing and can be pruned or cut back without injury. So easily and rapidly is it grown that it is found quite suitable to make low light hedges in the gardens, its bright green foliage and little red fruit making it quite attractive.

There are it appears several varieties of *Erythroylon coca*. One of which beside the one referred to here was formerly cultivated in the Botanic Gardens, the variety *Novo granatense*. This has more spreading branches, smaller obovate leaves, with a rounded top, and a short point projecting from the tip. This does not seem to have done so well here, and has disappeared.

There can be no doubt of the ease with which Coca can be grown anywhere in the peninsula. It belongs however to that class of cultures like Patchouli, and citronella grass in which the demand is limited and the possible supply vast. Such plants however often pay very well, from the fact that there are very few planters of them, the ordinary planter being deterred by the speedy fall in price of the product when there is a large quantity thrown on the market.

H. N. R.

Imperial Institute, South Kensington, London, S. W.

Report on *Erythroxylon Coca* leaves from Perak, by Professor Wyndham R. Dunstan, M.A., F.R.S., Director.

The sample of coca leaves which is the subject of this report was forwarded for examination to the Imperial Institute by the Director of Museums, Federated Malay States, with letter No. D. M. 56-1907 dated the 15th April 1907. The leaves were procured from the Kamuning Estate, Perak, where about half an acre has been planted with *Erythroxylon Coca*.

Description of sample.

The sample consisted of about 15 lb. of brownish-green leaves, which varied in length from 1 to 2 inches; they were brittle and very much broken. The leaves resembled those of *Erythroxylon Coca*, Lam., var. *spruceanum*, as cultivated in Java, but were rather browner than a good sample of the latter.

Results of Examination.

Chemical examination of the leaves gave the following results:—

Moisture at 100 C.	... ...	9.19 per cent.
Ash	... ...	6.95 ,, ,,
Total alkaloids	... ...	0.64 ,, ,,

The percentage of alkaloids present is quite equal to the average amount found in commercial supplies of coca leaves from other sources.

Commercial valuation.

A sample of the leaves was submitted for valuation to a firm of manufacturing chemists who reported that the colour was not particularly good, and that at present similar leaves containing 0.6 per cent of total alkaloids would fetch 7½d. to 8d. per lb., on the London market.

The firm stated that they had recently made a considerable puchase of Java leaves of the same alkaloidal strength, but of superior colour at the above mentioned price.

Conclusions and Recommendations.

These coca leaves from Perak were not very well prepared, being much broken and discoloured. To obtain the best price the leaves

should be bright green, unbroken, and of good aroma, and these characters can only be obtained by collecting the leaves carefully and drying them fairly rapidly.

It is stated that in Java and Ceylon the best qualities of coca leaves are dried quickly by means of a current of warm air produced by a fan.

The price obtainable at the present time for coca leaves is fairly remunerative, because the trade, outside South America, is in a few hands and there is no over-production of the leaves. The total demand for coca leaves is however, small and there would be great risk of overstocking the market and so reducing prices if further expensive planting is undertaken. In these circumstances if it is proposed to plant *Erythroxylon Coca* in the Federated Malay States the enterprise should be started on a small scale and afterwards extended, should circumstances point to the desirability of this being done.

15th July, 1907.

(Sgd.) WYNDHAM R. DUNSTAN.

RUBBER IMPORTS INTO THE UNITED STATES IN 1907.

Brazil supplied more than one-half of the manufactured India rubber imported and Mexico nearly four million dollars worth. African rubber comes mainly via. Europe although some Brazilian and East Indian is included in the 15 million dollars worth imported via Europe of the 154 million pounds produced in 1906, 77 millions or more than one-half were consumed in the United States. 31 millions in Great Britain and 20 millions in Germany. (J. J. Macfarlane in Foreign Trade of the United States for 1907.)

FERTILIZING PLANTS.

We have received a printed circular from Mr. Harrison of New South Wales entitled "Two great fertilizing plants for rubber and other estates." The plants recommended by the correspondent are a species of Melilot, (no botanical name given) and *Lespedeza striata.* There are several species of *Melilotus* known, natives of Europe where one of them, *M. officinalis,* probably the one referred to, is very extensively cultivated for fodder. Seeds of several species of Melilot, including this one, and *Lespedeza striata* have been often received at the Botanic Gardens in Singapore and tried as have most of the fodder plants of Europe, and with the same result, a dead failure. This is of course the result that one would expect. A plant accustomed to the temperate climate of England or Tasmania has no chance in the hot wet climate of the equator. The first heavy rainstorm or really hot day would finish it off quickly if it ever germinated at all. It is curious that people who would ridicule the idea of replacing turnips in the fields of Kent, by pineapples as a crop seem to think it quite reasonable that clovers and such plants from Kent should do well on the

equator. But one is not more absurd than the other. Many years ago before the present Botanic Gardens were started there was a great advertising of Prickly Comfrey as a highly suitable plant for fodder improving the soil, etc. Many planters it is said spent a good deal of money on this plant, a native of southern Europe and of course lost every cent they spent on it.

A good fertilizer for the tropics is certainly badly wanted but it is not in the Palæarctic region, i.e., Europe, Northern Asia and North America that we need look for it. It must be a tropical plant, or at least a subtropical one, and it should also be a leguminous plant.

At present we have no plants which are completely suited in every way. *Crotalaria striata* is often highly spoken of. It does not it seems to me thrive in damp low-lying ground and seems more at home in sandy places. It is also a slow spreader. The branches are too erect to cover the ground nicely and its seeds are persistently destroyed by a weevil. *Tephrosia purpurea* used in Java for this purpose is rather woody and makes woody stems branching above. Still it might be grown short and cut back, and prove satisfactory. It grows very readily and does not seem to be attacked by beetles or other pests. *Mimosa*, the sensitive plant has the objection of course that it is thorny. Indigo distinctly improves soil and the rubber trees grown among the Chinese indigo in the Chasseriau Estate in Singapore are very much better than those grown there elsewhere but it must be said that the Chinese do work the ground between the trees and use a good lot of manure.

The little *Desmodiums*, *D. triflora* and *D. heterophylla* so common on road-sides and in grass plots, improve the soil wherever they grow, but they are rather small and the collection of their seed is rather troublesome. A bigger herbaceous tropical *Desmodium* if it could be found would probably be the best thing we could get, *Desmodiums* correspond most nearly of tropical plants to clovers and and melilots, but most of them are rather shrubby and do not fill the ground very well. Some however are herbaceous and creeping, and perhaps we may be able to get a suitable plant from Brazil or Central Africa, but certainly not from temperate regions.

H. N. R.

Since writing the above I hear that the *Crotalaria* has done very well in some parts of the peninsula. Can some planter who has had experience of it give some account of it.—Ed.

COCONUT-PLANTING TERRITORY OF PAPUA.

(From particulars supplied by Mr. N. R. Schroder to "Dalgety's Review.")

The interest which is being aroused in the Commonwealth at the present time by the possibilities of the territory of Papua for coconut and rubber cultivation has induced Mr. N. R. Schroder, of Milne Bay, Papua, to send us some particulars of the former industry, which we have pleasure in publishing for the information of any intending planters.

The territory is situated outside the hurricane zone, has an agreeable climate, and a plentiful rainfall (except in the dry belt of the Central Division). Thus, the planter has every advantage which Nature can bestow to render his enterprise successful.

The soil is considered equal in richness to any in the world, and our correspondent's experience leads him to express it as his opinion that, in the course of a few years, when Australia has realised what a valuable asset she possesses right at her very doors, Papua will have become the most prolific and richest exporter of tropical products outside of Ceylon. Labour is plentiful and cheap, and land easily obtainable on the most liberal terms.

A good deal has been written on the subject of coconut-planting during the last few years, mostly by people in India, but comparatively little has been said by those conversant with the conditions obtaining in the South Sea Islands and British New Guinea to help intending planters who may be thinking of taking up land in Papua.

With regard to choice of land for cultivation, if no island is available, and land is taken up on the mainland, it should be as flat as possible. If a river or two run through the property, so much the better. They will help to irrigate the land, and cocoanuts require a great deal of water (running, not stagnant): if they are any swamps they must be thoroughly drained before any planting is attempted.

After land has been taken up, the next step is to obtain labour to cultivate it. "Boys" may be had from the local recruiting vessels at from £1 15s. to £2 per head (for one-year boys). These figures refer to New Guinea. In the Solomon Islands the rate is from £4 to £6 per head for three-year boys. The food of these labourers consist of rice, sweet potatoes, with meat twice a week. They also get a tobacco allowance of, say, two sticks per week. Their only requirement in the matter of clothing is one Lava-lava every three months, and one blanket per boy per annum.

There are many ways of clearing land, but the following method has been found the best. After the forest has been cut down, lop off all the branches of trees and then run a fire through. After this, stack all unburnt timber around stumps and big logs, and fire once again. Do this twice so as to leave as little dead timber as possible on the plantation. The timber, if left to rot, will in time manure the ground but this method entails the harbourage of an immense number of grubs and beetles, and these insect, breeding rapidly, leave the old logs and take up their residence in the young sweet coconuts, causing untold damage. By firing the ground throughly, these insect pests are kept within bounds.

Nurseries.

If there are no plantation near where seed nuts may be obtained, great care must be taken in the selection of nuts for planting. It is better to depend on the natives for them, and to go personally and buy them, inspecting the coconut-trees, and picking the nuts therefrom, taking particular care that the tree is not too old or too tall, but a young, vigorous, solid, and stout tree; also seeing that the nuts it bears are plentiful in number, and of a good shape. They should not be long and narrow, but round, with little husk and plenty of milk. Open them

and note how thick the flesh is. Do not always choose the big-looking nuts, as they may have a very large husk and yet be small in the nut proper. Take no nuts from yellow-looking trees. The dark-green trees are the best.

Having gathered all the seed nuts required, make a nursery, hoeing up the ground to a depth of about 1 foot, and removing all weeds. In setting the seed coconut cover about two-thirds of it, laying it at an angle of about 45 degrees in the earth, covering lightly with leaves. When the young trees have reached a height of 12 or 18 inches transplant to the plantation, being careful to pick out all the healthiest and to condemn the weak ones. This will be in about three months after the setting in the nursery.

From the foregoing it will be seen that it is advisable to get the nursery going early, so as to be ready to plant out when land has been cleared and got ready to receive the young plants. No time is, therefore, lost by this arrangement. Advantage should always be taken of a downpour of rain, and planting out should be undertaken immediately the ground is sufficiently moistened.

In planting, a sharp knife should be used in order to slice the roots off close to the husk. Holes should be dug about 2 feet in depth and 2 feet in diameter, and the nut planted therein about 9 inches below the surface, a filling of 9 inches of surface mould being placed at the bottom of the hole. The nut should then be completely covered. Keep a ring of about 12 feet in diameter around each plant, and the intervening ground well hoed and free from weeds, because the roots require a great deal of air and light during the first three years of the plant's existence.

The lining out of nuts should be done carefully, so that the trees are in line both horizontally and traversely, and so that they are not more than 30 feet apart. No other trees should be planted in between. Some planters have planted 33 feet apart, and are now putting rubber between the rows. This is considered a mistake, as both classes take a great deal out of the ground, and as they attain to maturity their roots will become interlocked. Thus they will be fighting for supremacy beneath the surface, and are bound to cripple each other in the long run. If it is desired to cultivate both classes of trees, Mr. Schroder's advice is to strictly plant them apart.

Insect Pests.

Beetles will, of course, be found on every plantation, however well kept it may be; but the clearing of the land of all dead timber will make the number very much less than if the logs were left to rot away on the ground. More beetles have been found in the cocoanut-trees planted on the outskirts of a plantation where the bush is rubbing shoulders, so to speak, than in the plantation itself, whence all dead timber has been removed.

There are several kinds of beetles inimical to coconuts. The big "Rhinoceros" species seems to do more damage. This beetle grows to a length of 2 inches and a girth of 1 inch. It burrows a way through the young trees right into the soft heart. It does not require much imagination to estimate the damage this pest can cause. The

tree will look quite healthy, new shoots will spring out, and coconuts appear as on any other tree, but the nuts will never ripen—as soon as the flesh begins to form in it the nut will drop off.

Until the beetle has been got out of the tree, the planter need not look for any return for all his work and outlay of money; for the creature will continue to its way upwards towards the new shoots, and all the nuts will be affected the same as the first. This beetle, however, can be extracted by an easy process.

Procure a wire about 3 feet in length, with a handle at one end and the other end twisted corkscrew fashion. Now, look under the leaves and you will notice that the cloth around the tree appears as if it had been chewed by a rat; pull it away and the beetle's hole will be visible; then push the wire up as far as it will go, twist it round, and in nine instances out of ten you will succeed in extracting the beetle. Dust the leaves near the trunk with Paris green, also putting Paris green in the hole. This will destroy any eggs the beetle may have left behind. A boy can be taught this method, and in a very little time he will become quite an expert. It is well, however, to give him a tin and to make him bring the captured beetles to you. It will be a matter of surprise what a large number he will find on a plantation where the logs have been left to rot on the ground between the trees.

Another small beetle which is very plentiful attains a length of ½ inch, but is very thin. It has a light-brown head and a dark body. This insect enters very young trees and feeds on the leaf that is just forming. Trees that are infested with this pest are easily distinguishable, for dry spots appear on the leaves. The presence of the beetle does not kill the tree, but retards its growth considerably. Wood ashes or Paris green is an effective remedy; open out the new leaf very carefully and dust in the same manner as for the "Rhinoceros" beetle.

The grub is another source of annoyance to the coconut-planter. He enters the tree from the roots and works his way upwards. His presence can be detected by the grating sound which he makes. When the sound has been located a hole should be cut in the tree and the grub extracted. Fortunately, this pest is seldom met with, and visitations are rare from it in Papua.

If the plantation be near the sea-front, all intervening timber should be cut away right down to the water's edge, as the coconuts require plenty of air, and the salt sea breeze is very beneficial too them. Seaweed, too, makes an execellent manure, and helps the young nut considerably. It may be remarked here that the first two flowers should be cut off, as this strengthens the young tree.

Estimate of Expenses and Returns.

For the further guidance of intending investors, a table is appended which gives approximately Mr. Schroder's idea of the expenses incurred in running two plantations of 1,000 acres, and of the profits to be derived therefrom.

This estimate, our correspondent mentions, is based upon a very low price for the product—viz., £10 per ton. Copra he puts down at £16 per ton in Sydney; but £10 he considers a bed-rock figure, below which the market is very unlikely to go for many years.

Expenses for First Year.—Area Planted, 500 Acres.

	£
Manager	300
Assistant manager	200
200 boys	900
Tools	125
33,000 seed nuts (imported)	131
Food for boys	150
Incidentals	100
Recruiting, tobacco, medicine, blankets ...	500
Returning boys	100
Manager's and assistant's house	150
	£2,856

Second Year.—Area Planted, 300 Acres.

	£
Manager	300
Assistant manager	200
150 boys	597
20,000 seed nuts	140
Food for boys	125
Recruiting, tobacco, medicine, blankets ...	400
Returning boys	75
Incidentals	100
	£1,937

Third Year.—Area Planted, 180 Acres.

	£
Manager	300
Assistant manager	200
100 boys	450
11,000 seed nuts	77
Recruiting, &c.	350
Incidentals	100
Food for boys	75
Returning boys	50
	£1,602

Fourth, Fifth, Sixth, Seventh and Eighth Years.

	£
Manager	300
Boys	450
Tools	50
Recruiting, &c.	350
Food	75
Returning boys	50
Incidentals	100
Two native overseers	48
	£1,423

Summary.

	£
First year	2,856
Second year	1,937
Third year	1,602
Fourth, fifth, sixth, seventh, and eighth years ...	7,115
	£12,510

Expenses per Year 1,000 Acres Fully Planted and Bearing.

	£
Manager	300
Two native overseers	48
Boys' wages	450
Freight to Sydney, £1 10s. per ton... ...	984
Insurance, commission, 5s. per ton	164
Incidentals	100
Imports	100
Recruiting and returning boys, &c. ...	300
	£2,446

1,000	Acres, Bearing 53 Trees to 1 Acre.
1,000	acres
53	trees to 1 acre
53,000	trees in all
60	nuts on each tree (low estimate)
3,280,000	nuts in all
5,000	nuts to 1 ton copra
656	tons copra per year
£10	per ton Sydney price
£6,560	income per annum

Total Income, Expenses, and Net Income 1,000 Acres, Fully Bearing.

	£
Income	6,560
Expenses	2,446
Net income	£4,114

During the first six years there is no income to speak of, with only a little during the seventh and eighth years. It is in the early stages, says Mr. Schroder, all expenses and hard work, but, with the exercise of economy, a 1,000-acre plantation ought to be brought to maturity for £13,500.

Queensland Agricultural Journal, June 1908.

NOTES ON RUBBER IN TROPICAL, AUSTRALIA.

By HOWARD NEWPORT, F.R.H.S., Instructor in Tropical Agriculture and Director of the Kamerunga State Nursery.

To those concerned in the extension of rubber cultivation in Queensland recently, the following figures may be of interest. Of the plants imported by Mr. F. P. Logan, in January, 1907, 4,040 were finally distributed ; of the Depatment's special importation in January, 1908, including plants raised from seed obtained at the same time, 7,434 plants resulted ; plants raised from seed at the Kamerunga State Nursery, including seed distributed (allowing for a 52 per cent. germination only), 4,726 plants. This gives a total of 16,200 plants distributed up to the end of April, 1907, equal to an area of 81 acres if planted 14 by 14 feet (or 200 to the acre), and if all were planted in definite areas, which, of course, they are not, many having planted but a few trees in their gardens and along roadsides, &c., in their farms.

The foregoing figures refer only to Parà Rubber (*HeveaBraziliensis*). Of other rubbers, mostly Assam or Rambong (*Ficus elastica*) ; Central American (*castilloa elastica*) ; Ceara (*Manihot glaziovii*) ; and African (*Funtumia elastica*), enough plants have been distributed to plant about 7 acres, as well as some 11,000 seed.

Of the Department's first importation in January of this year, the seed imported resulted in a germination of about 37 per cent., and the plants suffered a mortality *en route* of about 20 per cent. This was, however, mainly due to the consignment having been unfortunately carried on to Brisbane and returned to Cairns, involving an extra fortnight at sea, instead of having been landed in the North. Of the plants thus imported, some 2,500 are still in hand, but have all (and more) been bespoken, and are awaiting despatch.

The department is making another importation of some 10,000 seed or plants, and it would be as well for intending growers to bespeak these as soon as possible to ensure getting the number they want.

The Pará rubber plants put out in banana plantations that are still being worked, and in which the rubber can benefit by the clean weeding and partial shade, are doing remarkably well in the vicinity of the Tully River, near Cardwell, and Johnstone River, and Geraldton. Many of these plants, barely 18 inches high, and as thick as fencing wire when planted, now show 7 feet in height and a circumference of 3 inches at the ground for the year's growth.

Having been planted among the bananas, they participated in the cultivation, and thus the cost of upkeep has been practically nil. By the time the bananas are, according to the Chinese ideas, worked out, the rubber should be big enough to tap.

Regarding the value of land so planted, it will be interesting to note that the " Times of Ceylon " suggests that £100 per acre would be a moderate price for six-year-old rubber.

If only all the land that has been under bananas and subsequently abandoned, or even the land now being cultivated with bananas, were so planted, and became, with little or no cost, five or six year old rubber plantations when no longer required for bananas, what an asset to the

State, not to mention the landowner, and what a contrast to the present methods whereby such abandoned areas grow only noxious weeds!

The price of rubber has dropped considerably since this time last year, and good plantation Pará now fetches between 3s. and 4s. per lb. It is, however, expected to rise somewhat, though not to the figures of last year. Despite this, however, the opinion of those most interested, as shown in the following extracts from the "India Rubber World" for March, will be of interest:—

"Mr. James Wilson, of England, chairman of the Ceylon Land and Produce Company, on seven of whose plantation 5,695 acres have been planted to rubber, after a recent visit to Ceylon, expressed the opinion that rubber planting will pay for many years to come. He thinks that the price ought to rise a bit when the money market resumes its normal condition, but not to the high prices of a year ago.

"A planter from Ceylon, who visited England lately, reports an interview he had with one of the directors of the India Rubber, Gutta Percha, and Telegraph Works Company, at Silvertown, who expressed the opinion that rubber planting would be a good investment for the next twenty years at least. The rubber manufacturer felt that if rubber remains as cheap as now, a marked increase in its use would result."

Rubber is being extensively planted in the tropical countries all round us. In Sumatra alone, a correspondent of the "Ceylon Observer" states that 2,000,000 trees, representing 14,000 acres, have been planted. He adds that three rubber trees on an old coffee plantation are reputed to have yielded over 5 kilograms (11 lb.) each in one year.

Even at a profit of 1s. per lb., and a production of 1 lb. per tree, the return per acre of 200 trees is good; at 3 lb. per tree it will compare favourably with any agricultural product whatever in the country; and, with a possibility of such returns as above quoted, or even a portion of it, the returns, to say the least, are attractive enough for the most sanguine.

Rubber companies are quoting 15 to 30 per cent. dividends per annum in Ceylon, the Straits Settlements, Java, Sumatra, &c., and will shortly be doing so in the Solomon Islands and Papua. Why not in north Queensland?

One more quotation, *re* synthetic rubber from the "India Rubber World" is to the point:—

"While a great deal has been printed in England and the British colonies during the past year on the subject of 'artificial' or 'synthetic' rubber, and the possibility of some such material competing with natural rubber, it does not appear that any real progress has been made in the new field. In other words, the rumours referred to have served only to scare some investors in rubber-planting companies. The sentiment of the British crude rubber trade, after a year of such rumour-mongering, is well expressed in this paragraph from the review of the trade for 1907, issued by Lewis and Peat, London rubber brokers:— 'During the past year artificial rubber has been talked about a great deal, but, so far, nothing tangible has been forthcoming, and we do not know anyone in the rubber trade of any importance or authority who

believes in the likelihood of the production of substitute for the real article, or has seen a sample of it, and at the lower range of prices for all kinds of rubber and the increasing supplies the danger now from this source is more remote than ever.' "

Queensland Agricultural Journal, June 1908.

TREATMENT OF LATEX IN THE PREPARATION OF RUBBER.

M. KELWAY BAMBER, *The Laboratory, Colombo, Ceylon.*

A point of considerable importance in the manufacture of Plantation rubber is to obtain, not only purity, but constant uniformity in the finished product.

At present there are almost daily variations in appearance, due to causes which cannot easily be overcome, such as weather, age of trees being tapped, and the bringing of new trees into bearing, all of which affect the colour and clearness of the dried rubber.

The discolouration is due to oxidation of soluble organic bodies allied to tannin in the latex water, by means of an oxidising enzyme, and is intensified by a warm temperature and exposure to the air.

Thorough washing of the freshly coagulated caoutchouc will remove much of the soluble matter with the enzyme, but it is difficult or impossible to remove it all, and other means have to be adopted to prevent the darkening on drying which almost invariably occurs.

This is done by destroying the enzyme by means of heat before oxidation occurs, with the result that the rubber dries of a clear pale yellow colour, and of perfect uniformity from day to day.

The heating can be done in different ways before or after coagulation.

1st. By passing steam into the bulked latex until the temperature reaches 80° C or 167° F, and maintaining this temperature for 15 minutes or longer, according to the thickness of the rubber.

2nd. By immersing the biscuits or sheets etc., in water of the temperature for some minutes immediately after passing through the above rolling machine ; then re-rolling to the requisite thinness, and immersing again for a shorter time to ensure destruction of the enzyme.

3rd. Hot water can be employed in the washing machine, and if necessary steam heated rollers as well.

Heating while coagulating most nearly resembles the method of making hard para, but the other method gives excellent results.

To insure the best product cleanliness in all stages of collection and manufacture is absolutely essential, and if the loss in value from want of simple precautions in the preparation was more fully realised on the estates, much greater care would be exercised. Many samples of excellent rubber appear on the London market, but from want of uniformity, and perhaps the presence of some slight impurity, they do not realise by some pence per lb., the value they otherwise would.

Rubber made by this process, has already been sold on the market, and realised a premium of up to about 4d. per lb., over ordinary good biscuits which indicates that the process can be successfully applied on

the estate. It still remains to be proved whether the rubber is stronger than that manufactured by the ordinary method, and Messrs. Gow, Wilson & Stanton Ltd. are now having it tested by manufacturers to determine this point, but as the process resembles in some points the manufacture of fine hard Para, there is reason to expect some improvement in the physical properties in addition to the other advantages obtained.

In order to secure the best results from the process, the latex must be strained free from solid impurities, and all vessels kept perfectly clean. No time must be lost in putting the rubber into the hot-water after rolling or pressing, and the sheets or biscuits must be kept separate and constantly moving for a sufficient length of time for the rubber to acquire the necessary temperature throughout.

In all stages of the preparation the rubber must be protected from dust and other impurities.

M. KELWAY BAMBER F.I.C., M.R.A.C. &C.,

C/o. Messrs. Gow, Wilson & Stanton Ltd. 13, Rood Lane, E. C.

With regard to the above instructions, which have been largely circulated from London, I found on visiting several estates that the process was rarely carried out properly. In several the water was barely lukewarm, in others, and where the correct temperature might have been employed to start with, it was only maintained so for a few seconds as the immersion of several thick sheets of cold wet rubber rapidly reduced it. The rubber was rarely immersed for the correct time, in fact it was frequently only in the water for a few seconds.

It is absurd to imagine that good results can be obtained by such methods, and if the process is to be successful at all, the instructions must be carefully and thoroughly carried out. On only one estate that I visited was this being done, and the result was excellent in every way and in no factory have I ever seen a more uniform outturn of the palest crepe and sheet.

In addition to treating the sheet or crepe by this method *i. e.* immersion after rolling once or twice, the scrap on the trees should be collected immediately it has coagulated and immersed in water at 170°-180° F. so as to prevent darkening and it can then be rolled and manufactured in the usual way.

PRECOCITY OF RUBBER TREES.

In a Peradeniya circular quoted in the last Bulletin p. 267, on germination of Para rubber seeds by Mr. Macmillan, the latter refers to a note on trees in Johor of 3½ years old producing fruit and suggests that this "precocity" is undesirable. The phenomenon cannot be properly classed as precocity at all as the trees were fully as large as most five year old trees are. The trees in question were close to native homes and derived benefit from the household refuse cast about them. Precocity really means a fruiting or flowering while the plant is too undeveloped to produce normally, not when the tree from exceptionally good situation and strength has attained its full development

a year sooner. This is distinctly desirable. One might as well say that all Malay Peninsula trees are precocious because they develop a year sooner than Ceylon ones.

Besides the early flowering and fruiting trees mentioned as occurring in Johor, and referred to by Mr. Macmillan I have seen a very compact tree flowering at little over 3 years old in the Chasseriau Estate in Singapore, and in the last Bulletin Mr. Lease mentions a tree on Sapong estate Borneo flowering at 20 months old. This latter does seem absurdly young.

H. N. R.

RUBBER IN WESTERN SIAMESE STATES OF THE MALAY PENINSULA.

A report upon the trade of the Monthons of Saiburi and Puket by Mr. Consul Frost states that, in consequence of the rubber boom in the Straits most of the Tapioca raisers have taken to planting rubber among the tapioca, the latter being treated merely as a catch crop. Near Alor Star there are two European-owned estates planted only with rubber, which are doing well, and several other Europeans have applied for land but it is too early to say much of the future of this product. North of Kedah the only rubber to be seen was some recently planted as an experiment in the public gardens at Trang, and it is doubtful whether there would be sufficient rainfall all the year round to obtain the best results. If many large estates should be opened in this state the labour question is likely to be a difficult one. The Straits Government, in obedience to the terms imposed by the Government of India, prohibit as far as they can the immigration into Kedah of Tamil coolies. As the local labour is unsatisfactory it is difficult to see what can be found to take its place. A little Gutta-Percha is exported.

—*The India-Rubber Journal June 1st, 1908.*

FINE RUBBER FOR 12½ CENTS.

The cost of tapping eight-year-old Hevea trees and curing the rubber on an important plantation in the Malay States, according to a report to the share holders in the company owning it, for the last half of 1907 averaged 12½ cents (gold) per pound. The average yield of the trees for the year was about 3¼ pounds, just twice the average for the preceding year, and a still larger yield is expected for 1908.

The cost of extraction and preparing rubber for markets on this estate (one of the Anglo-Malay Company's properties) has been reduced steadily, due, it is to be inferred, both to the increased productiveness of the tree—doubling in one year the output per acre—and to the increased experience of the operatives. Doubtless we shall hear later of a still lower production cost, but even 12½ cents per pound allows a very handsome margin of profit for a product which realizes 90 cents a pound or more after deducting freight and selling charges.

Of course, cost of administration and interest on the investment have to be considered, but the upkeep of mature rubber trees is inexpensive, and the leading plantation companies now selling rubber seem

not to have been overcapitalized. While there are no indications that rubber will go much lower than now—for some years at least—it is evident that the people who are producing 12½ cent rubber to-day need not worry about selling prices during the rest of their natural lives.

—India Rubber World June 1st, 1908.

AGRI-HORTICULTURAL SHOW.

Kuala Lumpor 4th July, 1908.

In connection with above Show H. H. The Sultan of Selangor has been pleased to present a cup, value $100/- which, it has been decided to award to the Estate obtaining the greatest number of points in the Rubber Section. Points being awarded as follows:—First Prize 3, Second 2 and Third Prize 1. Exhibitors showing more than one sample although they may be disqualified under Rule 2 from receiving more than one prize in any class may have all their exhibits placed and marked for the purposes of this cup.

Intending exhibitors are requested to send in their entries together with application for railway passes when required giving name of station to be used.

J. W. CAMPBELL,
Honorary Secretary.

NOTICE.

Kuala Lumpor, 17th July, 1908.

Director Garden Singapore :

Sir,

I have the honour to inform you that two special Classes No. 13 A and 13 B have been opened in the Rubber Section for Malays only viz :

13 A Para Rubber 1st Prize $5/- 2nd Prize $3/-
13 B Rambong 1st Prize $5/- 2nd Prize $3/-

the minimum quantity to be exhibited in each class being Catties.

Arrangements are being made for Housing Malay Exhibitors at Kampong Bharu.

Kindly instruct your Penghulus to tell the people to go there on arrival at Kuala Lumpor.

I have the honour to be,
Sir,
Your obedient Servant,
J. W. CAMBELL.

Honorary Secretary, Agri-Horticultural Show.

P.S. Please note that there is a mistake in the quantities of Rubber mentioned in the Malay Edition of the Prize List. Those in the English list are correct. The Malay List went to Press first and at the last moment in response to requests from planters quantities were increased increased in all rubber classes.

BIG RUBBER TREES.

CORRECTION.

By an accidental misprint the height of the big tree No. 2 in the last Bulletin is given as 54 feet, this should be 84. The picture in that Bulletin of the rubber tree is that of this tree No. 2.

Ed.

PINEAPPLE CULTIVATION IN SINGAPORE.

The cultivation of pineapples in Singapore island has taken larger dimensions than before. Large tracts of country formerly occupied by secondary growth being now cleared and covered with pineapples. Great quantities of pines have been also brought into Singapore from the islands around.

The result of this immense crop has been that pineapples have been selling in town for a cent a piece and up country at 5 for a cent, that is about 20 for a penny. The tinning trade is now apparently entirely in Chinese hands. It is satisfactory to see in many of the pineapple fields coconuts or rubber being planted, as pineapple culture is by no means good for the land.

H. N. R.

MINUTES OF A SPECIAL MEETING OF THE KAMPAR DISTRICT PLANTERS ASSOCIATION.

HELD AT THE SEMENTA SCHOOL ON TUESDAY 26 MAY, 1908.

Present. H. M. Darby (chairman) W. R. G. Hickey, E. A. Ash, H. G. Graham, C. Lumsden, C. A. Boothby, A. C. M. Watson (visitor) W. Stenson, R. W. Wilson and the Hon Secretary.

The notice calling the meeting was taken as read.

Minutes of the last meeting were read and confirmed.

Alteration of rules. Proposed by the chairman that in rule No. 9 shall be inserted " but in the event of an emergency meeting being required 3 days notice shall be deemed sufficient "

Rule No. 14 " in the event of an emergency meeting being required 7 days notice shall be deemed sufficient."

Seconded by Mr. C. T. Hamerton. Carried.

Agricultural Bulletin. The chairman read the secretary's letter to the Editor Agricultural Bulletin and proposed that each vote should have a copy instead of each estate, and that the editor be written to again on the subject. Seconded by Mr. Hickey. Carried.

Water Supply and Drainage Assessment. The chairman read a letter to the R. G. A. on this subject and proposed that the matter be left in the hands of the committee. Seconded by Mr. Ash. Carried.

Tamil Immigration Fund Bill. The Chairman proposed that the following resolution be sent to the next meeting of the P. A. M,

" That in the opinion of this association the terms of assesment of the Tamil Immigration Fund Bill at the present time are not equitable, and should be amended so that the employers of labour should pay only on the number of coolies actually recruited in any one year either locally or from India, and not on their total labour force ; and that the P. A. M. be asked to approach Government to have this amendment made before the bill becomes permanent at the end of the current year." Mr. Hamerton seconded.

Mr. Bosanquet objected to Mr. Darby's resolution and proposed as an amendment, " That this association objects to the Immigration Bill as being against the interests of planters and estates in general and would like to see the tax removed altogether." Mr. Wilson seconded.

After considerable discussion the motion was put to the meeting and Mr. Darby's resolution was carried.

Hospitals. The chairman proposed that the future management of the hospitals be left in the hands of the committee. Mr. Hickey. Seconded. Carried.

Subscriptions. The Chairman proposed that the annual subscription be fixed at $10 per vote. Carried. And that a sum of $50 be placed with The Planter's Benevolent Fund. Mr. Wilson thought it would be to more advantage if details of the fund were procured before any subscriptions were sent. The matter was allowed to stand over.

The meeting terminated with a vote of thanks to the chair at 6/08 p. m.

A. C. S. BOSANQUET,
Hon. Secretary.

MECHANICAL PREPARATION OF LATEX.

PRIZE OFFERED BY LONDON FIRM.

London (via Penang), June 25.

Messrs. Gow, Stanton and Wilson, Limited, the well-known London produce brokers, have offered a cup, valued at twenty-five guineas for the most economical and complete process for the preparation of plantation para from latex.

The prize will be open to exhibitors at the forthcoming Rubber Exhibition in London, in September next.

JOHN HADDON & CO SPECIAL PRODUCE LETTER.

London, June 11th, 1908.

STRAITS.

BEESWAX — This being the consuming season a fair business is passing in all yellow descriptions and full prices are paid ranging from £5.15.0 to £7.10.0 per cwt according to quality.

CAPSICUMS — The supply of common qualities being large prices in consequence are low but the fine qualities are scarce and command good prices ranging from 45/- to 60/- per cwt.

CHILLIES — Are slow of sale where common kinds are concerned, but anything fine sells readily at remunerative rates, the finest at 40/- to 55/- per cwt.

CAMPHOR — A moderate business has been done but at prices favourable to consumers.

We close China Crude on the spot at 140/- per cwt and to arrive at 135/- per cwt c.i.f.

CARDAMOMS — For a period were low in value but have improved the tendency being towards still higher prices, good to fine bold realising 2/- to 3/6d per lb., medium's 1/6d to 2/-, small's 1/3d to 1/6d per lb.

COFFEE — Malay Peninsular—We quote Liberian at 48/- to 54/- per cwt. Old Yellowish Java at 80/- to 105/- per cwt. West Indian :—45/- to 75/- per cwt.

COCOA — After the decline in values which has taken place during the past few weeks, there is certainly a better feeling and we look forward to improve rates more especially in the Autumn when trade should improve.

Java :—Celebes, small to good red we value at 50/- to 80/- per cwt according to quality.

COPRA — Is in better demand F. M. Straits value £15.17.6. to £16 per ton and Manila £15.7.6 to 15.10 per ton c.i.f. usual terms.

DRAGONS BLOOD — Is in demand at firm prices. Singapore Reeds, dull to fine bright £8 to £9, lump, ordinary to fine bright £7 to £13.15 per cwt. Recently fair to good bright re-boiled lump sold at £12 to £12.13.6 with pickings at £7 per cwt.

GUM BENJAMIN

Market firm. Recent business—Sumatra good 2nd at £8.2.6 to £8.10, ordinary 2nd £6.10.0 to £6.15, common to fair 3rd £3.5.0 to £5.2.6 per cwt.

We quote Sumatra marbled, good to fine 2nd £8 to £8.15, common to fair £3.5, to £7.10.0. Palembang common to fair £1.5, to £2. Siam, fair to fine bold £7 to £25 per cwt according to quality.

GUM KOPAL

Trade has been rather irregular; Macassar, small yellow scrape pipey 30/- to 34-, small unsorted part blocky 24/6 ditto drossy 20/- to 23/6; Nuts, dark drossy 20/-, chips small specky 21/- to 23/- ditto drossy 20/-, dark drossy blocky sorts 17/- per cwt.

We value Manila and Macassar, fair dark brown to fine pale scraped 50/- to 75/-, mid. to fair half hard 32/6 to 47/6 Nuts ordy to hard 25/- to 43/-, chips 21/- to 42/6d. Soft blocky sorts 20/- to 26/-.

Pontianac :—Dark to pale scpd hard 65/- to 75/-. Unsorted to half scpd 35/- to 45/-. Nuts, small to bold 27/6 to 32/6 Chips 23/- to 29/-.

GUM DAMAR

A good business has been done in Singapore sorts, pale and amber at 48/- to 48/6, pea size 37/6. Siftings 30/-, dark speckly Pea size 29/- to 31/-; Batavian damaged sold at cheap prices, but we value Singapore specky to fine clean at 72/- to 75/- and Batavian, fair to fine 65/- to 80/- per cwt.

INDIA RUBBER

The market is firm but quiet. Plantation grown Para is in good demand, good Biscuits, sheets and Crepe at 4/1d to 4/3½d per lb.

In the last sales Crepe pale to palish sold at 4/1½d to 4/2½d, mottled 3/9¼d to 4/-, brown 3/7 to 3/9, dark 3/3 to 3/5¾d, block 2/9 to 2/11d. Biscuits and sheets at 4/1¾d to 4/3d, scrape 4/5½d to 3/- per lb.

ISINGLASS

The last sales went off very slowly. Penang was in fair demand and firm prices were realised particularly for good leaf and Tongue only 145 packages were catalogued of which 100 sold.

Round Leaf, fair to good pale 4/- to 4/3d; middling 3/4 to 3/8; part thin and rough 2/2 to 2/8d; pickings 1/4d to 1/11d; Long Leaf, brownish 2/7d. Tongue, fair to good pale 3/7 to 4/1d; pale and reddish 3/2 to 3/6d; dark and reddish 2/2 to 3/1d; pickings 1/1d to 1/10d; long palish 2/6 to 3/-; small and thin 1/8d to 1/10d; pickings 1/1d. Purse, small thin to fair pale 7½d to 1/1d; Floats fair to fine bold pale 1/2d to 1/10d per lb.

NUTMEGS

Continue a quiet market.

Singapore :—A few cases have been sold, privately 80's at 7d per lb. The rates ruling now cannot possibly pay our main supplies coming from the West Indies.

PEPPER

The demand on spot for Black Singapore has been quiet with only a small business passing; grayish to fair Singapore at 3⅛d to 3¼d.

For arrival July/September shipment, buyers at 3d and sellers at 3 1/16d. c.i.f. delivered weights.

White Pepper :—For arrival, fair Singapore June/August shipment, c.i.f. delivered weights and buyers.

SAGO

Market quiet, good fair quality is offering at 13/6 per cwt c.i.f.

On the spot we quote Pearl, large dull to fine 14/- to 15/9 medium dull to fine 14/- to 16/6, small dull to fine, 14/- to 15-; Flour, Good pinky to white 9/- to 10/-.

TAPIOCA

Privately the market has been steady, fair Singapore near at hand selling at 1⅞d, June/August shipment at 1¾d. October/December at 1 11/16d c.i.f.

Pearl Tapioco :—Medium for arrival is lower. June/August shipment, fair quality 14/9 to 14/6, and fair Penang at 12/9 to 11/- per cwt c.i.f.

Seeds :—12/6 to 11/9d c.i.f.

On the spot we quote Penang. Flake fair to fine 2d. to 2⅝d. Singapore 2d. 2⅝d. Java common to fine 1d. to 2⅛d.

Flour, fair to fine 9/- to 10/-. Pearl Bullet 19/- to 21/- medium 13/6 to 24/-. Seed fair to fine 15/-to 24/-.

TORTOISE SHELL

The last sales contained only small supplies, the bidding was somewhat irregular but on the whole prices were about steady with the exception of Yellow-belly which was rather cheaper.

Singapore offerings consisted chiefly of old stock which was bought in.

We value Macassar and Singapore small to bold at 6/- to 26/- per cwt pickings 7/- to 20/- per lb.

All descriptions of Produce sold to the best possible advantage.

We have received the above letter from John Haddon & Co., the well known exporters and importers of Colonial produce, of Salisbury Square, Fleet Street, London, and propose to publish this produce letter monthly, as received in the hopes that it may be useful to many planters and merchants.—Ed.

SINGAPORE MARKET REPORT.

May, 1908.

Articles.	Quantity sold.	Highest price.	Lowest price.
	Tons.	$	$
Coffee Palembang ...	...	24.00	24.00
Bali	54	21.50	21.50
Liberian ...	58	23.00	22.00
Copra	4,915	6.80	6.25
Gambier	2,526	7.40	6.90
Gambier Cube, Nos. 1 & 2 ...	220	12.25	10.50
Gutta Percha, 1st quality ...	...	300.00	240.00
Medium ...	...	240.00	80.00
Lower ...	...	80.00	12.00
Borneo Rubber, 1, 2 & 3 ...	...	100.00	43.00
Gutta Jelotong	...	5.75	4.15
Nutmegs, 110's ...	...	20.00	18.50
80's ...	...	21.50	20.50
Mace, Amboyna ...	...	60.00	59.00
Banda ...	...	74.00	70.00
Black Pepper	674	12.00	11.05
White Pepper (Sarawak) ...	266	19.50	19.12½
Pearl Sago, Small ...	147	4.05	3.90 fair.
Medium ...	...	...	...
Large	...	...	...
Sago Flour, No. 1 ...	2,346	3.02½	2.92½
No. 2	210	1.07½	1.05
Tapioca Flake, Small ...	536	7.12½	6.95 fair.
Medium ...	37	...	...
Pearl, Small ...	350	5.65	5.60 fair.
Medium ...	438	6.85	5.52½ ,,
Bullet ...	20	8.25	8.12½
Tin	2,420	72.25	65.50

SINGAPORE MARKET REPORT.

June, 1908.

Articles.	Quantity sold.	Highest price.	Lowest price.
	Tons.	$	$
Coffee Palembang ...	...	...	...
Bali	70	21.50	20.50
Liberian ...	44	24.00	23.00
Copra	6,196	7.35	6.20
Gambier	2,407	7.50	7.10
Gambier Cube, Nos. 1&2 ...	268	12.00	10.60
Gutta Percha, 1st quality ...	...	300.00	240.00
Medium ...	...	240.00	80.00
Lower ...	...	80.00	12.00
Borneo Rubber, 1, 2 & 3 ...	...	104.00	43.00
Gutta Jelotong	...	5.75	4.25
Nutmegs, 110's	...	18.50	17.50
80's	...	20.50	19.50
Mace, Amboyna	...	58.00	58.00
Banda	...	74.00	70.00
Black Pepper	1,541	12.00	11.00
White Pepper (Sarawak) ...	451	19.37½	17.80
Pearl Sago, Small ...	154	3.90	3.75
Medium ...	...	...	...
Large ...	...	...	...
Sago Flour, No. 1 ...	3,002	3.10	2.87½
No. 2 ...	345	1.05	1.05
Tapioca Flake, Small ...	634	6.90	5.77½ fair.
Medium ...	50	...	...
Pearl, Small	322	5.65 8.75	4.90 fair. 8.70 fine.
Medium ...	608	6.30	5.05 fair.
Bullet	...	8.00	7.37½
Tin	2,630	65.50	63.12½

EXPORTS TELEGRAM TO EUROPE AND AMERICA.

Fortnight ending May, 15th &31st.

				Tons.	
				15th.	31st.
Tin	Str.	S'pore. & Penang	to U. Kingdom &/or	2,251	2,400
do.	,,	do.	U. S. A.	520	834
do.	,,	do.	Continent	545	230
Gambier	,,	Singapore	Glasgow	...	...
do.	,,	do.	London	270	50
do.	,,	do.	Liverpool	109	...
do.	,,	do.	U.K. &/or Continent	5	65
Cube Gambier	,,	do.	United Kingdom	10	10
Black Pepper	,,	do.	do.	35	20
do.	,,	Penang	do.	140	120
White Pepper	,,	Singapore	do.	210	5
do.	,,	Penang	do.	50	...
Pearl Sago	,,	Singapore	do.	180	130
Sago Flour	,,	do.	London	825	250
do.	,,	do.	Liverpool	1,300	...
do.	,,	do.	Glasgow	50	...
Tapioca Flake	,,	do.	United Kingdom	175	160
T. Pearl & Bullet	,,	do.	do.	140	100
Tapioca Flour	,,	Penang	do.	90	180
Gutta Percha	,,	Singapore	do.	20	25
Buffalo Hides	,,	do.	do.	80	...
Pineapples	,,	do.	do.	30,000	18,000
Gambier	,,	do.	U. S. A.	430	950
Cube Gambier	,,	do.	do.	...	125
Black Pepper	,,	do.	do.	290	125
do.	,,	Penang	do.	40	...
White Pepper	,,	Singapore	do.	30	55
do.	,,	Penang	do.	60	...
Tapioca Pearl	,,	Singapore	do.	90	190
Nutmegs	,,	S'pore., Penang	do.	15	24
Sago Flour	,,	Singapore	do.	675	440
Pineapples	,,	do.	do.	9,250	10,750
do.	,,	do.	Continent	1,250	2,000
Gambier	,,	do.	South Continent	150	...
do.	,,	do.	North Continent	260	100
Cube Gambier	,,	do.	Continent	65	40
Black Pepper	,,	do.	South Continent	330	25
do.	,,	do.	North do.	120	25
do.	,,	Penang	South do.	50	20
do.	,,	do.	North do.	...	30
White Pepper	,,	Singapore	South do.	55	...
do.	,,	do.	North do.	85	20
do.	,,	Penang	South do.	10	5
do.	,,	do.	North do.	20	50
Copra	,,	S'pore., Penang	Marseilles	1,050	1,075
do.	,,	do.	Odessa	300	...
do.	,,	do.	Other S, Continent	680	200
do.	,,	do.	North Continent	1,300	1,800
Sago Flour	,,	Singapore	Continent	1,100	500
Tapioca Flake	,,	do.	do.	270	75
do. Pearl	,,	do.	do.	20	10
do. Flake	,,	do.	U. S. A.	...	50
do. do.	,,	Penang	U. K.	90	120
do. Pearl & Bullet	,,	do.	do.	150	240
do. Flake	,,	do.	U. S. A.	...	...
do. Pearl	,,	do.	do.	575	30
do. Flake	,,	do.	Continent	5	...
Tapioca Pearl	,,	Penang	Continent	40	260
Copra	,,	Singapore	England	700	50
Gambier	,,	do.	U. S. A.	..	...
Cube Gambier	,,	do.	do.	...	..

				Tons.	
T. Flake & Pearl	Str.	Singapore	U. S. A.	..	..
Sago Flour	,,	do.	do.	..	...
Gambier	,,	do.	South Continent	...	...
Copra	,,	do.	Marseilles	...	..
Black Pepper	,,	do.	South Continent	...	...
White Pepper	,,	do.	do.	...	...
do.	,,	do.	U. A. S.	...	...
Pineapples	,,	do.	do.	...	...
Nutmegs	,,	do.	do.	...	...
Black Pepper	,,	do.	do.	...	...
do.	,,	Penang	do.	...	...
White Pepper	,,	do.	do.	...	...
T. Flake & Pearl	,,	do.	do.	...	...
Nutmegs	,,	do.	do.	...	...
Tons Gambier				1,400	1,500
,, Black Pepper				430	310

Wired at 3.30 p.m. on 16th May.
,, 5.55 p.m. on 1st June.
,, 6.15 p.m. on 16th June.
,, 4.45 p.m. on 1st July.

EXPORTS TELEGRAM TO EUROPE AND AMERICA.

Fortnight ending June, 15th & 30th.

				Tons.	
				15th.	30th.
Tin	Str.	S'pore. & Penang	to U. Kingdom &/or	1,025	1,596
do.	,,	do.	U. S. A.	880	370
do.	,,	do.	Continent	665	285
Gambier	,,	Singapore	Glasgow	...	...
do.	,,	do.	London	100	130
do.	,,	do.	Liverpool	225	...
do.	,,	do.	U.K. & or Continent	25	25
Cube Gambier	,,	do.	United Kingdom	10	10
Black Pepper	,,	do.	do.	50	10
do.	,,	Penang	do.	60	150
White Pepper	,,	Singapore	do.	40	15
do.	,,	Penang	do.	10	...
Pearl Sago	,,	Singapore	do.	100	35
Sago Flour	,,	do.	London	375	250
do.	,,	do.	Liverpool	1,700	...
do.	,,	do.	Glasgow	50	50
Tapioca Flake	,,	do.	United Kingdom	230	45
T. Pearl & Bullet	,,	do.	do.	260	60
Tapioca Flour	,,	Penang	do.	160	100
Gutta Percha	,,	Singapore	do.	45	...
Buffalo Hides	,,	do.	do.	100	...
Pineapples	,,	do.	do.	55,000	18,250
Gambier	,,	do.	U. S. A.	175	875
Cube Gambier	,,	do.	do.	30	70
Black Pepper	,,	do.	do.	250	100
do.	,,	Penang	do.	150	50
White Pepper	,,	Singapore	do.	35	60
do.	,,	Penang	do.	10	...
Tapioca Pearl	,,	Singapore	do.	55	175
Nutmegs	,,	S'pore., Penang	do.	36	39
Sago Flour	,,	Singapore	do.	50	170
Pineapples	,,	do.	do.	9,750	19,750
do.	,,	do.	Continent	2,000	4,500
Gambier	,,	do.	South Continent	50	25
do.	,,	do.	North Continent	75	..
Cube Gambier	,,	do.	Continent	55	30
Black Pepper	,,	do.	South Continent	375	120
do.	,,	do.	North do.	180	140

					Tons.
Black Pepper	Str.	Penang	South Continent	30	10
do.	,,	do.	North do.	...	10
White Pepper	,,	Singapore	South do.	30	15
do.	,,	do.	North do.	10	160
do.	,,	Penang	South do.	20	...
do.	,,	do.	North do.	5	20
Copra	,,	S'pare., Penang	Marseilles	840	1,525
do.	,,	do.	Odessa	...	500
do.	,,	do.	Other S. Continent	680	500
do.	,,	do.	North Continent	1,600	1,650
Sago Flour	,,	Singapore	Continent	825	110
Tapioca Flake	,,	do.	do.	100	240
do. Pearl	,,	do.	do.	35	25
do. Flake	,,	do	U. S. A.	...	...
do. do.	,,	Penang	U. K.	120	10
do. Pearl & Bullet	,,	do	do.	150	110
do. Flake	,,	do.	U. S. A.	...	... 2
do. Pearl	,,	do.	do.	140	30
do. Flake	,,	do.	Continent	...	60
Tapioca Pearl	,,	Penang	do.	10	240
Copra	,,	Singapore	England	300	300
Gambier	,,	do.	U. S. A.	...	...
Cube Gambier	,,	do.	do.	...	...
T. Flake & Pearl	,,	do.	do.	...	...
Sago Flour	,,	do.	do.	...	...
Gambier	,,	do.	South Continent	..	...
Copra	,,	do.	Marseilles	...	...
Black Pepper	,,	do.	South Continent	..	...
White Pepper	,,	do	do.	..	...
do.	,,	do.	U. S. A.	...	...
Pineapples	,,	do.	do.	...	...
Nutmegs	,,	do.	do.	...	...
Black Pepper	,,	do.	do.	...	..
do.	,,	Penang	do.	...	...
White Pepper	,,	do.	do.	...	...
T. Flake & Pearl	,,	do.	do.	...	...
Nutmegs	,,	do.	do.	...	...
Tons Gambier				850	1,500
,, Black Pepper				650	850

GOW, WILSON & STANTON, Limited—
India Rubber Market Report.

13 & 23 Rood Lane, London, E.C.

12th, June 1908.

After the three weeks interval, on account of the Whitsun holidays, the offerings were on a rather large scale, and since the last auction the market has declined generally to the extent of about 1½d. per lb.

At the sale there was a fairly good demand, the finer qualities especially attracting attention and being well competed for.

Some very fine pale Warriapolla Biscuits again realised the highest price of the day, vi.x, 4/6 per lb. Rangbodde Ceara Biscuits coming next at 4/5, while the two finest lots of Crepe in the sale from Ellakande and Nikakotua Estates sold at 4/2½ per lb.

There was more enquiry for clean Scrap, most of which sold at firm rates, but the lower grades of Crepe were in some cases rather neglected.

Number of Packages Advertised.		Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.		
		Ceylon.	Malaya.	Totals.	No. of Packages Sold.	Price.	Hard Fine Para.	Plantation. Fine.	Plantation. Scrap.
To-day	1157	9½	54	63¼	593	3/8⅞	3/9	4/- to/46	2/9½ to 3/0½
Corresponding Sale Last Year	748	4½	35¼	39¾	192	4/10½	4/7	5/- to 5/8	3/10¼

To-Day's Quotations.

Sheet and Biscuits.		Crepe and Block.		Unwashed Scrap.	
Very fine pale Biscuits.	4/5 to 4/6	Fine Pale ...	4/- to 4/2½		
Good to Fine Biscuits.	4/- to 4/0½	Medium and Palish.	3/4½ to 3/10	Good to Fine	2/9½ to 3/0½
Good to Fine Sheet.	4/- to 4/1½	Dark ...	2/9½ to 3/2½	Low and Medium.	1/6

Para Statistics.

Receipts at Para for *May*.

1908.	1907.	1906.	1905.
3,210 tons	2,620 tons	2,320 tons	2,220 tons

Total Crop Receipts—*11 months—July to May.*

1907-08.	1906-07.	1905-06.	1904-05.
35,250 tons ...	36,570 tons ...	32,840 tons ...	31,600 tons

Plantation Exports.

Ceylon.—1st January to 18th May.

1908	106½ tons
1907	74 tons
1906	43 tons
1905	17½ tons

Malaya.—1st January to 30th April.

	Singapore.	Penang.	Total.
1908 ...	291½ tons...	155 tons ...	446½ tons
1907 ...	184½ tons...	21 tons ...	205½ tons

Particulars and Prices of To-Day's Sale.

CEYLON.

Mark.	Pkgs.	Description.	Price.
Rosebury	2	Biscuits ...	4/0½
Palli	4	,, ...	4/–
Taldua	1	Worm ...	3/8½
Waharaka	1	Biscuits ...	4/–
	1	Scrap ...	3/0½
Rangbodde	2	Very fine pale biscuits ...	4/5
Warriapolla	4	Very fine pale biscuits ...	4/6
Warriapolla	2	Scrap ...	2/7 to 3/11½
	5	Biscuits crepe, etc. pt. sold ...	3/2
Sorana	9	Biscuits ...	3/11 to 4/–
	1	Scrap ...	3/–
Yattipawa	3	Good crepe ...	4/–
	1	Dark ,, ...	3/–
Doranakande	6	Biscuits ...	4/–
	1	Dark sheet ...	3/8½
	9	Scrap and rejections ...	2/10 to 3/0½
Ayr	2	Biscuits and sheet ...	4–
	1	Scrap ...	2/9½
J. C. & Co. Ltd.	5	Crepe (loose and pressed) ...	bought in
D. B.	1	Dark crepe ...	bought in
M. A. K.	5	Black crepe (very soft) ...	bought in
D. G. H. & Co.	8	Dark to black crepe ...	bought in
	2	Scrap pt. sold ...	3/0¼
Clara	1	Biscuits ...	4/–
Galphele	3	Good block ...	bought in
Clontarf	2	Biscuits ...	bought in
Culloden	10	Darkish crepe ...	bought in
	17	Dark to black crepe pt. sold ...	3/3
Ellakande	10	Fine crepe ...	4/– to 4/2½
	2	Darkish ...	3/1 to 3/2½
Heatherley	4	Darkish to dark crepe ...	3/2½ to 3/5¼
Hattangalla	2	Biscuits ...	3/11¾
	3	Good to dark crepe ...	3/2¾
O. B. E. C.	1	Lace ...	2/8¼
Nikakotua	3	Good to very fine pale crepe ...	4/1¼ to 4/2½
	3	Darkish to dark crepe pt. sold ...	3/4
Arapolakande	7	Biscuits ...	4/– to 4/0½
	3	Crepe ...	3/3½ to 3/4½
Glencorse	2	Biscuits ...	3/11½ to 4/0½
	2	Scrap ...	2/10 to 3/0½
Dangan	3	Biscuits ...	bought in
	1	Scrap ...	bought in
Knmbukkan	7	Biscuits ...	bought in
	1	Block ...	bought in
Tudugalla	7	Good crepe ...	bought in
	5	Darkish ,, ...	bought in
Polatagama	1	Black ...	bought in

MALAYA.

Mark.	Pkgs.	Descriptions.	Price.
L. E. Muar Sttaits	65	Fine block ...	bought in
M. B. E. Straits.	8	Darkish crepe ...	3/1 to 3/5
R. M. P. Ltd.	4	Fine pale crepe ...	4/1¼
	8	Good and brown crepe ...	3/3¾ to 3/11½

Mark.	Pkgs.	Description.	Price.
D. R. E.	16	Good to dark Rambong crepe, etc. pt. sold	2/-
Damansara	11	Sheet ...	4/-
	16	Pale and palish pressed crepe ...	bought in
	15	Dark ...	bought in
S. K. R. Co., Ltd.	44	Good crepe ,, pt. sold ...	3/3 to 4/-
	28	Dark pt sold ...	2/9½ to 3/3½
B. & D.	10	Fine sheet ...	4/1½
	11	Sheet (pressed and loose) ...	2/6 to 3/11½
	4	Scrap and rejections ...	1/6 to 2/10
	18	Crepe ...	2/6 to 4/0¼
E. K. K. P.	3	Sheet ...	4/1
B. C.	1	Sheet ...	bought in
S. P.	1	Rambong ...	bought in
	1	Scrap ...	bought in
E. L. & Co	9	Sheet ...	4/0½
	8	Crepe pt. sold ...	3/2 to/4/0½
Matang	27	Sheet ...	4/0½
	8	Crepe ...	3/2 to 3/5½
C. M. R. E. Ltd.	13	Good to fine crepe pt. sold ...	3/11 to 4/1
Yam Seng	13	Fine sheet ...	4/0½
	3	Good scrap and rejections ...	2/11 to 3/0¼
Shelford	5	Dull sheet ...	3/10
	2	Pressed crepe ...	bought in
	5	Dark loose crepe ...	bought in
Bila	5	Sheet ...	4/0¼
	26	Good scrap ...	3/0½ to 3/0¾
	6	Dark crepe pt. sold ...	3/5
	1	Black crepe ...	bought in
Linggi Plants.	52	Fine crepe ...	bought in
	4	Darker ...	3/11¼
	13	Dark ...	bought in
Sungei Krudda	14	Sheet ...	3/10¾
V. R. Co., Ltd. Klang	1	Crepe ...	bought in
F. M. S.	21	Fine sheet ...	4/-
	8	Good to fine thick crepe ...	bought in
	55	Good crepe ...	3/- to 3/10¾
K. P. C., Ltd.	12	Sheet ...	3/11½
	5	Dark crepe ...	3/3½
	3	Darkish to dark crepe ...	3/1 to 3/4¼
S. B.	5	Good sheet ...	4/0½
P. R.	1	Good scrap ...	3/0½
	2	Scrap ...	bought in
K.	6	Fine sheet ...	4/0¾ to 4/1½
	6	Darkish crepe ...	3/2 to 3/4¼
P. S. E.	11	Sheet (part damaged) ...	3/10½ to 4/-
	6	Crepe ,, ...	3/2¼ to 3/5
	1	(24 lbs.) damaged crepe ...	bought in
K. M.	2	Sheet (sticky) ...	3/7
	1	Scrap ...	bought in
S. R. Co., Ltd.	22	Good to dark crepe ...	bought in
B. R. R. Co. Ltd.	47	Fine sheet ...	bought in
	6	Dark crepe ...	bought in
	20	Good to fine crepe ...	bought in
	19	Dark pressed crepe ...	bought in
F. (S) R. Co., Ltd.	11	Sheet ...	bought in
	12	Good to dark crepe pt. sold ...	3/5½
Highlands Est.	30	Fine sheet ..	4/- to 4/0¼
	28	Good crepe pt. sold ...	3/5¼ to 3/7¼
	21	Darkish to dark crepe pt. sold ...	3/4½ to 3/4¾

Mark.	Pkgs.	Description.	Price.
Jebong	53	Very fine pale crepe	.. bought in
	4	Mottled	... bought in
	22	Darkish to dark crepe	... bought in
	1	Fine crepe	.. bought in
Golconda	12	Fine sheet	... 4/-
	1	Good crepe	... 3/4¼
	2	Dark crepe	... bought in
	20	Good sheet	... 4/0½
S. S. B. R. Co., Ltd.	6	Good to dark crepe	... bought in

JAVA.

Mark.	Pkgs.	Description.	Price.
Pasir Oetjing	8	Rambong sheet (pressed)	.. bought in
	1	Scrap	... bought in
	1	Pressed sheet	... bought in

GOW, WILSON & STANTON, Limited— India Rubber Market Report.

13 & 23, Rood Lane, London, E.C
26th June, 1908.

The market has improved to some extent since the last auction, and a fair proportion of the offerings was sold at an irregular advance of about 1d. to 3½d. per lb. on last sale quotations.

The lower qualities of Crepe, however, was somewhat neglected, and some small parcels consisting of single packages of various grades were disposed of at rather lower rates for want of competition.

The most interesting lot catalogued was a consignment of 200 cases of Fine Block from Lanadron Estate; this, however, was withdrawn from auction, the sellers' limit of about 4/6 per lb. not being obtainable in the room.

The Ceylon offerings comprised only a very small proportion of the sale. A parcel of Fine Worm from Gikiyanakande Estate realised the highest price of the auction, viz., 4/4¾d. per lb.

Number of Packages Advertised.		Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.		
		Ceylon.	Malaya.	Totals.	No. of Packages sold.	Price.	Hard Fine Para.	Plantation. Fine	Plantation. Scrap.
To-day	1070	4½	50¾	55¼	448	3/8	3/10⅞	4/- to 4/4¾	2/3 to 3/-
Corresponding Sale Last year	602	4¼	32	36¼	283	4/11¾	4/7¼	5/1 to 5/7½	3/8¼ to 4/2

To-Day's Quotations.

Sheet and Biscuits.		Crepe and Block.		Unwashed Scrap.	
Very fine Pale Worm.	4/4⅜	Fine Pale ...	4/- to 4/3¼	Good to Fine	2/7 to 3/-
Good to fine Biscuits.	4/1 to 4/2¼	Medium and Palish.	3/5 to 3/11	Low and Medium.	2/2 to 2/3
Good to fine Sheet.	4/1½ to 4/2¼	Dark	2/5 to 3/4		

Para Statistics.

Liverpool Imports.—*1st January to 31st May.*

		* STOCKS at 31st May.	
1908	8,999 tons	1908	3,480 tons
1907	6,969 tons	1907	2,231 tons
1906	5,917 tons	1906	1,490 tons

*Excluding those in Dealers hands.

Plantation Exports.

CEYLON—1st January to 1st June.		MALAYA—1st January to 15th April.		
		Singapore.	Penang.	Total.
1908	111¾ tons	1908 .. 348 tons ...	172 tons...	520 tons
1907	77⅓ tons	1907 ... 215 tons ...	23 tons...	238 tons
1906	18¼ tons			

Particulars and Prices of To-Day's Sale.

CEYLON.

Mark.	Pkgs.	Description.		Price.
Densworth	3	Biscuits	...	4/1 to 4/1½
Vicartons	1	Biscuits	...	4/1½
	1	Scrap	...	2/2
C. R.	14	Scrap (heated)	...	bought in
Hilton	1	Biscuits	...	4/1¾
Ambatenne	5	,,	...	4/2 to 4/2¼
	1	Fine scrap	...	2/11¾
J. C. & Co., Ltd.	5	Dark crepe	...	bought in
D. B.	1	Block	...	bought in
A.	7	Black crepe	pt. sold ..	2/4 to 2/7½
Sunnycroft	1	Dark sheet	...	4 0¼
Glanrhos	7	Good to fine biscuits	...	4/2 to 4/2¼
Clontarf	3	Good to fine biscuits	...	4/2
Verulapitiya	1	Sheet	...	4/1½
Ambaganga	3	Pressed sheet	...	bought in
	1	Block ,,	...	bought in
Gikiyanakande	6	Good crepe	pt. sold ...	3/4 to 3/4¼
	5	Dark ,,	pt. sold ...	2/6
	9	Fine pale worm	pt. sold ...	4/4⅞
Alliawattie	8	Dark scrap	...	bought in

MALAYA.

Mark.	Pkgs.	Description.	Price.
C. M. R. E. Ltd.	18	Good to fine crepe ...	3/7½ to 4/3
	7	Dark crepe ...	bought in
Damansara	8	Sheet ...	bought in
	14	Good to fine pressed crepe ...	bought in
	11	Dark ,, ,, ...	bought in
P. S. E.	1	Sheet ...	4/1½
Selaba	1	Crepe ...	bought in
S. R. Co , Ltd.	12	Dark crepe ...	bought in
Highlands Est.	40	Fine sheet ..	bought in
	4	Dark crepe ...	bought in
	25	Good to darkish crepe pt. sold ...	3/2¾ to 3/6½
	2	Good to fine scrap pt. sold ...	2/11¾
	2	Good Rambong block ...	bought in
	1	Dark ,, (heated) ...	bought in
S. R. & Co.	14	Sheet ...	4/2
	2	Fine crepe ...	4/0¼
	74	Darkish to black crepe pt. sold ...	3/6½
V. R. Co., Ltd.	8	Fine pale to darkish amber crepe pt. sold	3/11¾ to 4/-
Klang	52	Darkish to black crepe pt. sold ...	3/4 to 3/8¼
F. M. S.			
K. P. C., Ltd.	19	Darkish to black pressed crepe pt sold	3/1½
K.	11	Fine sheet ...	4/2
	3	Crepe ...	3/6½ to 3/10¾
	8	Darker crepe ...	3/0½ to 3/2¼
P. S. E.	7	Sheet ...	4/2
	1	Dark crepe ...	3/2½
K. M.	1	Dull sheet ...	4/1½
	1	Scrap ...	bought in
S.	6	Sheet ...	4/2
	2	Scrap ...	bought in
P. R.	2	Scrap ...	2/3 to 3/11
B. R. R. Co., Ltd.	47	Sheet ...	4/1½
	18	Crepe (loose and pressed) pt. sold	4/5½ to 3/5¾
	38	Dark crepe (loose and pressed pt. sold	3/0¼
B. R. R. Co., Ltd.	5	Rambong ...	bought in
	3	Block ...	bought in
F. (S) R. Co., Ltd.	1	Good crepe ...	3/6½
	7	Dark ,, ...	bought in
L. E.			
Muar	200	Very fine block ...	bought in
Straits			
M. B.			
E.	15	Dark crepe ..	3/3½ to 3/5¾
Straits		,,	
D. R. E.	11	Rambong pt. sold ...	3/1¼
	1	Rejected sheet ...	bought in
R.	13	Fine crepe ...	4/0½ to 4/3¼
M. P.	5	Darker crepe ...	2/8¼ to 3/9¼
Ltd.			
L. P.	12	Dark pressed crepe ...	2/8
D.			
S. K. R. & Co., Ltd.	3	Fine crepe ...	4/1¼ to 4/1¾
	4	Good ,, ...	3/8¾
	2	Dark ,, ...	2/6
B. & D.	5	Pressed sheet ...	3/6 to 3/11½
	7	Rejections and scrap pt. sold ...	1/2 to 2/8
	9	Good to dark crepe pt. sold ...	2/5 to 3/11¾
	14	Good to fine sheet ...	4/2¼ to 4/2½
S. Y. D.	2	Scrap ...	bought in
Mc. I.	4	Scrap and rejections ...	1/- to 2/9½
C. W.	3	Dull biscuits ...	3/10½
	3	Scrap, etc. ...	2/7 to 3/-

Mark.	Pkgs.	Description.		Price.
S. P.	2	Scrap	...	bought in
Bila	19	Sheet	...	3/11 to 4/2¼
	3	Rejected sheet	...	bought in
	30	Scrap	...	2/11½ to 2/11¾
	13	Darkish to dark crepe	pt. sold ...	3/2 to 3/5½
Sungei Krudda	10	Rough sheet	...	bought in
	1	Crepe	...	bought in
Glenmarie	7	Sheet	...	4/1 to 4/2
	1	Crepe	...	3/4¼
	3	Scrap, etc.	pt. sold ...	2/-
L.	9	Sheet	...	4/2
A. R. Co.	11	Good and dark crepe	..	bought in
Linsum	5	Good crepe	...	bought in
	16	Dark ,,	...	bought in
Terentang	6	Black crepe	...	bought in
Linggi	18	Good and dark crepe	...	bought in
	25	Fine thick crepe	...	bought in
N. B. T. C. L. C. S.	11	Sheet	...	bought in
H. O. T.	2	Rough sheet	...	bought in

CEYLON, STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

12th June, 1908.

The following Lots, comprising about 55 Tons Straits and 8½ Tons Ceylon, were offered at Auctions to-day and sold as follows:—

STRAITS AND MALAY STATES.

Mark.	Pkgs.	Description.		Price.
L. E. M.U.A.R. M. B.	65	Cases No, 1 Block	...	bought in
E.	8	,, Crepe	...	3/1 at 3/5
R. M. P. Ltd.	12	,, Crepe	...	3/3¼ at 4/1¼
Damansara	11	,, Sheets	...	4/-
	31	,, Crepe	...	bought in
S. K. R. Co. Ltd.	57	,, Crepe	...	3/0¾ at 4/-
B. & D. F. D.	14	,, Sheets		3/11½ at 4/1½
P.	13	Pkgs. Crepe	...	3/2 at 4/0¾
B. & D.	5	,, Crepe	...	3/6 at 3/10¾
	5	,, Sheets	...	3/4½ at 3/11¼
E. K. K. P.	3	Cases Sheets		4/1
E. L. & Co. Ltd.	9	,, Sheets	...	4/0½
	7	,, Crepe	...	3/2 at 3/3¾
	1	,, Rambong Scrap	...	bought in
Matang	27	,, Sheets	...	4/0½
Matang	8	,, Crepe	..	3/2 at 3/5½
C. M. R. E. Ltd.	13	,, Crepe	10 sold ...	3/11 at 4/1
Yam Seng	13	,, Sheets	...	4/0½
	2	,, Scrap	...	3/0¼

Mark.	Pkgs.	Description.			Price.
Shelford	5	Cases Sheest		...	3/10
	7	,, Crepe		...	bought in
Pasir Oetjing	9	,, Sheets		...	,,
R.	5	,, Sheets		...	4/0¼
S. P.	26	,, Scrap		...	3/0½ at 3/0¾
Linggi	64	,, Crepe	12 sold	...	3/8 at 3/11¼
	5	,, Scrap		...	bought in
Sungei Krudda	14	,, Sheets		...	3/10¾
V. R. Co., Ltd.					
Kalang	17	,, Sheets		...	4/-
F. M. S.	63	,, Crepe		...	3/- at 3/10¾
K. P. C. Ltd.	12	,, Sheets		...	3/11½
	5	,, Crepe		...	3/3½
S. B.					
P R. & Co. Ltd.	5	,, Sheets		...	4/0½
	2	,, Scrap	1 sold	...	3/0½
K.	6	,, Sheets		...	4/0¾ at 4/1½
	6	,, Crepe		...	3/2 at 3/4¼
P. S. E.	11	,, Sheets		...	3/10½ at 4/-
	6	Bales Crepe		...	3/2¼ at 3/5
S. R. & Co., Ltd.	17	Cases Crepe		...	3/2½ at 3/7½
B. R. R. Co. Ltd.	47	,, Sheets		...	bought in
	45	,, Crepe		...	,,
F. (S.) R. Co., Ltd.	11	,, Sheets		...	,,
	12	,, Crepe	3 sold	...	3/5½
Highland Estate	31	,, Sheets		...	4/- at 4/0¼
	57	,, Crepe	part sold	...	3/4½ at 3/7½
R. A. B.					
Jebong	80	,, Crepe		...	bought in
Golconda	12	,, Sheets		...	4/-
	3	,, Crepe	1 sold	...	3/4¼
S. S. B. R. Co., Ltd.	20	,, Sheets		...	4/0½
	6	,, Crepe		...	bought in
Q.					
A. X. E.	5	,, Crepe		...	,,
L. A. B. U.					
M.	18	,, Crepe		...	,,
F. S.					

CEYLON.

Rosebury	2	Cases Biscuits		...	4/0½
No. 1					
Palli	4	,, ,,		...	4/-
Waharaka	1	,, ,,		...	4/-
Warriapolla	4	,, ,,		...	4/6
	3	Pkgs. Scrap		...	2/7 at 2/11½
Yatipauwa	4	Cases Crepe		...	3/- at 4/-
Doranakande	7	,, Biscuits		...	3/8½ at 4/-
	6	,, Scrap		..	2/9½ at 3/0½
Ayr	1	,, Biscuits		...	4/-
	1	,, Sheets		...	4/-
J. C. & Co., Ltd.	4	,, Crepe		...	bought in
M. A. K.	5	,, Crepe		...	,,
D. G. H. & Co.	8	,, Crepe		...	,,
	2	,, Scrap		...	3/0½
Sorana	6	,, Biscuits		...	4/-
T.					
F. W.	4	,, Crepe		..	bought in
Culloden	27	,, ,,	7 sold	...	3/3
Ellakande	13	,, ,,		...	3/1 at 4/2½

Mark	Pkgs.	Description.	Price.
Hattangalla	2	Cases Biscuits	3/11¾
	3	,, Crepe	3/2¾
Heatherly	4	,, ,,	3/2½ at 3/5¼
Nikakotua	6	,, ,,	3/3 at 4/2½
Dangan	3	,, Biscuits	bought in
Singalla	9	,, Biscuits	,,
	3	,, Scrap	,,
Tudugalla	12	,, Crepe	,,

FINE HARD on the spot to-day is 3/9 per lb.

(*Lewis and Peat, London.*)

CEYLON, STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

June 26th, 1908.

The following Lots, comprising about 37 Tons Straits and 4 Tons Ceylon, were offered at Auctions to-day and sold as follows:—

Straits and Malay States.

Mark.	Pkgs	Description.	Price.
C. M. R. E. Ltd.	25	Cases Crepe part sold	3/7½ at 4/3
Damansara	8	,, Sheets	bought in
	25	,, Crepe	,,
P. S. E. Selaba	1	,, Sheets	4/1½
S. R. Co.	12	,, Crepe	bought in
Highland Estate	40	,, Sheets	,,
	29	,, Crepe part sold	3/2½ at 3/6½
	2	,, Scrap 1 sold	2/11¾
S. R. Co., Ltd.	14	,, Sheets	4/2
	76	,, Crepe part sold	3/6¼ at 4/0¼
V. R. Co. Ltd., Kalang F. M. S.	60	,, ,, ,,	3/3½ at 3/11¾
K. P. Co. Ltd.	19	,, ,,	bought in
K.	11	,, Sheets	4/2
	11	,, Crepe	3/0½ at 3/10
P. S. E.	7	,, Sheets	4/2
K. M.	1	,, ,,	4/1½
	1	,, Scrap	bought in
S.	6	,, Sheets	4/2
	2	,, Scrap	bought in
B. R. R. Co., Ltd.	22	,, Sheets	4/1
	34	,, Crepe 9 sold	3/5
	5	,, Rambong Crepe	bought in
B. R. R. Co., Ltd.	25	,, Sheets	4/1½
	23	,, Crepe 3 sold	3/5¾
F. (S) R. Co., Ltd.	8	,, ,,	bought in
L. E. M.U.A R. M. B. E. A. S.	200	,, Block	,,
	12	,, Crepe	3/5¾

Mark.	Pkgs.	Description.		Price.
D. R. E.	11	Cases Rambong Crepe	..	3/1¼
R. M. P. Ltd.	18	,, Crepe	...	3/8¼ at 4/3¼
L. P. D.	12	,, ,, 9 sold	..	2/8
Sungei Kapar S. K. R Co., Ltd.	9	,, ,,	...	2/6 at 4/1¾
B. & D.	4	,, Scrap	...	1/1 at 2/6
	9	,, Crepe	...	2/5 at 3/11½
	18	Pkgs. Sheets	...	3/6 at 4/2½
S. Y. D.	2	Cases Scrap	...	bought in
S. R. C. W.	4	Pkgs. Biscuits	...	2/9½ at 3/10½
R. 4	12	Cases Sheets	...	3/8¼ at 4/2¼
S. P.	30	,, Scrap	...	2/6 at 3/4¾
Bila	9	,, Crepe	...	
R. P. Sungei Krudda	11	,, Sheets	...	,,
Glenmari	7	,, Sheets	...	1/1 at 4/2
	4	Pkgs. Crepe	...	3/- at 3/4¼
L. A. R.	8	Cases Sheets 4 sold	...	4/2
Co.	29	,, Crepe	...	bought in
Linsum	21	,, ,,	...	,,
Tarentang	6	,, ,,	..	,,
Linggi	25	,, ,,	...	,,
N. B. T. C. L.	11	,, Sheets	...	,,
S.S. H. O. T.	2	,, ,,	...	,,

CEYLON.

Densworth	3	Cases Biscuits	...	4/1 at 4/1½
C. R.	14	,, Scrap	...	bought in
Hylton	1	,, Biscuits	...	4/1¾
Ambatenne	5	,, ,,	...	4/2 at 4/2¼
	1	,, Scrap	...	2/11¾
J. C. & Co., Ltd.	5	,, Crepe	...	bought in
A.	7	,, ,, part sold	...	2/4 at 2/7½
Glanrhos	4	,, ,,	...	4/2¼
	3	,, Biscuits	...	bought in
Clontarf	3	,, ,,	...	4/2
Veralupitiya Estate	1	,, Sheets	...	4/1½
T. F. K. F. W. Ribu	7	,, ,,	...	bought in
Ambanganga	3	,, ,,	..	,,
Gikiyanakande	11	,, Crepe part sold	...	2/6 at 3/4¼
	8	,, Worms	...	4/4⅜
Allawatte	8	,, Scrape	...	bought in

Comparative Statement of Cultivated Rubber Exported from the Federated Malay States During the Years 1907 & 1908.

—	Exported during June 1908.	Previously.	Total export during 1908.	Export during similar period of previous year.	Increase.
	lbs.	lbs.	lbs.	lbs.	lbs.
Perak	24,687	164,946	189,633	98.591	91,042
Selangor	179,240	687,327	866,567	554,324	312,243
Negri Sembilan	32,147	293,811	325,958	208,610	117,384
Pahang		nil		nil	
Total ...	236,074*	1,146,084	1,382,158	861,525	520,633

*Excluding Pahang export for June.

KUALA LUMPOR, *7th July, 1908.*

J. R. O. ALDWORTH, *Commissioner of Trade and Customs.*

Penang.

Abstract of Meteorological Readings in Criminial Prison Observatory for the month of March, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Mean Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Mean Maximum.	Mean Maximum.	Mean Ronge.	Mean Wet Bulb.	Mean Vapour Tension.	Mean Dew Point.	Mean Humidity.			
	Ins.	°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
Criminal Prison Observatory	29·902	153·2	83·0	92·2	74·3	17·9	78·5	·869	75·5	77	N.W.	3·81	1·54

Criminal Prison, Penang
13th July, 1908.

S. Lucy,
Senior Medical Officer, Penang

Penang.

Abstract of Meteorological Readings in Criminal Prison Observatory for the month of April, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Mean Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Mean Maximum.	Mean Maximum.	Mean Range.	Mean Wet Bulb.	Mean Vapour Tension.	Mean Due Point.	Mean Humidity.			
	Ins.	°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
Criminal Prison Observatory	29·869	150·5	79·8	91·9	75·1	16·8	76·6	900	74·4	79	N.E.	8·93	2 55

CRIMINAL PRISON PENANG,

13th July, 1908.

S LUCY,

Senior Medical Officer, Penang.

Penang.

Abstract of Meteorological Readings in Criminal Prison Observatory for the month of May, 1908.

District.	Mean Barometrical Pressure at 32° Fah.	Mean Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Mean Maximum.	Mean Minimum.	Mean Range.	Mean Wet Bulb.	Mean Vapour Tension.	Mean Dew Point.	Mean Humidity.			
	Ins.	° F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
Criminal Prison Observatory	29·870	148·8	82·9	90·3	74·6	15·7	77·1	·912	73·3	82	N.W.	15·53	3·10

Criminial Prison Penang,

14th June,

S. Lucy,

Senior Medical Officer, Penang.

Penang.

Rainfall Return in Penang from January to June, 1908.

Stations.	Prison Observatory		Fort Cornwalles		Govt. Hill		Balek Pulau		Pulo Jengah		Pangken		Bruas		Lumet		Remarks
	Ins.	ct.	Ins.	ct.	Ins.	ct.	Ins.	ct.	Ins.	ct.	Ins.	ct.	Ins.	ct.	Ins.	ct.	
January	2	40	1	45	6	53	2	62	1	39	4	88	1	45	3	38	
February	3	72	4	56	5	78	4	91	6	26	3	84	2	95	3	28	
March	3	81	4	81	8	81	8	35	5	33	7	41	7	70	8	54	
April	8	93	5	83	14	95	14	43	3	42	4	35	2	95	5	51	
May	15	53	8	54	20	30	8	90	8	01	5	27	2	65	7	45	
June	10	42	6	87	14	68	8	32	3	51	6	84	3	95	7	94	

Prison Observatory,

Penang, 13th July, 1908.

M. E. Scriven.

Assistant Surgeon Observer, Penang.

Penang.

Abstract of Meteorological Readings in Criminal Prison Observatory for the month of June, 1908.

DISTRICT.	Mean Barometrical Pressure at 32 Fah.	Mean Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Mean Maximum.	Mean Minimum.	Mean Range.	Mean Wet Bulb.	Mean Vapour Tension.	Mean Dew Point.	Mean Humidity.			
	Ins.	°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
Criminal Prison Observatory	29·874	147·0	80·2	90·6	74·4	16·5	78·3	893	77·1	78	N.W.	10·42	5·65

CRIMINAL PRISON PENANG,

13th July, 1908.

S. LUCY,

Senior Medical Officer, Penang.

Perak.

Abstract of Meteorological Readings in Perak for the month of June, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Taipeng	...	151	82·29	93	70	23	77·74	889	...	81	...	9·83	3·75
Kuala Kangsar ...	...	...	82·18	93	71	22	76·18	821	...	75	...	3·45	1·40
Batu Gajah	...	152	81·32	92	73	19	77·43	890	...	84	...	5·79	1·45
Gopeng	...	...	80·84	91	68	23	75·89	829	...	78	...	7·04	4·34
Ipoh	...	...	80·99	91	70	21	76·36	846	...	79	...	8·74	2·09
Kampar	...	...	81·32	92	69	23	77·04	873	...	82	...	7·67	2·44
Teluk Anson ...	...	...	82·81	92	70	22	76·29	820	...	73	...	10·68	2·65
Tapah	...	...	81·75	93	68	25	76·69	852	...	78	...	14·15	2·67
Parit Buntar ...	...	...	82·82	91	72	19	77·93	891	...	80	...	7·38	3·67
Bagan Serai ...	...	...	82·35	91	72	19	77·80	892	...	81	...	3·03	2·16
Selama	...	...	82·49	92	72	20	77·82	890	...	80	...	5·45	2·25

STATE SURGEON'S OFFICE,

Taipeng, 10th July, 1908.

M. J. WRIGHT,

State Surgeon, Perak.

Selangor.

Abstract of Meteorological Readings in the various Districts of the State for the month of June, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
General Hospital, K. Lumpor	29.878	146.4	80.9	90.4	71.9	18.4	76.6	0.830	73.6	78	S. W.	6.76	2.57
Pudoh Gaol Hospital ,,	...	...	...	...	...	...	...	...	...	...	...	7.15	3.16
District Hospital ,,	...	...	...	...	...	...	...	...	...	...	..	5.16	2.10
,, Klang	...	...	...	...	...	...	...	...	...	...	...	2.07	1.25
,, Kuala Langat	...	...	...	...	...	...	..	...	...	...	...	2.66	1.57
,, Kajang	...	...	...	86.9	76.4	10.5	...	...	...	...	...	4.14	1.00
,, Kuala Selangor	...	...	...	88.5	77.6	10.9	...	...	...	...	...	5.04	1.22
,, Kuala Kubu	...	...	...	92.3	70.9	21.4	...	...	...	...	...	7.03	1.45
,, Serendah	...	...	...	91.4	71.7	19.7	...	...	...	...	...	11.40	2.85
,, Rawang	...	...	...	90.1	71.5	18.6	...	...	...	...	...	10.86	4.65
Beri-beri Hospital, Jeram	...	...	...	...	...	...	...	...	...	...	...	3.77	1.20
Sabak Bernam	...	...	...	...	...	...	...	...	...	...	...	2.73	0.75

STATE SURGEON'S OFFICE,
Kuala Lumpor, 15th July, 1908.

E. A. O. TRAVERS,
State Surgeon, Selangor

Seremban.

Table Showing the Daily Results of the Reading of Meteorological Observation taken at the General Hospital, Seremban, for the Month of June 1908.

DATE	TAMPERATURE OF RADIATION					WIND DIRECTION		TEMPERATURE OF COMPUTED EVAPORATION VAPOUR TENSION				RELATIVE HUMIDITY			CLOUDS 0 TO 10			CLOUDS & WEATHER INITIALS			RAIN	
	9 H	15 H	Mean H	9 H	15 H	Mean H	Sun	9 H	15 H	Mean H	9 H	15 H	Mean H	9 H	15 H	Mean H	9 H	15 H	21 H	9 H	15 H	21 H	Inch	Cents
1	79	85	82	86	69	17	141	55	W S W		75.6	76.7	76.1	888	922	905	90	97	03.5	2	3	2	S	S	S		
2	79	86	82.5	87	70	17	147	60	N E N W		73.9	77.5	75.2	839	955	897	85	76	80.1	2	4	1	S	C	S		
3	78	85	81.5	85	70	15	145	60	N E N W		76.3	73.4	74.8	906	826	866	94	68	81	1	7	6	S	N	C		.42
4	76	85	80.5	86	70	16	139	53	N W S W		74.3	78.4	76.3	848	973	911	25	80	87	3	8	5	S	N	C		
5	77	85	81	85	70	15	136	51	W S W		71.9	79.7	4.4	783	990	886	84	85	84.5	2	7	6	S	N	C		.68
6	76	85	80.5	86	69	17	145	59	W S W		74.3	73.4	73 8	848	826	837	94	68	81	8	5	4	N	C	S		.08
7	77	86	81.5	87	70	17	147	60	N S W		71.9	77.5	74.7	783	955	869	84	76	82	0	2	3	S	S	S		
8	76	87	81.5	87	71	16	142	55	N S		72.6	78.8	75.7	801	985	893	89	77	83	1	3	8	S	S	N		.32
9	77	88	82.5	88	71	17	145	57	N W S		70.2	79.8	7.5	7391	018	878	79	77	78	2	4	9	S	C	N	1	.54
10	75	82	78.5	83	69	14	119	36	W S W		73.3	77.7	5.1	820	926	873	94	85	89.5	8	5	2	N	C	S		
11	77	85	81	86	70	16	141	55	W S W		73.6	78.4	7.6	829	973	876	89	80	84.5	1	6	9	S	C	N		.38
12	77	86	81.5	87	71	16	144	57	W N		73.6	72.8	73.4	829	888	858	89	64	76.5	2	3	2	S	S	S		
13	77	83	80	88	72	16	140	52	W N E		71.9	74.7	74.3	783	856	819	84	76	80	1	6	2	S	N	S		
14	78	85	81.5	86	71	15	143	57	N W N E		74.6	78.4	76.5	847	975	910	89	80	84.5	6	7	5	C	N	C		.16
15	77	87	82	89	72	17	146	57	N W N		73.6	78.8	76.2	829	985	907	89	77	79.5	2	3	1	S	S	S		
16	78	88	83	89	72	17	149	60	N W W		72.9	79.8	76.3	8101	018	914	84	77	80	3	2	4	S	S	C		
17	77	88	82.5	89	71	18	148	59	N W S W		71.9	78.2	75.1	783	964	893	84	73	84.5	2	2	3	S	S	C		
18	77	87	82	88	71	17	146	58	N W S W		75.3	78.8	77.1	877	985	931	94	77	83	1	2	4	S	S	C		
19	78	84	81	87	72	15	140	53	N W S W		72.9	74.7	3.5	810	840	825	84	23	80.5	2	6	3	S	N	C		
20	77	87	82	88	72	16	192	54	N W S W		71.9	78.8	75.3	783	985	884	84	77	78.5	3	4	3	S	C	S		
21	78	88	83	89	71	18	144	55	N W S		72.9	79.8	76.3	8101	018	914	84	77	85.5	2	1	5	S	S	C		
22	77	87	82	88	71	17	143	55	W S W		70.2	78.8	74.5	739	985	862	79	77	78	3	2	1	S	S	C		
23	78	88	83	89	71	18	145	56	W S W		71.2	79.8	78.5	7651	018	891	79	77	80.5	4	5	6	C	C	C		
24	79	89	84	90	72	18	147	57	N W S W		73.9	79.2	75.5	839	998	918	85	73	80.5	2	3	1	S	S	S		
25	78	78	78	91	71	20	137	46	N W S		71.2	78.2	74.7	765	964	864	79	73	76	2	3	5	S	S	C		
26	78	89	83.5	91	72	19	139	48	N W S W		70.2	79.2	74.7	839	998	868	79	73	76	2	5	7	S	C	N		
27	77	84	80.5	86	70	16	143	57	N W S W		71.2	72.4	71.8	765	995	775	79	68	79.5	4	5	6	C	C	C		
28	78	86	82	88	71	17	145	57	W W		71.2	77.5	74.4	765	955	860	79	76	77.5	2	3	5	S	S	C		
29	77	86	81.5	89	70	19	144	55	S W W		70.2	79.4	74.8	7391	008	873	79	80	79.5	1	3	4	S	S	C		
30	77	85	81	86	71	15	140	54	N W N W		71.9	80.7	5.9	7831	026	904	84	85	84.5	1	5	6	S	C	C		
Total	77.3	85.8	81.5	87.4	70.4	17.1	142.4	55			72.6	77.2	74.9	805	954	879	85.4	77.3	81.3							3	.54

Seremban, 9-7-08.

D. MELCHIZEDEK,
Apothecary.

Pahang.

Abstract of Meteorological Readings in the various Districts of the State for the month of May, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Kuala Lipis ...	...	...	80·6	93	69	20·67	77·2	...	...	...	...	12·21	1.
Raub ...	...	...	81·	93	67	20·16	76·	...	...	...	...	8·77	1·48
Bukit Fraser ...	...	...	...	...	...	...	...	...	...	...	..	6·25	1·64
Bentong ...	...	...	81·7	94	70	70·90	76·	...	...	...	...	6·48	1·78
Temerloh ...	...	...	...	93	70	17·67	...	...	...	...	...	2·61	1·30
Pekan ...	...	...	82	93	72	15·2	78	...	...	...	...	12·61	2·53
Kuantan ...	...	...	83·4	92	72	14·8	78·	...	...	...	...	5·78	1·13
Sungei Lembing ...	...	...	...	87	68	...	...	...	...	...	...	15·23	3·55

STATE SURGEON'S OFFICE,

Raub, 18th July, 1908.

W. H. FRY,

State Surgeon, Pahang.

Kelantan.

Abstract of Meteorological Readings in Kelantan for the month of June, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
				Means F°	Means F°	Means F°						Inches	Inches
Kuala Lebir	...	...	...	91°.36	73°.56	17°.80	...	...	...	...	...	8.56	2.15
Taku Estate	...	...	...	...	...	...	...	...	...	...	...	7.28	2.37
Kuala Pergan	...	...	...	...	...	...	...	...	...	...	...	8.78	1.03
Kuala Kelantan	...	...	...	84°.90	73°.10	11°.80	...	...	...	...	...	4.94	2.58

STATE SURGEON'S OFFICE,
Kelantan, 7th July, 1908.

JOHN D. GIMLETTE,
State Surgeon, Kelantan.

WHITEAWAY, LAIDLAW & CO., LIMITED.

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Gents Split Derby Hobnails, tip on heel, treble stitched, not extra heavy, full medium toes, good fitting.

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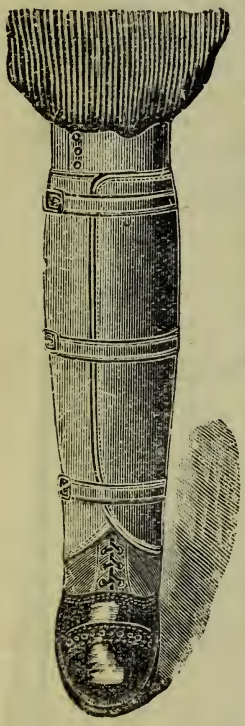
$5.25 p. pair



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„ Seam Back	5.00 „
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No. 9.] SEPTEMBER, 1908. [Vol. VII.

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STRAITS

AND

FEDERATED MALAY STATES.

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AND

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WEEDING IN PARA RUBBER CULTIVATION.

By J. B. Carruthers.

Rubber cultivation in the East is a comparatively new industry and has not the advantages of long experience to help in deciding as to the best and most economical modes of cultivation.

Experience gained in growing coffee, tea, cacao, &c., has been used in determining methods for the conduct of a rubber estate and it is perhaps natural that a successful tea or coffee planter should cling to those which he has found of value in his previous agricultural experience.

In the same way the methods used in the cultivation of tea, coffee, &c., were to some extent the results of experience gained in England and Scotland in the growing of turnips, wheat, cabbages, &c., in a temperate climate.

The desire to retain his own methods in a foreign country even when those methods are suited specially to his home land is a British characteristic. Forms of Government, clothes, games and other habits of life are introduced into countries where the climatic conditions are very different from that of his own country.

In agriculture this characteristic has led in some cases to improvements in native methods of cultivation but has also frequently caused the adoption of methods admirable in Europe but unsuitable for tropical and sub-tropical climates.

In the case of weeding, the practice which obtains in the cultivation of cereal crops in a northern country cannot be of great value in deciding what should be the method adopted in growing trees as a permanent cultivation, in a country, where the temperature and moisture are always favourable to rapid plant growth, where the sun is so powerful as to dry up all moisture from the surface layers of the soil, and where the rain often descends so heavily that in one day it may pour on the earth as much as in six months in England.

In rubber cultivation it is advisable to attack the question without preconceived ideas and to use only the experience of conditions similar to those under which the rubber is to be grown.

The object of the rubber planter is to produced healthy vigorous rubber trees containing large supplies of latex as quickly as possible. The climate in Malaya is for such a purpose ideal, sunshine and rain and a moist atmosphere of an equable temperature—the conditions aimed at in a forcing house. The soil cannot be described as rich though it is physically good and allows the passage of water and air both of which are necessary for vigorous root action.

Various writers on the subject of growing rubber have recommended the use of shade trees for growing young rubber and used as an argument the fact that wild rubber trees in Brazil grow in dense shade, yet those who have seen the healthy rapid growth of para rubber trees grown in the open in Malaya and observed their height and girth are satisfied that such conditions are suitable, probably the most suitable, for the vigorous growth of young rubber.

The conditions to be aimed at for the portion of the plant above ground are an equable, moist climate with a temperature not too high for the healthy growth of the plant cultivated. These conditions we have all the year round in Malaya.

The conditions to be desired for roots are briefly ;—a soil so constructed physically that it is not too loose to retain the water which is necessary for growth and yet not so close as to become water logged and prevent the access of air, which is also necessary, the soil must possess a sufficient amount of nutritive substances for the formation of plant tissue. The soil must be moist and shaded for these are the conditions under which the formation of plant food in the soil takes place.

The conditions present for the development of roots of rubber trees can be and are very largely dependent upon methods of cultivation and it is not difficult to see that the methods at present adopted are not calculated to produce the best results and are at the same time costing a large sum of valuable labour.

The coffee or tea planter in Ceylon and Malaya is a firm believer in clean weeding and has perhaps never seriously considered whether this method is suited to all cultivations in all climates. Weeding is practised in the corn fields and gardens of Britain therefore it should be used in the plantations of the East. Clean weeding is good farming. A good farmer at home is known by the freedom of his land from weeds ergo a good planter in the East must show bare earth between his plants. But the conditions in the two cases are totally different ; little or no harm is done in Britain by exposing the soil to the sun and rain, incalculable harm is done by exposing good friable soil in the tropics to baking sun-light and downpours of rain.

The cultivations are different and the growth of cereals, roots or other temporary crops in England can have little to teach us in regard to methods to be employed in rearing forest trees in the tropics.

Bacteria which are largely responsible for the continuous supply of plant food to the roots cannot exist in a dry baked soil and the roots themselves cannot live under these conditions.

The soils in Malaya are physically excellent in their structure though not chemically very rich and possess the requisite amount of plant food for para rubber cultivation. Many places require little or

no artificial aids to get rid of excess of water the structure allowing water to percolate freely while not being to loose to partially retain it.

Drainage is a factor the importance of which the planter has learnt by experience. If the soil is water-logged and consequently not sufficiently aerated rubber roots will not grow vigorously.

He has still to learn the advantages of protecting his soil from sun and rain or rather the disadvantages of exposing it to these inimical influences. His drains are made chiefly to decrease the loss of surface soil after rain but if he will cover his land with a beneficial weed the only drains that will be necessary will be those on flat land which prevent the land becoming waterlogged.

Nearly all the expenses of draining are thus saved and a sum of from $1/- to $4- per acre in order to permanently establish a protective plant which will obviate the necessity for drains on sloping land and at the same time encourage the root growth of his rubber trees, can readily be afforded, especially as it means a cessation of all expense in regard to weeding or attending to drains.

Millions of dollars have been spent on keeping the land on which rubber is growing exposed and probably three quarters of the labour force have been used in carrying this out. Hundreds of thousands of tons of top soil, which can never be replaced and the value of which as plant food is immense have been washed off clean weeded estates.

Is this expenditure of money and labour and sacrifice of top soil necessary in order to get the most rapid and vigorous growth of rubber trees? This is a problem which any planter can solve himself. Let him the next time he is opening a clearing sow or plant a selected green manure *Crotalaria*, *Mimosa* (sensitive plant) *Vigna*, *Desmodium* &c., or even *Passiflora foetida* (passion flower) directly the burning is finished and see that it is established so that the ground is never exposed to the sun and the rich top soil which is left behind when jungle is burnt is not immediately washed off. Let him plant his rubber in this and compare its height and girth and general vigour with the growth of rubber trees of equal age in his clean weeded clearings and I have no doubt that he will be convinced that the labour and money spent on clean weeding is not a sound commercial investment.

If he establishes his selected plant at once there is no fear of lalang that bug bear of the rubber getting admission.

During the past three years I have been making observations as to rubber which for various reasons has been allowed to remain in weeds or has had other plants growing with it which tend to protect the soil from sun and rain. In cases where the weed is lalang the benefit of the protection of the soil is to a great extent counteracted by the damage done by this, the worst of all the weeds of Malaya.

Lalang forms a close mat of roots which absorb a great of deal of rain and dew, the leaves of the plant do not protect the soil nearly as well as almost any other plant, being all arranged vertically and thus giving as little shade as possible. I have found the surface temperature in lalang to be some eight to ten degrees higher than in other weeds sensitive plant, passion flower &c., on similar soil.

Even where lalang is the weed the hinderance to the rapid growth of the rubber is not so marked as believers in clean weeding would

expect. No serious planter would allow if he could avoid it the invasion of lalang but looked at purely from a commercial aspect the position in regard to lalang on many estates is that the rubber trees have been checked in their growth compared with weeded trees about ¼ that is to say a five year old tree is only equal to a four year old tree which has been tended, but the cost of the weeding during the three years of the tended tree has been from $30 to $60 per acre and it is a question whether the hastening by a year of the tree's growth is worth the cost paid for it.

With other weeds the advantage of covering the soil usually balances the disadvantage caused by the weeds taking moisture and plant food from the soil at the expense of the rubber roots.

To take exact instances, an estate in Perak planted in rubber was owing to want of funds abandoned for five years and allowed to grow up in belukar. When cleared up only 8% of the trees were missing and the remainder showed excellent growth and are today at eleven years old giving 4 lbs., of dry rubber per tree per year though they have been tapped some years.

There are many thousands of acres of rubber in the Malay States and the Colony under Tapioca the cropping of which takes more plant food out of the soil than almost any known cultivation and even with this tax upon the soil the rubber trees benefiting from the shading of their roots are growing not very much less vigorously than their neigh- with no bours competitors but with their root areas exposed to sun and rain.

To put it briefly the policy of scrape, clean, expose, let in sun and rain should be exchanged for the policy of protect, cover, retain, prevent the baking of the sun and the washing of the rain. Without any detriment to the rubber this method of cultivation reduces more than considerably the cost of bringing a rubber estate into bearing.

This question was dealt with in my annual report for 1907 published in this Bulletin for September of that year and has been further discussed at length in my report for this year about to be published. It is of so much practical importance that no excuse is needed for its reiteration in order to urge the planter to give the whole matter serious consideration and what is still better to carefully try the effect of green manure or cover plants as against the more usual method of bare soil.

RATE OF GROWTH OF FOREST TREES IN THE FEDERATED MALAY STATES.

By A. Burn Murdoch.

On this subject, the most important in forestry, little or nothing is known as regards trees which grow in the Malay Peninsula. The difficulties in the way of ascertaining the age of trees, especially growing in dense forest, where no observations have hitherto been made are very great.

Malays as a rule smile if asked to give their opinions to the age of any given tree and I suppose that their amusement is natural, as

after all it is the most difficult question to answer, and one they have never been called on to investigate, as there is more than sufficient timber for their wants.

In India where dry deciduous mixed forests predominate, many of the more important timber trees have very clearly defined annual rings, due to the complete change in seasons, and a definite season of rest from growth, or to the sudden and quick growth in the spring when new leaves are put on.

Thus with Teak the annual rings are so well defined that in any given forest the rate of growth may be accurately gauged by means of an instrument called "Pressler's borer."

This is simply a hollow steel borer which is screwed into the tree to a depth of 2 to 3 inches. Inside the tube is inserted a small steel wedge-like pin, when the borer has been inserted to a sufficient depth this pin is tapped smartly and then the borer withdrawn by turning to the left, bringing with it a clean cylinder of wood about 2 to $2\frac{1}{2}$ inches long.

The rings are then counted and the length of the cylinder accurately measured.

It is usual to take three borings from each tree.

In gauging the rate of growth of teak in a forest the trees are divided into four classes as under:—

Class.	I	6′	to	7′	in girth
do.	II	$4\frac{1}{2}$′	to	6′	,,
do.	III	3′	to	$4\frac{1}{2}$′	,,
do.	IV	under		3′	,,

A hundred or more borings are made in each of these classes so that trees of all sizes are gauged. Thus an absolutely reliable result is obtained. Some borings which were taken in making a working napl of a forest reserve in Burma may be of interest and I give them here.

Class. IV. Trees under 3′ in girth 63 bored, 189 borings average annual (annual ring) .097522″ Average radial increase girth increment .612748″, therefore 59 years to attain a girth of 3′.

Class. III. 3′ to $4\frac{1}{2}$′ in girth 62 trees bored, 186 borings, average annual ring .106043″. Average annual girth increment .666287″, therefore it takes a teak tree 27 years to pass from 3′ girth to $4\frac{1}{2}$′ in girth.

Class. II. $4\frac{1}{2}$′ to 6′, 64 trees bored, 192 borings. Average annual ring .09408″, average annual girth increase .591128″, therefore it takes a tree 30 years to pass from $4\frac{1}{2}$′ to 6′ in girth.

Class. I. 6′ to 7′ in girth, 68 trees bored, 204 borings. Average ring .073362″, average annual girth increase .460947″, it takes therefore 26 years to pass from 6′ to 7′ in girth.

Adding these results together we get

to reach a girth of 3′		59 years
to pass from	3′—$4\frac{1}{2}$′	27 ,,
,,	$4\frac{1}{2}$′-6′	30 ,,
	6′—7′	26
Therefore for a seedling to reach 7′ in girth		142 years.

A few years are always added on to this result to allow of a teak seedling to have established itself.

In the same forest as above 24 stumps and logs were measured and the rings counted. The result worked out to 149 years to attain a girth of 7′, and for the purposes of the working plan 150 years was decided upon as the age.

The above illustrates with what accuracy this little instrument will gauge the rate of growth of trees. Of course in using this instrument iron woods must be avoided, or it will snap off.

It will be successful in woods considerably harder than teak, but would I fancy be useless in trees such as Chengal, Merbau, Penaga. Belian, etc. However as these trees do not appear to have definite and well marked annual rings we are thrown back here upon a very slow and tedious method, but one which is of course absolutely accurate, i.e., to measure annually as many trees as possible, and to take trees of all sizes. At first sight it would seem that this would mean waiting 100 years or more for results, but this is not the case. Thus taking the divisions into classes as in India above shewn, we will suppose that of the 407 trees I have had measured in the F. M. S. forests.

100	are in class	I	6′	to	7′	girth
100	,, ,, ,,	II	4¼′	,,	6′	,,
100	,, ,, ,,	III	3′	,,	4½	,,
107	,, ,, ,,	IV	under		3′	,,

at the time of first measurement. Then it is obviously not necessary to continue measuring a tree in class IV right through all the classes but only until it has reached class III, i.e., suppose that we find that it takes 40 years for a tree to reach 3′ in girth, 25 years to pass through closs III, 30 years to pass throuh class II and 35 years to pass from 6′ to 7′, then we will in 40 years know how long it takes the average tree to reach a girth of 7 feet i.e., 130 years. As regards the actual results so far as we have gone. I have before me 3 years of measurements of Chengal (*Balanocarpus*) and Merbau (*Afzelia*) taken in Bilut Reserve near Raub.

These big forest trees are measured at 20′ from the ground to avoid buttresses.

The forty Chengal trees shew these results: —

	Class I	Class II	Class III	Class IV
Average increase in girth in two years.	.56″	.58″	1.25″	.75″
Average increase in girth in one year.	.28″	.29″	.62″	.37″

Theses results if they could be relied upon would be of course discouraging as it would take a tree at this rate 97 years to attain a girth of 3 feet, 29 years to pass from 3′ to 4½′, 62 years to pass from 4½″ to 6′ and 42 years from 6′ to 7′, a total of 230 years.

As a matter of fact measurements cannot be relied upon until after about 10 or 12 years because in dealing with these large timber trees the bark is constantly breaking away owing to expansion by

growth, and growth may be more in one year than another. A very little bark breaking off a large tree would make a great difference. This factor will be elliminated more or less after several years of measurement.

100 Getah Taban trees (Gutta percha, Palaquium gutta) have been mesured near the waterfall at Taipeng, of girths varying from 18to 65 inches.

These shew a much more rapid rate of growth, 1.69" inches per annum, or 42 years to reach a girth of 6 feet at 6 feet from the ground, What at first sight seems remarkable is the great differences in rate of growth, e.g. some trees have grown in the 7 years as little as 3 inches in girth while other have put on 20 to 24 inches. There is no doubt that in natural forest in this country where the naturally sown seeding has to struggle for existance with a minimum of light, the girth increment is almost absent altogether until the crown of the tree gains access to light.

I have seen this exemplified in Trollah Reserve, where undergrowth has been cleared over about 2,000 acres to assist young Taban. A frequent sight after such a first clearing is a long thin Taban tree, about 30 to 40 feet high but only a few inches in girth. When the surrounding thick undergrowth is cut away these trees cannot bear their own weight at first, and bend over to a greater or lesser degree, sometimes so much as to require propping up. The girth increment of such a tree may be said to have been almost absent for years, all the energies of the tree being put forth in height-growth in an effort to reach the light.

When light is artificially admitted by cutting the surrounding growth, the girth increment will doubtless increase with great rapidity, and more leaves be put on. The inference is that the duty of the Forest Department in these forests is to assist valuable species, such as Chengal and Merbau to establish themselves, by letting in light.

From observation of the big forests in Kuantan and elsewhere, the conclusion has been forced upon me that the large solitary Chengal trees found there are of immense age, certainly not less than 300 years old. The almost complete absence of trees say 2′ to 4′ in girth is a very marked feature and a very serious problem for the forester.

It is obvious then that there is an immense field for the study of the rate of growth of timber trees and that a great deal depends upon it. Now that the Forest Department has been gradually increased in numbers, experiments will be made in clearing round young trees in the forest and measuring these trees annually, then comparing their rate of growth with trees uncleaned. Some few thousand Chengal and Merbau trees which were planted in 1898 in the Pondok Tanjong Rubber Plantation have grown exceedingly well and are probably four times the girth of trees of the same age in big forest.

These trees have had the partial shade of Heveas from the beginning, being planted in rows alternately with Heveas about 22′ apart by 12′ in the line. The average girth increment in 11 Merbau trees for one year is 1·15" and for 20 Chengal trees 1·19". This would give 31 years to reach a girth of 3′ for the former and 30 years for the latter, a very

different result to that obtained from the measurements of trees in big forest as already given ; where 97 years was the period required.

The method I have adopted in the forests is to cut lines 33′ apart through the undergrowth, and to plant trees 33′ apart in these lines. So far considerable success has been attained, especially with Merbau. It is probable that trees so planted will grow much more quickly than in their natural state. As they grow older light will be let in by judicious cutting of trees which are overshading them. In a few year's time it is hoped to have some definite results as to comparisons in the rate of growth of trees and self sown trees growing in the forests. The accurate measurement of forest trees is a matter requiring the close attention of all forest officers and measurements to be reliable must not be left to Maly Rangers, and as the trees or often in remote forests the work is slow and expensive. Without definite information on this head however no systematic working of the forests can ever be undertaken.

BANANA FIBRE WEAVING.

In the Bulletin de la Chambre d'Agriculture de la Cochin-China June 1908, Mr. Duchemin writes as to his method of preparing the cloth of Banana fibre and cotton mentioned in a previous number of our Bulletin. At eight o'clock one morning he cut a banana stem and some *Sanseviera* leaves, at ten o'clock the fibre prepared was dry, at eleven the threads were prepared for weaving and at a quarter to twelve he had a piece of cloth 54 centimeters long and 40 centimenters wide.

To do this it was enough to substitute a loom arranged with Banana thread for one with cotton at which a girl of 14 or 15 years old was working ; afterwards a frame of *Sanseviera* thread was substituted. The girl went on with the work as readily as with the cotton.

He points out that even if cotton is used as warp the use of Banana fibre saves 50 per cent, and that China would take as much thread and cloth as could be made, besides what the Indo-Chinese natives used.

The French colonies produce hardly any cotton so that France has to buy 200 millions worth of raw cotton each year.

One banana stem gives about a square yard (one metre square) of complete cloth, and nine grammes of *Sanseviera*, furnish a cloth of 33 centimeters long and 40 centimeters wide.

The fibre is prepared in the following way.

However carefully one defibrates an aloe, *Sanseviera* or many kinds of Banana, it always happens that the fibres although clean and white are not equal in thickness which is very inconvenient for weaving. To equalise them the following method is necessary. Take a large bundle of fibres and roll it into a ball. Put this into a wooden mortar and pound it gently with a wooden rice-pestle turning it over and over, and opening the ball so as to pound it all through. Very soon the fibres are well divided up and quite equal in thickness throughout. In the case of aloes and *Sansevieras*, the fibre can

then be combed with a fine comb, but as Banana fibre is too long for this, it is not possible to do this with it.

Then taking the bundle, tie it across in two or three places, if of Banana fibre, half its length, if of aloe or *Sanseviera*. A weight is then tied to the base of the bundle, to prevent the fibres getting twisted together during the work. The spinner is supplied with a basket and a bowl of rice water, i.e. water in which rice has been boiled. The bundle of thread and bowl are put on the right, the basket on the left. She takes two or three threads dipping the thumb and first finger in the rice water and twists the ends together, drawing them two fibres across the right knee. The thread is then curled round in the basket to dry in similar manner the free end is joined to another thread. The Chinese women and girls are so accustomed to this work that it only takes a few seconds to join the fibres. The threads then formed are put on the spindles as is done with cotton.

H. N. R.

GETAH GERIP FROM PULAU JERAJAH.

During last year Dr. Mugliston, Senior Medical Officer, Penang reported to the President Councillor there that he had prepared samples of a Rubber obtained from Rubber-vines growing on Pulau Jerajah, the leper Island, near Penang and that some Penang buyers regarded the samples as Rubber of the first quality.

By direction of the Resident Councillor I visited the Island and was shewn a vine then in flower which proved to be *Willughbeia firma*, the well known "getah gerip."

From the several incisions I obtained a small quantity of latex but this failed to coagulate with the only agent I had with me viz., acetic acid. (I understood Dr. Mugliston coagulated his samples by raising the temperature of the latex. The latex *exuded* much quicker from the blow of a large heavy knife than from an ordinary tapping instrument, and runs off fairly clean, leaving very little latex to coagulate on the bark (*practically nil*).

I was told there were several vines on this little Island. What I saw did not exceed $3\frac{1}{2}$ inches in diameter and I was not fortunate enough to find any seedlings which it was suggested might be abundant. It is however interesting to record an isolated place where the plants are not likely to be exploited.

Dr. Mugliston's' samples were prepared in biscuits, cups, and lumps. These were exhibited at the Kuala Kangsar show last year without success, in the class for Jungle Rubbers. Subsequently through the kindness of the Director of the Royal Gardens, Kew, the following report was obtained from Messrs. Lewis & Peat.

6, Mincing Lane, London, E. C.,
17th June, 1908.

To the Director, Royal Botanic Garden Kew.

Dear Sir,

We have carefully examined the sample of rubber you handed us this afternoon.

The biscuits are very dark and rough, but fairly strong and in good condition, worth about 3/- per lb.

The Nuggets, are clean and in good condition, but cut wet and very spongy, value about 1/9, 1/10 per lb.

The scrap is ordinary black illshapen lumps, also cutting spongy and wet and shewing a few pieces of bark and grift, worth about 1/6, 1/8 per lb.

The best form to send this rubber in would be as Biscuits, but a little more care should be taken in the preparation.

In the sample they are very uneven, and evidently not properly rolled; we think they have probably been exposed to the air and sunlight causing discoloration. (Signed) Lewis & Peat.

Note.—The rubber, except when at the Kuala Kangsar show was not exposed to the light. It is obvious from the wet and spongy condition spoken of such rubbers should be throughly smoked, and if prepared in biscuit form would very likely command a higher price as native collected getah gerip is usually exported large halls which are impossible to smoke efficiently.

R. Derry.

EXPORT OF RUBBER FROM BRAZIL IN 1907.

The following figures comparing the export of rubber from Brazil in 1907 with that in 1906 are quoted by the "Tropenpflanzer" from the "Brazilian Review."

1906

Quality.	Quantity. *In lbs.*	Value f.o.b. *In milreis.*
Seringa-fine	34.050.709	117.787.762
Seringa-entrefine	6.438.542	19.829.784
Seringa-Sernamby	18.265.790	36.249.194
Seringa-Caúcho	10.243.675	20.023.559
Seringa-Miscell.	616.847	1.668.826
Total Seringa (Para)	69.615.563	195.559.125
Massarandula Balata Gum		
Mangabeira	1.437.125	2.326.591
Manicoba (Ceara)	5.859.715	12.398.835
Grand Total	76.912.403	210.284.551
Grand Total in tons	34.336	

1907

QUALITY.	QUANTITY.	VALUE f.o.b.
	In lbs.	*In milreis.*
Seringa-fine	37.264.246	121.464.307
Seringa-entrefine	6.742.850	20.016.334
Seringa-Sernamby	17.123.964	34.920.789
Seringa-Caucho	11.254.964	24.465.903
Seringa-Miscell	1.055.872	2.917.540
Total Seringa (Para)	73.441.896	203.784.873
Massarandula Balata Gum	385	700
Mangabeira	1.492.123	2.203.583
Manicoba (Ceara)	5.343.092	11.515.132
Grand Total	80.277.496	217.504.288
Grand Total in tons	35.838	

There is an increase, therefore, in the total export in 1907 of 4·4 per cent or about $\frac{1}{23}$. There is proportionately greater increase in Para; the 69,615,563 lbs., or 37,108 tons, of 1906 grew to 75,441,896 lbs., or 33679 tons, in 1907, that is, increased by 8·4 per cent or about $\frac{1}{12}$. The returns of the Director of Agriculture F. M. S. show that the export from the Malay Peninsula in 1907 was 2.278.870 lbs., or 1017 tons that is $\frac{1}{35}$ of the total and $\frac{1}{32}$ of the Para export from Brazil.

The increase in value did not keep pace with that in quantity. The value of the 1907 product represents 3·4 per cent of an increase on the 1906 value.

The "India Rubber World" gives the Brazilian exports in kilograms for each of the last five years: the quantities are here turned into lbs.

	1903	1904
	lbs.	*lbs.*
Para (incl. Caucho)	64.501.041	62.342.853
Ceara	3.788.167	4.897.369
Mangabeira	1.455.478	1.881.457
Total	69.744.686	69.121.679

	1905	1906	1907
	lbs.	*lbs.*	*lbs.*
Para (incl. Caucho)	70.561.227	69.614.600	73.441.898
Ceara	5.900.877	5.860.800	5.343.092
Mangabeira	1.401.639	1.437.125	1.492.123
Total	77.863.743	76.912.525	80.277.113

The export in 1907 was 15 per cent or $\frac{3}{20}$ greater than that of 1903. During the five years the exports of Ceara increased by 41 per cent, those of Para by 13½, Mangabeira by only 2½.

The exports in 1906 and 1907 were distributed among foreign countries as follows:

1906

	Quantity.	Value.
	In lbs.	*In milreis.*
U. S. A.	36.848.787	101.517.262
Great Britain	27.329.740	72.613.947
France	6.783.280	20.668.379
Germany	5.021.071	13.157.196
Belgium	266.189	732.755
Uruguay	652.986	1.560.213
Argentina	10.351	34.799

1907

	Quantity.	Value.
	In lbs.	*In milreis.*
U. S. A.	36.984.752	100.076.756
Great Britain	31.577.994	83.215.943
France	5.513.554	16.800 301
Germany	5.128.745	13.991.199
Belgium	39.195	93.585
Uruguay	1.007.179	2.640.484
Argentina	24.620	82.953

The above does not include 385 lbs., of "Massaranduba gum" shipped in 1907 to Great Britain: the imports of Uruguay and Argentina are exports sent down the Plate River.

The export to Great Britain shows a substantial increase of 15½ per cent. The imports of the U. S. A. and Germany are slightly increased, and those of France and Belgium decreased.

W. J. G.

A CAMPHOR PEST.

An account of an insect attacking the camphor trees in Perak is published by Mr. Jacques Surcouf in the Journal D'Agriculture Tropicale, June 1908, page 186.

The sample of leaves and insects were sent by M. Geraud of Papan, Perak, to the Colonial laboratory of the Museum (presumably at Paris). The insects were identified by M. Heylaerts as one of the Psychodidæ, *Eumeta Hekmeyeri*, Heyl. The caterpillar fixes itself on the lower side of the leaves and eats the parenchyma, cutting out circles which it winds round the lower part of its body so that the animal appears to be inclosed in a flower or little pagoda. The caterpillar in pupating spins a ccocoon which in the males is furnished with a

prolongation to allow the pupa to move about. The male moths are black or brownish, and are very eager in searching for the females which are wingless and do not leave the coccoon.

The author says that though the Psychodid moths have never caused great damage, it must be remembered that the fields of the Lozere (France) were ravaged by an insect of this group. All the same every planter or gardener here knows too well these troublesome little insects which are as pestilential a group as one can meet. Protected some by silken cases, others by little hat shaped cases made of bitten-out leaf or sticks, and usually attacking a tree in great numbers, they are most difficult to exterminate as no insecticide affects them directly and handpicking is often the only remedy.

H. N. R.

MINUTES OF A GENERAL MEETING OF THE PLANTERS' ASSOCIATION OF MALAYA.

Held at 8.30 a.m., on July 19th, 1908, at the Ipoh Club, Ipoh.

Present. For the M. P. A. A. Mr. D. Ritchie, Mr. Thos. Boyd, Mr. A. Crawford. For the Perak P. A. Mr. Alma Baker, Mr. C. L. Gibson, Mr. J. I. Philips, Mr. H. S. Whiteside. For the Kuala Lumpur D. P. A. Mr. H. C. E. Zacharias. For the Batu Tiga D. P. A. Mr. H. F. Browell, Mr. H. L. Jarvis, Mr. P. W. Parkinson. For the Klang D. P. A. Mr. R. W. Harrison, Mr. J. Gibson. For the Kapar D. P. A. Mr. H. M. Darby. For the Kuala Langat D. P. A. Mr. E. Valpy.

CHAIRMAN :—MR. R. W. HARRISON.

SECRETARY :—MR. H. C. E. ZACHARIAS.

I. The notice convening the meeting is read.

The Minutes of the previous meeting, having been printed and circulated, are taken as read, confirmed and signed.

RUBBER EXHIBITION.

II. The Secretary reports the progress made with the arrangements for the forthcoming International Rubber Exhibition in London.

The number of exhibits, so far forwarded, being disappointingly small, it is resolved to appeal for some more exhibits to all Estates in bearing that have not yet sent in exhibits. The Secretary is likewise instructed to write to the R. G. A. in London, requesting them to ensure that Home Companies, so far not yet represented, send in exhibits and help to make the display as representative a one as possible.

It is further decided to ask Mr. L. Wray to see that all Lectures and Conferences, which are to be a special feature of the Exhibition, be properly and extensively reported ; and that such reports be printed and made available for circulation among all Members of this Association.

The Secretary having reported a very serious shortage in the funds at his disposal, Mr. C. L. Gibson remarks that the Perak P. A. are moving in the matter and hope soon to have their collections together.

It having been pointed out that the Ceylon Government are spending £1,200 on this Exhibition, the meeting resolves to submit to the Governments of the S. S. and F. M. S. that their contribution do equal this sum, and that Government lend, for decorative purposes, museum and other specimens characteristic of the Malay Peninsula, such as native manufactures, trophies, etc.

Benevolent Fund.

III. Mr. J. Gibson submits the report of the Select Committee on the Constitution of the Benevolent Fund and the proposed Rules drawn up by them. (*Vide* Appendix).

Resolved that these Rules be printed and circulated, and be brought up at the next Meeting of the Association.

The Liquor Question.

IV. Mr. Valpy, in introducing a motion to prohibit the consumption of liquor other than unadulterated toddy and beer to Tamils, enumerates the objections that might be made against such a measure. It was race legislation, certainly, but such existed already, as for instance the Gaming Enactment, which specified Chinese as a race as the only persons permitted to gamble at the Farmers' establishments. As for improving the quality of the gin and "port wine" sold at present, there was the difficulty of analysis, and consequently of detecting and punishing evasion of the law. A further objection had been made by pointing out that the D. O. had already discretionary power to create new and cancel old licenses; but to deal with this question by administrative rather than legislative measures seemed too vague to be really and universally effective. As for limiting the liberty of the subject, they should remember that the taste was an acquired one, and that before their arrival in this country none of their Tamil coolies had ever known gin. There would of course be a certain loss of revenue, but the improvement in the health of the coolies would be most marked, and police and legal charges considerably reduced, as 99 out of 100 quarrels of their coolies—be they of a criminal or merely civil nature—originated at the gin-shop. Both the State Engineer and the State Surgeon of Selangor had written to him heartily approving of the proposed measure, and he had no doubt that it would also receive the unqualified support of the Government of Madras. Tinkering with the question by merely restrictive measures, as to area, quality and such like, was of no use, and he urged the meeting to pass the resolution as it stood.

Mr. Parkinson seconds the motion and suggests that the words be added "and that no liquor be sold to Tamils on credit."

Mr. Browell supports the motion and the amendment, and informs the meeting that in his district Chinese liquor shops always insist on cash, but that Tamil licensees usually give credit, sometimes for more than a year. He knew that this credit system was the cause of many coolies bolting.

Mr. Zacharias suggests the use of the words "Tamil labourers" instead of "Tamils."

These two amendments, having been accepted, are incorporated in the original motion, which now stands as follows :—

"That Government be requested to prohibit the sale to Tamil labourers by spirit licensees of liquors other than unadulterated toddy and beer; and that no alcoholic liquor of any description be sold to Tamil labourers on credit."

This proposal is then put to the meeting and carried unanimously.

White Ants.

V. The Secretary reads out the following :—

"Extracts of Minutes of the M. P. A. Association's General Meeting held on 12th May, 1908 :—

The Chairman proposes that the following motion be forwarded to the Secretary, Planters' Association of Malaya, asking that same may be discussed at their next general meeting :

'That the Planters' Association of Malaya approach Government requesting that a reward be offered to such person as shall satisfy the Government of an approved method of exterminating white ants.'

The Chairman suggests that the different Planting Companies should give voluntary contributions, and that Government be asked to subscribe the balance of whatever amount it was decided to offer.

Discussion ensues, the Chairman suggesting that for a really reliable remedy the sum of £5,000 would not be too much."

In the absence of the Hon. J. Turner, Mr. Boyd formally proposes this motion.

Mr. Darby, in seconding the motion, thinks it would be advisable to find out first whether the Government would join in such a scheme.

Mr. C. L. Gibson remarks that the remedy must not only be effectual but also cheap.

The Secretary reads out two offers already received : one from Mr. West of Peradeniya, and one from Mr. Cox of Alor Pongsu.

Mr. Harrison thinks that this reward is only one way, but that there is also another one of getting at this problem, viz., by asking Government to second one of their Scientific Officers for one year to do nothing else but study the life history of Termes Gestroi.

Mr. Parkinson would like to specify Mr. Pratt on account of his valuable services in the past, and he was also not in favour of limiting the time at the disposal of such officer to one year only.

After some general discussion, the following resolution is then agreed to :—

"That, seeing the vital importance to the Agricultural Industry of the Malay Peninsula of discovering effective means of eradicating the white ant pest, this Association submits to Government :—

"*a.* That a reward be offered jointly by the Governments of the S. S. and F. M. S. and by the Planting Community to such person as shall satisfy the Government of a cheap and effective method of exterminating white ants.

"*b.* That a member of the Government Scientific Staff be seconded for the exclusive study of the life history of Termes Gestroi and the best method of dealing with his pest."

This is proposed by Mr. Harrison, seconded by Mr. Gibson and carried unanimously.

REPATRIATION OF UNFIT IMMIGRANTS.

VI. The Secretary reads the following letter from the Superintendent of Immigrants, S. S. and F. M. S.:—

SIR,

I have the honour to inform you that the attention of Government has been drawn to the fact a certain proportion of the Tamil coolies now being brought over from India by kanganies are of poor physique and consequently becoming a burden on the community after arrival.

2. I am instructed to enquire if the members of the Planters' Association of Malaya are prepared to make arrangments by which employers of Tamil labour should be made responsible for the cost of repatriation of such of their coolies as become incapacitated for work within a definite period after arrival in the country.

3. It is obviously not to the benefit of planters that coolies who are unable to earn their living should be introduced into the country, but at the same time there is no desire to place restrictions on recruiting of labour by kanganies.

4. I would therefore ask you to bring the question before the members of your Association at an early date, with a view to ascertaining whether the matter can be dealt with without special legislation.

I have, etc.,

(Sgd.) L. H. CLAYTON,

Supdt. of Imm. S. S. & F. M. S.

THE SUPERINTENDENT OF IMMIGRANTS, S. S. & F. M. S.,

Penang, June 20th, 1908.

SIR,

I have the honour to acknowledge receipt of your letter P. O. L. 767 of the 18th instant which I will lay before my Association at their next meeting on the 19th prox.

I have, etc.,

(Sgd.) H. C. E. ZACHARIAS,

Secretary.

Mr. J. Gibson says there is no doubt there are a number of undesirables at present in this country, and this Association should now most decidedly assist the Government in repatriating them. Prevention, however, being better than cure, he would suggest that all coolies be medically examined at Negapatam before being allowed to proceed to this country.

Mr. Parkinson is afraid that this medical inspection will very seriously interfere with kangany-recruiting. As a matter of fact, only very few unfit *free* labourers were coming over; but when they did, the expense of repatriation should be borne by the recruiting kangany.

If of course a cooly originally fit became unfit later on during his service, the Estate, was properly to be charged with the expenses of sending the man back to his country.

Mr. C. L. Gibson supports Mr. Parkinson and deplores any further Government interference with their recruiting. He also thinks that medical examination at Negapatam will materially enhance the cost of recruiting.

Mr. Jarvis feels sure that the majority of unfit coolies are not free estate coolies but Government-recruited men. The most unfit physically were the Malayalams, Moslems and others, with the immigration of which classes Government had experimented during the past year.

Mr. J. Gibson then proposes that the repatriation expenses be borne by the Immigration Fund, but fails to find a seconder.

Mr. Boyd all the same favours previous examination at the Coast.

Mr. Harrison thinks that the whole question refers more to the past, when there was a constant shortage of labour, and that it is one not likely to be of any importance for the future, when labour is becoming so plentiful that importers can begin to pick and choose. He would take this opportunity of urging planters to stop paying excessive commissions for recruiting. Nobody now-a-days need pay more than $10.

Mr. Darby states that his kanganies never get more than $1 for every cooly recruited, and he believes that the excessive commissions just referred to by Mr. Harrison are usually charges made by the professional recruiters, who are not generally resorted to by planters at all.

Mr. Harrison then proposes that repatriation expenses be borne by the respective importers.

Mr. Darby, in seconding this proportion, suggests that all members be also circularized and asked to discourage immigration of unfit coolies.

The motion is then put to the meeting and passed.

Compensation Under "Prevention of Diseases Enactment."

VII. The Secretary reads the following letter from the Agents, Bukit Panjong Estate:—

Klang, 6th June, 1908.

Dear Sir,

We shall be obliged if you will lay the following facts before your Association and request them to represent to Government the necessity of altering the present legislation with regard to the destruction of property under the "Prevention of Diseases Enactment."

On 2nd March last a death occurred on Bukit Panjong Estate which was reported, by the, clerk on the Estate, to the dresser at Kuala Selangor as a case of cholera. It would appear that the dresser accepted the clerk's version of the cause of death, and the District Medical Officer was sent for. It was afternoon on the following day (3rd instant) when the Medical Officer left Klang: consequently he could not have reached the Estate until nearly 24 hours after the death had occurred.

The deceased cooly was not a new arrival, but had been on the Estate a year or more, and meanwhile no further cases of sickness had occurred, nor were there any signs of fear amongst the coolies. No post mortem examination was held, and the symptoms as described to us were not those of cholera, yet on arrival the Medical Officer diagnosed the case as cholera, and ordered the destruction not only of the set of lines in which the dead cooly had lived, but also another set of lines situated about 28 yards away.

This we look upon as reckless destruction of private property without any adequate justification, and we represented the matter to Government and claimed compensation, which, however, was refused.

We subsequently consulted our lawyers, who, however, advise us that nothing is to be gained by taking proceedings against Government and that the only possible redress is to sue the Medical Officer for damages; but even then, in order to obtain compensation, we should have to prove malice, which, of course, we do not suggest.

It appears to us that a law which authorises a Government Officer to thus order the destruction of private property requires amendment, and we hope your Association will see its way to take the matter up.

Yours faithfully,

p. p. WHITTALL & Co.,

(Sgd.) F. O. SANDER,

Agents.

Mr. Parkinson gives some more details of the case, and says that the prevalent idea in the District was that the man died of drink. No *post mortem* was ever held, but the lines were burnt all the same, and all the occupants had to camp for the night in the open, huddled together without protection.

Mr. J. Gibson thinks that the Medical Officer must have undisputed discretionary power to deal as he thinks necessary, and deprecates any attempt at restricting such discretion

Mr. Browell says that it seemed clear that a mistake had occurred on that occasion, and that proper measures had not been taken to ascertain the facts of the case. The Medical Officer clearly had lost his head; still the principle of absolute discretion of the Medical Officer in cases like these could not be tampered with.

Mr. Parkinson is afraid that the previous speakers had somewhat misunderstood the drift of his remarks. He did by no means suggest that the powers of a Medical Officer be restricted, but he did think that theirs was a case fully deserving compensation at the hands of Government.

The discussion then became general, Mr. Parkinson eventually proposing.

"That the Government be requested to grant compensation for any private property the destruction of which may have been ordered by a Medical Officer under the 'Prevention of Diseases Enactment.'"

The motion, being seconded by Mr. Harrison, was put to the meeting and carried by 13 votes to 2.

Bolting of Coolies.

VIII. Mr. Browell proposes: "That this Association appoint a commission to go into the question of bolting by coolies, with the idea of that commission subsequently reporting to Government on the matter."

He states that the grievance is one of the oldest, but no improvement seemed in sight. In the past most bolters had gone to Railway and P. W. D. Works; now they went to work on other Estates.

Mr. Jarvis, in seconding the motion, thinks it would be a good idea if provision were made so that no cooly could take up a new job without reporting himself first to the Assistant Superintendent of Immigrants.

Mr. Darby rather favours a private Registration scheme.

Mr. Parkinson thinks it unnecessary to discuss the various schemes now. He would prefer to leave the commission to go into all this.

Mr. C. L. Gibson reminds the meeting that the system of Discharge Tickets had once already been submitted to Government who, however, had most categorically refused to entertain any such proposition.

Mr. Browell adds to his motion "that this commission consist of the Chairman and Secretaries of all constituent Associations, that such commission formulate a scheme and submit same to the next meeting of the P. A. M."

Mr. Darby, in seconding the motion, suggests that the first meeting of the Commission be held during the forthcoming Agri-Horticultural Show at Kuala Lumpor.

The motion is then put to the meeting and carried unanimously.

Alteration of Rule 5.

IX. Mr. Jarvis proposes and Mr. Browell seconds: "That in Rule 5 the words and 'shall be declared at the Annual Meeting in April' be deleted, and the following substituted: 'and new members shall enter the Association after the Report for the past year has been received at the annual meeting.'"

The proposer having shortly explained his proposition, which is only to make Rule 5 more explicit, the motion is put to the meeting and carried unanimously.

Indian Immigration Fund Bill.

X. The Secretary reads the following letter received from the Hon. Secretary of the Kapar D. A. A.:—

Klang, 5th July,

Dear Sir,

"At a recent meeting of the K. D. P. A. the following resolution was made, and I am directed by my Committee to ask you to bring it up at your next meeting.

"That in the opinion of this Association the terms of assessment of the Tamil Immigration Fund Bill at the present time are not equitable and should be amended, so that the employers of labour should pay only on the number of coolies actually recruited in any one year,

either locally or from India, and not on their total labour force. And that the P. A. M. be asked to approach Government to have this amendment made before the Bill becomes permanent at the end of the current year."

Yours faithfully,

(Sgd.) N. C. S. BOSANQUET,

Hon. Sec., K. D. P. A.

Mr. Darby, in formally proposing this motion, says that the present Bill is anything but equitable, and especially points out the injustice of making estates in the F. M. S. and S. S. pay the same amount of cess. The S. S. for instance were still without any export duty, which bore heavily on F. M. S. Estates, although the latter were mulcted also in a variety of other charges, such as for hospital and drainage. In his case, with an output of 200,000 lbs., of rubber, he had to pay about 2¾ cts., on every pound for labour cess, hospital and drainage assessment. His real motive, however, in bringing forward the motion was to elicit from the Chairman a statement of what the intention of the Government was as regards a rebate of the cess.

Mr. Browell seconds the motion.

Mr. Harrison considers the proposer very ill-advised to bring this matter forward at the present time. The Immigration Fund Scheme had only worked for about six months, but already it was clear that it had proved an unqualified success. Speaking for Selangor, he knew that this State was already simply flooded with labour.

That, as the Bill stood at present, there was an inequitable incidence, was recognized by everybody, and it was likewise settled that some rebate would be granted. But when, how much, and in what form this rebate would be given it was impossible to say at this time. The accounts for even the first quarter had not yet been completed, but he might tell them that the F. M. S. R. and P. W. D. for that period alone had contributed more than $30,000.

To clamour for an abrogation of the Bill, he considered absolutely fatal. Their position was all right now, but let, for instance, Ceylon start on similar lines, and the Peninsula would be as badly off again as ever it was. If Ceylon put their house in order, they would prove far more attractive a country to prospective emigrants from Southern India that ours could ever be. The only chance they had, was to keep constantly well ahead in their attractions and facilities, and ensure that absolutely sure and constant flow of labour into the Peninsula, on which the future of agriculture in these parts depended.

Mr. Parkinson thinks that, since it is settled that the measure will be altered at the end of the year, the present discussion is distinctly premature.

Mr. J. Gibson disagrees with the last speaker and thinks that, if they are to make their voice heard, they must start discussion in good time.

Mr. C. L. Gibson reminds the meeting that this Asssociation has already been told by Government that the whole subject is entirely in the hands of the Immigration Committee. He takes it that all that

Mr. Darby's motion really aims at is to ensure that before the present Rules are changed, this Association have an opportunity of fully discussing them.

Mr. Darby then withdraws his motion and substitutes the following:—

"That this Association be given an assurance that an opportunity will be given for full discussion of the I. I. F. Enactment before it is made permanent at the end of the year."

This motion is thereupon seconded by Mr. J. Gibson and passed unanimously.

XI. The Secretary reads a letter from the Hon. Secretary of the forthcoming Agri-Horticultural Show in Kuala Lumpor *re* entries and other arrangements made.

Resolved to ask the management that the judging be done by numbers, and not under the name of the exhibitors.

XII. A letter from *In Tinland re* publication of a paper devoted to the Rubber Industry; and a letter from the Consul of Belgium *re* International Exhibition at Brussels in 1910, are laid on the table.

Loans to Planters.

XIII. Mr. John I. Philips proposes:—

"That the Resident-General be requested to issue a complete statement regarding the conditions regulating the issue of loans to planters, and that to the various statements, already published, the following provisions be added:—

1. That the vote be *unlimited*.
2. That no loans be granted to public companies.
3. That no loan be made on account of any area not under cultivation at the present time.
4. That on all valuation made by the Officer deputed, and which shall be final, a loan of 25% be granted, but that the property be revalued at the end of every year, until the loans become repayable.
5. That no loan or part of a loan be devoted to any other purpose than that of maintenance."

Mr. Philips having shortly introduced and explained this motion, it is seconded by Mr. Valpy and passed unanimously.

Labour Enactment.

XIV. Mr. Harrison says that his attention has been drawn to the result of coolies being sentenced to imprisonment under Enactment 16 of 1904 (Selangor Series). Under this Enactment a magistrate may order an absconding labourer, after serving his sentence, to return to work on the Estate. This order, however, was rarely carried out, as at present there was nobody taking charge of the coolie on his discharge from gaol. He therefore proposed:—

"That the Residents of the Federation be asked to instruct the Police to return to the Estate any coolies on their being discharged from gaol; the expenses of such re-transportation to be borne by the Estate."

This motion having been seconded by Mr. Parkinson, is passed without discussion.

XV. Mr. Alma Baker wishes to know the position created by coolies bolting from Government Hospitals.

Mr. Jarvis thinks it injudicious to open this question, as the obvious reply of Government would be to ask the complaining Estate to erect its own hospital.

After some further general discussion, Mr. A. Baker withdraws the subject.

XVI. The date of the next meeting of the Association is then fixed for Monday, October 5th, 1908 at 10.30 a.m., at the Chamber of Commerce, Penang.

The Meeting terminates at 11.30 a.m.

H. C. E. ZACHARIAS.

Secretary.

APPENDIX.

P. A. M. BENEVOLENT FUND.

I. The Committee shall consist of the Chairman and Secretary of the P. A. M. (or such other body as may succeed it) and the Hon. Secretary and one other Member of each District Association together with 5 members (not necessarily planters) to be nominated by the Chairman P. A. M., and 8 members shall constitute a quorum.

II. The Meetings of this Committee shall be called by the Chairman P. B. F., on requisition by 3 members.

III. Ten days notice shall be given of any meeting, and the business to be transacted at such meeting shall be stated on the notice paper and particulars of cases for which assistance is asked shall be in the hands of the Secretary 20 days before the meeting at which the cases are to be considered.

IV. Subscriptions will be received and acknowledged by the Secretary.

V. The following shall be entitled to assistance from the Fund :—

(*a*). Proprietors, Managers and Superintendents of Estates on payment of an annual subscription of $10 to the Benevolent Fund.

(*b*). Assistant Superintendents of Estates (*i.e.*, any Assistant drawing a salary from an Estate) on payment of an annual subscription of $5 to the Benevolent Fund.

(*c*). A Donor of $100 to the Benevolent Fund, or an annual subscriber of $20 for 5 years, will be welcome as a Patron, and have a copy of the Proceedings of the Standing Committee and Statement of Accounts of the Fund rendered to him, and such donor or his family shall be entitled to assistance from the Fund if in need of such. Should such sum of $100 be subscribed by the proprietor of an estate on behalf of the estate, then the Superintendent shall be entitled to assistance from this Fund if in need of such during the life and ownership of the donor.

(*d*). Members of the Planting Committee or their families, other than those qualified under (*a*), (*b*), (*c*) above, may receive assistance from the Fund only by the unanimous consent of a meeting of not less than three-fourths of the members.

VI. Three Trustees shall be appointed by the P. B. F.

VII. The Secretary may with the sanction of two of the Trustees give temporary relief in case of emergency.

VIII. The Standing Committee has the right to refuse any subscriptions.

The following Rules are for the guidance of the Standing Committee :—

(*a*). No assistance to be given to any planter or any member of his family unless he has subscribed under the regulations mentioned in 5 above, except as provided for 5 (*d*).

(*b*). No planter or member of his family to be admitted as an applicant for assistance until Form A (copy annexed) is filled up and vouched for by two friends.

(*c*). No funds to be given to any one who is or has been within the twelve months preceding the application addicted to intemperance; relief may be extended to such a one, his widow, wife or children, if the Standing Committee consider them worthy of assistance, but the Fund is not established to relieve such cases.

(*d*). The Fund is not intended to provide an annual income for any one but to give temporary assistance in deserving cases in time of sickness, as well as from impecuniosity brought about by such other causes to be satisfactorily explained, when the Committee may vote a sum towards the passage or change necessary for the applicant. The Fund shall also be available to provide a widow, wife or children, or any one dependent on the applicant, with means to return to their homes and for their support for a reasonable time.

(*e*). It shall however be competent for any one in distress to apply for further relief, and the Standing Committtee may render such assistance if the funds are sufficient to meet the deserving cases of first applicants.

(*f*). The Standing Committee may make temporary loans to distressed planters or those dependent on them, taking security or not, as the case may require, which should be done if the applicant is only temporarily unable to earn a livelihood, and yet likely to be able to repay the loan at some future date. Such loans may bear such rate of interest as the Standing Committee think advisable.

(*g*). The available capital funds under the control of the Standing Committee may be invested at the discretion of the Trustees.

(*h*). The Standing Committee of the Planters' Benevolent Fund shall have power to consider and deal with all cases not provided for in the foregoing regulations, and shall have the power to alter and amend any rule and to make new rules at a special meeting to be called for that purpose.

FORM A. REFERRED TO.

Name and address for whom application is made.
Name and address of friends supporting the same.
Names and members in district party resides supporting the same.
Reason of application.
Age of all parties for whom assistance is sought.
How long in distress.
Position of applicant, or widow and children, if for their relief.
Salary of applicant, or deceased, for the past five years.
Family dependent on him.
Cause of losing property.
Cause of losing situation.
Certificate of health of the invalid from a medical officer.
Whether of temperate habits.

BATU TIGA DISTRICT PLANTERS' ASSOCIATION.

The general meeting was held July 1908 and the following are the minutes of a general meeting of the above Association held at 4 p. m., on the 25th ult., at the Rest-House, Batu Tiga.

PRESENT.

Seafield Estate.	Mr. H. R. Quartley.
Sungei Way Estate.	Mr. A. C. Corbetta.
Seaport Estate.	Mr. H. L. Jarvis.
Damansara Rubber Co.	Mr. H. F. Browell.
Glen Marie Estate.	Mr. H. E. G. Solbé.
Ebor and Sungei Nebong.	Mr. F. H. Staples.
Pilmore Estate.	Mr. C. Stephens.
Ashbourne Estate.	Mr. C. Henly.
Chairman.	Mr. H. F. Browell.
Hon. Secretary.	Mr. H. L. Jarvis.

SUBSCRIPTION.

The Estimates for the current year are submitted.

Mr. Henly proposes, and Mr. Corbetta seconds, that the subscription per vote for the current year be $30.

The Estimates are declared passed as follows :—

EXPENDITURE.

To P. A. M. Subscription	$400
Postages, and Stationery	25
Surplus	145
	$570

REVENUE.

By 19 Votes at $30	$570
	$570

Postal Service.

Mr. Browell says that needless inconvenience and delay are caused by the late closing of the up mail, and proposes that the Superintendent of Posts and Telegraphs be asked that a mail bag be made up to go by the 9.10 up train from Batu Tiga daily.

Mr. Jarvis seconds this, and other members having drawn attention to inconvenience caused by the late closing of the mail, the motion is carried *nem. con.*

Bolting Coolies.

Mr. Jarvis says he understands that many planters besides himself have suffered great losses by bolters. He does not suggest that any particular method of stopping the evil be put to the P. A. M., for, were a Commission appointed, they would naturally go into all the phases of the question very closely. He thinks a step in the right direction would be gained if coolies had to report to Assistant Superintendents of Immigration before taking on a new job, instead of the system obtaining at present by which the new employer has to send in the name after the cooly is engaged, this information being generally unreliable.

Mr. Henly says this is a step towards cooly registration, which he would like to see adopted entirely.

Mr. Corbetta says he would like to see the word "knowingly" left out of the last paragraph but one in Enactment No. 1 of 1907, as this would make the employer much more careful in taking on straying labour than at present.

Mr. Solbé says he does not believe in much legislation for the cooly, and that the responsibility should be made to rest more heavily on the employer.

Mr. Jarvis proposes, and Mr. Staples seconds. "That this Association urges the P. A. M. to appoint a Commission to go into the question of bolting by coolies, with the idea of that Association subsequently reporting to Government on the matter."

The motion is put to the Meeting and carried unanimously.

Telephones.

Mr. Jarvis says that, though complaints have been rife during the past few months regarding the Telephone Service, nothing appears to have been done to improve matters, and he proposes "that the attention of the Superintendent of Posts and Telegraphs be drawn to the very unsatisfactory state of that Service."

Mr. Browell seconds the resolution, which is carried *nem. con.*

London Rubber Exhibition.

The Chairman draws attention to the notices sent round inviting subscriptions for the coming London Rubber Exhibition, and expressed a hope that all Estates in the Association will come forward to support the Exhibition, from which the planting community are certain to derive great benefit.

With a vote of thanks to the Chair, the Meeting terminated at 5 15 p. m.

H. L. Jarvis

Hon. Sec.

JOHORE PLANTERS' ASSOCIATION.

Minutes of the Annual General Meeting of the Johore Planters' Association, held at the Johore Club, on July 23rd, 1908.

Present : Mr. A. S. Buyers, (in the Chair.); Messrs. Arden Burgess, Bryce, Gawler, Schirmer, Verterdal, Wallace, Malet, and J. A. le Doux, Brown.

1. The minutes of the Extraordinary General Meeting of June the 7th, were read and on the motion of Mr. Malet seconded by Mr. Buyers were confirmed.

2. The Report of the Committee for the year 1907-1908, was taken as read and the accounts were passed subject to the audit to be conducted by Messrs. Arden and Bryce.

3. A letter was read from the Chairman of the Association (Mr. F. Pears) regretting his inability to be present at the meeting and announcing his intention of not standing again for chairman.

4. The election of officers of the Association for the year ending March 31st 1909, resulted as follows :—

Hon. President—H. H. The Sultan ; Chairman—Mr. A. H. Malet; Vice-Chairman—Mr. A. S. Buyers ; Secretary—Mr. W. N. Gawler ; Committee—Messrs. Bryce, Arden, Burgess, Westerdal, Wallace and Diack.

Delegates to P. A. M., Messrs. Buyers and Bryce.

Previous to the election of the committee Mr. Buyers proposed and Mr. Arden seconded a motion that the committee consist of only 6 elected members, in addition to the ex-officio members. Carried.

Votes of thanks to the retiring Hon. President, Chairman and Secretary, concluded the formal business.

The chairman in thanking the members of the Association for electing him said he was sure that he was voicing the feeling of the meeting when he expressed regret at the decision of Mr. F. Pears not to consent to renomination as chairman but he hoped that the Association would still have the benefit of his valuable co-operation and advice.

In reviewing the work of the past year he thought that the members are first of all to be congratulated on the formation of the Association which if it served no other purpose at least enabled planters to make each other's acquaintance and compare notes on their work.

As regards their programme of work for the forthcoming year there were several matters that were to be brought forward for their consideration among these being the important question of the double assessment fee which was levied on all Tamil employing planters in Johore. As there was now such a plentiful supply of Tamil labour the tax of $10 per head should certainly be reduced to a more moderate figure especially as there could be no question of the F. M. S. Government being called upon to make good any deficiency on their guaranteed number of passages.

As the question of Javanese labour had been referred to in the report he would content himself by hoping in the near future Johore would come into line with the F. M. States whereby the supply of Indentured Javanese labour would be directly accessible to Johore planters.

In order to encourage the flow of capital into the country it behoved the Government to encourage planters by making the means of communication as good and easy as possible, also to get the Codified laws of the State translated and published in English in order that the intending planter might know something of the laws of the land in which he might invest his capital.

A vote of thanks to the chairman closed the proceedings.

W. N. GAWLER,
Honorary Secretary.

REPORT OF THE COMMITTEE.

TO THE MEMBERS OF THE JOHORE PLANTERS' ASSOCIATION :

GENTLEMEN,—

In presenting for your consideration the First Annual Report of this Association we congratulate you on the progress that we have been able to make during the year that has now come to an end. Nothing of a very eventful character has occurred and not very many important matters have been brought before you. In mentioning the business that has been transacted we will dwell as briefly as possible on the outstanding points of our past year's work congratulating you on the unanimity with which all our decisions have been arrived at.

1. This Association was formed at a meeting of Johore Planters held in the Johore Club on June 11th, 1907, His Highness the Sultan kindly consenting to be the First Honorary President and Messrs. R. Pears and Bryce to be Chairman and Vice-Chairman respectively. The former resigned his position on the return of his brother Mr. Francis Pears from Europe early this year and the latter on his departure to Europe in the autumn of last year. Thereupon Mr. Francis Pears was appointed Chairman and Mr. R Pears, Vice-Chairman.

2. During the year eight General and Committee Meetings have been held and have on the whole been well attended, the average at the former being 10 and at the latter meetings 6 members.

As our Members' Roll now totals 23 you will see that a fair amount of interest has been displayed in the business of the Association, taking into consideration the great distances that some of our members have to travel, if they wish to attend our meetings.

3. On October 19th, 1907, the Chairman (Mr. R. Pears) attended the Ipoh Conference which had for its result the formation at Kuala Lumpor on December the 1st of the "Planters' Association of Malaya" which is composed of delegates elected by each of the Local Associations and which focusses the opinion of Planters from all parts of the Peninsula. On this central body this Association is represented by the Chairman, Secretary and two elected delegates, the basis of representatives being 10 per cent. of the members of each local association with a minimum of 4 representatives.

Your delegates have attended each of the three meetings of the Central Association that have been held during the past year.

4. The following is a brief account of the business transacted by this Association during the year 1907-8 :—

(*a*) A Committee of 5 Members, *i.e.*, Messrs. R. Pears (Chairman), Buyers, Bryce, Burgess and Malet, was appointed to deal with the question of Tamil Labour and the result of their deliberations was placed before you in the Report written by the Chairman on the 27th July, 1907.

(*b*) Permission was obtained from the M. P. P. A. to use their machinery for the purpose of recruiting Coolies in India till the Immigration Ordinance should come into force.

(*c*) The Johore Government was asked to give a subsidy in aid of the Tamil Immigration Scheme so as to enable the Immigration Committee to lower the Assessment from $10.00 to the rate current in the F. M. S., *viz.*, $5.00 per head.

This the Government kindly consented to do and offered $5,000.00 annually for this purpose, but the contribution was not accepted by the Immigration Committee on the ground that the amount offered was not sufficiently large.

(*d*) The Johore Government was asked to endeavour to obtain a reduction of the rate of assessment but replied saying that they did not think it would be of any use to try and make any further alterations in the Scheme at the present time.

(*e*) The Johore Government was written to and invited to enter into negotiations with the Government of the Netherlands India in order to facilitate the importation of Indentured Javanese Labour into the State.

This request was not consented to by the Government but it was generally understood that the refusal arose out of no unwillingness to help the Planters but that at the time it was not desirable to anticipate any action in this direction that might be taken later on by the Straits Settlements and Federated Malay States' Governments on the lines of the Tamil Immigration Ordinance.

(*f*) The Government was asked to expedite the opening of the new railway line between Gemas and Rantau Panjang and promised that when arrangements had been concluded with the constructing engineers and the authorities of the Federated Malay States this would be done. We understand this portion of the line has now been opened as requested.

(*g*) A letter was written to Government asking that free license be granted to Planters permitting them to shoot, trap, or otherwise destroy all animals, birds, &c., that are destructive to crops.

In reply the State Secretary stated that this request had been duly submitted to His Highness the Sultan who had replied that he had already spoken to the Secretary on the matter and that such course as was then suggested by His Highness might be adopted.

(In conversation upon this matter His Highness said that he was of the opinion that no license was necessary and that Planters were not forbidden to take any such steps as they thought proper to protect their crops from the depredation of wild animals, birds, &c.)

Appended you will find a Statement of Assets and Liabilities; a Revenue Account and an Estimate of Income and Expenditure for the current year.

For the Committee,
F. PEARS,
Chairman
W. N. GAWLER,
Hon. Secretary.

JOHORE PLANTERS' ASSOCIATION.

Balance Sheet, June 30th, 1908.

Assets.	$	c.	*Liabilities.*	$	c.
Cash in Bank ...	360	19	Messrs. Fraser & Neave, Printing Account	24	25
Balance of Liabilities over Assets	300	93	Rubber Exhibition Account	15	...
			Postages Account ...	12	51
			Contribution to P. A. M. 1908-9	403	...
			Delegates' Expenses to Meetings	209	36
	$661	12		$661	12

Dr. *Revenue Account, June 30th, 1908.* *Dr.*

	$	c.		$	c.
To 23 Entrance Fees at $10	$ c. 230 ...		By Typewriting Account	7	50
"23 Subscriptions at $10	230 ...		,, Contribution to P. A. M.	143	...
	460	...	,, Printing Account .	50	95
,, Assessment Account	84	40	,, Stamp on Cheque ...	...	01
,, Rubber Exhibition Account	15	...	,, Cheque Book ...	...	75
			,, Balance in Bank ..	360	19
	$559	40		$559	40

Estimated Income and Expenditure, 1908-9.

Income.	$	c.	$	c.	*Expenditure.*	$	c.
23 Members Subscriptions			230	...	Debit Balance Brought Forward	300	93
Assessment Account	450	...			Delegates' Expenses to P. A. M.	150	..
Less Received	84	40			Printing and Stationery	75	...
			365	60	Postages	15	...
					Contingencies	54	67
			$595	60		$595	60

W. N. GAWLER,
Honorary Secretary.

PLANTERS ASSOCIATION OF MALAY.

Under the presidency of Mr. R. W. Harrison, (Klang, D. P. A. a meeting of the above Association was held July 22nd, at 8 a.m. in the Ipoh Club, and there were present the following delegates.

C. L. Gibson, J. I. Philips, Alma Baker, H. S. Whiteside, (Perak, P. A.) ; John Gibson, (Klang, D. P. A.); P. W. Parkinson, I. L. Jarvis, H. F. Browell, (Batu Tiga, D. P. A.); H. M. Darby, (Kapar, D. P. A.) E. Valpy, (Kuala Langat, D. P. A.); Thomas Boyd, A. Crawford, (Malayan, P. A.); H. C. E. Zacharias (Secretary).

The Business.

The Secretary read the business to be put before the Meeting which was as follows :—

1. Minutes of previous Meeting.
2. Report of Special Committee on Constitution of Benevolent Fund.
3. Proposed by Kuala Langat D. P. A :—"That Government be requested to prohibit the sale to Tamils by Spirit Licensees of liquors other than unadulterated toddy and beer."
4. Proposed by the Malay Peninsula Agriculture Associations:— " That this Association approach Government requesting that a reward be offered to such person as shall satisfy the Government of an approved method of exterminating white ants."
5. Repatriation of unfit Indian Immigrants.
6. Proposed amendment of the "Prevention of Diseases" Enaetment.
7. Proposed by Batu Tiga D. P. A. :—"That this Association appoint a Commission to go into the question of bolting by coolies, with the idea of that Commission subsequently reporting to Government on that matter."
8. Proposed by Batu Tiga D. P. A.:—"That in Rule 5 the words 'and shall be declared at the Annual Meeting in April' be deleted, and the following substituted : ' and new members shall enter the Association after the Report for the past year has been received at the Annual Meeting."

The Chairman then proposed that as the minutes of last Meeting held in the Kuala Lumpor on the 19th May last had already been circulated they be taken as read.

This was unanimously agreed to, and the minutes were accordingly declared passed.

The Rubber Exhibition.

The Secretary next drew attention to the scant way samples of F. M. S. rubber were being prepared for the approaching Exhibition in London and said that although a large amount of space had been applied for, only some seventeen exhibits were being shown up to date. Amongst these were Kamunting, Sungei Krudda, Bertam, Caledonia, Jebong, and Golden Hope Estates. He believed that in several instances orders had been given to Managers to refrain from sending exhibits at all.

After several members had spoken on the subject it was resolved that Government be asked to treat this Association in the same liberal manner as regards funds as the Ceylon Government was doing the association there.

The Chairman also pointed out that the latter country was sending home their own scientific man to the forthcoming London Exhibition.

A Benevolent Fund.

Mr. John Gibson spoke at length on the report of the Committee on the constitution of a Benevolent Fund, based on the lines of that at present in existence in Ceylon, and said it could be duly circulated and discussed before being finally adopted by the Association.

Resolution three was then discussed and passed in its entirety and it was also agreed that no credit of any kind be given to customers, this being a practice prevailing very much on many Estates at present.

The "White Ant Cure," resolution No. 4, was then discussed at great length, and eventually was carried with the further request that Government be asked to put in a scientific man to study the much vexed question thoroughly as was being done some months ago but had been suddenly stopped.

Undesirable Coolies.

Resolution No. 5 was then gone into and after several members had spoken on the subject rather strongly the Chairman proposed, and Mr. H. M. Darby seconded, that all undesirable coolies be repatriated at the expense of those who had brought them into the country.

The motion was carried unanimously.

On Resolution 7, after an amount of argument, the meeting passed the following motion.

"That Government be requested to grant compensation, under the Prevention of Diseases' Enactment, for any private property, the destruction of which shall have been ordered by any medical officer under said Enactment."

To Deal with Bolters.

Resolution No. 7, relative to the bolting of coolies, was then brought forward by Mr. H. F. Browell and seconded by Mr. H. M. Darby.

It was proposed, and carried *nem. con.* that the Chairman and Secretary of each district association shall constitute the Commission on the subject, and be asked to draw up a scheme to be submitted at the next meeting of the P. A. M.

The alteration of Rule No. 5 as proposed in the agenda was carried without a dissentient vote.

The Secretary then read a letter he had received from the Kapar, D. P. A. re the assessment of coolies, which ended in Mr. Darby putting in a motion to the effect that before Government or the Immigration Committee change any present existing rules that this Association be allowed a chance of expressing individual and its own views on this most important subject.

The motion was agreed to.

The Secretary also put on the table further correspondence he had received from the proprietor of "In Tinland" and the Secretary of the forthcoming Agri-Horticultural Show re exhibits and further prizes being presented, but neither was gone into.

THE CONDITIONS OF THE LOAN.

Mr. John I. Philips then proposed and Mr. E. Valpy seconded :—

"That the Resident-General be requested to issue a complete statement, regarding the conditions regulating the issue of loans to Planters, and that to the various statments, already published, the following provisions be added.

(A) "That the vote be unlimited."

(B) "That no loans be made on account of any area not under cultivation at the present time."

(C) "That all valuations be made by the officer deputed and shall be final. A loan of 25% to be granted, but the property to be revalued at the end of each year until the loan becomes repayable."

(D) "That no loan, or part of a loan, be devoted to any other purpose but that of maintenance."

Carried *nem. con.*

COOLIES WHO GO TO GAOL.

It was also resolved that a letter be written to the Secretary to Resident asking him to make arrangements with the Police Authorities that any Estate coolies serving imprisonment, at the end of their sentence be sent back to the Estate by the Police at the former's expense as at present a great many have absconded altogether when released from gaol.

The next meeting of the Association was fixed for Monday, 5th October, and will be held in Penang.

A cordial vote of thanks to the Chair concluded the meeting.

COMPARATIVE RUBBER EXPORT TABLE.

Comparative Statement of Cultivated Rubber Exported from the Federated Malay States During the Years 1908 and 1907.

—	Exported during July, 1908.	Previously.	Total export during 1908.	Export during similar period of previous year.	Increase.
	lbs.	lbs.	lbs.	lbs.	lbs.
Perak	32,827	189,633	222,460	113,307	109,153
Selangor	164,428	866,567	1,030,995	613,539	417,465
Negri Sembilan	28,847	325,958	354,805	254,458	100,347
Pahang	nil	nil	nil.	nil	
Total ...	226,102	1,382,158	1,608,260	981,295	626,965

KUALA LUMPOR,
11th August, 1908.

J. R. O. ALDWORTH,
Commissioner of Trade and Customs.

SINGAPORE MARKET REPORT.

August, 1908.

Articles.	Quantity sold.	Highest price.	Lowest price.
	Tons.	$	$
Coffee Palembang ...	...	...	...
Bali	10	22.00	20.50
Liberian ...	69	25.00	24.00
Copra	5,525	7.30	6.60
Gambier	1,095	7.50	7.30
Gambier Cube, Nos. 1&2 ...	410	11.90	10.40
Gutta Percha, 1st quality ...	...	300.00	240.00
Medium ...	...	240.00	80.00
Lower ...	...	80.00	12.00
Borneo Rubber, 1, 2 & 3 ...	...	105.00	47.50
Gutta Jelotong	...	6.00	4.50
Nutmegs, 110's	...	21.50	20.00
80's	...	23.50	22.00
Mace, Amboyna	...	74.00	74.00
Banda	...	58.00	58.00
Black Pepper	1,309	11.30	10.50
White Pepper (Sarawak) ...	373	18.00	17.25
Pearl Sago, Small ...	340	3.75	3.60 fair.
Medium ...	25	4.25	4.25
Large ...	...	...	...
Sago Flour, No. 1 ...	3,182	3.10	2.82½
No. 2 ...	495	1.15	1.10
Tapioca Flake, Small ...	508	Sing. 6.50 Peng. 4.25	5.50 fair. 4.25 ,,
Medium ...	35	...	...
Pearl, Small	507	Sing. 8.50 Peng. 4.90	8.50 fine. 4.20 fair.
Medium ...	501	6.00	4.60 fair.
Bullet	...	7.00	7.00
Tin	3,240	69.50	62.75

EXPORTS TELEGRAMS TO EUROPE AND AMERICA.

Fortnight ending July, 15th & 31st.

				Tons.	
				15th.	31st.
Tin	Str.	S'pore. & Penang	to U. Kingdom &/or	1,506	1,811
do.	,,	do.	U. S. A.	65	400
do.	,,	do.	Continent	576	200
Gambier	,,	Singapore	Glasgow	...	...
do.	,,	do.	London	200	20
do.	,,	do.	Liverpool	350	...
do.	,,	do.	U K. &/or Continent	25	100
Cube Gambier	,,	do.	United Kingdom	70	40
Black Pepper	,,	do.	do.	10	...
do.	,,	Penang	do.	170	20
White Pepper	,,	Singapore	do.	130	65
do.	,,	Penang	do.	..	...
Pearl Sago	,,	Singapore	do.	150	40
Sago Flour	,,	do.	London	625	430
do.	,,	do.	Liverpool	1,800	375
do.	,,	do.	Glasgow	325	...
Tapioca Flake	,,	do.	United Kingdom	350	55
T. Pearl & Bullet	,,	do.	do.	300	150
Tapioca Flour	,,	Penang	do.	150	180
Gutta Percha	,,	Singapore	do.	35	40
Buffalo Hides	,,	do.	do.	55	... 15
Pineapples	,,	do.	do.	60,000	18,750
Gambier	,,	do.	U. S. A.	1,100	300
Cube Gambier	,,	do.	do.	35	30
Black Pepper	,,	do.	do.	100	120
do.	,,	Penang	do.	...	220
White Pepper	,,	Singapore	do.	...	15
do.	,,	Penang	do.	...	10
Tapioca Pearl	,,	Singapore	do.	125	75
Nutmegs	,,	S'pore., Penang	do.	...	55
Sago Flour	,,	Singapore	do.	190	150
Pineapples	,,	do.	do.	3,750	14,000
do.	,,	do.	Continent	700	3,000
Gambier	,,	do.	South Continent	25	...
do.	,,	do.	North Continent	150	200
Cube Gambier	,,	do.	Continent	30	65
Black Pepper	,,	do.	South Continent	330	180
do.	,,	do.	North do.	290	110
do.	,,	Penang	South do.	20	40
do.	,,	do.	North do.	...	50
White Pepper	,,	Singapore	South do.	10	5
do.	,,	do.	North do.	110	110
do.	,,	Penang	South do.	5	..
do.	,,	do.	North do.	5	10
Copra	,,	S'pore., Penang	Marseilles	1,150	260
do.	,,	do.	Odessa	...	300
do.	,,	do.	Other S. Continent	1,000	240
do.	,,	do.	North Continent	1,200	2,350
Sago Flour	,,	Singapore	Continent	950	350
Tapioca Flake	,,	do.	do.	130	275
do. Pearl	,,	do.	do.	...	20
do. Flake	,,	do.	U. S. A.	5	100
do. do.	,,	Penang	U. K.	120	50
do. Pearl & Bullet	,,	do.	do.	70	100
do. Flake	,,	do.	U. S. A.	...	50
do. Pearl	,,	do.	do.	...	130
do. Flake	,,	do.	Continent	10	100
do. Pearl	,,	do.	Continent	60	190
Copra	,,	Singapore	England	1,100	240
Gambier	,,	do.	U. S. A.	..	...
Cube Gambier	,,	do.	do.	...	..

				Tons. 15th.	31st.
T. Flake & Pearl	Str.	Singapore	U. S. A.	..	..
Sago Flour	,,	do.	do.	..	...
Gambier	,,	do.	South Continent	...	...
Copra	,,	do.	Marseilles	...	..
Black Pepper	,,	do.	South Continent	...	...
White Pepper	,,	do.	do.	...	...
do.	,,	do.	U. S. A.	...	...
Pineapples	,,	do.	do.	...	...
Nutmegs	,,	do.	do.	...	...
Black Pepper	,,	do.	do.	...	...
do.	,,	Penang	do.	...	...
White Pepper	,,	do.	do.	...	...
T. Flake & Pearl	,,	do.	do.	...	...
Nutmegs	,,	do.	do.	...	...
Tons Gambier				800	300
,, Black Pepper				675	625

Wired at 4.50 p.m. on 16th July.
,, 3.30 p.m. on 1st August.

GOW, WILSON & STANTON, Limited—
India Rubber Market Report.

13 & 23, Rood Lane, London, E.C.
10th July, 1908.

Since the last auction there has been a steady improvement in values, and at to-day's sale the very small supplies met with fairly good support, a large proportion being sold in the room at prices showing an advance of from 2d. to 3d. per lb., on last auction rates.

All the finer qualities were in good request, the highest price of the sale, viz., 4/8 being paid for Warriapolla pale Biscuits, Ellakande pale Crepe coming next with 4/7½, the quotation for Sheet and Biscuits being 4/3½ to 4¾ per lb.

The lower grades of Crepe were again a little irregular, and some small lots of these kinds and Scrap sold in buyers' favour.

It is satisfactory to note that the price of Rubber now stands at the highest point touched since October, 1907, and Hard Fine Para to-day is about 1/3 per lb., above the lowest quotation recorded in February last of 2/9 per lb.

Number of Packages Advertised.		Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.		
		Ceylon.	Malaya.	Totals.	No. of Packages sold.	Price.	Hard Fine Para.	Plantation. Fine	Plantation. Scrap.
To-day	521	9	18¾	27¾	383	3/10⅝	4/0¼	4/2 to 4/8	2/10 to 3/-
Corresponding Sale Last year	585	10	20¼	30¼	180	5/1¼	4/8	5/2½ to 5/7½	3/9 to 4/1

To-Day's Quotations.

Sheet and Biscuits.		Crepe and Block.		Unwashed Scrap.	
Very fine Pale Biscuits.	4/8	Fine Pale ...	4/2 to 4/7½	Good to Fine	2/7 to 3/-
Good to fine Biscuits.	4/3½	Medium and Palish.	3/7 to 4/0½		
Good to fine Sheet.	4/3½ to 4/3¾	Dark and Block.	2/5¾ to 3/6		

Para Statistics.

Receipts at Para During *June*.

1908.	1907.	1906.	1905.
1,660 tons ...	1,500 tons ...	1,650 tons ...	1,450 tons

Total Crop Receipts—*July to June*—

FOR THE LAST FOUR COMPLETE YEARS.

1907-08.	1906-07.	1905-06.	1904-05.
36,910 tons	38,070 tons	34,490 tons	33,050 tons

Plantation Exports.

CEYLON—1st January to 15th June.

1908	133 tons
1907	82 tons
1906	58 tons
1905	20 tons

MALAYA—1st January to 31st May.

	Singapore.	Penang.	Total.
1908	368 tons	196 tons	564 tons
1907	244 tons	25 tons	269 tons

Particulars and Prices of To-Day's Sale.

CEYLON.

Mark.	Pkgs.	Description.	Price.
Kumaradola	8	Biscuits	4/3½
	1	Scrap	bought in
Udapolla	1	Scrap	bought in
J. J. V. & Co.	13	Scrap crepe rejections, etc.	bought in
Putupaula	8	Dark and black crepe	bought in
Glanrhos	1	Crepe, etc.	bought in
Dea Ella	2	Biscuits	bought in
	1	Scrap	bought in
Kepitigalla	6	Scrap	bought in
M. A. K.	3	Biscuits rejections, and scrap	bought in
	10	Heated scrap	bought in
Sorana	10	Good to fine biscuits	4/3½
Tallagalla	2	Biscuits	4/3½
	1	Fine scrap	3/-
Warriapolla	4	Very fine pale biscuits	4/8
	3	Rejections, scrap, etc., pt. sold	2/7 to 3/-
Doranakande	4	Biscuits	4/3¼ to 4/3½
	4	Scrap and rejections	2/10¾ to 2/11¾
Waharaka	2	Biscuits	4/3½
	1	Scrap	2/11½
Palli	8	Good to fine Ceara biscuits and sheet.	4/2 to 4/¾
C. R.	14	Low Scrap	bought in

Mark.	Pkgs.	Description.	Price.
J. C. & Co.	3	Dark and black pressed crepe pt. sold	2/10 to 3/5
D. B.	1	Dark block ...	bought in
Culloden	11	Good brown and very dark crepe...	2/6¼ to 3/6¼
Ellakande	7	Fine pale crepe ..	4/3¼ to 4/7½
	2	Dark ,, ...	3/1
Heatherley	5	Palish thick crepe ...	4/2 to 4/2½
	14	Pale to dark crepe ...	2/5¾ to 4/4¼
Ingoya	4	Rolled sheet ...	4/3 to 4/3½
	1	Biscuits ...	4/3½
Arapolakande	12	Fine biscuits ...	4/3½
	4	Brown and dark crepe ...	3/2¾ to 3/5½

MALAYA.

Mark.	Pkgs.	Description.	Price.
Jebong	39	Fine pale crepe ...	bought in
	18	Mottled and brown ...	bought in
Golconda	9	Sheet ...	4/3¾
	6	Darkish and black crepe ...	bought in
S. S. B. R. Co., Ltd.	14	Dark sheet ...	4/3¾
	1	Brown crepe ...	bought in
C. M. R. E., Ltd,	11	Fine pale & palish crepe pt. sold	4/6 to 4/6¼
	9	Medium crepe ...	3/9½ to 3/11½
	10	Dark ,, pt. sold ...	3/4
	2	Fine Rambong crepe ...	bought in
Shelford	2	Darkish crepe ...	bought in
	6	Pressed ,, ...	bought in
S. R.	1	Sheet (rejections) ...	bought in
R. A. G.			
H. & O.	1	Rejections ...	bought in
Highland Est	7	Fine sheet ...	4/3½
	6	Palish crepe ...	3/9¾
	16	Medium and dark crepe ...	3/2 to 3/8½
B. R. R. Co., Ltd.	5	Good palish crepe ...	bought in
B. & D.	2	Biscuits sheet scrap and rejections	1/8 to 4/1¼
Perhentian	19	Dark sheet ...	4/3¼ to 4/3¾
Tinggi	11	Medium and dark crepe ...	1/3 to 3/4½
S. & D.	7	Sheet ...	4/3½
	4	Scrappy ...	2/10¼ to 3/0½
S. Y. D.	2	Scrappy sheet ...	1/9
S. P. S.	1	Scrap ...	2/7½
Vallambrosa	8	Brownish crepe ...	3/9¼ to 3/11¼
	22	Darker ,, ...	3/1 to 3/5¾
S. R. & Co.	14	Dark sheet ...	4/3½
	6	Palish crepe ...	4/3
	25	Medium and dark crepe ...	3/0½ to 4/0½
Matang	11	Sheet ...	4/3½ to 4/3¾
	10	Palish and brown crepe ...	3/2 to 4/–
K. P. Co., Ltd.	15	Brown and dark crepe ...	3/3 to 3/3½
S. R.	9	Sheet ...	3/3½
S.	2	Scrap, etc. ...	2/7
K. M. S. R. S. B.	1	Scrap, etc. ...	bought in
P. R. & Co.	1	Scrap ...	bought in
P. A. R.	7	Biscuits ...	4/2¼

JAVA.

Mark.	Pkgs.	Description.	Price.
Pasir Oetjing	3	Pressed Rambong sheet ...	3/0½
	4	Scrap and rejections ...	bought in

GOW, WILSON & STANTON, Limited—
India Rubber Market Report.

13 & 23 Rood Lane, London, E.C.

24th, July 1908.

Under the influence of a very quiet market, prices have declined since the last auction. To-day's offerings met with poor competition, and a large proportion had to be withdrawn for want of support.

With the exception of a few parcels the quality generally was disappointing, and where sales were pressed, quotations marked an irregular decline, which was most noticeable on the medium and lower grades of Crepe, Scrap, etc., and these were in some instances disposed of at considerably lower rates than those ruling at the last sale.

The highest price was realised for a small parcel of very pale fine Sheet, marked B. & D., which sold at 4/7½. The next highest quotation was 4/6 for a pale lot of C. M. R. E. Crepe.

Sheet and Biscuits were in little request, the quotation being about 4/0¼ to 4/2.

Number of Packages Advertised.		Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.		
		Ceylon.	Malaya.	Totals.	No. of Packages Sold.	Price.	Hard Fine Para.	Plantation. Fine.	Plantation. Scrap.
To-day	747	11½	25½	37	213	3/5¼	3/11	4/- to 4/7½	2/4 to 3/-
Corresponding Sale Last Year	445	5	20½	25½	283	5/1⅝	4/10¼	5/5 to 5/8	3/9 to 4/1

To-Day's Quotations.

Sheet and Biscuits.		Crepe and Block.		Unwashed Scrap.	
Very fine pale Sheet.	4/7½	Fine Pale ...	4/- to 4/6	Good to Fine	2/1½ to 3/-
Good to Fine Biscuits.	4/- to 4/2	Medium and Palish.	3/4 to 3/11		
Good to Fine Sheet.	4/0¾ to 4/1½	Dark and Block.	2/2 to 3/3		

Para Statistics.

LIVERPOOL IMPORTS.

†1908—1st Jan. to 31st May	8,999 tons
1907—1st Jan. to 30th June	7,907 tons
1906—1st Jan. to 30th June	6,656 tons

* STOCKS.

†1908—at 31st May	... 3,480 tons
1907—at 30th June	... 2,047 tons
1906—at 30th June	... 1,231 tons

*Excluding those in Dealers hands.

† The June figures for 1908 are not available.

Plantation Exports.

CEYLON.—1st JANUARY to 15th JUNE.

1908	... 137 tons
1907	... 93½ tons
1906	.. 62¼ tons
1905	... 22¼ tons

MALAYA.—1st JANUARY to 31st MAY.

	Singapore.	Penang.	Total.
1908	413 tons	207 tons	620 tons
1907	268 tons	27½ tons	295½ tons
1906	80⅜ tons	14¼ tons	95 tons

Particulars and Prices of To-Day's Sale.

CEYLON.

Mark.	Pkgs.	Description.	Price.
L. B. & Co.	4	Sheet ...	bought in
	2	Scrap ...	2/6½
Taldua	8	Good and dark crepe ...	2/3 to 3/11
Sorana	4	Biscuits ...	bought in
Densworth	1	Biscuits ...	bought in
	1	Scrap ...	2/7
Ayr	2	Sheet and biscuits ...	4/0¾ to 4/2
	1	Scrap ...	bought in
C. P. H. & Co.	2	Biscuits ...	4/0¾
	3	Crepe ...	bought in
	6	Scrap ...	bought in
Dolahena	1	Sheet ...	bought in
C. R.	14	Scrap (very heated) ...	bought in
J. C. & Co., Ltd.	1	Dark pressed crepe ...	bought in
D. B.	1	Black block ...	bought in
We-Oya	3	Biscuits ...	bought in
Udapolla	2	Good biscuits ...	bought in
	2	Very fine scrap and cuttings pt. sold	3/-
	1	Dark scrap ...	bought in
Nilambe	1	Biscuits ...	bought in
Tudugalla	5	Good crepe ...	bought in
	5	Brownish to black pressed crepe...	bought in
J. J. V. & Co.	1	Pressed crepe ...	bought in
Culloden	23	Very fine thick crepe pt. sold ...	4/- to 4/1¾
	1	Little darker ...	3/10½
	19	Darkish to black crepe pt. sold...	3/4 to 3/4¼
Ellakande	9	Fine pressed crepe ...	bought in
	2	Dark pressed crepe ...	bought in
Langsland	11	Biscuits ...	bought in
	1	Scrap ...	2/4¼
Glendon	2	Biscuits ...	4/0¼
Hattangalla	2	Biscuits ...	4/0¼
	4	Darkish to dark pressed crepe pt. sold	3/3
T.	2	Sheet ...	bought in
Glanrhos	4	Dark crepe ...	bought in
Welkandala	2	Dark biscuits ...	bought in
	4	Dark to black crepe ...	bought in
Dangan	3	Biscuits ...	bought in
	1	Scrap (barky) ...	bought in

Mark.	Pkgs.	Description.	Price.
Ross	1	Biscuits ...	bought in
Hanipha	3	Fine biscuits ...	bought in

MALAYA.

Mark.	Pkgs.	Description.	Price.
Highland Est.	13	Fine sheet ...	bought in
	7	Palish crepe ...	bought in
	22	Darkish crepe ...	bought in
B. & D.	18	Pressed sheet crepe, etc. ...	1/6 to 3/11¼
	4	Good to very fine sheet pt. sold...	4/7½
T. B. S.	17	Crepe ...	3/3½ to 3/5
V. V.	3	Rejections ...	bought in
R. B.	2	Good scrap ...	bought in
S. B. N.	2	Good crepe pt. sold ...	4/–
S. K. R. Co., Ltd.	13	Good to fine crepe ...	2/9 to 4/1¼
D. R. E.	18	Rambong ...	bought in
B. M. & Co., Ltd.	4	Rejections and scrap pt. sold ...	2/8¼
L. E. Muar Straits	120	Very fine pale block ...	bought in
K. B. E. Straits.	21	Darkish to dark crepe ...	3/1½ to 3/4
R.	3	Fine crepe ...	4/2
M. P. Ltd.	6	Darkish ...	3/4½
Golconda	5	Dark crepe ...	bought in
S. S. B. R. Co. Ltd.	6	Sheet ...	bought in
	4	Dark crepe ...	bought in
Jugra Est.	5	Sheet ...	bought in
	9	Darkish to dark crepe ...	3/0½ to 3/6¼
	2	Rambong crepe ...	2/9
V. R. Co., Ltd. Klang	10	Darkish to black crepe ...	3/– to 3/7¾
F. M. S.			
P. R.	4	Sheet ...	4/1½
	2	Scrap pt. sold ...	2/10
P. S. E.	12	Sheet ...	bought in
	14	Dark crepe ...	2/6½ to 2/8¾
M. P. & Co., Ltd.	16	Black crepe ...	2/7
Bila	13	Sheet ...	bought in
	20	Scrap ...	bought in
	3	Good crepe ...	bought in
Bila	2	Dark pressed crepe ...	bought in
J. & Co.	2	Sheet ...	bought in
	1	Rejections ...	bought in
Sungei Krudda	9	Good crepe ...	bought in
	5	Biscuits ...	bought in
T.	7	Sheet ...	bought in
	4	Good crepe ...	bought in
	35	Good brown to black crepe ...	bought in
Linggi Plants.	12	Dark crepe ...	bought in
F. (S) R. Co., Ltd.	11	Sheet ...	bought in
	11	Good to dark crepe pt. sold ...	3/6¾
C. M. R. E., Ltd.	28	Good to fine pale crepe pt. sold ...	3/9 to 4/6
	8	Dark crepe ...	bought in
	2	Rambong crepe ...	bought in
Sungei Choh	2	Very fine pale sheet ...	bought in
	3	Darker ...	bought in
Shelford	5	Dark sheet ...	bought in
	6	Crepe ...	bought in
S. R. Co., Ltd.	30	Sheet ...	bought in

CEYLON, STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

July 10th, 1908.

The following Lots, comprising about 18¾ Tons Straits and 11½ Tons Ceylon, were offered at Auctions to-day and sold as follows:—

STRAITS AND MALAY STATES.

Mark.	Pkgs.	Description.		Price.
R. A. B. Jebong	57	Cases Crepe	...	bought in
Golconda	9	,, Sheets	...	4/3¾
	6	,, Crepe	...	bought in
S. S. B. R. Co., Ltd.	14	,, Sheets	...	4/3¾
C. M. R. E. Ltd.	32	,, Crepe	part sold ...	3/4 at 4/6
Shelford	8	,, ,,	...	bought in
Highland	7	,, Sheets	...	4/3½
Estate	21	,, Crepe	...	3/2 at 3/9¾
B. R. R. Co. Ltd.	6	,, ,,	...	bought in
B. & D.	3	,, Biscuits	...	3/4 at 4/-
	2	,, Scrap	...	1/8 at 2/11
	4	,, Sheets	...	3/6 at 4/1¼
	3	,, Crepe	...	3/9 at 3/10
Perhentian	19	,, Sheets	..	4/3¼ at 4/3¾
Tinggi Estate	10	,, Crepe	...	1/3 at 3/4½
S. & D.	7	,, Sheets	...	4/3½
	4	,, Scrap	...	2/10¼ at 3/0½
S. Y. D.	2	,, ,,	...	1/9
V. R. Co., Ltd. Kalang	30	,, Crepe	...	3/1 at 3/11¼
F. M. S. S. R. & Co., Ltd.	14	,, Sheets	...	4/3½
	31	,, Crepe	...	3/0½ at 4/3
Matang	11	,, Sheets	...	4/3½ at 4/3¾
	10	,, Crepe	...	3/2 at 4/-
K. P. C. Ltd.	15	,, Crepe	...	3/3 at 3/3½
	9	,, Sheets	...	4/3½
S. R. R.	2	,, Biscuits	...	2/7
P. A. R.	7	,, Sheets	...	bought in

CEYLON.

Mark.	Pkgs.	Dtscription.		Price.
Crapolakande	12	Cases Sheest	...	4/3½
	4	,, Brepe	...	3/3¾ at3/5½
Kumaradola	8	,, Biscuits	...	4/3½
J. J. V. & Co., Ltd.	12	,, Scrap	...	2/7 bid
Putupaula	3	,, Crepe	...	bought in
A. R. P. C.	1	,, ,,	...	2/10

Mark	Pkgs.	Description.		Price.
Dea Ella	2	Cases Biscuits	...	bought in
Kepitigalla	6	,, Scrap	...	2/10 bid
M. A. K.	1	,, Biscuits	...	bought in
Sorana	2	,, Scrap	...	,,
Tallagalla	10	,, Biscuits	...	4/3½
	2	,, ,,	...	4/3½
Warriapolla	1	,, Scrap	...	3/-
Doranakande	4	,, Biscuits	...	4/8
	3	,, ,,	...	4/3½
Waharaka	4	,, Scrap	...	2/10¾ at2 /11¾
	2	,, Biscuits	...	4/3
No. 1	1	,, Scrape	...	2/11½
Palli	4	,, Biscuits	...	4/2
C. R.	4	,, Sheets	..	4/3¾
	14	,, Scrape	...	bought in
J. C. & Co., Ltd.	3	,, Crepe 2 sold	..	2/10 at 3/5
Culloden	11	,, ,,	...	2/6¼ at 3/6¾
Ellakande	9	,, ,,	...	3/1 at 4/7½
Heatherley	20	Pkgs. ,,	...	3/3¼ at 4/4¼
Ingoya	4	,, Sheets	...	4/3 at 4/3½
	1	,, Biscuits	...	4/3½

CEYLON, STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

July 24th, 1908.

The following Lots, comprising about 25½ Tons Straits and 13 Tons Ceylon, were offered at Auctions to-day and sold as follows:—

Straits and Malay States.

Mark.	Pkgs	Description.		Price.
Highland Estate	13	Cases Sheets	...	bought in
	29	,, Crepe	...	,,
B. & D.	9	,, Sheets	...	3/6½ at 4/7½
	6	,, Crepe	...	2/6 at 3/11¼
	4	,, Scrap	...	1/6 at 2/7
T. B. S.	17	,, Crepe	...	3/3½ at 3/5
R. B.	2	,, Scrap	...	bought in
S. K. R. Co., Ltd. S.	13	,, Crepe	...	2/9 at 4/1¼
D. R. E. Ltd.	18	,, ,,	...	bought in
B. M. & Co., Ltd. L. E.	2	,, Scrap	...	2/8¼
M.U.A R. M. B.	120	,, Block	...	bought in
E. R. P.	21	,, Crepe	...	3/1½ at 3/4
M. P. Ltd.	9	,, ,,	..	3/4½ at 4/2
Golconda	5	,, ,,	...	bought in
S. S. B. R. Co., Ltd.	6	,, Sheets	...	,,
	4	,, Crepe	...	,,
Jugra Estate	5	,, Sheets	...	4/0¼ bid
	10	,, Crepe	...	2/9 at 3/6¼
V. R. Co , Ltd., Kalang	10	,, ,,	...	3/- at 3/7¾

Mark.	Pkgs.	Description.			Price.
F. M. S.					
S. B.	4	Cases Sheets		...	4/11½
P. R.	2	,, Scrap	1 sold	..	2/10
& Co., Ltd.					
P. S. E.	12	,, Sheets		...	bought in
	14	,, Crepe		...	2/6½ at 2/8¾
K. P. Co. Ltd.	16	,, ,,		...	2/7
B R. R. Co., Ltd.	7	,, Block		...	bought in
Bila	13	,, Sheets		...	,,
	8	,, Scrap		...	,,
	17	,, Crepe		...	,,
J. & Co.	2	,, Sheets		...	,,
C. P.	4	,, ,,		...	,,
	4	,, Biscuits		...	,,
S. P.	6	,, Sheets		...	,,
Sungei Krudda	14	,, Crepe		...	,,
C. M R. E. Ltd.	38	,, ,,	part sold	...	4/4 at 4/6
Sungei Choh	5	,, Sheets		...	bought in
Shelford	5	,, ,,			,,
	6	,, Crepe		...	,,
S. R. Co.,	30	,, Sheets		...	,,

CEYLON.

Mark.	Pkgs.	Description.			Price.
L. B. & Co.	4	Cases Sheets		...	4/11½ bid
	2	,, Scrap		...	2/6½ bid
Taldua	8	,, Crepe		...	2/3 at 3/11
Sorana	4	,, Biscuits		...	bought in
Ayr	1	,, Sheet		...	4/2
	1	,, Biscuit		...	bought in
	2	,, ,,		...	4/0¾
C. P. H. & Co.	3	,, Crepe		...	bought in
	6	,, Scrap		...	,,
Dolahena	1	,, Sheet		...	,,
C. R.	14	,, Scrap		...	,,
J. C. & Co., Ltd.	1	,, Crepe		...	,,
W. E. Oya	3	,, Biscuits		...	,,
Udapolla	2	,, ,,		...	,,
	2	,, Scrap	1 sold	...	3/-
Tudugalla	10	,, Crepe		...	bought in
Culloden	35	,, ,,	24 sold	...	3/4 at 4/1¾
Ellakande	6	,, ,,		...	bought in
Langsland	11	,, Biscuits		...	,,
Glendon	2	,, ,,		...	4/0¼
Hapergastenne	4	,, Worms		...	bought in
Glanrhos	4	,, Biscuits		...	,,
Welkandala	2	,, ,,		..	,,
T.	4	,, Crepe		...	,,
F. W.	7	,, Sheets		...	,,
Linggi Plants, Ltd.	12	,, Crepe		...	,,
T.	39	,, ,,		...	,,
Dangan	3	,, Biscuits		...	,,
F. S. R. Co., Ltd.	5	,, ,,		...	,,
	11	,, Crepe	4 sold	...	3/6¾
	6	,, Sheets		...	bought in
Hanipha	3	,, Biscuits		...	,,

The price of FINE HARD on the spot to-day is 3/11½ per lb.

(*Lewis Peat, London.*)

Perak.

Abstract of Meteorological Readings in Perak for the month of June, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb	Vapour Tension	Dew Point.	Humidity.			
Taipeng	...	152	81·53	93	69	24	76·75	856	...	79	...	3·78	1·35
Kuala Kangsar ...	...	...	81·35	93	69	24	75·44	801	...	74	...	3·17	·90
Batu Gajah	...	150	80·63	91	71	20	76·33	851	...	81	...	5·65	1·47
Gopeng	...	...	80·32	90	69	21	74·97	801	...	77	...	5·07	1·06
Ipoh	...	...	80·22	92	69	23	75·32	811	...	78	...	8·08	2·44
Kampar	...	...	81·08	93	67	26	76·16	837	...	78	...	2·65	·75
Teluk Anson ...	...	...	81·99	92	69	23	76·80	853	...	78	...	.72	·45
Tapah	...	...	82·43	93	68	25	76·48	833	...	75	...	3·71	1·31
Parit Buntar ...	...	...	81·75	90	70	20	76·76	855	...	78	...	3·96	1·15
Bagan Serai ...	...	...	82·04	91	71	20	76·91	857	...	78	...	1·41	·92
Selama	...	...	81·21	92	70	22	76·58	855	...	79	...	6·27	1·50

STATE SURGEON'S OFFICE,

Taipeng, August 13th, 1908.

M. J. WRIGHT,

State Surgeon, Perak.

Pahang.

Abstract of Meteorological Readings in the various Districts of the State for the month of June, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Kuala Lipis ...	...	...	78·04	92	68	19·16	70·5	...	...	...	...	17·16	1.60
Raub ...	...	...	81·06	93	68	19·9	75·7	...	...	...	...	2·36	1·02
Bukit Fraser ...	...	...	...	...	...	...	...	...	...	...	...	6·74	1·13
Bentong ...	...	...	79·3	94	70	18·76	76·3	...	...	...	...	5·28	1·03
Temerloh ...	...	...	...	98	70	18·16	...	...	...	...	...	6·87	2·17
Pekan ...	...	...	82	92	72	15·3	78	...	...	...	...	5·60	1·25
Kuantan ...	...	...	91·1	93	70	15·2	77·9	...	...	...	...	4·27	1·31

STATE SURGEON'S OFFICE,

Raub, 29th July, 1908.

W. H. FRY,

State Surgeon, Pahang.

Penang.

Abstract of Meteorological Readings in Criminal Prison Observatory for the month of July, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Mean Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Mean Maximum.	Mean Minimum.	Mean Range.	Mean Wet Bulb.	Mean Vapour Tension.	Mean Dew Point.	Mean Humidity.			
	Ins.	°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
Criminal Prison Observatory	29·879	144·7	78·9	87·3	74·0	13.3	77·3	·900	76·2	87	N. W.	7·06	2.05

CRIMINAL PRISON, PENANG.

12th Aug, 1908.

S. LUCY,

Senior Medical Officer, Penang.

Kelantan.

Abstract of Meteorological Readings in Kelantan for the month of July, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
				Means F°	Means F°	Means F°						Inches	Inches
Kuala Lebir	...	...	...	89°.49	73°.45	18°.30	...	...	...	...	...	8.46	1.13
Taku Plantation	...	...	...	...	...	...	...	...	...	...	...	7.07	.67
Kuala Pergan	...	...	...	...	...	...	...	...	...	...	...	9.65	2.43
Kuala Kelantan	...	...	...	84°.13	72°.03	12°.09	...	...	...	...	...	9.36	1.80

STATE SURGEON'S OFFICE,
Kelantan, 6th Agust, 1908.

JOHN D. GIMLETTE,
State Surgeon, Kelantan.

Seremban.

Abstract of Meteorological Readings in Negri Sembilan for the month of July, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Seremban	...	142	...	83.5	69.9	13.6	...	88.4	...	86.7	10	3.20	12.5
K. Pilah	...	...	...	86.65	72.1	...	...	...	...	...	...	4.61	...
Tampin	...	...	...	...	...	...	...	...	...	...	...	4.37	...
Port Dickson Beri-Beri Hospital	...	...	...	...	...	...	...	...	...	...	...	8.36	...
Mantin	...	...	...	...	...	...	...	...	...	...	...	1.91	...
Port Dickson	...	...	...	...	...	...	...	...	...	...	...	5.49	...
Ayer Kuning	...	...	...	...	...	...	...	...	...	...	...	4.41	...
Jelebu	...	...	...	...	...	...	...	...	...	...	...	2.94	...

STATE SURGEON'S OFFICE,
Seremban, 9th July, 1908.

J. D. MELCHIZEDEK,
State Surgeon, Seremban.

Selangor.

Abstract of Meteorological Readings in the various Districts of the State for the month of July, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Valpour Tension.	Dew Point.	Humidity.			
General Hospital, K. Lumpor	29.868	146.4	80.5	89.6	71.2	18.4	76.4	0.833	73.6	80	S. W.	3.28	1.05
Pudoh Gaol ,, ,,	...	...	...	...	...	...	...	...	...	...	...	5.34	1.91
District Hospital ,,	...	...	...	...	...	...	...	...	...	...	...	2.94	1.08
,, Klang	...	...	...	...	...	...	...	...	...	...	...	1.47	0.67
,, Kuala Langat	...	...	...	88.3	74.4	13.9	...	...	...	...	...	8.49	2.85
,, Kajang	...	...	...	87.1	75.3	11.8	...	...	...	...	...	2.32	1.35
,, Kuala Selangor	...	...	...	88.4	78.1	10.3	...	..	...	...	...	4.23	2.22
,, Kuala Kubu	...	...	...	92.4	69.7	22.7	...	...	...	...	...	3.52	0.87
,, Serendah	...	...	...	91.5	71.9	19.6	...	...	...	...	...	4.41	1.84
,, Rawang	...	...	...	90.2	69.7	20.5	...	...	...	...	...	2.38	0.55
Beri-beri Hospital, Jeram	...	...	...	...	...	...	...	...	...	...	...	3.14	1.40
Sabak Bernam	...	...	...	...	...	...	...	...	...	...	...	0.32	0.80

STATE SURGEON'S OFFICE,
Kuala Lumpor, 14th August, 1908.

E. A. O. TRAVERS,
State Surgeon, Selangor.

Seremban.

Table Showing the Daily Results of the Reading of Meoterological Observations taken at the General Hospital Seremban for the Mouth of July, 1908.

DATE.	TEMPT OF RADIATION.						TEMPT RADIATION.		WIND DIRECTION.		TEMPT OF EVAPORATION.			COMPUTED VAPOUR TENSION.			RELATIVE HUMIDITY.			CLOUDS 0 TO 10			WEATHER INITIALS.			RAIN.	
	9 H.	15 H.	Mean.	Maximum.	Minimum.	Range.	Sun.	Difference Sun & Shade.	9 H.	15 H.	9 H.	15 H.	Mean.	9 H.	15 H.	Mean.	9 H.	15 H.	Mean.	9 H.	15 H,	21 H.	9 H.	15 H.	21 H.	Inch	Cents
1	77	84	80 5	86	70	16	141	55	W	N W	68.5	80	74.2	697	I.026	861	75	85	80	2	3	5	S	S	C		
2	76	85	80.5	85	70	15	142	57	N W	S W	67.4	74.9	71.1	672	865	768	75	65	70	1	4	3	S	C	S		
3	76	84	80	86	71	15	143	57	W	E	69.2	81.7	75.4	713	I.082	897	79	90	84.5	3	4	8	S	C	N	I	25
4	78	83	80.5	81	70	11	140	59	N W	S W	80	71.6	75.8	1.023	775	899	100	58	79	1	3	2	S	S	S		
5	77	85	81	84	71	13	138	54	W	W	68.5	79.7	74.1	697	I.010	853	79	90	84.5	1	2	1	S	S	S		
6	75	85	80	83	70	13	140	57	W	S W	74.3	83.4	78.8	848	I.141	994	94	95	94.5	2	3	2	S	S	S		
7	76	84	80	83	70	13	136	53	W	W	76	81.7	78.8	897	I.082	989	100	90	95	1	2	2	S	S	S		
8	75	85	80	84	71	13	140	56	N W	W	72.3	78.4	75.3	793	973	883	94	80	87	1	2	1	S	S	S		
9	76	84	80	83	70	13	140	57	W	S W	69.2	80.1	74.6	713	I.064	883	79	85	82	0	1	3	S	S	S		.05
10	75	85	80	84	70	14	141	57	W	S	73.3	80.1	76.7	820	I.064	942	94	85	89.5	2	1	2	S	S	S		
11	77	85	81	84	71	13	140	56	N W	S W	75.3	81.7	78.5	898	I.082	979	94	90	92	0	1	3	S	S	S		
12	78	83	80.5	83	70	13	141	58	N W	W	70.5	83	76.7	748	I.127	937	89	100	94.5	4	2	3	C	S	S		
13	75	82	78.5	84	71	13	144	60	W	S W	71.6	78.7	75.1	774	978	877	89	90	89.5	3	2	2	S	S	N		
14	74	83	78.5	84	69	15	143	59	W	S W	70.5	79.7	75.1	748	I.010	879	89	90	99.5	0	1	8	S	S	C		.97
15	73	83	78	85	71	14	144	59	N W	W	69.5	78	73.7	722	956	839	89	85	87	2	3	4	S	S	S		
16	75	86	80.5	84	71	13	143	59	W	S W	69.8	83.3	76.5	731	I.180	955	84	95	89.5	0	2	1	S	S	S		
17	74	85	79.5	84	70	14	144	60	N W	S W	70.5	83.4	76.9	748	I.141	944	89	95	92	2	3	5	S	S	C		.78
18	74	83	78.5	83	71	12	143	60	W	S W	68.8	79.7	74.2	705	I.010	857	84	90	87	3	2	4	C	S	C		
19	75	81	78	83	71	12	142	59	W	W	73.3	76.5	74.9	820	897	858	94	90	92	6	3	4	C	S	C		.07
20	74	82	78	83	72	11	144	61	W	S	60.2	77	68.6	522	926	724	62	85	73.5	0	3	2	S	S	S		
21	76	84	80	85	71	14	143	58	N W	S W	72.6	75.7	74.1	801	888	844	89	76	82.5	2	3	3	S	S	S		
22	74	80	77	77	69	8	144	67	N W	W	72.3	75	73.6	793	867	831	94	85	89.5	2	5	4	C	S	C		
23	77	85	81	83	68	15	143	60	S W	W	75.3	80	77.6	877	I.026	951	94	85	89.5	4	3	2	C	S	S		
24	75	85	80	83	68	15	143	60	W	S W	70.9	78	74.4	756	956	856	84	85	84.5	4	2	3	C	S	S		
25	76	83	79.5	84	69	15	144	60	W	S W	89.8	81.1	85.4	731	I.064	897	84	85	84.5	5	7	2	C	S	S		
26	75	86	80.5	85	70	15	145	60	W	S W	70.5	86.1	78.3	748	I.064	906	94	85	89.5	2	3	2	S	S	S		
27	74	85	79.5	84	69	15	144	60	N W	S W	68.8	80	74.4	705	I.026	855	84	85	84.5	3	2	3	S	S	C		
28	74	88	81	85	69	16	145	60	N W	S W	69.8	86.4	78.1	731	I.258	994	84	95	89.5	2	4	5	S	C	C		
29	75	79	77	81	68	13	145	64	N W	S W	73.6	72.3	72.9	829	793	811	89	80	89.5	5	6	7	C	S	N		.08
30	77	84	80.5	85	68	17	144	59	S W	W	68.5	77.4	72.9	697	938	817	65	80	72.5	3	3	4	S	S	C		
31	74	84	79	85	69	16	143	58	W	N W	70.5	75.7	73.1	748	888	818	89	76	82 5	2	2	4	S	S	C		
Total..	75.7	83.8	79.75	83.5	69.9	13.6	142.3	58.8			70.2	72.3	75.4	.764	I.076	884	83.4	82.2	86.7							3	20

Seremban, 9-7-08.

D. MELCHIZEDEK,
Apothecary.

Even an indirect or implied command requires *jangan* as a negative, for instance,

suroh dia jangan naik, tell him not to go up.
baik kita pergi atau jangan? shall we go or not?

In dependent clauses in which a purpose is expressed, that is to say after such conjunctions as "in order that," "so that," "lest," the negative must be expressed by *jangan*, as,

spaya kaki-nya jangan kotor.
so that his feet should not get dirty.

VOCABULARY.

NOUNS.

anjing, dog.
dhobi, washerman.
ikan, fish.
itek, duck.
kipas, fan.
baju, shirt.
kolam, pond
kuching, cat.
nama, name.
obat, medicine.
pagar, fence.
pokok, plant, tree.

VERBS.

bayar, pay.
koyak, tear.
makan, eat.
minum, drink.
sewa, let for hire.

EXERCISE XII.

[1] Did the washerman tear this shirt? No sir, it was torn before. [2] Have you paid him? No. [3] Does that man know how to sew? No, he does not. [4] Are you going to eat? Oh no. [5] Do you want to buy anything? No. [6] Do you know the name of this plant? No, I don't. [7] Do you want to sell this cat? Certainly not. [8] Is this your dog? No. [9] He shut the gate of the fence so that the people should not come in. [10] Are there no fish in the pond? [11] It not this your fan? [12] Have you eaten or not? [13] Is your house let? No. [14] Tell the cook not to buy a duck to-day.

LESSON XIII.

The verbs "Sudah" and "Habis."

74 The use of *sudah* as an auxiliary verb has already been explained in paragraphs 45, 46, and 48, and its use in expressing past intervals of time in paragraph 41. As a verb proper, its meaning in the imperative is "finish," "that is enough."

75. *Sudah* may also be used in the indicative mood in the

P-ga'ngan, that which is held or controlled, charge, task, vocation, office.

P-ga'wai, officer, official.

Phala, see *pahala*.

Pi-a'la (Pers.), drinking cup. Cf. *chawan*.

Piara, see *pihara*.

Pi-a'tu, orphan; also *anak piatu*. Cf. *yatim*.

Pi'chek, narrow, confined, limited. Cf. *simpit*.

Pi'chit, *m-mi'chit*, to pinch, nip.

Pi'hak, side, quarter, flank, party.

Pihutang, see *hutang*.

Pi'jak, *m-mi'jak*, to tread on, stamp on. Cf. *injak* and *irek*.

Pi'jat, a bed-bug; also *kutu busok*.

Pi'kat, a horse-fly.

Pi'kat, *m-mi'kat*, to catch birds with birdlime.

P-mi'kat, a decoy bird; a bird catcher.

Pikir, see *fikir*.

Pi'kul, *m-mi'kul*, to carry on the shoulders or back; a measure of weight, being about what a man can carry on the shoulders = 133 lbs.

Pi'leh, *m-mi'leh*, to choose, select, elect.

Pi'le-han, chosen, elect.

Pi'lu, moved, affected, troubled, agitated. Cf. *rawan*.

Pim'pin, *m-mim'pin*, to hold or lead by the hand, guide, lead.

Pi'nang, *m-mi'nang*, the betel-nut palm; to ask in marriage, make an offer of marriage.

Pu'lau Pi'nang, Penang.

Pin'dah, *ber-pin'dah*, to move from one place to another, migrate, move house. Cf. *aleh*.

Pin'dah-kan, to remove a thing, transport, transplant.

Ping'gan, a large plate, a dish. Cf. *piring*.

Ping'gang, the waist.

Bu'ah ping'gang, the kidneys.

I'kat ping'gang, belt, girdle.

Ping'gir (Jav.), edge, border, shore. Cf. *tpi*.

Pin'jam, *m-min'jam* (149), to borrow.

B-ri' pin'jam, to lend.

Min'ta pin'jam, to borrow.

Pin'jam-kan, to lend (a thing).

Pin'ta, *m-min'ta*, to request, ask; see *minta*.

Pin'tal, *m-min'tal*, to spin thread. Cf. *rahat*.

Pin'tas, *m-min'tas*, to make a short cut, cut across. Cf. *rntas*.

Pin'tu, door, gate.

Pin'tu ger'bang, the gate of a fort or city.

Pin'tu pa'gar, a gate in a fence.

Bn'dol pin'tu, threshold.

Chu'kai pin'tu, house assessment.

J-nang' pin'tu, door posts.

P-nung'gu pin'tu, door-keeper.

Pi'pa (Port.), a barrel.

Pi'peh, flat, smooth.

Pi'pi, the cheeks.

Pi'pis, *m-mi'pis*, to bray or grind on a stone, as spices. Cf. *giling*.

Pi'pit, a generic name for birds of the sparrow tribe.

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IMPROVEMENTS OF FRUITS IN MALAYA.

The cultivation of Tropical Fruits on scientific lines has up to the present moment not, except in a few isolated cases, been attempted seriously in Malaya. This is unfortunate as the absence of this cultural knowledge is too apparent in the poor quality of the native fruits exposed for sale in the local markets.

Furthermore the industry has been almost abandoned in places, notably Singapore, and many of the old plantations in other parts of the Peninsula have been almost abandoned for so long that the quality and quantity of their produce is decidedly poor.

The scarcity of fruit of good quantity in Singapore has been particularly noticeable within the last two or three years, and what is available is mostly imported from outside sources. This state of affairs exists not only in Singapore but also, in a more or less degree, in other parts of the Peninsula and is in a great measure attributable to a lack of enterprise shewn by the native and Chinese cultivators.

It is true that the Government offers fairly attractive conditions to the small land holder but notwithstanding one sees a gradual decline in the industry. What is most urgently required is a properly organized scheme with Government help in the form of thoroughly trained Instructors in the approved method of cultivation and improvement of native fruits, and assistance in procuring young plants of selected and improved strains at a cheap rate.

The time has also come when an effort should be made to introduce many of the delicious tropical fruits which are not indigenous to Malaya but nevertheless flourish and fruit successfully here.

With this object in view early in 1907 I submitted a scheme to the Government of Perak for the improvement of native fruits and for the introduction and distribution of others not met with in cultivation here.

Roughly this proposal was to establish small nurseries at different places in the State which a central station at Taipeng where native fruits could be improved by a careful system of grafting, crossing and selection. The plants obtained by these means to be distribut-

ed to the several branch nurseries where they could be grown on and sold to the native cultivators at cheap rates. By this scheme it was hoped that the branch nurseries would become self supporting and prove valuable agents in the distribution of improved strains of native fruits. It was also proposed to train native Instructors at the central establishment who in turn could instruct the native in the up-to-date cultural methods. Further it was proposed that seeds and plants of fruits from other tropical countries should be obtained and distributed.

This scheme in a slightly modified form, was adopted by Government and is now in operation. It is hoped as time goes on that this new departure will develop and form the nucleus of a thoroughly organized system throughout the Federated Malay States and Straits Settlements.

Until such a scheme matures and instruction is available it is scarcely reasonable to expect that the native cultivator will abandon his present haphazard methods and adopt more up-to-date ideas; but in the meantime much can be done by estate owners and others who are in the habit of growing fruit for their own use or for sale. Their efforts would certainly demonstrate to the natives in their immediate neighbourhood the advisibility of adopting the same methods. The increased price of the produce from those estates should form the strongest argument in favour of their adopting the same methods.

The formation of fruit being influenced by different methods of cultivation and the grower having it within his power to determine the development of flower to a great extent it is hoped that to those who are interested in the improvement of the cultivation of tropical fruits the following few remarks may be of some value.

In all our agricultural efforts we seek to increase the value of our plants by increasing the quality and quantity of their crops or by decreasing the time necessary for their production. The means at our disposal for attaining this desired end are many and in adopting these the agriculturist is making use of general experience which has been accumulated during years of practice.

In all cases in which the market value of a plant lies in its flowers, or in the resulting product of those flowers,—the fruit,—it is desirable to increase as much as possible the number of flowering buds. To do so it is necessary to discourage the formation of needless vegetative organs (leaves) and encourage the development of the flowering buds by inducing the plant to store up a plentiful supply of food material in the stems and branches as reserve material. In practice it is common to observe that the excessive formation of leaves and sappy branches is detrimental to the production of flowers. In all cases it proves to be advantageous to counteract this by pruning. By this means the food material is thrown into the dormant flower buds which consequently develop in greater numbers.

If left to itself for any length of time a fruit tree in the tropic soon develops a great number of these barren branches and the crown becomes a tangled mass which prevents the entrance of light and air and uses up a needless quantity of the food reserve at the expense of the fruit crop. It can therefore be seen that pruning is necessary in fruit trees if the best results are desired. This is particularly the case with Mangosteens, Rambutans, Mangoes and other close growing fruit

trees of a bushly compact nature. In the case of larger fruit trees of a less compact nature *e. g.* the Durian, the same amount of pruning is not necessary after the tree has passed the younger stages. The best time to prune most kinds of tropical fruit trees is just after a period of vegetative growth and before the flowers begin to develop. Then extra vigor is thrown into the flower buds and the result is a greater number of healthy flowers, and the resulting product—fruits.

It is of the greatest importance that fruit trees should be subjected to a thorough system of pruning from their earliest days. This produces well proportioned plants, increases their floriferousness and improves the quantity and quality of their fruits. Young fruit trees while in the nursery beds should be frequently transplanted. This induces the development of a healthy fibrous root system, an item of great importance in fruit culture.

Another great point in successful agriculture is the judicious use of manures. The practical agriculturist aims at producing luscious and edible fruit in which either the pericarp or receptacle is to become succulent and sweet and it is always beneficial to accelerate the full development of the succulent tissues, their tenderness, lusciousness and sweetness by artificial means. This is effected by means of manures and in tropical countries where trees have no distinct resting period a certain amount of care must be exercised in their application.

In the case of trees which have reached the fruiting stage manure may be applied at various times during the year with success. Assuming that the soil is poor in nutritive salts applications of quick acting manures just before the period of growth commences will be beneficial. Top dressings of farm yard manures are also helpful at this period. Phosphatic manures induce the development of flower buds therefore the time to apply these is just before the appearance of the flowers. In the case of trees that make their growth and flower almost at the same time it is impossible to pursue this treatment but periodical applications of good farm yard manure will be sufficient to produce a marked improvement in the quantity and quality of the crop.

Another and perhaps the most important means of improving our fruits is by selection. In forming new orchards plants of none but the very best selected stock should be used. These plants should be raised from seed saved from strains possessing superior and desirable qualities, varying according to the nature of each particular kind, but readily recognised after a little study.

In other words young plants should be raised from trees known to produce fruit of the best quality. As a general rule it is not desirable to raise young stock of fruit trees from seed as the progeny very seldom comes true, generally reverting to something inferior and nearer the original type.

The best methods of propagating selected stock are by means of budding, grafting, inarching, layering and by cuttings. Plants raised by one or other of these methods are either equal to or an advance on the parent tree.

A few of the qualities desirable in a good fruit are (*a*) size, (*b*) flavour, (*c*) thickness and succulency of the mesocarp (flesh) (*d*)

thickness of the epicarp (skin) (*e*) colour (*f*) shape, (*g*) keeping and carrying qualities etc.

By a system of careful selection on these lines it is possible to obtain a fruit possessing almost perfect qualities, in fact the many excellent varieties of highly cultivated English fruits have been obtained by these means.

It must be admitted that the adoption of a thorough system of fruit improvement in the Peninsula would be of great assistance to the native Agriculturist and a great benefit bestowed on thousands of consumers.

The following is a list of the fruits of the Malay Peninsula, both those introduced and the native ones worth cultivating:—

Malay Name.	*Scientific Name.*	*English Name.*
Nona-Kapri	Anona squamosa	Custard apple
Durian-Blanda	Anona muricata	Sour-sop
Buah S'ri Kayah	Anona reticulata	Bullock's heart
Rukum	Flacourtia cataphracta	
Mangis	Garcinia mangostana	Mangosteen
Mundu	Garcinia dulcis	
Asam Gelugur	Garcinia atroviridis	
	Caryocar nuciferum	Butter-nut
Durian	Durio zibethinus	Durian
Blimbing	Averrhoa Bilimbi	
Carambola	Averrhoa carambola	Carambola
	Malpighia urens	Barbados Cherry
Limau Bali	Citrus decumana	Forbidden Fruit (Pumelo)
Limau Keah	Triphasia trifoliata	Lime-berry
Limau Manis	Citrus aurantium	Orange
Limau Nipis	Citrus limonium var acida	Sour Lime
Limau Kasturi	Citrus medica var	
Limau susu	do.	
Limau Puru	Citrus hystrix	
Buah K'nah	Canarium commune	Kenari-nut
Sentol	Sandoricum indicum	
Kechapi	Sandoricum radiatum	
Langsat	Lansium domesticum	
Rambutan	Nephelium lappaceum	
Pulassan	Nephelium chryseum Bl.	
Mata Kuching	N. longana	
Litchi	N. Litchi	Litchi
Manga	Mangifera indica	Mango
Bachang	M. foetida	
Binjai	M. caesia	
Lanjut	M. lagenifera	
Kwini	Mangifera odorata	
Rumeniya	Bouea burmanica	
Kundangan	B. macrophylla	
Kajus	Anacardium occidentale	Cashew-nut
	Spondias dulcis	Hog-plum
Nam-Nam	Cynometra cauliflora	

Malay Name.	*Scientific Name.*	*English Name.*
Assam java	Tamarindus indicus	Tamarind
	Chrysobalanus Icaco	Coco-plum
Jambu batu	Psidium guava	Guava
Jambu Bol	Eugenia malaccensis	Malay apple
Jambu Mawar	E. jambos	
Jambu Ayer	E. aquea	
Chermai Blanda	E. uniflora	Pitango
	E. brasiliensis	Brazil Cherry
	Cyphomandra betacea	Tree Tomato
	Bertholletia excelsa	Brazil-nut
Buah Susu	Passiflora laurifolia	Passion Fruit
Buah B'lawah	P. quadrangularis	Grenadilla
Papayah	Carica papaya	Papaw
Chiku	Achras sapota	Sapodilla-Plum
Mabola or Buah Mentagah	Diospyros discolor	Butter Fruit
	Persea gratissima	Avocado Pear
Sukun	Artocarpus incisa	Bread-fruit
Nanka	A. integrifolia	Jack-fruit
Champedak	A. polyphemia	
Tampunei	A. rigida	Monkey Jack
Rambai	Baccaurea Motleyana	
Chermai	Cicca acidissima	
Malakka	Phyllanthus pectinatus	
Nanas	Ananasa sativa	Pine-apple

For further complete list of the edible fruits of the peninsula and their accounts see (Agricultural Bulletin S. S. and F. M. S. Vol. I. pages 297, 371, 429, 499, & 531).

T. W. Main.

THE IMPROVEMENT OF THE DAIRY COW IN THE MALAY PENINSULA.

The complete success of dairy farming depends to a great extent on the cattle used therein and it is dependent also on the improvement which is capable of being brought about in the cows which any dairy man keeps. It may therefore be said that the dairying industry of any country is not on a solid basis unless the class of cow used is of the best character.

Great strides have been made in England and elsewhere in perfecting the present race of dairy cow until an animal has been produced which pleases the most exacting judge of dairy stock. When we look at the state of perfection the horse has reached for racing purposes we can realise what possibilities there are in different parts of the world for the improvement of the milk producing cow. In no part of the world does the dairy cow require improving more than in the Malay Peninsula. The cow is an Indian breed with poor milking qualities and yields a milk poor in quality. Further the milk is obtained and sold under the most insanitary conditions so much so that the rapidly

increasing European population steadily refuses to buy the milk from the native cowkeepers, who by the way are chiefly Indians, and resorts to the bottled or tinned brands so plentifully imported. The want of a good healthy and pure milk is sorely felt and the risk run in using the local article is so great that anything in the way of improving the qualities of the native cow will be warmly welcomed.

The introduction of the English Shorthorn from Australia has been adopted by a number of people in the Federated Malay States with such good results as to warrant further experiments with this excellent breed. Being of a light build and not inclined to beefiness the Shorthorn seems to be well adapted to stand a tropical climate and up to the present time there have been surprisingly few failures. I have not heard of any other breed having been introduced but it is quite reasonable to expect that such breeds as the Guernsey and Jersey would stand our climate as well as the Shorthorn does.

I would not advocate the introduction of herds of English cattle to supplant the Indian breed, this would undoubtedly be a failure; but I certainly do advocate their introduction as a means of improving the native or Indian cow by interbreeding. I have seen several cross bred heifers of this nature from Shorthorn dams sired by Indian Bulls and in each case the Shorthorn blood has predominated. At the Perak Government Dairy Farm at Maxwells Hill, Taipeng a herd at present numbering young and old about a dozen, is kept. The Bull is a pure bred pedigree Shorthorn of fine type and the cows are all well bred animals with good milking qualities. There it is intended to gradually weed out the Indian cows and have a dairy entirely composed to English cattle.

There should be no difficulty in doing this as the cattle thrive at that elevation (3,500 ft.) much better than on the plains. The native cows in the herd are being sired by the Shorthorn Bull and great things are expected in the future. It is hoped that the young progeny from this Bull will gradually spread over the Peninsula as I have no doubt they will. Several private individuals are doing good work on similar lines but in a smaller way and at present I see no reason to doubt that in time an entirely new race of dairy cow will spring up far superior to the native beast in milk and beef producing qualities.

That an improved milk supply is urgently needed, especially in large towns like Singapore, Penang, Kuala Lumpor and Ipoh goes without saying and outbreaks of disease such as typhoid fever amongst Europeans are surprisingly rare, when we look at the filthy samples of fresh milk offered for sale in these places. The absence of disease is probably due to the fact that most people dread the local article and used tinned or bottled milk which is at least sanitary.

Milk although one of the most valuable forms of natural food is at the same time one of the best agents for conveying and spreading disease germs.

If therefore there be any infection present at the source of supply it can be taken as a certainty that the milk will quickly convey the germs to every point where it is distributed. When we look at the filthy state of native cattle sheds and the manner in which the natives live crowded together in the same sheds with the cattle we see at once

ideal conditions for the propagation and distribution of all kinds of disease through the milk sold.

It is unreasonable to expect that the native cow keeper will ever improve his methods unless force is brought to bear on him by the authorities and a properly organized scheme is introduced for their management, under strict Government supervision, and the scientific improvement of the present breed of Dairy cattle.

T. W. Main.

SOME DISEASES OF RUBBER PLANTS.

In the Bulletin du Department de l'Agriculture des Indes Neerlandaises, No. 12. III, Dr. Bernard gives an interesting article on diseases of rubber plants under the title of "Sur quelgues Maladies des Plantes a caoutchouc." Under a chapter "considerations generales" he points out that plant pathology is an art still in its infancy and shows how much more difficult a study it is than animal pathology, as a sick animal shows signs of its ailment externally, while a plant may be seriously ill and show very few signs of it, and again while it is easy to administer medicines internally to animals we can only make use of surgical operations and hygiene to plants, at present. Plants under cultivation are necessarily put under abnormal conditions. They are usually cultivated in a country remote from their original home and under a different climate. Wild plants grow separately, not crowded together as in cultivation but isolated through the forests which prevents the spread of any ailment by which they are attacked.

He dilates on some of the important points in cultivation which have for their object the hygiene of the plant, such as attending to the straightening of the tap-root when planting out, the eradication of lalang and its replacement by beneficial herbaceous plants, and the thorough digging over of the ground, and strongly condemns the planting of Hevea in old coffee ground, where he says a disease may spread from the old worn out coffee-bushes to the young Heveas, and as strongly urges the breaking up of the estate by barriers of other plants to prevent the spreading of disease; Hevea plantations being broken up into lots with *Ficus elastica* barriers.

Further experimental research with a view of obtaining more vigorous and disease resisting strains, and varieties giving an increased and superior product are required: such studies as have been made in tobacco and sugar cultivation with such remarkable results. There have been as yet few of these investigations made on the Para rubber, for in the first place the experiments which can readily be made on an annual plant such as tobacco, must take a far longer period in a tree such as Hevea, and secondly because in Java there are too few trees old enough to be utilised for such experiments and thirdly because the demand for plants has been so much greater than the supply that all the plantlets have been required for cultivation rather than for experiment. When however the boom of late years has passed and the cultivation has settled down into a steady course opportunities for such research and investigation will be found and used.

The next part of the paper deals with the various pests of rubber plants the first of which attacking *Hevea* is *Corticium Javanicum* the Javanese Jamur upas (Djamoer oepas) which the author considers the worst pest. A remarkably good photograph is given of this destructive fungus. It has already been described in the Bulletin.

It not only attacks rubber but is most destructive to coffee, and also attacks other plants. It attacks trees of all ages but is most destructive to plants of $1\frac{1}{2}$ to $2\frac{1}{2}$ year's age. It usually appears on the bases of the lower branches, but also and here it is more dangerous on the trunk at about the height of the first branches. It first appears as a pink or nearly white spot, and grows, thickens and becomes brighter rose color. It spreads and eventually surrounds the trunk or branch killing it. The edge of the mass of fungus is merely superficial but the mycelium filaments of the centre penetrate to the wood. The bark becomes porous, broken up and soft. The small beetles then attack the decaying portion and finish the work of destruction. The author made small wounds in a young Hevea bark and inoculated them with spores of *Corticium* taken from a coffee tree, and the growth of the fungus proved that the disease on the coffee was identical with that of the rubber tree.

The fungus appeared in the west monsoon, and it was clear that the dampness of the air favoured the growth much. In a plantation at Bandong, of about 180,000 trees, two years old, during the rainy season about 30 trees were attacked each month, about 500 trees in all. In the dry season only one or two here and there were attacked. The disease was contagious, and the fungus passed from tree to tree, and from coffee bushes to Heveas. The author strongly condemns therefore the habit of planting Hevea among old worn out diseased coffee.

The remedy is to cut away all parts attacked. The infected portions should not be carried through the plantations but burnt on the spot. Rubber stands operations of this nature very well. By lopping and tapping where necessary in the above mentioned Bandang Estate only about 20 trees attacked were lost. He points out however the risk in tapping larger sized trees, due to the wound made being too large, and allowing water to settle on the tops and permitting fungus spores and notably *Corticium* spores to grow there. In the case of an attack he recommends spraying the neighbouring trees with Bordeaux mixture.

The next fungus described is what he calls the *white root fungus* (champignon blanc des racines) met with in Java and Sumatra and as dangerous as the *Corticium*. This attacks trees of all ages but especially those of 1 or 2 years old, which appear quite healthy and suddenly commence to go brown at the top, the leaves later became yellow and fall. It is difficult often to know whether this is due to the normal leaf-fall or to the disease. A little later a wound in the bark only lets a little latex exude and later all flow ceases from the base upwards to the top. In a few days the plant is quite dead. The roots are found to be covered with more or less strongly developed cords, white, leathery elastic and matted, branching and eventually quite covering the root. At first the strands are found on the tap-root, which is destroyed; later it spreads to the side roots.

In young plants it is nearly always fatal. The tree generally dies in from 10-15 days after the attack is noticed.

At present (in Java,) it is not a serious disease. In an estate at Bantam out of 70,000 trees about 30 were killed by this fungus, but though these were in the same part of the plantation the trees were distant from each other and surrounded by healthy trees. So it appears that if contagious, the risk of contagion is very small.

Culture experiments failed to produce any reproductive organs, so that the plant could not be identified, but it is probably one of the Polyporeae.

Four root parasites of Hevea are recorded, *Fomes semitostus* and *Irpex flava* in the Straits and *Poria vincta* and *Hymenochete sp.* in Ceylon.

(The white root fungus described by Dr. Bernard suggests a fungus which has several times been sent to the editor occurring sporadically in estates, not spreading from tree to tree as Fomes does. This root fungus we have not yet seen fruit of. It may be *Irpex*).

The occurrence of the parasite Bernard suggests is due to excessive dampness in the soil, and in the Bantam estate it was found that the trees had been badly planted, the tap-root not having been straightened in planting. The occurrence of such fungi as *Corticium*, may have an enfeebling result in the roots. He affirms too that the remains of lalang decaying in the soil (presumably the rhizomes) play a part in the extension of this malady. (This is an important statement and one that it is desirable to have fuller details about. Personally I have seen nothing in the Peninsula to suggest it).

The remedies suggested for this disease are better drainage, and disinfection of the soil with lime, destruction of the infected plants, and planting the soil with soil-improvement plants are urged. Watering sick plants with lime water constantly and manuring have produced good results.

The third pest is a species of *Fusicladium*. This produces a black canker of the stalk. It is not at present a serious disease. In two different plantations it attacked a dozen plants close together, a little later in one of these plantations, it attacked a new lot of about forty trees, of which thirty perished. This lot was about half an mile away from the preceding one. The disease appeared on the pruned branches, and the top of the tree after topping. The leaves withered, became yellow and died and then fell off. The flow of latex diminished rapidly, then ceased and in a few days the plant was dead. Sometimes only the upper part died, and at the tree budded again below the diseased part. The bark cracked and peeled off, where affected, and the fungus formed a blackish fur on the surface of the wood. The Mycelium threads are brown and branched and after destroying the bark and base penetrated the young wood which darkened in colour. Is infectious spreading from plant to plant.

It is advisable to seal up the cut made in tapping, and to cork up the hole in the top, to cut off the part affected below the diseased part, burn the pieces and spray with Bordeaux mixture. Spraying with a substance known as *Carbalinum* which is said to have given good results in Europe and Java is recommended.

The author then mentions the Ceylon canker *Nectria diversispora* described in the Ceylon agricultural journals, and goes on to urge the system of not too close planting of Hevea, with some leguminous plant between and separated into plots by barriers of *Ficus elastica*; and this breaking up of the plantation with sections, he recommends too for nurseries as, it is better to have a number of small detached nursery beds separated by hedges rather than one large one, to permit any disease spreading through the lot. This all will agree with.

Pestalozzia Palmarum a leaf parasite on coconuts, tea, Gutta percha etc., has been met with on *Hevea* and *P. guepini* occurs also in Ceylon and Java, but does not do much harm as long as it confines itself to the leaves; when it attacks the stalks of young plants however it is fatal.

Stilbella (*Stilbum*) *Heveo* attacks the young branches dead after an attack of *Corticium*.

Among annual pests of Hevea the author mentions Acari, (mites) borers, small beetles (*Xyleborus* and *Bostrichidae*) which attack damaged part of the trees, termites, (but apparently *Termes Gestroi*, does not occur in Java); red ants which devour the plantlets as they germinate, eating off the growing points; a caterpillar (unidentified) which eats the leaves and a bug which attacks the foliage and finally porcupines and wild pigs.

In concluding his account of the diseases of Para rubber, he mentions one or two obscure ailments which do not seem of any importance and includes under them the well known formation of burrs on the trunk which he suggests are due to punctures caused by some insect. This however we know is not the case.

The paper concludes with some accounts of pests of *Ficus elastica* (chiefly insects) Castilloa attacked by *Corticium* and the white root fungus; *Kickxia elastica* and Ceara rubber.

He writes at some length about lalang but the chief addition to the information we possess on the injury caused by this plant, lies in the fact that in plantations where this grass was found to be abundant, the root fungus appeared, and in digging it was seen that fragments of dead lalang rhioimes were covered with the mycelium. An estate which had been for two years healthy while there was no lalang was neglected on account of expense, lalang then invaded it and simultaneous the root-fungus.

However as one has frequently seen Para rubber grown in lalang, and free from root-fungus, and vice versa a good deal of root-fungus and no lalang present, it is probable that the only connection between the two is that the lalang spoiled the soil, and weakened the plants which were then attacked by the fungus. I do not think that we have yet got at the real cause of the injury done to trees by the presence of lalang in the ground, and more experiments and observations are required on this subject.

A good suggestion is to use the shrub *Leucaena glauca* against lalang. It is a leguminous plant, easy to grow from seed and though apt to get rather large might be will kept cut back so as not to interfere with the growth of the young rubbers. It seems to have been successfully employed to kill lalang.

Lima beans (*Phaseolus lunatus*) which gave satisfactory results in this way, but were found to be too expensive. They have also the objection that being climbers they cause trouble by twining round the young plants, and after the catastrophe in Province Wellesley some years ago when the brown-seeded wild form being used, some coolies collected and ate the beans with fatal results it is hardly likely that it will be used again here.

H. N. R.

NOTES ON SOME PISCICIDES.

At the recent Agri-horticultural exhibition at Kuala Lumpor, there was as usual a prize offered for the best sample of Tuba, the roots of *Derris elliptica* so commonly cultivated by the Chinese for the purpose of killing insects infesting the vegetable gardens, and which is also well known as a piscicide, for stupefying fish. The Malays however who entered for this competition sent a series of roots and fruits which were used by them as piscicides, or Tubas. Of the use of these nothing seems to be known, and as the knowledge of all plants of a poisonous nature is very desirable, I put together what notes I have on these, in the hope that the attention of those who have an opportunity of making further observations may be called to these plants.

The largest series was shown by a Malay who exhibited samples of eight kinds of piscicides, but as most of these however were represented by roots only they were unidentifiable. The Malay names were given as follows.

Tuba Bua	Selowung
Tuba Ubi	Tuba Pahang
Tuba Jenou	Ambi Ara
Tuba Lucheh	Kechubong.

Tuba buah is the fruit of a *Diospyros*, *D. toposioides* King, and Gamble (*Ebenaceæ*). It is a big tree about 40 feet tall or less, with alternate coriaceous leaves, oblong-elliptic shortly acuminate or acute, base rounded, with 16 to 20 pairs of nerves, little curved and arching far from the edge. Male flowers ¼ inch long in cymose axillary panicles. Females larger, fruit in cymes often very thickly crowded on the branches, an inch or an inch and a quarter through when ripe and at first covered with a red fur, which rubs off easily. In shape it is globose with a depressed top. The sepals form a thick undulating disc four lobed and shorter than the fruit, covered at first with red hairs, which rub off.

The fruit is said by the Malays to be very poisonous to fish. It occurs in Perak, in the Dindings and in Selangor.

Another species of the same genus named *Mentuba*, was obtained by Mr. Cantley's collector in Malacca at Selandor. It is a tree 60

feet tall with alternate leaves oblanceolate acuminate with a short blunt point and very coriaceous, drying brown; they are 6 inches long and 3 inches wide, quite glabrous with 7 pairs of nerves curved and arched within the margin. The fruit is on short half-inch cymes, and the peduncles as well as the buds, young portions of the stem, fruit and sepals are all covered with short red hair. The fruit is globose but not depressed at the top and larger than in *D. toposioides;* the sepals are four short rounded lobes, thinner and smaller than in the latter species and not forming a thick disc. The fruit is said to be poisonous, and the name Mentuba implies that it is used for the purpose of fish-stupefying.

Others of our Ebony trees probably have the same properties and several species from other parts of the world are stated by Greshoff in his Vischvergiften to be used in the same way.

Tuba Ubi. This is the tuberous root of a very remarkable species of *Dioscorea* of which a living plant was sent a year or two ago to the Singapore Botanic Gardens by Mr. A. D. Machado of the Kamuning Estate. The tubers are large and palmate of a dark brown colour outside and about a foot or more long, forming a rather large mass.

The stem is woody and angled and thickly covered with triangular brown thorns, laterally flattened and from 2 to 6 connate forming short thorny ridges. The thorns are ¼ inch or more long. Leaves deeply cordate acuminate 6 inches long and as wide, the cusp 1½ inch long, nerves eleven radiating from the base and ascending to the cusp, transverse nervules prominent and numerous; peteole 4-5 inches long thorny along the upper edge.

The flowers as is so often the case in this genus must he rare, as the Malays did not know of them.

Selowung. This was only represented by roots, but is probably identical with specimens sent many years ago by Vaughan Stevens under this name, as used by the Sakais in the manufacture of their dart poison. The plant proved to be *Miquelia cordata* King, a rare plant in collections and but little known. It is a rather slender climber, 10 to 15 feet long, with alternate thin ovate to oblong leaves, acuminate blunt with about 6 pairs of nerves alternate 6 inches long by 2 wide or less, covered on the back especially on the main nerves and reticulations with short apparently glandular hairs. The petioles are an inch long and undulate, apparently stem clasping and also pubescent. The inflorescence is axillary on a long peduncle. The flowers white and small. The fruit is very curious; it is oval and flat, ending in a long beak, shortly stalked, an inch long with a half inch beak, bright red. The seeds are very numerous.

I have it from Perak; Chanderiang (Kings Collector 5,680.) Ipoh. (Curtis 3321) and Maxwel's Hill (Ridley 5,229.) It has also been obtained in Kemaman by Vanghan Stevens.

Kechubong in the well known *Datuoa fastuosa* (*Solanaceæ*) a weed of villages, the poisonous properties of which are well known, and

need not be dilated on. The remaining four viz. Tuba Jenow, Tuba Lucheh, Tuba Pahang, Tuba Ambi Ara are quite unknown to me, and specimens identifiable are most desirable. Perhaps some of the District Officers, medical men and others who are in contact with the up country Malays would take so much trouble as to make enquiries of the natives as to these plants and get them to bring specimens for identification. Plants of this nature are often valuable medicinally, and it surely hardly needs to be pointed out how important it is to be acquainted with the poisonous plants of any country.

H. N. Ridley.

RAMIE FIBRE.

PROGRESS OF ITS MANUFACTURE IN EUROPE.

Adaptability to Malaya Soil.

(Written Specially for Straits Times.)

It will be a matter of interest to planters of ramie fibre in the Straits Settlements to learn that the progress made in the profitable spinning of this fibre in 1906 was more than maintained in Europe last year.

In accordance with expectations formed, the Erste Deutsch Ramie Gesellschaft, of Emmendingin, Baden, Germany, declared an increased dividend of 15 per cent., as against one of 12 per cent. for 1906, their net profits amount to 197,382 marks for the year, as against 646,767 marks for 1906. This represents a net profit in English currency of nearly £43,000.

The mills established some two or three years age at Enschede, Holland, and Grevin, Westphalia, are also making satisfactory progress, and it may be said generally that the sales and profits of the mills engaged in spinning the fibre, with one or two exceptions, all showed marked increases over those of the preceding year. It is to be hoped that ramie growers in the Straits Settlements, so often referred to as the best ramie growing area, may be able to find an increased outlet in Europe for the product.

The Faure Decorticator, according to a statement made by the inventors and patentees, Messrs. A. Faure and Company, of Limoges, France, is likely to be still further improved upon in many respects. Of the two classes of these machines made by this firm, it may be stated that the product of the large machine, which has been invented with a view to obtaining a larger yield of dry fibre per working day, than the 140 lbs. given by the smaller machine is not as good either in regard to regularity or the manner in which it is cleaned as that produced by the smaller machine, it being stated by ramie spinners to

be about 20 per cent. inferior in value. It is, however, still unutilisable. The small size, or No. 2, machine, a fair number of which are working in India, is, therefore, the one which growers should make use of, and if the land on which their crop is cultivated is of a nature to yield a sufficiently large percentage of long stems, the machine will deal with them satisfactorily and profitably to the grower.

Expelling the Gums.

The attention of certain ramie spinners, has been lately drawn to a method of expelling the gums from ramie and removing the inner bark from the stems by passing them through rolling mills, and the writer recently saw samples of the product prepared in this manner, which looked fairly well, and the material will be tested shortly at one or two factories with a view to ascertaining how it degums, and whether or not the fibres are in any way crushed or broken by this method of dealing with them.

Necessarily in all systems for removing the epidermis from the stem of the plant, the chief essential is that the same shall be accomplished with as little loss to the quantity of the long fibre (which they contain, and which is the most valuable as a textile product) as possible and in the same manner the method must be capable of dealing successfully with the short stems, and extracting the fibre which they contain with the very minimum of waste.

A circumstance of very considerable importance to the ramie grower, and one which doubtless will be investigated by the Economic Products Department of the Government of India, is a statement made in a hand book on the subject of Rhea or Ramie Fibre cultivation, issued some years ago by the Rhea Fibre Treatment Company, of Shaftesbury Avenue, London, the owers also of the Rochdale Rhea Fibre Mills, at Castleton, Rochdale, Lancashire, which was to the effect that there exists a variety of the Bon or Bom Riha, which grows wild in many districts in India and Burma, the fibre yield of which averages from 66 to 70 per cent. per ton of fibre degummed, as against a yield of 45 per cent. obtained from the variety Boehmeria Nivea. In these districts, it is stated the true ramie or Rhea, Boehmeria Nivea will not grow so well.

This remarkable statement in regard to the fibre appears to have escaped general notice, but it is one of very considerable importance, as, should it prove to be the case, and also that this species of the plant will adapt itself to cultivation in the Straits Settlements, then it undoubtedly would be the one to which ramie growers should direct their attention, as their crop would be more valuable on the commercial market.

Cultivation in Johore.

In the course of a lecture on Ramie Cultivation and Manufacture, which he delivered in 1894, before the Dundee Chamber of Commerce, Mr. J. M. MacDonald, Managing Director of an English Ramie Spinning

Company in the Midlands, who was also prominent in organising a combination of manufactures with a view to taking up the cultivation of the fibre on a large scale in Johore, where it was also intended to decorticate and degum the fibre on the land where it was grown stated that above all other districts he regarded the Straits Settlements as the most favourably situated for ramie cultivation, and the land there capable of producing the largest yields of fibre, and he estimated the quantity of white fibre or filasse obtainable from the variety Boehmeria Nivea as averaging from 45 to 55 per cent., with a yield thereafter of a couple of years growing of about $1\frac{1}{4}$ to $\frac{1}{2}$ tons of dry fibre to the acre.

This yield, in his opinion, would increase annually, and he estimated accordingly that this estate would be able to sell the product in London at a figure which would undersell fibre cultivated in any other district.

The property of this combination, the Straits Settlements Ramie Fibre Growing Company, was acquired under a concession granted by the Sultan of Johore, and there is little doubt but that for the unfortunate death of Mr. MacDonald, which occurred on the property while it was being prepared for planting, ramie cultivation, would now have been an established industry in the Straits Settlements.

For the purposes of decortication of the fibre, use was to have been made of a decorticator of special design which was the invention and patent of Mr. MacDonald. Many prominent Dundee manufacturers had sufficient confidence in the peculiar adaptability of the soil and climate of the Straits Settlements to grow the fibre successfully to support Mr. MacDonald in his venture, but withdrew from the matter on his death.

Early in the present year, a Syndicate was organised in London, and is still in existence, which has for its ultimate object the extensive growing and decortication of the fibre in Malaya, and small parcels of ramie ribbons grown in Java were sold in January this year, in Holland, at £7 per ton.

The facilities for easy and rapid shipment are apparently the strong points which lead people in Europe interested in ramie culture and manufacture in a great degree to favour the Straits Settlements as a growing area.

Quotations for Yarns.

Meantime the price of China grass has averaged £25 to £28 per ton. The principal ramie mills are quite as well able to degum ramie ribbons as China grass, provided the product is clean and dried thoroughly before shipment.

It should, further, be baled in such a manner that it cannot get damp on the voyage, in order to avoid fermentation, and consequent weakening of the strength of the fibre. Any small growers of the fibre desiring a smaller type of machine than the Faure Decorticator, and at the same time a cheaper one, might be able to obtain one of the

MacDonald machines by communicating with the Midland Spinning Company, Tower Chambers, London, E.C.

Leading French Continental Ramie Spinners are quoting for ramie yarns spun on the metric system, or 1,000 metres of simple spinning to the kilogramme (9lbs. 2 ozs.) as under, in frames per kilogramme (one franc equals 9½d. in English Currency):—

		Singles.		Doubles.		
		Weft.	Warp. Twisting		Twisting	Twisting
			Flat and round	tight to 100	extra tight	
Nos.	Quality.		to 75			to 125
10	L.B.	to 90	to 1.25	3.86	3.91	3.96
11	E.H.	—	3.75	3.89	3.95	4.01
12	,,	—	3.79	3.93	3.99	4.05
13	,,	3.77	3.83	3.97	4.03	4.11
14	,,	3.81	3.88	4.01	4.08	4.15
15	,,	3.85	3.92	4.05	4.13	4.21
20	,,	4.15	4.25	4.35	4.45	4.55
25	E.F.	4.45	4.57	4.70	4.83	4.95
30	,,	4.75	4.90	5.05	5.20	5.35
31	1a	4.83	4.98	5.14	5.30	5.45
32	,,	4.91	5.07	5.23	5.39	5.55
33	,,	5.00	5.16	5.33	5.50	5.66
34	,,	5.09	5.26	5.43	5.60	5.77
35	,,	5.19	5.36	5.53	5.70	5.88
40	,,	5.75	5.95	6.15	6.35	6.55
45	,,	6.47	6.69	6.92	7.13	7.35
50	,,	7.31	7.56	7.81	8.06	8.31
55	Extra	8.21	8.48	8.76	9.01	9.29
60	,,	9.20	9.50	9.80	10.10	10.40
65	,,	10.21	10.53	10.86	11.18	11.50
70	,,	11.30	11.65	12.00	12.35	12.70

New Patents.

For yarns of the above class, the chief market exists in spinning combined with linen warp yarns, and into various descriptions of pure ramie cloths to compete against linen goods.

For yarns spun on the worsted scale, Messrs. Foster and Company, Ramie Spinners, of the Water Lane, Selby, Yorkshire, quote as under:—

1/12s	Bleached	Ramie	Yarn	F2 Quality	...	2/0½ lb.
1/16s	,,	,,	,,		...	2/1 ,,
1/20s	,,	,,	,,		...	2/1½ ,,
1/24s	,,	,,	,,		...	2/2 ,,
1/32s	,,	,,	,,		...	2/2½ ,,
1/36s	,,	,,	,,		...	2/3½ ,,

Folded ½d. per lb. extra. Terms net cash.

These are meant for wearing with woollen goods to which they impart non shrinking effects.

Many new patents have been taken out during the last twelve months for ramie decorticating machinery, and also for new methods of its degumming. The most notable expansion in the trade after Germany is in France. In England it has also increased, and has been better in Switzerland, where, in 1906, there was comparatively, a quiet year in comparison with those preceding it.

Among other new purposes to which the fibre is being turned may be mentioned that of the manufacture of filter cloths, and there is a prospect that the waste arising in spinning will be made use of more largely by paper manufacturers. When used as a base for this purpose many materials, which cannot otherwise be utilised, can be employed successfully, and the cost of production is reduced considerably.

All classes of paper, from the finest to the commonest qualities, can be made economically from ramie waste ; the quality depends largely on the quantity of the material which is employed in the manufacturing operations. When it is used alone, the quality is of a most excellent standard. When mixed with other materials, it reduces cost production, and produces a good article. The adaptability of the fibre to take the dye well enables fine tints to be obtained.

In the United States, the Howard Ramie Fibre Company, which put down during the year a plant capable of treating 14 tons of raw material weekly, are stated to be making satisfactory progress, and overcoming the initial difficulties of their treating and manufacturing operations.

Experiments in the spinning and weaving of the fibre have been made in many new districts in England, and on the Continent.

Straits Times, August 19th 1908.

Notes on Above.

The interest in this article lies in the account of the recent progress made in Europe in developing the trade and in the tables of prices.

The account of the Bom Riha is a very old one, and the plant is well known, none of the forms of *Bœhmeria* have done as well as a local strain, known as the Singapore variety, but the story of *B. Nivea* and the other varieties has often been told in the Bulletin and elsewhere, so need not be dilated on.

The trouble with Ramie is not as people at home seem to suppose the preparation of the filasse but the cultivation at a price that will pay.

H. N. Ridley.

THE CHINESE METHOD OF ROTATION OF CROPS AND RECLAMATION OF LALANG LAND.

The most conspicuous evidence of the folly of the Government leasing of agricultural land in the Straits Settlements, is the existence of enormous tracts of valuable land, now overgrown with lalang (Imperatia cylindrica) and consequently thrown back upon the Government as a practically valueless asset. It generally takes about ten years for such land to be covered with good secondary forest growth. Had the Government stipulated that every acre of land should be replanted with some permanent trees, or had they made the conditions of the lease such that it would be more profitable to cultivate such land than abandon it and take up new virgin jungle, we might have had all these waste areas beautifully afforested or at least yielding some returns. Fortunately since the cultivation of Para Rubber has proved to be a success, even with tapioca as a catch crop—thanks to the pioneer work of Mr. Tan Chay Yan at Bukit Asahan—now the Malacca Rubber Plantations Limited, the Government or the officials of the land office, are quite awake as to the necessity of preventing tapioca and other lands going into waste under lalang.

It may therefore be of considerable importance to planters to know that Chinese vegetable growers practice an economical method of reclaiming lalang land. In discussing this, it may be interesting also to note in passing their system of manuring, for the lalang is not merely weeded out but is also choked out by a careful rotation of valuable crops. As a rule, it costs about twenty dollars at least to clear one acre of lalang. The Chinese, who pay their farm hands at $12-$15 a month, manage to get good returns within two years by reclaiming lalang land, and to convert it into a useful vegetable garden.

The fact that this system has succeeded so well in Singapore, where the soil is generally poor, argues that it should be more successful, wherever the soil is more fertile. It must be admitted that without the use of farm-yard or human manure this system cannot succeed very well.

The essence of it may be explained in a few lines. The stems of the lalang are exposed by hoeing or deep ploughing, and removed by the rake and burned. The soil has to be turned up two or three times if necessary to remove the weed completely.

At the same time, the aid of nature is called in. Rapidly growing plants are planted at once in carefully manured beds. A struggle for existence is thus artificially introduced, and within three months or so, the patch of waste land is covered with green vegetables. The transformation is very impressive, but the steps require to be seen. The change affords a striking object lesson of the importance and value as well as feasibity of permanent cultivation of the soil.

But unfortunately in Singapore, cultivation of the soil is not profitable unless "night-soil" is utilised. Human excreta constitute the most efficient and at the same time the cheapest manure. The Municipal authorities evidently do not take the slightest interest in the utilisation of this refuse. They proposed an extensive scheme of casting it out to sea, and dumping it all into the deep ten miles off

Singapore. Surely when this was proposed, neither the Engineer nor the Medical Health Officer had in mind the state of vegetable cultivation in the Colony. The bulk of our population consists of people, whose food is principally a mixture of rice and vegetables. Without the night-soil removed from town the numberless vegetable guardens in the country must be abandoned. The result will inevitably be that vegetables will be grown in Johore and elsewhere—Rhio perhaps and if there is danger in the use of such matter, the risks of infection will be increased, since our sanitary authorities cannot possibly control these foreign growers. It seems to us that the most useful method of disposal of excreta for this Colony—in view of the urgent needs of vegetable growers—is some scientific means of treating the manure in different depots in the country and then distributing it to the gardens. The risks of this form of manure carrying infection are not great inasmuch as the night-soil is thoroughly fermented before it is put to the soil. One can easily conceive of its utilization in an appropriate manner without offending the taste of even the most fastidious.

Without some good manure, it is not easy to raise plants on such exhausted soil as forms the habitat of lalang as a rule. This much maligned grass is in our opinion a friend to man in disguise. When the soil is composed principally of clay—and the surface humus has been all washed away, there are very few plants that can grow on it. But such land is sooner or later invaded by lalang—whose underground stems penetrate deeply, and ramify in all directions. In this way the surface soil is broken up. As the grass grows up and dies down, a quantity of organic debris begins to collect, and in course of time, affords a suitable nidus for the growth of shrubs and forest trees. If it were not for the lalang, the afforestation of such waste land would take a very long time indeed. But unfortunately lalang is very treacherous to get rid off, and is very fatal to the growth of young plants. There are very few tree seedlings, that can survive in the struggle for existence. Even such hardy trees as the coconut palms become sallow and sickly and eventually stunt and die. Para Rubber trees make a brave struggle, and if there is enough humus in the soil, soon outgrow the lalang, and if closely planted may force the latter to die out on account of the shade.

The method of stamping out the lalang must be carried out systematically. As soon as an acre or so of the land has been ploughed, holes $3' \times 3'$ are dug out at about $20'$ intervals, and filled with manured humus, the seeds of *labu*—the bottle gourd, or of other species of quickly growing acucurbita are sown. The young plants quickly spread all over the ground. In the meantime, the ground is turned up a second time, the stems of lalang being thrown up, collected and burned.

In a couple of months, the gourd has flowered and withered away. Again, the land is hoed, and then as a rule some atropaceous plant such as chillies or egg-plants are planted in beds. The ground is by this time well freed of lalang, and is scrupulously weeded. The young plants, replanted usually from a nursery, are manured with a diluted mixture of ripened excreta and water daily or thrice weekly.

The chillies are well nigh exhausted about four months from the time of planting. They are generally succeeded by a crop of sweet potatoes, after which the land is allowed to lie fallow for a couple of months. Then the weeds are ploughed up and used as green manure mixed with farm-yard compost.

Briefly the order may be stated categorically.

1. Chilli.
2. Some leguminous plant.
3. Sweet potatoe.
4. Tapioca.

Indigo is a favourite leguminous plant to be cultivated. It requires very careful manuring, and generally yields three crops of cuttings—after which the land is allowed to rest for a few months.

By careful tillage and judicious manuring, these Chinese vegetable gardeners are able to make use of the poorest land available and to obtain good returns for their toil and investment. When lalang land has been thus reclaimed, it is not unprofitable to plant it up with rubber between the vegetables grown.—*Dr. Lim Boon Heng.*

FIFTH JOINT ANNUAL AGRI-HORTICULTURAL SHOW OF THE MALAY PENINSULA, HELD AT KUALA LUMPOR 10th, 11th, and 12th, AUGUST, 1908.

Kuala Lumpor Agri-Horticultural Show 1908.

The fifth Agri-Horticultural Show of the Malay Peninsula was held in Kuala Lumpor on the 10th, 11th, and 12th August. The Show which was opened by His Excellency Sir John Anderson K. C. M. G. was favoured by excellent weather and was by general consent considered very successful.

Working arrangements.—The system of working this year's Show was somewhat different to that of previous years in that the whole management of the Show was undertaken by one small Committee of nine members. No Sub-Committees were appointed with the exception of a committee of three who drew up the prize list in the native art section, and the Horse Committee which had entire charge of that portion of the Show.

In place of the usual sub-committees in each division Stewards were appointed for each section, whose duty it was to attend to the arrangements of the exhibits on arrival, and facilitate the work of the Judges in their section.

This change in working arrangements is I think one to be recommended, the small committee is more workable, and the selection of Stewards each having a definite section to look after is preferable to the old system of having a sub-committee of say five persons, who each left the work to the other with the result on many occasions when most needed, they were not to be found.

Show and Buildings. The site of this year's Show was the Malay Settlement Padang which is most conveniently situated and made an admirable ground for the purpose. The buildings were arranged all round the grounds with the Horse-Ring in the centre. The main buildings three in number 150′ × 50′ were used for Division A. Agricultural Produce Division B. Flowers, Fruits &c., and Division D. Native Arts. The Agricultural Implements &c., had a shed 100′ × 50′ allotted to them. A similar shed (100′ × 50′) was put up for trade exhibitors. Special sheds were put up for Horses, Fowls and Cattle. The total cost of buildings and staging was $3,120.85.

Exhibits. The Forest Department put up a most interesting and instructive exhibit of forest produce including fine collection of Rotans, Gums, Damars and Getahs &c., &c. The exhibit as a whole was most creditable to the Department and was awarded a Diploma.

Agricultural Produce. In this section entries were in most cases good.

Padi. The entries in padi were very large and the samples good. The principal prizes went to the Krian District.

Rubber. It is to be regretted that entries in the rubber section were not so numerous as in previous years. This may perhaps be accounted for by the fact that the quantities required were increased to a minimum of 25 lbs. There appears to be a disinclination on the part of some owners and Directors to enter into competitions of this sort. In one or two cases the reason given for not competing, where Estate Managers were seen was that "their Directors had forbidden them to enter." The quality of the rubber shown was on the whole excellent. The prize for the best rubber in the Show was won by Mr. F. G. Harvey, Petaling Estate, with very fine sample of crepe.

An excellent exhibit of rubber packed for shipment shown by Mr. B. C. N. Knight, Jebong Estate, was awarded the Governor's Cup for the best Agricultural Exhibit in the Show.

The Sultan's Cup awarded "by points" for the most successful exhibitor in the Rubber section was won by Mr. A. D. Machado, Kamuning Estate.

Coconuts and Copra. Entries in Coconuts and Copra were numerous. The samples submitted were reported by the Judges to have been excellent and caused a good deal of trouble in placing the awards. The Cup for Copra was won by Mr. Molesworth of Jugra Estate.

General Produce. The principal items that call for attention under this heading are the very fine cloves and nutmegs from Penang. The exhibits of Tapioca in all forms were good. The entries in Cotton were numerous and the samples in many instances very good.

The Oil exhibits as a whole where not up to the standard of previous years. Coconut oil being a remarkable exception. Penang cloves oil and tapioca flour from Malacca were awarded Diplomas in this section.

Fruits and Flowers. The principal feature in this shed was the fine group of plants exhibited by Mr. Tong Tak In of Kuala Lumpor, which

was awarded a cup as a special prize. The Exhibition of plants and flowers was as a whole very disappointing.

The group put up by Mr. Coomaraswamy Pillai was perhaps the best exhibit in the section.

Fruits were not very numerous this year. Small fruits in particular being very poor. Pine-apples, Limes, Oranges, Pisangs and Durians were fair. The vegetable section does not yet receive the support it merits and it is probable that better prizes will have to be offered to induce entries in this section. An excellent stand of vegetables from the Taipeng Hills was put up by Mr. Long, Superintendent Government Plantations, Perak, and was much admired.

A very choice group of plants was shown by Mr. Fox, Superintendent of Gardens and Forests, Penang, amongst which were some fine plants of Gesner as and the pretty *Habenaria carnea* from Lankawei.

In the section for Preserved Fruits, Jellies and Pickles, Chutneys filled well. The principal prizes went to Mr. F. Alexander, Kuala Lumpor, who was awarded a Diploma for his exhibit collectively.

Divsion D. Native Arts and Industries. This section was as usual the largest in the Show and the exhibits in most cases quite up to the standard of previous years. The Perak schools put up a very large exhibit which taken as a whole was good but not quite up to the standard set up at former shows.

The Selangor schools put up some rotan work and wood carving. The embroidery and weaving section was well filled. The specimen of embroidered mat from Lower Perak was very fine. The specimen of Kian Telepoh shewn by Penghulu Morrib, Kuala Langat, was very fine and was awarded the Resident's cup as the best exhibit in native arts and industries in the Show.

Pahang sent a large number of Sarongs and took a number of prizes for them.

Malacca Lace Makers. A most interesting feature in this section was the exhibit of lacemaking from Malacca by five small children in charge of a school mistress. They showed themselves to be expert at their work and were a great centre of attraction at all times. The metal work section did not fill so well as it ought to have done. The principal feature of the section being the Brunei exhibits which took a large number prizes. Seremban Tin-ware was exhibited in large quantities. The new class opened for minature Malay models was a huge success as far as entries was concerned but much of the interest in this class was lost through over crowding and for want of descriptive tickets. Both prizes in this class went to Lower Perak.

It might be well another year to give all models, Basket work and Rotan work a shed to themselves. The Malacca Baskets were exhibited in quantity and attracted a good deal of attraction.

Brunei Government put up a stand of silver and bronze work also sarongs &c., in addition to what they entered in open classes. The exhibit which was one that attracted considerable attention, was awarded a diploma.

The Malay Art School, Kuala Kangsar, put up a stand of silver work and pottery.

Division C. It is to be regretted that the entries in the Cattle section were not more numerous. Practically all that did come were from Perak and Malacca. The prize for the champion animal went to Mr. Brett Brussi, Perak.

There were no entries in Buffaloes and Pigs.

Poultry. The entries in the poultry section were much larger than in previous Shows with the result that there was a shortage of pens for housing. As a result arrangements in this section were bad. At the time the entries closed officially, the number of pens was full, and in addition some fifty entries were accepted on the Show ground, people bringing their birds along, some from a distance, it was not thought advisable to discourage them by not allowing them to complete. This fact accounts for the confusion in this section.

Agricultural Implements. Entries in this division were poor. The Federated Engineering Company, Kuala Lumpor, took first prize for rubber tapping tools, also for Agricultural Implements European made.

Two exhibits were shewn of coagulating machinery the one being a circular iron tank with a hand propelled paddle and the other a similar mechanism arranged so that it could be attached to the ordinary form of Shanghai bath which has a smooth glazed interior. Both these machines did their work effectively and were awarded a silver and bronze medal respectively.

Horse Section. In all 78 horses and 16 gharry ponies were entered. The champion prizes were won by Messrs. Yap Brothers for black mare over 15 hands, and for horse under 15 hands hy Mr. C. E. Spooner, C. M. G. with Catucha.

Prize Winners. Amongst prize winners Penang and Province Wellesley were the most successful. The percentage of prizes to entries being very high indeed.

Next on the list come Malacca, Lower Perak, Kuala Kangsar and Krian. The later districts prizes chiefly for padi. The State of Negri Sembilan sent a large number of entries. Selangor with the exception of Kuala Langat District was poorly represented considering the fact that the Show was held in the State.

A great deal of the success of the Shows as far as entries go depends on the interest the District Officers take in the matter and without their co-operation results would be poor indeed.

General. Although entries officially closed on 3rd August "the majority were received on the last two days (2nd and 3rd)" and a large number came in late.

This caused a tremendous rush of work on the week before the Show. The entries up to Wednesday 5th August numbered 5994; in addition to this some 2000 entries were accepted after this date most of them being taken on the ground.

Articles for sale were not so readily disposed of as in previous years. This is probably due to the scarcity of money. The sellers can scarcely agree with press comments as to Museum people snapping up

the best articles before the public have the opportunity of buying, a crititicism that cannot be said to apply to this year's Show.

The Show being favoured by such fine weather, realized a good sum of money from the gate which at once placed it in a sound position financially. Each subscriber of $10/-, and all judges, Stewards and Exhibitors were admitted free. Over 1,000 exhibitors tickets were given out. About 1,500 school children were admitted free.

The F. M. S. Railways Department again undertook the conveyance of exhibitors 3rd class and exhibits free of charge. The British India Steam Navigation Company offered 50 free tickets from Penang to Port Swettenham. The Straits Steamship Company allowed a 25% reduction on all bonafide exhibitors and exhibits concessions that were much appreciated.

Accommodation of visitors. Special arrangements were made for the accommodation of visitors to the Show. The Victoria Institution was turned into a Temporary Hotel and under the stewardship of Mr. T. H. B. Phillips. The Bulls Head Mess House was put at the disposal of the committee by the Government and the management of it undertaken by Mr. Van Donop.

J. W. Campbell, Superintendent Experimental Plantations,

Kuala Lumpor.

Governor's Speech.

No prettier or more convenient site could have been found than that selected on the Padang of the Malay Settlement for the fifth annual Agri-Horticultural Show of the Malay Peninsula, now being held at Kuala Lumpor. The flat plain in a small valley, surrounded by the hills that beautify the capital of the Federated Malay States, was an ideal site, while Kuala Lumpor itself is a convenient centre, not only for exhibitors but for visitors from all parts of the Peninsula. The officials learn something from each successive Show, and it was the opinion of those who have visited previous Shows that the arrangements for the display of the exhibits in classes and sections and for expeditious judging of the exhibits were distinctly in advance of anything hitherto experienced.

There were over 6,000 individual exhibits this year, and in the class for Padi no less than 608 entries were made, for Cotton 78, and for models illustrative of native life and occupations no less than 246 in the two classes. The Committee were wisely advised when they introduced the award of diplomas in addition to prizes, which will have a more permanent value to successful competitors than the money awards.

Native Interest.

That the Show is appreciated and valued by the natives was apparent to anyone who visited the showyard on Saturday and Sunday. From all parts of the Peninsula, from Pekan and Malacca, from Perak and Negri Sembilan, as well as from Selangor and Pahang, and even from Brunei, collections of native produce manufacture and native were arriving and being placed in position by busy officials, under the superintendence of Mr. J. B. Carruthers, Chairman of the Committee, and

Mr. J. W. Campbell, the hard-worked but courteous Honorary Secretary, whose readiness to answer the numerous questions addressed to him be token a knowledge of detail acquired by weeks and months of careful organisation. It is fitting at this point to set down the names of the Committee by whom the final arrangements were carried out :—Mr. J. B. Carruthers, Director of Agriculture (Chairman) ; Mr. E. Burnside, Collector of Land Revenue, Selangor (Vice-Chairman) ; the Raja Muda, M. C. Towkay Chan Sow Lim, Mr. C. ; Mr. R. C. Grey, Mr. D. A. Dalziel (Hon. Treasurer) ; Mr. W. J. P. Hume, Chinese Secretariat; Mr. H. R. Moullin, Public Works Department ; and Mr. J. W. Campbell, Superintendent, Experimental Plantations (Hon. Secretary).

Opening Ceremony.

By ten o'clock on Monday, most of the exhibits had been judged, and everything was in readiness for the formal opening of the Show by His Excellency the High Commissioner, Sir John Anderson, K.C.M.G. His Excellency was escorted from the Residency by the Malay States Mounted Infantry under the command of Captain A. J. Fox, and was received at the showyard by a guard of honour of the Malay States Volunteer Rifles under the command of Captain Shaw. The guard of honour presented arms upon His Excellency's arrival, and were inspected by him before His Excellency took up his position on the steps of the Pavalion for the opening ceremony.

Here a large number of ladies and gentlemen were assembled, and the scene presented by the pretty costumes of the ladies, the uniforms of the Sultan of Selangor and his suite and the civil officials and volunteers, and the gaily-coloured dressed of the natives, was most picturesque.

Mr. Belfield's Speech.

Mr. Belfield, Resident of Selangor, said—Your Excellency, on behalf of the committee, subscribers and exhibitors at this our fith annual Agri-Horticultural Exhibition, I have the honour to express our thanks to you for again arranging to be present to open our proceedings, and for thus evincing your continued interest in a movement which we all hope is conducing to the furtherance of agricultural development in the Colony and F.M.S. I may be permitted to remind Your Excellency that the period during which these annual Shows have been held is synchronous with that of your own residence in the Colony. The first Show was held in Kuala Lumpor in 1904, a few months only after your arrival at Singapore, and on that occasion and at every succeeding fixture you have been foremost in aiding local endeavours by sympathetic interest and practical assistance. His Highness the Sultan desires me to express his gratification that Kuala Lumpor should for the second time have been selected as the venue of the Exhibition. His Highness expresses the belief that those of our visitors who have not been here since the first Show was held will have observed some material improvements in the town and neighbourhood. He also voices the hope that Your Excellency and the visitors here to-day will find that the standard of the present Show is not in any way inferior to those which have preceded it, notwithstanding the recent period of commercial depression which has reacted prejudicially

upon all classes of the community and upon all forms of business interests. I have the honour to ask Your Excellency to declare the Show open.

Speech by High Commissioner.

In declaring the Show open, His Excellency the High Commissioner said that Mr. Belfield had been unkind enough to remind him that he had been more than four years in this part of the world, and that, in the ordinary course of circumstances his time as High Commissioner was more than half finished. Mr. Belfield had also reminded them that this was the second time the Show had been held in Kuala Lumpor, and he was sure that those who saw it would agree that the present one showed an enormous advance, not only in the number, variety and quality of the exhibits, but also a great advance in the manner and method of arrangements which the Committee had shown. It was a great advantage to those who had come to the Show that it had been so well laid out, and in consequence they had not to double on their tracks and waste time going from one end to the other in search of particular exhibits. At each succeeding stage they would find something as interesting as where they had gone before. The exhibits of native industries were most interesting. He was sure, that those who looked as the basket work, and not only the basket work but the silver work, and the other varieties of native craft, would see what great strides had been made in the last few years. Not only was Malacca to the front again, but Perak had begun to progress in this direction. Ladies, he was sure would find the Perak, work far more useful than the Malacca basket work, which was, after all, rather a curiosity, whereas the Perak was very useful.

Bad Times.

As the Resident had said, they had been passing through a time of commercial depression. Some prophets said they had got to the bottom and were now on the up-grade. He was sure everyone hoped it was so. But as far as the planting industry was concerned he was not sure they had not been a little in need of a bad time. Everything was so prosperous and prices were so high that there was a disposition on the part of planters to think they had fallen into a fortune and had only to sit still and reap it. It was one of the advantages of bad times that it made people study economy as use their brains to devise improved methods of production and of handling the product. If the bad times through which they had been passing had that result with the planting industry of the Federated Malay States, he felt sure, instead of coonsidering it a bad time, they would all look upon it as a blessing in disguise. Whether or not, all cordially wished the bad times at an end. Towards the end of last year, the planting industry was not only feeling the stress of bad times, but also there was not quite so much harmony among themselves as they ought to expect in such a happy family. Usually, the only enemy of the planting community was the Government; perhaps he should say the industry had now two enemies, the Government and the white ant. (Laughter). He scarcely knew which was the worst. Perhaps on the whole the white ant left a more permanent mark on the industry than the Government.

Advice from Planters.

Last year the planters were doing a little quarrelling among themselves—only a family disagreement,—but now it seemed to have died out. Anyhow the newspapers had dropped it, and so he supposed it had ceased to the interesting. But he taught it was partly due to that incident that they had the formation of that useful body—the Planters' Association of Malaya. The formation of the Association was not only of importance to the planting industry but also to the Government, and was, His Excellency thought, a step in the right direction. The Association not only served to focus the opinion of the planting community as to their wants, which everyone knew were numerous, but it also helped the Government by giving them a representative body to which they might look for advice and from which they might always expect criticism which was helpful. Since his arrival in Kuala Lumpor, he had heard from his colleague, the Resident-General, that, at a recent meeting, they had again been going for their old enemy, the Government, thinking, apparently, that has planting had been having a bad time, Government ought to have a bad time as well, and that the planters ought to have a little more of that attractive thing—the surplus. Well, when the Government embarked, a few years ago, on what many considered the hazardous policy of helping the resident planter, because they did not want to lose him, they said they would advance up to half a million dollars for the purpose of helping to clear off mortgages and to help them to weather bad times, which were certainly then much worse than now, and worse than at any time since he had been here. When that policy was started they thought there would be a rush for the half million dollars. Curiously enough, on the contrary it was a long time before people came forward. Perhaps they did not think the Government was in earnest when they said the money was there and they could have it on application, provided they gave good security.

Government Liabilities.

About the same time it was found that the British public was very eager to take a hand in planting, and very little call was made upon Government funds. When the British public had enough shares in the planting industry, the planters turned again to Government, and the half million was soon gone. Then the planters came again to the Resident General, and he (the High Commissioner) agree to go another half million. That went very quickly, and then they offered a third. With that third half million the question arose whether Government was to go on and where it was to stop. The matter was considered anxiously and carefully. Government had many duties, responsibilities and liabilities, of which the outside public knew little or nothing. Of these liabilities, some were prospective, some actually incurred; some were liable to be increased and some were not yet settled. The Government had to bear in mind all these, for the surplus was not so very large. He assured them that the Government could dispose of every dollar of it. However, that did not weigh so much with the Government as the fact that the loans were to a large extent going to those who could not be described as resident planters, the class they

wished to attract and keep in the country, but to the man who took up planting as a speculation, and wanted a loan to save the speculation until he was able to place it on the market at a profit.

Speculation.

It was no function of the Government to assist speculation of that sort, and they came to the conclusion that the time had come to restrict loans exclusively to those for whom they were originally intended, the resident planters, the men they wished to come into the country to form a strong planting community with their interests here. There were also instances of estates which in the hope of the Government purse proving bottomless had been started with insufficient capital, and there was some likelihood, if they stopped, that the estates would be closed down. There could be no hard and fast rule, but they decided after consideration to make further advances strictly for maintenance. They did not want land under cultivation to fall back or to be abandoned, and thus be a reproach to the F.M.S. and perhaps become an injury to the industry. Therefore, for the present, no more loans would be granted, except for the purpose of maintaining existing plantations. While that might disappoint some, he was satisfied it was best in the interest of the country, and those who came out on speculation, with no intention of becoming resident planters had better clear out of their speculations as soon as possible. The man who went into a concern merely with the intention of making a little money out of it as an incidental speculation was not as likely to contribute materially to the advancement of the industry as he who went into planting and lived and worked himself on his land. He was the man they wanted to encourage, and to him they had to look for the real development of the industries of the Malay Peninsula.

Labour.

One other matter of interest to the planting community—the labour question. It was gratifying to know that labour had been coming in freely. In the last year just over 60,000 labourers had come, and in the first half of this year 30,000, very nearly. With these numbers he thought there should be no more complaints of the shortage of labour. The means taken to increase the supply had been subjected to a good deal of criticism. He could not say that he thought the Tamil tax an unfair one. At any rate, they must continue it for some few years. Possibly, by and by, when the country was well-known and the demands for fresh labour diminished, it might be possible to remove it, but he was afraid that, so far as they could see at present, it had come to stay. When the proposal for levying a tax was under discussion in Singapore, he had stated on behalf of Government that there were certain considerations which Government would have to look to later, when it was seen how the money went. The other day, an amending Bill had been introduced to deal with some of the considerations that had been pressed on Government, mainly by the older-established estates. The Government, naturally, did not wish to press unfairly upon them, and the amendments they had introduced —and which would be submitted to the Planters' Associations so that Government might have the benefit of their criticism—were two.

First of all, they wanted, out of the profits of the tax, to give some acknowledgment to those who had already established a considerable labour force when the tax came into existence. The equity of this, he was sure, they would agree with. Whether the money, when it was distributed, would come up to their expectation, was another matter. He was afraid not.

Self-Help Rewarded.

Another point was to give relief to those planters who were in the habit of sending their own kanganis to India to recruit labour. One important object the Committee and the Government had in view was to get rid of the great evil of crimping, and by making the tax universal they thought they had destroyed whatever incentive there was to crimp. They thought there was now sufficient labour and no inducement to a man to steal another's coolies. But so long as some sent their own kanganis to India to recruit obviously these planters were doing more than men who sat down and waited for the labour to come to him, and only took it off the hands of the Government. Therefore, the Committee had recommended—and the Government was prepared to agree—that some allowance should be made to those who sent their own kanganis to India. It was only fair, His Excellency thought they would agree, to take away this grievance and to do something to relieve them from the acute evil of crimping.

His Excellency concluded by apologising for trespassing upon their patience, but he did not often have the opportunity of speaking to them. He then declared the Show open.

Reprint from Straits Times August 12.

LIST OF WINNERS.

(*As Reported by The Malay Mail*)

Division A. I.

1. Padi, best sample of any named variety.
   - 1st prize. Peng. Haji Ahmat, Malacca.
   - 2nd prize. Che Wang, L. O., Penang.
   - 3rd prize. Syed Usop, Chigar Galah, K. Kangsar.
   - Highly Commended Penghulu Long, Malacca.
2. Pulut, best sample of any named variety.
   - 1st prize. Mohamed Bin Yupe, L. O., Penang.
   - 2nd prize. Raji Bosah Penghulu, Krian.
   - 3rd prize. Peng. Mat Tedong, Malacca.
3. Rice, best sample, prepared by machinery.
   - 1st prize. Wan Yeop Ibrahim, Parit Buntar.
   - 2nd prize. Khy Heng Bee, Sungei Penang.
   - 3rd prize. Mohamed Datoh, Karamat Rd , Penang.
4. Rice, best sample, prepared in a lesong.
   - 1st prize. Peng. Hussain, G. Semmengol, Perak.
   - 2nd prize. Penghulu, Jebong Matang, Perak.
   - 3rd prize. Kamaludinbin Haji Baludin, Penang.

5. Best collection of different Padi, in the ear, 10 heads in each sample.
   1st prize. Penghulu Ijok, Perak.
   2nd prize. Puteh Penghulu, Alor Pongou. Perak.
   3rd prize. Mat Noh. Penang.
6. Best Padi and Pulut, grown in one mukim, to be exhibited by the Penghulu of mukim, and so certified by him.
   Each exhibitor to produce an affidavit, sworn before a Magistrate, that his whole exhibit was grown in his own mukim last padi season.
   1st prize Hussin Penghulu, Griong Semmenggol, Krian.
   2nd prize Hussin bin Katib Hassan, K. Kangsar.
   3rd prize Kamaludin bin Haji Baludin, Penang.

DIVISION A. II.

Governor's cup. Awarded to Mr. B. C. N. Knight of Jebong Estate, Simpang, Perak, for his best Sample of Rubber in the Show.

Sultan's Cup. Awarded to A. D. Machado, Kamuning Estate.

7. Para Crepe, best sample.
   1st prize. F. J. Harvey, Petaling, Estate.
   2nd prize. J. B. Douglas, Terentang Estate, Negri Sembilan.
   3rd prize. A. D. Machado, Kamuning Estate, Perak.
   H. C. B. C. N. Knight, Jebong Estate.
8. Para sheet or Biscuit, Packed in boxes as shipped from the estate.
   1st prize. O. Pfenningworth, Highlands and Lowlands Estate.
   2nd prize. Crawford, Caledonia Estate, P. W.
9. Para Block, dry.
   1st prize. A. D. Machado, Kamuning Estate, Perak.
10. Para Block, wet.
   1st. prize. A. D. Machado, Kamuning Estate, Perak.
11. Rambong in any form.
   1st prize. Bukit Rajah Estate.
   2nd prize. Atherton Estate, Port Dickson.
   3rd prize. J. Molesworth, Jugra Estate.
12. Rubber, (Para) packed in boxes as shipped from the Estate.
   1st prize. B. C. N. Knight, Jebong Estate.
   2nd prize. F. J. Harvey, Petaling Estate.
   3rd prize. H. M. Darby, Vallambrosa Estate.
13. Any other Rubber. (Plant from which obtained must be stated with each).
   1st prize. A. D. Machado, Kamuning Estate.
   2nd prize. O. Pfenningworth, Highlands and Lowlands Estate.
   13A. Penghulu Md. Momot, Malacca.
   13A. Sinnaiah, Kuala Kangsar.
   13B. Penghulu Abdul Gani, Malacca.

Best Rubber in the Show, Petaling Estate, 2 sorts crepe.

DIVISION A. III.

14. Coconuts, unhusked, best sample.
   1st prize. Penghulu Hassan, Penang.
   2nd prize. Penghulu, Sungei Pringgi, Matang.
   3rd prize. Haji Latib, Setapak, Kuala Lumpor.

15. Coconuts, husked, best sample.
    1st prize. Penghulu Sungei Pringgi, Matang, Perak.
    2nd prize. Penghulu Mat Suh, Kuala Selangor.
    3rd prize. Haji Noordin, Setapak, Kuala Lumpor,
    Highly Commended. Mat Mahin Rambau, Negri Sembilan.
16. Coconuts, best bunch.
    1st prize. Penghulu, Jugra and Bandar, Kuala Langat.
    2nd prize. H. M. Darby Vallambrosa Estate.
    Special prize. Penghulu Semmiah Ulu, Langat.
17. Coconuts, husked, best sample.
    1st prize. R. M. Connolly, Ipoh, Perak.
    2nd prize. Penghulu Haji Nasan, Malacca.
    3rd prize. Penghulu Ijok, Perak.
    Highly Commended, H. M. Darby, Vallambrosa, Klang.
18. Copra, best sample, 5 catties.
    1st prize. Mr. Valpy, Klanang Estate, Kuala Langat.
    2nd prize. Abu Bakkar bin Ishak, Penang.
    3rd prize. Penghulu Mat Sub, Kuala Selangor.
    Highly Commended. Penghulu, Sungei Pringgi, Matang, Perak.
18a. Copra, 50 catties.
    1st prize. (Cup). J. Molesworth, Jugra Estate, Jugra.
    2nd prize. (Silver Medal). K. T. Koomarasawmy Pillai, Kuala Lumpor.
    Highly Commended. Mr. Valpy, Klanang, Kuala Langat.
19. Tapioca, roots, best sample, 3 roots.
    1st prize. Brahin, Penang.
    2nd prize. Kulop Mat Jiri, Kuala Kangsar.
20. Tapioca, pearl, best sample. 2 catties.
    1st prize. S. Moorehouse, Malacca.
    2nd prize. Osmainbin Isak, Penang.
21. Tapioca, flake, best sample. 2 catties.
    1st prize. A. Crawford, Caledonia Estate, Province Wellesley.
    2nd prize. S. Moorehouse, Malacca.
22. Tapioca, flour, best sample. 2 catties.
    1st prize. S. Moorehouse Malacca.
    2nd prize. A. Crawford, Caledonia Estate, Province Wellesley.
23. Arrowroot, fresh, 25 roots.
    1st prize. H. H. Norris, Singapore.
    2nd prize. Bahu Din, Tapah.
24. Arrowroot, prepared, best sample. 1 catty.
    1st prize. Kamala Din, Penang.
    2nd prize. A. Crawford, Caledonia Estate, Province Wellesley.
25. Sago, pearl, best sample. 2 catties.
    1st prize. A. Crawford, Caledonia Estate, Province Wellesley.
26. Sago, flour, best sample, 1 catty.
    1st paize. A. Crawford Caledonia, Estate, Province Wellesley.
    2nd prize. Hussin Penghulu, Perak.
27. Maize, best sample. 12 heads.
    1st prize. Bidul, Perak.
    2nd prize. Mahomed Esah, Kuala Kangsar.
    3rd prize. Nooh, Batu, Kuala Lumpor.

28. Ginger, best sample, 20 roots.
    1st prize. Penghulu, Samman, Malacca.
    2nd prize. Sidek, Penang.
    3rd prize. Daluman bin Awang, Penang.

29. Turmeric, best sample, 25 roots.
    1st prize. Haji Mohamed Samman, Penang.
    2nd prize. Penghulu Abu, Malacca.
    3rd prize. Kamaludin, Penang.

30. Tuba (akar), best sample, 1 catty.
    1st prize. P. J. Cornelius. Penang.
    2nd prize. Teow Beng Huat, Penang
    3rd prize. Hussain bin Haji Isak, Penang.

31. Sugar, cane, best sample, 10 canes.
    1st prize. Bulat, Serendah.
    2nd prize. Sidang Arshad, Malacca.
    3rd prize. Datoh Mohamed Casim, Klang.

32. Sugar, coconut, best sample, 2 catties.
    1st prize. Penghulu Yusup, Malacca.
    2nd prize. Penghulu Abu, Malacca.
    3rd prize. Abdul Majid, Klang.
    Highly Commended. Mohamed Sahid, Penang.

33. Sugar, nipah, best sample. 2 catties.
    1st prize. Mohamed Arsat, Penang
    2nd prize. Penghulu Abdul Raman, Penang.
    3rd prize. Raja Tahir, Kuala, Langkat.

34. Sugar, kabong, best sample. 2 catties.
    1st prize. Mohamed Mansur, Lower Perak.
    2nd prize. Siakap, Negri Sembilan.
    3rd prize. Kulop Mohamed, Kuala Kangsar.

35. Sugar cane, brown, best sample.
    1st prize. Mohamed Casim, Penang. (Silver Medal).
    2nd prize. A. Mohamed Sheriff, Penang. (Bronze Medal).
    Highly Commended. A. Crawford, Caledonia Estate, Province Wellesley.

36. Sugar cane, white, best sample. 2 catties.
    1st prize. A. Crawford, Caledonia Estate, Province Wellesley (Silver Medal).
    2nd prize. Mr. Boyd, Kalampang Estate, Bagan Serai, (Bronze Medal).

37. Coffee, Arabian, best sample. 2 catties.
    1st prize. Haji Mohamed Sahid, Penang.
    2nd prize. No award.

38. Coffee, Liberian, best sample.
    1st prize. O. Pfenningworth, Klang. (Silver Medal).
    2nd prize. R. A. Gibson, Golden Hope Estate, Klang. (Bronze Medal).
    Highly Commended. J. Molesworth, Jugra Estate, Jugra.

39. Coffee, any another variety. 2 catties.
    1st prize. R. A. Gibson, Golden Hope Estate, Klang (Silver Medal).
    2nd prize. J. Molesworth, Jugra Estate, Jugra (Bronze Medal).

40. Cocoa, fresh pods, best sample. 10 pods.
    1st prize. Haji Mohamed Nasir Lower Perak.
    2nd prize. Kulop Mohamed, Kuala Kangsar

41. Toddy, best sample. 1 pint.
    1st prize. Penghulu Anjang, Malacca.
    2nd prize. Mohamed Sultan, Kuala Lumpor.

42. Rum, best sample. 1 pint.
    1st prize. Mr. Boyd, Kalumpang Estate, Bagan Serai.
    2nd prize. A. Crawford, Caledonia Estate, Province Wellesley.

43. Rum shrub, best sample. 1 pint.
    1st prize. A. Crawford, Caledonia Estate, Province Wellesley.
    2nd prize. Mr. Boyd, Kalumpang Estate, Bagan Serai.

DIVISION A. IV.

44. Betel-nuts, fresh, best sample. 50.
    1st prize. Harun, Kuala Kangsar.
    2nd prize. Mohamed Bedin, Lower Perak.
    3rd prize. Alang Tahib, Kuala Kangsar.

45. Betel-nuts, dried and split, best sample. 1 catty.
    1st prize. Brahim, Penang.
    2nd prize. Kung Thean Sung, Penang.
    3rd prize. Mohamed Bin Salleh, Penang.

46. Sireh leaves, best sample. 100 leaves.
    1st prize. Sidang Haji Mohamed, Malacca.
    2nd prize. Hasanudin Bin Long, Malacca.
    3rd. prize. Penghulu Baba, Malacca.

47. Cloves, best sample, 1 catty.
    1st prize. Low Chit Neun, Penang.
    2nd prize. Lean Shak Foong, Penang.
    3rd prize. Cheah Chee Eong, Penang.

48. Nutmegs, fresh best sample. 50.
    1st prize. C. Tuah Choo, Penang.
    2nd prize. Kulop Mohamed, Kuala Kangsar.
    3rd prize. Kamuludin Bin Haji, Bahudin, Penang.

49. Netmegs dried, best sample. 50.
    1st prize. Low Chit Neun, Penang.
    2nd prize. Mat (Paya Trubong), Penang.
    3rd prize. Osman Bin Ishark, Penang.

50. Mace, dried, yellow. 1 catty.
    1st prize. No award.
    2nd prize. Osman Bin Ishark, Penang.
    3rd prize. No award.

51. Mace, dried, red. 1 catty.
    1st prize. Mohamed Bin Mohamed, Salleh Penang.
    2nd prize. Haji Mahomed Saman, Penang.
    3rd prize. Osman Bin Ishark, Penang.

52. Pepper, white, best sample. 1 catty
    1st prize. Mohamed Abu, Tapah, Perak.
    2nd prize. Loh Kong Yew, Sipang, Kuala Langat.
    3rd prize. Chu Woh Estate, Negri Sembilan.

53. Pepper, black, best sample. 1 catty.
    1st prize. Khoo Choo Boo, Penang.
    2nd prize. Cheah Chee Eong, Penang.
    3rd prize. Assistant Penghulu Temerloh, Perak.
54. Spices, best collection. optional.
    1st prize. Shaik Hussin, Penang.
    2nd prize. Haji Mohamed Saman, Penang.

DIVISION A. V.

55. Patchuli, best sample. 1 catty.
    1st prize. Penghulu Sungei Trap, Batu Gajah.
    2nd prize. P. J. Cornelius, Penang.
    3rd prize. Low Chit Neun, Penang.
56. Oil, Citronella, best sample. 1 pint.
    No award.
57. Oil, lemon grass, best sample. 1 pint.
    No award.
58. Oil, coconut, best sample. 1 pint.
    1st prize Mohamed Serajudin, Sungei, Perak.
    2nd prize. J. Molesworth, Jugra Estate, Jugra.
    3rd prize. Pengulu, Sungei Trap, Perak.
    Highly Commended. Federal Oil Mills, Kuala Selangor.
59. Oil, gingelly, teal seed (minyak lengah), best sample. 1 pint.
    1st prize. Kung Thean Sung, Penang.
    2nd prize. M. Nanih Municipality, Penang.
    3rd prize. Tuah Cheow Kay, Penang.
60. Oil, castor, best sample. 1 pint.
    1st prize. Mohamed, Penang.
    2nd prize. Mohamed, Kassim, Penang.
    3rd prize. Shaik Hussin, Penang.
61. Oil clove, best sample 1 pint.
    No award.
62. Oil, Para Rubber seed, best sample. 1 pint.
    1st. prize. A. Crawford, Caledonia Estate, Province Wellesley.
    2nd prize. No award.
63. Oil, Kabu Kabu seed, best sample, 1 pint.
    No award.
64. Oil, any other kind, best sample, 1 pint.
    1st prize. Indat Penghulu Sulim, P. Molim.
    2nd prize. Ahamat Penghulu, Lower Perak.
65. Oil, cake, coconut, best sample. 5 catties.
    1st prize. Federal Oil Mills, Kuala Selangor.
    2nd prize. Kasi Dollah Lenggong, Upper Perak.
    Highly Commended. Sidang Haji Mohamed, Malacca.
66. Oil, cake, Para seed, best sample, 5 catties.
    1st prize. A. Crawford Caledonia Estate, Province Wellesley.
    2nd prize. No award
67. Oil, cake, Kabu kabu seed, best sample, 5 catties.
    No award.
68. Seed, Kabu kabu : best sample, 2 chuppas.
    1st prize. Mohamed Bin Ismail, Penang.
    2nd prize. Mohamed Omor, Lower Perak.
    Highly Commended Abdullah Serat, Sungi Siput, Kuala Kangasr.

69. Oils, best collection ¼ pint of each.
1st prize. No award.
2nd prize. Tuah Cheow Kay (Shooff), Penang.
3rd prize. No award.

Division A. VI.

70. Getah, best collection of local. ½ catty of each.
1st prize. No award.
2nd prize. Penghulu Ijok Slmah Perak.
3rd prize. Hiji Mat Yasin Situl, Negri Sembilan.

71. Getah taban, best sample, 1 catty of each.
1st prize. Haji Mohamed, Negri Sembilan.
2nd prize. Mohamed Serajudin, Sungkai, Perak.
3rd prize. Penghulu Ijok, Perak.

72. Gambier, best sample. 1 catty of each.
1st prize. Hussain Bin Haji Isak, L. O. Penang.
2nd prize. Penghulu Beranang, Kuala Langat.
3rd prize. Penghulu Haji Lintang Malacca.
Highly Commanded. Long Kong Yew, Kuala Langat.

73. Dragon's blood, best sample ½ catty of each.
1st prize. Hussain, Penghulu Krian, Perak.
2nd prize. Aujong Said, Kuala Kangsar.
3rd prize. Penghulu Ijok Selama, Perak.

74. Gums and damars, best collection of local ½ catty of each.
1st prize. Daloh Paduka Raja, Lower Perak.
2nd prize. Penghulu Ijok, Selama, Perak.
3rd prize. Said Omar, Kuala Kangsar. Commended. Megat Abu Sammah.

75. Cotton (Kakabu) best sample, 1 catty.
1st prize. A. Crawford, Caledonia, Estate, Province Wellesley.
2nd prize. J. Molesworth, Jugra Estate, Kuala Langat.
3rd prize. Haji Mohamed Ali, Lower Perak. Special. Mat Bin Hashim, Penang.

76. Cotton any other variety, best samples 1 catty.
1st prize. Mohamed Ali, Kuala Kangsar.
2nd prize. Anjang Abdullah-Pasir Panjang, Lower Perak.
3rd prize. Lean ah Keon, Penang. Special. Mohamed Mansur, Lower Perak. Highly Commended. Jusoh, Butterworth.

77. Fibres, best collection, 1 bundle of each.
1st prize. Khoo Soo Ee, Penang.
2nd prize. G. Baptist, Penang.
3rd prize. G. F. Lachlan, Telok Anson. Commended. Federated Oil Mill, Kuala Selangor.

78. Rotans, best collection, optional.
1st prize. Haji Mohamed Sahid, Penang.
2nd prize. Mat Saleh, Kuala Kangsar.
3rd prize. Kulop Samat, Kuala Kangsar.
Commended. Datoh Paduka Raja, Lower Perak.

79. Bamboos, best collection, optional.
1st prize. Dadoh Puduka Raja, Lower Perak.
2nd prize. Siakap Panti, Negri Sembilan.
3rd prize. Penghulu Pupai, Larut, Perak.

80. Walking sticks, best collection (unprepared). 1 of each.
    1st. prize. Shuckor Konn Buaia, Kuala Kangsar.
    2nd prize. Mohamed Yasin bin Haji Mohamed, Penang.
    3rd prize. Along Yusup, Tapah.
81. Medicinal plants, best collection (open) optional.
    1st prize. No awards.
    2nd prize. No awards.
82. Medicinal plants (Natives only) optional.
    1st prize. Penghulu Jurian Sebatang, Lower Perak.
    2nd prize. Mr. Kassim c/o Land office Penang.
    3rd prize. Said Usop, Ghigagalah· Kuala Kangsar.
    Highly Commended. Penghulu Ijak Selama, Perak.

DIVISION. B. I.

83. Avoids other than Caladiums. 3 plants.
    No entry.
84. Caladiums. 3 plants.
    1st prize. Tong Tak In, Kuala Lumpor.
    2nd prize. Mrs. Carruthers, Kuala Lumpor.
85. Coleus. 3 plants.
    No entry.
86. Crotons. 3 plants.
    1st prize. Lee Kong Lam, Kuala Lumpor.
    2nd prize. No award.
87. Dracenas. 3 plants.
    No entry
88. Ferns, any distinct variety. 6 plants.
    1st prize. No award.
    2nd prize. Tong Tak In, Kuala Lumpor.
    3rd prize. No award.
89. Ferns, Adiantum, distinct.
    1st prize. No award.
    2nd prize. Mrs. Carruthers, Kuala Lumpor.
    3rd prize. No award.
90. Ferns, any variety, best specimen. 1 plant.
    1st prize. Mrs. W. E. Smith, Telok Anson.
    2nd prize. No award.
91. Marantas and Calatheas. 3 plants
    No entry.
92. Palms, distinct kinds. 3 plants.
    1st prize. Kong Tak In, Kuala Lumpor.
    2nd prize. Lee Kong Lam, Kuala Lumpor.
    3rd prize. Lee Kong Lam, Kuala Lumpor.
93. Palms best specimen. 1 plant.
    1st prize. No award.
    2nd prize. Lee Kong Lam, Kuala Lumpor.
    Highly Commended. Tong Tak In, Kuala Lumpor.
94. Selaginella, best specimen. 1 plant.
    No entry.
95. Any ornamental foliage plant not included in above, 3 plants.
    1st prize. Tong Tak In, Kuala Lumpor.
    2nd prize. N. Siew Hin, Kuala Lumpor.

96. Foliage plant, any kind, best specimen. 1 plant.
1st prize. Choo Kia Peng, Kuala Lumpor.
2nd prize. No award.

DIVISION B. II.

97. Amaryllis and Lilies. 3 plants.
Mrs. Spooner, Kuala Lumpor.
98. Asters, best specimens. 3 plants.
No entry.
99. Balsams, best specimens. 3 plants.
No entry.
100. Cannas, best specimens. 3 plants.
No entry.
101. Cocks' combs best specimen. 3 plants.
No entry.
102. Chrysanthemums, best specimens. 3 plants.
1st prize. No award.
2nd prize. Mrs. Burn Murdoch, Kuala Lumpor.
103. Dahlias, best specimens. 3 plants.
No entry.
104. Dianthus (Indian Pinks) 3 plants.
No entry.
105. Eucharis, best specimens. 3 plants.
No entry.
106. Gloxinias. 3 plants.
No entry.
107. Orchid, best specimens. 1 plant.
1st prize. No award.
2nd prize. Choo Kia Peng, Kuala Lumpor
108. Phlox best specimens. 3 plants.
No entry.
109. Petunias, best specimens, 3 plants
No entry.
110. Zinnias best specimens. 3 plants.
No entry.
111. Roses, best specimens. 3 plants.
No entry.

DIVISION B. III.

112. Begonias, distinct kinds. 3 plants.
1st prize. Lee Kong Lam, Kuala Lumpor.
2nd prize. Mrs. Carruthers, Kuala Lumpor.
Commended. Mrs. W. E. Smith, Telok Anson.
113. Begonia, best specimen. 1 plant.
1st prize. Lee Kong Lam, Kuala Lumpur.
2nd prize. Mrs. Smith, Telok Anson.
114, Group of plants arranged for effect in space not exceeding 9 sq.ft
1st prize. K. T. Coomarasawmy Pillai, Kuala Lumpor.
2nd prize. No award.
115. Group of Chinese plants, fantastic shape.
1st prize. T. Seow Teng, Kuala Lumpor.
2nd prize. No award.
Special prize. Tong Tak In, Kuala Lumpur.
Special prize. Chian Ah Peng, Kuala Lumpor.

DIVISION B. IV.

116. Asters, optional.
No entry.

117. Chrysanthemums, optional.
1st prize. No award.
2nd prize. Mrs. Burn Murdoch, Kuala Lumpor.

118. Dahlias, optional.
No entry.

119. Roses, optional.
No entry.

120. Cannas, optional.
No entry.

121. Orchids. optional.
No entry.

122. Cut flowers arranged for effect.
No award.

123. Collection of cut flowers, not less than 12 kinds.
1st prize. Mrs. Trump, Kuala Lumpor.
2nd prize. Mrs. Carruthers, Kuala Lumpor.
3rd prize. No award.

124. Table decoration.
1st prize. Miss V. Grey, Kuala Lumpor.
2nd prize. Mrs. Nutt, Kuala Lumpor.
3rd prize. Mrs. Walsh, Kuala Lumpor.

DIVISION B. V.

125. Pisangs (Bananas) best collection. 6 of each kind.
1tt prize. Kulop Mat Jin, Kuala Kangsar.
2nd prize. Haji Mohamed Nasir, Lower Perak.
3rd prize. Mat Bin Hasin, Penang.
Commended, Usop, Batu, Kuala Lumpor.

126. Pisangs (Bananas) best bunch, any kind. 1 bunch.
1st prize. Saleh, Kuala Lumpor.
2nd prize. Talib, Kuala Lumpor.
Highly Commended, Haji Mohamed, Kuala Kangsar.
Commended, Raja Tahir, Kuala Langat.

127. Champedak, 3 fruits.
1st prize. H. H. Norris, Singapore.
2nd prize Penghulu Salim Alei, Malacca.
Highly Commended, Hasamudin Bin Long, Malacca.
Commended, Penghulu Mat Din, Malacca.

128. Jack fruit. 1 fruit.
1st prize. Penghulu Hasan, Penang.
Highly Commended. Sidang Mamat, Malacca.
Commended. Ugal Alimat, Kuala Kangsar.

129. Durian. 2 fruits.
1st prize. Raja Tahir, Kuala Langat.
2nd prize. Marip bin Mat Said, Malacca.
3rd prize. Sohariah, Kuala Langat.
Highly Commended, Penghulu H. Amat, Malacca.
Commended, Penghulu Jugra and Bandar, Kuala Langat.

130. Melon. 1 fruit.
1st prize. No award.
2nd prize. Penghulu Beranang, Ulu Langat.

131. Pineapple (Mauritius). 3 fruits.
1st prize. Syed Hamid, Penang.
2nd prize. L. Hamad, Penang.
3rd prize. Che Wang, Penang.

132. Pineapple (any other variety). 3 fruits.
1st prize. Usop, Batu Kuala Lumpor.
2nd prize. Haji Saret, Kuala Lumpor.
3rd prize. Sidang Bakar, Malacca.
Commended. Jamin, Kuala Lumpor.

133. Pomeloes. 3 fruits.
1st prize. Pun Sun, Kuala Lumpor.
2nd prize. R. M. Conolly, Ipoh, Perak.

134. Papaya. 3 fruits.
1st prize. Siakap, Negri Sembilan.
2nd prize. Tuah Choo, Penang.
3rd prize. Haji Akub, Serendah.
Commended. Mahulah, Batu, Kuala Lumpor.

135. Oranges. 6 fruits.
1st prize. Penghulu Sam Batu Berendan, Malacca.
2nd prize. R. M. Conolly, Ipoh, Perak.
3rd prize. R. W. Munro, Permatang Estate, Jugra.

DIVISION B. V.

136. Limes. 12 fruits.
1st prize. Abdul Rais Senggang, Kuala Kangsar.
2nd prize. D. Paduka Paja, Lower Perak.
3rd prize. R. W. Munro, Permatang Estate, Jugra.

137. Lemons. 12 fruits.
1st prize. Abdul Rais Senggang, Kuala Kangsar.
2nd prize. Abulaker Bin Issahak, Penang.
3rd prize. Kamaludin, Penang.

138. Chiku. 6 fruits.
1st prize. Mohamed Hussain Bin Haji Ali, Penang.
2nd prize. Mohamed Hussain, Kampong Bharu, Penang.

139. Custard Apple. 6 fruits.
1st prize. Mohamed Jafer, Kuala Langat
2nd prize. Mat bin Din, Penang.

140. Duku. 20 fruits.
1st prize. Jamidin bin Abu, Malacca.
2nd prize. Haji Darus bin H. Mahomed, Saman, Penang.

141. Binjai, 6 fruits.
1st prize. Sodong Laman, Malacca.
2nd prize. Haji Hassan, Malacca.

142. Jambu. 20 fruits.
1st prize. Umpu, Kuala Lumpor.
Commended. Kung Thean Sung, Penang.

143. Langsat. 3 bunches.
1st prize. No award.
2nd prize. Jamudin bin Abu, Malacca.

144. Mangoes. 6 fruits.
1st prize. Penghulu Hassan, Penang.
145. 6 fruits. Bachang.
1st prize. Penghulu Jugraand Bandar, Kuala Langat.
146. Mangosteens. 12 fruits.
1st prize. Sidang H. Mohamed, Malacca.
2nd prize. Penghulu Salim, Malacca.
3rd prize. Sidang Haji Ma'ali, Malacca.
Highly Commended. L. Hamid, Penang.
147. Pulasan. 20 fruits.
1st prize. Mat, Penang.
2nd prize. Penghulu Jugra and Bandar, Kuala Langat.
148. Rambai, 3 bunches.
1st prize. Hussain, Penang.
2nd prize. Said Ahmad, Penang.
149 Rambutan. 20 fruits.
1st prize. Teoh Beng Huat, Penang.
2nd prize. Mat, Penang.
3rd prize. H. Mohamed Saman, Penang.
150. Mata kuching. 20 fruits.
1st prize. Syed Ahmad, Penang.
2nd prize. Hussain bin Haji Issack, Penang.
3rd prize. Hussain Datoh Kramat, Penang.
151. Durian blanda. (Sour-Sop) 3 fruits.
1st prize. Haji Osman, Lower Perak.
152. Any fruit not included in above. Optional.
1st prize. Mohamed bin Mohamed Saleh, Penang.
2nd prize. Peng Mat, Malacca.
153. Cultivated fruits, best collection. Any number of kinds.
1st Prize (Cup). Low Chit Mun, Penang.
2nd prize. Tuah Choo Kay, Penang.
3rd prize. Latip bin Usop, Malacca.
154. Wild edible fruits, best collection.
1st prize. F. G. Bahiri, Penang.
2nd prize. Abdullah Ali, Lower Perak.

DIVISION B. VI.

155. Preserved fruits, best sample any method. Optional.
1st prize. Girls' School K. L. Kiri, Kuala Kangsar.
2nd prize. Datoh Mohamed Kassim, Klang.
156. Chutney, best sample, any method. Optional.
1st prize. (Bronze Medal) F. Alexander 2½ mile, Pahang Road, Kuala Lumpor.
2nd prize. Girls' School, Taipeng, Perak.
157. Pickles, best sample, any Method. Optional.
1st prize. F. Alexander, 2½ mile, Pahang Road. Kuala Lumpor.
2nd prize D. Podusingho Trolak, Tapah.
158. Jellies, best sample, any Method. Optional.
1st prize. (Bronze Medal) F. Alexander, 2½ mile, Pahang Road, Kuala Lumpor.
2nd prize. (Bronze Medal.) Girls' School, Jernam Perak.

59. Honey, in comb. 1 lb.
1st prize. Abdullah Ali Lower Perak.
2nd prize. Penghulu H. Ahmat, Malacca.

60. Butter, 1 lb.
1st prize. Shaik Hussain, Penang.
2nd prize. Rahamathullah, Penang.

61. Eggs, best collection, fowls, ducks, or turkeys. Optional.
1st prize. Kung Thean Sung, Penang.
2nd prize. Ahmat, Kuala Lumpor.

62. Artichokes, best sample. 12 tubers.
1st prize. No entry.

63. Beetroot, best sample. 6 specimens.
1st prize. Ahmat Ulu Yam.

64. Benny fruits or chocho. 6 specimens.
No entry.

65. Brinjals. 6 specimens.
1st prize. Penghulu. Abdulgany, Malacca.
2nd prize. Straits Settlements Bertam Rubber Company, Province Wellesley.

66. Radishes. 10 specimens.
1st prize. Cheng Hun, Penang.
2nd paize. No award.

67. Ladies' fingers. 6 specimens
1st prize Mohamed Arshat, Penang.
Highly Commended. Brahim, Penang.

68. Cucumbers. 6 specimens
1st prize. Straits Settlements Bertam Rubber Company, Province Wellesley.
2nd prize. Mohamed Tahib, bin Mohamed Nor, Penang.
Highly Commended. Mohamed Arshat, Penang.
Commended. Ahmat, Lower Perak.

69. Tomatoes, best dish. 6 specimens.
1st prize. R. M. Conolly, Ipoh. Perak.
2nd prize. No award.

DIVISION B. VII.

70. Beans, best collection. Optional.
1st prize. Jayah, Penang.
2nd prize. Ahmin, Kuala Kangsar.

71. Cabbages, 3. Optional.
1st prize. P. Y. Seow Teng, Kuala Lumpor.
Highly Commended. R. M. Conolly, Ipoh.

72. Lettuces, 6. Optional.
1st prize. Cheng Hun, Penang.
2nd prize. Said Ahmad, Penang.

73. Onions, shallots and garlic, best collection. One bundle of each.
1st prize. Kung Thean Sang, Penang.
Highly Commended. Musim, Rawang.

74. Herbs used in curries and sambals, best collection. One bundle of each.
1st prize. Ah Seng, Penang.
2nd prize. Mohamed Arshad, Penang.

175. Chillies, best collection, 30 of each.
1st prize. Kutop Mohamed bin Wahab, Tanjong Malim, Perak.
2nd prize. Lamah, Kuala Langat.
Highly Commended. Mohamed Bidin, Lower Perak.

176. Chillies, best sample any kind. 30 specimens.
1st prize. Penghulu Sam, Malacca.
2nd prize Haji Mastafa, Penang.
Highly Commended. Cheng Hun, Penang.

177. Vegetables and herbs for making a salad, best callection. 3 of each.
1st prize. Phaik Hussain, Penang.
2nd prize. Mohamed Arsat. Penang.

178. Vegetables, best collection. 3 of each.
1st prize. Ah Seng, Penang.
2nd prize. Lai Lang, Rawang.
Highly Commended. Low Chit Mun, Penang.

179. Pumpkins. 3 specimens.
1st prize. Datoh Mohamed Kassim, Klang.
Highly Commended. Ang Yew, Ulu Yam.

180. Water-melons, gourds, squashes, luffas, etc., best collection. of each.
1st prize. Mohamed Omar, Lower Perak.
2nd prize. Saleh, Kuala Lumpor
3rd prize. No award.

181. Yams, kladies, best collectlon. 6 of each.
1st prize. Penghulu Sam, Malacca.
2nd prize. Penghulu Ahmat, Malacca.
3rd prize. Ahmat Penghulu, Lower Perak.

182. Any vegetables not included in above. Optional.
1st prize. R. M. Conolly, Ipoh, Perak.
2nd prize. Peng Mat, Malacca.
Highly Commended, Sidang Dris Malacca.

DIVISION C. I.

183. Bull (locally bred).
1st prize. Hasan, Kampong Baru, Kuala Lumpor.
2nd prize. K. T. Koomarasawmy Pillai, Kuala Lumpor.

184. Cow and calf.
1st prize. No award.
2nd prize. K. T Koomarasawmy Pillai, Kuala Lumpor.

185. Bull (imported).
1st prize. No award.
2nd prize. ,,

186. Cow and calf (imported).
1st prize. R. M. Connolly, Ipoh.
2nd prize. K. T. Koomarasawmy Pillai, Kuala Lnmpor.

187. Pair of draught bullocks with cart, (Indian).
1st prize. K. T. Koomarasawmy Pillai, Kuala Lumpor.
2nd prize. Taku, 10th Mile, Sungei Besi.

188. Pair of draught bullocks with cart, (Siamese).
1st prize. No award.
2nd prize. Penghulu H. Ahmat, Malacca.

189. Champion animal in section. Horace Brett, Perak.

DIVISION C. II.

No Entries.

DIVISION C. III.

194 to 196, No Entries.

197. Ram goat.
1st prize. Sidang H. Mohamed, Bin H. Musah, Malacca.
2nd prize. Mat Tahir Bin Abdul Rani, Malacca.

198. Ewe goat with kids
1st prize. Sidang Marshat, Malacca.
2nd prize. No award.

DIVISION C. IV.

199. Bantam cock and hen.
1st. prize. Syed Harron Alynite, Penang.
2nd prize. Sidang Haji Mohamed B. H. Musa, Malacca.

200. Malay cock and hen.
1st prize. Mohamed Esah, Kuala Kangsar.
2nd prize. Mohamed Kasim, Penang.

201. Malay game cock and hen.
1st prize. Mohamed Bedin, Lower Perak.
2nd prize. Ah Bun, Kuala Langat.

202. Collection of Malay fowls. 6.
1st prize. W. W. Douglas, Kuala Lumpor.
2nd prize. Mohamed Omar, Lower Perak.

203. Collection of Chinese fowls. 6.
1st prize. No award.
2nd prize. Penghulu Sungei Tierggi, Matang, Perak.

204. Collection of fowls, any breed.
No award.

205. Pair of Muscovy ducks.
1st prize. Jamir, Kuala Lumpor
2nd prize. J. G. Dragon Kuala Lumpor.

206. Pair of ducks, any breed.
1st prize. Mohamed Kassim, Penang.
2nd prize. Penghulu Ijok, Perak.

207. Pair of ducks, hybrid.
1st. prize. No award.
2nd prize. Kulop Samat, Bruas, Kuala Kangsar.

208. Gander and goose.
1st prize. Ahmat, Kuala Lumpor.
2nd prize. Laiman, Kampong Buaia, Kuala Kangsar.

209. Pair of pigeons.
1st prize. W. W. Douglas, Kuala Lumpor.
2nd prize. J. Carrol, Recreation Club, Kuala Lumpor

210. Best domesticated wild bird.
1st prize. Mohamed Bin Mohamed Saleh, Penang.
2nd prize. Raja Alang, Rawang.

211. Best domesticated wild animal.
1st prize. T. H. Sarnelis, Pudoh, Kuala Lumpor.
2nd prize. Allang Mat Daud, Lungki, Perak

DIVISION D. I.

212. Collection of Malay jewelry, not more than 8 pieces.
No award.

213. Pinding, any metal. 1.
1st prize. Mohamed Alsop, Brunei.
2nd prize. No award.

214. Sireh requisites, any metal. 1 set.
1st prize. Penghulu Jugra and Bandar, Kuala Langat.
2nd prize. Omar, Penang.
Highly Commended. Haji Mohamed Shaid, Penang.

215. Muka bantal, gold suasa or silver. 1 pair.
No award.

216. Ornamental boxes, any metal except tin. 1 pair.
1st prize. Mat Hasan, Brunei.
2nd prize. Mohamed Usop, Brunei.
Commended. Haji Mohamed Shaid, Penang.

217. Talam or semerit, any metal. 1 pair.
1st prize. Jalaludin, Brunei.
2nd prize. Haji Mohamed Shaid, Penang.

218. Piring or semerit, any metal. 1 pair.
No award.

219. Batil, any metal. 1 pair.
1st prize Penghulu Jugra and Bandar, Kuala Langat.
2nd prize. Penghulu Ijok, Kinta, Perak.

220. Dulang, any metal. 1 pair.
1st prize. Bin Mohamed Usop, Brunei.
2nd prize. Pandak Lazin, Kuala Langat.

221. Krusang, gold suasa or silver. 1 set.
No award.

222. Any kind of metal work not included in above. Optional.
1st prize. Haji Mat Daud, Brunei.
2nd prize. Mohamed Usop, Brunei.

223. Kris with sheath. 1.
1st prize. Penghulu Sungei Raia, Perak.
2nd prize. Penghulu Ipoh, Perak.
Commended. Mohamed
Bedin, Sungei Durian, Lower Perak.

224. Tumbok lada with sheath. 1
1st prize. Prae Bin Husin, Remban, Negri Sembilan.
2nd prize. Pengian Yakop, Brunei.

225. Parang with sheath. 1.
1st prize. Pengian Yakop, Brunei.
2nd prize. Ahamod Tasir, Lower Perak.

226. Golok with sheath. 1.
1st prize. Penjirian Yacob, Brunei.
2nd prize. Sultan of Pahang.

227. Ornamental tin box. 1.
1st prize. Ng Seng, Serendah.
2nd prize. Swe Heng, Serendah.

228. Collection of tinware. Not more than 8.
1st prize. Foh Seng, Seremban.
2nd prize. Tye Shin, Seremban.

229. Malay gong. 1
1st prize. Assistant Penghulu Tanjong Poh Alang, Perak.
2nd prize. Penghulu Irian Abdulrhaman, Brunei.

DIVISION D. II.

230. Carved wooden box. 1.
1st prize. Bulat School Master, Bernang.
2nd prize. Kidan Bin Dolah, Negri Sembilan.

231. Wood carving, any other form. 1.
1st prize. Zabadi, Brunei.
2nd prize. H. B. Ellerton, D. O., Negri Sembilan.
Special prize. Hazi Dollah Bin Nohodu Mat, Penang.

232. Model of a Malay house.
1st prize. Indot K. L. Kanan Kuala Kangsar.
2nd paize. Mohamed Mansur, Lower Perak.
Special prize. Abdul Hamid Penghulu, Ulu Selangor.

233. Malay models : best set of models illustrative of any one of the following subjects :—Fish-trapping, game snaring, weaving, navigation, rice cultivation, Malay ceremonies, Malay magic. Surface measurment of each exhibit not to exceed 4 sq. ft.
1st prize. Mohamed Manswer, Lower Perak.
2nd prize. Mohamed Bidin, Lower Perak.
Special prize. Penghulu, Tapah, Batang Padang.

234. Malay children's playthings, best collection, Optional.
1st prize. Mohamed Ali-Senggang, Kuala Kangsar.
2nd prize. Mohamed Mansur, Lower Perak.

235. Articles made from the coconut palm, best collection, Optional.
1st prize. No award.
2nd prize. Haji Serat Rungkup, Lower Perak.

236. Sumpitan with quiver. Optional.
1st prize. Mohamed Serajudin Sungkai, Perak.
2nd prize. Said Yusuf, Chigar Gatah, Kuala Kangsar.

237. Set of Malay musical instruments. Not more than 8.
No award.
Special prize. Mohamed Casim, Bukit Raja, Klang.

DIVISION D. III.

238. Malay embroidery, best specimen. 1.
1st prize. Mohamed Omar, Lower Perak.
2nd prize. No award.
Special prize. Penghulu Bernang, Ulu Langkat.

239. Embroidered slippers. 1 pair
1st prize. Raja Kudin, Klang
2nd prize. Penghulu Ipoh, Perak

240. Embroidered muka bantal. 1 pair.
1st prize. Haji Mohamed Yasin, Lower Perak.
2nd prize. Abdullah Ali, Lower Perak

241. Embroidered mats. 1 pair.
1st prize. Mohamed Omar, Lower Perak.
2nd prize. Rajah Zyobidah, Kuala Lumpor
3rd prize. No award.

242. Embroidered tudong saji. 1.
1st prize. Penghulu, Durian Sibatang, Lower Perak.
2nd prize. No award.

243. Malay lace, 1 piece.
1st prize. Sena Gurau, Malacca.
2nd prize. No award.
244. Sarong (silk and gold). 1.
1st prize. Wan Usop, Kuala Lumpor.
2nd prize. Dayang Siti Hajijah, Brunei
245. Sarong (massuli), 1
1st prize. No award.
2nd prize Penghulu, Pulan Rusa, Pahang.
2nd prize. Tunku Tuan Besar, Pahang.
246. Sarong (silk). 1.
1st prize. Penghulu, Pulan Rusa, Pahang.
2nd prize. Tunku Tuan Besar, Pahang.
247. Sarong (cotton) 1.
1st prize. Siti Esah, Brunei
2nd prize. Indot, Kuala Kangsar.
248. Silk for Malay baju, best piece, 1 piece.
1st prize. Tunkn Tuan Besar, Pahang.
249. Best collection of varieties of Malay weaving. Optional
1st prize. Mohamed Amin, Kuala Kangsar.
2nd prize. Bedul, Kuala Kangsar.
250. Kain lepas. 1.
1st prize. Penghulu, Ipoh, Perak.
2nd prize. No award.
251. Kain telepok. 1.
1st prize. Penghulu Morilen, Kuala Langkat.
2nd prize. Haji Hamad Kuala Langkat.
252. Kain pelangi. 1.
1st prize. No award.
2nd prize. Mohamed Amimu, Kuala Kangsar.
253. Kain tudong kepala. 1.
1st prize. Haji Darus, Penang.
2nd prize. Punghulu Morib, Kuala Langkat.
254. Selendan.
1st prize. Wan Usop, Kuala Lumpur.
2nd prize. Girls' School, Telok Anson.

Division D. IV.

255. Ornamental basket (rattan) 1 pair.
1st prize. Pengnulu Ijok, Selama Perak.
2nd prize. Mohamed Martin, Bedor, perak.
256. Ornamental baskets (mengkuang or pandan) Set of 4.
1st prize. Penghulu Yusup. Malacca.
2nd prize. Chi Itam bti : Jasir, Negri Sembilan.
257. Hats (mengkuang or pandan). 1.
1st prize. Sinen Binti Chu, Port Dickson.
2nd prize. Haji Abdul Carim, Negri Sembilan.
258. Mat (coloured).
1st prize. Abdul Raman, Palani, Negri Sembilan.
2nd prize. Penghulu Ujong, Permatang, Kuala Selangor
259. Mat (tikar bangka).
No award.

260. Mat (tikar hampar).
1st prize. Datoh Paduka Raja, Lower Perak.
2nd prize. Sow Thok, Ampang, Kuala Lumpor.
261. Mat (mengkuang or pandan).
1st prize. Haji Mohamed Yasin, Lower Perak.
2nd prize. Mohamed Arshat, Lower Perak.
Special prize. Pandan Mat.

DIVISION V.

262. Kajang (mengkuang), 1 piece.
1st prize. Datoh paduka Raja, Lower Perak.
2nd prize. Mohamed Toh Maharaja, Derva Lam-Kanan Kuala Kangsar.
263. Attap. 10 pieces.
1st prize. Haji Mohamed Nasir, Lower Perak.
2nd prize. Mohamed Bedin, Lower Perak.
264. Set of cooking utensils. Not more than 8.
No award.
265. Labu. 1.
1st prize. Ngah Ahmat, Kuala Kangsar.
2nd prize. Datoh Paduka Raja, Lower Perak.
266. Gelok. 1.
1st prize. Muda Lamsah, Negri Sembilan.
2nd prize. No award.
267. Buyong. 1.
1st prize. D. Dinas de Silva, Kuala Lumpor.
2nd prize. No award.
268. Ornamental pottery, best collection. Not more than 6 pieces
1st prize. Murugapah, Province Wellesley.
2nd prize. No award.
269. Industrial earthenware, best collection Not more than 6 pieces
No award.
270. Rope and twine. Optional.
1st prize. Penghulu Abdul Gani, Malacca.
2nd prize. Bala-Rassah, Negri Sembilan.
271. Malay Pottery, hand-made. 3 pieces.
1st prize. Boys' School, Pulan Packat, Perak.
2nd prize. Boys' School, Pulan Tiga, Perak.
272. Ornamental baskets. 1.
1st prize. Girls' School, Telok Anson.
2nd prize. Girls' School, Kam : Buaia Perak.
273. Malay Mats. 3.
1st prize. Boys' School, Klang.
2nd prize. Girls' School, Trong, Perak.
274. Sireh requisites. 1 set.
1st prize. Boys' School, Pasir Panjanghlis, Perak.
2nd prize. Pasangan Boys' School.
275. Model Malay house. 1.
1st prize. Boys' School, Kuala Kangsar
2nd prize. Boys' School, Kajang.
276. Wood-carving. 1.
1st prize. Malay School, Bernang Dalish.
2nd prize. Boys' School, Bagan Dalish.

277. Embroidery. 1. piece.
1st prize. Girls' School, Tenish.
2nd prize. Girls' School, Telok Anson.

278. Sarong. 1.
1st prize. Girls' School, Kila Lama Kiri, Kuala Lumpor.
2nd prize. Girls' School, Lenggong.

279. Fishing nets. Optional.
1st prize. Boys' School, Jeram.
2nd prize. Boys' School, Pasir Panjang, Larut, Perak.

280. Collection of miniature Malay models. Optional.
1st prize. Boys' School, Kampong, Padang Gajah.
2nd prize. No award.

281. Best article of rattan furniture.
1st prize. Boys' School, Taipeng.
2nd prize. Malay School, Setapak.

282. Collection of models of Malay boats. Optional.
1st prize. Boys' School, Telok Anson.
2nd prize. No award.

283. Embroidered mat. 1.
1st prize. Girls' School, Bandar.
2nd prize. Girls' School, Kata Lama, Kanan.
Highly Commended. Girls' School, Telok Anson.
Highly Commended. Girls' School, Trong.

DIVISION E.

284. Agricultural implements, locally made. Optional.
1st prize. Abdul Shuckor, Kuala Kangsar.
2nd prize Sidang Drisbin Hasan, Malacca.
Special prize. Ahmet, Kuala Lumpor.
Commended. Datoh Puduka Raja, Lower Perak.
Highly Commanded. F. E. Co., Kuala Lumpor.

285. Agricultural implements, European made.
1st prize. Federated Engineering Company, Kuala Lumpor.
2nd prize. No award.

286. Machinery in connection with preparing rubber, to be exhibited at work. Diploma &c.
1st prize. F. J Harvey, S. M.
2nd prize. J. B. Douglas, Terantang Estate.
Commended. Federated Engineering Company, Kuala Lumpor

287. Spraying apparatus. Optional.
1st prize. No award.
2nd prize. No award.
Commended. Federated Engineering Company, Kuala Lumpor.

288. Best tools for tapping rubber. Optional.
1st prize. Federated Engineering Company, Kuala Lumpor
2nd prize. Messrs. Brown and Davidson, Ceylon.

289 and 290. Bullock carts and hand carts. No entries.

291. Agricultural baskets. 2 of each kind.
1st prize. Penghulu, Ulu Langkat, Kajang.
2nd prize. Said Ahmad, Penang.

292. Casks, tubs, etc., 3 specimens. No entry.

293. Miscellaneous. Optional.
1st prize. Hussain Bin Haji Ishak, Penang.
(For a model of cotton spinning apparatus.)
Commended. Nain Lenggong, Negri Sembilan.
Special prize. Tan Ong Pin, Kuala Lumpor. (For making tricks.)
Special prize. H. B. Ellerton D. O. (for implements collecting wood oil).

PERSONAL.

Mr. H. C. Pratt, the Government Entomologist, has been transferred from the Institute for Medical Research to the staff of the Director of Agriculture and will be engaged in the first instance in completing his investigations published last May in this Bulletin into the life history of *Termes Gestroi*, the white ant attacking living rubber trees. He will also carry on experiments in the direction of prevention and cure of this ubiquitous pest.

GROWTH OF GUTTA PERCHA.

THE EDITOR AGRICULTURAL BULLETIN,

Singapore.

DEAR SIR,

In reference to Mr. Burn Murdoch's interesting article on the rate of growth of forest trees in the F. M. S. the following measurements of two Getah Taban trees growing amongst my young Para trees may be of interest. The trees I may mention are situated on a gentle slope and have been practically clean weeded the whole time. Measurements taken 3ft. from the ground.

			TREE NO. 1.	TREE NO. 2.
18th	January	1906	$14\frac{1}{8}''$	$11\frac{1}{4}''$
25th	April	1906	$14\frac{1}{2}''$	$11\frac{3}{4}''$
18th	October	1906	$15\frac{1}{2}''$	$12\frac{1}{4}''$
18th	October	1907	$17\ ''$	$14\frac{1}{2}''$
5th	September	1908	$18\ ''$	$15\frac{1}{2}''$

Therefore during 31 months the two trees have increased in girth $4\frac{1}{8}''$ and $4\frac{1}{4}''$ respectively, or an average increase of about $1.65''$ per annum, against $1.69''$ of the 100 Taban trees at Taiping, referred to by Mr. Murdoch.

In a year or two these two Taban trees will be entirely shut in by Para trees, when there will be probably a falling off in the rate of growth, so far as girth is concerned. I shall continue my measurements.

Yours Faithfully,

G. A. L.

EMERGENCY MEETING OF THE PLANTERS' ASSOCIATION OF MALAYA.

Meeting held at 2.30 p.m., on August 27th, 1908, at the Selangor Club, Kuala Lumpor. Present:—For the Perak Planters' Association: Mr. C. L. Gibson, Mr. H. S. Whiteside; Negri Sembilan Planters' Association: Mr. J. le P. Power; Johore Planters' Association: Mr. A. H. Malet, Mr. A. L. Buyers: Kuala Selangor D. P. A: Mr. A. Irving; Klang D. P. A: Mr. Jno. Gibson, Mr. A. B. Lake, Mr. R. W. Harrison; Kapar D. P. A: Mr. H. M. Darby, Mr. C. T. Hamerton; Kuala Langat D. P. A: Mr. E. Macfadyen; Kuala Lumpor D. P. A: Mr. E. B. Skinner, Mr. F. G. Harvey, Mr. C. Burn Murdoch, Mr. A. J. Fox, Mr. H. C. E. Zacharias. Batu Tiga D. P. A: Mr. H. F. Browell, Mr. P. W. Parkinson, Mr. H. L. Jarvis. Mr. R. W. HARRISON Chairman. and Mr. H. C. E. ZACHARIAS, Secretary. Mr. L. H CLAYTON, (Visitor).

1. The Secretary, having read the notice convening the Meeting, places before the Meeting the following letters:—

No. 3278/1908. KUALA LUMPOR, *13th August, 1908.*

SIR,

I am directed to forward herewith copies of the Bill to repeal and re-enact with the amendments the Tamil Immigration Fund Ordinance (Straits Settlements) 1907, the second reading of which is proposed to be taken in the Legislative Council of the Colony on the 21st August.

2. As it is considered desirable that the Bill should be proceeded with without unnecessary delay, I am to request that any observations which the Planters' Association may wish to make may be submitted as soon as possible.

I have, etc.,

(Sgd.) S. W. MACARTHUR,

Federal Secretary.

KLANG, *19th August, 1908.*

THE SECRETARY TO H. E. THE GOVERNOR,
SINGAPORE.

SIR,

Enclosed I have the honour to hand you copies of my telegrams of to-day's date with reference to postponing the final reading of the revised Immigration Ordinance.

An emergency meeting of the Planters' Association of Malaya cannot be called with less than 7 days' notice, and as the first intimation we received of the Second Reading of the Bill being taken on the 21st inst., was in a letter from the Federal Secretary dated 14th inst., it was impossible for us to call a meeting in time.

I have, etc.,

(Sgd.) R. W. HARRISON,

Chairman, P. A. M.

Misc. 1284/1908. SINGAPORE, *21st August, 1908.*

SIR,

I am directed to enclose copies of telegrams which have passed between us on the subject of the date of the Second Reading of the Tamil Immigration Fund Amendment Bill.

2. The Second Reading has now been fixed for the 4th September, which will give time for the views of the Planters' Association of Malaya, formulated at the meeting to be held on the 30th August, to be placed before the Government.

3. I am to suggest that Mr. Clayton might be asked to attend the meeting so as to afford any explanation of the proposed legislation which may be desired by Members of the Association.

I have, etc.,

(Sgd.) CLAUD SEVERN.

Ag. Secretary to High Commissioner, F. M. S.

Copy of telegram from Mr. Harrison to Secretary to High Commissioner dated the 19th August, 1908:—

"Time allowed for discussion Immigration Bill insufficient for my Association; we ask for postponement; meeting Association called 23rd August."

To Mr. Harrison dated the 19th August, 1908:—

"Second Reading Immigration Fund Bill postponed to 28th August."

From Mr. Harrison dated the 19th August, 1908:—

"Date of Meeting should be 30th not 23rd."

To Mr. Harrison dated the 20th August, 1908:—

"Second Reading fourth September; suggest Clayton be asked attend meeting thirtieth afford any explanations members may desire."

2. The Secretary further informs the Meeting that he has received the following letters from the Penang, Kapar and Negri Sembilan Associations respectively:—

PENANG, *20th August, 1908.*

THE SECRETARY, P. A. M.

DEAR SIR,

We are in receipt of your wire of yesterday's date and confirm having replied to you as follows:—

"Think there is no necessity for meeting; majority of delegates of this Association in favour of Immigration Bill with the following amendment:—*Definition of Employer*—A person who pays for work done by Tamil labourers to some person other than the labourers shall be considered to be the employer of such labourers unless he shall prove *to the satisfaction of the Superintendent that the Assessment on the labourers has already been paid.*"

This amendment we are given to understand is to be introduced by the Chairman of the Immigration Committee and has your President's support as well as that of Mr. Turner.

It is almost impossible just now to get a quorum of this Association's Committee together, as they are unable to leave their work on the Estates.

We are, etc.,
(Sgd). KENNEDY & Co.,
Agents, M. P. A. A.

THE SECRETARY. P. A. M. KLANG, *18 August, 1908.*

DEAR SIR,

I have to thank you for your letter dated the 14th inst., referring to the Tamil Immigration Fund Bill.

I am directed to inform you by my Committee that this Association regrets that there still appears to be no movement in the direction of making provision that estates should pay their assessments on coolies imported and not on their whole labour force.

Yours faithfully,
(Sgd.) N. C. S. BOSANQUET,
Honorary Secretary, K. D. P. A.

SEREMBAN, *26 August, 1908.*

THE SECRETARY, P. A. M.

DEAR SIR,

Herewith I beg to enclose the proxies of the Negri Sembilan delegates which I should be obliged if you would make use of.

I wish to point out that the planters of Negri Sembilan are of strong opinion that the Immigration Fund Ordinance should be carried on on the same lines as at present.

Kindly put forward our proxies in favour of no alteration in the Bill.

Yours faithfully,
(Sgd.) G. W. HINGSTON,
Honorary Secretary, N. S. P. A.

3. Mr. R. W. Harrison, in opening the discussion of the amended Bill, said that the amendments had been brought in at the instance of the Immigration Committee. The chief amendments were (i) the decision to grant rebates and (ii) the definition of employer. This latter, he observed, did not affect planters greatly.

Mr. Clayton had kindly consented to attend this meeting and would be able to answer any questions that might arise.

Mr. E. B. Skinner asked whether there would be a large surplus on the year's working of the Immigration Fund.

Mr. L. H. Clayton said that there undoubtedly would be a surplus, but that he could not give the exact figures, as the accounts for the first six months were not yet finished. There should be a pretty fair balance.

Mr. Skinner suggested that until these accounts were in their hands it was premature to discuss any Amendment Bill. The present Enactment should stand until the end of this year, and then be amended, if necessary, in the light of the financial statement for the year just passed. He predicted that the apportioning of rebates would prove a great nuisance. In any case he felt strongly that the change that was required was for the cess to be levied in future on those coolies only that had been recruited during the preceding quarter, and not on the total labour force employed. Some coolies never changed and it was absurd to have to pay perhaps as much as $50 for the same coolie.

Mr. E. Macfadyen said that until a definite shape had been suggested for the rebate, it was impossible to predict whether it would be easy or difficult.

Mr. H. M. Darby: Is this Bill the final amendment?

Mr. L. H. Clayton: Of course, an Enactment can always be changed. It is now about a year since the original Bill was passed by the Legislative Council, and I take it this is what His Excellency had in his mind when he said the Ordinance would be re-cast in another year.

Mr. A. B. Lake thought that the main difficulty was financial. They would always be behindhand with the figures, and how were they to criticize any new measure without having any figures before them?

Mr. Darby agrees with Mr. Skinner that the cess should be on newly recruited coolies only.

Mr. Harrison said that the principal object of the present Enactment was to make the non-importer of labour pay. If in future the cess was only going to be levied on the number of coolies imported, the whole scheme would be stultified.

As regard figures, he would give them the following approximate summary of assessment collected for 1st Quarter:—

ESTATES:—		
Colony	4,950	
Perak	11,500	
Selangor	22,800	
Negri Sembilan ...	4,700	
Pahang	200	
		44,150
RAILWAY DEPARTMENT, Colony and Federated Malay States		9,050
GOVERNMENT DEPARTMENTS (excluding Railways), MINERS AND CONTRACTORS:—		
Colony	3,100	
Perak	10,100	
Selangor	6,800	
Negri Sembilan ...	2,000	
Pahang	800	
		22,800
		$76.000

TOTAL CONTRIBUTIONS:—

Colony ...	...	8,050
Perak ...	...	21,600
Selangor ...	...	29,600
Negri Sembilan	...	6,700
Pahang ...	...	1,000
Railway Department	...	9,050
		$76,000

I calculate that during the first quarter about $38,000 has been paid towards the importation of labour by employers who previously did not pay anything. Practically the whole of the labour imported with free tickets paid for by the Fund has gone to estates, and the larger portion of it to Selangor.

Mr. C. L. Gibson asked for some indication of the lines on which the rebate would be given, and pointed out that if they were going to go back as far as 1905 the rebate in each individual case would be a mere driblet.

Mr. Clayton said that the original idea had been to give a rebate retrospectively for one year only, but that it had been pointed out that it would be better to give the Immigration Committee a free hand. As soon as the Committee got the full figures, they would have to devise the best means of granting a rebate, and at the same time rule out those who in the past had depended exclusively on locally recruited labour. His department had kept records of all Immigrants who had come over since 1905 and also, separately, the number of those who had come over on state-aided tickets.

If the surplus was not large, the rebate would be taken on the basis of one previous year only; if large enough, on the basis of the three previous years.

Mr. C. L. Gibson enquired what the liability of the employer would be under the new definition of the term; more particularly whether a Manager would be entitled to deduct any cess which the contractor might incur before paying the amount of the contract due to the contractor.

Mr. Clayton stated that such procedure would be perfectly legal. He would however suggest that a proviso to that effect be added to any contract about to be made.

Mr. Lake was afraid that one planter might slur over this liability, whilst another would be more conscientious, with the result that the latter might find difficulty in getting contractors to work for him.

Mr. Browell thought that the word "contractor" wanted defining.

Mr. Parkinson came back to the point originally raised, viz., that the rebates should be based on the number of coolies imported, not on the number of coolies on which cess had been paid.

Mr. Skinner still thought the best plan would be to approve of the Bill as it stood, and to reconsider same as soon as the accounts for the whole of 1908 were available.

Mr. Lake supported Mr. Skinner, and urged that it was impossible to do anything definite until they knew what the financial position was.

Mr. J. Gibson said that the rebate should be on coolies already paid for. There should be no differentiation between old and new estates. Many young estates had recruited an enormous number of coolies to get through with the programme laid down for them. Now many had completed this, in fact wanted to get rid of coolies. He knew one estate with a force of 800 which wanted to get rid of 300. It would be an injustice if such estates were treated differently from older estates.

Mr. Macfadyen said that in 1906 he imported 85 coolies with five free tickets. If we confine ourselves to the present year we do what is fair. If we extend the rebate outside this year, we shall gratify few, waste money, and be unfair.

Mr. Darby really thought that nobody wanted rebates at all for what had happened in the past. All they wanted now was to ensure that for the future the cess would be levied on newly-engaged coolies only.

Mr. Clayton thought that that would give a loophole to the miners to get out of paying the cess altogether. Another difficulty was with temporary workers. They had to follow up contractors whose labour force varied very much, one day 10 and another 200. Mr. Darby's suggestion made it unworkable as regards contractors, though simple with estates.

Mr. Macfadyen moved that the rebate be confined to 1908 coolies, by substituting "1908" for "1905" in § 7, 1.

Mr. Fox reminded Mr. Clayton that no free tickets had been in force during the first six weeks of this year, and he thought those estates who had recruited during that time were entitled to first relief out of any accumulated funds.

Mr. Harrison said that his personal idea to deal with any surplus was to give a free return ticket to any coolie who had uninterruptedly served one employer for, say, two years. At present Selangor was full up with labour and the other States would shortly be so too; but enormous acreages were coming into bearing in another three or four years and the labour force required then would be as nothing compared with what filled their requirements now. By adopting his suggestion he felt sure they would break the back of the bolting difficulty. The coolie getting a free passage would be able to take his savings back with him intact. This would popularize the country and would represent an advance over anything done by the countries with which we have to compete.

Mr. Macfadyen then proposes and Mr. Fox seconds:—

"That the Immigration Committee be asked not to take any action in regard to rebates until the accounts for the working of the Indian Immigration Fund Enactment during 1908 have been presented to and considered by this Association."

Mr. Skinner having withdrawn his original motion, Mr. Macfadyen's motion is put to the Meeting and carried unanimously.

4. Mr. Macfadyen then proposes and Mr. J. Gibson seconds:—

"That '1907' be substituted for '1905' in §, 7, 1 of the Bill."

Mr. Parkinson proposes and Mr. Whiteside seconds, "That this para stand as now in the Bill."

Mr. Parkinson's amendment having been to put the Meeting is lost.

Mr. Macfadyen's motion is then put and declared carried.

5. Mr. Browell reverts to the definition of "contractor." He thinks a weeding contractor should not come under the working of this Enactment.

Mr. Skinner points out that it is only fair to pay double the cess on coolies out of whom the employer gets double the ordinary amount of work.

Mr. Macfadyen concurs that the cess must be calculated on the actual amount of work done, not on the number of individuals employed, which latter is apparently the mode desired by Mr. Browell.

Mr. Clayton states that employers of free coolies, working on contract, need only show the total sum paid. Only coolies on daily wages must be kept by name on the Register. The 40 cents per day rule, however, did not apply to coolies working on fixed day tasks.

Replying to several other questions, Mr. Clayton said that.

(1) picking scrap, by contracting for a fixed payment per lb. picked, was a contract, and that coolies thus working would come under the 40 cents per day rule;

(2) in §5 ("to the satisfaction of the Superintendent") the only appeal possible was to the Immigration Committee;

(3) it was not feasible to absolutely fix dates for the Meetings of the Immigration Committee months ahead.

Mr. Darby thought that the Hon. Secretaries of all the constituent Associations should always be notified of any forthcoming Meetings of the Immigration Committee.

6. Mr. Harrison then proposes and Mr. Malet seconds, "That this Association approves of the Indian Immigration Fund Amendment Bill, except as far as same has already been amended at this Meeting." This motion is put to the Meeting and carried unanimously.

7. Mr. Macfadyen enquires what progress was being made in connection with the London Rubber Exhibition, to which the Secretary replies from memory, no previous notice having benn received of this subject.

The Meeting terminates at 4 p.m.

H. C. E. ZACHARIAS,

Secretary.

(Received on the 11th day of September, 1908 Ed).

SINGAPORE MARKET REPORT.

August, 1908.

Articles.	Quantity sold.	Highest price.	Lowest price.
	Tons.	$	$
Coffee Palembang ...	...	...	...
Bali	5	23½	21
Liberian ...	43	27	24
Copra	6,322	7.72½	6.90
Gambier	1,083	8.15	7.62½
Gambier Cube, Nos. 1&2 ...	237	12.40	11.25
Gutta Percha, 1st quality ...	...	300	240
Medium ...	...	240	80
Lower ...	...	80	12
Borneo Rubber, 1, 2 & 3 ...	...	103	42
Gutta Jelotong	...	7.25	5.90
Nutmegs, 110's	...	21	19.50
80's	...	22	21
Mace, Banda	...	80	76
Amboyna ...	...	64	59
Black Pepper	1,760	11.37½	10.62½
White Pepper (Sarawak) ...	838	17.62½	16.50
Pearl Sago, Small ...	77	3.75	3.60 fair.
Medium ...	30	4.35	4.35
Large ...	...	...	...
Sago Flour, No. 1 ...	4,903	3.15	2.82½
No. 2 ...	970	1.45	1.15
Tapioca Flake, Small ...	257	5.90	5.65 fair.
Medium ...	315	...	...
Pearl, Small	564	8.60	4.30 fair.
Medium ...	578	5.90	5.50 fair.
Bullet	...	...	...
Tin	3,195	70	65.62½

GOW, WILSON & STANTON, Limited—

India Rubber Market Report.

13 & 23, Rood Lane, London, E.C.

7th August, 1908.

Since the holidays there has been a good deal of speculative demand evidenced for Para grades, and quotations have in consequence been improved, to-day's value being about 1½d. above the lowest quotations since the last auction. This improvement, however, has not been reflected to the same extent in Plantation kinds, as the manufacturing demand continues to be somewhat quiet.

At to-day's auction buyers were operating with caution and a good part of the offerings were bought in for want of competition. There has, however, since been more enquiry privately, and a fair proportion of the taken out lots has been sold at advances.

4/6 was the highest price in the sale, Warriapolla biscuits again obtainig this distinction, the next highest price was 4/4½ for Balkadua crepe. Sheet and Biscuits mostly sold at about 4/1.

	Number of Packages Advertised.	Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.		
		Ceylon.	Malaya.	Totals.	No. of Packages sold.	Price.	Hard Fine Para.	Plantation. Fine	Plantation. Scrap.
To-day	977	9	42	51	457	3/8⅞	4 value	4/1 to 4/6	2/4 to 2/11½
Corresponding Sale Last year	853	10	35	45	427	4/10¾	4/9½	5/3 to 5/10	3/9 to 4/3

To-Day's Quotations.

Sheet and Biscuits.		Crepe and Block.		Unwashed Scrap.	
Very fine Pale Biscuits.	4/6	Fine Pale ...	4/1 to 4/4½	Good to Fine	2/8 to 2/11½
Good to fine Biscuits.	4/1	Medium and Palish.	3/5 to 4/-		
Good to fine Sheet.	4/0¾ to 4/1½	Dark and Block.	2/5 to 3/4		

Para Statistics.

Receipts at Para During *July*.

1908.	1907.	1906.	1905.
1,300 tons	1,370 tons	1,840 tons	1,450 tons

Total Crop Receipts—*July to June*—for the last four complete years.

1907-08.	1906-07.	1905-06.	1904-05.
36,910 tons ...	38,070 tons ...	34,480 tons ...	32,970 tons.

Plantation Exports.

CEYLON—1st January to 6th July.

1908	135½ tons
1907	95⅓ tons
1906	64½ tons
1905	23 tons

MALAYA—1st January to 26th June.

	Singapore.	Penang.	Total.
1908	453½ tons	223½ tons	676¾ tons
1907	281¾ tons	27½ tons	309¼ tons
1906	115 tons	18 tons	133 tons

Particulars and Prices of To-Day's Sale.

CEYLON.

Mark.	Pkgs.	Description.	Price.
Nikakotua	4	Good to fine crepe ...	3/2¼ to 4/2
Gikiyanakande	4	Darkish crepe ...	bought in
Kepitigalla	1	Rejected sheet scrap, etc. ...	bought in
C. L.	1	Dark scrap ...	bought in
	2	Block ...	2/8
	6	Dark pressed crepe ...	bought in
New Blackstone	1	Rough sheet and biscuits ...	4/-
Hanipha	3	Good biscuits ...	bought in
Galphele	2	Crepe ...	bought in
	2	Block ...	bought in
Dangan	1	Scrap (barky) ...	bought in
	2	Block ...	bought in
Kumaradola	5	Biscuits ...	4/1
	2	Crepe pt. sold ...	3/4
Udapolla	2	Biscuits ...	bought in
	1	Worm ...	bought in
Elston	1	Biscuits ...	4/1
Nilambe	1	,, ...	bought in
Tuduagalla	5	Good crepe ...	bought in
	4	Dark ,, ...	bought in
J. J. V. & Co.	1	Crepe ...	bought in
Verulapitiya	1	Rough sheet ...	bought in
Ambaganga	1	Pressed sheet ...	bought in
Tallagalla	6	Biscuits ...	3/5½ to 4/1
	2	Scrap and rejections ...	2/8½ to 2/11
Ballacadua	1	Very fine pale crepe ...	4/4½
	1	Dark ...	3/2
	1	Biscuits ...	4/1
	2	Crepe ...	2/11½ to 3/2½
Nikakotua	3	Good to fine crepe ...	3/10 to 4/1½
Waharaka	1	Dull biscuits ...	4/1
Mudumana	3	Good and rough biscuits and sheets	4/1
Doranakande	3	Biscuits and sheet ...	4/- to 4/1
	5	Scrap and rejections ...	2/8 to 2/8½
Ayer	1	Biscuits ...	4/1
	2	Scrap pt. sold ...	2/7½
Warriapolla	5	Very fine pale biscuits ...	4/6
	4	Scrap, etc. ...	1/- to 2/11½

Mark.	Pkgs.	Description.		Price.
Igalkande	1	Dull biscuits	...	bought in
Hanwella	1	Sheet	...	bought in
Seremban	1	Good crepe	...	bought in
Sorana	4	Biscuits	...	4/1
C. R.	14	Scrap (very heated)	...	bought in
J. C. & Co., Ltd.	1	Pressed crepe	...	3/-
D. B.	1	Block	...	bought in
Culloden	18	Darkish crepe	...	2/11¾ to 3/5
	4	Black ,,	...	2/5
Ellakande	3	Pale pressed crepe pt. sold	...	3/10¾ to 4/-
	2	Dark pressed crepe	...	bought in
Heatherley	2	Dark pressed crepe	...	2/10¾ to 3/3¼
Arapolakande	8	Biscuits	..	4/1
	6	Pale crepe	...	4/3
	5	Darkish crepe	...	3/2 to 3/6¼
Hattangalla	3	Biscuits	...	4/1
	2	Pressed crepe	...	bought in

MALAYA.

Mark.	Pkgs.	Description.		Price.
Ayer Angat	6	Good and darkish crepe	...	bought in
Linsum	17	Dark crepe	...	bought in
Terentang	24	,,	...	bought in
Bantang Kali	6	,,	...	bought in
L.				
A. R.	4	Good crepe	...	bought in
Co.				
G. H.	1	Dark crepe	...	bought in
H. C.	1	Sheet	...	bought in
C. L.	3	Good crepe	...	bought in
R. W.	10	Dark crepe	...	bought in
Linggi Plants	8	Good scrap	...	bought in
Kamaning	2	Block	...	bought in
G. etc.	17	Good and dark crepe	...	bought in
O. H.	3	Good sheet pt. sold	...	4/1½
	2	Rejections and scrap	...	2/8
	3	Rough sheet and scrap	...	bought in
C. M. R. E., Ltd.,	23	Good to fine crepe	...	bought in
	12	Good darkish and dark crepe	...	bought in
	4	Rambong crepe	...	3/1
Damansara	6	Sheet	...	bought in
	9	Good to fine crepe	...	bought in
	10	Good pressed crepe	...	bought in
	12	Dark pressed crepe	...	bought in
Shelford	6	Dull sheet	...	bought in
Yam Seng	9	Good sheet	...	bought in
	3	Scrap and rejections	...	2/8½ to 2/10¼
B. R. R. Co., Ltd.	18	Sheet	...	4/1
	22	Good pressed crepe	...	bought in
	8	Darkish and dark crepe	...	bought in
F. (S) R. Co., Ltd.	2	Sheet	...	4/0¾
	12	Good and dark crepe	...	bought in
S. S. B. R. Co., Ltd.	11	Sheet	...	4/1
	1	Dark crepe	...	2/8¾
Golconda	9	Sheet	...	bought in
	5	Crepe	...	bought in
Linggi	77	Good to fine crepe (1 case sold	...	4/0¼)
	45	Darkish to dark crepe	...	bought in
Highland Est.	68	Fine sheet	...	4/1
	47	Good crepe pt. sold	...	3/2½ to 3/6
	7	Darkish pressed crepe	...	3/1½ to 3/4¼
S. K. R. & Co., Ltd.	23	Fine to darkish crepe pt. sold	...	3/- to 4/0½
	1	Dark crepe	...	bought in

Mark.	Pkgs.	Description.		Price.
B. & D.	24	Sheet (loose and pressed)	...	3/6 to 4/1
	15	Scrap rejections, etc.	pt. sold...	2/4 to 2/8
B. B., etc.	20	Good crepe	pt. sold ...	3/9
	3	Rambong crepe	...	bought in
	2	Black pressed crepe	...	2/5
	3	Scrap and rejections	...	bought in
Pehentian	18	Good sheet	...	4/0¾ to 4/1
Tinggi	7	Good to dark crepe	pt. sold ...	2/11 to 3/5¾
S. & D.	17	Sheet	...	4/1
	1	Rejections	...	3/-
L. E. D.	7	Sheet	...	4/1
Senawang	3	,,	...	4/1¼
Sampong	1	Dark sheet	...	3/8
V. V., etc.	5	Scrap and rejections	...	bought in
S. B. N.	1	Crepe	...	bought in
E. M. & Co., Ltd.	1	Dark scrap	...	2/2
P. S. E.	11	Good to fine sheet	...	4/1 to 4/1¼
	4	Dark crepe	...	2/9½
K.	7	Sheet	...	4/1¼
G.	1	,,	...	4/1
S.	7	,,	...	4/1
V. R. Co., Ltd.	1	Rejections	...	2/1½
Klang	50	Good crepe	..	3/4¾ to 3/8¾
F. M. S.	23	Dark ,,	...	3/1 to 3/2¾

GOW, WILSON & STANTON, Limited—
India Rubber Market Report.

13 & 23, Rood Lane, London, E.C.

21st, August 1908.

The private market has exhibited more activity since the last auction, and during the past few days there has been a fair business doing in Plantation sorts. Orders for Crepe have been in evidence, some very pale lots having changed hands at 4/8.

Prices have improved to some extent, and the small supplies offered at to day's auction generally speaking met with good competition, the chief demand running on the medium and lower grades of Crepe, which have lately been somewhat neglected. These kinds mostly sold at an advance of from 2d. to 3d. per lb. on recent quotations.

The finest parcels of Crepe continue to be readily taken, and the highest price of the sale—4/6—was realised for a single case of this grade from the Malacca Rubber Plantations. The next highest figure of 4/4½ was paid for a small lot of Inch Kenneth Crepe.

Biscuits and Sheet ruled from 4/1 to 4/2 showing an advance of ½d. to 1d. per lb. on last sale rates.

It is worthy of note that quotations are now on a higher basis than has been the case since October, 1907.

Number of Packages Advertised.		Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.		
		Ceylon.	Malaya.	Totals.	No. of Packages Sold.	Price.	Hard Fine Para.	Plantation. Fine.	Plantation. Scrap.
To-day	684	5¼	30¼	35½	376	3/7⅜	4/0¾	4/1 to 4/6	2/8 to 2/11¼
Corresponding Sale Last Year	693	7	29½	36½	219	5/0⅛	4/8¾	5/1 to 5/6	3/9½ to 4/0½

To-Day's Quotations.

Sheet and Biscuits.		Crepe and Block.		Unwashed Scrap.	
Good to Fine Biscuits.	4/1 to 4/2	Very Pale ...	4/6	Good to Fine	2/8 to 2/11¼
Good to Fine Sheet.	4/1 to 4/2	Fine Pale ...	4/2 to 4/4½	Low and Earthy.	6d. to 2/2½
		Medium and Palis h.	3/7½ to 4/1½		
		Dark ..	2/7 to 3/5¼		

Para Statistics.

LIVERPOOL IMPORTS.
From 1st January to 31st July.

1908	12,344 tons
1907	8,827 tons
1906	7,180 tons

* STOCKS.
At 31st July.

1908	2,361 tons
1907	1,762 tons
1906	1,318 tons

*Excluding those in Dealers hands.

Plantation Exports.

CEYLON.—1st JANUARY to 27th JUYL.

1908	159 tons
1907	112½ tons
1906	73½ tons
1905	25½ tons

MALAYA.—1st JANUARY to 17th JULY.

	Singapore.	Penang.	Total.
1908	490½ tons	237 tons	727½ tons
1907	304½ tons	32¼ tons	336¾ tons
1906	139¼ tons	19 tons	158½ tons

Particulars and Prices of To-Day's Sale.

CEYLON.

Mark.	Pkgs.	Description.	Price.
Palli	8	Good biscuits and sheet	4/2
	1	Scrap	2/11
Densworth	2	Biscuits	4/1½
	1	Low Scrap	6d.
	1	Good scrap	2/11½
Ambatenne	1	Good biscuits	4/1¾
	2	Scrap	2/10 to 3/0¼
Northumberland	1	Biscuits	bought in
Clara	1	Biscuits	bought in
	2	Scrap	2/11
Taldua	9	Crepe pt. sold	3/3½ to 4/0¼
Ayr	1	Dark scrap	2/-
C. R.	14	Scrap (very heated)	6d.
Wavena	9	Good and rough sheet	4/- to 4/1½
	4	Scrap and lumps	2/8 to 2/11¼
Kumbukkan	3	Dark crepe	3/3 to 3/3¼
	5	Fine biscuits	bought in
Udapolla	5	,, ,,	4/1½
	2	Good to very fine scrap	2/3 to 2/11
Elston	2	Biscuits	4/1½
	4	Scrap and rejections	2/8¼ to 2/10½
Polatagama	3	Darkish crepe	3/6
Tudugalla	7	Good to darkish crepe	3/4 to 3/11
J. J. V. & Co.	1	Darkish pressed crepe	3/4
Kumaradola	1	Rejections	bought in
	2	Scrap (very dirty)	bought in
Heatherley	4	Good to darkish crepe	3/3 to 3/7
Nikakotua	2	Good brown crepe	3/9½ to 4/-
	6	Dark crepe	3/1 to 3/4½
Ingoya	6	Good biscuits and sheet	4/1½
Ellakande	2	Pressed crepe	3/1½

MALAYA.

Mark.	Pkgs.	Description.	Price.
Matang	15	Fine pale add palish crepe	4/0½ to 4/3½
	19	Good darkish to dark crepe	3/- to 3/10
S. & D.	8	Sheet	4/1¼
	7	Scrap and rejections pt. sold	2/8¼
L. E. D.	2	,, ,,	2/- to 2/8½
	2	Sheet	4/1½
Mac. A. & Co.	2	Barky scrap (heated)	1/-
C. Wood	2	Biscuits	4/1¼
	1	Brown crepe	3/4¾
Ragalla	1	Sheet	4/2
	2	Scrap and rejections	2/8½ to 2/9¼
B. & D.	39	Sheet, crepe, scrap, etc. pt. sold	1/3 to 4/1
B. C. R.	7	Good to dark crepe	3/1½ to 3/10
	1	Very fine pale crepe	4/6
M. P. Ltd.	23	Fine palish	4/1½ to 4/4
B. & D.	14	Fine sheet pt. sold	4/1½
F. D. P.	5	Rejections and scrap pt. sold	2/9
	2	Crepe	3/3 to 3/11
	1	Rough sheet	4/1
	1	Dark pressed crepe	1/3

Mark.	Pkgs.	Description.		Price.
B. & D. H.	3	Good and dark crepe	...	2/- to 4/-
	5	Good to fine sheet	...	3/9 to 4/1¾
	1	Scrap	...	2/4
S. K. R. Co., Ltd. B. & D.	2	Crepe	...	3/10¾
F. D. M.	1	Pressed sheet	...	3/8
B. B., etc.	19	Darkish crepe	pt. sold ...	3/7 to 3/8¼
	4	Scrap and rejections	pt. sold ...	2/10½
Perhentian Tinggi	1	Crepe	...	3/1½
V. V., etc.	6	Rejections, scrap, etc.	...	bought in
C. M. R. E. Ltd.	43	Fine pale and palish crepe	pt. sold	3/11½ to 4/4
	40	Good darkish to dark crepe	...	3/1 to 3/11½
	4	Rambong	...	bought in
Inch Kenneth	9	Good to fine pale crepe	...	3/11½ to 4/4½
	5	Darkish to dark crepe	...	3/1½ to 3/9
	1	Rambong	...	bought in
S. S. C.	7	Fine sheet	...	4/1¾
P. S. E.	2	,, ,,	...	4/1¾
Selaba				
Damansara	17	Good sheet	...	4/1¾
	13	Pressed crepe	pt. sold ...	2/7
Shelford	5	Dull sheet	...	bought in
	3	Pressed crepe	...	bought in
B. R. R. Co., Ltd.	12	Sheet	...	bought in
	6	Pressed crepe	...	bought in
	17	Darkish ,,	...	3/- to 3/7¼
F. (S) R. Co., Ltd.	11	Sheet	...	4/1½
	8	Good to dark crepe	pt. sold ...	2/10¼ to 3/7¼
Jebong	32	Very fine pale crepe	...	bought in
	1	Fine palish	...	4/2½
Golconda	9	Sheet	...	bought in
S. S. B. R. Co, Ltd.	5	Sheet	...	4/1½
	3	Darkish to black crepe	...	2/9 to 3/2½
V. R. Co., Ltd. Klang F. M. S.	1	Thick prersed crepe	...	bought in
O. & H.	3	Fine sheet	...	4/1½
	2	Good scrap	pt. sold ...	2/10¾
Linggi	1	Black crepe	...	bought in
S. R. Co., Ltd.	17	Good sheet	...	bought in
	2	Good crepe	...	4/0½
	9	Dark to black	pt. sold ...	3/1 to 3/6
V. R. Co., Ltd. Klang F. M. S.	20	Sheet	...	4/1½ to 4/1¾
	30	Block	...	bought in
K. M., etc.	24	Sheet	...	4/- to 4/1¾
	13	Good and dark crepe	...	3/1¾ to 3/9
L. C. Y. Y. L.	1	Pressed sheet etc.	...	bought in
K. P. Co., Ltd.	1	Black pressed crepe	...	bought in
	7	Block	..	bought in

EXPORTS TELEGRAMS TO EUROPE AND AMERICA.

Fortnights ending August 15th & 31st.

				Tons. 15th.	31st.
Tin	Str. S'pore. & Penang	to U. Kingdom &/or		3,241	1,446
do.	,, do.	U. S. A.		200	545
do.	,, do.	Continent		245	380

				Tons.	
Gambier	Str.	Singapore	Glasgow	15th.	31st.
do.	,,	do.	London	25	50
do.	,,	do.	Liverpool	100	...
do.	,,	do.	U.K. &/or Continent	25	50
Cube Gambier	,,	do.	United Kingdom	125	20
Black Pepper	,,	do.	do.	...	...
do.	,,	Penang	do.	150	50
White Pepper	,,	Singapore	do.	75	50
do.	,,	Penang	do.	..	...
Pearl Sago	,,	Singapore	do.	90	35
Sago Flour	,,	do.	London	650	470
do.	,,	do.	Liverpool	1,700	...
do.	,,	do.	Glasgow	100	150
Tapioca Flake	,,	do.	United Kingdom	150	40
T. Pearl & Bullet	,,	do.	do.	310	70
Tapioca Flour	,,	Penang	do.	280	260
Gutta Percha	,,	Singapore	do.	35	...
Buffalo Hides	,,	do.	do.	130	...
Pineapples	,,	do.	do.	32,750	2,750
Gambier	,,	do.	U. S. A.	800	450
Cube Gambier	,,	do.	do.	85	40
Black Pepper	,,	do.	do.	675	340
do.	,,	Penang	do.	...	220
White Pepper	,,	Singapore	do.	310	130
do.	,,	Penang	do.	...	5
Tapioca Pearl	,,	Singapore	do.	140	120
Nutmegs	,,	S'pore., Penang	do.	16	32
Sago Flour	,,	Singapore	do.	700	100
Pineapples	,,	do.	do.	13,000	7,250
do.	,,	do.	Continent	5,000	3,250
Gambier	,,	do.	South Continent	...	...
do.	,,	do.	North Continent	75	175
Cube Gambier	,,	do.	Continent	20	40
Black Pepper	,,	do.	South Continent	320	110
do.	,,	do.	North do.	95	95
do.	,,	Penang	South do.	60	30
do.	,,	do.	North do.	10	40
White Pepper	,,	Singapore	South do.	20	40
do.	,,	do.	North do.	95	110
do.	,,	Penang	South do.	5	20
do.	,,	do.	North do.	...	60
Copra	,,	S'pore., Penang	Marseilles	640	400
do.	,,	do.	Odessa	2,050	..
do.	,,	do.	Other S. Continent	600	540
do.	,,	do.	North Continent	2,000	3,200
Sago Flour	,,	Singapore	Continent	750	225
Tapioca Flake	,,	do.	do.	50	130
do. Pearl	,,	do.	do.	10	10
do. Flake	,,	do.	U. S. A.	200	75
do. do.	,,	Penang	U. K.	210	120
do. Pearl & Bullet	,,	do.	do.	375	160
do. Flake	,,	do.	U. S. A.	...	10
do. Pearl	,,	do.	do.	...	440
do. Flake	,,	do.	Continent	...	40
do. Pearl	,,	do.	Continent	280	180
Copra	,,	Singapore	England	150	240
Gambier	,,	do.	U. S. A.	..	...
Cube Gambier	,,	do.	do.	...	...
T. Flake & Pearl	,,	do.	U. S. A.	..	..
Sago Flour	,,	do.	do.	..	...
Gambier	,,	do.	South Continent	...	...
Copra	,,	do.	Marseilles	...	...
Black Pepper	,,	do.	South Continent	...	...
White Pepper	,,	do.	do.	...	...

				Tons.	
White Pepper	Str.	Singapore	U. S. A.	15th.	31st.
Pineapples	,,	do.	do.	...	...
Nutmegs	,,	do.	do.	...	...
Black Pepper	,,	do.	do.	...	...
do.	,,	Penang	do.	...	...
White Pepper	,,	do.	do.	...	...
T. Flake & Pearl	,,	do.	do.	...	...
Nutmegs	,,	do.	do.	...	...
Tons Gambier				300	500
,, Black Pepper				900	775

Wired at 3.40 p.m. on 1st September.

,, 4 p.m. on 17th September.

JOHN HADDON & CO. SPECIAL PRODUCE LETTER.

London, August 6th, 1908.

STRAITS.

BEESWAX

A nice business has been done during the past month arrivals of all descriptions of Yellow Wax realising firm prices. This demand will continue during our summer which is the bleaching Season.

East Indian Wax—selling at £5.15.0 to £6.10.0 per cwt according to quality.

CAPSICUMS

The bulk of offerings consist chiefly of very common qualities but the few small parcels of really fine have found ready buyers at 50/- to 60/- per cwt, while common East Indian are slow of sale even at 20/- per cwt.

CAMPHOR

Market firm but of late the higher range of prices demanded on the other side has somewhat checked business.

China Crude—fair merchantable quality, buyers at 160/- per cwt with Sellers at 162/6 per cwt c.i.f. With a special guarantee 165/- c.i.f. has been paid.

CHILLIES

Market steady, common qualities move off slowly at 20/- to 30/- per cwt but finer grades are in demand at 45/- to 55/- per cwt.

CLOVES

Are an irregular market closing quiet.

On the spot Penang dull to fine bright bold are worth 10d to 1/3d per lb.

COFFEE

We have had to deal with mostly old faded Coffee which has sold in many cases at barely the prices obtainable when it first arrived but colory parcels which are scarce have commanded dearer rates.

Malay Peninsular: we quote, Liberian at 48/- to 54/- per cwt; 01 yellowish Java at 80/- to 105/- per cwt; West Indian 45/- to 75/- per cwt.

COCOA

This is naturally a quiet time when the manufacture of Chocolate is restricted, pressure to sell some few weeks back has been relieved "Bears" realising they had gone too far have had to cover at higher prices. From the bottom values have improved 3/- to 5/- per cwt. We anticipate a decided improvement within the next few weeks when Autumn trade buying will commence, shipments therefore will come to a ready market. There is no doubt but that the recent decline was over done.

COPRA

A good business has been done at advancing rates. We close buyers of Java August/September at £17.7.6 per ton; Straits F. M. S. August/September at £17.5.0; F. M. at £16.10.0; Malabar August/October at £19.5.0 c.i.f.

DRAGONS BLOOD

This market has been rather quiet and in consequence prices have slightly given way.

In the last sales 41 Cases were offered and 3 sold; fine bright reboiled lump, few pieces dull selling at £11.10.0 and ordinary dull bag shape lump at £7 per cwt. Seedy lump at £10 per cwt and fair Seedy pickings at £8 per cwt.

GUM BENJAMIN

In steady request. In recent sales we offered 73 Cases of which 25 sold, fair Sumatra seconds, small almond realising £6.5.0 inferior ditto, part brown at sides £5.17.6. Privately Sumatra seconds, good almondy sold at £8.5.0, fair ditto at £7 ordinary at £6 and fair Pale and Bang at 42/6 per cwt.

GUM KOPAL

Trade has been quiet and only a few lots have sold. In the last Public Sales what was offered was mostly bought in. The supply of 3.070 packages were catalogued of which only about one-third sold.

Manila-Macassar, nubbles, good pale 34/- to 37/6, chips bold pale hard 41/-; Koro, bold chips 16/6d; Pontianac, nubbles, bold 34/-; Angola, red £5.12.0; Benguela, glassy bold 90/-, bold pale 80/- to 81/-, small mixed 36/-, pickings 25/- to 30/-, coated 40/-; Amboyna, scraped, part hard 38/6, yellow pipey 28/6, nubbles, mixed 22/- to 25/-, chips, bold 26/-, small dark 21/- to 24/-, blocky sorts 23/6d to 24/- per cwt.

GUM DAMAR

A steady business is passing. In the last sales the following were sold; Singapore, good pale 74/-, fair grey sorts 48/6 to 49/6, specky grains 37/-. siftings, small 32/-, pickings 38/-. No sales in August. Next auctions 3rd September. We value Singapore ordinary specky fine at 30/- to 73/-. Batavia, good to fine pale at 67/6 to 70/- per cwt.

INDIA RUBBER

With the improved prices in Para values for Plantation Rubbers have sold at improved prices although we close a shade off from the top.

In the last auctions Sheet, Biscuts and Crepe medium qualities were about 2d down and common quite 3d per lb lower, the best parcels however sold at full prices.

Malay and Straits:—(25½ Tons): Sheet, fine pale sold at 4/7½d dark part pressed at 3/7½d to 3/10½d. Crepe, fine pale at 4/4 to 4/6d. fair palish at 3/11¼d to 4/2d, mottled at 3/6d to 3/9 brown at 3/3½d to 3/4½d, dark brown at 2/8¾d to 3/1½d, black part softish at 2/6d to 2/7d. Scrap, fair to good at 2/8¼d to 2/9¼d, mixed part inferior at 2/1½d to 2/4d. Rambong at 2/9d.

Ceylon:—(13 Tons): Biscuits and Sheet, fair to good sold at 4/0¼d to 4/2d. Crepe, fair thick palish at 4/- to 4/1¾d, light brown at 3/8d to 3/11d, brown at 3/2d to 2/4½d, dark brown at 2/9d, black at 2/3d. Scrap, fair to good at 2/10d to 3/-, mixed and dark at 2/4¼d to 2/7d.

ISINGLASS

The usual attendance of buyers and with only moderate offerings of Penang, Saigon etc., prices were steady, Penang character Leaf sold well.

90 packages offered (about 23,700 lb.) and 55 sold; Round Leaf, middling to fair heavy at 3/6d to 3/10d, middling reddish at 3/2d, reddish part thin and rough at 2/6d to 2/10d, small part thin and dark at 2/1d to 2/10d, small part thin and dark at 2/1d to 2/4d, common thin and pickings, at 1/10d. Long Leaf, fair pale at 3/-. Tongue, fair to good heavy yellow and reddish at 3/4 to 3/9d, ordinary to middling at 2/8d to 3/-, thin at 1/10d to 2/1d, mixed dark and pickings at 1/6 to 1/9d. Tails fair to fine bold at 1/1d to 1/10d. Purse, fair at 1/- to 1/1d, middling at 8½d to 10d, per lb.

Saigon:—13 packages offered (about 5200 lb.) and sold: Thin tongue at 1/4d, thin pouches at 10½d, per lb.

China:—2 Bales offered (440 lb.) and bought in Pale circular leaf at 2/10d. per lb.

Japan:—3 Bales Yokohama squares offered (about 700 lb) and bought in.

PEPPER

Black:—Market has been steady; on the spot sales have been made at 3d per lb for fair quality. For arrival a good business has been done particularly of late. August/October a 2/29d to 2⅞d. c.i.f. London or Continent and August/October New York at 2 $\frac{3}{32}$d. c.i.f. delivered weights.

PEPPER (*Continued*)

White Pepper:—On the spot has been worth 5d. for Singapore fair and 4½d per lb. for Penang fair. Business to arrive has been comparatively small we close Sellers Singapore August/October at 4 17/32d. c.i.f. delivered weights at which business has been done.

SAGO

Market quiet and only a small business passing privately. In the last sales the good supply of 698 Bags small was allowed to pass without notice at 12/- to 12/6d per cwt while 79 Bags of fair medium were also taken out at 15/6 per cwt.

TAPIOCA

A good business has been done at advancing prices although we closed rather easier.

In sales freely offered and the demand was practically nil. Of 539 bags Singapore only 46 Bags sold, good at 2¼ fine "Double Goat" was taken out at 2 5/32d; of 764 Bags Penang 107 Bags sold, dull grayish at 1 5/32d; the remainder was bought in at 2d to 2¼d for fair to good.

Privately the market for arrival has been dull and lower; the sales Singapore October/December shipment at 1 9/32d to 1 9/32d and sellers c.i.f.

Tapioca Siftings:—80 Bags rather specky Java were offered and sold, without reserve, at ¾d, being lower.

Pearl Tapioca:—Was dull of sale and the moderate offerings were all bought in comprising 413 Bags Medium, fair to good Singapore at 18/- to 19/-, and fair to good Java at 16/- to 18/6. 91 Bags Seed were also taken out at 15/6 for fair Java.

Privately the market is dull and unchanged and business has been done. Singapore Medium August, October shipment at 13/6d to 13/3d. and value, and Penang equal to fair Singapore at 12/6d. and sellers, fair Penang closing sellers at 12/- all c.i.f. terms.

SHELL

Tortoise:—The offerings of Singapore and Macassar consisted of 400 lbs. of Shell which was mostly withdrawn, sorts on String, small to bold medium substance realising 22/- and small and medium 13/- to 15/- and Chicken at lb. 8/- to 9/- per lb.

M. O. P:—The recent sales of Manila, Penang, Cream realised the following prices.

Macassar:—London sorted, medium and bold, fair substance, few yellow £8.5.0 to £8.7.6, ditto medium substance £7.12.6, thin medium and chicken, fair to good color £7.15. to £7.17.6 heavy shells, part only slight defective, fair to good color £7 to £7.12.6, grubby pickings, part badly coated and inferior 95/- to £5, broken pieces, fair £6.2.6 to £6.7.6 Country sorted,

SHELL (*Continued*) AA chicken and thin medium clean, fair color £7.17.6 to £8.2.6; A medium shells, part stout, fair color £7.17.6 to £8.10.0; B medium, part bold, part slight grubby, fair color £7.17.6 to £8.12.6; C heavy boldshells part grubby and part fine shells £9.15.0; D pickings part fair bold, but part badly coated £6 to £6.15; E ditto badly grubby, part very inferior 85/- to 97/6d. per wct.

Manila, Penang, Ceram &c. Medium and do lb medium substance and part very yellow £6 to £7.15, thin medium and chicken 72/6d to £5.10, heavy shells, part only slight grubby £5 to £6.2.6. grubby pivkings badly coated and inferior 65/- to 75/-, broken, pieces 70/- per cwt.

TIN A good business has been done during the past few weeks prices advancing fully £15 per ton brought about entirely by artificial manipulation. Taking into consideration the position of supply to demand the price should not be above £110 to £120 per ton.

In the early part of July the price dropped within a few pounds of this limit so that with Straits cash £137.10.0 to £137.15.0 and three months at £138.15, to 138.17.6 there is every inducement for Miners to push forward their production and sell, for we should not be at all surprised to see values at a lower parity.

CEYLON, STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

August 21st, 1908.

The following Lots, comprising about 27 Tons Straits and 6 Tons Ceylon, were offered at Auctions to-day and sold as follows:—

STRAITS AND MALAY STATES.

MARK.	PKGS.	DESCRIPTION.		PRICE.
Matang	34	Cases Crepe	...	3/- to 4/3½
S. & D.	12	,, Sheets	8 sold ...	4/1¼
	3	,, Scrap	...	2/8¼
L. E. D.	2	,, Sheets	..	4/1½
McAlister & Co., Singapore.	2	,, Scrap	...	1/-
C. Wood	2	,, Biscuits	...	4/1¼
Ragalla	1	,, Sheets	...	4/2
	18	Pkgs. Crepe	...	2/- to 4/2
B. & D.	13	Cases Sheets	...	3/2 to 3/9¼
	22	,, Biscuits	...	2/2½ to 4/1
	5	,, Scrap	...	1/3 to 2/[illegible]

Mark.	Pkgs.	Description.	Price.
B. C.	6	Cases Crepe	... 3/1½ to 3/10
R. M. P. Ltd.	24	,, ,,	... 4/1½ to 4/6
	18	,, Sheets part sold	... 4/1 to 4/1½
B. & D.	6	,, Crepe	... 1/3 to 4/-
B. & D.	4	Pkgs. Biscuits	... 2/9 to 4/1¾
F. D. P.	4	Cases Scrap part sold	... 2/4
S. K. R. Co., Ltd.	2	,, Crepe	... 3/10¾
B. B.	4	,, ,,	... 3/8¼
S. N.	8	,, ,,	... bought in
B. W.	5	,, ,,	... ,,
B. B. W.	1	,, ,,	... ,,
Oerhentian Finggi Estate	1	,, ,,	... 3/1½
V. V.	3	,, Scrap	... 3/- bid
R. B.	2	,, ,,	... bought in
C. M. R. E. Ltd.	88	,, Crepe	... 3/1 to 4/4
Inch Kenneth	15	,, ,, most sold	... 3/1½ to 4/4½
R. S. S. C.	7	,, Sheets	... 4/1¾
P. S. E.	2	,, ,,	... 4/1¾
Damansara	17	,, ,,	... 4/1¾
	13	,, Crepe part sold	... 2/7
Shelford	5	,, Sheets	... bought in
	3	,, Crepe	... ,,
B R. R. Co., Ltd.	12	,, Sheets	... ,,
	23	,, Crepe part sold	... 3/- to 3/7¼
F. S. R. Co., Ltd.	11	,, Sheets	... 4/1½
	8	,, Crepe part sold	... 2/10½ to 3/7½
R. A. B.	33	,, ,,	... bought in
Golconda	9	,, Sheets	... 4/1½
S. S. B. R. Co., Ltd.	5	,, ,,	... 4/1½
	3	,, Crepe	... 2/9 to 3/2½
O. & H.	3	,, Sheets	... 4/1½
S. R. Co., Ltd.	17	,, ,,	... bought in
	11	,, Crepe	... 3/1 to 4/½
V. R. Co., Ltd., Klang F. M. S.	20	,, Sheets	... 4/1½ to 4/1¾
K. M.	2	,, ,,	... 4/-
	20	,, ,,	... 4/1½ to 4/1¾
P. R. S. R. R.	2	,, ,,	... 4/1¾
K.	13	,, Crepe	... 3/1¾ to 3/9

CEYLON.

Mark.	Pkgs.	Discription.	Price.
P. A. L. L. I.	1	Cases Sheets ..	4/2
	7	,, Biscuits ...	4/2
	1	,, Scrap ...	2/11
Densworth	2	,, Biscuits ...	4/1½
Ambatenne	1	,, ,, ...	4/1¾
	2	,, Scrap ...	2/10 to 3/0¼
Clara	1	,, Biscuits ...	4/3 bid
Taldua	9	,, Crepe part sold ...	3/3½ to 4/0¼
C. R.	14	,, Scrap ...	bought in
Wavena	9	,, Sheets ...	4/- to 4/1½
	4	,, Scrap ...	2/8 to 2/11¼
Kumlukkan	3	,, Crepe ...	3/3 to 3/3½
	5	,, Biscuits ...	4/1½ bid
Udapolla	4	,, ,, ...	4/1½
Elston	2	,, ,, ...	4/1¾
	4	,, Scrap ...	2/8¼ to 2/10½
Tudugalla	7	,, Crepe ...	3/4 to 3/11
Heatherley	4	,, ,, ...	3/3 to 3/7
Nikakotua	8	,, ,, ...	3/1 to 4/-
Ingoya	4	,, Biscuits ...	4/1½
	4	,, Sheets ...	4/1½
Ellakande	2	,, Crepe ...	3/1¼

The price of FINE HARD to-day on the spot if 4/0¾ per lb.

CEYLON, STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

August 7th, 1908.

The following Lots, comprising about 40½ Tons Straits and 9 Tons Ceylon, were offered at Auctions to-day and sold as follows:—

STRAITS AND MALAY STATES.

Mark.	Pkgs.	Description.	Price.
S. K. R. Co.	6	Cases Crepe ...	4/-
	3	,, ,, ..	4/-
	2	,, ,, ...	bought in
	3	,, Scrap Crepe ...	3/-
B. & D.	12	,, Sheets ...	4/1
	4	,, Scrap ...	2/4
	3	,, Sheets ...	3/6
	4	,, ,, ...	3/10
B. B.	4	,, Crepe ...	bought in
	8	,, ,, ...	,,
	5	,, ,, ...	,,
R. M. B.	3	,, Rambong Crepe ...	,,
Perhentian	17	,, Sheets ...	4/1
Tinggi Estate	4	,, Crepe 2 sold ..	2/11
S. & D.	9	,, Sheets ...	4/1
	8	,, ,, ...	4/1
L. E. D.	7	,, ,, ...	4/1

Mark.	Pkgs.	Description.	Price.
Seanawang	3	Cases Sheets ...	4/1¼
S. K. R.	2	,, Crepe ...	4/0½
	3	,, ,, ...	4/-
	2	,, ,, ...	3/8¼
R. B.	2	,, Scrap ...	bought in
P. S. E.	11	,, Sheets ...	4/1 at 4/1¼
K.	8	,, ,, ...	4/1¼
S.	7	,, ,, ...	4/1
V. R. Co., Ltd.	6	,, Crepe ...	3/7¾
Kalang	12	,, ,, ...	3/8¾
F. M. S.	34	,, ,, ...	3/4¾ at 3/5
	12	,, ,, ...	3/1
	11	,, ,, ...	3/1
Highland Estate	73	,, Sheets ..	4/1
	19	,, Crepe ...	bought in
	16	,, ,, ...	,,
C. M. R. E.	10	,, ,, ...	,,
	5	,, ,, ...	,,
	3	,, ,, ...	,,
	6	,, ,, ...	,,
Damansara	6	,, Sheets ...	,,
	9	,, Crepe ...	,,
Shelford	6	,, Sheets ...	,,
Yamseng	9	,, ,, ...	,,
Linsum	15	,, Crepe ...	,,
Terentang	6	,, ,, ...	,,
	16	,, ,, ...	,,
Linggi Plants	1	,, ,, ...	,,
	75	,, ,, ...	,,
	13	,, ,, ...	,,
	12	,, ,, ...	,,
B. R. R. Co.	18	,, Sheets ...	4/1
	8	,, Crepe ...	bought in
	13	,, ,, ...	,,
S. S. B. R. Co.	11	,, Sheets ...	4/1
Golconda	9	,, ,, ...	bought in
	5	,, Crepe ...	,,

CEYLON.

Mark.	Pkgs.	Description.	Price.
Tallagalla	5	Cases Biscuits ...	4/1
Ballacadua	1	,, Crepe ...	4/4½
Nikakotua	2	,, ,, ...	3/10
Doranakande	2	,, Biscuits ...	4/1
	2	,, Scrap ...	2/8½
Warriapolla	5	,, Biscuits ...	4/6
Sorana	4	,, ,, ...	4/1
Culloden	4	,, Crepe ...	3/4¼
Arapolakande	8	,, Biscuits ...	4/1
	6	,, Crepe ...	4/3
Culloden	7	,, ,, ...	3/5
	5	,, ,, ...	2/11¾
Hattangalla	3	,, Biscuits ...	4/1
Hanipha	3	,, ,, ...	bought in

Mark.	Pkgs.	Description.	Price.
Kumaradola	4	Cases Biscuits ...	4/1
Tudugalla	2	,, Crepe ...	bought in
	3	,, ,, ...	,,
Sorana	14	,, Biscuits ...	4/1

The price of FINE HARD to-day on the spot is 3/11½ per lb.
(*Lewis and Peat, London.*)

Penang.

Abstract of Meteorological Readings in Criminal Prison Observatory for the month of August, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Mean Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Mean Maximum.	Mean Minimum.	Mean Range.	Mean Wet Bulb.	Mean Vapour Tension.	Mean Dew Point.	Mean Humidity.			
Government Hill	...	...	...	...	...	...	...	...	...	...	...	15.75	...
Fort Cornwallis	...	...	...	...	...	...	...	...	...	...	...	14.55	...
The Prison	29.877	141.2	79.1	90.1	75.3	14.8	77.8	.918	77.0	8.7	N. E.	14.66	3.57
Balik Pulau	...	...	...	...	...	...	...	...	...	...	...	20.51	...
Pulau Jeragah	...	...	...	...	...	...	...	...	...	...	...	10.14	...
Pangkore	...	...	...	...	...	...	...	...	...	...	...	9.03	...
Buass	...	...	...	...	...	...	...	...	...	...	...	2.15	...
Lumut	...	...	...	...	...	...	...	...	...	...	...	5.90	...

CRIMINAL PRISON PENANG,
7th September, 1908.

S. LUCY,
Senior Medical Officer, Penang.

Perak.

Abstract of Meteorological Readings in Perak for the Month of August, 1908.

DISTRICT	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Taiping	...	152	82·43	94	70	24	77·05	858	...	78	...	8·05	4·30
Kuala Kangsar	...	...	80·71	94	69	25	75·91	835	...	79	...	6·38	1·51
Batu Gajah	...	155	80·87	92	72	20	76·48	856	...	81	...	3·43	1·09
Gopeng	...	...	81·18	93	65	23	75·14	795	...	74	...	5·47	1·55
Ipoh	...	...	81·29	92	70	28	75·63	811	...	75	...	4·28	·95
Kampar	...	...	81·40	95	69	26	75·98	825	...	76	...	9·45	2·12
Teluk Anson	...	...	81·92	93	69	24	76·74	850	...	78	...	5·06	1·42
Tapah	...	...	81·92	93	68	25	76·66	849	...	77	...	9·38	2·80
Parit Buntar	...	...	82·74	92	72	20	77·26	864	...	77	...	8·55	5·21
Bagan Serai	...	...	82·72	92	71	21	77·34	867	...	78	...	5·95	3·59
Selama	...	...	82·04	92	72	20	76·79	852	...	78	...	7·42	2·63

STATE SURGEON'S OFFICE,

Taipeng, September 12th, 1908.

M. J. WRIGHT,

State Surgeon Perak.

Selangor.

Abstract of Meteorological Readings in the various Districts of the State for the month of August, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
General Hospital, K. Lumpór	29.884	147.8	80.2	89.7	71.4	18.3	75.9	0.817	73.2	79	S. W.	2.98	0.88
Pudoh Gaol ,, ,,	...	...	...	...	...	...	...	...	...	...	...	2.82	1.07
District Hospital ,,	...	...	...	...	...	...	...	...	...	...	...	3.09	1.80
,, Klang	...	...	...	...	...	...	...	...	...	...	...	2.71	1.05
,, Kuala Langat	...	...	...	88.5	73.8	14.7	...	...	...	...	...	4.04	1.55
,, Kajang	...	...	...	88.9	75.7	13.2	...	...	...	...	...	2.53	1.05
,, Kuala Selangor	...	...	...	85.2	74.7	10.5	...	..	...	...	...	2.38	0.77
,, Kuala Kubu	...	...	...	92.7	70.6	22.1	...	...	...	...	...	11.21	3.53
,, Serendah	...	...	...	92.8	71.2	21.6	...	...	...	...	...	3.41	1.32
,, Rawang	...	...	...	91.8	71.1	20.7	...	...	...	...	...	5.77	1.44
Beri-beri Hospital, Jeram	...	...	...	...	...	...	...	...	...	...	...	6.00	2.90
Sabak Bernam	...	...	...	...	...	...	...	...	...	...	...	1.69	1.20

STATE SURGEON'S OFFICE,
Kuala Lumpor, 17th September, 1908.

E. A. O. TRAVERS,
State Surgeon, Selangor.

Seremban.

Abstract of Meteorological Readings in Negri Sembilan Hospitals for the month of August, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Seremban	...	143	81·3	87·2	68·9	18·3	...	973	...	903	S. W.	3.06	1.10
Kuala Pilah	...	...	...	...	...	...	...	...	...	...	...	2.68	94
Tampin	...	...	...	...	...	...	...	...	...	...	...	8.97	2.23
Port Dickson Beri-Beri Hospital	...	...	...	...	...	...	...	...	...	...	...	9.98	3.10
Mantin	...	...	...	...	...	...	...	...	...	...	...	3.01	93
Port Dickson	...	...	...	...	...	...	...	...	...	...	...	3.64	1.91
Ayer Kuning	...	...	...	...	...	...	...	...	...	...	...	3.73	95
Jelebu	...	...	...	...	...	...	...	...	...	...	...	2.46	94
Total ...	...	...	...	...	...	...	...	...	...	...	...	37.53	3.10

STATE SURGEON'S OFFICE,

Seremban, 10th September, 1908.

J. D. MELCHIZEDEK,

For State Surgeon, Seremban.

Seremban.

Table Showing the Daily Results of Meteorological Observation taken at the General Hospital, Seremban for August, 1908.

Date.	Temperature of Radiation.						Tempt Radiation.		Wind. Direction.		Tempt of Evaporation.			Computed Vapour Tension.			Relative Humidity.			Clouds 0 to 10			Weather Initials.			Rain.	
	9 H.	15 H.	Mean.	Maximum.	Minimum.	Range.	Sun.	Difference Sun & Shade.	9 H.	15 H.	9 H.	15 H.	Mean.	9 H.	15 H.	Mean.	9 H.	15 H.	Mean.	9 H.	15 H.	21 H.	9 H.	15 H.	21 H.	Inch	Dcr.
1	78	84	81	86	68	18	143	57	W	N W	76.3	80.7	78.5	906	1.045	975	94	90	92	3	2	2	S	S	S		
2	77	87	82	88	69	19	144	56	W	W	75.3	85.4	80.3	877	1.219	1.048	94	95	94.5	2	4	3	S	C	S		
3	79	86	82.5	89	68	21	143	54	W	S W	77.3	86.3	81.9	937	1.180	1.058	95	95	95	1	4	5	S	C	S		
4	76	89	82.5	89	69	20	144	55	N W	S W	74.3	82.5	78.4	848	1.112	980	94	81	87.5	2	3	2	S	S	S		
5	76	88	82	89	68	21	143	54	N W	S W	74.3	83.1	78.7	848	1.134	991	94	85	89.5	2	0	2	S	S	S		
6	77	87	83	88	69	19	143	55	W	S W	75.3	87.4	81.3	877	1.299	1.088	94	95	94.5	1	3	4	S	S	S		
7	78	88	83	89	68	21	144	55	W	S W	74.6	84.7	79.6	857	1.195	1.026	89	90	89.5	0	2	3	S	S	S		
8	77	86	81.5	87	69	18	143	56	S W	N W	73.6	82.7	78.1	829	1.121	975	89	90	89.5	1	2	6	S	S	C		.18
9	76	80	78	87	68	19	140	53	W	S W	74.3	76.6	75.4	848	916	882	94	90	92	2	4	4	S	C	S		
10	78	83	80.5	86	69	17	143	57	S W	S W	74.6	81.3	77.9	857	1.067	962	89	95	92	0	1	2	S	C	S		
11	77	86	81.5	88	68	20	144	56	N W	S W	71.9	80.1	76	783	1.064	923	84	85	84.5	2	4	5	S	C	S		
12	77	86	81.5	87	68	19	143	56	N W	S W	73.6	82.7	78.1	829	1.121	975	89	90	89.5	3	5	3	S	C	S		
13	80	84	82	85	69	16	144	59	N W	S W	77.7	82.3	80	947	1.103	1.025	90	95	92.5	2	3	4	S	S	C		
14	79	85	82	86	69	17	143	57	W	S W	73.9	83.4	78.6	839	1.141	990	85	95	90	2	3	5	C	S	C		.06
15	78	81	79.5	84	68	16	139	55	N W	S W	72.9	76	74.4	810	897	853	84	85	84.5	4	5	4	C	C	C		
16	79	83	81	86	68	18	140	54	N W	S W	73.9	81.3	77.6	839	1.067	953	85	95	90	6	1	4	C	S	C		.32
17	78	85	81.5	86	69	17	140	54	W	S W	76.3	83.4	79.8	906	1.141	1.023	94	95	94.5	3	2	5	C	S	C		
18	77	85	81	84	68	16	139	55	N W	S W	73.6	83.4	78.5	829	1.141	985	89	95	92	4	2	3	C	S	C		.15
19	73	85	79	86	69	17	140	54	N W	S W	71.3	81.7	76.5	766	1.082	924	94	90	92	4	2	6	C	S	C		
20	77	86	81.5	88	70	18	147	59	W	S W	73.6	80.1	76.8	829	1.064	946	89	95	92	2	4	5	C	C	C		
21	76	87	81.5	88	71	17	145	57	N W	S W	72.6	83.7	78.1	801	1.158	979	89	90	89.5	4	5	2	C	C	S		
22	78	88	83	89	70	19	144	55	N W	S W	72.9	81.5	77.2	810	1.075	942	84	81	82.5	2	3	2	S	C	S		
23	77	87	82	88	69	19	143	55	W	N W	73.6	85.4	79.5	829	1.219	1.024	89	95	92	2	4	3	S	C	S		
24	78	87	82.5	89	70	19	145	56	N W	S W	74.6	83.7	79.1	857	1.158	1.007	89	90	89.5	3	5	4	S	C	C		
25	79	86	82.5	88	69	19	144	56	W	W	75.6	82.3	78.9	888	1.180	1.034	90	95	92.5	4	6	7	C	C	N		.08
26	77	87	82	89	70	19	146	57	N W	S W	73.6	85.4	79.5	829	1.219	1.024	89	95	92	3	5	7	S	C	N		42
27	78	84	81	86	69	17	145	59	W	S W	74.6	75.7	75.1	851	888	872	89	76	82.5	4	6	3	C	C	S		
28	76	85	80.5	88	70	18	144	56	N W	S W	74.3	81.7	78	848	1.082	965	94	90	92	2	4	2	S	C	S		
29	77	84	80.5	87	69	18	145	58	W	S W	71.9	80.7	76.3	783	1.045	914	84	90	87	4	5	6	C	C	C		.62
30	76	85	80.5	88	70	18	146	58	W	S W	72.6	81.7	77.1	801	1.082	941	89	90	89.5	2	3	5	S	S	C		.13
31	78	85	81.5	89	69	18	139	50	N W	W	74.6	80	77.3	857	1.026	941	89	85	82	2	6	8	S	C	N	1	.10
Total..	77.3	85.4	81.35	87.2	68.9	18.3	143	55.7			74.2	82.1	78.1	845	1.101	973	89.8	90.9	90.3							3	06

Seremban, 10-9-08.

D. Melchizedek,
Apothecary.

Kelantan.

Abstract of Meteorological Readings in Kelantan for the month of August, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
				Mean F°	Mean F°	Mean F°						Inches	Inches
Kuala Lebir	...	...	...	90.01	72.79	17.2	...	...	...	...	...	7.53	2.33
Kuala Pergam	...	...	...	...	...	...	...	...	...	...	...	5.22	1.91
Kuala Kelantan	...	...	...	84.22	73.39	10.84	...	...	...	...	...	9.89	2.61
Taku Plantation	...	...	...	...	...	...	...	...	...	...	...	7.90	1.60

STATE SURGEON'S OFFICE,
Kelantan, 14th September, 1908.

JOHN D. GIMLETTE,
State Surgeon, Kelantan.

Pahang.

Abstract of Meteorological Readings in the various Districts of the State for the month of July, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Kuala Lipis ...	...	...	76·8	91 0	67·0	20·2	74·7	...	...	...	...	17·09	1·12
Raub ...	...	...	78·2	90·0	66 0	20·1	74·0	...	...	...	...	5·91	2·38
Bukit Fraser ...	...	...	...	...	...	...	...	...	...	...	...	4·49	1·57
Bentong ...	...	...	78·4	93 0	66·0	19·5	74·6	...	...	...	...	6·89	1·48
Temerloh ...	...	...	...	94·0	70·0	18·1	...	...	...	...	...	5·01	2·40
Pekan ...	...	...	82·0	91·0	70·0	17·0	77·0	...	...	...	...	4·20	1·03
Kuantan ...	...	...	86·0	91 5	67·5	17·0	76·8	...	...	...	...	7·64	2·40
Sungei Lembing ...	...	...	...	87·5	66·0	...	...	...	...	...	..	6·34	2·05

STATE SURGEON'S OFFICE,

Raub, 25th August, 1908.

W. H. FRY,

State Surgeon, Pahang.

P-ga'gan, that which is held or controlled, charge, task, vocation, office.

P-ga'wai, officer, official.

Phala, see *pahala*.

Pi-a'la (Pers.), drinking cup. Cf. *chawan*.

Piara, see *pihara*.

Pi-a'tu, orphan; also *anak piatu*. Cf. *yatim*.

Pi'chek, narrow, confined, limited. Cf. *simpit*.

Pi'chit, *m-mi'chit*, to pinch, nip.

Pi'hak, side, quarter, flank, party.

Pihutang, see *hutang*.

Pi'jak, *m-mi'jak*, to tread on, stamp on. Cf. *injak* and *irek*.

Pi'jat, a bed-bug; also *kutu busok*.

Pi'kat, a horse-fly.

Pi'kat, *m-mi'kat*, to catch birds with birdlime.

P-mi'kat, a decoy bird; a bird catcher.

Pikir, see *fikir*.

Pi'kul, *m-mi'kul*, to carry on the shoulders or back; a measure of weight, being about what a man can carry on the shoulders = 133 lbs.

Pi'leh, *m-mi'leh*, to choose, select, elect.

Pi'le-han, chosen, elect.

Pi'lu, moved, affected, troubled, agitated. Cf. *rawan*.

Pim'pin, *m-mim'pin*, to hold or lead by the hand, guide, lead.

Pinang, *m-mi'nang*, the betel-nut palm; to ask in marriage, make an offer of marriage.

Pu'lau Pi'nang, Penang.

Pin'dah, *ber-pin'dah*, to move from one place to another, migrate, move house. Cf. *aleh*.

Pin'dah-kan, to remove a thing, transport, transplant.

Ping'gan, a large plate, a dish. Cf. *piring*.

Ping'gang, the waist.

Bu'ah ping'gang, the kidneys.

I'kat ping'gang, belt, girdle.

Ping'gir (Jav.), edge, border, shore. Cf. *tpi*.

Pin'jam, *m-min'jam* (149), to borrow.

B-ri' pin'jam, to lend.

Min'ta pin'jam, to borrow.

Pin'jam-kan, to lend (a thing).

Pin'ta, *m-min'ta*, to request, ask; see *minta*.

Pin'tal, *m-min'tal*, to spin thread. Cf. *rahat*.

Pin'tas, *m-min'tas*, to make a short cut, cut across. Cf. *rntas*.

Pin'tu, door, gate.

Pin'tu ger'bang, the gate of a fort or city.

Pin'tu pa'gar, a gate in a fence.

Bn'dol pin'tu, threshold.

Chu'kai pin'tu, house assessment.

J-nang' pin'tu, door posts.

P-nung'gu pin'tu, door-keeper.

Pi'pa (Port.), a barrel.

Pi'peh, flat, smooth.

Pi'pi, the cheeks.

Pi'pis, *m-mi'pis*, to bray or grind on a stone, as spices. Cf. *giling*.

Pi'pit, a generic name for birds of the sparrow tribe.

Even an indirect or implied command requires *jangan* as a negative, for instance,

suroh dia jangan naik, tell him not to go up.
baik kita pergi atau jangan? shall we go or not?

In dependent clauses in which a purpose is expressed, that is to say after such conjunctions as "in order that," "so that," "lest," the negative must be expressed by *jangan*, as,

spaya kaki-nya jangan kotor.
so that his feet should not get dirty.

VOCABULARY.

Nouns.	
anjing, dog.	*obat*, medicine.
dhobi, washerman.	*pagar*, fence.
ikan, fish.	*pohon*, plant, tree.
itek, duck.	
kipas, fan.	Verbs.
baju, shirt.	*bayar*, pay.
kolam, pond	*koyak*, tear.
kuching, cat.	*makan*, eat.
nama, name.	*minum*, drink.
	sewa, let for hire.

EXERCISE XII.

[1] Did the washerman tear this shirt? No sir, it was torn before. [2] Have you paid him? No. [3] Does that man know how to sew? No, he does not. [4] Are you going to eat? Oh no. [5] Do you want to buy anything? No. [6] Do you know the name of this plant? No, I don't. [7] Do you want to sell this cat? Certainly not. [8] Is this your dog? No. [9] He shut the gate of the fence so that the people should not come in. [10] Are there no fish in the pond? [11] Is not this your fan? [12] Have you eaten or not? [13] Is your house let? No. [14] Tell the cook not to buy a duck to-day.

LESSON XIII.

The verbs "Sudah" and "Habis."

74 The use of *sudah* as an auxiliary verb has already been explained in paragraphs 45, 46, and 48, and its use in expressing past intervals of time in paragraph 41. As a verb proper, its meaning in the imperative is "finish," "that is enough."

75. *Sudah* may also be used in the indicative mood in the

For companion book see other side of this page.

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A ROOT DISEASE OF PARA (HEVEA BRAZILIENSIS) RUBBER TREES.

By W. J. Gallagher, M.A. Government Mycologist, F. M. S.

A fungus, which attacks the roots of Para Rubber trees with fatal results, appears from the number of communications received by the Department of Agriculture to be fairly common at present over this Peninsula. It is doubtful if there is an estate free from it, as its presence, even when it has killed trees, often remains unsuspected.

The disease is seldom distributed over an entire estate, but is confined to limited areas in which at first a tree here and there is attacked. Half a dozen or more vacancies may often be seen together when, owing to a misconception of the cause of death or for other reasons, no preventive measures were taken on the death of the first tree. The trees succumbed one after another as the disease spread. The "supplies" were failures too; planted in a soil full of threads of the fungus they were soon attacked by it and either never "struck" or died shortly after doing so. On these infected areas the mortality is often as high as thirty trees per acre, but for a whole estate the yearly average is probably not a tree per acre. I have seen only one particularly bad instance; in 400 acres of trees two and a half years old, about five per cent had died, and two dead trees were never adjacent. The incidence is heaviest on peaty soils, and where there has been a bad burn.

The disease occurs among trees of from fifteen to thirty months old. I have not noticed it on trees older than two and a half years. Nursery plants of a few months old may be attacked, and will quickly succumb if a source of infection is at hand.

Symptoms.

The disease is not discovered, as a rule, until the tree is dead. The first symptoms are somewhat as follows:—The leaves of a healthy-looking tree suddenly become brown, first round the edge and especially at the tips, and the entire leaf soon loses its natural colour: this is

a sign that something has interfered with the water supply to the parts above ground; it is due to the "ringing" of the tap root by the fungus. Little or no latex will flow out in response to a wound in the stem. Occasionally the leaves fall off, but generally before this happens the tree is blown down. Sometimes a healthy looking tree falls over, the leaves remain green, and the plant apparently continues to grow. If the roots are examined all will be found to be dead except one or two lateral roots which still supply the necessary nourishment; and it is only a question of days or at most weeks until these are killed.

Owing to the destruction of some of the lateral roots by the parasite a tree frequently loses its firm hold in the soil and is shaken about by the wind causing a cup-shaped depression round the collar. This may go on for many days before the tree shows any other signs of the disease but it is a pretty sure indication of the presence of root disease, and the "shuck" tree, as planters term it, should be treated as infected and incurable.

The following extracts taken at random from letters sent into the Department from different districts give an idea of the uniformity of the symptoms as observed by planters.

A....."The first signs are the leaves turning a metallic colour, drooping, and then falling off. It does not show until the trees are practically dead.....the high lands seem as subject to it as the valleys or flats.....estate virgin jungle."

B....."The diseased plants are scattered over the estate, but in one instance four or five were together. The leaves generally become a rusty colour from the bottom upwards..... .....there is no inclination to topple over except where white ants have eaten the roots.....ground well drained, ...plants from one and a half to two years old..... .....estate virgin jungle."

C....."In sporadic instances over the planted area well-nurtured trees (mostly eighteen months old) have suddenly died back.....ten cases on 300 acres in the last six months; this in itself is not serious, but one has to look to the future, especially as fungus seems to be the cause."

D....."On this estate there is somewhat heavy mortality among trees of 20-30 months old.....the disease is especially rapid as noted above ground..... trees appear "shuck;" leaves crumple and in the course of a day or two fall off.....sickness attacks not in isolated cases but in clumps of adjacent trees. The tap root seems to be first attacked. The neighbouring estate in same lie of country seems to be free of the disease."

E....."About a dozen have died out on 26 acres .....each root has a white thready growth on it .....virgin jungle.....other trees healthy looking.....those that have died have been in different parts of the land."

F....."I send some of the dead trees. They were sixteen months old and grew on flat well drained land..... .....the trees were together, but neighbouring plants look quite healthy."

When a tree, which has been killed by this root disease, is pulled up, the cause of death is at once apparent. In many places there is a cobweb-like felt of whitish fungus, but in parts the fungus threads (*mycelia*) are closely aggregated in straw-coloured strands, like stout cord, stretching somewhat irregularly over the surface of the root.

If incisions are made in the tap root and stem, a discoloration of the wood will be observed in the former, but not in the latter except occasionally for a little way above the collar.

Method of Attack.

Some planters maintain that the tap root is first attacked. Considering the method of planting and for various reasons this seems unlikely; as far as I have seen the lateral roots, and only those near the surface, are the first to suffer. The deeper lateral roots, or at least their extreme ends, are mostly free from fungal threads even when the tap root is already covered with them. Often the tap and lateral roots over one side only have been choked by the mycelia, the lateral roots on the other side being free. In such cases the side on which the diseased roots lie is always next a jungle stump. On different occasions I have traced the mycelia along lateral roots to decaying jungle stumps. It may be taken as pretty certain that these stumps and logs are the original source of trouble. It is mostly impossible to identify them, but on more than one occasion I have found Meranti (*Shorea* sp.) and Merbau (*Afzelia palembanica*) offenders. The lateral roots of the para tree spread so fast that in a year or little more all jungle stumps are in contact with them. But a root may be attacked before reaching an infected stump as the fungal threads can travel for some distance through the soil.

The only occasions on which I found nursery plants attacked was when the nursery had been badly cleared and old stumps had been left in it. I may mention that in many of these nurseries the respective managers had not suspected the presence on their young plants of anything inimical. They were all quite healthy in appearance, but would have succumbed when planted out, and each diseased plant would have served as a centre of contamination from which healthy plants would have been infected.

Identification of Fungus.

Fructifications (fruits), such as the usual "bracket mushrooms" found in abundance on the dead logs and stumps of a clearing, have not been noticed in association with this disease, nor has it produced spores (seeds) notwithstanding numerous infection experiments and long continued cultures in various nutrient media in the laboratory, consequently it is impossible to give it a scientific name, an omission which from the planter's point of view is not of much moment. It is

possible that a "bracket" fructification is formed, and it may be discovered when the life history of the parasite is more fully investigated. The planter will then know the cause of the ill health or death of a tree when he notices the "brackets" on adjoining dead wood. On the other hand the fruits may be so small as to be invisible to the naked eye; and they may be found on the living plant only or on dead wood only.

This parasite appears to belong to the dangerous class of facultative parasites; that is it can live on dead wood (saprophyte), and if need be on on living wood (parasite).

Fomes semitostus, a "bracket" fungus, has been reported as a source of root disease here and in Ceylon. I have found it on only two occasions, and have not been able to connect it with the disease under discussion.

Remedial Measures.

Though cure is almost impossible prevention of further infection is fairly easy. Owing to the absence of seeds (spores) infection must take place underground, and only when a para root is in contact with a jungle stump or log supporting the parasite. The under-ground strands of threads of many fungi, such as *Agaricus melleus*, a dangerous parasite on oak trees in forests of the temperate zone, travel for considerable distances through the soil, but seldom at as great a depth as two feet. The present fungus appears to have such a capacity in only a limited degree. I have never found strands more than a foot from a piece of root or decaying log; but the soil of a rubber clearing, especially when it is peaty, is full of roots and all kinds and sizes of decaying wood. The spread of the disease is likely to be much slower than with those which attack leaves or other above-ground parts, where wind, animals, and human agencies assist the dissemination of spores. On the other hand living in the soil secures it from the destructive influences of sunshine and, in our climate, of drought.

In many cases where close planting has been followed, managers pay no attention to trees dying here and there over the estate, looking on it rather as a premature removal of what may have to be cut out later on. Such indifference is not wise, and may have costly results. Except when stagnant water is the source of trouble, the death of a young tree is, according to my experience, generally due to root disease, which can be easily identified by the planter who is on the look out for it. If preventive measures are not taken the disease spreads and adjacent trees begin to die off. It is impossible to be too insistent upon the importance of treating every diseased tree as a possible centre from which many more trees may be infected.

As already mentioned the planter's efforts must be directed to prevention. The diseased area must be isolated, and precautions taken against the possibility of the disease spreading.

Attempts to cure are hardly practical, if indeed cure is even possible. An application of lime to a tree but slightly attacked may sometimes be successful. Lime is alkaline and an alkaline medium of this

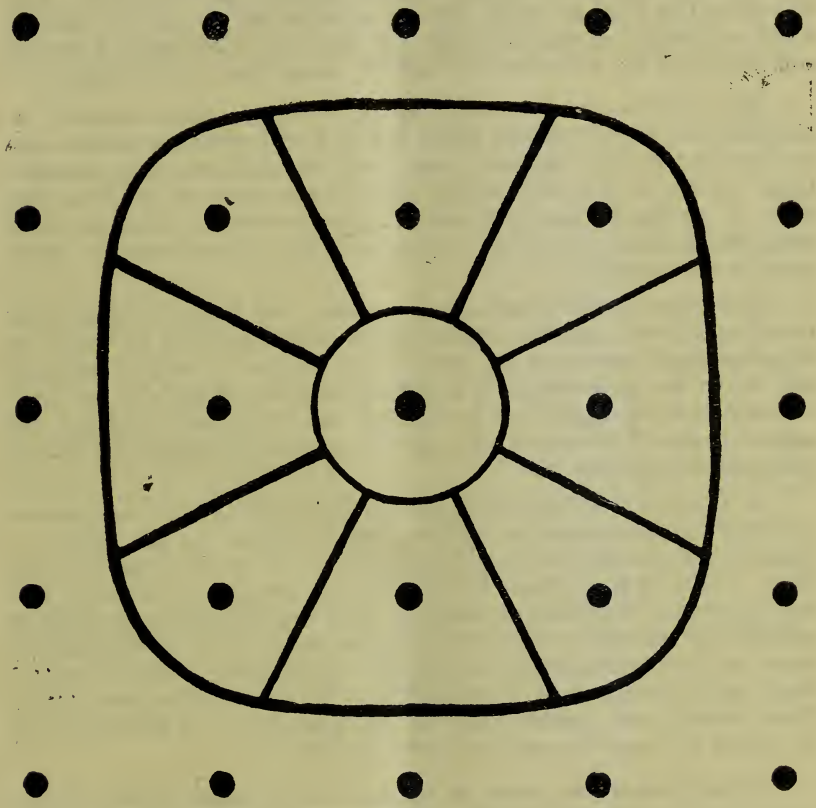
kind is not encouraging to the growth of fungi. It is advisable and beneficial to fork in unslaked lime round the trees adjacent to one already killed by the fungus.

The planter must aim at

1. Starving the fungus by isolation and removing all wood on which it may live.

2. Killing it by exposure to the sun and by applying lime.

The diagram on this page indicates the methods to be followed, and which have been carried out with success by several planters. The



black lines represent trenches : the dots trees ; the one within the inner circle representing the tree on which the disease has been discovered, the others are to all appearances healthy. If several adjacent trees are dead or known to be diseased then the inner trench must be made to enclose them.

The trenches shoud be a foot and a half deep and nine inches to a foot wide. The earth taken out should be thrown to the inside of the trenches. The area enclosed by the inner trench should be turned

over to a depth of two feet on three or four occasions at intervals of a fortnight, and roots, branches and wood of all kinds collected and burned along with the dead tree.

There are usually large logs which cannot be burned without endangering neighbouring sound trees. Such logs should at least be scorched and then piled up on their ends. The entire tap root of the dead tree must be taken out. There is no occasion at this stage to leave a large hole where the tree grew. It is advisable, though, to dig out the earth for a radius of a foot and to a depth of two feet deep round where the dead root was, and to burn all roots and pieces of wood turned up so that the bed for a new supply may be clean. The hole should be filled up again, care being taken not to fill in bits of wood so plentiful on every clearing. If the hole is left open, a certain area on which the excavated soil lies will escape being turned over.

The circular trench should be cut carefully and as narrow as possible otherwise the earth taken out of it will cover the inside area so heavily that the "turning over" will not go down deep enough. Lime should be liberally applied and covered over at the first digging; it should be also scattered in the trenches, which must be kept cleared out to the proper depth; all logs or roots crossing them must be cut through.

The object of the trenches is to prevent the fungal threads from spreading as they are not, as far as my observations go, to be found at a greater depth, except on tap roots, than one and a half or at most two feet. The inner trench is to prevent infection of the ring of trees adjacent to the diseased one, but as they may be already infected the outer trench is dug; only a few may be infected, consequently radial trenches are made as well.

In practice it will be found impossible, owing to the intervention of huge logs and stumps, to dig trenches as regular as the figure indicates; the planter must use his discretion as to where he will cut them; knowing their object he will have no difficulty in selecting the best positions. The stumps near the dead tree should be removed if possible; at least the soil should be cleared away round their roots as deep as the trenches, and an attempt made to burn them: even if they are not consumed completely the fungus will be burned off. Their lateral roots should be cut off and destroyed. It would be well to isolate all jungle stumps within the trenches.

These precautions must be carried out to their fullest if the disease is to be eliminated. Many planters are dissatisfied unless they are given a simple remedy which can be applied in a few minutes to a diseased tree. The preventive measures here suggested require some labour, especially since dead trees generally occur singly and widely apart. For this reason and perhaps because they are not in the routine of work they are postponed, not carried out in their entirety, or totally neglected. Experience shows there is no saving in abridging the preventive methods recommended, but in the end a distinct loss. More trees die down and longer trenches must ultimately be dug at greater labour cost than if the full directions had been followed when the first

dead tree was noticed. When unavoidably the lines of the scheme cannot be fully followed, the inner trench at least should be made and the work recommended to be done within it carried out. This curtailment must not be taken as recommended except in special circumstances, and only as an irreducible minimum.

Owing to the amount of dead wood in and on the surface soil of an ordinary estate and to the length to which the lateral roots of para trees so quickly spread, there is little use in merely turning the fungus covered roots of the dead tree up to the sun and digging a hole about two feet square and two feet deep for a new "supply." Notwithstanding advice to the contrary this is too often done. The old roots and dead wood around are most likely supporting the fungus, and as soon as these are reached by the young roots of the "supply" infection occurs, and in a couple of months there is need to put in another "supply."

The presence of root disease on a tree may be detected two months or more before it drops its leaves or is blown down: if it is shaken it will be found to be markedly loose in the ground. Once a case of this disease has been noticed in a field a good coolie might test the trees say once every week or fortnight marking those he noticed loose for a closer examination by the manager. If the soil is carefully cleared away a little round a suspected tree the fungal threads will be noticed on one or more roots if root disease is present. When the tap root is not attacked it may be possible to kill the parasite by cutting off and burning the diseased lateral roots and forking in plenty of lime round the tree. It is safer and surer to take out the tree and proceed in the way recommended above, as the source of the trouble is probably still existent on some neighbouring stump. I think that the idea of examination by a coolie might be extended further and a periodical examination, say once a month, made of all trees from one to three years old.

With regard to the putting in of the "supplies," this is dependent somewhat on the season, but at least eight or ten weeks should elapse before replanting. The trenches should be left open about three months; if any of the suspected ring has been infected, it will probably show itself before that time, but it would be wise to make an examination by clearing away the soil from the root to a depth of a foot or so when the fungal threads will be seen if the tree is infected. The upper six to ten inches of the tap root are first attacked.

On account of the large continuous areas under rubber and our uniformly moist climate an apparently insignificant disease may easily become epidemic if not grappled with in time. Planters should therefore immediately report unhealthiness among their plants. Diseased specimens should be sent and full information given. Unfortunately letters usually tell little more than that the plant died. It is better to err on the side of saying too much; nothing should be omitted because

it seems trifling to the writer, it may instead be of considerable aid in diagnosing the disease or suggesting remedies. To help planters in describing diseased plants an "Information Form" has been drawn up and will be sent free to any planter. The Form is not meant to be exhaustive but rather to aid the planter in recording his observations; and mention of special circumstances or points of interest in connection with a disease should not be omitted because they do not come within the answers, but included as useful additional information. It is advisable for a planter to describe the most convenient way of reaching his estate from the nearest railway station in case an official may have to make investigations on the spot.

Usually too little material is sent, and that in a bad condition. Specimens should not be sent in small envelopes as is too often done; in this way they arrive too dry or shrivelled up, and the quality is usually too small. Moist specimens should be carefully packed in a ventilated box; so should pieces of stem, branch or root. Leaves should be put out flat between sheets of newspaper cut to a convenient size and protected by cardboard on the out sides. Leaves should not be sent alone, but with twigs.

It is undesirable to send specimens in bags, as is frequently done. A stem or root should be fixed in a box by screwing a nail through one end of the box and into the wood of the plant. Specimens such as leaves and pieces cut out of root or stems, besides being forwarded in a dry state, should also be sent in alcohol—one part ordinary whisky or arack added to two parts water, using if possible a fairly wide-mouthed but not necessarily large bottle: the cork should be sealed.

It is best not to send a specimen which has been dead for a long time: on these numbers of different post mortem fungi and bacteria are usually to be found, and the real source of trouble can seldom be separated. Specimens should if possible be sent which contain more sound than diseased tissue: the boundary line between these two is the most useful for work in the laboratory.

FURTHER REPORT ON THE EXTERMINATION OF RATS IN RICE-FIELDS.*

Work Done at Tanjong Malim.

Tanjong Malim, 8th-12th September, 1908.

1. The field was cleared and planted for the first time this year. The rats, owing to the ground being for the most part under water, were not in the batas, but had their holes in 'busuts' (old ant hills) and dead jungle stumps which had not been burned off. The conditions were therefore not at all favourable, and I was sceptical of success when I was first saw them. The results were, however, most satisfactory, and Mr. M. D. Daly, Assistant District Officer who gave me much assistance, is quite convinced of the simplicity, efficacy, and cheapness of carbon bisulphide.

*See Agricultural Bulletin S. S. and F. M. S. March, 1908.

2. Nearly 600 holes were treated on Tuesday and Wednesday, and some of those treated on Tuesday were opened on Wednesday for demonstration purposes and were found to contain dead rats. With the exception of two holes, which probably escaped notice when the liquid was being applied, all those treated remained closed; and on Saturday the Malays could find no open holes. The justifiable inference is that all the rats had been poisoned and were then dead in the burrows.

3. The liquid was carried in a beer bottle with a special glass stopcock passing through a hole in the cork. The two assistants from the Department poisoned the first dozen holes to show the natives how the work was done. After that it was left to the Malays themselves, but under my supervision or that of my laboratory assistant.

4. The work was carried on from 10 o'clock to 4 o'clock as all or nearly all the rats are at this time in their burrows.

5 Two beer bottles were sufficient for 550 holes, but the results of numerous experiments I have carried out lead me to believe that with proper care and improved methods of application one bottle should do quite 500 holes. The quantity contained in one beer bottle costs, delivered in Kuala Lumpor, between 58 and 59 cents.

6. Mr. Daly believes that if remedial measures were not taken the rats would totally destroy the padi (nice) in these fields.

7. The Malays were deeply interested in the work, and seemed so convinced of the efficacy of the liquid that they wished to keep some for future emergencies.

W. J. GALLAGHER.

FEDERATED MALAY STATES.

REPORT OF THE DIRECTOR OF AGRICULTURE FOR THE YEAR, 1907.

The report of the third year's work of the Department of Agriculture, Federated Malay States, records progress made in various directions.

The buildings in Swettenham Road, where over 100 acres of land suitable for experimental purposes has been reserved, were finished in August, and the various officers of the department took possession of them on the 26th August.

The light for working purposes in the laboratories is good and the library is suitably housed. The arrangement and fitting of laboratories, library and offices naturally occupied some time, and the Government Mycologist began the arranging and cataloguing of the books and pamphlets in the library. Much time is lost in answering enquiries or making investigations by the absence of a comprehensive catalogue which enables any notes on a technical subject to be found at once without searching through various books or pamphlets where the information is most likely to be found. The card catalogue system, universally found to be best for such libraries, has been adopted.

Mr. W. J. Gallagher, the Government Mycologist, took up his appointment on the 4th April. He devoted himself at first to arranging and cataloguing the library and making himself familiar with the

botanical and agricultural conditions of the Federated Malay States. The appointment of a scientific man to devote himself to the study of the diseases of cultivated plants is one of the best forms of insurance of agricultural interests which can be adopted.

That such an official can at once produce a panacea for all or any diseases which are causing damage to the various cultivated plants of the country no one will expect, but that all diseases can be looked after from their earliest stages and studied in the only way in which any knowledge can be gained—*i.e.*, in situ—is of great value. The history of such work has shown that the investigation of diseases of plants has always led to methods being discovered for successfully combating each evil.

Malaya is especially fortunate in the climate which is unsurpassed for rapid growth of vegetation; but these exceptionally good conditions are also in some cases favourable to the prosperity of insect and fungal pests, and it is imperative that careful watch should be kept by all cultivators so that the earliest signs of disease, to whatever cause due, may be brought to the notice of the department.

Delays in the treatment of any disease are dangerous, and every year cases are reported in which, if preventive and curative measures had been taken earlier, a good deal of labour and expense would have been saved. All effective measures for the preservation of health, whether carried out by individuals or by the Government, rest upon exact knowledge of the causes of the diseases and the effects they produce. The best time to investigate a disease of cultivated crops is the first time it is observed and not when it is found that great damage is being done.

Mr. Gallagher's report, though it is a record of his first few months' work in an entirely new field, contains interesting and important information.

Mr. T. C. Nock, Assistant Inspector of Coconuts, took up his duties early in the year and has already proved the value of his appointment by the energy and interest he has displayed in his work.

Chemistry, which should form a very important part of this report, is unfortunately absent, the Government Chemist has duties in connection with the Medical, Legal and Health Office Departments of his work, which leave little or no time for agricultural questions.

Experiment Station.

No Department of Agriculture is complete without a well-organised experiment station where new products can be grown, and experiments with improved methods of cultivation of these plants already cultivated can be systematically carrid on. The planter cannot initiate experiments for the improvement of his cultivation since many experiments have to be made which end in failure. These failures are often the most valuable results of such work, as they prevent serious losses to planters who might try the same methods on a larger scale if the statistics of careful experiment had not shown their uselessness. To carry on successfully a continuous series of experiments it is necessary to have technical knowledge so that the theoretical basis of the experiment shall be sound, and exactitude in recording all the factors at the beginning and during all details of its progress.

The chief data required may be the cost of the labour so that methods may be cheapened or the improvement of the plant so that bigger yields may be obtained. All of these factors in experimental work make it imperative that those carrying on any experiment should be close to the plot where it is growing, and that the laboratory where plants can be examined, soils tested, etc., should be as near as possible to the work.

To take an example, in the case of experiments as to tapping rubber. The latex must be measured accurately as soon as it is taken from the tree, the amount of caoutchouc and water in it estimated and the amount of dry rubber eventually obtained recorded. Or, in the case of a manurial experiment, chemical analysis is required to obtain information as to the improvement of the soil.

The experiments which have been started on a block of a little over 100 acres surrounding the laboratories and offices of the department have been carefully planned and the results will be accurately recorded. Knowledge gained by an experiment cannot always at the time be put to economic use, but though this is so it does not follow that this knowledge is not of great value, as it may dovetail in with other facts learnt by experimental means and help to solve some important economic problem.

Every agricultural country has its peculiar climatic and soil conditions, and the Federated Malay States differ very greatly from any other country. The conditions of alternating sunshine and rain which obtain, point to methods which may not be sound for other countries, where with greater rainfall and with long droughts methods may be useful which are not necessary or beneficial here.

The various experiments which have been initiated and are being carefully carried on are described in detail in the report of the Superintendent of Experiment Plantations, Mr. J. W. Campbell, who deserves great credit for the rapidity and care with which he has cleared the land and laid it out with the various products with which experiments are being made. It is too soon to discuss the posssiblities of knowledge gained by the results of these experiments, but the green manure plots show every sign of proving to the practical planter that the present mode of cultivation of rubber by keeping the soil free from all vegetation is a most expensive process, and at the same time does not give the best conditions for the rapid and healthy growth of the rubber trees.

When the experimental plots are sufficiently advanced to demonstrate any of the points desired to be proved either negatively or in favour, opportunity will be afforded for planters to have the methods which have been followed explained to them in situ so that they may see for themselves the results. It is always easier to prove to the practical man the advantage of any new departure in agricultural methods by showing him it on a plot of sufficient size to satisfy him of its being a proof of its practicability on a larger scale.

The plots of camphor show that this plant will grow in Malaya at sea level with great vigour. My experience of this plant in Ceylon was entirely different, there the most vigorous plants were some thousands of feet above sea level, but the growth of the trees in Batu Tiga and Kuala Lumpor plots has been so extraordinarily rapid that there is no doubt of the suitability of this climate to the cultivation of this plant.

The portion of the experiment station which is being formed into an arboretum will be of great value in the trial of various useful and ornamental trees introduced from other tropical countries.

Climate and Condition of Crops.

The climatic conditions during the year do not call for any special comment. No abnormal drought or rainfall has to be recorded. The conditions for rapid vegetative growth are almost unique in Malaya—viz., alternating sunshine and rain with an equable temperature and a moist, humid atmosphere.

The general health of cultivated plants was good; locally diseases by animals, insects, fungi and other causes did some damage, but there was no special outbreak of new disease or recrudescence of any already known pest. With definite knowledge of the various diseases already known, which attack our cultivated plants and increased experience in methods of dealing with them, the danger of any pest sweeping over a cultivation unchecked and seriously crippling the industry is greatly reduced.

It is, however, well that the constant fear of attacks by insects, fungi or other causes should haunt the cultivator. The paradise of the man who fears no devastating pest is but a fool's paradise, and the condition of the planter who by watchfulness and forethought prevents any evil getting the better of his plants or minimises their effects is in the end pleasanter and more profitable.

Statistics of Agriculture.

The compilation of accurate statistics of agriculture in Malaya, which was undertaken when the department was instituted, takes up a large amount of time which might be spent on useful technical work. In order that progress or retrogression may be recorded and the position of the various industries accurately known, it is necessary to have such figures, and unless care is taken that they are reliable they are misleading and useless.

The statistics published in last year's reports were in the case of Malacca inaccurate. This was due to the fact that a very large acreage of agricultural land is in the hands of Chinese, and the forms issued, which were printed in English, were not understood.

The Resident Councillor of Malacca kindly drew my attention to the fact that Chinese estates were in many cases left out, and this error has been rectified by using in the case of Chinese estates all over the Peninsula forms printed in Chinese.

The figures in the various tables have been compiled with care, and if any error exists it is probably not more than five per cent. During the year various enquiries have been made from England and America as to the relative reliability of various estimates and records which are obtained from Government and planting sources. One mistake which is constantly recurring, and leads the rash estimator of future rubber outputs into serious exaggeration, is the confusing of the terms "alienated," "planted," and "opened" land.

Land alienated for agricultural purposes, of which there is probably 1,000,000 acres in the Peninsula, applies only to land which

Government has let for agricultural purposes, which in some cases has not been, and never will be, used for that purpose. In the case of rubber, the land alienated is nearly four times as much as that actually growing rubber. Opened land means, as a rule, that the jungle has been burnt and sometimes that the land is kept weeded, but this has no interest agriculturally, except in so far as it points to the fact that it may be expected to be cultivated in the near future.

The only term which need be considered from an agricultural point of view is "planted" land.

AGRICULTURAL ACREAGES IN THE FEDERATED MALAY STATES, 1907, EXCLUDING PADI AND HORTICULTURE.

——	Selangor.	Perak.	Negri Sembilan.	Pahang.	Total.
Coconuts ...	21,321	57,776	18,000	15,463	112,560
Rubber ...	61,552	46,167	17,656	860	126,235
Coffee ...	7,595	756	2,382	100	10,833
Other cultivations, chiefly Tapioca.	1,604	10,270	261	...	12,135
Totals ...	92,072	114,969	38,299	16,423	261,763

COCONUTS.

Coconuts have had a prosperous year without any serious outbreak of disease, and the diseases which are already rife have been during the year successfully combated by the Inspector of Coconuts and his staff. It is not easy to estimate what damage would have been done to the coconut industry if the coconut preservation staff had not been in existence, and it is not therefore possible to give any idea as to the amount, no doubt very considerable, which this preventive and curative work has added to the wealth of the country.

An increase over last year of about seven per cent. in the acreage of this staple industry shows that there is an appreciation of the profits which can be gained by the cultivation of coconuts.

This important branch of the agriculture of the Federated Malay States, covering at the end of last year 112,500 acres, is dealt with in detail in the report of the Inspector of Coconuts. During the past year, owing to the drop in rubber prices, there has been a tendency to take an interest in the "Consols of the East," cultivation and land has been taken up which will be planted with this easily cultivated and profitable palm.

PADI.

The problems of padi culture have an especial interest. Long years of cultivation in many countries have evolved methods which must to a great extent command attention and carry weight because of the fact that they are the outcome of a process of selection of the

fittest methods. Though this fact should not deter from the desire to find how they can be still further improved, it gives to the problems in padi cultivation a different aspect from those with which we are faced in a new cultivation like rubber, with very little past history, and no experience wrapped up in tradition and capable of being extracted and made useful.

The experiments carried on at Parit Buntar owe much of their success to the care of Mr. F. F. Faithfull, A.M.I.C.E., Assistant Engineer, Krian Irrigation Works, who took the greatest interest in all the problems which it was hoped to solve and recorded with great care all the necessary data. He aroused the interest of the padi-planting Malays in the neighbourhood of the experimental plots and explained to them the purpose of the different experiments and the value of the results.

The Federated Malay States Government have spent a large sum of money in increasing the fertilityof some 70,000 acres of excellent padi land by a comprehensive irrigation scheme, and it is important that all within that area, should enjoy not only the advantages of the regular water supply, but that their methods of cultivation should be such that these advantages can be reaped as bountifully as possible.

I have not been able to get accurate statistics as to the relative yields per acre outside and inside the artificially irrigated area, but all the observations I have made and all the data I could obtain point to the fact that the crop has been increased by probably 30 to 40 per cent. by the use of irrigation. The monetary value of this iseasy to calculate.

The crops of padi all over the Federated Malay States were about average except inside the irrigated area, where they were greater than usual, and some areas near Kuala Kangsar which were badly attacked and damaged by rats. Mr. Gallagher kindly undertook an investigation as to methods of combating this ubiquitous pest, and his preliminary experiments with carbon bisulphide were most encouraging. They will be continued when the next padi crop is planted, and it is probable that this method may prove an effective and practical way of ridding the padi planter of one of his most constant and expensive enemies.

With regard to other enemies of padi, eelworm and fungus—more insidious because less easily detected, but causing none the less damage—these pests are automatically lessened within the irrigation area by the regular application of water and the uniform times of letting off the water and drying of the plants above ground. Where the plants are left too long in their young and tender condition without water they are open to the attacks of certain insect pests, and when they are kept too long growing in water other pests are enabled to thrive. In addition to this the value of the power of at any time drying or flooding the padi fields is in itself an admirable weapon against diseases.

The following table shows the results of last year's experiments, the chief object of which was to determine the question of how many plants per "perdu"—*i.e.*, group of young plants put in on one spot—and how many "perdu" per acre give the largest yield. The seed crop was weighed and measured and the straw was weighed. It is too soon to draw definite conclusions until these experiments have been continued and expanded for some little time.

Padi Experiments Krian, 1907.

Letter of plot.	Variety planted.	Date of planting in nursery.	Date of "meridis" (transplanting in nursery).	Date of final planting in field.	No. of plants per "perdu."	Distance between "perdu."		No. of "perdu" per acre.	No. of plants per acre.	Date of reaping.	Amount of crop per acre in gantongs. 1 gantong = 1 gallon.	Weight of crop per acre in lbs.	Weight of straw per acre in lbs.	No. of grains of seed in one gramme.	No. of seed per head.
						ft.	ins.								
C	Saraup	13-7-07	24-7-07	12-9-07	3½	1	0	43,560	152,460	1-2-08	614	3,420	17,736	52.40	249
B	Radin	,,	,,	4-9-07	3½	1	6	19,360	67,760	17-1-08	542	2,966	13,424	44.74	200
E	,,	,,	,,	6-9-07	3½	1	0	43,560	152,460	19-1-08	492	2,714	15,746	49.91	206
D	,,	,,	,,	16-9-07	3½		9	77,440	274,040	19-1-08	504	2,786	11,244	46.62	211
A	,,	,,	,,	3-9-07	3½		6	174,240	609,840	15-1-08	480	2,678	23,820	41.13	130
F	,,	,,	,,	9-9-07	1		6½	148,464	148,464	19-1-08	516	2,834	15,838	47.50	190
G	,,	,,	,,	5-9-07	2		9	77,440	154,880	21-1-08	442	2,422	17,784	44.87	191
H	,,	,,	,,	6-9-07	5	1	2	32,003	160,015	21-1-08	502	2,782	18,650	49.71	210

Green manures will be tried in the place of allowing all and sundry plants to grow on the land between crops, and this as well as seed selection experiments will be added to the present plots.

When the experiments have been continued for another season, the results will be analysed and discussed; various deductions may be drawn from the table of last year's results which is compiled just in time for this report.

Coffee.

The acreage under coffee has increased a little, there being 10,833 last year as compared with 9,708 at the end of 1906. A large acreage of coffee is continually being killed out by the rubber trees with which it has been interplanted growing up and shading the coffee bushes so that they do not grow vigorously and only struggle in producing less and less fruit. Selangor possesses 75 per cent of the whole acreage. The crops have been on the whole good, but the figure of acreage crop per acre is not of any value as a great deal of the coffee growing under rubber and yielding little or no fruit is included.

Tapioca.

The cultivation of tapioca (*Manihot utilissima*), which occupies about 10,000 acres in the Federated Malay States, and more than double that acrea in the Straits Settlements, continues to give large returns to the careful planter. The tapioca plant is specially free from disease of leaf, stem or root, and its temporary cultivation makes it possible, should any pest attack it, to destroy the affected plants and thus prevent the spread of the disease. During last year experiments have been carried out to show the relative effect of different manures on tapioca, the results of which will appear in a future report. An investigation is being carried on in the scientific laboratories at Buitenzorg into the varieties of tapioca used in cultivation, and at the request of Dr. Treub specimens were sent from Malaya to be examined and experimented with.

Rubber in Malaya.

The rapid progress of the rubber industry in Malaya continued during 1907, and at the end of that year 45,764 more acres of rubber land had been planted, an increase of about 46 per cent on the total of the previous year. The number of acres of planted rubber on the 31st December, 1907, being 179,227. The number of trees in 1906 was under 13,000,000, and in 1907 27,558,400, a large acreage being planted closer than before.

The output of dry rubber increased by 144 per cent; 1907 showing an export of 2,278,870 lbs., or 1,017 tons, as against 935,056 lbs., or 417 tons, in the previous year. More than seven times the amount of rubber was exported in 1907 than two years before in 1905.

RUBBER STATISTICS MALAYA, UP TO THE 31ST DECEMBER,19 07.

	Federated Malay States.	Straits Settlements and Kedah.	Johore.	Total.
No. of estates	287	65	13	365
Acreage in possession	412,210	116,549	96,849	625,608
Acreage planted up to 31st December, 1907	126,235	42,866	10,126	179,227
Acreage planted during 1907	40,473	9,344	5,764	55,581
No. of trees planted up to 31st December, 1907	19,628,957	6,787,216	1,142,196	27,558,369

RUBBER IN FEDERATED MALAY STATES.

At the end of 1906 there were in the Federated Malay States 85,000 acres, at the end of last year 124,580, an increase of about 46 per cent. There were 10,745,000 trees planted in 1906, and nearly twenty million in 1907. The output of dry rubber was nearly doubled, showing 1,028,792 lbs., or 459 tons, in 1906, and 1,984,285 lbs., or 885 tons, in 1907, an increase of 93 per cent. Since January, 1906, the amount of rubber planted has been trebled, and the whole of that large acreage is in a healthy and vigorous condition.

RUBBER STATISTICS, FEDERATED MALAY STATES, UP TO THE 31ST DECEMBER, 1907.

	Selangor.	Perak.	Negri Sembilan.	Pahang.	Total.
No. of estates ...	124	114	34	15	287
Acreage in possessions ...	194,183	141,032	59,631	17,364	412,210
Acreage planted up to 31st December, 1907	61,552	46,167	17,656	860	126,235
Acreage planted during 1907 ...	19,135	16,050	4,945	193	40,743
No. of trees planted up to 31st December,1907	9,648,093	6,648,957	3,165,388	166,590	19,628,957

Comparative Table of Rubber Acreages and Trees in Malaya, 1906 and 1907.

	State.	Rubber Acreage.		No. of Trees.	
		1906	1907	1906	1907
F. M. S.	Selangor	44,821	61,552	5,477,390	9,648,093
F. M. S.	Perak	29,612	46,167	3,990,462	6,648,957
F. M. S.	Negri Sembilan ...	10,663	17,656	1,196,150	3,165,388
F. M. S.	Pahang	483	860	81,000	166,590
S. S.	Malacca	*28,784	36,946	*472,056	6,019,940
S. S.	Province Wellesley ...	4,738	5,920	615,940	767,276
	Johore	4,362	10,126	*492,906	1,142,196
	Total ...	123,463	179,227	12,325,904	97,558,440

In Province Wellesley is included one estate in Singapore, one estate in Penang and one in Kedah.

*These figures are approximate.

Ten Years of Rubber Planting in the Federated Malay States.

The history of rubber planting in the Federated Malay States is probably unique in the rapidity with which a new cultivation, found to be specially suited to the climate, has been established.

The black columns show only the Federated Malay States acreages and do not include Malacca, Johore and Province Wellesley. The progress of these places has, however, been approximately the same.

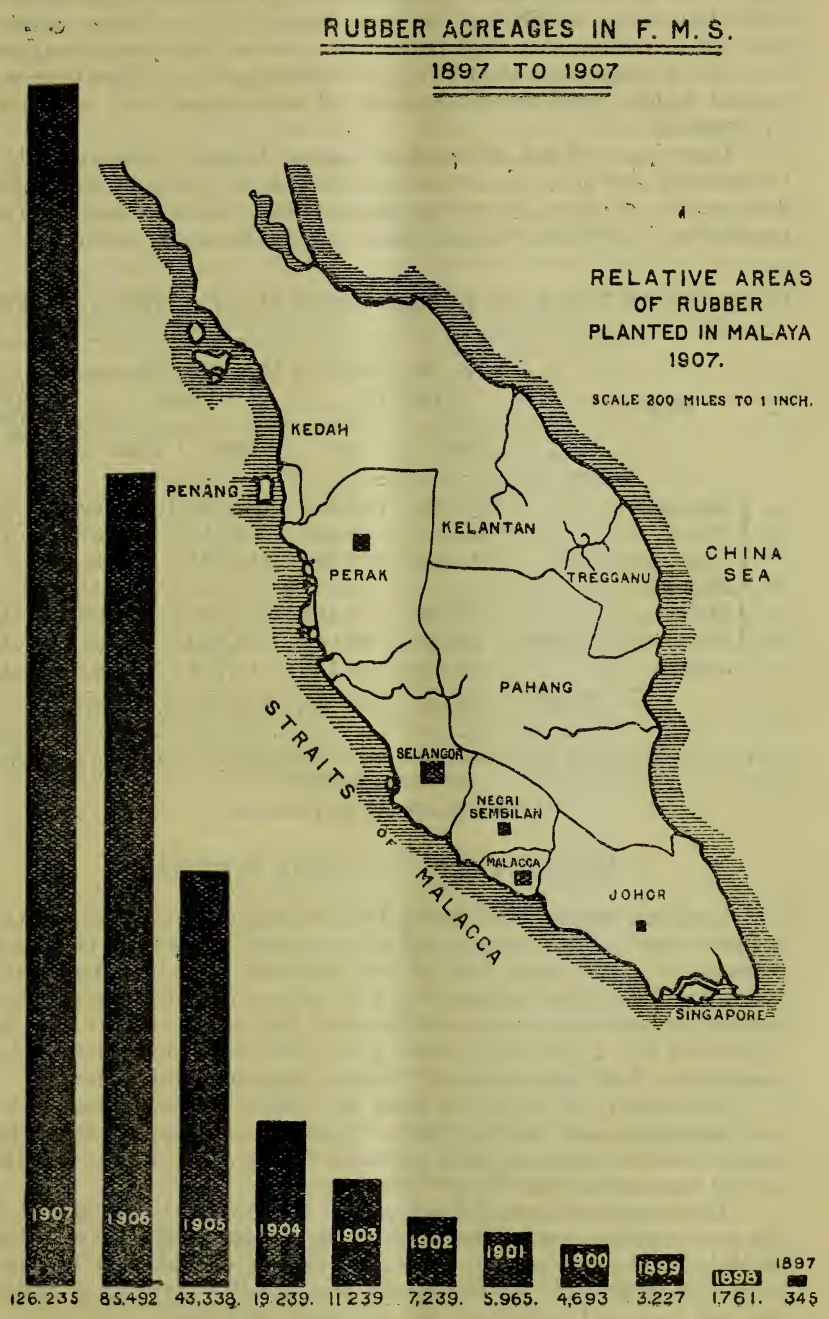
In 1897, rubber estates were less than 350 acres in extent, 10 years after they had increased by 360 times. In 1902 less than 7,500 acres had been planted, five years after 17 times that amount was under rubber. Nearly all of this land was virgin jungle previously to its being planted with rubber, which had to be cleared before any planting operations could be begun. Nine-tenths of the whole acreage has been cleared and planted by the younger generation of planters, who deserve the greatest credit for the excellent way in which their work has been carried out. The difficulties under which most of them have opened up their estates have been many and various: bad conditions of health, both for master and coolie, and steadily rising price of labour owing to local conditions.

Yields of Dry Rubber per Tree.

The average amount of dry rubber is over the whole Peninsula 1 lb. 12 ozs. per tapped tree, exactly the same figure as was recorded for last year. This is most encouraging, as the number of trees which are being tapped for the first time far exceeds those already tapped, especially in Selangor, where the average is 1 lb. 7 ozs. per tapped tree.

Experiments are being carried on in various parts of the Peninsula: Perak, Selangor and Negri Sembilan, in regard to yields of comparatively old trees which have not previously been tapped. In Krian these experiments have been carried out for nearly four months, only half the

TEN YEARS OF RUBBER PLANTING IN THE FEDERATED MALAY STATES.



tappable area of the trees being used and space being left so that more than three years will elapse, with continuous tapping every other day, before the healed surface will be again reached. The figures for one year will be published in next year's report, but as far as they have gone the yields average more than 2 lbs., per mensem per tree. The trees are planted widely apart round the edges of a graveyard and are about 17 years old.

There is as yet not sufficient evidence as to what yields may fairly be expected over large areas of trees from 10 to 20 years old, but all the data which we have at present points to the fact that estimates or prophecies of probable yields at these ages will be amply confirmed.

COMPARATIVE TABLES OF RUBBER CROPS, MALAYA, 1906 AND 1907.

	STATE.	NO. OF TREES TAPPED		RUBBER YIELDS LBS.		AVERAGE YIELD PER TREE 1907.	
		1906	1907	1906	1907		
S.S. F.M.S.	Selangor	364,638	772,656	620,033	1,131,086	1	7½
	Perak	67,710	132,556	94,848	272,804	2	1
	Negri Sembilan	91,410	240,401	146,891	586,864	2	7
	Pahang	...	...	...	...	...	
	Malacca	*7,000	12,455	*12,000	23,490	1	14
	Province Wellesley	20,076	48,000	*13,560	82,131	1	11
	Johore	48,350	94,159	47,724	182,495	1	15
	Total	599,184	1,300,227	935,056	2,278,870	1	12

In Province Wellesley is included one estate in Singapore, one estate in Penang and one in Kedah.

*These figures are approximate.

MARKET PRICES AND THEIR EFFECTS.

Various circumstances during 1907 led to a decrease in the extraordinary rapidity with which land was acquired, cleared and planted in rubber. In some cases, lack of the necessary superintendence and labour for opening land stopped work, in others a gradual increase of the cost of bringing an estate into bearing, and the fact that this increase had led to the cost of opening and planting in some estates being greater than had been estimated hindered plans for future clearings.

The steady drop in the price of rubber, especially during the last half of the year, had the effect of making the capitalist abate the feverish anxiety to get as many acres planted up as quickly as possible and to some extent regardless of cost.

These circumstances did not reduce the investors' confidence in the profit-earning possibilities of plantation rubber as the share prices of Malayan Companies showed, but the visions of Eldorado assumed more natural tints and led to a careful consideration of the most economic and improved methods in the cultivation of rubber.

The industry is still yielding exceptionally handsome profits and such questions should be considered and experimented without delay. Recent history has shown us that in the case of other tropical agricultural industries the desire to practise the most approved methods of cultivation, and the cheapest way in which to carry them out, came only in a drop in profits. Cultivated rubber in Malaya pays a handsome profit on money invested, but that seems to be no reason for not being constantly on the look out to find in various directions methods of saving in cost of production and improved cultivation.

To carry on a rubber estate or any other agricultural enterprise for a number of years, paying large profits, but without any alteration in the management of the estate, the details of cultivation or the preparation of the product for the market, must be considered as curious and discreditable; since it shows that experience and knowledge has in no way helped to improve methods or economic working.

The rubber market was in common with all other trade affected to a large extent by the financial trouble in America. It is the custom of manufacturers to keep in stock sufficient unvulcanised pure rubber for six months' operations, it is therefore possible for them to continue to work for some time without purchasing new stocks. The stock in England and Germany was consequently increased and the price very greatly affected. At the beginning of the year plantation rubber was sold at 5s. 9d., which quickly dropped to 5s., recovering in July, but after that time dropping quickly and steadily, till in November, the lowest price then recorded for best plantation rubber before *viz.*, 3s. 4d., was reached, being a drop of 100 per cent from the price of 18 months previously. That this drop in prices was to a very large extent due to a financial and not to ordinary "supply and demand" causes is admitted by those who have largest experience of the fluctuations of market prices. The price will recover and probably vacillate about 4s. It is satisfactory to remember that even the lowest price yet reached for plantation rubber is more than 100 per cent above the cost of production.

Over-production and Synthetic Rubber.

The fear of over-production which bulked very large a year or more ago has, owing to more accurate knowledge of the world's demand for rubber and the amount produced, to some extent subsided.

The drop in prices, while having the effect of reducing the amount of rubber planting, may also to a great extent reduce the output from Brazil, where the margin of profit is much less than in cultivated rubber.

This also should lead not only to a consideration of cheapening of methods of production, but to the possibilities of increasing the demand for rubber. No product lends itself more to measures for improving and widening the market. The almost endless possibilities to the economic uses of rubber, and the small proportion of the purchasing population of the world which at present knows and uses rubber, both demonstrate to the fact that measures taken to provide new outlets for rubber are much more hopeful than in the case of food or textile products like coffee or copra, which have a comparatively limited number of uses.

It is not to the interests of cultivated rubber that the output of the Brazilian product should decrease very rapidly. There is not yet sufficient cultivated rubber or wild rubber from other source to supply the increasing demand.

Those who look forward to a future with immense areas of cultivated rubber in suitable climates, of which the Malay Peninsula can claim to be the best, believe that cultivated rubber will in time satisfy all the manufacturers in regard to its physical qualities and will be produced in sufficient quantity to meet the world's requirements.

It is not easy to foresee the future demands for rubber, but a substance which has made itself so indispensable to all civilised races must be required in increasing quantities, and the fear of over-production may be cancelled, by the quite as likely possibility of the supply not meeting the demand and the consequent resort to other substances as substitutes for rubber.

The question of what are termed "rubber substitutes" has been much discussed, and various scares of important discoveries have made the flesh of those interested in rubber creep. That various substances can be used instead of rubber for various purposes is acknowledged, just as cotton can be used for silk, or paper for cotton, but that is a different question to the production of a substitute for rubber which will possess the physical properties of rubber to which all its commercial value is due. In this direction the year 1907 had nothing to show, and December, 1907, was no nearer than December, 1906, to the practical solution of the problem which would produce a great rival to plantation rubber. Chemists and those best able to judge of the possibilities of the discovery of a substance having all the physical properties of India rubber made from crude materials of so cheap a nature as to be able to undersell the natural article, cannot foresee success, and all so-called perfect substitutes for rubber brought before the public have failed to survive investigation.

Improvement in Planting Methods.

One satisfactory effect of the drop in prices has been a serious tendency to consider whether the present methods of opening and keeping up an estate could not be modified so as to save expense.

In every industry profits very large in relation to the cost of production have a tendency to produce a perhaps too liberal treatment of expenditure, and in rubber this is the case, compared with the practice in the tea and coffee industries in Ceylon and Southern India.

Rapid planting of healthy vigorous trees was the object aimed at, even if this was achieved at a larger cost per acre than slow and less expensive methods might have incurred.

Is Clean Weeding Advisable?

The remarks in my last report as to the value of a green manure plant, of which I gave examples, in the place of the general habit of regularly scraping off weeds and allowing the sun and rain free access to the soil had little or no effect at that time, but the desire to cut down expenses has caused the suggestion to be reconsidered,

Weeding on most of the rubber estates in the Federated Malay States is the item costing most annually. This sum is spent on labour, and represents in many cases 70 per cent or more of the total labour of the estate.

The object of the rubber planter is to obtain as quickly as he can vigorous trees of as large a girth as possible, at the smallest cost, and in order to effect this he keeps his fields as clear of weeds as possible and so allows the rubber tree to have all the moisture and plant food available in the soil.

That clean weeding will show a better result in the growth of the rubber trees than allowing all and any weeds to grow continuously, can no doubt be proved. In Perak, however, some of the estates from want of money or shortness of labour have not been able to keep their plantations clear of weeds and have abandoned weeding. In some cases the weeds are checked by being regularly cut, but in others nothing at all has been done to eradicate or discourage the weeds.

The growth of trees on such places is somewhat poorer than trees in similar conditions which have been kept free from weeds, bnt the vigour and girth of the trees where the weeds have been allowed to grow is not so markedly different as the disciples of clean weeding would expect to see.

The belief in clean weeding is a tradition handed down from English farming to tea and coffee planting in the East, good farming is associated with absence of weeds. In Europe, the farmer of cereals and other crops does not practice the method of using certain plants as a substitute for weeds. There are various reasons why clean weeding in such crops is a good policy in Europe, but annual crops have to be treated differently from permanent cultivations, and the conditions of labour, cultivation, plant growth and especially climate are entirely different in the tropics from those in temperate climates and consequently methods have to be modified.

The objections to clean weeding in rubber cultivation in the Federated Malay States and removal of all protection from the surface of the soil, are that it allows a large amount of percolation, of heat radiation and of evaporation of moisture, also that heavy rainfall on all but flat surface always results in the constant removal of very large quantities of top soil, which are either carried away in streams or transferred to the drains. It is not easy to estimate the loss that takes place in tropical climates where soils are allowed to remain exposed and frequently scraped. An immense amount of plant food is continually also lost through percolation and drainage, the greater part of this is absorbed by the roots of any plants growing on the surface, and when the leaves and stems of these plants are cut this is to a great extent returned to the soil.

With the soil protected from the rays of the sun the conditions of moisture and temperature are most favourable to the development of bacteria which are responsible for the liberation of plant of food. In clean weeded land the top two inches or more of soil are, because of admission of heat and light, made impossible for feeding roots and the preparation of food for them. When the ground is covered this surface layer is kept moist and useful for the feeding roots. A considerable

area is thus added to the area of soil available for rubber roots and the growth of the trees is improved.

In addition to arguments for clean weeding there is a local one, the danger of the ground being taken possession of by "lalang" (*Imperata arundinacea*), a pestilent weed, which once allowed to invade a plantation can only be eradicated at enormous expense. This plant is ubiquitous, is always one of the first to cover newly opened land, and by far the most difficult weed to eradicate.

The experience gained in the use of tapioca as a catch crop in rubber which obtains on some thousands of acres of rubber showing excellent growth is another argument in favour of keeping the soil covered up. Few, if any, crops take more from the soil than tapioca, but this loss of valuable plant food in the soil is to a great extent compensated for by the advantage of keeping the soil from the sun and rain. The girths of young rubber trees grown with tapioca is in many cases as large as those of trees in similar land, clean weeded, and without any other crops.

The position thus is: Clean weeding is a costly process, which ensures quick growth of young rubber trees and prevents the land being taken possession of by undesirable weeds. On undulating land it causes loss of top soil, and on all land it means loss of moisture in the surface layers of the soil.

Rubber plants usually grow better in clean than in weed-covered land, because the plant food and water present in the soil is all available for the rubber and is not used by the roots of various other plants, which are useless to the planter.

The high cost of weeding and the fact that, with a not too abundant supply of labour, the majority of coolies are employed at this work, both point to the desirability of some other method not less helpful to the growth of young rubber, if such can be found.

Though figures of cost of weeding vary very greatly, on some estates the cost two years after the land has been opened is not under $2 per acre, per month, or $24 per year. This represents on an estate of 1,000 acres a cost of $24,000 per year, and a probable cost for weeding of nearly $100,000 before the rubber is in bearing.

In labour it represents a continual force of about 250 coolies working for 300 days in the year.

I have for the last three years been investigating the question of a substitute for weeds which will reduce the wage bill without reducing the rapidity with which the rubber trees grow, and mentioned in my annual report for last year three plants which observation and experiment show to be suitable and therefore worth a serious trial on everyestate.

These three plants belong to the order Leguminosæ, the clover, pea and crotaloria tribe, a group of plants many of which are characterised by the possession of bacteria on their roots. These bacteria, the life history of which has been investigated fully by a large number of botanists and agriculturists, live in what is technically called symbiotic relationship—*i.e.*, both host plant and bacterium being of mutual service to each other. In a report of this character it is unnecessary to more fully explain this point, but it will suffice to say that the bacteria which form characteristic nodules on the roots of the host

plant, take nitrogen from the air, and this nitrogen is afterwards available in the soil as plant food. The amount of nitrogen thus added to the soil varies with the species of the bacteria and their numbers, but in the case of one of the plants hereafter mentioned experiments have shown it to be as much as 200 lbs. per acre per year.

Leguminous plants which possess these bacteria may therefore be considered as friends and not as foes, as useful plants and not as weeds in a rubber plantation.

In order to get the maximum of benefit from these plants it is necessary to cut them down periodically and leave them lying on the ground. The length of time they should be allowed to grow depends on the vigour of the plant, in most cases about nine months.

This cutting down need not be an expensive operation, as it is not intended to eradicate the plant, but only to allow the green parts to form a mulch on the surface of the land and thus return something to the soil.

The operations of weeding must, as the planter knows to his cost, be carried on periodically and not be delayed, or the weeds will get out of hand, and the cost of eradication be very greatly increased or made well nigh impossible, but the cutting or hacking down the leguminous green manure plants may be postponed without danger until such time as labour is available for the purpose.

The three plants which seem to me most suitable in Malaya for the purpose above mentioned are: *Crotalaria striata*, *Mimosa pudica and Desmodium triflorum.*

Crotalaria striata is a quick-growing vetch-like plant with trifoliate darkish green leaves. In good soil with sufficient rainfall it grows to a height of 6 feet in about a year. When sown sufficiently thick it completely covers the ground within a few weeks, so that the clearing is like a good lucerne or vetch crop in Europe, and the surface of the ground is not seen at all.

It has been proved by experiments with this plant in Ceylon that 14,000 lbs. of organic matter were formed by crotalaria under cacao, and the nitrogen in this organic matter was equal to that in 1,700 lbs., of castor cake or 700 lbs. of nitrate of soda. Other plants—weeds —cannot get enough light under the dense cover of the crotolaria, and new weeds are kept out as their seeds cannot reach the ground which is so well covered. If the crotalaria is sown in good growing weather, and if the land is clear of all weeds, no further weeding should be necessary, but in the case of land which is thoroughly permeated with the underground stems of lalang or with the roots of other weeds it may be found that during the first two or three months weeding is necessary. The crotalaria seed is sown broadcast. As to the quantity to be used per acre it is better to sow more than is necessary than to leave bare patches where weeds can thrive. Mr. Lauder Watson, who is the first Federated Malay States planter to use this plant in rubber planting, informs me that on Lauderdale, where the photograph of crotalaria was taken, he used about 7 lbs. I have seen good results from using only 4 lbs. per acre.

Mimosa pudica, the "sensitive plant," which was another of the plants suggested in the last annual report, is in many ways the pest of

all plants to put down as a substitute for weeding. In many cases it has taken less trouble to establish this plant than crotalaria, and it thrives extremely well in the Malayan Peninsula on varying soils. The peculiar habit of shutting up its leaves when touched is in its favour. When rain falls at all heavily the leaves shut and the water reaches the soil at once, but when the sun shines again the leaves open up and protect the soil from its rays.

My experience of this plant is that while it grows well on sloping and dry land it seems to enjoy more moist conditions and can be seen in great vigour in ravines and flat places where the moisture is more abundant.

Desmodium triflorum, a small creeping shamrock-like clover, has the advantage that it grows only a few inches high and covers the ground with a turf easy and pleasant to walk on. It is, however, more difficult to establish, and as it seeds very sparingly, it is not easy to obtain any quantity of seed for planting. On one estate some two hundred acres has been successfully laid down with this plant by taking it from neighbouring waste land and planting it as soon as the land was cleared.

The question of the best method of establishing one or other of the substitute for weeds or clean weeding is being experimented on both at the Experiment Plantations of this department and by various planters who are alive to the great advantages to be gained if they can cover their ground with a friendly plant. By far the best time to establish one of these plants at a minimum cost is directly the land has been burnt off. In virgin land after burning no seeds of herbacious plants are alive in the soil, and any seeds sown of plants planted have no competitors and quickly take possession of the soil. Having once got the plant established at the danger of lalang or other weeds gaining an entrance, the immediate necessity of putting the rubber in is over, since the fields do not get any worse, but rather better for the reception of the rubber plants and the cost of cutting away the crotalaria, mimosa or other plant to put in lines and holes is very little. Drains are not necessary or even useful and thus another expense is saved. The only weeding necessary is in case jungle trees or shrub sprout, and these can easily be noticed among the prevalent growth of a single plant and removed. No soil is lost from the beginning of the opening of the land, and the gain in this to the roots of the rubber plant is not to be neglected.

The chief arguments, and they are many and constant, against the adoption or even the trial of the abandonment of weeding in favour of a green manure are: That it has never been done in rubber or in other tropical products, an argument which is always used to discourage any new departure. That the plants suggested will not take pessession of the land to the exclusion of other plants—weeds. This can be met by an appeal to experimental plots, and as far as I have observed where care is taken and money spent, even in two or three year old clearings, these plants can be established in a short time.

It must be remembered that even if 30 per cent of the surface of the land is covered by harmful weeds, and the rest by one selected

plant, it is probable that the rubber will grow more vigorously than in clean weeded fields, and with no cost for weeding.

That the thorns on the Mimosa will be a nuisance to coolies getting about the estate. This argument is used without considering that by putting in green manure, the number of coolies whose work will take them into the field is very small and their legs canbe protected. The only reason why coolies are needed in a field properly covered by the green manure is to search for white ants and to put in any supplies, the latter work will very probably be lessened by the fact that the shaded ground gives very much better conditions for the growth of the young rubber plants than its exposure to sun and rain.

That the appearance of an estate would be against it in the eyes of a valuer. The answer to this is that when the valuer or retired planter, to whose mind such methods are worse than sacrilege, sees that the growth of the trees is as good as before, and remembers the money that has been saved, he will no longer consider bare soil the acme of good planting.

The chief argument that I have personally met with among planters is "Yes, if you could convince my 'V.A.' or my Directors, but unless they are convinced I am powerless," but this difficulty can be removed by the planter clearly showing by measurement of trees and figures of decrease of cost on a small plot that the method is correct. It is difficult to remove fixed and long standing views as to tropical cultivation from the minds of men who have experience, but the stern facts of dollars and cents saved without diminution of vigour in the rubber trees when shown will convert.

Before leaving this question I may be allowed to quote from Dr. E. B. Vorkee's recent work on agriculture published during last year.

This is written in regard to American agriculture, where the conditions are not so unfavourable for clean weeding as in tropical countries with a heavy rainfall.

"To keep the land constantly occupied with growing plants is particularly important, both in the hot summer months and in fall and spring. The covering of the land in summer prevents the temperature rising so high as to destroy the organisms in the soil, while the covering in fall and spring prevents the mechanical losses that occur from wind and rain and by the carrying away of food in the soil water."

Dr. Alfred Russel Wallace, whose name will always be associated with Malayan regions, writes to me in regard to the protective forest belts which have been, and are being, laid out through the Federated Malay States: "They prevent the loss of soil which can *never* be replaced." The italics are Dr. Wallace's. This is also true of the soil lost by clean weeding.

On some estates there are growing among the weeds leguminous plants which possess nitrogenous nodules on their roots, and it may be possible in these cases for coolies to be shown how to leave these plants in weeding, so that in a short time they may get entire on of the field and weeding, so that in a short time they may get entire possession of the field and weeding may be discontinued. Leguminous plants can often be recognised by those unacquainted with botany, their

leaves being divided, and in appearance like those of the vetch, pea, mimosa cassia or crotalaria.

As the chief cost of an estate until its profit-earning period is that of weeding, any suggestion as to the reduction of that prime expense should meet with consideration.

If every estate would set apart a portion of their newly opened clearings for an experiment with a green manure, keeping a record of the cost of putting the land into Crotalaria, Mimosa, Desmodium and whatever other useful plant is selected, and recording the money spent on adjoining land cultivated on the existing clean-weeding method, and carefully measuring the trees on each place to see the relative progress, I have little doubt that the benefit of keeping the soil covered, instead of constantly scraping off the weeds, will be seen.

That the planter should adopt suggestions made by scientific experts without weighing them carefully is not to be expected, but what is wanted is that each practical man should satisfy himself by careful trial that this proposal in regard to cultivation of rubber estates is feasible.

Even if this experiment results in a loss of money and the destruction of a few acres of rubber he cannot be blamed in making it, considering the large economy that is to be effected if it is proved to be successful.

Weed Killing by Spraying.

The experiments in regard to the eradication of lalang and other weeds by means of spraying with a solution of arsenite of soda were carried on both by the department and by several planters with encouraging success. The difficulties in regard to the prohibitive cost which was charged locally has been to some extent overcome, and supplies of this substance were obtained from Calcutta at one-fifth of that charged in the Federated Malay States.

This cost is, however, too great, it can be obtained in England at a cost, including freight to Port Swettenham, at about 12 cents per lb. As the chief cost in this method of destroying weeds is the cost of the material used in the spray it is most important to obtain the arsenite of soda as cheaply as possible. The difficulty in regard to sprayers has also been to a great extent overcome, and though it is not yet possible to get suitable sprayers locally yet some English and American machines at varying prices from $1 for hand sprayers to $250 for steam power have been investigated and shown to be suitable to the purpose.

While the use of arsenite of soda was first investigated as mentioned in my last report for the eradication of the most pestilent weed, lalang (*Imperata arundinacea*), this method of getting rid of weeds is still more efficacious in the case of other weeds submitting a larger and flatter surface to the spray. The leaves are all killed within 48 hours and should be left to rot on the ground and not pulled out or scraped away, by this means the soil is protected from rain and sun, and if the plant becomes green it can be again sprayed. The cost of this method of destroying weeds necessarily varies with the character of the fields to be sprayed, but in the most cases with hand atomiser sprayers the cost should not be 50 cents per acre where very weedy, and on ordinary fields probably not more than 10-15 cents.

A series of experiments near the laboratories of the department are in progress to estimate the cost of eradicating lalang by the following processes:

1. Spraying and arsenite of soda;
2. Digging and picking out all roots;
3. ,, re-chungkoling;
4. The introduction of *Passiflora fœtida*, "wild passion flower," a vigorous creeping plant which smothers lalang and can itself be easily removed.

These are being carried out in various ways on some 10 1-acre lots and the exact cost in each case recorded. The lalang, which has been in possession of the fields for some years, is tall and vigorous, typical of thousands of acres which are to be found throughout the Peninsula.

Health of Rubber Trees.

The health of rubber trees has remained good during the year, on new disease has to be chronicled, and the diseases which were already known have shown no special activity. Both the root fungus (*Fomes semitostus*) and the rubber termite (*Termes gestroi*) have done a large amount of damage. The Government Entomologist carried on a most successful investigation into the life history of the rubber termite, discovering many details of its methods of attack, a knowledge of which will enable the planter to carry on a much more successful campaign in the future. It is much to be hoped, considering the immense monetary loss caused by this ubiquitous pest, that these investigations will soon be continued and completed. The interim report which he has published shows among other interesting facts that the planters' methods of only dealing with the white ants when he finds them on a rubber tree are not the most strategical measures of attack. The rubber termite is found in large quantities in decaying stumps, and it is in these places that they can be destroyed in large numbers, whereas there are ants differing very slightly in appearance which are found on rubber trees which do no damage to the living rubber tree.

The nests and their characteristic connecting tunnels are clearly described by Mr. Pratt, and the planter is thus enabled with more definite knowledge to carry on the war against this most insidious and ever-present menace to healthy rubber.

In addition to this valuable piece of work, the Government Entomologist investigated and reported on an attack by a longicorn beetle on rubber, a stinging caterpillar (*Thosea* sp.) on cocoanuts, and made an examination of some padi insects which he was unable to follow up so as to gain definite knowledge as to the life histories and methods of attact of these pests.

The Government Mycologist has visited various estates and given advice as to the prevention and cure of various diseases of cultivated plants.

Rubber Machines.

The number of estates which have trees of sufficient growth for tapping is as yet not very many, but each year more become productive, and the question of the best and most economical machinery for pre-

paring rubber for the market and for cleaning "scrap," "bark" and "earth" rubber is one of the most important in the profitable working of an estate.

Dr. Kuhleman, Chemical Adviser to one of the largest rubber manufactories in Germany, paid a visit recently to this country to acquaint himself with the methods of the planter in his preparation of rubber. He was impressed by the care which is universally taken to ensure the purity and cleanliness of the rubber sent home.

In asking his advice upon the plant used by the planter. Dr. Kuhleman informed me that one point which he noted was, that the washers and rollers, in use on estates were so short in length. This was the case in the begining of the manufactories in Germany. Machines with narrow rollers were at first put up and then when these could not deal with the amount of rubber required more were added, but it was soon found more economical to have one roller of 10 feet long than five of 2 feet. It will be well that planters should in making arrangements for their rollers and washers look ahead to the time when they are producing much larger quantities of rubber than at present. The machines at present in use are, for dealing with a large quantity of rubber, mere toys, and will either have to be multiplied or larger machines put in.

The longer roller has an advantage over the short cnes at present in use that the risk of oil from the bearing reaching the rubber as it passes through the rollers is decreased. Rubber prepared in a number of small-length machines will be in more danger of being discoloured at places than that prepared in fewer and longer rollers.

The length of rollers in rubber-washing machines used in factories in Europe is often 12 feet, whereas, as a rule on estates in the Federated Malay States two or more rollers of not more than a foot in length are often used.

Preparation of Rubber for the Market.

Block rubber, the advantages of which for packing, transport and preservation are undoubted, has not commended itself generally to the planter. Until large quantities of any of the forms of rubber produced in Malaya, viz., block, crepe and sheet, are put on the market, it will not be possible to settle the much-vexed question as to the advantages of each. A sale at a high price of a shipment of any of these forms at once produces the impression that that special form is more attractive to buyers and will command better prices, but it should be remembered that the quality of the rubber as well as the shape in which it is sent is a factor, and the most important factor, in determining its market value. In whatever form it is sent it is of the most vital importance that planters should continue to aim at the purest and cleanest rubber. The manufacturers have begun to realise the advantages of the freedom from impurities which Eastern plantation rubber possesses, and this good opinion is too valuable to be endangered by using less care in preparation.

Rubber Seed for Oil Manufacturing Purposes.

Rubber seed, both with the huskon and decorticated, has been sent to the Imperial Institute and to various commercial firms dealing

in such products in Europe and Australia in order to introduce this article to them with a view to a future market.

The oil from the seed is a drying oil not unlike linseed oil in appearance and smell, and probably will prove as good as, if not better than, the latter oil in manufacture of paints and varnishes. Manufactures or dealers wishing to have samples of the seeds either decorticated or in the shell should communicate with this department. A profit per acre after paying all expenses of picking, husking, packing and shipping of at least $5 to $8 may be earned on estates with trees in full fruit bearing. While the demand for considerable quantities of seed for planting purposes continues, this method of disposing of seed is vere much more profitable than the sale for oil, but with an immense number of trees producing fruit the supply for planting purposes will soon greatly exceed the demand and an additonal market is needed. If the seeds are left on the ground they germinate freely and money must be spent in weeding out the young plants.

The questions in regard to the best methods of preparation and packing of the seed in exporting it for oil purposes continues to engage the attention of the Department of Agriculture, and a further report will be issued.

Labour.

The supply of coolies for rubber estates, which is the most important factor in the prosperity of such an industry, has during 1907 not given any reason for alarm. The total number of coolies on rubber estates in the Federated Malay States on 31st December was 58,073, as against a total at the same date in 1906 of 39,274, an increase of 50 per cent. This increase has been about equal in the different races working on estates, with the exception of Chinese not so great an increase is recorded. A considerable number of Tamils have come from work in the mines to agriculture, to which they are probably better suited; this was due to the fact of the new regulations in regard to returns of Tamil employees under "The Tamil Immigration Enactment." Government has undertaken to organise the machinery for controlling and helping the continuous import of coolies, and this implies a continuity of police and a constant care which on number of individual efforts, however well directed, could effect.

Estate Labour, Malay Peninsula, 1907.

——	Federated Malay States.	Straits Settlements.	Johore.	Total.
Tamils ...	43,824	5,361	462	49,647
Javanese ...	6,029	1,336	173	7,538
Malays ...	2.872	1,543	423	4,838
Chinese ...	5,348	6,606	894	12,848
Total ...	58,073	14,886	1,952	74,911

The total number of coolies employed on estates in the Malay Peninsula in 1907 was 74,911, of which two-thirds are Tamils from Southern India.

ESTATE LABOUR, FEDERATED MALAY STATES, 1907.

———	Selangor.	Perak.	Negri Sembilan.	Pahang.	Total.
Tamils ...	25,440	13,970	4,165	249	43,824
Javanese ...	2,674	2,552	773	30	6,029
Malays ...	755	1,608	419	90	2,872
Chinese ...	1,808	2,271	1,226	43	5,348
Total ...	30,677	20,401	6,583	412	58,073

COOLIE SANITATION.

The health of coolies on estates has improved during the past year, and while owing to the conditons associated with opening up land in large areas a great deal of malaria, dysentery and other diseases prevails, there has been a diminution of these cases compared with the previous year.

This is due to increased care for the sanitation of the coolie in draining and clearing ravines and swamps which harbour the mosquito, in building healthy weather-proof lines and in providing pure water supply. The coolies which have been introduced during the year are, as a rule, of rather better physique then previously. Many coolies are still passed from India and admitted to the Federated Malay States without the requisite amount of reserve health to fit them to be useful, and hardworking labourers, but the proportion of such undesirables is becoming less, and when all coolies are in a vigorous state of health when recruited there will be little trouble in dealing with the sickness afterwards acquired.

The site for lines should not be chosen until all the desiderata for health are satisfied. I have known cases where lines have been builtin unsuitable spots and the coolies suffered continuously in health until the lines were abandoned and others built on better sites.

The planter is careful to provide healthy conditions for his labour force, but is frequently not so solicitous about the conditions under which he himself lives. In a country where malaria is rife, and in conditions which lay him specially open to infection, it is most unwise not to be extremely careful that the conditions of his board and lodging are such that he can live well. Among the European planters of the Federated Malay States it is unusual to find one who has not been in hospital once or more. In Ceylon, it is as unusual to find a man who has been an inmate of the hospital, and many planters there have spent long periods in the low country without ever having been ill enough to require treatment in hospital.

Shareholders and Directors should realise that by the provision of comfortable and pleasant houses and sufficient pay to" do themselves well" they are more likely to get a good return for their money. The amount of time and money lost through Superintendents and Assistants being either too ill to work or feeling listless and unable to throw themselves with energy into their not too easy task, is much greater than would be supposed.

My experience in visiting the planter on his estate is that the man whose bungalow is well looked after and who keeps a good table is less likely to be on the sick list than the man who from a desire to keep down expenses and not to waste time in opening up the estate, lives in a hastily made house and leaves the running of it entirely to his servants.

The relation between malaria and agriculture is an interesting question. No country can ever be completely successful in agriculture, however favourable its climate and soil, if the conditions are not suitable for healthy life of mankind. The amount of malaria existing in any district considerably affects the rapidity and cost of opening the rubber land. In a place where malaria is rife a small percentage only of the coolies are vigorous and able to do a full day's work, the European Superintendent is not able to supervise so carefully if he also is subject to attacks of fever.

To take all measures which will reduce the danger of malaria infection is therefore as important an operation in opening up a rubber estate as the planting or other strictly agricultural operations.

Annual Agri-Horticultural Show.

A most successful Agri-Horticultural Show took place at Kuala Kangsar, organised by an energetic Committee, and having the advantage of patronage and help from H. H. the Sultan of Perak and the British Resident of Perak. The Show was very representative of the best produce of agriculture in Malaya, as well as native arts and craft. It had an additional interest in being a more typical Malayan Show than those held in towns of cosmopolitan character, and its success was to a great extent due to the efforts of Malayan gentlemen, especially the Dato Sri Adika Raja, I.S.O., and the Dato Stia Raja.

H. E. the High Commissioner, who was in residence at Kuala Kangsar, peformed the opening ceremony, which was attended by their Highnesses the Sultans of Perak, Johore and Selangor. An interesting exhibition from Brunei of the characteristic metal work of that country was brought over by native chiefs escorted by Mr. Roberts of the Public Works Department.

These Shows, especially when attended, as the Kuala Kangsar Show was, by large numbers of natives engaged in agricultural pursuits spread the desire to improve different cultivations. At the same time they are of value to those engagaed in helping the natives by allowing them to see in what direction help may be best given.

Seeds of prize fruits are obtained from the exhibitions and form a basis upon which the work of improvement of fruits by selection and other methods is carried on by the department.

GENERAL.

A good many scientific and agricultural experts visited the Native States in search of information in regard to various tropical cultivations.

Professor Treub, the renowned head of the scientific work in all departments in Java, and the leading authority on tropical agriculture, paid a short visit on his way to Sumatra, and gave valuable information.

Mr. Norman McLeod, Assistant Conservator of Forests, Southern Nigeria, who was sent officially by H. E. Sir Walter Egerton, Governor of that Colony, to enquire into rubber and other matters, made a tour of planting districts.

Mr. M. K. Bamber Government Chemist, Ceylon, Dr. Olssen Seffer, of Mexico, Mr. A. E. Pratt, Zoologist, *en route* to New Guinea, where he is leading an expedition into the hitherto unexplored regions of that island, Dr. Kuhleman, a Chemical Rubber Expert from Hanover. Mr. Richmond from the Philippines, and others spent some times in the Native States, and were assisted by the department in their researches.

J. B. CARRUTHERS,

Director of Agriculture and

Government Botanist, F. M. S.

PACKING PARA RUBBER SEED FOR EXPORT.

The demand for para rubber seeds in different parts of the tropical world has become very considerable of late and as the seed of this tree deteriorates very rapidly after it is ripe and soon looses its germinating power it is not easy to send large quantities over long distances without a large percentage of losses unless the packing is done very carefully and the best method adopted.

Numerous experiments have been tried at the Botanic Gardens here in Singapore from time to time in order to find out the best method of packing the seed. Judging by reports received from different parts of the globe, the system we now adopt seems to be as nearly perfect as possible, as will be seen by the following extract from the "Report of the Botanic Gardens of British Guiana for the year 1907-1908."

"In May 10,800 para rubber seeds were received from the Royal "Botanic Gardens, Singapore, from which 6,956 plants were raised, i. e. "64.4 per cent of the seeds germinated after being 53 days on the journey.

"In October and the beginning of November 52,000 seeds arrived "from the same place and when sown produced 42,100 plants which "gives a germination of approximately 80 per cent.

"These were received packed in one pound biscuit tins with burnt "rice husk. Three tins were then enclosed in a canvas covering and "were within the limit of weight allowed for by the Post Office, by "which means they were sent.

"The importance of obtaining *Hevea brasiliensis* seeds by post to "avoid as far as possible any delay on the journey, as well as the risk "of being heated in the hold of a vessel was pointed out in my last "report.

"This is further emphasized by the fact that at about the same "time as our own seeds arrived a Water Street firm sent 10,500 para "rubber seeds, packed in six kerosine tins which had travelled in the "ordinary way as merchandise, to be grown for them at the Gardens. "These seeds received the same careful treatment as our own but produced "only 18 plants."

This is an excellent record for seeds which were in the tins for over 53 days from the time of packing until their arrival in British Guiana and it is very doubtful if the 80% germination has ever been or ever will be beaten for a journey of this length. I have seen many much poorer germinations on estates in the Peninsula where the seeds were actually grown, harvested and sown.

From this and many similar results obtained by us in packing para rubber seeds we have every confidence in recommending this system of packing to all who wish to send seeds over long distances and obtain the best results.

Equally satisfactory results have been obtained by using powdered charcoal as a packing material but we find burnt rice husks cheaper and also lighter which is a very important point in favour of its adoption when sending seeds by Parcel Post.

As hundreds of thousands of seeds are now being shipped out of the Peninsula and as particulars of the best system of packing are constantly being asked for, I give the following particulars which may be of some value.

Tins 12" x 8" x 5" are used. These are made locally and cost about 20 cents each. Each when properly packed holds 600 seeds and is within the Post Office regulation weight of eleven lbs., for this class of parcel.

In packing the seeds a layer of burnt rice husk in put on the bottom of the tin and then alternate layers of seeds and husk are added until the whole 600 seeds have been packed when the tin will be quite full.

A lid is put on each tin but is not soldered down as we find that this prevents an excess of moisture collecting inside the tins and the burnt rice husk, is thereby kept at the proper degree of moisture.

I should have mentioned that the burnt rice husk (or powdered charcoal) should be slightly moistened before packing in order to keep the seeds in a fresh healthy state ; but care should be taken that not too much miosture is added or the seeds are liable to germinate and rot on a long journey.

The demands from British Possessions and other Colonies in the tropics for para rubber seeds from the trees in the Singapore Botanic Gardens are steadily increasing, 400,000 seeds will be dispatched during the present year and many orders have been refused owing to our inability to supply the seeds.

All our seeds are sent long distances on journeys of not less than one month packed as described above and it is extremely satisfactory to be able to state such results from this method.

T. W. Main,

Botanic Gardens Singapore.

THE AGRICULTURAL EXHIBITION AT MEDAN, SUMATRA.

The following is a report on my visit to the great Industrial and Agricultural Exhibition recently held in Deli. I left Penang in the S. S. "Malaya" on the evening of the 27th ultimo and returned on the morning of the 2nd instant. On arriving in Medan I called on Dr. de Bussy the Honorary Secretary of the Land Conut or Agricultural Section. He kindly directed me in finding lodgings which would not have otherwise been easily obtainable. The exhibition was held on the esplanade facing the Station, the area is said to be about seven acres in extent, and so numerous were the building that every part of it was covered. The arrangements were in the hands of a general purposes Committee with the Resident of the East Coast as President, and each of the 8 Divisions were managed by Sub-Committees. The divisions were (*a*) Buildings (*b*) Industrial Arts (*c*) Chinese (*d*) Agriculture (*e*) Cattle (*f*) Battak (*g*) Amusement (*h*) Fisheries. Judging from the admirable way every thing seemed to work, the organization was excellent. The buildings were solid structures of planking, with attap roofs, and I was informed that the large structure known as the feast tent, put up a little while ago by the Railway Co. when celebrating their 25th Anniversary cost 8000 guilders alone.

The building allotted to the agricultural section was a lofty domed octagonal structure with avenues radiating from it. The central portion contained the very complete collections of tobacco leaves of nearly if not every known kind whilst outside the building on one side were a series of nursery beds shewing the tobacco plants in vigorous growth. This was a wise precaution for at this season the tobacco grown on estates is all harvested so that it gave visitors an opportunity of seeing the living plants; and to this must be added the value to planters, of seeing other kinds of tobacco than what are usually cultivated on estates, In addition to the different kinds of tobacco shewn in the Central Hall, the Director of the Agriculture Experimental Station shewed a complete series of plants under glass cases which were more or less affected by diseases which prey on tobacco together with the distinctive insects in their various stages, all neatly set up in glass cases; and easy for inspection and study. To supplement the above instruction, were a number of huge photographs on the walls all of which illustrated some phase of tobacco culture. Not less interesting were the series of soils from different parts of Sumatra, Deli, Langkat, Serdang &c., and a complete equipment of apparatus for analysis of soil was shewn along side. The remaining exhibits in the Central building call for no comment being of such things as harness and saddlery, a few cases of tools etc.

No. 1 Avenue was devoted to Agricultural implements used on estates, such as ploughs, various baskets and hand barrows for carrying tobacco leaves; levels, and road tracers and such like. In avenue No. 2 was contained some most interesting agricultural produce. The lower half was occupied by the united Serdang Sumatra Rubber Plantation Co. who shewed some excellent Liberian Coffee in bulk, both in cherry and parchment, some bales of the tree cotton cleaned and uncleaned. The most interesting of their exhibits was the Rambong rub-

ber. Arrangements had been made for having supplies of latex and the process of coagulating and washing were gone through. A 12 horse power Campbell's oil Engine, and a Brown & Davidson's washer being used for this purpose. Mr. V. Ris the General Manager also gave an exhibition of tapping the Rambong which contrary to the usual practice was in the herring bone style. I was informed that on one of their estate they had 30,000 trees each yielding about 1½ lbs. of dry rubber which sold at present at about 2/6d per lb., as against about 4/2 for fine para. I noticed three para rubber trees about 2 or 3 years old which had been pulled up by the roots; they were badly attacked by the para rubber fungus, *Fomes Semitostus*, and in conversation with Mr. Ris he thought that when a tree was discovered infected with it the trees should be destroyed for ¼ of an acre round it to try and stamp it out. The remaining portion of this avenue was for the most part occupied by Mr. L. A. Range, General Manager of several estates who shewed Rambong in sheet form. Seeds of Para, Lagos silk, and Rambong rubbers, ratans, padi in the ear, sugar from the sugar palm, gambier, tea, vanilla, wood specimens, and a brick-making machine completed this avenue. None of the last named were in any quantity, nor do they call for any special comment, except, perhaps in case of the vanilla pods, which were ready good and shew what can be done with this somewhat difficult plant to cultivate. The remaining avenues were taken up by exhibits of tradesmen, who shewed almost everything a planter could want in the way of tools and machinery for the Estate. The models of Estate buildings, such as drying and fermenting sheds, coolie lines etc., were on a large and comprehensive scale. As regards the rest of the exhibition it consisted of an unrivalled collection of articles from the Battaks. The pottery, brass work, and gold thread cloth from Java, were also of an excellent description. The brush and basket work of the blind from the Banding Institute Java was strong and serviceable.

In comparing the Deli exhibition with the Agricultural Exhibitions of our own, it is necessary to state at once that the Deli Exhibition was not a purely Agricultural one. It was primarily an exhibition of a general nature in which amusements formed a considerable part as it was got up to commemorate the 10th anniversary of Queen Wilhelmina's Coronation, a comparison would not therefore be of any value. As regards agriculture so far as the staple crop of the country was concerned the Exhibition was well nigh complete; but even here one was struck by the absence of competition and although competition was open in some of the Divisions it was difficult to know what articles were or were not intended for competition. As regards the flower, fruit and vegetable show, which took place on Sunday the 30th it was a modest affair. Some of the flowers shown were good. I have never seen better carnations, nor chrysanthemums in the East. Both fruit and vegetables were but poorly represented, but when it is remembered that this was only a small item in a very large programme, due credit must be given for the display. I was informed that the entire exhibition cost between fifty and sixty thousand dollars of which the management hoped to get back about 50 per cent by gate money, etc., and judging by the crowds of natives that swarmed through the grounds, I think they will do it.

10,000 natives went through the barriers on Monday the 31st. In conclusion I must acknowledge the courtesy of the officials, especially of Dr. De Bussy, the Honorary Secretary of the Agricultural Division.

W. Fox.

ANNUAL REPORT OF THE NEGRI SEMBILAN PLANTERS' ASSOCIATION, 1907-1908.

GENTLEMEN,

We your Committee place before you our 10th Annual Report.

1. *Meetings.*—There have been six General Meetings during the year and several Committee Meetings. The former have been better attended, but your Committee must again impress on you that the Planting Community in these States has become a very large power and that as co-operation is the secret of success it is desirable that all who can possibly do so should attend the Meetings.

2. *New Members.* Several new Members have joined the Association but only two new Estates have been registered. We have to record that Mr. T. H. Hill, the pioneer planter of the F. M. S., retired during the year under review.

3. *Coffee and Coconuts.*—Owing to high rents these products have not received any attention, but we understand that the quit rent on land for the cultivation of Coconuts has been materially reduced.

4. *Para Rubber.*—As will be seen by the cultivation returns which are embodied in this report, considerable extensions have been made. Your Committee regret to have to record a serious drop in the prices of all grades of rubber owing to various causes, but, as plantation rubber has proved satisfactory to the manufacturer, your Committee is of opinion that if prices do not fall to any great extent there is yet a great future before the industry. The best method of preparation has not been absolutely determined on; but Crepe appears to have found favour during the year.

5. *Roads.*—We are glad to have to record considerable improvement under this heading with regard to existing roads. New roads are under construction, and we hope that the Government will pursue a forward policy in respect to the maintenence of old roads, and the construction of new ones.

6. *Medical and Hospitals.*—As anticipated in the last annual report, this Association engaged the services of a Medical Officer on the 1st of August last; the scheme, as regards the Association, has not worked out satisfactorily, and consequently it has been abandoned. The question of health has not been lost sight of and independent arrangements have been made with local practitioners.

Several joint hospitals in convenient positions have been erected, and some on individual Estates with good results. During the year under review the health in this State has been exceedingly bad.

European Hospital at Seremban.—Your Committee cannot too strongly express their disapproval of the action taken by the Government in closing down the European Hospital which affects the

European Community. We wish to express our appreciation of the work done in the hospital during the past year under most unfavourable circumstances.

7. *Labour.*—The year under review sees the introduction of the Tamil Immigration Fund Enactment. This Act has been severely criticised by the members of the Association recorded at their meeting of 5th August, 1907, that they were unanimously in favour of legislation on the labour question. Whether this Enactment will have the desired effect of flooding the country with Indian labour still remains to be seen, but one point at least has been gained: the Government has recognised that every employer should bear his part in introducing labour into the country. That the Enactment bears heavily on old established Estates is undoubtedly true, but it must be remembered that a very large proportion of the assessment falls upon the Government itself as being one of the largest employers of labour. A weekly service has been established between India and the F. M. S. which should prove attractive to the coolie. It seems at the present stage difficult to forecast the amount this assessment will produce, but your Committee are given to understand that, should the funds prove sufficient, those employers of labour who pay the first assessment are likely to receive a rebate.

Sunday Names.—The question of Sunday Names has been under consideration and this Association agreed that, provided all employers of labour were unanimous, they should be abolished.

8. *Ad valorem Duty on Rubber.*—Your Committee are of opinion that the Government should be approached with a view to the abolishment of duty on rubber. It seems unfair that the rubber producers of these States should be placed at a disadvantage by paying duty when the adjacent British and Dutch Colonies pay none.

9. *Land Tenure.*—The increase in premium and quit rent, which the Government saw fit to impose, are still in force and a large amount of capital which would have found its way into this State has undoubtedly been diverted to other countries where land is cheap and labour conditions more favourable.

10. *Drink Question.*—This question has again received considerable attention among the planting community with regard to their Indian coolies. Your Committee are of opinion that the present condition of affairs in this respect is absolutely disgraceful. To raise revenue licenses are promiscuously issued to Chinamen, in the majority of cases with absolutely no Government Supervision over the quality of liquor sold, and quite recently a case has occurred which goes to prove that some supervision is absolutely necessary. All that the planting community would ask, whilst recognising that a certain amount of drink is necessary to the coolie, that proper supervision over the quality of the liquor sold be exercised by the Government as is done in India.

11. *Postal Communications and Telephones.*—The importance of telephonic communication has now become a necessity. This State is very much behind hand in this respect. Your Committee are glad to report steps have been taken to improve matters by the establishment of local post offices and a telephone exchange at Seremban.

12. *General.*—Your Committee think that considerable discredit has been thrown on the planting community in general by a recent letter written to the Singapore Free Press by Mr. E. V. Carey. They think it only fair to point out that the abuses enlarged upon in his letter have not to their knowledge occurred in this State and they here record their opinion that the planters of Negri Sembilan have, as a body, done their best in the interests of their employers.

W. BLOOMFIELD DOUGLAS,
(*Hon. Sec.*)

C. MALCOHN CUNNING
(*Chairman*).

SINGAPORE MARKET REPORT.

September, 1908.

Articles.	Quantity sold.	Highest price.	Lowest price.
	Tons.	$	$
Coffee Palembang ...	...	...	...
Bali	41	23½	22
Liberian ...	56	27	24
Copra	6,593	7.40	6.75
Gambier	2,280	8.15	7.40
Gambier Cube, Nos. 1&2 ...	220	12.50	11.75
Gutta Percha, 1st quality ...	...	300.00	240.00
Medium ...	...	240.00	80.00
Lower ...	...	80.00	12.00
Borneo Rubber, 1, 2 & 3 ...	...	105.00	40.00
Gutta Jelotong	...	7.60	5.62½
Nutmegs, 110's	...	21.00	20.50
80's	...	22.00	21.00
Mace, Banda	...	90.00	78.00
Amboyna ...	6	64.00	63.00
Black Pepper	2,208	11.00	9.85
White Pepper (Sarawak) ...	974	16.87½	15.45
Pearl Sago, Small ...	145	3.60	3.50
Medium ...	10	...	...
Large ...	...	...	...
Sago Flour, No. 1 ...	4,524	3.04	2.82½
No. 2 ...	356	1.55	1.40
Tapioca Flake, Small ...	600	5.65	4.75 fair.
Medium ...	80	...	...
Pearl, Small	329	8.60	4.30 fair.
Medium ...	636	5.50	4.85 fair.
Bullet	...	...	...
Tin	3,060	67.62½	65.50

GOW, WILSON & STANTON, Limited—
India Rubber Market Report.

13 & 23, ROOD LANE, LONDON, E.C

4th September, 1908.

Since the last auction there has been a steady but rather quiet market. The quotation for Para has shown very little change, but Plantation kinds have been rather more enquired for.

The quantity on offer at to-day's sale was smaller than that for the corresponding auction last year, several parcels which had been expected being too late to be included.

There was a fairly good demand for most descriptions at about ½d. per lb. advance on last auction quotations. The better kinds of Crepe chiefly attracted attention and were well competed for, the highest price in the sale, viz., 4/7 being realised for a pale lot of this grade. The next best price was 4/6, which was paid for a parcel of Gikiyanakande Worm. Sheet and biscuits sold at from 4/1½ to 4/2½ according to quality, the finest lot—a parcel from Syston Estate—being withdrawn for want of competition.

The lower grades of Crepe were hardly as strong as at the last sale, but Scrap was more sought after than has lately been the case.

Number of Packages Advertised.		Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.		
		Ceylon.	Malaya.	Totals.	No. of Packages sold.	Price.	Hard Fine Para.	Plantation. Fine	Plantation. Scrap.
To-day	670	13	20½	33½	501	3/8⅛	4/0¾	4/1 to 4/7	2/8½ to 3/1
Corresponding Sale Last year	799	16	24¼	40¼	245	4/8⅞	4/6½	5/0 to 5/7¾	3/6 to 3/9¼

To-Day's Quotations.

Sheet and Biscuits.		Crepe and Block.		Unwashed Scrap.	
Good to Fine Biscuits. Good to Fine Sheet.	4/1½ to 4/2½	Very Pale ...	4/7	Good to Fine	2/8½ to 3/1
		Fine Palish...	4/1 to 4/4	Ordinary ...	2/0 to 2/6½
		Medium .. Dark and Brown.	3/8½ to 3/11½ 2/10¾ to 3/5¾		

Para Statistics.

Receipts at Para for *August*.

1908.	1907.	1906.	1905.
1,900 tons	1,500 tons	1,690 tons	1,300 tons

Total Crop Receipts—*July to August*.

1908.	1907.	1906.	1905.
3,210 tons ...	2,870 tons ...	3,530 tons ...	2,750 tons.

Plantation Exports.

CEYLON—1st January to 10th August.

1908	159¾ tons
1907	115½ tons
1906	79 tons
1905	29 tons

MALAYA—1st January to 31st July.

	Singapore.	Penang.	Total.
1908...	520¼ tons...	262¾ tons...	783 tons
1907...	323 tons...	34¼ tons...	357½ tons
1906...	143 tons...	20½ tons...	163½ tons

Particulars and Prices of To-Day's Sale.

CEYLON

Mark.	Pkgs.	Description.	Price.
Kepitigalla	1	Good block ...	3/9
Gikiyanakande	16	Very fine pale worm pt. sold ...	4/6
	3	Good to fine crepe ...	3/11¾
	5	Dark crepe ...	3/2½
C. L.	52	Good bronish to black crepe pt. sold	2/11 to 3/9
	7	Rejections and dull biscuits ...	bought in
	3	Cuttings ...	bought in
Glanrhos	22	Good to fine pale biscuits pt. sold	4/2½
	11	Good brown crepe ...	3/3 to 3/3½
Glanrhos	2	Dark block (soft and barky) ...	2/8
Marakona	1	Sheet ...	4/2½
Clontarf	3	Biscuits ...	4/2½
Verulapitiya	1	Sheet ...	4/2½
	1	Scrap ...	2/8½
Welkandala	3	Dark biscuits ...	4/1¾ to 4/2
	4	Good brown crepe ...	3/1¾ to 3/3
	1	Dark blocked crepe ...	2/5
T.	13	Good to fine biscuits ...	bought in
	2	Mottled crepe ...	bought in
O. C. W., etc.	2	Good scrap and rejections ...	3/-
	3	Low scrap ...	bought in
	4	Palish worm ...	bought in
Warriapolla	2	Good scrap ...	2/10 to 3/0½
	2	Biscuits ...	4/2
	1	Scrap (heated) ...	bought in
	3	Rejections ...	bought in
Warriagalla	3	Biscuits ...	bought in
	1	Scrap (heated) ...	bought in
Gonakelle	1	Biscuits ...	4/2½
	2	Good scrap and rejections ..	3/-
Doranakande	2	Scrap ...	2/11
	2	Biscuits pt. sold ...	3/10
M. A. K.	4	Crepe and rejections pt. sold ...	3/9
L. B. & Co.	3	Good to fine sheet pt. sold ...	4/2½
	1	Scrap ...	2/6½
D. C.	5	Good to dark crepe ...	3/3½ to 4/0¾
Ambatenne	4	Biscuits ...	4/2¼ to 4/2½
	5	Fine scrap and rough biscuits ...	3/- to 3/4

Mark.	Pkgs.	Description.	Price.
Densworth	1	Dark biscuits ...	4/2½
	1	Dirty scrap ...	bought in
Tallagalla	5	Dark biscuits ...	4/2¼
	8	Scrap and rejections ...	2/1 to 3/-
Sorana	9	Biscuits ...	4/2¼
	15	Scrap and lumps ...	2/6 to 2/11½
Taldua	1	Good worm ...	bought in
	2	Good crepe ...	3/10¼ to 3/11
Syston	4	Very fine biscuits pt. sold ...	4/2
Doranakande	4	Good biscuits ...	4/2½
	1	Dull sheet ...	bought in
	7	Good and medium scrap ...	2/10¼ to 3/1¼
Ayr	2	Good biscuits and sheet ...	4/2
Arapolakande	8	Biscuits ...	4/2½
	5	Good brown crepe ...	3/3½ to 3/5
Hattangalla	3	Biscuits ...	4/2½
	1	Pressed crepe ...	3/3
Ingoya	4	Good sheet ...	4/2½
S.	1	Biscuits ...	4/2½

MALAYA.

Mark	Pkgs.	Description.	Price.
Glenmarie	7	Dull sheet pt. sold ...	4/2½
	1	Dark pressed crepe ...	2/10
Kamuning	3	Good sheet ...	4/2½
	3	Good brown crepe ...	3/9
	5	Scrap rejections, etc. ...	1/6 to 3/5
R. R.	2	Very fine pale crepe ...	4/7
	4	Mixed ,, ...	4/0½
	7	Good and dark ...	2/10¾ to 3/8½
	1	Dark block (soft) ...	bought in
	5	Good biscuits ...	4/2
Sungei Krudda	42	Good to fine pale crepe pt. sold ...	4/- to 4/4
	18	Good brown crepe ...	3/3 to 3/4
Bila	2	Good brown crepe ...	3/3¼
J. & Co.	1	Rejections ...	2/9
Linggi Plants	27	Fine palish crepe ...	bought in
	26	Good crepe ...	4/0½ to 4/1½
	2	Soft brown crepe ...	3/0½
	17	Good brownish and darkish ...	3/2½ to 3/11¼
Damansara	17	Sheet ...	4/2½
	31	Good to fine crepe pt. sold ...	3/1½
	20	Dark pressed crepe and Rambong	3/1 to 3/2¼
S. K. R. Co., Ltd.	8	Good to fine crepe ...	3/11½ to 4/1
	3	Good to dark crepe ...	3/3½
E. K. K. P.	3	Good and dark sheet ...	4/1½ to 4/2½
	3	Scrap and rejections ...	2/11¾ to 3/0¼
B. & D.	4	Scrap and rejections ...	2/6
B. W., etc.	7	Brown and dark crepe ...	3/2¼ to 3/10¼
	9	Scrap crepe, etc. ...	2/- to 3/2½
P. S. E.	12	Fine sheet ...	4/2½
	2	Dark block ...	bought in
	7	Good brown to dark crepe ...	3/2¾ to 3/10
S.	20	Sheet pt. sold ...	4/2½
P. R.	5	Sheet ...	4/2½
	2	Good scrap ...	3/
	2	Scrap block ...	2/3½
S. R. Co., Ltd.	17	Sheet ...	bought in
	3	Dark crepe ...	bought in
L. C. Y. Y. L. V. R. Co., Ltd.	1	Rejections ...	bought in

Mark.	Pkgs.	Description.	Price.
Klang F. M. S. K. P. Co., Ltd.	30 Block		... bought in
	7 Block		... bought in

GOW, WILSON & STANTON, Limited— India Rubber Market Report.

13 & 23, Rood Lane, London, E.C

18th September, 1908.

Since the last sale the Market has shown a general improvement, and the quotation for Para has this week touched the highest point recorded for nearly a year.

There has been a good demand privately for Plantation sorts, and to-day's auction, which was the largest yet held of these descriptions, passed with good competition for most grades, the medium and lower kinds of Crepe being in most request, and making an advance of from 2d. to 3d. per lb. on recent quotations.

Sheet and Biscuits were in rather large supply, and these did not show the same improvement, though the best price realised, viz., 4/3½, was 1d. per lb. higher than that of the last sale.

The highest price of the auction was 4/7 realised by some pale Crepe from the Consolidated Malay Rubber Estates, while a parcel of the same grade from Matang sold at 4/6.

It will be seen from the figures given below that the shipments from 1st January to middle of August from Ceylon and Malaya amounted to about 1,000 tons, against 1,101 tons for the whole of 1907.

A report on the Trade of the Consular District of Para just issued, contains interesting information regarding the Rubber Industry in Brazil, and indicates the serious effect of the recent low prices on the production from that country.

Number of Packages Advertised.	Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.		
							Plantation.	
	Ceylon.	Malaya.	Totals.	No. of Packages Sold.	Price.	Hard Fine Para.	Fine.	Scrap.
To-day 1413	6½	69¼	75¾	984	3/9⅝	4/2	4 4/2 to7	2/8½ to 3/3
Corresponding Sale Last Year 799	16	24¼	40¼	245	4/8⅞	4/6½	/5/0 to 5/7¾	3/6 to 3/9¼

To-Day's Quotations.

Sheet and Biscuits.		Crepe and Block.		Unwashed Scrap.	
Good to fine Biscuits. / Good to fine Sheet.	4/2 to 4/3½	Very Pale ...	4/6 to 4/7	Good to Fine	2/8½ to 3/3
		Fine Palish...	4/2 to 4/4	Low ...	6d. to 1/6
		Medium ...	3/10½ to 4/1		
		Dark and Brown.	3/- to 3/8¾		

Para Statistics.

LIVERPOOL IMPORTS. From 1st January to 31st August.		* STOCKS. At 31st August.	
1908	12,919 tons	1908	2,246 tons
1907	8,464 tons	1907	1,655 tons
1906	7,828 tons	1906	1,119 tons

*Excluding those in Dealers hands.

Plantation Exports.

CEYLON.—1st January to 24th AUGUST.		MALAYA.—1st January to 12th August.		
		Singapore.	Penang.	Total.
1908	192 tons	1908...540½ tons	..268 tons	...803½ tons
1907	124 tons	1907...336½ tons...	35½ tons	...372 tons
1906	86⅛ tons	1906...163½ tons...	22½ tons	...186 tons
1905	32½ tons			

Particulars and Prices of To-Day's Sale.

CEYLON.

Mark.	Pkgs.	Description.	Price.
North Matale	5	Fine biscuits	... 4/3½
	1	Brown crepe	... 3/9½
	2	Scrap	... 1/6 to 2/6
Ayr	1	Sheet	... 4/2
Northumberland	1	Good biscuits	... 4/2
Clara	1	,,	... 4/2
Taldua	5	Good crepe	... 3/6 to 4/-
	1	Dark heated crepe	... 2/6
	1	Palish worm	.. bought in
Rosebury	3	Good biscuits	... 4/2 to 4/2¼
	1	Dark sheet	... 4/2
	4	Scrap cuttings, etc.	... 1/- to 3/3½
	1	Fine scrap	... bought in
Palli	7	Good biscuits and sheet	... 4/2
	1	Scrap	... 3/1¼
Densworth	2	Biscuits	... 4/2¼
	3	Scrap	.. 6d. to 2/10½
Pathregalla	1	Biscuits	... 4/2
	2	Scrap	... 2/10 to 3/-
P. G. D.	3	Scrap (earthy)	... bought in
H. L. W.	4	Palish worm	... 4/1¾
Warriagalla	2	Scrap	... 1/- to 1/6
	1	Dull biscuits	... 4/0¾

Mark.	Pkgs.	Description.	Price.
T. C. S.	4	Dull biscuits	4/1¼
M. A. K.	2	Scrap (dirty)	bought in
Devituria	2	Fine sheet	4/2¾
D. C.	1	Good crepe	4/1
Tudugalla	3	Brown crepe	3/6
Polatagama	4	Good to fine crepe	3/6 to 4/0¾
	1	Dark crepe	3/2
Weoya	5	Good biscuits	bought in
	1	Block	bought in
Panawattee	1	Pressed sheet	bought in
Putupaula	7	Biscuits	bought in
T.	4	Good biscuits	bought in
Glanrhos	4	Good biscuits	bought in
Ayr	1	Dark sheet	bought in
C. L.	2	Good darkish crepe	bought in
Culloden	10	Darkish crepe	3/4¼ to 3/6
	3	Black pressed crepe	2/9¼
Heatherley	6	Brownish crepe	3/4½ to 3/6½
Ellakande	2	Darkish	3/4
Langsland	10	Good biscuits	bought in
	1	Dark block	bought in
D. C.	4	Good crepe	4/2½
	1	Scrap crepe	3/2¼
Welkandala	2	Darkish biscuits	4/2¼
Glanrhos	1	Very fine pale biscuits	4/4
Koswana	1	Biscuits	4/2¼
	1	Scrap	3/-
Goonambil	1	Good biscuits	4/2¼
	1	Ceara ,,	4/2¼
	1	Good scrap and pieces	3/-
Duckwari	1	Fine biscuits	bought in
Vicartons	1	Ceara ,,	4/1¾
	1	Scrap	bought in

MALAYA.

Mark.	Pkgs.	Description.	Price.
Matang	19	Good to very fine pale crepe	4/2¾ to 4/6
	12	Good brown to dark	3/3¼ to 4/4-
	8	Good sheet	4/2½
R.	59	Very fine pale crepe pt. sold	3/8½ to 4/4
M. P.	7	Good to darkish crepe	3/5½ to 3/11½
Ltd.	1	Rambong	3/5
B. & D.	5	Sheet and biscuits	3/6¼ to 4/1½
	1	Rambong crepe	3/4
	5	Scrap, etc.	2/- to 3/-
B. & D.	2	Dark pressed crepe	2/9
	2	Good crepe	4/0¼
Damansara	11	Good sheet	4/2¼
	22	Fine crepe	4/2¼
	20	Good to dark pressed crepe pt. sold	2/11½ to 3/5
E.	4	Good and rough sheet	4/- to 4/2¼
K. K. P.	2	Scrap, rejections, etc.	3/0½ to 3/1½
S. K. R. & Co., Ltd.	10	Fine palish to brownish crepe	3/10½ to 4/2½
	6	Dark crepe	3/3
S. & D.	10	Good sheet	4/2
	1	Scrap	2/11½
L. E. D.	3	Sheet	4/2
	3	Scrap	3/1¼
Senawang	1	Good sheet	4/2
	2	Dark scrap	2/8½ to 2/11
	5	Dark crepe and rejections, etc.	1/6 to 3/2

Mark.	Pkgs.	Description.		Price.
R. A. G.	2	Sheet	...	4/2
	4	Good scrap and rejections	...	2/11 to 3/1½
S. Y. D.	3	Dark scrap (heated)	...	6d.
Jugra Est.	6	Sheet	...	4/2
	11	Good and dark crepe	...	3/4½ to 3/10½
	3	Rambong	...	3/6
B. & D.	21	Good sheet	...	3/11 to 4/2¼
F. D. P.	7	Scrap and rejections	...	2/11 to 3/3
	3	Dark crepe	...	3/4
	11	Crepe	pt.sold ...	3/- to 4/2¼
G. H.	5	Fine crepe	...	bought in
S. B. N.	1	Good crepe	...	bought in
A. M. P. Co., Ltd.	12	,, ,,	pt. sold ...	4/2
S. S. B. R. Co., Ltd.	9	Good sheet	...	4/2
	9	Dark crepe	...	3/3¼ to 3/3½
Jebong	16	Brown crepe	...	3/5
	1	Pale crepe	...	bought in
Highland Est.	1	Brown crepe	...	bought in
E.	21	Dark crepe	...	bought in
R. W. & Co.	12	Fine pale crepe	...	bought in
	4	Brown crepe	...	bought in
	9	,,	...	bought in
V. R. & Co., Ltd. Klang F. M. S.	1	Pressed crepe	...	bought in
P. S. E.	11	Good to fine sheet	...	bought in
A. M. R. Co., Ltd.	11	Darkish crepe	...	bought in
Linggi	17	Dark crepe	...	bought in
B. B.	4	Good darkish crepe	...	bought in
P.	2	Dark and pressed crepe	...	bought in
C. M. R. E., Ltd.	4	Brownish	...	3/11
B. & D.	2	Dark	...	bought in
M. A. K.	15	Black pressed	...	bought in
Linggi Plants	13	,, ,,	...	bought in
B. R. R. Co., Ltd.	21	Good to dark pressed crepe	...	bought in
V. R. & Co., Ltd. Klang F. M. S.	32	Good to fine sheet	...	bought in
	49	Good and darkish crepe	...	3/9½ to 3/11
	3	Pressed crepe	...	3/11
	40	Brown and dark crepe	...	3/3 to 3/7¼
	30	Block	...	bought in
S. R. Co., Ltd.	26	Good sheet	...	bought in
	29	Brown to dark crepe	pt. sold ...	3/5 to 3/8
K.	9	Fine sheet	pt. sold ..	4/2¼
	15	Good crepe	...	3/6 to 3/9½
L. C. Y. Y. L.	1	Rejections	...	bought in
K. P. Co., Ltd.	3	Good theet	...	4/2¼
	1	Good crepe	...	3/9
	8	Dark ,,	...	3/3½ to 3/4¼
	3	Black pressed crepe	...	bought in
	1	Block	...	bought in
P. R.	5	Good sheet	...	4/2
	1	Scrap	...	3/1½
S. B.	1	Fine sheet	...	4/2¼
Bila	13	Good sheet	...	4/2 to 4/2½
	16	Good to dark crepe	pt. sold ..	3/5¼ to 3/9½
	3	Rejected sheet	...	3/10
	2	Good scrap	...	3/1¾
S. R.	5	Pale sheet	...	4/2¼
Sungei Krudda	17	Fine palish crepe	...	4/4
	11	Palish to dark	pt. sold ..	3/4½ to 4/0¼
T.	10	Palish crepe	...	bought in

Mark.	Pkgs.	Description.	Price.
	17	Good sheet ...	bought in
	9	Dark crepe ...	bought in
	1	Biscuits ...	boukht in
	14	Good crepe ...	bought in
R. V.	2	Brown crepe ...	bought in
G. E.	2	Good biscuits pt. sold ...	4/3
Linggi	7	Very fine pale and palish crepe pt. sold	4/1½
	28	Good to dark brown crepe pt. sold	3/2½ to 3/6
C. M. R. E., Ltd.	20	Fine pale crepe ...	4/3¾ to 4/7
	16	Palish pt. sold ...	3/11¼ to 4/1
	8	Dark ...	3/5
	1	Rambong ...	bought in
	8	Fine pale crepe ...	bought in
	3	Brownish ,, ...	bought in
P. P. E.	14	Fine palish crepe ...	bought in
	11	Brownish and mottled to dark crepe pt. sold ...	3/3 to 4/0½
Sungei Choh	5	Good to very fine pale sheet ...	4/2¼ to 4/2½
Beverlac	2	Fine sheet ...	4/2¼
	7	Darker ...	4/2¼
	1	Good mottled crepe ...	3/8½
	6	Good darkish to dark crepe pt. sold	3/4 to 3/6½
	2	Good scrap ...	3/1¼
P. S. E.	2	Fine sheet ...	4/2¼
	2	Good to darkish crepe ...	3/4 to 3/7¾
R.	7	Fine sheet ...	4/2¼
S. S. C.	1	Darkish crepe ...	3/3¼
Shelford	5	Dull smoked sheet ...	4/2¼
	7	Good and dark crepe ...	3/4¼ to 3/8¾
T. A.	9	Fine pressed Rambong ...	bought in
K. S. R.	1	Scrap ...	1/6
	1	Biscuits and scrap ...	bought in
B. R. R. Co., Ltd.	19	Fine sheet ...	4/2¼
	9	Good to fine crepe ...	3/8¼ to 3/9
	1	Pressed crepe ...	bought in
	21	Brown ,, pt. sold ...	3/4½ to 37¾
F. (S) R. Co., Ltd.	12	Sheet ...	4/2¼
	24	Good to dark crepe ...	3/2½ to 3/8¼
Highlands	47	Fine sheet pt. sold ...	4/2½ to 4/3½
	35	Good crepe ...	3/8½ to 3/11¾
	7	Dark ,, ...	3/4½ to 3/5¼

JAVA.

Mark.	Pkgs.	Description.	Price.
Sengon	6	Good biscuits (Ceara) ...	4/- to 4/2¼
	1	Rejections ...	3/6
	1	Scrap (heated) ...	bought in
	1	Block ...	bought in

CEYLON, STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

September 4th, 1908.

The following Lots, comprising about 19 Tons Straits and 13 Tons Ceylon, were offered at Auctions to-day and sold as follows :—

Straits and Malay States.

Mark.	Pkgs.	Description.		Price.
Damansara	17	Cases Sheets	...	4/2½
Selangor	51	,, Crape	part sold ...	3/1 at 3/10¾
S. K. R. Co., Ltd.	11	,, ,,	...	3/3½ at 4/1
Sungei Kapar				
E.	3	Pkgs Sheets	...	4/1½ at 4/2½
K. K.	2	Cases Scrap	...	3/0¼
P.				
B. & D.	4	Pkgs. ,,	...	2/6
B. W.	5	Cases Crepe	...	3/10¼
B. B. W.	1	,, ,,	...	3/2¼
R. B.	2	,, Scrap	...	3/0½
Glenmarie	7	Pkgs. Sheets	4 sold ...	4/2½
Batu Tiga	1	Case Crepe	...	2/10
Kamuning	3	,, Sheets	...	4/2½
G. & C. L.	3	,, Crepe	...	3/9
R.	1	,, Sheets	...	3/5
R. R.	14	Pkgs. Crepe	...	2/10¾ at 4/7
	5	Cases Biscuits	...	4/2
Sungei Krudda	65	,, Crepe	nearly all sold...	3/3 & 4/4
Bila	2	,, ,,	...	3/3¼
C. D.				
Linggi Plants Ltd.	31	,, ,,	...	bought in
Linggi Plants	15	,, ,,	...	3/3 at 3/11¼
P. S. E.	12	,, Sheets	...	4/2½
	9	Pkgs. Crepe	...	3/2¾ at 3/10
R. R.	20	Cases Sheets	...	4/2½
S.				
S. B.				
	5	,, ,,	...	4/2½
P. R. & Co.	4	Pkgs. Scrap	...	2/3½ at 3/-
S. R. Co., Ltd.	17	Cases Sheets	...	bought in
S. R. & Co., Ltd.	3	,, Crepe	...	,,
L. C. Y.				
Y. L.	1	,, Sheets	...	4/2
S. P. R.				
V. R. Co. Ltd., Klang	29	Pkgs. Block	...	bought in
F. M. S.				
K. P. Co., Ltd.	7	Cases ,,	...	,,

CEYLON.

Mark.	Pkgs.	Discription.		Price.
P. G. D.	3	Cases Scrap	...	bought in
H. L. W.	4	,, Worms	...	,,
Warriapolla	3	,, Scrap	2 sold ...	2/10 at 3/0½
	2	Pkgs. Biscuits	...	4/2
Doranakande	2	Cases Scrap	...	2/11
M. A. K.	1	,, Biscuits	...	bought in
L. B. & Co.	2	,, Scraps	...	,,
Deviturai	3	,, Sheets	1 sold ...	4/2½
D. C.	5	,, Crepe	...	3/3½ at 4/0¾
Ambatenne	6	Pkgs. Biscuits	...	3/4 at 4/2½
	3	Cases Scrap	...	3/- at 3/1
Densworth	1	,, Biscuits	...	4/2¼
Tallagalla	6	,, ,,	...	2/10 at 4/2¼
	7	,, Scrap	...	2/1 at 3/0¼

Mark.	Pkgs.	Description.		Price.
Sorana	9	Cases Biscuits	..	4/2¼
	15	,, Scrap	...	2/6 at 2/11½
Taldua	1	,, Worms	...	bought in
Doranakande	5	,, Biscuits 4 sold	..	4/2½
	5	,, Scrap	...	3/1¼
Ayr	1	,, Biscuits	...	4/2¼
	1	,, Sheets	...	4/2¼
Gikiyanakande	16	,, Worms 6 sold	...	4/6
	8	,, Crepe	...	3/2½ at 3/11¾
C. L.	3	,, Worms	...	bought in
	52	,, Crepe part sold	...	2/11 at 3/9
	7	,, Sheets	...	bought in
Linggi	22	,, Crepe	...	4/0¾ at 4/1¼
B. N.				
Glanrhos	22	,, Biscuits nearly all sold...		4/2½
	13	,, Crepe	...	2/8 at 3/3½
Clontarf	3	,, Biscuits		4/2½
Veralupitiya	1	,, Sheets	...	4/2½
T.	7	,, ,,	...	bought in
F. W.	8	,, Scrap	...	,,
Arapolakande	8	,, Biscuits	...	4/2½
Hattangalla	3	,, ,,	...	4/2½
	1	,, Crepe	...	3/3
Ingoya	4	,, Sheets	...	4/2½
Arapolakande	5	,, Crepe	...	3/3½ at 3/5

The price of FINE HARD to-day on the spot is 4/0½ per lb.

CEYLON, STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

September 4th, 1908.

PARA.

The Market during the past week has been firm, and a fair business has been done at dearer rates. The sales include: Fine Hard on the spot at 4/1 for new and 4/2 for old and afloat at 4/0¼ at 4/0½, Sept. and Oct. 3/11 at 3/11½, Oct. Nov. and Dec. 3/10¼ at 3/10½ per lb.

Soft Fine done on the spot at 3/10½ and afloat at 3/10, Nov. Dec. at 3/7¾ per lb.

Negroheads—Scrappy scarce and wanted, Buyers at 2/10 at 2/10¼ per lb. Cametas 2/2, Islands 1/8½ values.

BOLIVIAN.

Sales of spot Fine at 4/2, being to-day's value.

MOLLENDO.

Small sales on the spot at 3/7½ for Fine.

PERUVIAN.

No sales of Fine reported, value of spot 3/11½ per lb.

Ball—A fair business done. On the spot at 2/7 at 2/7¼, Oct. Nov. 2/7¾ at 2/8 and Nov. Dec. at 2/8 per lb.

Slab—Buyers at 2/1 at 2/1½ per lb.

MEDIUM GRADES. Although the demand is a trifle better, these qualities are still most difficult of sale, and only for better grades can Buyers privately be found.

PLANTATION GROWN PARA. A fair business has been done in Biscuits and Sheets up to 4/2 per lb.

Particulars of the Auctions as follows:—

PARA & PERUVIAN. 55 Pkgs. Offered and 34 sold: Fair average quality Ball 2/7½, low inferior 2/- per lb.

MOLLENDO. 20 Pkgs. Offered and 2 sold: Coarse Entrefine and Virgin 3/2 per lb.

COLOMBIAN and CENTRAL AMERICA. 164 Pkgs. Offered and 44 sold: Fair white Scrap 2/2, softish Peruvian Ball character 2/2 per lb.

UGANDA. 38 Pkgs. Offered and 9 sold: Lumps 2/8, Pears part white 2/5, clean pale pressed Sheet 3/3¼ per lb.

ASSAM. 118 Pkgs. Offered and 36 sold: Fine Red Plantation 3/4 per lb.

The following were offered and bought in:—

ORINOCO.	79	Pkgs. ... ...
MANGABEIRA.	110	,, ...
MOZAMBIQUE.	101	,, ...
MADAGASCAR.	17	,, ...
LOANDA.	36	,, ...
RANGOON.	89	,, ...
BORNEO.	54	,, ...
TONQUIN.	12	,, ...
PENANG.	29	,, ...

PLANTATION GROWN PARA. Of 767 Pks. Offered nearly all sold at about 1d. per lb. advance for Biscuit, Sheet and Crepe. Scrap was about 2d. better.

Crepe. Fine pale 4/4, palish and mottled 3/10 at 4/1, dark 3/2½ at 3/9, black 2/10 at 2/11 per lb.

Biscuits & Sheets. 4/2¼ at 4/2½ per lb.

Scrap. Inferior to good 2/5 at 3/0½ per lb.

Worms. Fine pale 4/6 per lb.

CEYLON, STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

The following Lots, comprising about 63 Tons Straits and 12 Tons Ceylon, were offered at Auction to-day and sold as follows:—

STRAITS AND MALAY STATES.

MARK.	PKGS.	DESCRIPTION.	PRICE.
Matang	31	Cases Crepe	... 3/4 at 4/6
	8	,, Sheets	... 4/2½

Mark.	Pkgs.	Description.	Price.
R. M. P. Ltd.	65	,, Crepe ...	3/5 at 4/4
B. & D.	3	,, Sheets ...	4/1½
Damansara	11	,, ,, ...	4/2¼
Selangor E. K. K. P.	42	,, Crepe mostly sold ...	2/11½ at 4/2¼
	3	,, Sheets ...	4/2¼
S. K. R Co., Ltd.	16	,, Crepe ...	3/3 at4/2¼
S. & D.	10	,, Sheets ...	4/2
	3	,, Sheets ..	4/2
L. E. D.	3	,, Scrap ...	3/1¼
R. Sanawang R.	1	,, Sheets ...	4/2
	1	,, Scrap ...	2/11
Sanawang	2	,, Rambong Ball ...	3/2
R. A. G.	2	,, Sheets ...	4/2
S. Y. D.			
S. R.	3	,, Scrap very low and dirty ...	6d.
Jugra Estate	6	,, Sheets ...	4/2
	14	,, Crepe ...	3/4½ at 3/10½
B. & D.	13	,, Sheets ...	4/2 at 4/2¼
F. D. P.	6	,, Biscuits ...	3/3 at 4/-
B. & D.	3	,, Crepe ...	3/4
	5	Pkgs. Sheets ...	3/11 at 4/2
	7	Cases Crepe ...	3/1 at 4/2¼
S. S. B. R. Co., Ltd.	9	,, Sheets ...	4/2
	9	,, Crepe ...	3/3¼ at 3/3½
Jebong	17	,, ,, 16 sold ...	3/5
Vallambrosa V. R. Co., Ltd.	32	,, Sheets ...	bought in
Klang F. M. S.	127	,, Crepe ...	3/2¼ at 4/2½
	30	Pkgs. Block ...	bought in
S. R. Co., Ltd.	26	Cases Sheets 17 sold ...	4/4½
	29	,, Crepe part sold ...	3/5 at 3/8
K.	9	,, Sheets 1 sold ...	4/2¼
	15	,, Crepe ...	3/6 at 3/9½
K. P. Co., Ltd.	3	,, Sheets ...	4/2¼
Klanang	12	,, Crepe part sold ...	3/3½ at 3/9
	7	,, Block ...	bought in
S. B. P. R. & Co.	5	,, Sheets ...	4/2
Bila	13	,, ,, ...	4/2 at 4/2¼
	16	,, Crepe part sold ..	3/5¼ at 3/9½
S. R.	5	,, Sheets ...	4/2¼
Sungei Krudda	28	,, Crepe ...	3/4½ at 4/4
Linggi Plants	35	,, ,, 2 sold ...	4/1½
C. M. R. E. Ltd.	56	,, ,, part sold ...	3/5 at 4/7
Sungei Chop	5	,, Sheets part sold ...	4/2¼ at 4/2½
P. S. E.	9	,, ,, ...	4/2¾
Selaba	3	Pkgs. Crepe ...	3/3¾ at 3/7¾
Shelford	5	Cases Sheets ...	4/2⅛
	7	,, Crepe ...	3/4¾ at 3/8¾
B. R. R. Co. Ltd.	19	,, Sheets ...	4/2⅜
	31	,, Crepe mostly sold ...	3/4½ at 3/9
F. S. R. Co., Ltd.	12	,, Sheets ...	4/2⅛
	24	,, Crepe ...	3/2 at 3/8¾
Highland Estate	54	,, Sheets part sold ...	4/2½ at 4/3½
	42	,, Crepe ...	3/4½ at 3/11¾
North Matale	5	Cases Biscuits ...	4/3½
Northumberland	1	,, ,, ...	4/2
Clara	1	,, ,, ...	4/2
Taldua	6	,, Crepe ...	2/6 at 4/-

Rosebury	5	,,	Biscuits	... 3/2 at 4/2⅝
Palli	7	,,	Sheets	... 4/2
Densworth	2	,,	Biscuits	... 4/2⅝
P. G. D.	3	,,	Scrap	... bought in
T. C. S. R.	4	,,	Biscuits	... 4/1⅞
M. A. K.	2	,,	Scrap	... bought in
T. B. & Co. Leviturai	2	,,	Sheets	... bought in
Dudugalla	3	,,	Crepe	... 3/6½
Polatagama	5	,,	Crepe	... 3/2 at 4/0¾
Putupaula	7	,,	Biscuits	... 4/2 bid
F. W. T.	2	,,	,,	... 4/2 bid
Roschaugh Culloden	13	,,	Crepe	... 2/9¾ at 3/6
Roschaugh Neatherly	6	,,	,,	... 3/4½ at 3/6½
Langsland	10	,,	Biscuits	... 4/2 bid
F. W.	31	,,	Crepe	... bought in
T.	17	,,	Sheets	.. bought in
R. V.	2	,,	Crepe	... bought in
P. P. E.	5	,,	,, part sold	... 3/3 at 4/0½
Peverlay	9	,,	Sheets	... 4/2½
	7	,,	Crepe part sold	... 3/4 at 3/8½
	2	,,	Scrap	... 3/1⅞

The price of FINE HARD to-day on spot is 4/1¾ per lb.

(*Lewis and Peat, London.*)

JOHN HADDON & CO. SPECIAL PRODUCE LETTER.

London, September 11th, 1908.

STRAITS.

BEESWAX — The bleaching season being over the demand has become very quiet, to sell yellow descriptions are cheaper. Bombay and Calcutta:—Good to fine we value at £5.10. to £6/2/6 per cwt.

CAPSICUMS — Well grown beans are readily saleable at 50/- to 60/- per cwt. but bad growth are not wanted.

CAMPHOR — A good business has been done but of late the tendency has been downward, China Crude on the spot 155/- per cwt. and to arrive 150/- per cwt. c.i.f. Malay Straits Camphor worth on the spot about 150/- per cwt.

CLOVES — Have been an irregular market, a fair business has been done in Zanzibar, small parcels of Penang and

CLOVES.—*Continued.* Singapore have been offered from time ot time realising fair rates, value Penang, full to fine bright bold 9d to 11d. Amboyna, dull to fine 7½d to 8d. per lb. Ceylon dull to fine 7d to 8d per lb. Zanzibar, fair to fine bright 4d to 4¼d per lb.

COPRA

The market very quiet and tendency downward. Since our last report the value has declined fully 10/- to 15/- per ton, a good business has been done at the declining rates.

GUM COPAL

After an interval of two months an accumulation of supplies was brought forward amounting to 5790 packages of all descriptions.

1130 cases 3973 baskets and 685 bags offered and about 2300 packages sold. Manilla and Macassar, good medium and small pinky scraped at 56/6d to 58/-, dark amber and brown at 51/ to 53/-, medium to bold fluted at 31/- to 36/- blocky ditto at 30/-, medium pale pipey part small at 27/- to 28/-, rough blocky soft sorts at 21/- to 24/6d. Nubbles, good hard pale at 35/- to 36/6d, fair palish at 29/- to 31/-. white small and medium at 35/-, ordinary dark at 20/-, Chips, good palish at 24/- to 25/-, fair at 23/-. Siftings, ordinary to middling palish at 23/-, to 25/-. Dust at 6/- to 13/6d. Pontianac good nubbles at 38/-, mixed softish at 27/-, Sambas, good to fine pale scraped at 70/- to 75/-, good pinky at 67/- to 69/- pale block at 60/- Nubbles, good palish at 36/-. Amboyna, rough dark blocky sorts at 21/- to 21/6d. Nubbles, mixed part dark and rough at 19/- to 23/6d. Chigs, good bold at 24/- to 26/-, small at 21/- 22/-, blocky ditto at 20/- to 20/6d. Pickings, blocky dark at 15/-, Benguela Sorts, fair at 60/- to 62/-. ditto part rough and blocky at 45/- to 50/-, dark pickings at 25/- to 30/-. Angola, fair red £5.5.0.

GUM DAMAR

In heavy supply, met a moderate demand, and part sold at steady prices. Of 294 cases 64 baskets and 535 bags Singapore offered only 72 packages sold, good pale selected at 77/-, fair small dusty palish sorts at 53/6d to 54/-. Of 268 bags and 29 baskets Penang 275 packages sold, fair gray sorts at 49/- to 49/6d, gray pickings at 37/-, block at 40/-; fair specky. Siftings at 36/-to 37/-6, blocky at 33/-, palish dusty at 31/-, blocky dust at 25/-. Batavian: 117 packages offered and sold without reserve, small palish sorts at 44/-; Siftings, good palish part specky at 35/- to 46/-. Dust 23/- to 24/-. Ceylon 9 packages offered and 8 sold, good sorts at 72/6d, dark pickings at 3/- subject.

ISINGLASS

The offerings of Penang met a good demand and a large proportion sold at firmer rates for Leaf, and firm to dearer prices for Tongue, Sagon was also in large supply but met with good competition, both long and round leaf selling at 2d to 4d per lb., advance.

Penang:--93 packages offered (about, 22,500 lb.,) and 67 sold: Round Leaf, good heavy at 4/2d to 4/3d, middling to fair at 3/6d to 3/11d, middling to fair reddish at 3/1d to 3/5d, reddish mixed part small at 2/4d to 2/8d, small part thin and rough dark at 1/7d to 2/3d, common pickings at 11½d. Tongue, good heavy at 3/9d to 3/11d, middling to fair ditto at 3/1d to 3/3d, fair pale long at 2/6d to 2/7d, small thin at 2/2 to2/3d, Tails, good bold at 1/9d, fair at 1/4d. Purse, fair at 1/1d, middling at 8½d to 10d, pickings at 3½d.

Saigon:---83 packages offered (about 17,000 lb.,) and 80 sold: Long Leaf, fair to good heavy palish at 5/3d to 5/9d, fair ditto at 5/- to 5/2d, middling to fair yellow and reddish at 4/4d to 4/11d, ordinary to middling reddish part small at 3/1d to 3/11d. Round Leaf, fair to good palish at 4/2d to 4/4d, middling to fair yellow and reddish at 3/5d to 3/10d, reddish mixed dark at 2/8d to 3/2d, ditto mixed small and rough at 2/2d to 2/6d. Tails, good at 1/5d to 1/7d.

PEPPER

The market has been very dull and prices in buyers favour. Sellers of Singapore September/October shipment at $2\frac{13}{16}$d for usual Continental ports, $2\frac{22}{32}$d for New York.

White Pepper:—Has also been quiet with but a small business closing Singapore September/October shipment at $4\frac{13}{16}$d c.i.f.

On the spot black Singapore fair quality sellers at 3d. White Singapore at 5d and Penang at 4½d per lb.

SAGO

Has been a very quiet market and to sell the spot parcels prices have had to be reduced, medium sold at 13/- to 13/6d per cwt., and small fair quality at 11/- per cwt.

SHELL

M.O.P. There was a good attendance of buyers at these sales, Macassar sold at 10/- to 20/- advance and Mergui at firm prices, Green Snail Shells sold well.

Macassar and Aroe:—969 cases offered and 707 sold at 10/- to 20/-advance. Bold and medium £9 to £10.7.6., small and chicken £8.15. to £9.10; pickings £5.5, to £10; pieces £5 to £7.2.6.

Island Sorted: AA, chicken £8.5. to £8.10: A, small medium £8.10. tn £9.7.6; B, stout medium £8.5.0 to £9.5.0; C, bold heavy £9 to £10.17.6; D, more or

SHELL—*Continued.* less wormy £6.10. to £7.2.6; E, pickings £4.5.0 to £5.2.6; W.P.C., part defective £7.10. £7.15.

Mergui:— 201 packages offered and 154 sold at rather dearer rates. Bold and medium £7.2.6 to £7.7.6; medium and chicken £6.2.6 to £6.10.: pickings £4.15. to £6.10; pieces 90/-

Green Snail:—581 packages offered and 422 sold at firm prices. New Guinea: bold 24/- to 36/-; defective 14/- Mergui: Medium and bold 43/- to 44/-, smali 32/- to 33/6d; defective 16/6d to 17/-, Penang and Singapore: Small to bold part defective 26/- to 29/-.

TAPIOCA Also lower, Singapore fair dullish sold down to $1\frac{1}{2}$d and good Java at $1\frac{1}{2}$d to $1\frac{3}{8}$d per lb. For arrival October November Singapore $1\frac{1}{3}\frac{3}{2}$d c.i.f., closing buyers at $1\frac{3}{8}$d. Pearl Tapioca:—quiet dullish to fair Penang sold at 12/6d to 13/6d per cwt. Privately sellers of Singapore medium Seprember/October shipment at 13/- and fair Penang at 12/-c.i.f.

TIN The market has continued a downward course and Miners have done well to sell. The outlook is by no means settled lower prices may be expected.

Straits £130.15. to £130.17.6, 3 months at £130 to £130.2.6 which is a drop of about £6.10. since our last report.

Selangor.

Abstract of Meteorological Readings in the various Districts of the State for the month of September, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
General Hospital, K. Lumpor	29.877	142.8	79.3	88.3	72.0	16.3	75.7	82.0	73.2	81	S. W	10.17	1.16
Pudoh Gaol ,, ,,	...	...	...	...	...	...	...	...	...	...	...	9.02	1.58
District Hospital ,,	...	...	...	...	...	...	...	...	...	...	...	12.78	1.60
,, Klang	...	...	...	...	...	...	...	...	...	...	...	5.23	1.15
,, Kuala Langat	...	...	...	86.3	75.0	11.3	...	...	...	...	...	8.24	1.97
,, Kajang	...	...	...	86.3	75.8	10.4	...	...	...	...	...	5.87	1.33
,, Kuala Selangor	...	...	...	88.2	77.9	10.2	...	..	...	...	...	11.03	2.32
,, Kuala Kubu	...	...	...	90.2	70.9	19.3	...	...	...	...	...	15.12	2.81
,, Serendah	...	...	...	90.8	71.1	19.7	...	...	...	...	...	11.57	1.30
,, Rawang	...	...	...	89.4	70.9	18.5	...	...	...	...	...	17.19	2.39
Sabak Bernam	...	...	...	...	...	...	...	...	...	...	...	5.21	7.35

STATE SURGEON'S OFFICE,
Kuala Lumpor, 16th October, 1908.

E. A. O. TRAVERS,
State Surgeon, Selangor.

Negri-Sembilan.

Abstract of Meteorological Readings in Negri Sembilan Hospitals for the month of September, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Seremban	...	132.3	79.7	84.9	70.7	14.2	74.4	.863	...	85	S. W.	8.65	1.72
Kuala Pilah	...	...	...	...	...	...	...	...	...	...	...	4.35	2.10
Port Dickson town	...	...	...	...	...	...	...	...	...	...	...	9.90	1.40
Mantin	...	...	...	...	...	...	...	...	...	...	...	10.75	2.52
Ayer Kuning	...	...	...	...	...	...	...	...	...	...	...	8.40	2.30
Tampin	...	...	...	...	...	...	...	...	...	...	...	10.15	1.85
Jelebu	...	...	...	...	...	...	...	...	...	...	...	3.84	70
Port Dickson Beri-Beri Hospital	...	...	...	...	...	...	...	...	...	...	...	12.42	1.90
Total ...	...	...	...	...	...	...	...	...	...	...	...	68.46	14.49

STATE SURGEON'S OFFICE,

Seremban, 13th September, 1908.

J. D. MELCHIZEDEK,

For State Surgeon, Seremban.

Kelantan.

Abstract of Meteorological Readings in Kelantan for the month of September, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
				Mean F°	Mean F°	Mean F°						Inches	Inches
Kuala Lebir	...	...	...	88.97	72.85	16.12	...	...	...	...	...	10.30	1.86
Kuala Pergan	...	...	...	...	...	...	...	...	...	...	...	16.40	2.85
Kuala Kelantan	...	...	...	83.93	73.87	10.43	...	...	...	...	...	6.32	1.10
Taku Plantation	...	...	...	...	...	...	...	...	...	...	...	10.52	2.30

STATE SURGEON'S OFFICE,
Kelantan, 7th October, 1908.

JOHN D. GIMLETTE,
State Surgeon, Kelantan.

Perak.

Abstract of Meteorological Readings in Perak for the Month of September 1908.

DISTRICT	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Taipeng	...	149	80·75	92	72	20	76·68	865	...	82	...	22.25	5·76
Kuala Kangsar	...	...	79·93	92	71	21	75·70	835	...	81	...	7.71	3·99
Batu Gajah	...	155	79·64	91	73	18	76·38	867	...	86	...	11·95	2·29
Gopeng	...	...	79·32	92	65	27	74·85	807	...	80	...	17·64	5·71
Ipoh	...	...	80·59	92	72	20	76·34	850	...	81	...	13·52	3·74
Kampar	...	...	78·58	93	70	23	75·78	857	...	86	...	15·48	4·74
Teluk Anson	...	...	81·49	92	70	22	76·98	865	...	80	...	13·06	2·56
Tapah	...	...	80·18	92	62	30	74·16	766	...	74	...	17·18	2·25
Parit Buntar	...	...	80·79	90	70	20	76·50	856	...	81	...	16·07	6·52
Bagan Serai	...	...	80·77	91	72	19	76·52	856	...	81	...	18·17	6·53
Selama	...	...	80·59	92	72	20	76·60	865	...	82	...	22·54	3·20

STATE SURGEON'S OFFICE,

Taipeng, October 14th, 1908.

M. J. WRIGHT,

State Surgeon Perak.

Penang.

Abstract of Meteorological Readings in Criminal Prison Observatory for the month of September, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Mean Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Mean Maximum.	Mean Minimum.	Mean Range.	Mean Wet Bulb.	Mean Vapour Tension.	Mean Dew Point.	Mean Humidity.			
	Ino.	°F	°F	°F	°F	°F	°F	°F	°F	°F		Ins.	Ins.
Government Hill	...	...	...	...	...	...	...	...	...	...	...	40.96	...
Fort Cornwallis	...	...	...	...	...	...	...	...	...	...	.	33.70	...
The Prison	29.877	137.8	78.1	89.6	73.7	15.9	77.3	.922	76.8	90	N. E.	25.54	5.22
Balik Pulau	...	...	...	...	...	...	...	...	...	...	...	28.42	...
Lepu Asylum	...	...	...	...	...	...	...	...	...	...	...	17.48	...
Pangkore	...	...	...	...	...	...	...	...	...	...	...	15.00	...
Bruas	...	...	...	...	...	...	...	...	...	...	...	11.45	...
Lumut	...	...	...	...	...	...	...	...	...	...	...	11.36	...

CRIMINAL PRISON PENANG,
Penang, 14th October, 1908.

S. LUCY,
Seenior Medical Office Penang.

Pahang.

Abstract of Meteorological Readings in the various Districts of the State for the month of August, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Kuala Lipis ...	...	...	77·9	92 0	67·0	19·5	75·5	...	...	...	...	5·72	2·20
Raub ...	...	...	78·8	93·0	66 0	20·4	74·6	...	...	...	...	6·23	1·65
Bukit Fraser ...	...	...	...	...	...	...	...	...	...	...	...	2·48	0·64
Bentong ...	...	...	80·6	93 0	68·0	18·7	75·3	...	...	...	...	4·67	1·15
Temerloh ...	...	...	...	94·0	70·0	18·3	...	...	...	...	...	7·37	3·80
Pekan ...	...	...	82·0	93·0	70·0	17·3	77·0	...	...	...	...	7·70	1·90
Kuantan ...	...	...	82·6	93 5	70·0	17·1	77·3	...	...	...	..	4·23	1·25

STATE SURGEON'S OFFICE,

Raub, 24th September, 1908.

W. H. FRY,

State Surgeon, Pahang.

Seremban.

Table Showing the Daily Results of the Reading of Meteorological Observation taken at the General Hospital, Seremban, for September. 1908.

Date.	Temperature of Radiation.						Tempt Radiation.		Wind. Direction.		Tempt of Evaporation.			Computed Vapour Tension.			Relative Humidity.			Clouds 0 to 10			Weather Initials.			Rain.	
	9 H.	15 H.	Mean.	Maximum.	Minimum.	Range.	Sun.	Difference Sun & Shade.	9 H.	15 H.	9 H.	15 H.	Mean.	9 H.	15 H.	Mean.	9 H.	15 H.	Mean.	9 H.	15 H,	21 H.	9 H.	15 H.	21 H.	Inch	Cts.
1	79	86	82.5	88	71	17	144	56	W	S W	73.9	79.4	76.6	839	1.008	923.5	85	80	82.5	4	5	2	C	C	S		
2	78	85	81.5	87	70	17	145	58	N W	S W	72.9	75	74	810	873	841.5	84	72	78	3	2	1	S	S	S		
3	77	87	82	89	71	18	146	57	N W	S W	73.6	75.5	74.5	829	884	856.5	89	69	79	2	5	2	S	C	S		
4	79	84	81.5	88	70	18	139	51	W	S W	73.9	77.4	75.6	839	938	888.5	85	80	82.5	6	3	7	C	S	N		
5	78	83	80.5	87	71	16	136	49	S W	W	72.9	76.3	74.6	810	905	857.5	84	80	82	4	5	4	C	C	C		
6	76	79	77.5	86	69	17	137	51	S W	S	74.3	73.9	74.1	848	839	843.5	94	85	89.5	5	6	7	C	C	N		
7	78	83	80.5	84	70	14	144	60	N W	S W	71.2	79.7	75.5	765	1.010	887.5	79	90	84.5	2	0	1	S	C	S		.18
8	79	83	81	86	69	17	145	59	W	S W	72.3	76.3	74.3	793	905	849	80	83	81.5	4	5	9	C	C	N		
9	78	85	81.5	88	70	18	144	56	N W	W	74.6	81.7	78.1	857	1.082	969.5	89	90	89.5	5	6	3	C	C	S		
10	77	80	78.5	84	70	14	139	55	S W	W	72.3	78.7	75.5	793	978	885.5	80	90	85	4	5	7	C	C	N		
11	78	82	80	86	70	16	138	52	W	S W	72.9	80.3	76.6	810	1.033	921.5	84	95	89.5	5	9	8	C	N	N		
12	76	83	79.5	85	69	16	134	49	W	S W	72.6	81.3	77	801	1.067	934	89	95	92	5	6	7	C	C	N		
13	76	79	77.5	84	69	15	139	55	S W	S W	70.9	75.6	73.2	756	883	819.5	84	90	87	6	8	9	C	N	N		.06
14	79	75	77	80	69	11	132	52	S W	N W	67.2	73.3	70.2	660	820	743	87	94	80.5	6	10	8	C	S	N		
15	78	80	79	85	70	15	140	55	S W	S W	72.9	78.3	75.6	81	968	889	84	95	89.5	2	3	5	S	S	C		.32
16	78	84	81	88	70	18	139	51	N W	S W	72.9	74	73.4	810	840	825	84	72	78	3	2	5	S	S	C		
17	76	80	78	86	72	14	130	44	N W	N W	74.3	76.6	75.4	848	860	904	94	90	92	4	4	5	C	C	C		.15
18	77	81	79	82	73	9	126	44	N W	N W	73.6	74	73.8	820	849	839	89	80	84.5	3	4	5	S	C	C		
19	76	82	79	84	73	11	135	51	N W	W	74.3	77	75.7	848	926	887	94	85	89.5	7	3	4	N	C	C		
20	78	83	80.5	85	72	13	136	51	S W	S W	74.6	78	76.3	857	956	906.5	89	85	87	4	3	5	C	S	C		
21	77	85	81	86	73	13	142	56	S W	S W	72.6	75	73.8	801	873	837	89	72	80.5	3	7	7	C	N	N		
22	76	84	80	85	72	13	138	53	N W	N W	73.6	74	73.8	829	840	834.5	89	72	80.5	7	4	5	N	C	C		
23	77	86	81.5	87	71	16	140	53	W	N W	74.6	74	74.3	857	856		89	68	78.5	3	5	5	S	C	S		
24	78	81	79.5	83	72	11	132	49	N W	N	74.6	76	75.3	857	897	877	89	85	87	3	7	2	S	N	S		.08
25	78	77	77.5	84	71	13	128	44	N W	N W	71.6	73.6	72.6	774	829	801.5	89	89	89	2	10	7	C	N	N		4
26	75	76	75.5	88	71	17	96	18	N W	N W	75.3	72.6	74	877	801	839	94	89	91.5	7	8	8	N	N	N		
27	77	79	78	89	71	18	129	50	N W	S W	73.9	72.3	73.1	839	793	816	85	80	82.5	3	5	3	S	C	S		2
28	79	82	80.5	83	71	12	129	46	N W	S W	76.3	75.3	75.8	904	877	890.5	94	80	87	7	7	4	N	N	C		.62
29	78	82	80	83	71	12	116	33	S W	S W	76.3	75.3	75.8	904	877	890.5	94	80	87	7	2	3	N	S	S		.13
30	77	85	81	86	71	15	140	54	S W	S W	73.6	73.4	73.5	829	826	827.5	89	68	78.5	1	3	5	S	S	C		.10
Total	77.4	82	79.7	84.9	70.7	14.2	132.3	54			73.3	75.4	74.4	821	906	863	87	83	85							8	00

Seremban, 12-10-1908.

D. Melchizedek,
Apothecary.

Reliable Underwear.

INDIAN GAUZE VESTS

the Coolest
& most suitable for the
INDIAN CLIMATE

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No. 12.] DECEMBER, 1908. [Vol. VII.

Agricultural Bulletin

OF THE

STRAITS

AND

FEDERATED MALAY STATES.

EDITED BY

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Director of Botanic Gardens, S. S.

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PRICE OF

THE AGRICULTURAL BULLETIN

of the

Straits Settlements and Federated Malay States

FROM 1909.

Owing to the increased size of the Bulletin and the increased cost of printing it is found necessary to inerease the price of the Bulletin to cover expenses.

From the first of January, 1909

The Price of the Bulletin will be as follows:—

Annual Subscription for Straits Settlements and Federated Malay States	$5.00
Annual Subscription for other places in Malaya ...	$5.50
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Single copy ...	50 cts. or s.1/2d.
Whole Volume	$5.00

H. N. RIDLEY,

Editor.

AGRICULTURAL BULLETIN

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No. 12.] DECEMBER, 1908. [Vol. VII.

ANALYSIS OF SOILS IN THE BOTANIC GARDENS SINGAPORE.

We are indebted to Mr. C. Kelway Bamber for the following analysis of soils in the Economic Gardens Singapore. The samples were especially selected from certain spots in the gardens, with a view of eliciting a comparison of those of the low damp ground on which the rubber trees grow well, with the hilly parts, which for a long time had been exposed by cultivations in past years and deprived of most of their humus.

Soil No. 1, was taken from the rubber plantation near the main entrance gate of the Economic Gardens. The ground is low lying and has water always at a foot or a foot and a half below the surface. It appears to be the remains of a silted up river, originally tidal, as close by nipa fruits are still to be met with at no great depth. The soil is full of remains of old trees, which presumably grew there later, and it was probably a thick forest. In early days of the settlement it appears to have been cleared, and cultivated with indigo by the Chinese till 1884 when it was taken over by the Gardens Department. The sample taken was from the vicinity of the big tree No. 2 figured in a previous number of the Bulletin.

No. 2, is taken from a hill of rather poor soil and somewhat rocky with masses of laterite scattered through it. Here rubber trees were planted some years ago, and they are now fine well grown but rather short stout trees feathering to the ground. In some parts of this slope plants like *Hibiscus rosa sinensis* have not grown at all well.

No. 3, is rather low lying and somewhat sandy a considerable quantity of sand being formed close by, rubber has done well here.

No. 4, is a clayey slo[illegible] with little humus. It has been long ago cleared for Chinese cultivation, chiefly orchards, and then grew up in secondary jungle. This was cleared off in 1890, and planted as an arboretum. Lalang was very abundant and many leguminous trees here have made very slow growth.

No. 5, is a very similar locality, on neither of these have para rubber trees been planted.

No. 6, a continuation of the same hill was planted up with trees by Mr. Cantley and is the locality where the big tree was found growing which is described in a previous Bulletin. Trees have grown remarkably well in this soil.

No. 7, is on a continuation of the same hill but it has been cleared of trees to a large extent. Rubber trees grow fairly well here but have not grown quite as well as in No. 6.

The most striking thing about these soils is the poverty of phosphoric acid and potash, even in the best soil. The soil of No. 1 which except for its excess of moisture is decidedly the best is richest of any in organic matter oxide of alumina, lime, magnesia, and lowest in sand and oxide of iron. No. 3 is on the same level approximately as No. 1, but more sandy. Ramie, rubber, citronella grass have done well in it and para rubber grows better here than in any of the others. No. 4 & 5, are bad soils, as far as growth of plants is concerned, yet the analysis does not appear worse than No. 6, whereon grows the tallest para rubber tree in the gardens.

It is probable that a good many other factors than the actual constituents of the soil are of great importance to plant growth probably greater than the actual chemical constituents, the temperature, flow and loss of water, the soil bacteria, freeness of the particles of soil, are all probably factors which have to be taken into account.

22nd August, 1908.

H. N. RIDLEY Esq., Botanic Gardens, Singapore :

Dear Sir,

Herewith my report on the seven samples of soil from your Botanic Gardens received together with your letter of the 20th, ult:

No. 1, is a dark loamy soil in a fine state of division. It is exceptionally rich in nitrogen, has a fair amount of lime, but is deficient in phosphoric acid and potash.

No. 2, is a yellow clay loam, fairly rich in nitrogen, but deficient in available mineral matter generally.

No. 3, is a grey loam with some stony fragments. It is fairly rich in nitrogen, is poor in potash and phosphoric acid and has a fair supply of lime and magnesia.

No. 4, is a yellow loam in a good state of division, is poor in nitrogen, potash, phosphoric acid and magnesia, but has a good supply of lime.

No. 5, is similar in composition and appearance to No. 4, but if anything has a slightly better supply of plant food.

No. 6, is a yellow loam in a good state of division, the nitrogen, potash and phosphoric acid are poor, but the lime and magnesia are in fair proportion.

No. 7, is a yellow loam in a fine state of division. It is poor in potash and phosphoric acid and has a fair supply of lime, magnesia and nitrogen.

Yours faithfully,

per. pro. M. Kelway Bamber.

A. D. Bruce, B.S.C., F.C.S.

ANALYSIS OF SOIL.

STRAITS SOILS. *Botanical Gardens Singapore.*

MECHANICAL COMPOSITION.

	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7
Fine soil passing 90 mesh	49.00 %	44.50 %	26.00 %	40.00 %	42.00 %	49.00 %	46.00 %
Fine soil passing 60 mesh	48.00 ,,	32.00 ,,	25.00 ,,	33.00 ,,	28.00 ,,	38.00 ,,	36.50 ,,
Medium soil passing 30 mesh	2.00 ,,	6.50 ,,	18.00 ,,	8.50 ,,	5.50 ,,	5.00 ,,	8.50 ,,
Coarse sand and small stones	1.00 ,,	17.00 ,,	31.00 ,,	18.50 ,,	25.00 ,,	8.00 ,,	9.00 ,,
	100.00	100.00	100.00	100.00	100.00	100.00	100.00

CHEMICAL COMPOSITION.

Moisture	7.400 %	3.800 %	3.800 %	2.400 %	2.400 %	2.200 %	2.000 %
Organic matter and combined water	34.000 ,,	11.000 ,,	12.000 ,,	10.600 ,,	11.600 ,,	11.800 ,,	10.600 ,,
Oxide of iron and manganese	2.000 ,,	6.000 ,,	2.000 ,,	6.400 ,,	6.600 ,,	6.200 ,,	4.000 ,,
Oxide of alumina	23.602 ,,	4.664 ,,	4.439 ,,	4.024 ,,	6.266 ,,	5.128 ,,	5.847 ,,
Lime	0.280 ,,	0.140 ,,	0.180 ,,	0.220 ,,	0.200 ,,	0.160 ,,	0.140 ,,
Magnesia	0.316 ,,	0.057 ,,	0.115 ,,	0.086 ,,	0.100 ,,	0.144 ,,	0.115 ,,
Potash	0.023 ,,	0.030 ,,	0.030 ,,	0.015 ,,	0.038 ,,	0.030 ,,	0.023 ,,
Phosphoric acid	0.338 ,,	0.038 ,,	0.038 ,,	0.012 ,,	0.025 ,,	0.025 ,,	0.025 ,,
Soda	0.341 ,,	0.271 ,,	0.398 ,,	0.243 ,,	0.371 ,,	0.313 ,,	0.250 ,,
Sand and silicates	32.000 ,,	74.000 ,,	77.000 ,,	76.000 ,,	72.400 ,,	74.000 ,,	77.000 ,,
	100.000	100.000	100.000	100.000	100.000	100.001	100.000
Containing Nitrogen	0.826 %	0.112 %	0.224 %	0.084 %	0.084 %	0.095 %	0.112 ,,
Equal to Ammonia	1.003 ,,	0.136 ,,	0.272 ,,	0.102 ,,	0.102 ,,	0.102 ,,	0.136 ,,
Lower oxide of iron	Much	Fair	Good	Fair	Fair	Good	Fair
Acidity	Marked	Marked	Marked	Marked	Marked	Marked	Marked

NOTES ON THE NUTRITION OF PLANTS.

A knowledge of the physical properties of soil and the substances necessary for the effective nutrition of plants is of the utmost value to the Agriculturist. In practice soils become impoverished, more are less rapidly, according to the requirements of the various crops and as no soil can endure for any length of time the loss of mineral substances which go to form part of the crop, without being replenished, it is necessary to replace these by applying manures.

It has been shewn by chemical analyses that only a small number of substances are necessary for the growth of cultivated plants. The essential nutritive substances which must always be present in sufficient quantity and in soluble form are, hydrogen, nitrogen, oxygen, sulphur, phosphorus, carbon, potassium, iron, calcium, magnesium, and probably chlorine. In addition to these there are several subsidiary substances which are always present in the tissues of plants but not indispensable for growth, such as sodium and silica, also such admixtures as zinc, copper, cobalt, aluminium, manganese, etc., according to the nature of the soil.

All plant tissues contain oxygen, hydrogen and carbon.

Carbon is the chief constituent of all vegetable tissues forming about one-half of their dry weight. The leaves absorb the carbon from the atmosphere in the form of carbonic acid which is decomposed in the cells of the leaves under the influence of light, giving back oxygen to the air.

Oxygen and hydrogen are taken up by the roots in the form of water which is necessary for the conduction of the nutritive salts from the soil to all parts of the plant. The bulk of this water is ultimately given off through the pores of the leaves in the form of vapour.

Nitrogen is the substance chiefly required for the building up of young tissues and is always present in the protoplasm of the cell and other albuminoids. Most plants obtain their nitrogen from the nitrates and ammonic salts of the soil. Manures suitable for supplying fresh nitrogen to soils are usually in the form of compounds containing ammonia or other complex organic compounds. Leguminous plants are, however, able to take up nitrogen through their leaves from the atmosphere. In practice we make use of this peculiar property of *Leguminosæ* in green manuring our crops by sowing such plants as *Crotalaria striata*, *Tephrosia purpurea*, *Desmodium heterophyllum*, *Desmodium triflorum*, etc. etc., either in conjunction with crops such as rubber or alone.

If we examine the roots of any one of the above mentioned plants and other *Leguminosæ* which have been grown in poor soil we find the roots bear numbers of curious tubercles. The tubercles are in greater numbers the poorer the soil is in humus and soluble nitrogenous substances especially nitrates. In fact it has been proved that leguminous plants shew a healthy development and yield a good crop in a soil almost devoid of nitrogen.

These tubercles contain colonies of bacteria which by some peculiar means assimilate the nitrogen obtained from the air and convert it into plant food. These organisms multiply and inrich the soil in which the plants grow, hence the custom of manuring by some leguminous green crop.

This form of manuring crops has many points to recommend it. The planter is saved the expense of weeding, his soil is always moist and protected from the scorching sun; wash by heavy rains is prevented etc., *Crotalaria striata* and *Tephrosia purpurea* are fairly tall growing plants and should be kept dwarf by periodically pruning their tops to a reasonable height, say three feet. *Desmodium heterophyllum* is the best of this genus for sowing as a green manure. It is not a tall grower and does well in almost any soil. *Desmodium triflorum* is often recommended but is comparatively rare.

For other than *Leguminous* plants nitrogen in the form of nitrates is generally regarded as the best form of nitrogenous food to apply to the soil. The nitrogen for fertilizing purposes especially in farmyard manure or decomposing vegetable matter is not in the form of nitrates but either in the form of ammonia or other organic compounds and before it is taken up by the growing plant the ammonia is changed into nitric acid by means of ferments or micro-organisms in the soil. The three conditions which exert a marked influence on this nitrifaction are heat, air and moisture. This shews us the reason why thorough tillage is essential to good cultivation. The loosening and breaking up of the surface soil allow the admission of the necessary oxygen and regulates the supply of heat and moisture. When the soil is saturated with moisture or on the other hand is allowed to become very hard and dry nitrification is retarded and is in danger of being permanentlystopped.

The nitrifying organisms in the soil cannot develop in the presence of a free acid and it often happens that a soil becomes sour being overcharged with nitric acid. In cases of this kind the application of lime will counteract the acidity and restore the soil to a healthy state. Most soils, however, contain a sufficiency of lime for this purpose and it need only be applied in rare instances.

Sulphur and phosphorus are both taken from the soil by plants. Both substances are found in the form of calcium salts. Sulphur is found largely in the form of gypsum. Phosphorus is found in most soils in combination with iron. Plants deficient in phosphorus assume a red appearance.

Potassium is essential to all plant life in the formation of carbohydrates such as starch, sugar, and cellulose. If potassium is absent from the soil the growth of plants stops and the leaves refuse to continue their functions, that is the formation of starch within the chlorophyll grains (green colouring matter).

Magnesium enters a plant in the form of sulphates and phosphates as also does calcium to which it is closely allied. Magnesium is said to work with nitrogen in the formation of chlorophyll and protoplasm.

Iron is widely distributed in soils and is also necessary for the formation of chlorophyll of plants.

All combinations of lime that are necessary for plant nutrition have their origin in calcium which is chiefly of use in strengthening the fabric of the plant. Besides this it is valuable in fixing oxalic acid which although produced by most plants is poisonous to them.

The subsidiary nutritive substances such as sodium and silicium also play their important parts in the growth of plants. Sodium is taken up by most plants in the form of common salt which in itself has considerable manurial value when applied to soils for certain crops.

Silicium is always present in soil as silica and like lime is used to strengthen the cell walls.

Other substances of this class are occasionally present in plants but are not sufficiently important to require mention in detail here.

The question of how to replace those nutritive substances which are abstracted from the soil during the growth of plants is an important one to the agriculturist and embraces the all important subject of manuring. Green manuring has already been touched on, other manures are generally divided into three kinds, vis. (*a*) Stable or Farmyard manure, (*b*) inorganic manures, (*c*) organic manures.

Stable manure contains all the food substances of plants and when available is the best means of replacing those substances which have been exhausted from the soil during the growth of the crop. In this country it is not obtainable in sufficient quantities, unfortunately, to supply anything like the demand, but when possible it should be used in preference to all others.

Bones for field crops or fruit trees are extensively used as manure. The fertilizing qualities are lasting when the bones are used in a crushed state and more active when in the form of powder. Bones contain large quantities of phosphoric acid which is a valuable ferti-

lizer. Bone meal has for many years been successfully used on sugar and coconuts and is recommended as a splendid manure for all estates. It can be shipped direct from home (which is advisable) or obtained in Penang or Calcutta.

Guano is a well known and valuable manure being the excrement of birds. Many of the limestone caves in Perak and Selangor contain deposits of bat-guano which can generally be collected on payment of a small fee. It is a quick acting and very powerful manure. Its beneficial effect on green crops and grass land is rapid and very maked. Up to the present time I have not heard of it having been used on rubber or coconut plantations but I feel sure that if sufficient quantities can be obtained it will be a valuable manure for these purposes.

Leaf mould is invaluable as a manure either as a mulch round the roots of rubber and coconut trees or when dug into stiff soils. Large quantities of leaves are obtainable on every estate and these when thoroughly decayed form a cheap and most effective manure.

Many artificial inorganic manures are now in favour. It is true they do not, like stable manure, contain all the food substances required by plants but they contain the most important ones in a more concentrated form. The strength of artificial manures and their adaptibility for certain crops is determined by their analysis which all respectable dealers supply with their goods. All substances entering into plant food must be in a state of fluidity or in the form of gas or air, therefore the chief recommendation of an artificial inorganic manure should be its power of yielding as much soluble matter as possible to the roots and that in a gradual manure.

Ammonia is one of the chief component parts of all manures and has a powerful stimulating action on the growth of plants. It is supplied in inorganic manures chiefly in the form of ammoniacal salts.

Potassium appears in commerce in the form of potassium sulphate. If the soil is not rich in lime it is advisable when manuring with raw potassium sulphate to add a considerable quantity of quick lime.

Phosphoric acid is obtainable in various forms. Quickest effects are obtained form superphosphates. If it is necessary to add nitrogen to the soil as well as phosphoric acid a mixture of ammonium sulphate and superphosphates can be used. A well know manure containing those properties is Peru Guano.

Slag which is a biproduct of iron works contains from forty to sixty per cent phosphate of lime together with silica, oxides of iron, magnesium, sulphur, etc. This is an effective manure for damp soils. In dry soils the action is much less rapid.

Wood ashes form an excellent manure, being exceptionally rich in potash. The layer of wood ash and charcoal left on a clearing after a burn off is very beneficial to the young crop. Charcoal has the property of absorbing ammonia and other gases and again giving them off as plant food.

Salt is a useful substance not only as a manure on some soils but for the extermination of slugs, worms, and larvæ of different kinds.

Lime is not naturally found in a free state but in combination with (*carbonic*) acid forming what is known as carbonate of lime or chalk.

Quick lime is formed by driving off the carbonic acid by burning. It is extremely caustic and quickly decomposes vegetable and animal matter hense its value as a fertilizer for soils containing large quantities of peat, consisting of roots and fibres, that would otherwise remain a long time in an undecomposed state. Caution is necessary in applying lime to some soils as it possesses the property of setting free ammonia one of the indispensable constituents of plant food. Lime is also a valuable fungicide.

In this country plant food substances are easiest obtainable in combination in the form of one of the many artificial manures now on the market which are composed in such a manner as to contain as near as possible in a concentrated form the quantities of each substance necessary for the healthy development of plants.

When ordering manures it is always advisable to order direct from home from some firm of good repute.

The present prices of these manures may stand in the way of them being generally used, but it is reasonable to suppose that if a demand arose shipments could be made from home at resonable rates.

The good effects of manures on coconuts is indisputable and from what we at present know the yield of latex from para rubber trees is considerably increased by their application and it is possible that the quality is also improved but this, I think, is an open question at the present moment. At any rate further results of experiments will be waited for with interest in order to find out whether the rubber is equal in quality or better than that from unmanured trees and whether the extra yield will justify the extra outlay. I don't know that these points have been demonstrated up to the present time but everything points to such being the case.

T. Wilson Main.

"LALANG" (IMPERATA ARUNDINACEA, *Cyrill.*) AS A PAPER MAKING MATERIAL.

One of our correspondents sent a sample of lalang grass recently to England, and has received the following report, also samples of paper made from lalang grass entirely and ½ lalang and ½ cotton :

CERTIFICATE OF ANALYSIS.

Sample of Lalang Grass Marked "Exchange, Singapore, Straits Settlements" on 23rd July, 1908.

This is to certify that the above sample has been carefully examined with the following results :—

This grass was forwarded to "The Aynsome Technical Laboura-tories" for investigation, that its commercial use as a source of pulp for paper making might be ascertained.

The object of the present report is to draw attention to the importance and value of this grass as a pulp-producing material, and to indicate its chief characteristics and economic value.

The sample was a pale buff colour, lustrous in appearance and of fair strength, of the order Gramineæ.

The chemical examination furnished the following results, the percentages other than that of moisture being expressed on the dry material :—

Moisture	13.21
Ash	4.14
Loss on L. Hydrolysis	10.76
Loss on B. Hydrolosis	46.65
Loss on Mercerisation	31.62
Loss on Acid Purification ...	0.95
Gain on Nitration	21.19
Cellulose	47.41
Length of Ultimate Fibre...	1.20 m.m.

The ultimate fibre obtained from this grass is very similar in most respects to Esparto; the yield of bleached fibre being about the same. This is a favourable indication inasmuch as "Esparto" is one of the best known and most useful sources of supply to the trade. The fibres as seen under the microscope are short, smooth, cylindrical, fairly uniform in diameter, gradually tapering to rounded extremities: they also occur together in little bundles. The pulp will be found to contain a number of small cuticular cells which do not however shew in the finished paper. The fibres are stained a pale yellow with iodine solution, which fades more rapidly than is usual with coloured pulps.

The results obtained from the chemical analysis show that the grass is capable of yielding a good quality of cellulose, suitable in every way for the manufacture of paper. Although the grass is very susceptible to the action of dilute alkalis, the final product is exceptionally pure and readily resolved.

From observations noted during this preliminary examination the following scheme was adopted for the production of the pulp on a larger scale.

Process.

The available grass in its natural condition weighing 400 grams. (14.1 oz.) was in a clean state, and required little treatment beyond cutting into small pieces ready for boiling. It is usually necessary on a large scale to pass the material through some type of cleaner to remove dirt and adventitious matter. The grass was then thoroughly wetted and soaked until it became soft and pliable. It was placed in a boiler of the spherical type, covered with water and digested with caustic soda corresponding to 15% on the grass treated for a period of 10 hours under a pressure which was kept constant at 4 atmospheres ; an even temperature about 135°C. being maintained.

Owing to the quantity of material at our disposal being somewhat limited, it was only possible to conduct one experiment, consequently a good margain in the use of caustic and degree of general treatment was allowed.

The pulp obtained after washing was of good uniform quality and colour. The yield agreed very closely and was only slightly higher than the preliminary chemical analysis shewed, which indicates complete re-action in the digester.

The pulp was carefully beaten for about an hour and at the same time bleached, chloride of lime being used for the purpose : 10 parts of dry powder being used per 100 parts of pulp.

The stuff was taken from the beater and well washed and subsequently a small quantity of loading was gradually added and the whole again beaten for half-an-hour. At this stage of the operation the rosin size was introduced and the decomposition of the soda resinate completed with the calculated quantity of alum. The amount of size used corresponded to 4% on the dry pulp present, the total time occupied in preparation of the pulp for running on the machine being 2 hours.

Preparation of Paper.

No great difficulty was experienced in running the pulp: it retained however a considerable quantity of water after passing the suction-boxes and in consequence it was found necessary to keep the press roll down hard. On a large machine this precaution would not be necessary as more suction-boxes are available and complete control is assured.

The paper was passed over 9 cylinders at a pressure of about 8 lbs. to the square inch, then through one calender and finally reeled off. In a similar manner a second sample was prepared, using a mixture of half pulp obtained from the lalang grass and half cotton beaten together. The paper obtained from this blend could prove very useful as a high-class wrapping paper, it being stronger and possessing a comparatively high resistance to folding as will be seen in the following table of physical tests done on the finished specimens of papers. The paper made from "all-grass" pulp would with judicious treatment for improvement of colour be very suitable for printing purposes.

The following table of figures was obtained and compiled from tests and analyses made on the air-dried finished papers.

	Pure Lalang.	Half Lalang. „ Cotton.
Physical Properties :—		
Breaking strain (lbs.)	8.37	8.88 (way of machine)
Stretch (%)	1.03	1.35
Rubbing test	27	151
Thickness (inches)	$\frac{1}{125}''$	$\frac{1}{235}''$
Chemical Constituents :—Per cent.		
Rosin Size	2.20%)	2.43%)
Ash (Natural	)	) on the) dry paper
(and loading	3.01%)	1.94)
Moisture	10.40	8.68

The addition of cotton to the pure lalang fibre has the effect of improving its resistance to crumbling, and also in a lesser degree its tensile strength.

G. Stewart Remington.

ANNUAL REPORT OF THE GOVERNMENT MYCOLOGIST, FEDERATED MALAY STATES, FOR 1907.

I assumed duties on the 4th April, but the mycological laboratory was not ready for occupation until September, and microscopes, chemicals and other laboratory apparatus ordered after my arrival were not delivered until November, so that the year was almost at its end before I was in a position to undertake definite scientific work. There was other very necessary, if not strictly mycological, work to be done. The large collection of books and pamphlets belonging to the Director in the departmental library needed to be classified and indexed so as to be easily available for reference by officers of the department and others. The greater part of my time was devoted to this work, which is now almost completed, but I also visited some twenty estates at the request of managers who sought advice about diseased plants.

Travelling occupied a good deal of time, but the information conveyed by letter is often meagre, and the specimens sent not complete enough, so that a personal visit to the seat of the disease is necessary and in the end more satisfactory. I have on occasions found the existence of other diseases than that about which I had been originally consulted.

Field work has been helpful in other ways. A good deal of the work in plant sanitation must consist in a study in the field of the relation of the plant to its surroundings; this is particularly true of the Para plant, about the biology of which a good deal has yet to be cleared up. Besides, I wished to acquire as quickly as possible a practical acquaintance with the methods of local agriculture.

The greater number of letters received reported root disease, probably *Fomes semitostus Berk.* It appears to travel from some of the numerous old jungle stumps among the rubber trees to the healthy young Para plant of from fifteen to thirty months old. Like most root diseases it is insidious, and seldom noticed until the tree is almost dead; even when the leaves drop off from its effects the cause is often attributed to the tree "wintering." Cure is usually impracticable, but the diseased trees can be isolated and the infection of neighbouring trees prevented. The removal of the old jungle stumps is for various reasons not practicable, but as long as they are left planters must be prepared to see root disease cropping up. All old stumps ought to be removed from nurseries at least. I have been able on different occasions to follow fungal threads from an old stump in the nursery to half-a-dozen or so of the young plants immediately round it. These, if planted out, would not alone have succumbed themselves, but would have formed centres of infection.

A wound parasite has been giving trouble among one-year old plants on several estates. It appears to gain entrance where the stem has been stumped before transplanting from the nursery. It is found, as a rule, on trees which have been planted as rather large stumps; in such cases the top was not taken off with a clean cut, but hacked somewhat. The bark becomes black and dead and can be easily removed, underneath it, on the wood, is a black damp mould. The fung-

us threads appear to move faster up the stem than down it, and generally have not reached the collar before the disease is noticed, when this is the case there is no need to destroy the plant. The diseased portion can be easily recognised by the black colour of the root and wood. The stem should be cut off in the sound tissue above the collar, and the wounds covered with tar. If the old stump had been tarred very likely the disease would never have appeared. The same disease has been found on old trees which had been peeled by animals in some cases, in others scorched by fire. When one remembers that for the first year of its life the young para plant is growing among a crowd of dead stumps and stems covered with fungi, luckily for the most part harmless, but liable to include kinds which have the faculty of becoming parasitic, the planter cannot be too watchful of wounds, and should take measures to cover all of any size, stump wounds, included, with tar.

Among other pathological appearances must be mentioned the occurrence of huge "knots" or "burrs" on old trees. They are stated not to appear until the tree has been tapped. The appearance is like a malformed development of a dormant bud. It looks like a much flattened deformed branch, up to nine inches in width and three to four feet in length, growing up the stem and covering the true bark, from which it may usually be prised back. It reduces the tappable area considerably as the bark on the malformation contains little or no latex. An investigation of this interesting but undesirable phenomenon, with the hope of successfully combating it, is in progress.

Disease has been observed on various other plants, the most widely spread being a bacterial disease of mangosteens; about 25 per cent. of fruits are attacked. It has made no great headway at the time the fruit is ripe, when it may be noticed as a yellow matter on some or all of the seeds on opening the fruit. It is of no great consequence at present owing to the consumption of the mangosteen being purely local.

Helminthosporum, sp. was found on rice sent in, but was not the cause of its lack of health.

Defective drainage was in a few instances the cause of considerable mortality among para trees. The para rubber tree appears to adapt itself fairly well to its surroundings, but it suffers in a badly drained soil; stagnant water prevents soil aeration and the root is suffocated. The growing point or top dies back, branches shoot out much as if the plant had been thumb-nailed pruned, but never develop far, the leaves scorch from the tip downwards and fall off. The root has a character of its own. Plants put out in an ill-drained soil show several short parallel roots running down from where the root had been stumped. Probably in many peaty soils an excess of humous acids acts injuriously. The anatomy of plants, like heaths, which grow naturally in such soils, is so arranged that the leaves give out a minimum of moisture to the air, and take correspondingly little from the soil. The para rubber tree has almost the opposite character. It would be no doubt good practice in such soils to lime the holes made for the "stumps," and to fork in lime about six months afterwards. The ash of the burned jungle neutralises the acidi-

ty, and it is further lessened by good drainage giving better aeration to the soil.

Where areas measured by the square mile rather than the acre are without exception covered with the same kind of plant, as is the case with *Hevea braziliensis* in the Federated Malay States, it is most important to attack disease before it has made any headway. Once it becomes virulent and epidemic the monetary loss would be enormous. Constant vigilance is therefore very necessary, and all appearances of unhealthiness should be reported without delay. There should be no waiting until the plant is actually dead, and infection has most likely spread to others round it. Many of our planters have learned to their cost in other countries the danger of epidemic fungal disease and are quick to notice sick plants, but not all have yet learnt the importance of taking some steps at the earliest signs of ill-health in their trees.

W. J. GALLAGHER,
Government Mycologist, F. M. S.

REPORT OF THE INSPECTOR OF COCONUT TREES, DEPARTMENT OF AGRICULTURE, FOR THE YEAR 1907.

The area under coconut cultivation at the end of 1907 in the Federated Malay States I estimate, approximately, at 112,500 acres, apportioned to the four States as follows:

Perak	57,776 acres
Selangor	21,321 ,,
Negri Sembilan	18,000 ,,
Pahang	15,463 ,,

Showing, as compared with 1906, an increase of 7,500 acres, or a little more than 7 per cent., which may, I think, be considered satisfactory.

Of the above acreage nearly two-thirds are now in bearing, and I should say the whole may be roughly valued at $22,000,000.

In the area planted up during 1907 about 650 acres were opened up by Europeans, from which it may perhaps be inferred that, after a lapse of some years, they are again beginning to interest themselves in this product. The remainder, about 6,850 acres, planted by the native community, is fairly distributed over Perak, Selangor and Negri Sembilan.

I noticed in the earlier part of the year with some anxiety that the Malays were beginning to plant para rubber in preference to cocoanuts, but I am glad to say that they have practically abandoned this cultivation lately. My reasons for objecting to their planting para rubber are these: In the first place this cultivation does not suit them nearly so well as coconuts, and I question very much if it is, so far as they are concerned, really more profitable, while it undoubtedly leads to theft of seed and young plants from the surrounding rubber plantations. When the trees ultimately mature the outcome will prove, perhaps, more serious, not only by the adulteration of the rubber, necessarily

affecting the position of the general high standard of quality for the States which the experienced planter is endeavouring to attain, as also the theft of the rubber with the difficulty of tracing the culprits on account of the natives having trees of their own, but from the neglect in the treatment of the trees, as from this cause the chances of disease or fungi appearing become greater.

I now refer to the four States separately.

State of Perak.

The total area under coconuts in the State at the end of 1907 I estimate, approximately, at 57,766 acres, the district of Lower Perak alone contributing over 30,000 acres. These figures show an increase of 4,371 acres over the preceding year, made up from the various districts as follows:

District.	Increase.	Total acreage
Lower Perak	621 acres ...	30,621 acres
Krian, Selinsing and Selama...	1,814 ,, ...	10,140 ,,
Matang and Larut	170 ,, ...	6,773 ,,
Kuala Kangsar (Upper Perak)	233 ,, ...	5,919 ,,
Kinta	1,533 ,, ...	4,313 ,,
	4,371 ,,	57,766 ,,

Lower Perak.—In this district 621 acres were planted up with cocoanuts during the year—Bagan Datoh and Strathmashie Estates accounting for 357 acres. Very few cocoanuts were planted in, and no copra was exported from, the up-river mukims during the year, but in most of the other mukims the natives have started planting nurseries with a view to opening up more land in 1908.

The crops throughout the district were good, and considerable improvement is noticeable in the general upkeep of the plantations, except perhaps in the mukims of Bagan Datoh and Rungkup, where, owing to the prevalence of malaria, the natives have of necessity been obliged to neglect their holdings. I regret to report that in September, 10,000 trees at Bagan Datoh and 5,000 at Kayan were seriously damaged by a fire that broke out, and I fear very few will recover. The fire, I understand, originated among some lalang at the extreme boundary, towards the end of a very severe drought, and owing to the amount of dry rot on the surface crept underground and destroyed many trees even among holdings that were being well maintained. It was indeed a most unfortunate incident and resulted in a heavy loss to those concerned, as some of the trees had just come into bearing, but I am pleased to say that notwithstanding the damage they have suffered the owners are again planting up the land with cocoanuts.

I am pleased to report that the Penghulus of Utan Melintang, Sungei Durien, Telok Anson and Telok Bharu gave my Sub-Inspector much assistance.

Krian and Selinsing.—During the year no less than 1,814 acres of land were planted up with coconuts, and the plantations show some improvement in upkeep.

Kuala Kangsar, Matang and Larut.—The condition of the plantations in these districts, I am glad to say, is satisfactory, and continues to steadily improve.

Kinta and Batang Padang.—Further progress has been made in the native holdings. I understand that a law has been introduced by Government allowing owners of worked-out mining lands to utilise them for agricultural purposes, and my Sub-Inspector informs me that several owners have taken advantage of this and have planted coconuts.

State of Selangor.

Staff.—Mr. T. C. Nock was appointed Assistant Inspector on the 23rd of February, and assumed duty on the 5th March, and his services have proved of great assistance to me.

Cultivation.—I estimate 21,321 as the approximate acreage under coconuts in the State at the end of 1907. This shows an increase of 2,248 acres as compared with the year before.

These figures are made up from the various districts as follows:

District.	Increase.	Total acreage.
Kuala Selangor and Bernam ..	171 acres	9,921 acres.
Klang and Kuala Langat	760 ,,	7,760 ,,
Kuala Lumpor, Ulu Selangor and Ulu Langat	1,317 ,,	3,640 ,,
	2,248	21,321

Kuala Selangor and Bernam.

Kuala Selangor.—In the mukims of Tanjong Karang and Pasangan there is a tendency on the part of the owners to neglect their coconuts and devote their time to fishing and the making of ataps. Fortunately, however, the beetles give no trouble here, and the only result of this neglect is that the land at the foot of the trees becomes overgrown with lalang and blukar, which interferes with their growth.

There are several abandoned plantations in which the beetles gave a good deal of trouble, but these have been treated and there is now a general improvement in the condition of the trees.

Bernam.—There are nearly 3,000 acres of land under coconuts in this district, and so far the beetles have given no trouble. The trees, however, are somewhat handicapped in their yield by the fact that many of the kampongs are frequently inundated at high tide, and much of the land is insufficiently drained.

Klang and Kuala Langat.

Klang.—On the whole the plantations in this district are in good order, the exceptions being the abandoned kampongs between the 8th and 13th miles, Klang-Kuala Selangor road. These, however, were treated as often as possible, and though they are overgrown with lalang and blukar, the condition of the trees themselves—as regards their freedom from beetles—has noticeably improved. Care was taken in discovering and destroying actual and probable breeding places—such as rotting stumps of coconut trees, manure and rubbish heaps, etc.—and the pest is consequently decreasing, and is now well in hand.

Kuala Langat.—The trees in this district continue to do well and give excellent returns, and the beetles give little or no trouble.

Kuala Lumpor, Ulu Selangor and Ulu Langat.—The native holdings in these districts have considerably improved during the year.

Kuala Lumpor.—Though the beetles have greatly decreased, the trees still require constant attention to keep this pest well in hand. In this district also especial attention was given to the destroying of all probable breeding places, and this greatly helped in checking the spread of the pest. The trees which give the most trouble are those which are scattered over mining land, as they receive no attention from the owners, and with the limited number of coolies at the disposal of this department it is quite impossible to treat these trees as often as one would wish. Nevertheless, they are gradually being improved and the worst trees are being cut down, whenever possible, and destroyed. At Pudoh and Ampang, where the beetles gave so much trouble during 1906, it is gratifying to be able to report that the pest is now checked and the beetles are under control, and as a result the trees already show great improvement.

At Rawang, the beetles gave considerable trouble at the beginning of the year, but were effectually dealt with.

In all the other mukims the beetles have only given very slight trouble, and the trees now only require constant supervision to prevent this pest from increasing and doing damage.

Considerable improvement is noticeable in all districts and the natives generally are beginning to realise the advantage to be gained by carefully attending to their trees, and are consequently taking a greater interest in their plantations.

Selangor Oil Mills.—Nine thousand five hundred pikuls of copra were purchased by the Selangor Oil Mills during the year, and 4,780 pikuls of oil and 3,830 pikuls of oil cake were made at their factory.

State of Negri Sembilan

The approximate area under coconut cultivation in the State at the end of 1907 I estimate at 18,000 acres, an increase of 804 acres over the preceding year. These figures are made up as follows:—

District.	Increase.	Total acreage.
Tampin	425 acres	5,573 acres
Seremban and Jelebu ...	—	5,190 ,,
Kuala Pilah	300 acres	5,033 ,,
Coast	79 ,, ...	2,204 ,,
	804	18,000

and I may mention that there are fewer trees per acre than in Perak and Selangor.

Tampin.—The general condition of the plantations in this district is good and shows considerable improvement, and the beetle pest has been effectively dealt with.

Seremban and Jelebu.—Though there was no increase in the area under coconut cultivation in these districts during the year, the plantations are well maintained and their condition satisfactory.

Kuala Pilah.—The beetles here are well under control, and the kampongs throughout the district show much improvement in upkeep.

Coast.—The condition of the native holdings continues to improve and the beetles give no trouble in this district.

State of Pahang.

I made a visit of inspection throughout Raub, Bentong, Tras and Kuala Lipis in July, and again a further tour down river between Kuala Lipis and Pekan, and thence to Kuala Pahang and Kuantan during September.

I found immense improvement in the upkeep of the Malay kampongs, especially between Kuala Lipis and Chemor, and again in the Kuantan district.

It is satisfactory to report that the making of copra is now on the increase, worked, however, by Chinese shop-keepers, and its manufacture has been extended to Temerloh, Nungoh, Lebar and Pulo Manis.

The dry disease has not entirely disappeared, a few trees having been destroyed by it during the year, but it seems to be very much on the decrease.

The area under coconut cultivation in the State shows an increase of 270 acres, chiefly in the Kuantan district, but the Sub-Inspector at Pekan has not been able to give me, up to date, full returns. .

The Sub-Inspector at Pekan mentions in his report that the poorer natives are very anxious that Government should grant them small plots of land free of taxes for the first four or five years and the usual quit-rent thereafter, on the understanding that they guarantee to plant up the land, so granted, with coconuts.

Beetles.

Perak.—As in the previous year the damage from this source has been practically very little, Kinta and Lower Perak being very free from this pest. At Kuala Kangsar some 106 trees were affected, but the attacks of the beetles were not allowed to spread and the cause of the trouble has been effectively dealt with. At Matang about 472 beetles were destroyed. In the Krian district the catches were heavier, the attacks being almost entirely restricted to the Chinese sugar estates.

Selangor.—During the early part of the year literally thousands of beetles were discovered and destroyed at Rawang in the trees on the plantation belonging to the estate of the late Gunawardena. The trees were all seriously damaged and the case seemed almost hopeless. However, they were all carefully cleaned and treated in April, and in October, when the coolies again attended the trees, they failed to find a single beetle. This proves that when the method now adopted is properly applied even extreme cases can be dealt with successfully. The trees are now slowly but surely recovering, and before long should, with attention, yield excellent crops. In all other districts the pest is well in hand and the beetles appear to be decreasing.

Negri Semilan and Pahang.—The beetles gave little or no trouble in these States during the year.

Treatment of Affected Trees.—In connection with this I may mention that my latest method of dealing with the beetles has become more perfected, and during the year under review has proved most effective; in fact, I believe that I am now in a position by means of it to guard a large area against their attacks, even when they appear in large numbers. It is not only that the mixture when correctly applied keeps the tree practically impervious to further attacks, but experience distinctly proves that it has a stimulating and recuperative effect on the trees that have been affected by the beetles. Besides, another advantage is that it is not very costly. The difficulty lies in getting the owners to apply the treatment thoroughly, and so far this has had to be done almost entirely by my staff.

It is evident that the beetles become more productive in the damp or rainy weather, as during the drought in August and September hardly any were found, and in the trees that had been treated those found were dead.

Other Pests.—Bears continued to do considerable damage to the trees in the native kampongs at Si Jagob, Likier, Kayan and Sungei Durien in Lower Perak, and at Tampin and the Coast district in Negri Sembilan. A reward of $20 for each bear was included in the schedule of rewards for the destruction of noxious animals, and two bears were killed in Lower Perak during the year, and a large animal was shot in the Coast district, Negri Sembilan, at the beginning of the current year.

Wild pigs, I regret to state, have caused much more harm than I anticipated, but this is greatly due to the carelessness of the owners in not following out the instructions that have been given them by this department when planting out their trees from the nurseries, and I trust that during the current year I may be able to impress this upon them more thoroughly, and so overcome, to a great extent, the damage these animals are continually doing.

Copra.—During the year, approximately 55,421 pikuls of copra were exported from the States, as follows:

Lower Perak	28,090	pikuls
Kuala Selangor and Bernam ...	9,584	,,
Klang and Kuala Langat	16,370	,,
Pekan	1,121	,,
Matang and Larut	256	,,
	55,421	,,

in addition to which 9,500 pikuls were purchased by the Selangor Oil Mills at Kuala Selangor.

Prices.—The price of coconuts in the various districts during the year was as follows:

Krian and Selinsing	5 to 6	cents each
Kuala Lumpor, Ulu Selangor and Ulu Langat	4 to 9	,,
Kuala Pilah	4 to 8	,,
Kinta and Batang Padang	3 to 7	,,
Matang and Larut	3 to 6	,,

Lower Perak	...	...	3 to 6 cents each
Klang and Kuala Langat	...	...	3 to 6 ,,
Seremban and Jelebu	...	...	3 to 4 ,,
Kuala Kangsar	...	...	3 to 4 ,,
Kuala Selangor and Bernam	...	...	2 to 6 ,,
Tampin	...	...	2 to 3 ,,
Pahang	...	...	2 to 16 ,,
Coast	...	...	2 cents each

Prospects.—Now that everything is being done to prevent and free the trees from disease and pests, and no doubt so far with beneficial results, and further supported by the tuition, assistance and encouragement given to the native community by my staff, which judging by the greater care and interest now being taken in their holdings and the improved condition of the kampongs, they are certainly beginning to appreciate, I feel confident that the steady development of the cultivation by them, year by year, is practically assured.

In addition to this, it is satisfactory to note that the Europeans seem to be again interesting themselves in this product, and with favourable influences at work the general outlook for the continued extension of this profitable and important agricultural industry in the States appears to me to be decidedly hopeful.

The Agri-Horticultural Show, which was held at Kuala Kangsar in August, was quite a success, and in the division in which my department was interested there were many excellent exhibits from the natives—*i.e.*, fine specimens of coconuts, both in kind and variety, and interesting articles made from the fruit, leaves and stem, showing the wonderful resources of the tree. There were also good samples of copra, oil, sugar, coir and fibre—in fact, in all branches of this industry the States were exceptionally well represented.

L. C. Brown,

Inspector of Coconut Trees, F. M. S.

Report of Superintendent of Experimental Plantations for the Year, 1907.

The chief work for the year under review has been the opening out of the new Experimental Plantation at Swettenham Road, with which good progress has been made.

Expenditure.—The total expenditure for the year on the Kuala Lumpor and Batu Tiga plantations, exclusive of establishments, amounted to $11,914.92, showing a saving of $1,794,08, effected entirely on the Batu Tiga vote.

Staff.—Mr. J. V. Sangarapullay was appointed Overseer and Clerk, Swettenham Road plantation, with effect from 1st January, 1907 having been transferred from the Gunong Angsi plantation. Mr. R. S. Soobramanium, Overseer and Clerk, Batu Tiga, was on leave for the first six months of the year. Mr. Sangarapullay was on leave from 10th October to 22nd December.

Labour Supply.—A sufficient supply of coolies has been available throughout the year. A large number of the coolies on the Kuala

Lumpor plantation suffered a good deal from malarial fever—this was due no doubt, in a great measure, to the freshly felled clearings. Dysentry was prevalent during the early part of the year, but practically disappeared when the water supply was laid on and the coolies ceased using that from the adjacent wells. So bad did the malady become at one time that water had to be carted from the town pending the laying of the pipe. There has also been a considerable amount of fever at Batu Tiga.

Swettenham Road Plantation.

This plantation (48 acres) which was opened in the latter part of 1898 by the Forest Department and planted with—

Hevea brazilensis (Para rubber) ...	1,278	trees planted	18′ x 18′
Swietenia macrophylla (Mahogany) ...	1,499	,,	6′ x 6′
Dryobalanops camphora (Malayan camphor)	490	,,	6′ x 6′
Dichopsis gutta (Getah taban) ...	75	,,	—

was handed over to the Agricultural Department in the end of 1906. The area of the plantation was increased during 1907 to about 120 acres by taking in surrounding land.

Felling and Clearing.—The work of felling the portion in front of the Agricultural Offices (about 40 acres) was commenced in February, the work being done departmentally by Tamil coolies at a cost of $9.50 per acre.

As soon as this area was burnt off there was good demand for the timber, which was quickly removed; all subsequent fellings were done by contract at $5 per acre, the contractors removing the timber on payment of duty to the Forest Department. In this way 2,843 carts of firewood were removed realising $852.79.

Draining.—Owing to the steep slopes on the land a large number of contour drains are necessary to prevent the soil being washed away; as each piece of ground is opened up drains are cut. It was also found necessary after the destruction of the lalang, with which they were badly infected, to cut drains through the old rubber plots. In all, 146 chains of drains have been cut.

Roads.—Sixty-one chains of roads have been traced and cut out.

Hevea Braziliensis (*Para rubber*).—There are at present on the plantation 900 tappable trees, with an average girth of 29½ inches at three feet from the ground.

No tapping could, however, be undertaken during the year owing to the want of a curing house. A plot, 3¼ acres, was planted on hill land, 12½′ x 25′, with stumps, the result of seeds taken from specially selected trees—*i.e.*, trees that showed exceptionally good growth and that yielded good latex. The trees from which the seeds were taken were selected on different estates.

In October a batch of selected seeds was obtained from old trees in Taipeng, of these 150 holes were sown at stake, two seeds in each; holes being made 12½′ x 25′. In almost every case both germinated, while in only two instances was there a complete failure.

If good seeds from old trees can be obtained this method of planting is, I believe, the cheapest and best, particularly if the work

can be done when one is sure of getting a fair amount of rain. The growth of young trees whose roots have never been disturbed will be more rapid, also stronger, and the plants, I believe, less liable to disease than stumps taken from nurseries, which in the course of transplanting have their roots more or less mutilated. Failing planting at stakes the next best process would be to plant out the seedlings as soon as possible after germination. In connection with this experiment 500 seeds of the same batch as above were sown in nursery beds.

Towards the end of December a plot of 150 plants was put out from this lot. Similar batches will be put out in April and November this year and records kept of rate of growth, etc.

Close Planting.—The question having arisen as to whether it might not pay when a very large return was required for a limited number of years, to resort to close planting, seeing the increased tapping area available, a block of one acre was planted out 4′ x 2′. Records of growth, tapping area, effect of close planting on the trees and latex, will be kept and published from time to time.

Rubber seeds.—The crop of rubber seeds was plentiful, but the demand almost nil. Eighty-six thousand seeds were despatched to New Guinea.

Four consignments of seeds, both whole and decorticated, were despatched, one to the Imperial Institute, two to merchants and manufacturers in England and one to Australia for experiment and report as to the possibilities of para seed oil as an article of commerce.

Manicoba Rubber (*Manihot* sp.).—Seeds of this rubber were received from the Royal Botanic Gardens, Kew, in April, and a Wardian case of 50 plants in July. They were in both cases on arrival placed in nursery beds, and planted out in permanent quarters in November during the wet season.

The plant, which is a native of Brazil, is said to be superior to the Ceara rubber (*Manihot glazovii*). In general appearance the plant is more compact and the leaves smaller and darker than those of Ceara.

Rambong (*Ficus elastica*).—Plants of this useful rubber were obtained from the Forest Department, Perak, and a plot of two acres planted out, 30′ x 30′.

Castilloa elastica.—Seeds of this rubber, so valuable in some parts of the world, were obtained from the old Kuala Kangsar trees and also from Kamuning Estate, Perak, from which a stock of young plants has been raised for planting in the present year.

Camphor.—The camphor trees at Batu Tiga, planted in 1904, continue to make good progress, the average measurement of the trees is now 19 feet and about 8 feet through at 3 feet from the ground. Several of the stronger trees are over 21 feet high. It is unfortunate that no distillations have been made so far to determine the actual yield of camphor; there is at present ample material available to work upon. It is important that this work be done without delay.

A supply of camphor seeds was obtained from Messrs. Mollison & Co., Japan, on the 3rd May, and sown at once in nursery beds in moderate shade. From this batch about 600 plants were obtained. Germination commenced about the end of June; on the 15th July a

large number were up. On examining the seed beds it was found that there were still many seeds quite sound that showed signs of germinating. Occasional seedlings kept coming up until the end of September. In addition to above a batch of 50 young stumps—*i.e.*, young plants cut back leaving about four inches of stem—were also received from Messrs. Mollison & Co. The plants were packed in bundles, the roots being wrapped in damp moss; several shoots had started to grow on the journey. The plants on arrival were put in nursery beds in dense shade, which was gradually reduced as the plants became more accustomed to the light. All the plants lived and are now forming good bushes.

A permanent plot of 350 plants was put out in September, planted 10′ x 10′. Three hundred plants were distributed to different estates for trial. The raising of camphor from cuttings on a large scale has not, I regret to say, so far proved successful.

Tapioca.—A series of manuring experiments with tapioca (*Manihot utilisima*) were initiated in June. The object being to note the effects of various chemical manures on the growth and weight of the crop. For this purpose 12 plots, each $\frac{1}{10}$th of an acre, were laid out. The experiment was divided into two sections:

a (6 plots). The manure was applied and lightly changkolled in as soon as the cuttings had started to grow freely.

b (6 plots.). The manure was applied and changkolled in 14 days before planting.

The manures used, with the rate of application per acre, were as follows:

No. 1, marked N., 80 lbs. of sulphate of ammonia, containing about 20 per cent. nitrogen;

No. 2, marked N.P., 80 lbs. of sulphate of ammonia, 100 pounds concentrated superphosphate, containing about 40 per cent. phosphoric acid $P^2.O^5.$;

No. 3, marked N.P.K., 80 lbs., sulphate of ammonia, 96 lbs., concentrated superphosphate, and 160 lbs., sulphate of potash containing about 50 per cent. potash, $K^2.O.$, of the remaining plots three were used as controls, and in three the planting distances were varied. As this experiment is not yet complete no figures are yet available. A report on the results will be published later.

Pisang or Banana (*Musa sapientum* vars.).—A collection of 66 varieties of pisangs was obtained from Mr. A. Hale, District Officer, Larut and Krian, in October. The plants have been put in well-prepared holes and are doing well. Mr. Hale is a great believer in the banana, and has gone to a good deal of trouble to get his present large collection together. An interesting article on banana cultivation by Mr. Hale appeared in the "Agricultural Bulletin of the Straits and the Federated Malay States," Vol. V., No. 6

Coconuts (*Cocos nucifera*).—A collection of 20 named varieties of coconut was obtained at Kuala Kangsar. They have been put in nursery beds and will be available for planting in the present year.

Coffee.—A plantation of coffee was made on the hillside near the Superintendent's bungalow. The following kinds being planted :

Coffea robusta
,, *liberica*
,, *stenophylla*
,, *hybrida* (*arabica and liberica*).

The plants used were old stumps brought from Batu Tiga.

Cocoa (*Theobroma cacao.*—Preparations have been made for experiment with this important product. A piece of ground has been cleared and planted with—

Dadap (*Erythrina indica*), as shade trees ;

Seeds of Theobroma (best varieties) are being obtained from Ceylon.

Pepper (*Piper nigrum.*—A plot of about two acres has been arranged for pepper. Half the area is planted with Munkudu (*Morinda tinctoria*) and the other half with dadap as shade trees.

Grasses.—Plots of the following oil-producing grasses have been formed :

Andropogon schœnanthus (Lemon grass)
,, *nardus* (Citronella)
,, *muricatus* (Cus-cus)

A collection of the various fodder grasses, both native and introduced, has been started, six species having been put in. The number will be added to as material becomes available.

Fibres.—Two plots of fibre-producing plants have been put out on steep slopes—viz.

(*Agave vivipara*) Maguey fibre
Furcraea gigantea.

Fruits.—A portion of the Exprimental Plantation has been set apart for fruit culture. It is hoped in time that something may be done towards the improvement of native fruits. There is excellent material at hand to work upon (much better in many instances than that upon which western horticulturalists had to start, and with which such excellent results have been achieved).

Seeds of all the finest fruits were obtained at the Kuala Kangsar Show. From these stocks of young plants have been raised, some of which have been planted out in permanent quarters.

A large number of young orange (*Citrus aurantium*) pomeloe (*Citrus decumana*) and limes (*Citrus limetta*) have been raised from seed, some are planted out, others being retained in the nursery for budding and grafting experiments.

Arboretum.—The foundation for an arboretum has been laid during the year; the ground selected for the purpose being the strip of nicely undulating ground in front of the offices, containing, roughly, about 60 acres.

Thirty-two species have already been planted, the work having been done during the wet weather in November.

The method of arrangement adopted is that in which the general appearance of the ground and the requirements of particular trees are studied and catered for. This being considered more desirable than the usual system of division into natural orders or tribes.

The following is a list of species planted to date :

No.	Name.	Natural Order.	Local Name.
1.	Swietenia macrophylla	Meliaceæ	Mahogany
2.	Dichopsis oblongifolia	Sapotaceæ	Gettah Taban Merah
3.	Melaleuca leucadendron	Myrtaceæ	Gelam
4.	Eugenia grandis	,,	Jambu Ayer Laut
5.	Dillenea indica	Dilleniaceæ	Simpok
6.	Bixa orellana	Bixaceæ	Arnatto
7.	Durio zibethinus	Malvaceæ	Durian
8.	Pterocarpus indicus	Leguminoæ	Angsena
9.	Cassia nodosa	,,	
10.	,, javanica	,,	
11.	,, fistula	,,	
12.	Afzelia palembanica	,,	Merbau
13.	Fagraea fragrans	Loganisceæ	Tembusu
14.	,, fastigiata	,,	Malebera
15.	Corton tiglium	Euphorbiaceæ	
16.	Casuarina equisetifolia	Casuarineæ	Ru
17.	Hevea braziliensis	Euphorbiaceæ	Para Rubber
18.	Manihot Glasiovii	,,	Ceara
19.	,, sp.	,,	Manicoba Rubber
20.	Elateriospermum tapos	,,	Buah Prah
21.	Adansonia digitata	Malvaceæ	
22.	Parkia africana	Leguminosæ	African Locust
23.	Acacia Koa	,,	
24.	Tamarindus indicus	,,	Tamarind Tree
25.	Poinciana regia	,,	
26.	Cæsalpinia Sappan	,,	
27.	,, sp.	,,	Yellow Poinciana
28.	Erythrina sp.	,,	
29.	Albizzia lebbek	,,	
30.	Cæsalpinia pulcherrima	,,	
31.	Bombax ceiba	Malvaceæ	Silk Cotton Tree
32.	Bauhinia tomentosa	Leguminosæ	

The building up of an arboretum, representing trees that grow in the country, either native or introduced, is a work of years. The collecting of the various trees takes time.

The work in this direction is, however, considerably lightened by the hearty co-operation of the Forest Department, who have kindly supplied many specimens and have promised seeds, etc., of others as they become available.

All the specimens were carefully labelled as they were planted out, and records made of planting, origin, etc.

A Substitute for Weeding.—The remarks of the Director of Agriculture in his 1906 report on the planting of leguminous plants as a substitute for weeding have excited considerable interest in the matter during the year.

Experiments have been initiated and are being carried on with *Crotolaria striata, Mimosa pudica and Desmodium triflorum ;* all there

being plants whose roots contain nitrogenous nodules, and thereby enrich the soil in which they grow.

Crotalaria striata.—Seeds of this plant have been in such great demand during the year that it has been found impossible to get sufficient seed to carry out the experiments at first designed (arrangements have been made to get the seed early in this year). A plot, one acre, was sown broadcast and came up well. Owing to the shortage of the seed supply the plants were allowed to grow up for seed and not cut over in the ordinary way.

Mimosa pudica.—Special attention has been given to this plant. Areas of it have been planted up in various ways and at various distances. Some very good examples of it can now be seen both at Kuala Lumpur and Batu Tiga plantations.

Full details of the various experiments have been recorded to date, when the work is more advanced they will be published.

With regard to planting, the quickest returns were obtained from old, long, straggly plants, in seed, pulled up from the road-sides. These plants were put in about 2½ feet apart and the long shoots layered, viz., covered with soil at about the middle of the shoot. The plot was planted in the middle of June, by the middle of August the plants had made good growth and a large number of young seedlings were visible. By the end of September the plot was well covered with a dense mass of growth.

Weeding was done twice (July and the last week in September), the work of weeding was slow, the coolies working very cautiously owing to the thorns. A plot of young seedlings, planted 18 inches apart, put out on same dates as preceding one, took nearly three months longer to cover the ground, one plot sown with seeds (broadcast) was very slow in germinating, it took about ten months to cover the ground.

The mimosa grows, when once established very quickly, but is occasionally inclined to become patchy.

Desmodium triflorum.—A stock of this plant was collected at Sungei Buloh, where it grows in large quantities by the side of the railway. A plot, 1/10th of an acre, was planted in clumps about 15 inches apart.

The weather being favourable growth was quick from the beginning, in two months the ground was almost covered; at the end of four months it was completely covered, the whole forming a beautiful green carpet.

When at their best the plants were unfortunately attacked by insects, and almost completely defoliated. Spraying with kerosene and soft soap was resorted to and proved effective, the plants are now again assuming their original green colour. Desmodium triflorum appears to be fairly common all over the country, but unfortunately it seeds very sparsely.

The only practical method of propagation is by division, the creeping stems emit roots from every node under favourable conditions.

The plant in the open usually grows about two or three inches high, but in slight shade, or in moist places, it sometimes grows about

12 to 18 inches high. Weeding was necessary three times during the six months since the plot was planted, but on each occasion only a few rough weeds came up, these had to be hand pulled.

Nursery.—A piece of ground about three acres in extent was opened up and laid out for use as a nursery.

Collections of fruit trees, flowering shrubs and trees, etc., are being raised and will be available for use in the Public Gardens and for distribution.

The various economic plants required for the Experimental Plantations are also being raised there.

An atap shed has been erected in the nursery for growing seeds, etc., under that are too small to sow in the open owing to the heavy rains.

During the year plants were distributed when available.

A number of flowering plants were supplied to the Railway Department for station gardens.

Batu Tiga.

The plantations at Batu Tiga contain but few interesting subjects, the plot of camphor being perhaps the only one of any real value there. A considerable portion of the ground was covered during the year with Mimosa pudica. The plant has done well, large areas are now thickly covered with it.

Weeding Experiment.—An area of about four acres was planted with Hevea braziliensis seedlings. This area was divided up into four blocks and treated as follows:—

(*a*) Planted with Mimosa pudica, and not weeded after the mimosa had got established

(*b*) Clean weeded;

(*c*) A circle 3 feet round each plant is weeded, rest of field unweeded;

(*d*) Unweeded.

This experiment has not yet been long enough initiated to get figures of results, records are being kept of the growth of the trees in each area, etc. These will be published from time to time.

Experiments for the eradication of lalang (*Imperata arundinacea*) by spraying were carried out during the early part of the year, but were abandoned owing to the want of a suitable sprayer.

The wells for the supply of drinking water were deepened and brick-lined. The office roof was re-ataped during the year.

Public Gardens, Kuala Lumpor.

The expenditure for the year on upkeep amounted to $5,498.95, while a sum of $1,000 (revoted from 1906 estimates) borne on the Federal Estimates under Agricultural Department, (plants seeds, etc., and orchid and foliage house in Botanic Gardens) was also expended.

The gardens have been maintained in good order throughout the year.

Roads.—The upkeep of the roads, which is under the charge of the Public Works Department, leaves much to be desired.

The roads are treated as ordinary public roads, and as such are no doubt in excellent condition; but as garden walks and drives there is a

general untidiness, ragged,weedy edges, etc., which detract greatly from the general appearance of the place.

Clearing.—During the year the work of cutting out useless trees, opening up vistas and of giving growing space to useful and ornamental trees was proceeded with.

This work was rather difficult in many instances, where rare and useful trees have been planted without due consideration, or perhaps sufficient knowledge of their requirements, and which have now outgrown their allotted space and require more room, which can only be given at the expense of other good trees.

Plant House.—The plant house, which was repaired and re-roofed in the end of 1906, was arranged early in the year. The whole centre of the house being used for rockwork with small paths running through it, the sides as before being retained for pot plants. The general effect is very fine, almost all the plants have made excellent growth, those in the rockeries where root room is not restricted have in many instances made noble specimens.

In the centre of the house is a specimen of the beautiful tree fern (*Alsophia* sp.) which is so common on the Taipeng hills. This plant is now recovering from the effects of removal and will in time become very effective.

The collection of plants in the garden has been considerably enriched during the year by the addition of a very fine named lot of foliage plants obtained from the Botanic Gardens, Singapore. Many of the subjects were used for planting out on the rockeries, the others being retained as pot plants. The varieties of achimenes and gesnera grown in pots flowered well and were very effective for a long period, as was also a batch of Jacobinia coccinea, both planted out and in pots, which flowered several times during the year.

Two fine specimens of platycerium, both different species, were obtained, and as hanging plants add greatly to the appearance of the house.

Fern and Orchid Houses.—The fern and orchid houses, erected in the end of 1906, were fitted up with staging and filled with plants early in the year.

A small collection of orchids was obtained by purchase from the Botanic Gardens, Singapore. The fern house was filled partly from stock in hand and partly from plants obtained from Bangalore and other sources.

Things horticultural in the open garden leave much to be desired, the present arrangement of beds of shrubs and flowering plants cannot be considered as satisfactory. It was intended to arrange the beds and borders near the plant house during the last wet season, but this was found to be impossible owing to so much of the writer's time being taken up with planting arrangements at the Experimental Plantation.

The giant orchid (*Grammatophyllum speciosum*) which had not bloomed, I understand, for several years, flowered this year, carrying at one period 14 well-developed spikes.

Several trees and shrubs when in flower were very effective, notably the large masses of Bouganvillea and the clumps of Petrea volubilis.

This planting of masses of flowering shrubs judiciously carried out might be still further extended with advantage.

The lake has been cleared of weeds several times during the year. One small island was planted with a large flowering reed (*Arundo speciosum*) with which it is intended to replace the yellow bamboo (*Bambusa aurea*), which does so badly owing to the ground being too wet.

A small pond near the road was planted up with the American water hyacinth (*Eichornia crassipes*), a plant with pretty blue flowers which is much admired.

There is plenty of room for the extension of water gardening. Several shallow ponds are available where nympheas and other water plants could be successfully cultivated.

The giant water lily (*Victoria regia*) ought also to be grown.

A number of coconut trees were cut down, the stumps being retained as support for growing creepers over. Good holes were taken out at the base of each stump and filled in with good soil and manure. All the plants are making good progress while many have become effective. This promises to be one of the features of the garden.

Labelling.—Steps have been taken to name the collections in the garden, a number of labels have been written and put out.

Early in the year it was noted that a considerable number of petty thefts were carried on, the gardens being a happy hunting ground for the *kabuns* from adjacent houses who came in and practically took anything they wanted. This practice has now to a great measure been suppressed.

Mangosteens.—The mangosteens fruited in June and July, the fruits were distributed amongst various residents.

A large number of persons of all nationalities use the gardens as a place of resort. The plant house since its rearrangement has been well patronised, and judging from the number of enquiries received for plants noted there, by many interested in horticulture.

General.

While on leave on Taipeng hills, during the early part of January, I made a collection of native plants, amounting in all to some eighty-five species for the Public Gardens, Kuala Lumpor.

The collection included plants of the fine tree fern, several rare species of ferns, aroids, and some orchids.

In September a visit was paid to Taipeng and Kuala Kangsar for the purpose of getting plants and seeds for the Experimental Plantations.

In December I assisted at the adjudication of stations on the Federated Malay States Railways. Many of the stations were tastefully arranged, while several showed that considerable care had been bestowed upon them.

During the trip I was able to get several plants useful for the gardens, and to note one or two good botanizing grounds.

During the greater part of the year I was placed at a considerable disadvantage in living so far away from my work, the Superintendent's bungalow was not finished until October, considerable delay having been caused owing to the amount of sickness (malaria a mongst the contractor's coolies.

Plants Received.—Plants and seeds were received during the year from:

Royal Botanic Gardens, Kew
,, ,, Peradeniya
,, ,, Calcutta
Botanic Gardens, Singapore (purchased)
,, ,, Penang
Government Plantations, Perak
Forest Department, Perak and Selangor
Commissioner of Agriculture and Forestry, Honolulu
Curator, Museum, Taipeng
A. D. Machado, Esq., Kamuning Estate, Perak
E. M. Baker, Esq., Kuala Lumpor
A. Hale, Esq., Taipeng
G. H. Phillips, Esq., Kuala Lumpor
Messrs. Moonisawmy and Sons, Bangalore (purchased).

Agri-Horticultural Show.—I attended the Agri-Horticultural Show at Kuala Kangsar in August, and was able to procure seeds of many useful fruits for experimental purposes. The Shows grow more interesting each year, the quality of the exhibits, especially those of natives, show great improvement on previous efforts.

J. W. CAMPBELL

Superintendent, Experimental Plantations, F. M. S.

ANNUAL REPORT ON THE GOVERNMENT PLANTATIONS, F. M. S., STATE OF PERAK.

For the year 1907.

REVENUE

2. The total revenue collected by the department during the year was $2,688.67. This shows an increase of $337.27 over last year's returns and compares with previous years as follows:

1903.	1904.	1905.	1906
$1,484.88	$1,703.41	$2,087.00	$2,351.40

ADMINISTRATION.

3. I have been in charge of the Plantations Department during the entire year.

LARUT HILLS STATION.

4. The revenue which amounts to $2,688.67 shows an increase of $337.27 over last years's returns.

The expenditure amounted to $6,980.15.

VEGETABLES.

5. The output of vegetables shows a substantial increase notwithstanding the many climatic drawbacks. The rains this year have been exceptionally disastrous to crops, so much so that supplies had to be stopped during the whole of November and part of December. The

total rainfall for November at Maxwell's Hill was 40.33 inches, and during that time work was practically at a standstill and all crops then in the ground were totally ruined.

6. During the remainder of the year crops were good, particularly peas, tomatoes, beans, carrots, turnips, cabbage, beetroot, celery and leeks.

Manuring Experiments.

7. The scarcity of cow manure made it necessary that experiments should be carried on as in 1906, to discover the best and most economical manures to use in the gardens on the hills. Bat guano from the Padang Rengas caves has proved itself to be the best, cheapest and quickest acting of all the manures tried. Large quantities of this guano will be used during this year, and it is hoped that the gardens will soon be considerably improved thereby. Amongst artificial manures, bone meal has proved a lasting and efficient manure. It is one of the cheapest that can be obtained in the Federated Malays States or Colony, and one or two dressings per year shows a marked improvement especially when applied to rose and other flowering plants.

Preparing and Packing Seeds for Tropical Countries.

8. During the year I have further proved that it is quite unnecessary to subject flower and vegetable seeds to a special drying process before despatching them from England to tropical countries. The drying process has a detrimental effect on the germinating powers of most seeds.

9. During the year I made several test sowings which I think prove this. Seeds from ordinary paper packets which had been packed in brown paper parcels were sown at the same time as others which had been spcially dried and packed in hermetically sealed tins, with the result that the former showed a germination of 85 per cent. whilst the latter did not exceed 55 per cent. It seems to me that the only people who benefit from this process are the seed merchants at home, while the buyer suffers by having the germinating power of his seeds considerably reduced by the special drying process which he has also to pay for.

Roses.

10. There has been an increased supply of roses during the year. Two thousand nine hundred and two bunches were despatched during the year (not including those supplied daily to the different bungalows when occupied). Two thousand four hundred and ninety-eight bunches were spplied free and 400 bunches were sold. Two hundred and fourteen rooted cuttings were sold during the year at $5 per dozen. Several thousands of young plants have been raised during the year. These will be used for renewing worn out plants and for sale. The old plants are being gradually rooted out and the beds are being planted up with young plants. I hope to have renewed all these beds by the end of this year. Numerous new beds have been opened up and planted with rose plants. These are principally at the Box, the Cottage and Maxwell's. I am sorry to report that the consignment

of teas and hybrid teas received from England in 1906 are not proving satisfactory. Many have died and the remainder are not doing well. It seems to me that roses do best on their own roots in this country. All the above plants have been grafted on the briar stock.

Violets.

11. The number of violet beds has been increased and improved; 632½ bunches were despatched during the year.

Decorative Plants.

12. A good supply of flowering and decorative plants has been maintained, both in pots and in beds. English flowering annuals have done exceedingly well and have been an increased source of pleasure to visitors.

Several new things have been introduced during the year and have proved valuable and showy plants, especially *Coleus thyrsoideus* and *Salvia zurich.*

Cottage.

13. The Cottage grounds and roads have been maintained in good order during the year. The garden has been very much improved and a constant supply of flowering plants maintained during the year. A number of new rose beds have been made and planted, and old beds have been replanted.

Hill Roads.

14. The year has been the wettest experienced for some considerable time, and the hill roads have proved more troublesome than ever. In March, and again in October, November and December, the number of bad landslips was very serious. These were repaired as quickly as possible and at no time was the road closed to traffic.

Rainfall.

15. The total rainfall for the year was: Maxwell's 196.88 ins., Cottage 206.80 ins. For both stations February with 9.59 ins., was the driest month, and November with 75.13 ins. was the wettest. June, September and October were also wet months, each showing a fall of over 40 inches.

Diseases and Pests.

16. Fungoid diseases have been bad during the wetter parts of the year. Potatoes and tomatoes have suffered badly. Spraying with different fungicides was carried on but with little or no success. The cabbage moth was very troblesome at times, but by using insecticides the damage was soon repaired.

Cattle Herd and Dairying.

17. The cattle herd has been greatly improved by the introduction of an English bull and three English cows. Thirteen calves were born during the year, including two English heifer calves and one English

bull calf. One old pack bullock was shot and one bull calf died. Four aged milk cows and one aged bull were sold, also seven young bulls and one heifer. These were disposed of to make room for the English cattle. The total quantity of milk obtained during the year was 8,539½ bottles, showing an increase of 988½ bottles over last year. The quantity of milk obtained during the year was small and at times it was difficult to meet the demand. One hundred and forty-five lbs. of butter were made during the year, showing an increase of 49 lbs., over last year's output.

Tests were carried on during the year to discover a grass suited to the hills. So far guinea grass has proved a success, but it is hoped by next year to have obtained other grasses with better feeding properties. Plots of nine different kinds of grass seeds were put down at Maxwell's and at the Tea Gardens, and it is hoped that several of these will prove successful. Fresh grazing ground has been opened up during the year and the change is already noticeable on the cattle.

Public Gardens, Taipeng.

18. These gardens were maintained in good order during the year. Planting was carried out on an extensive scale. A scheme of massing clumps of plants for colour effect was followed and the results are in every way satisfactory. A considerable number of new beds were made and planted and old beds renewed. Good progress was made in clearing and levelling, especially along the back of the gardens. This land is being planted as opportunity admits and when completed will be a great improvement to the gardens.

Residency Grounds, Taipeng.

19. The Residency grounds have been maintained in good order. Old beds have been renewed and several new ones formed and planted. A good supply of pot plants has been maintained and the plant house has been kept in good condition.

Nurseries.

20. The nursery has been gradually extended. and stocks of flowering and decorative plants have been raised. These are being used for planting out in the Public Gardens and other places.

Shade Trees.

21. The planting of shade trees in Taipeng was almost completed by the end of the year, only one or two places remained to be planted.

Tapping Para Rubber Trees, Taipeng.

22. The rubber trees on Government land in Taipeng were tapped during the latter part of the year and about three pikuls of dry rubber obtained. The produce will be sold early this year.

Seeds and Plants Presented.

23. Seeds and plants were presented by A. D. Machado, Esq.; P. Moss, Esq.; Royal Gardens, Kew; Botanic Gardens, Peredania, Ceylon; Botanic Department, Trinidad; and J. W. Campbell, Esq.

Agri-Horticultural Show.

24. The Agri-Horticultural Show was held at Kuala Kangsar on the 9th, 10th and 11th August. I acted as Honorary Secretary. The Show was a great success and shewed a profit of $712.28. These Shows increase in excellence year by year. The quality of the exhibits was much in advance of those of former years. Perak exhibits were particularly good in rubber, fruit and padi. Perak exhibitors carried off 150 first prizes, 125 seconds and over 50 thirds, besides several silver cups, medals and diplomas. The usual display of English vegetables from the Larut Hill Gardens was staged and attracted great attention

T. W. Main,

Superintendent, Government Plantations, Perak.

CEARA RUBBER IN CHRISTMAS ISLAND.

Mr. Tait writes. "The few plants we have here are making good growth having reached a height of 12 feet and a girth of 7 inches, at 3 feet from the ground, at nine months old; from all accounts this seems a fair growth."

This certainly seems satisfactory considering the peculiar nature of the Christmas Island soil. The whole island consists of three raised coral-reefs rising from sea level to about 1100 feet altitude, over this coral rock lies a layer of phosphate of alumnia which is of some depth near the settlement. During the dry season, the country gets very dry and owing to the nature of the rock the water sinks through till it arrives at the volcanic rock which forms the base of the island at sea level. In such a peculiar soil and climate it is almost surprising that anything grows well, but the whole island is forested with large trees, and vegetables, limes, papaya, and other fruit trees grow well on the rich brown soil near the settlement. Para rubber has been planted as well as ceara, but it is probable that the latter will prove the most suitable.

H. N. Ridley.

SOME INSECT PESTS.

The memoirs of the Department of Agriculture in India always contain interesting and well illustrated papers on agricultural subjects and very valuable are Maxwell-Lefroy's life histories of insect pests in these memoirs. The one recently appearing, Vol ii, No. 3, contains an account of the red cotton bug *Dysdercus cingulatus*, an insect which is as much responsible as anything in the climate for our failure to grow cotton successfully here.

The insect has been already described in the Bulletin (Vol. 3 to 5, page 160). The account of its life history by Lefroy is as follows, much condensed however. The eggs are laid in cracks in the soil where the female scratches earth over them or occasionally on the bract of a cotton boll. The insect lays from 80 to 100 eggs which hatch in a week. The bugs pass through five months, and are adult in from forty-nine to eighty-six days, after the last mault they are not sexually mature for some time, as much as three weeks, when they begin to breed.

The bugs attack besides cotton, the ocher (Hibiscus esculentus) commonly known here as ladies' fingers, and according to Lefroy prefer this to the cotton hanging in clusters on the pods, and also it is partial to the silk cotton tree *Bombax malabaricum* on the seeds of which it feeds. Lefroy knows only one other distinct food plant the cultivated hollyhock and has reports of its occurence on *Hibiscus abelmoschus* and the garden *Hibiscus*. (Here however it attacks many other malvaceæ besides these.)

He finds it also however on maize, wheat and other plants when its ordinary food fails. The chief harm the bug does is to spoil the young bolls by sucking them and preventing their development, and by destroying the seeds and dirtying the lint with excrement, in older ones.

In India the insects breed as long as food is abundant and the weather is warm, while in the cold weather they hide away in fallen leaves, grass etc. The long hot dry weather is passed in shelter or feeding on any available plants. Insufficient food prevents breeding, but the animals keep alive during a scarcity with any plants they can do with and as soon as the cotton or Hibiscus is ready for them in abundance they mature the sexual organs and breed. In the Straits and peninsula we have no dry or cold season so that the animals can go on breeding all the year round.

In Pusa the simplest method for dealing with the bugs was found to be to provide each coolie with a winnow and a kerosene tin containing a little water and kerosene. He shakes the bolls or shoots on which the bugs are into the winnow, a quick jerk brings them to one corner whence they are emptied into the tin. This method was found to practically exterminate them; spraying was found to be useless as any insecticide strong enough to kill the bug, killed the plant.

It was observed that the *Hibiscus esculentus* was more attractive to the bug than cotton and it was grown as a trap crop, the bugs collecting on the pods and leaving the cotton. It was very easy to collect the bugs on the *Hibiscus*.

An excellent colored plate gives figures of all the stages of the bug's life, from the egg to the adult.

H. N. Ridley.

THE FUTURE OF COCOA PLANTING.

(Review.)

This little work is a reprint of a paper read at the Colonial Fruit Show of the Royal Horticultural Society, (June 11th 1908) by Mr. Harold Hamel Smith, the Editor of "Tropical Life," and the author

of " Cocoa planting in the West Indies." The paper is preceded by an introduction by Sir Daniel Morris and followed by the discussion to which the paper gave rise, and several additional articles by Mr. Hart of Trinidad, Mr. Cradwick and others.

The booklet, deals with the industry of cocoa planting in all branches, and adds many suggestions for improvements in cultivation and preparation of cocoa, such subjects as the use of vacuum chambers for drying the beans, the plan of planting belts of rubber trees to break up the estate and prevent the spread of disease are discussed. The value of systematic manuring is shown by a photograph of a wonderful tree in Para which gave 720 pods, yielding 60 lbs., of dried cocoa in one year.

Cocoa planting has never attained any popularity in the Malay peninsula. It has occasionally been planted in small lots, but has generally been soon given up. Pods however of good and full size have often been shown at our agricultural shows, and at every show there are some exhibits. The chief trouble here seems to have been the various diseases to which the tree is subject, and the aggressiveness and abundance of our squirrels, rats and other such mammalian pests.

There is a considerable amount of discussion as to whether cocoa should or should not be grown under shade, and Mr. Barrett in this pamphlet is quoted as very strongly of opinion that shade is objectionable and absolutely injurious. The little experience we have had with the plant here tends in the opposite direction. Not only do unshaded isolated trees speedily perish but in a case in which a shaded tree in the Botanic Gardens was partially unshaded by the fall of boughs on the shade tree, the exposed part of the cocoa died in a very short time from fungus attacks. But what may be suitable treatment for plants in the East Indies may not be suitable treatment for those in the West.

The time may come when we shall treat the cultivation of cocoa in the peninsula seriously as a supplementary cultivation to rubber, or as an independent one but it can hardly be expected just yet. Those however who would wish to try the cultivation again would do well to add this little book to their stock of literature on planting. It is published at the " Tropical Life " publishing Depot, 83 Great Tichfield Street, London, at the price of one shilling and is well worth the cost.

H. N. Ridley.

RUBBER IN HAWAII.

The rubber industry is a new one in Hawaii but already large areas have been planted. The plant used is Ceara rubber (*Manihot Glaziovii*), over 400,000 trees have been planted in Hawaii and new plantations are rapidly being established. There are large areas suitable and available for its cultivation. The first trees were introduced 15 to 20 years ago, and it makes rapid growth and seems suited to Hawaiian conditions.

Preliminary tapping experiments have been made by the experiment station indicating a high yield of rubber of good quality even from trees

3 to 4 years old. These experiments show that from one third to two thirds of an ounce of rubber can be obtained per day from a tree for about half the year.

(J. G. Smith in Philippine Agricultural Review I. 6. p. 242).

A NEW ORDINANCE TO PREVENT THE INTRODUCTION OF PESTS INTO THE COLONY.

Nearly all the Colonies especially those of the tropics have now regulations as to the importation of plants or seeds from countries in which there is any animal or plant pest affecting these plants, and through which the disease is likely to be introduced. These regulations are intended of course to protect cultivated plants only, and are usually, but not always, enforced when there is a definite disease affecting an extensive cultivation in the country of the would be exporter, and the same cultivation without the disease in the country to which it is intended to export the plant. Thus Jamaica for many years prohibited the importation of any living plants of whatever kind from any country in which there was cultivated coffee affected with *Hemileia Vastatrix*, and thus kept the disease out of the country for a considerable period. There are diseases which no man can possibly prevent the invasion of as the distances which spores of fungi can float on the wind is very great and in countries at all contiguous they can drift across if the wind is suitable. The bee hawk moth, the caterpillar of which was so destructive to the coffee some years ago in Selangor is also a very long flying insect. I found it quite abundant in Christmas island over 200 miles from the nearest land it could have come from.

But these are rather exceptional cases and most plant diseases appear to be accidentally imported by man. In the interests therefore of the great areas of cultivations of plants now a days, it is essential to prevent as much as possible any disease that has unfortunately appeared in one country from invading another.

Hitherto there has been no ordinance permitting the Colony to refuse to allow to be imported diseased plants, and it became clearly desirable that it should have this power. Hence at the suggestion of the Director of Gardens the following ordinance has been passed.

Straits Settlements Ordinance No. XIII of 1908.

An ordinance to prevent the introduction into the Colony of pests and insects destructive to trees, plants and crops.

It is hereby enacted by the Governor of the Straits Settlements with the advice and consent of the Legislative Council thereof as follows:—

1. This Ordinance may be cited as "The Destructive Pests Ordinance 1908."

2. The Governor in Council may from time to time make such orders as may to the Governor in Council appear expedient for preventing the introduction into the Colony of any insect, fungus or

other pest destructive to agricultural or horticultural crops or to trees or plants and for preventing the spreading in the Colony of any such insect, fungus or other pest.

3. Any such order may prohibit or regulate the landing in the Colony of any tree or plant, or the leaves, branches, stems, roots, seeds, or fruit of any tree or plant, or any vegetable substance or other article the landing whereof may appear to the Governor in Council to be likely to introduce such insect, fungus or other pest, and may direct or authorize the treatment or destruction of any such article, if landed. Any such order may also direct or authorize the treatment, removal or destruction of any crop, tree, plant, or substance on which the insect, fungus or other pest in any stage of its existence is found, or by means of which it may appear to the Governor in Council to be likely to spread, and the entering on any lands for the purpose of such treatment, removal or destruction, or for the purpose of any examination or inquiry authorized by the order, or for any other purpose of the order.

4. The Governor in Council may from time to time make orders for the payment of compensation in respect of any crop, tree, plant, or other substance destroyed under the provisions of this Ordinance.

5. Any person acting in contravention of any order under this Ordinance shall be guilty of an offence, and shall be liable upon conviction to a fine not exceeding five hundred dollars.

Passed this 11th day of September, 1908.

A. H. LEMON,
Clerk of Councils.

PLANTERS' ASSOCIATION OF MALAYA.

Minutes of Meeting of the Planters' Association of Malaya, held at 1.30 p.m., on October 5th, 1908, at the Chamber of Commerce, Penang.

Present:—For the Malaya Peninsula Agricultural Association. The Hon. John Turner, Mr. John Lamb, Mr. A. Crawford, Mr. R. G. Palmer, Mr. D. Ritchie, Mr. Thos. Boyd, Mr. C. A. Law; For the Perak Planters' Association: Mr. C. L. Gibson, Mr. Alma Baker, Mr. B. C. N. Knight, Mr. E. Lauder Watson; For the Kuala Lumpor D. P. A: Mr. H. C. E. Zacharias; For the Kula Selangor D. P. A: Mr. A. Irving; For the Kapar D. P. A: Mr. H. M. Darby; For the Klang D. P. A: Mr. R. W. Harrison; For the Kuala Langat D. P. A: Mr. E. Macfadyen; For the Negri Sembilan P. A: Mr. E. N. T. Cummins; For the Johore P. A: Mr. A. H. Malet; Mr. R. W. Harrison (in the Chair); Mr. H. C. E. Zacharias, Secretary.

1. The Notice convening the Meeting having been read, the Minutes of the General Meeting of July 19th and of the Emergency Meeting of August 27th are taken as read.

2. Mr. C. L. Gibson having raised a point as to the accuracy of § 5 of the printed Minutes of August 27th, it is proposed by Mr. Darby, seconded by Mr. Law, and passed unanimously, that the Minutes of both Meetings be confirmed.

3. The Secretary reports that no reply had been received yet from Government regarding the Resolution forwarded by him in respect of §§ 4, 7 and 13 (July 19th, 1908).

The Secretary is instructed to write in again and solicit an early reply from the Resident-General.

REPRESENTATION ON THE LEGISLATIVE COUNCIL.

4. Mr. C. L. Gibson moves the following proposal standing in his name:—

"That considering the vastly increased importance of planting interests in the F. M. S. and Johore, this Association considers it expedient to approach H. E. the High Commissioner with a view to his granting an additional planting representative on the Legislative Council of the Colony."

He reminds the meeting that in his speech at the opening of the last Agri-Horticultural Show in Kuala Lumpor, His Excellency the High Commissioner had expressed his approval of the formation of the Planters' Association of Malaya, as it not only served to focus opinon of the planting community as to their wants, but also was a representative body which the Government could rely upon for advice. They would take His Excellency at his word and approach him in order that the representative views and knowledge of the Association could be brought direct before the Council in Singapore. It was unfortunate that there was no Federal Council of the F. M. S., and that legislation had to be initiated in Singapore.

As this, however, was the state of affairs, they had to reckon with it, and he thought the best way would be to have another Member on the Council. Nobody recognized more than he did the excellent work done by the Hon. John Turner; but one planting member was not enough, especially as the interests and methods of the different districts of the Peninsula were quite distinct. To illustrate the size of the interests at stake, he put before them the following facts and figures:—

1. CAPITAL INVESTED.

(*Very incomplete—rubber only.*)

Paid up F.M.S.	$21,483,353
Straits (Colony)	3,734,160
Johore	1,942,543
	$27,160,056

say $30,000,000 probably all in 3 years £3,500,000

2. ACREAGE UNDER RUBBER.

(*Exclusive of Johore and the Colony*).

		At end of	
1907	Rubber	126,235	Acres.
	Coffee	10,833	,,
	Sundries	24,695	,,
		161,763	,,

Of above, rubber in 1907 alone, 40,473 acres, *i.e.*, $\frac{1}{3}$ in single year.

III. Export Rubber from F. M. S. only.

(*Not including Johore and Colony.*)

	1906	1,028,792 lbs. = 460	tons.
	1907	1,984,285 ,, 885	,,
6 mos.	1908	1,382,158 ,, 617	,,

to 31st December; say 1,300 tons.

IV. Duty Paid.

(*F. M. S. only*).

	1906	$50,023
	1907	97,750
6 mos.	1908	52,000

to 31st December, say $115,000.

Depreciated market first six months; now rising.

V. As Employers of Labour.

And so contributing indirectly, but still considerably, to the Revenue.

Malay Peninsula, 75,000 labourers.

F. M. S. Total Labourers to end of 1907, 58,000, of which Tamils and Javanese = 55,000; large increase 1908.

VI. Value of Rubber Exported.

(3 States as per declaration *Government Gazette*).

	1906	$1,855,436
	1907	3,822,000
6 mos.	1908	2,080,000

The Hon. John Turner thoroughly agrees with this proposal; so far, only planting in the North of the Peninsula had been represented on the Council, and it was only right that the widely divergent interests of the districts further south should be equally represented, now that these interests had assumed such vast proportions. Of course, he did not know how far their request could be acceded to, without violating the constitution of the Colony; but if it could be done, it would be an excellent thing all round. As for himself, it would be of the greatest assistance to him to have a colleague, with whom he could consult on all matters of planting interests; and he had great pleasure in seconding the motion.

The proposition was then put to the Meeting and passed unanimously.

Mr. Gibson then proposed as a rider, that this Resolution be at once formulated by a Select Committee and forwarded to H. E. the High Commissioner.

After some general discussion, it was resolved that the drafting of the petition be left in the hands of Messrs. Gibson, Harrison and Zacharias.

Bolting of Coolies.

The Secretary reads the following report of the Commission on the Bolting of Coolies:—

The Sub-Committee appointed to report on the question of the bolting of coolies submit that a system of registration is necessary, and suggest that it should be worked on the following lines:—

1. That an officer of the Indian Immigration Department be attached to every District Office.

2. That, amongst others, it be the duty of the officer to keep a register of all labourers in his District, as defined by the Indian Immigration Enactment.

3. That it be compulsory for all employers of Tamil labour to give a discharge ticket on the completion of the usual month's notice.

The ticket should show the following particulars:—

1. Name.
2. Parents' names and village.
3. Place of discharge.
4. Length of service.
5. Reason of discharge.
6. Rate of wages paid.
7. Distinguishing marks.

4. That all employers of Tamil labour be forbidden to take on any Tamil labourers, unless they come direct from India, or can produce from their last employer a discharge certificate, which has been registered at the respective District Office, in accordance with § 3.

5. That every employer taking on a discharged coolie shall pay a nominal registration fee for each such coolie, and that all fees so collected shall be paid into the Indian Immigration Fund, which, in a measure, will defray the expenses of the proposed scheme.

6. That in Section 2 of the Indian Immigration Amended Enactment (No. 1 of 1907) the word "knowingly" be omitted, and the whole of the scheme be worked in with that Enactment.

7. That the Committee strongly recommend, in conjunction with the scheme, that a system of finger-prints be universally adopted.

8. That Mr. Harrison's suggestion, of granting free return tickets to all coolies able to prove a stated term of uninterrupted service with one employer, be adopted.

Mr. Darby, speaking on behalf of the Sub-Committee appointed, said that the Indian Immigration Enactment 1904, Amendment Enactment 1907, copies of which were before them, had been introduced by Government in order to fix the responsibility more definitely on the employer who took on absconding coolies, rather than on the labourer who had bolted from his estate. The suggestions of the Sub-Committee really only tended to enable the Government to carry out these intentions systematically; and if these suggestions were adopted by Government, they should be incorporated in the Enactment just cited. The employers of locally-recruited labour only hampered Government in the good work they were doing by trying to flood the country with labour. It could, and no doubt would, be argued that discharge tickets interfered with the liberty of the subject. He, how-

ever, could not see that, as every employer would be compelled to grant discharge tickets. There was one more point he wished to emphasize, viz., that the rate of wages as previously paid would be inserted in the tickets. This he had no doubt would greatly tend towards reducing the price of labour all round, especially in States commanding higher wages than were usual in Selangor.

The Hon. John Turner said that everybody agreed that local recruiting was undesirable. The only question was, how to prevent it? He felt positive that a system of discharge tickets was emphatically not feasible, not perhaps on account of the attitude of our own, as rather of that which the Indian Government most likely would adopt. To him it seemed that the present scheme of the Indian Immigration Fund was the only real remedy. It might take some time for things to right themselves, but right they would. Personally he sympathized with the idea of levying even five times the poll-tax of imported coolies on employers of locally-recruited labour; that, however, was impossible to do, and so was their scheme of discharge tickets. If an Indian coolie was not given here the same freedom as that which he enjoyed in India, the great probability was that the Indian Government would stop emigration to the Malay Peninsula altogether. Was it wise to court such a risk; His advice was, leave well alone, and give the working of the Indian Immigration Fund Ordinance a chance.

Mr. Cummins informs the meeting that, if the system of discharge tickets is adopted, he would withdraw item 8 on the Agenda, as the one seemed to include the other. As for discharge tickets without finger-prints, they were quite useless, as had been proved everywhere, notably in Ceylon. Finger-prints were the only certain means of identification.

Mr. Cummins then read out the following extract from a private letter which their Chairman (Mr. Power) had received from Mr. Conlay, who was one of the greatest living authorities on this system:—

"To make finger-print registration of coolies effective, two measures are necessary, 1, the taking of finger-prints of all coolies engaged under advances; and 2, the refusal of all employers of labour to engage coolies locally unless they yield their prints. These latter prints would in every case be examined in a central office in order to ascertain whether the subject was already under advances to somebody else.

"The taking of prints on estates could be taught to an intelligent native in a few minutes. Government authority and Government departmental co-operation would be required to enable this and make it a success, otherwise estate coolies could abscond and get work in the P. W. D. or Railway Dept.

"The cost would be very little over and above the cost of stationery and postage. Two or three trained clerks and a well-lighted room in a central office would be all that would be required, but, as I have said, the scheme to be effective must have Government co-operation and unanimity on the part of all employers of labour.

"The organization would be a matter of extreme simplicity and its effect infallible."

As for the question of wages, that had been mentioned: it was absurd to expect uniformity of wages as long as there was no unifor-

mity in the rates of living. All speakers had spoken of an intention of flooding the country with labour. What did that mean, but that there would be a surplus of labour available for local recruiting? Is that surplus not going to be permitted to take on engagements ?

In reply to a question put to him by Mr. Knight.

The Hon. John Turner explains the system prevailing in Demarara 20 years ago. The chief difference was that all labour there was indentured and that the tickets were issued by Government.

Mr. Macfadyen considered that it would come to the same thing, if here every free coolie on landing received a similar ticket.

Mr. Irving believed that the discharge ticket system had been proved a failure, and he would like to see it eliminated altogether. All they wanted was registration. As for the gentlemen who advocated trebling the labour cess for locally-recruited coolies, they did not seem to realize that there was already a distinct surplus of labour in some districts. Why make it impossible for these lawfully discharged coolies to seek re-employment in another and less fortunate district? Registration was necessary and could only be done by a system of finger prints. After all it was their own money really, and he therefore thought that they should have a voice in saying how it should be spent; provided, of course, that there was going to be a surplus of the Indian Immigration Fund.

Mr. Darby thought that the ultimate effects of the Indian Immigration Fund Enactment were still years off, and they wanted some remedy now and at once. Mr. Irving's objection could be met by an arrangement with the Indian Immigration Dept. The grievance was of old-established estates losing specially trained coolies. The suggestions now before them contained a small registration fee, payable by an employer taking on locally-recruited coolies. Surely this was only fair, as it would make people pay something for the advantage of obtaining acclimatized coolies.

Mr. Boyd was inclined to agree with Mr. Darby. They taught the coolie his work, and when he knew it, he was induced to go to another estate. This was, he supposed, called local recruiting. He called it crimping, and it ought to be stopped.

Mr. Cummins emphatically protested against the imputation, at least as far as Negri Sembilan was concerned.

Mr. Macfadyen says it seemed agreed that without finger-prints the whole system would be useless. At the same time a system of finger-prints seemed exactly the kind of restriction the Indian Government would object to. They were on the horns of a dilemma, and he failed to see how anything could be done for the time being.

Mr. Baker is strongly against a policy of inactivity. There was nothing like trying. Let them put their views before Government: if they ewre adopted, well and good ; if not, they had not lost anything. He took the £ s. d. view and thought that the Government, having charged them heavily in order to import coolies, should at least help hem to keep those coolies.

Mr. Darby then formally proposes:—

"That Government be asked to assist employers of Tamil Labour to retain same by introducing legislation on the lines of the scheme now before this Meeting."

This motion was seconded by Mr. Knight and passed unanimously.

LONDON RUBBER EXHIBITION 1908.

6. The *Secretary* lays the following financial statement before the Meeting regarding the London Rubber Exhibition:—

ACCOUNTS PER OCTOBER 1ST, 1908.

Dr. GOVERNMENT ACCOUNT. Cr.

To Grant from S.S. Govt.		£260	By P.A.M.	£160	
,, F.M.S.	,,	500	less sent to Wray	50	
					£110
			Carruthers	230	
			less sent to Wray	60	
					170
			L. Wray:—		
			from Govt. direct	370	
			,, P.A.M.	50	
			Carruthers	60	
					480
		$760			£760

P. A. M. ACCOUNT.

To Floor Space	$2,588.76	By Donations:—	
Less Govt. grant	1,371.43	,, Kuala Lumpor D.P.A.	364.00
	$1,217.33	,, Kuala Selangor D.P.A.	345.00
Malay House	663.62	,, Perak Planters' A.	230.00
£50 to L. Wray	431.36	,, Kuala Langat D.P.A	190.00
Charges	42 20	,, Kalang D.P.A.	175.00
Freight paid to date	350.57	,, Batu Tiga D.P.A.	160.00
		,, N. Sembilan Planters' A.	75.00
		,, Johore Planters' A.	70.00
		,, Kapar D.P.A.	50.00
		,, Malay Penin. Agricul. A.	nil
			1,659.00
		,, Fees	140.00
		,, Deficiency	906.08
	$2,705.08		$2,705.08

Mr. Zacharias explained that, since the 1st inst., $350 had been promised as a donation from the M. P. A. A. This reduced their deficiency to about $600, out of which $500 had been originally voted.

In reply to a question by Mr. Macfadyen.

Mr. Zacharias explained that this excess payment had been authorised by the Exhibition Sub-Committee.

As regards their request for the loan of Museum specimens, he had been informed privately that this request had not been acceded to, but that the Imperial Institute had loaned the contents of their F.M.S. Court.

BENEVOLENT FUND RULES.

7. The Rules of the Benevolent Fund, as circulated with the Minutes of July 19th, 1908, are then placed before the meeting.

Mr. Irving proposes and Mr. Darby seconds that they be adopted as printed. Passed unanimously.

WHITE ANTS.

8. The Secretary reads the following correspondence:—

No. 3,995/1908.

Kuala Lumpor, 21st August, 1908.

SIR,—I am directed by the Resident-General to acknowledge the receipt of your letter of the 31st ultimo on the subject of certain resolutions passed at a meeting of the Planters' Association held on the 19th idem.

2. I am to enquire what sum the planting community would be prepared to contribute towards a reward to be offered for the discovery of a cheap and effective method of exterminating white ants.

I have, etc.,

(Sgd.) S. MCARTHUR,

Ag. Federal Secretary.

September, 3rd, 1908.

SIR,—I have the honour to acknowledge receipt of your letter No. 3.995 of 21st ult.

In reply I am to suggest that the reward be raised in equal shares by the Government of the Colony and the Federation and by the Planting interests of the Peninsula.

I have, etc.,

(Sgd.) H. C. E. ZACHARIAS,

The Federal Secretary, F. M. S. *Secretary.*

No. 3,995/1908.

Kuala Lumpor, 10th September, 1908.

SIR,—I am directed to acknowledge the receipt of your letter of the 3rd inst., on the subject of the proposal that a reward should be offered for the discovery of a cheap and effective method of exterminating white ants.

2. I am to say that it is proposed that the Government of the Straits Settlements should contribute a fifth share of the amount to be

offered as a reward, the remaining four-fifths being made up by equal contributions of two-fifths each from the Government of the Federated Malay States and the planting community of the Peninsula, and I am to ask you to be so good as to state, for the information of this Government, what amount will be contributed by the latter body.

I have, etc.,
(Sgd.) S. McARTHUR,
Ag. Fed. Secretary.

September, 15th, 1908.

The Federal Secretary, Federated Malay States.

SIR,—I have the honour to acknowledge receipt of your letter No. 3,995 of the 10th inst., reply to which I beg leave to defer until after our next meeting, which will be held on the 5th prox.

I have, etc.,
(Sgd.) H. C. E. ZACHARIAS.
Secretary.

The *Secretary* also lays on the table a letter received from Mr. Pears offering a remedy.

The Hon. John Turner proposes that the share of the planting community be fixed at £2,000, since for a really efficient and cheap remedy ridding the Peninsula altogether of the white ant pest, a reward of £5,000 would by no means be excessive.

Mr. Harrison quite concurred and seconded the proposal to fix their two-fifths portion, as defined by the Federal Secretary, at £2,000.

He would take this opportunity of informing members that Mr. Pratt had been transferred from the Institute of Medical Research to the Department of Agriculture, and that he was to devote the next six months exclusively to the study of the white ant pest.

Mr. Turner's proposal was then put to the Meeting and carried unanimously.

RETURN OF CONVICTED ABSCONDERS.

9. The Secretary informs the meeting that he has received the following replies on this subject from the four Residents of the Federation:—

No. 4461/1908.

Taipeng, 6th August, 1908.

SIR,

Referring to your lettter of 29th ultimo regarding the return to estates of coolies on their release from prison, I am directed to inform you that the police authorities will arrange for escorts when possible in cases in which they are asked to do so.

2. It is advisable that application should be made at the time of conviction if it is desired to have the coolie returned to the estate under escort. The police can hardly be expected to provide escorts unless they

are asked to do so, for it might turn out that the employer did not want the coolie returned under escort, and in this case he would no doubt decline to pay for the escort.

I have, etc.,

(Sgd.) R. J. WILKINSON,

Ag. Sec. to Resident, Perak.

No. 3981/1908.

Kuala Lumpor, 5th August, 1908.

SIR,

In reply to your letter dated the 29th July, 1908, asking that arrangements may be made with the police authorities for the return to their estates of all absconding coolies on their release from prison, when an order has been made by a magistrate that they should return; I am directed to inform you that in such cases the employer should make arrangements to send some one to the prison to take charge of the coolie on release.

I have, etc.,

(Sgd.) R. C. GREY,

Sec. to Resident, Selangor.

No. 2314-8/1908.

Seremban, 10th September, 1908.

SIR,

I am directed to repply to your letter of the 29th ult. in which you ask that the police authorities may be directed to make arrangements for the return to their estates immediately on their release from prison of all absconding coolies sentenced to imprisonment.

2. The return of labourers to their employers on completion of a term of imprisonment is provided for in Section 33 (iii) of the Labour Enactment 1904, and in the special case of Statue Immigrants in Sec. 91 of the Indian Immigration Enactment 1904.

3. In such cases the employer should either send a person to receive the prisoner at the prison on his liberation, or should request the officer in charge of the prison to send the prisoner under police escort to his place of employment; the request in the latter alternative being accompanied by a remittance to cover such expenses as may be necessary.

4. If employers will comply with these provisions of the law, the police will provide the necessary escorts.

I have, etc.,

(Sgd.) E. B. MAUNDRELL,

Ag. Sec. to Resident.

No. 1289/1908.

Pahang, 10th Sept., 1908.

SIR,

With reference to your letter of the 29th July last, on the subject of the return of absconding labourers to estates on their release from prison, I have the honour to inform you that ordinarily the employer

should make arrangements to receive a discharged labourer at the prison.

I have, etc.,

(Sgd.) HENRY CHEVALLIER,

Ag. British Resident.

Mr. Darby proposes that the suggestion made by the Resident of Perak be adopted generally, with the addition that it be at the option of the employer to say whether the coolie is to be escorted back to the estate itself or only as far as the nearest police station. The expenses of transportation from police station to estate, as incurred by the authorities, were sometimes quite unnecessarily high, and the employer would usually be able to make far more economical arrangements.

Mr. Harrison seconds this proposal, which is carried unanimously,

The *Secretary* is instructed to approach the Resident-General accordingly.

ALTERATION OF RULE 4.

10. Mr. Macfadyen proposes the following motion standing in the name of the Kuala Langat District Planters' Association :—

"That rule 4 be amended by the following alteration of the last clause, viz., with a minimum of two representatives, subject to the right of any constituent Association to be represented by not less than four representatives, if it announces its wish to that effect at the beginning of the financial year."

He considers that, as the rule stands at present, it entails very great hardship on small Associations. Under the present system the cost fell so heavily on the several estates constituting their Associations that in his own case for instance it meant a contribution of $100 for a 1,000 acre estate, which of course was absurd.

At the same time their interests were really quite distinct from those of surrounding Associations, and it therefore seemed wrong to go back and re-amalgamate with them. He took it that the formation of District Associations should be encouraged, and the adoption of his proposal was necessary to enable them to carry out such a policy. It was of course understood that any Association wishing for a larger number of representatives would still be able to have the same.

Mr. Turner seconds the motion, which is put to the meeting and carried unanimously.

PAPERS TABLED.

11. The Secretary lays the following papers on the Table :—

a. Annual Report of Johore Planters' Association for 1907-8.

b. Year Book of Planters' Association of Ceylon for 1907.

c. Report of Indian Immigration Office, F. M. S., for 1907.

d. Letter dated Aug. 6th, 1908, from Mr. H. F. O. Larsen *re* infringement of his patents.

LOANS TO PLANTERS.

12. Mr. Alma Baker thought that some fixed standard of cultivation should be laid down by Government for the guidance of the officers administering the Loans Fund, specifying the degree and nature of cultivation required. He knew of two instances in which, acting on the advice of Mr. Carruthers, estates had been allowed to get dirty. An amateur had been sent to value them, but the loan had been refused as the estates had been reported to be abandoned. Mr. Carruthers had written strongly on the subject, as he considered that, when an estate was clean, it lost plant food and was 25 per cent. less valuable than one kept dirty.

It was absurd to send an amateur valuer like a District Officer, who would say thatan estate was abandoned when it was being kept in, accordance with the recommendation of such an authority as Mr. Carruthers. Some standard must officially be declared, as otherwise great unfairness would result.

Mr. Macfadyon pointed out that it was difficult to lay down a general rule like that. If any injustice had taken place, it would be better to follow up the special case. They could not eliminate the personal equation from any report of this nature; and all they could really ask Government to do was not to employ amateurs. He would therefore propose as an amendment:—

"That for the purpose of Estate valuations, the Government do not go outside their own scientific staff of officers of the Department of Agriculture."

Mr. Alma Baker then withdraws his original motion and seconds Mr. Macfadyen's, which is thereupon put to the meeting and passed unanimously.

SHIPPING RINGS.

13. The Hon. John Turner gives notice that, at the next meeting he will bring forward a motion asking Government to legislate against Shipping Rings in the Colony.

14. Resolved that the next meeting be held at 10 a.m., on December 6th, 1908, at Seremban.

The Meeting terminated at 1.30 p.m., and at the close only the following gentlemen remained, viz., Messrs. Irving, Macfadyen, Lamb, Palmer, Crawford, Ritchie, Darby, Boyd, Baker, Turner, Harrison and Zacharias.

H. C. E. ZACHARIAS,

Secretary.

MINUTES OF AN EMERGENCY MEETING OF THE PLANTERS' ASSOCIATION OF MALAYA, HELD AT NOON ON OCTOBER 18th, 1908, AT THE SELANGOR CLUB, KUALA LUMPOR.

Present:—For the Malay Peninsula Agricultural Association: The Hon. John Turner, Mr. R. G. Palmer, Mr. D. Ritchie, Mr. John Lamb; For the Kuala Lumpor District Planters' Association: Mr. F. G. Harvey, Mr. E. B. Skinner, Mr. A. J. Fox, Mr. C. Burn-Murdoch, Mr.

H. C. E. Zacharias; For the Batu Tiga District Planters' Association: Mr. C. Henly, Mr. H. F. Browell, Mr. H. L. Jarvis; For the Klang District Planters' Association; Mr. R. W. Harrison; For the Negri Sembilan Planters' Association: Mr. J. le P. Power; Mr. R. W. Harrison (in the Chair); Mr. H. C. E. Zacharias, Secretary.

1. The Secretary having read the telegraphic notice convening the Meeting, the Hon. John Turner moved the following Resolution, of which he had given notice at the previous Meeting of the Association, viz.:—

> "That this Association views with the greatest apprehension the action of the Shipping Ring on the industries of the Colony and Federated Malay States in the excessive freights now charged on produce to Europe, and requests that His Excellency the Governor and High Commissioner will take such steps as he may deem advisable to have the shipping of the Colony put on a fair and equitable basis."

In introducing this motion, he said that many of our agricultural industries showed only so small a margin of profit that they could not stand high freights. Rubber was at present able to stand it, and its export amounted to only little; but even in that case, why should they be bled to swell the profits of the Shipping Ring?

It was said that the Conference provided greater facilities and more regular services. Nothing that the Shipping Ring did was of great benefit to them as agricultural producers. They were the people who had to pay for high rate of freight and for everything in connection with it.

The Straits Government was going to great expense in increasing the facilities for shipping at Singapore; but all that would be of no avail as long as the present high freight rates remained in force.

Mr. Ritchie then seconded the resolution.

2. Mr. Harrison thought that the resolution did not get at the root of the present difficulty. The present Shipping Conference was a strong combine of lines, English and foreign, and rates had certainly risen. But there were two points of view—that of the F. M. S. and that of the Colony. If they went bald-headed for the Conference they would be playing into the hands of the Colony. Hanging on to the question was that of an F. M. S. Port. Direct shipments were increasing, but at present practically all their produce went through Penang or Singapore. The real point was, that on the total freight collected in the Straits, seven firms got a secret rebate of 5%. The total sum thus paid was estimated as between £30,000 and £100,000. That large and secret commission came practically directly out of the pocket of the producer. If that money had not to be spent, freights would be more likely to adjust themselves. The rebates were originally given because these firms used to provide their own steamers. The main thing for them to do was to agitate for legislation against that secret commission. Secret commissions were already illegal in England; they should be made so in this country too. The Shipping Companies were not paying large dividends in spite of the increased freights.

Mr. Skinner, concurring with Mr. Harrison, said that Mr. Turner's motion simply asked Government to take any action they liked and

left it to them to find out what they wished to be done. If they asked for legislation against secret rebates they brought forward a definite proposal, and would therefore carry more weight. As for the recent increase in rubber freights homewards, it was too early to speak of any effect of that move on the industry. In supporting Mr. Harrison's views, he would therefore propose the following amendment:—

"That this Association views with apprehension the artifical conditions of the shipping business prevailing at present in the Colony and its detrimental effect upon the industries of the Straits Settlements and Federated Malay States, and requests that His Excellency the Governor of the Straits Settlements and High Commissioner for the Federated Malay States will take such steps as may be deemed advisable to have the shipping of British Malaya put on a fair and equitable basis by abolishing all secret rebates and by suchother steps as he may deem necessary."

Mr. Harrison seconded the amendment, and invited Mr. Zacharias to address the Meeting.

Mr. H. C. E. Zackarias, speaking as a member of the Committee of the Selangor Chamber of Commerce, said that the Chamber looked at the matter from the point of view of the commerce and industries of the State. These depended on Port Swettenham, as did Negri Sembilan and parts of Perak and Pahang. The interests of Port Swettenham and Singapore were not identical. Singapore was complaining of the divergence of trade which was the natural result of the hinterland being developed. Port Swettenham got somewhere about 50 ocean-going steamers last year as against 25 the year before. Port Swettenham was being made more and more use of as far as imports were concerned. Export trade would doubtless follow as soon as rubber assumed large enough proportions. A great step forward had been taken when the Government stipulated that the B. I. boats should call there regularly, and a boat now arrived there every week. The Railway and the P. W. D. got most of their indents direct to Port Swettenham. Business men here had the greatest interest to encourage that to the detriment of Singapore and Penang. They did not wish to pay transhipment charges. Hence they had to make it clear that their interests were not identical with those of the Colony. Naturally, however, the Shipping Ring could not leave out Port Swettenham, and so it was to our advantage, so far as the Shipping Ring was concerned, to fall into line and take the steps deemed advisable to protect our mutual interests. The discussion at the meeting of the Selangor Chamber of Commerce made it clear that the Shipping Rings as such had given us advantages. In the past shipping competition had made it impossible for the companies to carry on business on a remunerative basis. Hence they had found it necessary to combine and raise freights. They established regular and accelerated services. The passenger service then was nothing like what it is now. Purely freight lines were now able to maintain regular service and ensure ships from Penang reaching Home in 35 days. Take the old conditions, and you will find that the benefit has not been one-sided. Unfortunately there is a pernicious system mixed up with it—the secret rebate. The shipping companies give a general 10% rebate to every shipper. This does not effect the public. It is this 5% secret rebate. The result is

quite clear. Each of the seven firms gets the secret rebate not only on goods sent home by themselves but on the total freight collected in the Colony. Against every £1 freight paid by the general public the favoured seven pay only 19/-. The secret rebates disorganize not only the trade of the whole country but also its industries. We shall strengthen our case by going for the real culprits and not for the shipping companies who have done us a lot of good. The shipping companies are not making huge fortunes over raised freights. Any margin goes into the pocket of the seven. We must go for the real culprits, not for the accessories.

3. The Hon. John Turner said that they were an agricultural Association for the whole of the Peninsula, not for the F. M. S. only, and it was only as an agricultural Association that they carried any weight with Government. He also considered that the interests of the Colony and the F. M. S. were identical on this question, which was merely one of bringing down the rates of freight which were identical for everybody. Mr. Skinner's amendment only differed from his general proposition by being more special, and he therefore would withdraw his original motion.

Mr. Skinner's amendment thus became a substantive motion, and on being put to the Meeting was carried unanimously.

The Meeting terminated at 12.45 p.m.

H. C. E. ZACHARIAS,

Secretary.

BALANCE SHEET OF AGRI-HORTICULTURAL SHOW 1908.

OFFICE OF THE SUPERINDT. OF EXPERIMENT PLANTATIONS F. M. S.

Kuala Lumpor, 19th November, 1908

SIR,

I have the honour to forward herewith balance sheet of the Agri-Horticultural Show held in Kuala Lumpor 10th, 11th and 12th August last.

I have the honour to be Sir,

Your Obedient Servant,

(Sgd). J. W. CAMPBELL,

Hon : Secretary, Agri-Horticultural Show.

KUALA LUMPOR FLOWER SHOW

Mr. J. W. Campbell has courteously sent us a copy of the Prize list for the forthcoming Kuala Lumpor Flower Show.

The show will be held in the Town Hall, Kuala Lumpor, on Saturday 13th February, 1909, and will be open from 12 noon to 10 p.m.

The Prize list is an attractive one containing some 70 classes and should draw many competitors from different parts of the state.

T. W. M.

BALANCE SHEET.

Receipts.

Subscription F. M. S. Government Contribution	$	2000 00
,, S. S. ,, ,,		2000 00
,, Private		3342 00
,, ,, for special prizes ...		533 37
Gate Receipts		1549 85
Rent for Trade space and Bar		465 00
Receipts from Visitors Housed		453 82
Proceeds of sale of Buildings		242 62
Total	$	10586 66

Expenditure.

Prizes, Cups and Medals	$	731 86
Money Awards		1845 00
Printing and Advertising		391 77
Transport		262 72
Band		25 00
Gate expenses		131 40
Postage and Telegrams		51 31
Expenses of Housing Visitors		687 75
Cost of buildings, lighting and fencing ...		3667 15
Miscellaneous clerical services		66 00
,, coolies wages		52 75
,, petty expenses		346 57
Balance in Bank		2327 40
Total	$	10586 66

I have examined this statement of Receipts and Expenditure with the Ledger-Vouchers and Books produced and certify that according to these it is a true statement.

Sd. H. Vane.

JOHN HADDON & CO. SPECIAL PRODUCE LETTER.

London, October 9th, 1908.

STRAITS REPORT.

BEESWAX — A quiet market the small business has centred upon the better qualities.

CAPSICUMS — Really fine Beans sell well and have commanded 50/- to 60/- per cwt.

CAMPHOR — Has improved, China Crude advancing to 160/- per cwt. On the spot, and to arrive 160/- to 165/- per cwt c.i.f.

CLOVES — Have fluctuated considerably, after dropping to $4\frac{1}{16}$d rose to $5\frac{1}{8}$d closing quiet thereat.

The small offerings of Penang realising 10d to 11d per lb., for dull to fine bright bold.

COPRA — After a brief quiet period has shown marked strength prices advancing about 30/- per ton. Offers are wanted for any shipment up to March next.

GUM COPAL — Supplies have been heavy but with holders firm little has been sold.

Sambas, pale and pinky, hard scraped sold at 67/6d. Manila and Macassar, good palish nubbles at 27/-, ambery rough at 23/-, dark rough at 19-; Chips, fair palish at 23/-, small at 20/-. Pontianac, amber scraped at 60/- good nubbles at 37/-, mixed at 26/-; Chips small at 24/6d Amboyna, amber and dark scraped at 42/-, medium ditto at 32/6d to 34/-, coated nubbles at 19/6d; Chips, good bold 25/6d, small at 22/6d, dusty ditto at 18/-, dark drossy pickings at 13/-.

GUM DAMAR — The Moderate supply of 69 cases 189 baskets and 244 bags Singapore and Penang was offered and 185 packages sold at about steady prices, fair amber sorts at 51/6d, fair grayish sorts at 48/6d to 50-, block as 39/-, and pickings at 34/-. Siftings, specky graint at 25/- to 35/6 pale small at 29/-, Dust at 25/-, block at 22/6d.

Borneo: 103 bags black coated and dusty were bought in.

ISINGLASS — There was a good demand for all kinds. Sagon sold well in the last sales at 2d to 3d per lb., advance for long and round leaf.

85 packages offered and 78 sold: Long Leaf, fair and good pale 5/- to 5/9d; middling 4/7 to 4/11d; reddish part small 3/11d to 4/6d; rough and small 3/1d to 3/3d Round Leaf, fair and good pale 4/2 to 4/4; middling 3/5 to 3/10d: part rough and thin 2/5 to 3/2; pickings 2/2 to 2/3; tails palish 1/5 to 1/8d per lb.

Penang:—In good demand at steady prices. 98 packages offered and 67 sold: Round Leaf, fair to good palish 3/11 to 4/3; middling 3/4 to 3/8d; part thin and rough 2/4d to 2/8d; good pickings 1/7d to 2/-; Tongue, fair to good pale 3/9 to 3/11d; pale and reddish 3/1d to 3/3; dark and reddish 2/6d; pickings 11½d to 1/-; long, fair pale 2/7d; small and thin 2/2 to 2/3d; Purse ordinary to fair pale 8½d to to 1/1d; floats, fair to good bold /14d to 1/9d per lb.

PEPPER

Black—Singapore has been in quiet request and with heavy supplies prices have been downward.

Fornarrival January/March shipment sold down to 2¾d c.i.f. delivered weights.

White Pepper also has shown an easier tendency November December closing sellers at 3 $1\frac{5}{8}$d per lb.

SAGO

Business to arrive has been comparatively speaking small ranging from 9/9d, to 9/6d per cwt c.i.f.

On the spot, small, fair quality is worth 11/-, medium dull 12/6d, good 13/- per cwt.

SHELLS

M.O.P. The next sales take place on November 19th. There was a good attendance of buyers at the last sales, Macassar sold at 10/- to 20/- advance and Mergui at firm prices. Green Snail Shells sold well.

Macassar and Aroe:—969 cases offered and 707 sold at 10/-to 20/- advance. Bold and medium £9 to £10.7.6; small and chicken £8.15 to £9.10 pickings £5.5 to £10., peces £5 to £7.2.6.

Island Sorted: AA, chicken £8.5. to £8.10., A, small medium £8.10 to £9.7.6., B, stout medium £8.5.0 to £9.5.0., C, bold heavy £9 to £10.17.6, D, more or less wormy £6.10, to £7.2.6, E. pickings £4.5.0 to £5.2,6. W. P. C., part defective £7.10 to £7.15.0.

Mergui:—201 packages offered and 154 sold at rather.

Dearer rates. Bold and medium £7.2.6 to £7.7.6., medium and chicken £6.2.6 to £6.10., pickings £4.15. to £6.10. pieces 90/-.

Green Snail:— 581 packages offered and 422 sold at firm prices.

New Guinea: bold 24/- to 36/-, defective 14/-.

Mergui: Medium and bold 43/- to 44/-, small 32/- to 33/6d., defective 16/6d to 17/-, Penang and Singapore, small to bold part defective 26/- to 29/-.

TAPIOCA

Market has been quiet but close with a firmer tendency. Singapore November/December shipment, closing buyers at $1\frac{13}{32}$d.

Pearl Tapioca is quiet, closing buyers of Singapor medium November/December shipment at 12/3 and fair Penang at 11/3d per cwt c.i.f.

Tapioca Flour—Buyers October/December shipment at 8/- to 8/6d per cwt for fair quality.

All descriptions of Produce sold to the best possible advantage.

GOW, WILSON & STANTON, Limited—

India Rubber Market Report.

13 & 23, ROOD LANE, LONDON, E.C.

16th October, 1908.

Since the last sale we have had an active market, and a large business has been doing in all grades. As will be seen from the statistics given below, the position has become very strong owing to the smallness of stocks in warehouse in the United States, and much of the buying that has recently been taking place on that side appears to be for immediate requirements.

Only small supplies of Plantation Rubber were offered at to-day's auction, which met with keen competition; they were mostly disposed of in the room at advances of from 2d. to 5d. per lb. on last sale rates.

All grades were in request, particularly Crepe, and the highest price of the sale, viz., 5/-, was realized for some fine pale lots of this from the Consolidated Malay and Jebong Estates.

Number of Packages Advertised.		Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.		
		Ceylon.	Malaya.	Totals.	No. of Packages sold.	Price.	Hard Fine Para.	Plantation.	
								Fine	Scrap.
To-day	836	$17\frac{1}{2}$	$36\frac{1}{2}$	44	762	4/4⅞	4/6½	4/8 to 5/-	3/3 to 3/6½
Corresponding Sale Last year	513	4	$25\frac{3}{4}$	$29\frac{3}{4}$	278	4/2⅞	4/2½	4/8½ to 5/2	3/1 to 3/8

To-Day's Quotations.

Sheet and Biscuits.		Crepe and Block.		Unwashed Scrap.	
Good to Fine Biscuits.	4/8 to 4/8¾	Very Pale ...	4/10 to 5/-	Good to Fine	3/3 to 3/6½
Good to Fine Sheet.	4/8 to 4/9	Medium and Palish.	4/1 to 4/9		
		Dark and Brown.	3/6 to 4/-		

Plantation Exports.

CEYLON—1st January to 31st September.

1908	... ...	236¾ tons	
1907	... ...	149½ tons	
1906	... .	103½ tons	

MALAYA—1st January to 28th August.

	Singapore.	Penang.	Total.
1908	611½ tons	358¼ tons	969¾ tons
1907	402¾ tons	117⅝ tons	520½ tons
1906	173 tons	26½ tons	199½ tons

U.K. Statistics.

Imports.	Tons. 1907.	Tons. 1908.
Nine months ended 30th September	25,650 ...	21,232
Month ended 31st July	2,787 ...	1,552
Month ended 31st Augu t	2,054 ...	1,580
Month ended 30th September	2,124 ...	1,904

U.S.A. Statistics.

Imports.	Tons. 1907.	Tons 1908.
Year ended 30th June	34.359 ...	27,782
Month ended 30th June	2,355 ...	3,140
Month ended 31st July	1,879 ...	2,497

U.S.A. Stocks.

	1907.	1908.
Value of Stocks in Warehouses as at 30th June ...	£81,598 ...	£8,198
Value of Stocks in Warehouses as at 31st July ...	£71,819 ..	£6,366

Particulars and Prices of To-Day's Sale.

CEYLON

Mark.	Pkgs.	Description.		Price.
Ingoya	21	Fine biscuits and sheets	...	4/6 to 4/8½
	1	Good block	...	4/2
	3	Scrap	...	2/6 to 3/5
Hattangalla	2	Good biscuits	...	4/8¼
	3	Crepe	...	3/6 to 3/11
S. G. A.	5	Good biscuits	...	4/8 to 4/8½
	3	Fine scrap and rejections	...	3/3 to 3/6½
Elston	2	Good biscuits	...	4/8½
	4	Good darkish crepe	...	4/1½
Heatherley	3	Fine pale crepe	...	4/8
C. L.	2	Brown crepe pt. sold	...	3/10
	1	Lace	...	bought in

Mark.	Pkgs.	Description.	Price.
M. A. K.	1	Block ...	bought in
P. G. K.	1	Black presssed crepe ...	bought in
Halwatura	1	Fine crepe ...	4/7
Kahagalla	4	Good to fine crepe ...	4/4½ to 4/6¼
	2	Dark to black pressed pt. sold ...	3/11⅓
Maddagedera	3	Good biscuits ...	4/8¾
Katugastota	1	,, ,, ...	4/8½
	1	Good scrap ...	3/6½
Hapugastenne	4	,, ,, ...	3/6½
Halgolle	2	,, ,, ...	3/6½
	1	Cuttings ...	3/6
Moneregalla	2	Good biscuits ...	4/8½
	2	Scrap and cuttings ...	3/6¼ to 3/6½
Galphele	4	Good crepe ...	bought in
Merton	5	Good sheet ...	4/8½
Kumbukkan	3	Good biscuits ...	4/8¾
	1	Good scrap ...	3/6
Ambatenne	4	Good biscuits ...	4/8¾
	1	Good scrap ...	4/8¾
	1	Rejections ...	3/6
Densworth	2	Good biscuits ...	4/8½
	1	Scrap ...	3/4½
Deviturai	3	Good to fine sheet ...	4/8½ to 4/8¾
	1	Scrap ...	3/4½
Taldua	3	Good crepe ...	4/3 to 4/6¼
	2	Dark ,, ...	3/10
	1	Good worm ...	bought in
Northumberland	1	Good darkish crepe ...	4/2
Clara	1	Good biscuits ...	4/8¾
Doranakande	7	Good biscuits and sheet ...	4/8½
	6	Good to dark scrap ...	3/5 to 3/10
Waharaka	7	Good bi cuits ...	4/8½ to 4/8¾
	2	Dark crepe ...	4/–
Glencorse	1	Good biscuits ...	4/8½
	4	Good to dark scrap ...	3/3½ to 3/6½
Ayr	2	Good biscuits and sheet ...	4/8½
Tallagalla	5	Good biscuits ...	4/8¾
	4	Scrap ...	3/3 to 3/5
M. A. K.	2	Dark scrap ...	bought in
P. G. D.	3	Low scrap ..	bought in
Glanrhos	2	Black block ...	bought in
C. R.	14	Low scrap ...	bought in
Rangbodde	1	(9 lbs.) very fine pale biscuits ...	bought in

MALAYA.

Mark.	Pkgs.	Description.	Price.
S. R. Co., Ltd.	23	Good to fine sheet ...	4/7¾ to 4/8
	24	Good crepe ...	4/6 to 4/7
	15	Dark crepe ...	3/10¾ to 4/0
V. R. Co., Ltd.	16	Fine sheet ...	4/8
Klang	8	Palish crepe pt. sold ...	4/4½ to 4/7½
F.M.S.	33	Good brown to dark crepe ..	3/11½ to 4/3¼
Matang	22	Fine pale crepe ...	4/11½
	4	Palish crepe ...	4/6¾ to 4/8¾
	18	Good brown to dark crepe ...	3/9 to 4/2½
	4	Good sheet ...	4/8
T. K.	1	Pressed Rambong crepe (part virgin)	3/0¼
O.			
I. R.			
R. S. R.	10	Sheet ...	4/8¼
L. C. Y.	1	Rejections ...	3/9¼
Y. L.			

Mark.	Pkgs.	Description.	Price.
Jebong	24	Fine pale crepe	5/-
	19	Fine palish	4/11 to 4/11¼
	1	Little darker	4/8
	7	Palish	4/5¾ to 4/7¼
	17	Dark	3/10½
S. S. B. R. Co., Ltd.	7	Good to fine sheet	4/8½ to 4/9
	3	Brown crepe	4/1½
Kepong	2	Brown crepe	4/1¼ to 4/1½
	3	Good crepe	4/6
	3	Biscuits	4/8½
W. Figg	1	Rejections	3/4
	3	Good sheet	4/8½
	1	Scrap	3/6¼
C. M. R. E., Ltd.	17	Fine pale crepe	4/8½ to 5/-
	23	Fine palish and mottled	4/3¼ to 4/8¾
	24	Dark	3/10¼ to 3/10½
	1	Fine Rambong	3/8
R.	8	Good to very fine sheet	4/8¾
S. S. C.	3	Brown crepe	3/11½
	1	Dark	3/-
Shelford	9	Rough sheet	bought in
	11	Dark crepe	3/10½
Damansara	3	Good pressed crepe	3/11½
	9	Darker	3/8¾
Highland Est.	18	Good crepe	4/2¾ to 4/4¾
	7	Dark ,,	3/10¾ to 3/11½
	1	Very fine crepe	5/-
	22	Fine sheet	4/8¾ to 4/9
F. (S.) R. Co., Ltd.	6	Good sheet	4/8½
	18	Good to dark crepe	3/8¼ to 4/1¾
B. R. R. Co., Ltd.	15	Good to dark crepe	bought in
Jugra	6	Good sheet	4/8½ to 4/8¾
	5	Good crepe	4/1¾ to 4/3¾
	3	Dark pressed	2/10½ to 3/11
R.	32	Good to fine crepe	4/5 to 4/10
M. P. Ltd.	11	Brown	4/1 to 4/2
Damansara	23	Good to fine crepe	4/6 to 4/9
	11	Pressed crepe	3/3½ to 3/11
B. & D.	12	Sheet	4/- to 4/8½
	4	Rejections	2/9 to 3/4
	5	Dark crepe	2/9½ to 4/-
	4	Good to fine crepe	4/1 to 4/9
S. K. R. Co., Ltd.	22	Good crepe	4/3¾ to 4/8½
	6	Brown	3/11
	1	Block	bought in
R. R.	3	Rough biscuits and sheet	4/3 to 4/8½
C. W. etc.	7	Scrap and rejections pt. sold	3/4 to 3/6
L. & P.	2	Rough sheet	4/6 to 4/8½
B. R. R. Co., Ltd.	2	Pressed crepe	3/11

JAVA.

Mark.	Pkgs.	Description.	Price.
Pasir Oetjing	1	Rambong sheet (loose and pressed)	bought in

GOW, WILSON & STANTON, Limited—
India Rubber Market Report.

13 & 23, Rood Lane, London, E.C.

30th October, 1908.

The upward course of the market has been well maintained, and the Para quotation shows an advance of about 1d. per lb. since the last auction.

To-day's offerings of Plantation Rubber were keenly competed for, and were almost all disposed of in the room at prices showing advances of from 3d. to 6d. per lb. on last sale quotations.

The medium and lower grades of crepe were in most demand, and prices for these marked the greatest improvement.

The highest price of the auction—5/4—was realised for some pale Crepe marked "T," several other parcels of this grade and some fine Biscuits selling at 5/2 to 5/3½ per lb.

It is satisfactory to notice that the premium on Plantation Rubber over Para has now been brought back to the same level as that ruling at the corresponding period of last year.

Number of Packages Advertised.		Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.		
		Ceylon.	Malaya.	Totals.	No. of Packages Sold.	Price.	Hard Fine Para.	Plantation.	
								Fine.	Scrap.
To-day	1069	13¾	44	57¾	1019	4/9⅝	4/7½	4/11¾ to 5/4	2/7 to 3/10½
Corresponding Sale Last Year	908	12¾	32¼	45	351	4/1⅜	4/2½	4/7 to 4/8½	3/1 to 3/7

To-Day's Quotations.

Sheet and Biscuits.		Crepe.		Unwashed Scrap.	
Good to fine Biscuits.	4/11¾ to 5/3½	Very Pale ...	5/3 to 5/4	Good to Fine	3/6 to 3/10½
Good to fine Sheet.	4/11¾ to 5/1¾	Medium and Palish	4/7 to 5/2	Medium ...	2/7 to 3/5¼
		Dark and Brown.	3/10½ to 4/6½		

Plantation Exports.

CEYLON.—1st January to 5th OCTOBER.		MALAYA.—1st January to 25th SEPTEMBER.		
		Singapore.	Penang.	Total.
1908	244 tons	1908...642¼ tons	398½ tons.	1,040¾ tons
1907	161½ tons	1907...441 tons	...127⅝ tons	...568¾ tons
1906	107 tons	1906...197 tons	... 27¼ tons	...224¼ tons
1905	41¾ tons			

Note.—In our Market Report of the 16th instant, we omitted to mention that a parcel of Highlands Crepe also realised the highest price of that day's sale, viz., 5/- per lb. in addition to the lots from the Consolidated Malay and Jebong Estates.

U. S. A. Statistics.

IMPORTS from 1st January to 31st August.

	Tons. 1906.	Tons. 1907.	Tons 1908.
India Rubber	18,876	22,564	20,336
Gutta and Balata	4,092	10,162	4,537
Old Scrap for re-manufacture	6,078	9,683	2,167
	29,046	42,409	27,040

IMPORTS of Crude Rubber.

Imports.	Tons. 1907.	Tons. 1903.
Year ended 30th June	34,359	27,782
Month ended 31st July	1,879	2,497
Month ended 31st August	1,681	1,692

From the foregoing table, it will be seen that the imports of Old Scrap for re-manufacture have decreased by 7,500 tons (say 77 per cent.) during the 8 months ending 31st August, 1908, as compared with the same period last year.

It is interesting to note that such a large decrease should take place during a period of low prices, and it seems to point to the increased use of the raw article under such conditions.

U. S. A. Stocks.

	1907.		1908.
Value of Stocks in Warehouses as at 30th June ...	£81,598	..	£8,198
,, ,, ,, ,, 31st July ...	£71,819	...	£6,366
,, ,, ,, ,, 31st August ...	£62,698	...	£4,842

Particulars and Prices of To-Day's Sale.

CEYLON.

Mark.	Pkgs.	Description.	Price.
Dangan	7	Biscuits	... 4/9¾ to 4/11¾
	2	Scrap	... 3/5¼ to 3/6¾
R.	12	Good to fine thick crepe	... 5/- to 5/0¾
B. C.	1	Dark crepe	... 4/3½
Tudugalla	5	Good crepe	... 4/11½ to 5/0
	4	Dark ,,	... 4/5¾

Mark.	Pkgs.	Description.	Price.
Udapolla	1	Very fine scrap	3 8½
Rosehaugh	33	Fine thick crepe	5 2 to 5 3¼
	11	Darker	5 2½
	2	Fine palish crepe	5 0¼
	29	Brown and dark	4/1 to 4 6½
	1	Block	3 1
D. C.	1	Fine biscuits	5/0¾
	1	Brown crepe	4 5½
	1	Rejections	3/5½
Ingoya	6	Good sheet and biscuits	5 0¾ to 5/1
	1	Scrap	2 7
Hattangalla	3	Biscuits	5/1¼
	1	Crepe	4/4½
Palli	12	Ceara biscuits and sheet	5/0¾ to 5 1
Welkandala	3	Biscuits	5/1½
	3	Dark crepe	4 3½
Chesterford	1	Biscuits	5/1½
Glanrhos	10	Good to very fine biscuits	5 1¾ to 5 3½
	4	Good to fine crepe	5 0½ to 5 2¼
	1	Dark block	3 6
	9	Brown and dark crepe	3/10 to 4 5¾
Clontarf	3	Biscuits	5/1¾
T.	2	Biscuits and sheet	5/1½
	4	Worm	5/3½
R. M. B., etc.	4	Good rambong	4 6¼
	5	Good and dark crepe	3/10 to 5/-
	3	Rejections	1/3 to 3/9
Rosehaugh	13	Fine thick crepe	5 3 to 5 3¼
	6	Good brown crepe	4/8
	5	Dark crepe	4 4½ to 5/-
	3	Darkish crepe	4/7
Syston	1	Fine biscuits	5/2¼
	1	Pressed crepe	4 4½
Sunnycroft	1	Biscuits	5/1¾
Ambatenna	2	,,	5/1¾
	1	Scrap	3/6
Dolahena	4	Sheet	5/1½
	1	Scrap	2/9½
N. P.	1	Biscuits	5 1½
	1	Scrap	3/10
Talagalla	3	Good biscuits	5/1½
	6	Scrap, etc.	3/- to 4/4
Glencorse	1	Good biscuits	5 1½
	2	Good scrap	3/10
Ayr	1	Good biscuits and sheet	5/1½
	1	Scrap	3 10
Doranakande	4	Good scrap	3/10½

MALAYA.

Mark	Pkgs.	Description.	Price.
F. (S.) R. Co., Ltd.	8	Sheet	5/-
	20	Good to dark crepe	4/2 to 4/9
B. R. R. Co., Ltd.	24	Sheet	5/0¼
	33	Good crepe	4/3¼ to 4/9¼
	10	Dark to black crepe	4/0½ to 4/1¾
	1	Fine Rambong	3/8½
Jebong	42	Very fine pale crepe and palish crepe	bought in
	8	Good palish crepe	4/11 to 5/-
	16	Dark crepe	4/7
Golconda	6	Sheet	5/-
	8	Good to dark crepe pt. sold	4/- to 4/7

Mark.	Pkgs.	Description.	Price.
S. S. B. R. Co.,	13	Fine sheet ...	5/1¾
Ltd.	8	Dark crepe ...	4/5 to 4/6½
C. M. R. E., Ltd.	13	Fine pale and palish crepe ...	5/2 to 5/3
	18	Palish and mottled ...	4/10 to 4/0
	10	Dark ...	4/1
	1	Rambong ...	3/10½
S. R. Co., Ltd.	6	Fine sheet ...	5/0½
	31	Fine palish and brownish crepe ...	4/11¾ to 5/0½
Damansara	22	Fine pale and palish crepe ...	5/– to 5/0½
	3	Good brown crepe ...	4/10
	13	Dark pressed crepe ...	4/– to 4/1¼
P. S. E.	3	Sheet ...	5/0¼
Selaba	2	Crepe ...	4/6½ to 4/7
	1	,, Dark ..	4/2¼
N/M	6	Crepe (damaged) pt. sold ...	2/10
V. R. & Co., Ltd.	27	Fine sheet ..	5/1 to 5/1½
Klang	16	Good to fine pale crepe ...	4/10 to 5/0½
F. M. S.	44	Good brown ...	4/8 to 4/10¼
	14	Dark ...	4/7
J.	2	Good sheet ...	5/1
	1	Block ...	4/–
	1	Crepe ...	3/10
K.	8	Fine sheet ...	5/1
	11	Crepe ...	4/7 to 49¾
G.	1	Sheet ...	5/0¾
	1	Crepe ...	4/5½
P. S. E.	13	Fine sheet ...	5/1¾
	1	Fine crepe ...	5/0¼
	5	Good dark crepe ...	4/3 to 4/5¼
S. B.	6	Sheet ...	4/1½
P. R.	2	Scrap ...	3/2½ to 3/9
	3	Crepe ...	2/7 to 3/11
S.	18	Sheet ...	5/1¼
R. R.	5	Rejections ...	3/4 to 4/2
Highland Est.	20	Fine sheet ...	5/1½ to 5/1¾
	16	Good crepe ..	4/8½ to 4/9¾
	3	Dark crepe ...	4/4½
Bila	21	Sheet ...	5/1¾
	1	Rejections ...	bought in
	29	Crepe ..	4/6¾ to 49 ¼
Sungei Krudda	10	Fine palish crepe ...	5/0½ to 5/1
	8	Good crepe ...	4/9½ to 5/0¾
	14	Dark ,, ...	4/2½ to 4/9¼
	2	Crepe (damaged) ...	2/0
T.	28	Good crepe ...	5/0¼ to 5/1½
	2	Biscuits and sheet ...	5/1½
E. E.	4	Fine sheet ...	5/1½
	2	Good to dark crepe ...	4/4½ to to 4/8
B. & D.	23	Good to dark sheet ...	5/1 to 5/2
	7	Rejections, etc. ...	1/3 to 4/0¼
	2	Good crepe ...	5/– to 5/0¼
Perhentian	12	Dark sheet ...	5/1½
Tinggi	3	Good to dark crepe ...	3/10½ to 4/8½
S. K. R. Co., Ltd.	2	Good sheet ...	5/1¼
	1	Good crepe ..	5/– to 5/0¾
	5	Darker ...	4/5 to 5/0¼
	1	Damaged ...	2/0
B. C. R. Co., Ltd.	4	Good sheet ...	5/1½
	1	Rejected sheet ...	4/10
M. B.	29	Dark thick crepe ...	4/6½ to 4/8¼
E.	4	Sheet ...	5/1¾
	2	Scrap and rejections ...	3/8 to 3/10½

Mark.	Pkgs.	Description.	Price.
E.	3	Sheet	... 4/1½
K. K.	2	Scrap and rejections	... 3/8 to 3/10
P.	1	Rough sheet	... 4/8
B. & D.	4	Black crepe	... 4/1½
F. D.	8	Good to fine sheet	... 5/1½ to 5/1¾
P.	4	Rejections	... 3/9½ to 3/10
T.	3	Biscuits	.. 5/0¾
	5	Worm	... 5/2¾
	2	Very fine pale crepe	... 5/4
E. M. P.	1	Dark crepe	... 4/4½

CEYLON, STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

October 2nd, 1908.

The following Lots, comprising about 34½ Tons Straits and 19 Tons Ceylon, were offered at Auctions to-day and sold as follows:—

Straits and Malay States.

Mark.	Pkgs.	Description.	Price. per lb.
C. M. R. E. Ltd.	45	Cases Crepe most sold	... 3/5¾ at 4/6
Damansara	42	,, ,, part ,,	... 4/2½ at 4/5½
Sungei Choh	2	,, Sheet	... 4/4¾
Yam Seng	26	,, ,,	... 4/4 bid
	4	,, Scrap	... 3/4¼
B. R. R. Co., Ltd.	34	,, Sheet	... 4/4
	32	,, Crepe	... 3/5¼ at 3/10¼
F. S. R. Co., Ltd.	4	,, Sheet	... 4/4
	17	,, Crepe	... 3/5¼ at 3/10
S. R. Co., Ltd.	20	,, Sheet	... 4/4½ subject
	42	,, Crepe	... 3/7½ at 4/4
Vallambrosa V. R. Co. Ltd., Klang	23	,, Sheet	.. 4/4 at 4/4¼
F. M. S.	92	,, Crepe	... 3/7 at 4/4
K.	6	,, Sheet	... 4/4¼
	3	,, Crepe	... 3/6 at 3/10½
P. S. E.	15	,, Sheet	... 4/4 at 4/4¼
	13	,, Crepe	... 3/10
R. R. S.	9	,, Sheet	... 4/4¼
S. R. S.	8	,, Scrap	... 3/1 at 3/4¼
B. M. & Co.	2	,, Sheet	... 4/4½
	2	,, Scrap	... 3/3¾ at 3/4½
S. K. R Co., Ltd.	16	,, Crepe	... 3/6 at 4/4¼
E.	4	,, Sheet	... 4/4½
K. K.	1	,, Scrap	... 3/4½
P.	1	,, Biscuits	... 3/4¾
B. & D.	4	,, Sheet	... 4/3 at 4/4½
	2	,, Crepe	... 4/3¾
R. R.	5	,, Sheet	... 4/4½
S. & D. R.	2	,, Scrap	... 3/5¼
M. P. Ltd.	10	,, Crepe	... 4/4½ at 4/5
G. H.	5	,, ,,	... bought in

Mark	Pkgs.	Description.	Price.
R. Co., Ltd.	3	,, Sheet	... 4/4¼
Highland Estate	47	,, Crepe	... 3/7½ at 4/3
	16	,, Sheet	... 4/4¾
R. S.			
S. P.	15	,, ,,	... 4/4½
Bila	18	,, Crepe	... 3/10 at 3/11¾
R. P.			
S. S. R. R. Co., Ltd.	10	,, Crepe	... 3/8¼ at 4/4½
Golconda	10	,, Sheet	... 4/4¼ bid
C. M. R. E., Ltd.	4	,, Crepe	.. 4/0½
Linggi Plants, Ltd.	5	,, ,,	... 4/0¼
M. B.			
E.	3	,, ,,	... bought in
B.			

Ceylon.

Mark.	Pkgs.	Description.	Price.
Beverlac	22	Cases Sheet	... 4/4 at 4/4½ bid
	5	,, Crepe	... 3/3¼ at 3/8
	4	,, Scrap	... 3/4½
Rosehaugh	44	,, Crepe	... 3/3¼ at 4/8
Ingoya	9	,, Sheet	.. 4/4¼ at 4/4½
M. A. K.	5	,, Biscuits	... 4/4½
	1	,, Crepe	... bought in
	1	,, Sheet	... 3/4
Hattangalla	3	,, ,,	... 4/4¼
	2	,, Crepe	... 3/6¾
Anapolakande	9	,, Biscuits	... 4/4¼ at 4/4½
M.	35	,, Crepe	... 3/2 at 4/4
	5	,, Biscuits	... 4/4¼
Sorana	9	,, ,,	... 4/4¼
Mudamana	3	,, ,,	... 4/4¼
R. M. B.	6	,, Crepe	... 4/5
R. T.	3	,, ,,	... 4/5
Tallagalla	6	,, Biscuits	... 4/4½
	4	,, Scrap	... 2/8 at 3/4½
Warriapolla	5	,, Biscuits	... 4/11
Clara	3	,, Scrap	... 3/0¼ at 3/4½
Doranakande	3	,, Biscuits	... 4/4¼
	6	,, Scrap	... 3/2 at 3/4½
Ayr	1	,, Biscuits	... 4/4¼
Rosehaugh	20	,, Crepe	... 3/7 at 4/8¼
P. G. D.	3	,, Scrap	... bought in
Clontarf	3	,, Biscuits	... 4/4¼
	4	,, Crepe	... 3/7½ at 3/7¾
Glanrhos	12	,, ,, 9 sold	... 3/5
	12	,, Biscuits 9 ,,	... 4/4½
Kumaradola	7	,, ,,	... 4/4½
	4	,, Crepe	... 3/8 at 3/9¾
Tudugalla	9	,, ,, part sold	... 3/8¼
Shelford	5	,, Sheet	... 4/3 bid
Culloden	19	,, Crepe	... 3/9 at 3/9¼ bid
Arapolakande	3	,, ,,	... 3/6
Hattangalla	2	,, ,,	... bought in
P.	4	,, Biscuits	... 4/4¼ at 4/4½
R.	7	,, Crepe	... 4/4
T.	10	,, ,,	... 4/3½ bid
F. W.			

There was a good attendance of Buyers and practically everything sold with good competition. Sheets all Biscuits show an advance of about 2d. per lb. over last Sale; Fine Crepes about 2d. up, dark Crepes keenly competed for at 4d. @ 6d. per lb. over last Auctions' rates.

The top price 4/11 was realized for some very fine pale Warriapolla Biscuits.

Scrap also in good demand at about 3d. per lb. advance.

FINE HARD PARA 4/3½ per lb.

CEYLON, STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

October 6th,

The following Lots, comprising about 35 Tons Straits and 7½ Tons Ceylon, were offered at Auctions to-day and sold as follows :—

STRAITS AND MALAY STATES.

MARK.	PKGS.	DESCRIPTION.		PRICE.
S. R. Co., Ltd.	23	Cases Sheets	...	4/7¾ at 4/8
S. R. & Co., Ltd. Vallambrosa	39	,, Crepe	...	3/10¾ at 4/7¼
V. R. Co., Ltd., Klang	16	,, Sheets	...	4/8
F. M. S.	41	,, Crepe	...	3/11½ at 4/8
Matang	44	,, ,,	...	3/9 at 4/11½
	4	,, Sheets	...	4/8
S. R. R.	10	,, Sheets	...	4/8¼
Jebong	68	,, Crepe	...	3/10½ at 5/-
S. S. B. R. Co., Ltd.	7	Pkgs. Sheets	...	4/8½ at 4/9
	3	Cases Crepe	...	4/1½
Kepong	5	,, ,,	...	4/1¼ at 4/6
	3	,, Biscuits	...	4/8½
W. Figg	2	Pkgs. Scrap	...	3/4 at 3/6¼
	3	Cases Sheets	...	4/8¼
A. M. R. Co., Ltd.	24	,, Crepe	...	4/9
Pataling	14	,, ,,	1 sold ...	4/1
Linggi Plants K.	4	,, ,,	...	4/7
C. M. R. E. Ltd.	65	,, ,,	...	3/8 at 5/-
R. S. S. C.	8	,, Sheets	...	4/8¾
Shelford	6	,, ,,	...	bought in
	11	,, Crepe	...	3/10½
Damansara	12	,, ,,	...	3/8¾ at 3/11½
Highland Estate	26	,, ,,	...	3/10 ¾ at 5/-
	22	,, Sheets	...	4/8¾ at 4/9
Merton	5	,, ,,	...	4/8½
F. (S) R. Co., Ltd.	6	,, ,,	...	4/8½
	18	,, Crepe	...	3/8¼ at 4/1¾
B. R. R. Co., Ltd.	15	,, ,,	...	4/1¼ bid
Jugra Estate	6	,, Sheets	...	4/8½ at 4/8¾
	8	,, Crepe	...	2/10¼ at 4/3¾
R M. P. Ltd.	43	,, ,,	...	4/1 at 4/10 3/3½ at 4/9

Mark.	Pkgs.	Description.	Price.
Damansara Selangor	34	,, Creep ...	
B. & D.	6	,, Sheets ...	4- at 4/88
B. & D.			29½
F. D.	1	,, Crepe ...	
P.	1	,, Sheets ...	48½
S. K. R. Co., Ltd.	28	,, Crepe part sold ...	43¾ at 4/8½
Sungei Kapar			4/3
R. C. W. R.	1	,, Biscuits ...	
L. E. D.	2	,, Sheets ...	4/8½
	2	,, Scrap ...	3/6
S. Y. D.	4	,, ,, ...	out
S. R.			3/11
B. R. R. Co. Ltd.	2	,, Crepe ...	
B. & D.	3	,, ,, ...	3/9½ at 4/6¼
	2	,, Sheets ...	4/6½
Ingoya	10	,, Sheets ...	4/6 at 4/8½
	10	,, Biscuits ...	4/8¼ at 4/8½
	1	,, Sheet Block ..	4/2
Hattangalla	2	,, Biscuits ...	4/8¼
	3	,, Crepe ...	3/6 at 3/11
Elston	2	,, Biscuits ...	4/8½
	4	,, Crepe ...	4/1½
Heatherly	3	,, ,, ...	4/8
Kahagalla	6	,, ,, 5 sold ...	3/11½ at 4/6¼
Maddagedera	3	,, Biscuits ...	4/8½
Katugastota	1	,, ,, ...	4/8½
	1	,, Scrap ...	3/6½
Halgolle	3	,, ,, ...	3/6 at 3/6½
Kumbukkan	3	,, Biscuits ...	4/8¾
Ambatenne	5	,, ,, ...	3/6 at 4/8¾
	1	,, Scrap ...	3/6
Densworth	2	,, Biscuits ..	4/8½
Devitturai	3	,, Sheets ...	4/8½ at 4/8¾
L. H.			
Taldua	5	,, Crepe ...	3/10 at 4/6¼
Clara	1	,, Biscuits ...	4/8¾
Doranakande	5	,, ,, ...	4/8½
	2	,, Sheets ...	4/8½
	6	,, Scrap 2 sold ...	3/56
Waharaka	7	,, Biscuits ...	4/8½ at 4/8¾
A. Y. R.	1	,, ,, ...	4/8½
	1	,, Sheet ...	4/8½
Tallagalla	5	,, Biscuits ...	4/8¾
	4	,, Scrap ...	3/3 at 3/5
Glanrhos	2	,, Blocks ...	bought in
C. R.	14	,, Scrap ...	,, ,,

The 35 Tons of Straits and Malay States and 7½ Tons of Ceylon catalogued practically all sold with good competition. The average price for Sheets and Biscuits was 4/8½. Crepes met a good demand, and very fine Lots realized up to 5/-; brown and dark sold well. Scrap also a little dearer.

FINE PARA 4/5½ per lb.

WITH LEWIS AND PEATS'S COMPLIMENTS,

RUBBER REPORT.

PARA. Since our last we have had a very firm and advancing Market, and a good business has been done. The sales include:—Fine Hard at 4/6½ at 4/7½ on the spot, at 4/6 at 4/6½ for November December, at 4/5 at 4/6 for January, February and at 4/5 at 4/5½ for February, March.

Soft Fine spot 4/4 nominal, 4/2½ at 4/3½ forward value.

Negroheads dearer at 3/5½ for Manaos, Scrappy 2/3 for Islands and 2/4½ at 2/5 for Cametas.

BOLIVIAN. Fine 4/7½ value.

PERUVIAN. Also dearer at 4/7 for Fine, 3/- at 3/1 for Negroheads, for 2/4 Slab.

Ball sold in considerable quantities at 3/1½ at 3/3 for spot, 3/2 at 3/3½ for November, & December 3/2½ at 3/4 for December and January at 2/3 at 3/3½ for January, February.

MOLLENDO. Small sales of Fine at 4/3¾ per lb.

PLANTATION GROWN PARA. Fair sales privately at last Sales' rates to 2d. per lb. advance.

Particulars of the Auctions as follows:—

PARA & PERUVIAN. 34 Pkgs. Offered and 9 sold: Soft Fine 4/4, Ball 3/3, dead and weak coarse 4/0½ per lb.

MOLLENDO. 17 Pkgs. Offered and all sold: Fine 4/3¾ Entre. fine 4/1¾, coarse 4/-, Scrappy 3/2 per lb.

MATTOGROSSO. 61 Pkgs. Offered and all sold: Good virgin 4/- at 4/0¼, rejections 2/9, virgin lumps and strips 3/7, Negroheads 3/1¼, dirty 2/7, Mangabeira 2/7 per lb.

ORINOCO. 4 Pkgs. Offered and sold: Reddish Ball 2/5 per lb.

COLOMBIAN AND CENTRAL AMERICAN 27 Pkgs. Offered and 10 sold: Brown Scrap and Ball 3/2½, rather dirty 3/1½ per lb.

ZANZIBAR. 76 Pkgs. Offered and 75 sold: Reddish and whitish Ball 3/1, Lamu Ball 2/8 at 2/9¾, Beira reddish Ball 3/2½, red rooty 2/- at 2/1, whitish Ball 1/8½ per lb.

UGANDA. 12 Pkgs. Offered and 3 sold: Clean lumps 2/8 per lb.

MADAGASCAR. 18 Pkgs. Offered and 17 sold: Gummy immature 1/10 at 1/10½, white and brown cake 2/1½, whitish and pinky 2/9½ fairly clean niggers 1/10½, grey lump mixed gummy 2/0½ per lb.

RANGOON. 13 Pkgs. Offered and sold: Good clean red Scrap 2/11¾ at 3/1 per lb.

The following were offered and bought in:—

BOLIVIAN. 38,

MANICOBA. 17,

ASSAM. 58 Pkgs.

PLANTATION GROWN PARA. At Sale to-day there was a good attendance of Buyers, and practically everything sold with active competition at about 5d. per lb. advance on Biscuits, Sheets and Crepe. Fine pale Crepe 5/2 at 5/3, palish 5/- at 5/0½, mottled 4/8½ at 4/11½, brown 4/5½ at 4/7, dark 4/2 at 4/3, black 3/6 at 4/1. Biscuits and Sheets 4/11½ at 5/3½ Scrap 3/8 at 3/10½. Rambong 3/6 at 3/11 per lb.

1,072 Pkgs. Offered and sold at the above rates.

Kelantan.

Abstract of Meteorological Readings in Kelantan for the month of October, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
				Mean F°	Mean F°	Mean F°						Inches	Inches
Kuala Lebir	...	...	...	88.56	72.87	15.69	...	...	...	...	...	7.60	1.13
Kuala Pergan	...	...	...	...	...	...	...	...	...	...	...	12.56	1.83
Kuala Kelantan	...	...	...	83.58	72.93	10.71	...	...	...	...	...	4.93	1.40
Taku Plantation	...	...	...	...	...	...	...	...	...	...	...	9.22	1.44

State Surgeon's Office,
Kelantan, 9th November, 1908.

John D. Gimlette,
State Surgeon, Kelantan.

Negri-Sembilan.

Abstract of Meteorological Readings in Negri Sembilan Hospitals for the month of October, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Seremban	...	139	80.5	85.4	70.8	14.6	...	0.908	...	84.6	S. W.	6.59	2.49
Kuala Pilah	...	...	...	...	...	...	...	...	...	...	...	10.08	1.70
Port Dickson Beri-Beri Hospital	...	...	...	...	...	...	...	...	...	...	...	21.03	5.23
Port Dickson town	...	...	...	...	...	...	...	...	...	...	...	12.85	2.65
Mantin	...	...	...	...	...	...	...	...	...	...	...	5.53	1.61
Ayer Kuning	...	...	...	...	...	...	...	...	...	...	...	8.32	2.97
Tampin	...	...	...	...	...	...	...	...	...	...	...	5.90	1.70
Jelebu	...	...	...	...	...	...	...	...	...	...	...	6.76	0.80

STATE SURGEON'S OFFICE,

Seremban, 11th October, 1908.

J. D. MELCHIZEDEK,

For State Surgeon, Seremban.

Pahang.

Abstract of Meteorological Readings in the various Districts of the State for the month of September, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Kuala Lipis ...	...	...	78·9	91	0·68	18·9	76·3	...	...	...	...	10·44	1·85
Raub ...	...	...	78·5	91	0·65	19·8	74·2	...	...	...	...	11·05	2·34
Bukit Fraser ...	...	...	...	...	...	...	...	...	...	...	...	13·55	2·18
Bentong ...	...	...	79·5	91	0·70	17·4	74·7	...	...	...	...	10·66	2·04
Temerloh ...	...	...	...	93	0·70	16·2	...	...	...	...	...	12·97	4·60
Pekan ...	...	...	82·0	92	0·70	16·0	77·0	...	...	...	...	12·71	4·08
Kuantan ...	...	...	82·8	92	0·69	15·7	76·4	...	...	...	.	12·32	2·10

STATE SURGEON'S OFFICE,

Kuala Lipis, 26th October, 1908.

A. S. MILLARD,

for Ag: State Surgeon, Pahang.

Penang.

Abstract of Meteorological Readings in Criminal Prison Observatory for the month of October, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Mean Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Mean Maximum.	Mean Minimum.	Mean Range.	Mean Wet Bulb.	Mean Vapour Tension.	Mean Dew Point.	Mean Humidity.			
	Ins.	°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
Prison Observatory	29.863	139.4	77.2	87.5	73.3	14.2	77.2	0.887	75.82	86	N. W.	10.17	1.61
Government Hill	...	...	...	...	...	...	...	...	...	...	...	16.82	...
Fort Cornwallis	...	...	...	...	...	...	...	...	...	...	.	12.24	...
Balek Pulau	...	...	...	...	...	...	...	...	...	...	...	12.28	...
Pulo Gerajah	...	...	...	...	...	...	...	...	...	...	...	10.53	...
Bruas	...	...	...	...	...	...	...	...	...	...	...	2.85	...
Lamut	...	...	...	...	...	...	...	...	...	...	...	14.30	...
Pangkore	...	...	...	...	...	...	...	...	...	...	...	14.84	...

CRIMINAL PRISON PENANG,
Penang, 11th November, 1908.

W. H. FRY,
Senior Medical Office Penang.

Perak.

Abstract of Meteorological Readings in Perak for the month of October, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Taipeng	...	156	80·71	92	70	22	76·58	862	...	82	...	21·47	3·75
Kuala Kangsar ...	...	...	79·32	90	71	19	75·64	838	...	84	...	12·49	2·36
Batu Gajah	...	158	79·66	91	74	17	76·43	868	...	86	...	7·85	2·15
Gopeng	...	...	78·83	90	64	26	74·89	817	...	82	...	12·63	1·76
Ipoh	...	...	79·79	91	71	20	76·32	861	...	85	...	8·32	1·12
Kampar	...	...	79·37	90	69	21	75·64	838	...	83	...	15·59	3·45
Teluk Anson ...	...	...	81·34	92	69	23	76·54	850	...	79	...	7·69	2·55
Tapah	...	...	79·92	93	69	24	75·77	879	...	81	...	17·18	3·29
Parit Buntar ...	...	...	80·84	89	72	17	76·79	869	...	82	...	6·93	1·01
Bagan Serai ...	...	...	80·93	90	72	18	76·83	868	...	82	...	5·99	1·40
Selama	...	...	80·07	92	72	20	76·42	862	...	84	...	26·88	5·22

STATE SURGEON'S OFFICE,

Taipeng, November 12th, 1908.

M. J. WRIGHT,

State Surgeon, Perak.

Selangor.

Abstract of Meteorological Readings in the various Districts of the State for the month of October, 1908.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in sun	Temperature.				Hygrometer.				Prevaling Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum	Minimum	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
General Hospital, K. Lumpor	29.874	142.5	80.2	88.7	72.1	16.6	76.1	0.829	73.5	80	S. W.	8.73	2.64
Pudoh Gaol ,, ,,	...	...	...	...	...	...	...	...	...	...	...	8.50	2.09
District Hospital ,,	...	...	...	...	...	...	...	...	...	...	...	5.19	0.62
,, Klang	...	...	...	...	...	...	...	...	...	...	...	6.73	1.09
,, Kuala Langat	...	...	...	86.3	75.2	11.1	...	...	...	...	...	8.98	1.52
,, Kajang	...	...	...	85.2	75-1	10.1	...	...	...	...	...	10.82	2.25
,, Kuala Selangor	...	...	...	88.2	78.0	10.2	...	...	...	...	...	8.58	1.17
,, Kuala Kubu	...	...	...	89.8	70.9	18.9	...	...	...	...	...	21.74	3.65
,, Serendah	...	...	...	91.7	70.5	21.2	...	...	...	...	...	8.40	1.81
,, Rawang	...	...	...	89.3	71.0	18.3	...	...	...	...	...	13.16	4.45
Sabak Bernam.	...	...	...	...	...	...	...	...	...	...	...	6.79	2.10

STATE SURGEON'S OFFICE,
Kuala Lumpor, 18th November, 1908.

W. D. NAVEN,
State Surgeon, Selangor

Seremban.

Table Showing the Daily Results of the Reading of Meteorological Observation taken at the General Hospital, Seremban, for October. 1908.

DATE.	TEMPERATURE OF RADIATION.						TEMPT RADIATION.		WIND DIRECTION.		TEMPT OF EVAPORATION.			COMPUTED VAPOUR TENSION.			RELATIVE HUMIDITY.			CLOUDS 0 TO 10			WEATHER INITIALS.			RAIN	
	9 H.	15 H.	Mean.	Maximum.	Minimum.	Range.	Sun.	Difference Sun & Shade.	9 H.	15 H.	9 H.	15 H.	Mean.	9 H.	15 H.	Mean.	9 H.	15 H.	Mean.	9 H.	15 H.	21 H.	9 H.	15 H.	21 H	Inch	
1	76	86	81.5	87	72	15	142	55	N W	S W	73.6	76.6	75.1	827	904	865.5	89	72	80.5	2	3	3	S	S	S		.10
2	78	82	80	86	71	15	140	54	N W	S W	74.6	78.7	76.6	857	978	917.5	89	100	94.5	2	7	2	S	N	S		.05
3	78	86	82	87	70	17	138	51	N	S W	74.6	79.4	77	857	1.008	932 5	89	72	80.5	1	5	0	S	C	S		.40
4	79	83	81	83	70	13	132	49	N W	S E	75.6	75.3	75.5	883	877	883.5	90	80	85	1	3	5	S	S	C	2	49
5	73	82	77.5	83	69	14	128	45	S W	N W	71.3	77	74.1	700	926	813	94	85	87.5	10	5	1	S	S	C		.85
6	78	82	79.5	85	70	15	129	45	N W	S W	76.3	78.7	77.5	906	978	812	94	90	92	2	3	4	S	S	C		.30
7	77	87	82	88	71	17	138	50	N	W	71.9	75.5	73.7	783	884	833.5	84	79	81.5	1	2	2	S	S	S		
8	78	85	81.5	86	71	15	139	53	N W	S W	73.9	73.4	73.6	839	82	832.5	85	63	76.5	3	7	2	S	S	S		
9	78	87	82.5	88	70	18	146	58	N W	S W	72.9	75.5	74.2	810	884	847	84	69	76 5	0	3	3	S	S	S		
10	80	83	81.5	86	71	15	145	59	N W	N W	73.3	76.3	74.8	775	905	840	75	80	77.5	2	4	3	C	C	S		
11	77	86	81.5	87	71	14	145	58	N W	W	73 6	76.5	75.1	829	934	882.5	85	85	85	4	5	1	C	S	S		
12	79	82	80	84	70	14	147	63	N W	N W	73.9	77	75.4	839	926	882.5	84	90	87	1	2	3	S	S	S		
13	78	83	80.5	85	71	14	145	60	N	N W	72.9	79.7	76.3	810	1.008	910	89	90	89.5	2	3	0	C	C	S		
14	77	84	80.5	84	71	13	142	58	N W	W	73.6	80.7	77.2	829	1.045	939	89	95	92	4	5	6	C	C	S		
15	76	83	80.5	86	72	14	140	54	N W	W	72.6	80.3	76.5	891	1.180	990	84	85	84.5	6	5	3	C	C	S		
16	76	83	79.5	87	71	16	126	39	W	S W	70.9	82.1	76.5	756	1 038	927	84	90	87	4	3	5	C	N	S		
17	77	84	80.5	88	70	18	146	58	S W	S W	71.9	80.7	76.3	783	1.045	914	84	95	89.5	8	3	2	S	S	N		
18	78	84	81	85	70	15	147	62	S	S W	72.9	82.3	77.6	810	1.103	956.5	79	85	82	3	4	7	N	S	C		.35
19	77	86	81.5	88	71	17	145	57	S	S	70.2	80.1	75.1	739	1.004	991.5	84	85	84.5	4	7	9	C	S	N		.45
20	77	87	82	88	70	18	149	61	S	S E	71.9	82.1	77	783	1.078	937.5	89	95	92	2	7	0	S	N	N		.05
21	77	86	81.5	87	70	17	145	58	S E	S E	73.6	80.3	77	829	1.180	1.004.5	89	90	89.5	3	7	4	S	N	C		
22	76	86	81	87	70	17	130	43	N W	S W	79.6	80.7	80.3	891	1.121	951	87	80	83.5	8	6	9	N	N	C		
23	76	83	79.5	84	71	13	137	53	N W	S W	72.6	74 7	73.0	891	885	843.5	84	90	87	4	3	8	C	S	N		.40
24	77	82	79.5	84	71	13	135	51	N W	S W	71.7	78.7	75 3	783	978	880	84	90	87	2	4	6	C	S	N		.09
25	78	85	80.5	85	72	13	149	64	N W	S W	72.9	79.7	76.3	810	1.010	910	89	72	80.5	1	4	5	C	S	C		
26	77	81	79	81	71	10	136	55	N W	N W	73.6	74	73.8	899	840	834.5	84	85	84.5	7	6	2	C	C	S		.15
27	78	84	81	86	73	13	139	53	N W	S W	71.2	73.9	72.5	765	839	802	84	59	71 5	4	3	2	N	C	C		.25
28	76	79	77.5	84	72	12	139	55	S W	S	70.9	63.8	67.4	756	592	674	80	85	82.5	4	7	4	C	C	C		.15
29	79	80	79.5	82	68	14	136	54	N W	N W	72.3	75	73.0	793	867	830	89	80	84 5	5	9	4	C	N	C		.10
30	76	80	78	87	70	17	141	54	N W	S W	72.6	73.3	73	891	820	810 5	89	76	82.5	5	7	5	C	N	C		.35
31	78	83	80.5	89	70	19	115	26	N W	N	74.6	73	73.8	8 7	810	833 5	89	76	82.5	8	3	4	N	S	C		
Total	77.3	83.7	80.5	85.4	70.8	14.6	139	53.7			72.9	77.6	75.2	863	849	908	85.3	82 9	84.6							6	59

Seremban, 12-10-1908.

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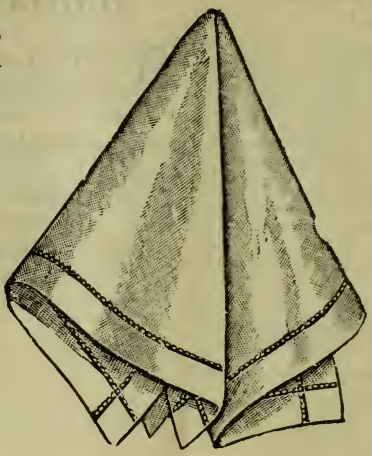

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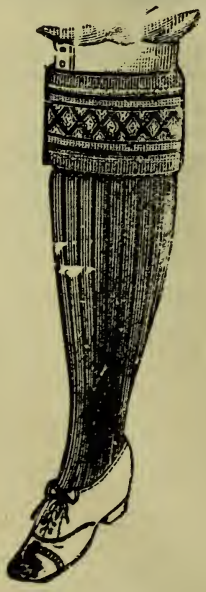

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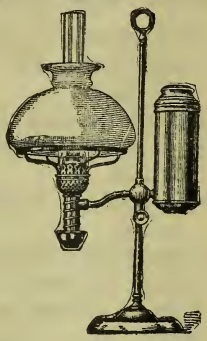

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