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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.R.C.I.,
Director of Botanic Gardens, S. S.,

AND

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Director of Agriculture & Government Botanist, F. M. S.

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To be purchased at the Botanic Gardens, Singapore, S. S.,
or from Messrs. KELLY & WALSH, Limited,
No. 32, Raffles Place and 194, Orchard Road, Singapore.

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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 commercial value. 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 valuation 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 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 4s. 6d. 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. 1.]

JANUARY, 1908.

[VOL. VII.]

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 *Maianthemum*, *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 colonum*. 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 inconspicuous* 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 bulbiferous 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 *Chamaerops*, the Japanese and Chinese palms, the Californian and Floridan species, and the Chilian palms such as *Fubæa* are almost the only palms which will not grow here. The desert palms of Egypt and the dry parts of Africa, such as *Hyphæne* and *Borassus* are not easy to grow inland, and *Hyphæne* 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. *Archontophoenix*, and *Ptychoperna 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 Sansevierias 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 Reginae*, 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. Occasional 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 Honey-suckles, 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 honey-suckle 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 *Dipterocarpeæ* 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. *Napoleonlea imperialis*, of West Africa, *Cryptostegia madagascariensis*, *Strophanthus hispidus*, the Gustavias of Brazil, *Duranta Plumieri* *Franciscea eximia*, *Diospyros discolor*, and very many others reproduce themselves with great regularity. *Lantana mixta* and *Mimosa sepriaria*, *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 *Begonia magnifica*, *B. oequinoctialis*, *Tecoma ceramensis*, *Odeptadenia speciosa*, *Mussaenda erythrophylla*, *Bougainvilleas*, *Tecoma Curtisii*, *Ipomea arborea*, *Allamanda Cathartica* (*A. schottii* and *A. williamsii* fruit regularly) and *Solanum maroniense* 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 starve or kill those not accustomed to it. There are certain infectious diseases, such as the "mosaic" diseases of tobacco, and "pear 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 underground parasites fall within this category. Others, called saprophytes, can live on dead matter only; the greater number of these are used in 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 resistant 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 roots. 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 1909. The price in Formosa is about half that of crystallized camphor, and rose from 3 yen per picul in 1888 to 15 yen in 1909.

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 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 4/4 $\frac{1}{4}$ 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 4/2 $\frac{3}{4}$ 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.

9/13

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	11 $\frac{3}{4}$	37 $\frac{1}{4}$	49	481	3/7 $\frac{1}{8}$	3/8 $\frac{1}{2}$	3/11 to 4/4 $\frac{1}{4}$	2/6 to 3/0 $\frac{3}{4}$
Corresponding sale last year	... 289	4	12	16 $\frac{1}{4}$	217	5/2 $\frac{3}{4}$	5/2	5/7 $\frac{1}{2}$ to 5/8 $\frac{1}{2}$	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	186 $\frac{1}{2}$	599 $\frac{3}{4}$	786 $\frac{1}{4}$	7,180	about 4/10 $\frac{1}{4}$
Same period 1906	6,116	80 $\frac{1}{4}$	235 $\frac{3}{4}$	325	3,830	5/6 $\frac{1}{4}$

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., 6/9 $\frac{3}{4}$. 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 5/2 $\frac{1}{2}$; to-day the highest price for Rubber from the Far East is 4/-, while that of Para is 3/5 $\frac{1}{2}$.

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	4/9½
Same period 1906	6,462	98½	250½	348½	4,130	5/6½

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.

6/14

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	... 4/0 $\frac{3}{4}$.
	1	Lump scrap	... bought in.
G M	10	" "	... 2/5 to 2/6.
Vicarton	2	Good palish biscuits (77 lbs.)	... 3/7 $\frac{1}{2}$ to 4/-.
	1	Barky scrap	... 2/-.
Matang	23	Good palish to darkish crepe	... 3/2 $\frac{1}{4}$ to 3/8.
	12	Good sheet	... 4/2 $\frac{1}{2}$.
	3	Wet pressed crepe and scrap	... pt. sold 3/-.
Sorana	6	Good biscuits	... 4/2 $\frac{1}{4}$.
Gonakelle	1	Good biscuits	... 4/2 $\frac{1}{2}$.
	2	Fine scrap and cuttings	... 2/7 $\frac{1}{2}$ to 2/11.
V S	7	Good biscuits and sheet	... 4/- to 4/0 $\frac{3}{4}$.
	4	Darkish and dark crepe	... 2/4 to 3/4 $\frac{1}{2}$.
	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	... 4/2 $\frac{1}{2}$.
	1	Scrap	... 1/6.
Densworth	2	Good biscuits	... 4/2 $\frac{3}{4}$.
	1	Good scrap	... bought in.
Sunnycroft	1	Good sheet	... 4/-.
Doranakande	4	Block scrap	... 2/7.
Tallagalla	2	" "	... 2/7.
	9	Good biscuits	... 3/4 to 4/-.
	7	Crepe, scrap and rejections part sold	... 2/7 to 2/3-.
Taldua	2	Good biscuits	... 4/2 $\frac{1}{2}$.
	1	Scrap	... 2/6.
Northumberland	1	Block scrap	... 2/6.
Clara	1	" "	... 2/9.
	3	Good and medium biscuits	... 3/9.
Culloden	13	Very fine pale crepe	... 4/1.
	5	Fine palish and brownish	... 3/7 $\frac{1}{4}$ 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	... 4/2 $\frac{3}{4}$.
	7	Fine biscuits	... 4/3.
	1	Good mottled crepe	... 3/7 $\frac{1}{2}$.
	3	Brownish to darkish	... 3/6.
	1	Good scrap	... 3/-.
Glencorse	1	Fine biscuits	... 4/3.
	3	Good scrap and cuttings	... 2/5 $\frac{1}{2}$ to 2/10 $\frac{1}{2}$
Neboda	9	Good brownish to dark crepe	... 3/1 $\frac{1}{2}$ to 3/7 $\frac{1}{2}$.
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 3/10 $\frac{1}{4}$ to 4/-.
	1	Dark pressed crepe	... bought in.
Marakona	1	Fine sheet	... 4/1 $\frac{1}{4}$.
Clontarf	1	Black crepe	... bought in.
Gikiyanakande	10	Very fine pale worm	... bought in.
	7	Brownish to darkish crepe	3/2 $\frac{1}{4}$ 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.

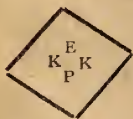
MALAYA.

Jebong	94	Very fine pale crepe	... bought in.
Golconda	7	Good sheet	... 4/0 $\frac{1}{2}$.
	1	Dark block	... 3/-.

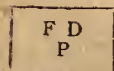
L E



66	Very fine block	... bought in.
54	No. 2 block	... bought in.









5	Fine sheet	... } withdrawn
1	Fine pale crepe	... }
1	Darkish	... }

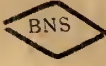





4	Good block	... bought in.
2	Scrap	... bought in.
10	Good sheet	... 4/- to 4/2.
1	Rejections	... 2/10.

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	... 4/1 $\frac{3}{4}$.
	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.
  Jugra B	7	Biscuits, scrap, etc. pt. sold,	2/5 to 2/10.
	1	Darkish pressed crepe	... 2/9.
	3	Dark block	... bought in.
	46	Good palish and mottled crepe part sold,	... 3/7 $\frac{1}{4}$ to 3/7 $\frac{1}{2}$.
	10	Dark	... part sold, 3/1 $\frac{3}{4}$ to 3/4 $\frac{1}{4}$.
	E A C	15	Very fine pale crepe	... 4/0$\frac{3}{4}$.
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, 4/1$\frac{3}{4}$.
	2	Scrap	... bought in.
P S E	8	Fine sheet	... 4/2 $\frac{1}{4}$.
	3	Ball	... bought in.
B S	18	Fine sheet	... 4/2.
Bila	19	Good scrap and rejections...	2/7 $\frac{1}{2}$ to 3/0 $\frac{3}{4}$.
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 2/10 $\frac{1}{4}$.
	11	Dark pressed crepe and scrap part sold,	... 2/4.
	1	Mottled crepe	... 3/7 $\frac{1}{2}$.
Highlands	6	Good sheet	... bought in.
	20	Fine sheet	... 4/3 $\frac{3}{4}$ to 4/4 $\frac{1}{4}$.
	36	Good palish to darkish crepe	... 3/3 to 3/8 $\frac{1}{2}$.
	1	Fine block	... 3/8.
Glenmarie	1	Good dark block	... 3/3 $\frac{1}{2}$.
	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,	3/2 $\frac{1}{2}$.
	36	Fine sheet	... bought in.
	1	" (damaged)	... bought in.
	2	Good scrap	... bought in.
	9	Fine palish crepe	... bought in.
H E A	3	Darkish to dark blocked crepe	... bought in.
	31	Fine pale and palish crepe...	bought in.
	2	Darker	... bought in.
	5	Darkish	... bought in.
	9	Fine palish crepe	... bought in.
	9	"	... bought in.
	6	Fine and medium block	... 3/3 $\frac{3}{4}$ to 3/4 $\frac{1}{4}$.
	Terentang		
	Linsum Shelford		

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	°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, 5th 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	86.0	73.6	83	N. W.	17.66	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.			
	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	%		Ins.	Ins.
Durian Daun Hos- pital ...	Not Registered.	153·8	79·1	87·1	72·5	14·5	79·8	1·001	69·5	92·3	W.	7·64	2·34

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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, 19th 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 $\frac{1}{2}$ 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	81'0	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 L.	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, 31st December, 1907.

A. J. McCLOSKEY,
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.			
Kuala Lipis ...	Ins.	°F	°F	°F	°F	°F	°F	°F	°F	%		Ins.	Ins.
Raub	76·91	92·	68·	17·56	75·65	...	...	...	...	5·71	2·02
Bukit Fraser	78·36	89·	67·	18·06	74·83	...	...	...	...	11·28	1·72
Bentong	14·64	2·02
Temerloh	80·3	91·	68·	16·63	75·73	...	...	...	...	10·80	2·54
Pekan	94·	70·	18·26	...	...	...	...	...	5·85	1·45
Kuantan	80·0	96·	72·	18·0	76·	...	...	...	...	11·23	2·68
Sungei Lembing	85·46	94·5	69·	15·80	77·26	...	...	...	...	4·38	·78
	87·	66·	...	...	...	...	...	...	14·77	2·45

STATE SURGEON'S OFFICE,

RAUB, 28th 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

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SURGEON'S OFFICE,

KUALA LEBIR, 13th 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	86.3	74.8	82	N.	7.42	2.05

COLONIAL SURGEON'S OFFICE,
PENANG, 11th 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° F.	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, 31st 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	°F	%		Ins.	Ins.
Durian Daun Hos- pital ...	Not Registered.	149·9	78·3	86·7	73·7	12·9	79·0	98·0	69·8	94·7	N.	12·31	3·33

OFFICE OF THE MEDICAL OFFICER,
MALACCA, 17th January, 1908.

F. B. CROUCHER,
Medical Officer, Malacca

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 rain-fall during 24 hours.
		Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Humidity.		
Taiping ...	147	80.46	95	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	7	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 17th 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.				HYGROMETRY.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.	
			Mean dry Bulb.	Minimum.	Maximum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.				
Kuala Lipis	76·93	89·	68·	15·25	74·83	...	...	...	...	...	...	...
Raub	77·03	87·	64·	15·48	76·17	...	...	...	...	...	13·15	2·25
Bukit Fraser	7·36	1·07
Bentong	79·77	90·	69·	14·29	75·12	...	...	...	...	...	12·83	3·35
Temerloh	93·	70·	18·25	...	...	...	...	...	...	9·28	1·75
Pekan	78·	90·	70·	9·2	75·	...	...	...	...	...	9·47	1·67
Kuantan	80·1	88·5	68·5	12·9	76·5	...	...	...	...	...	31·33	15·50
Sungei Lembing	86·	65·	...	...	...	...	...	...	...	28·74	10·35
													20·92	5·02

STATE SURGEON'S OFFICE,
RAUB, 28th 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	30.00	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

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KUALA LEBIR, SURGEON'S OFFICE,
15th January, 1908.

JOHN D. GIMLETTE,
Surgeon.

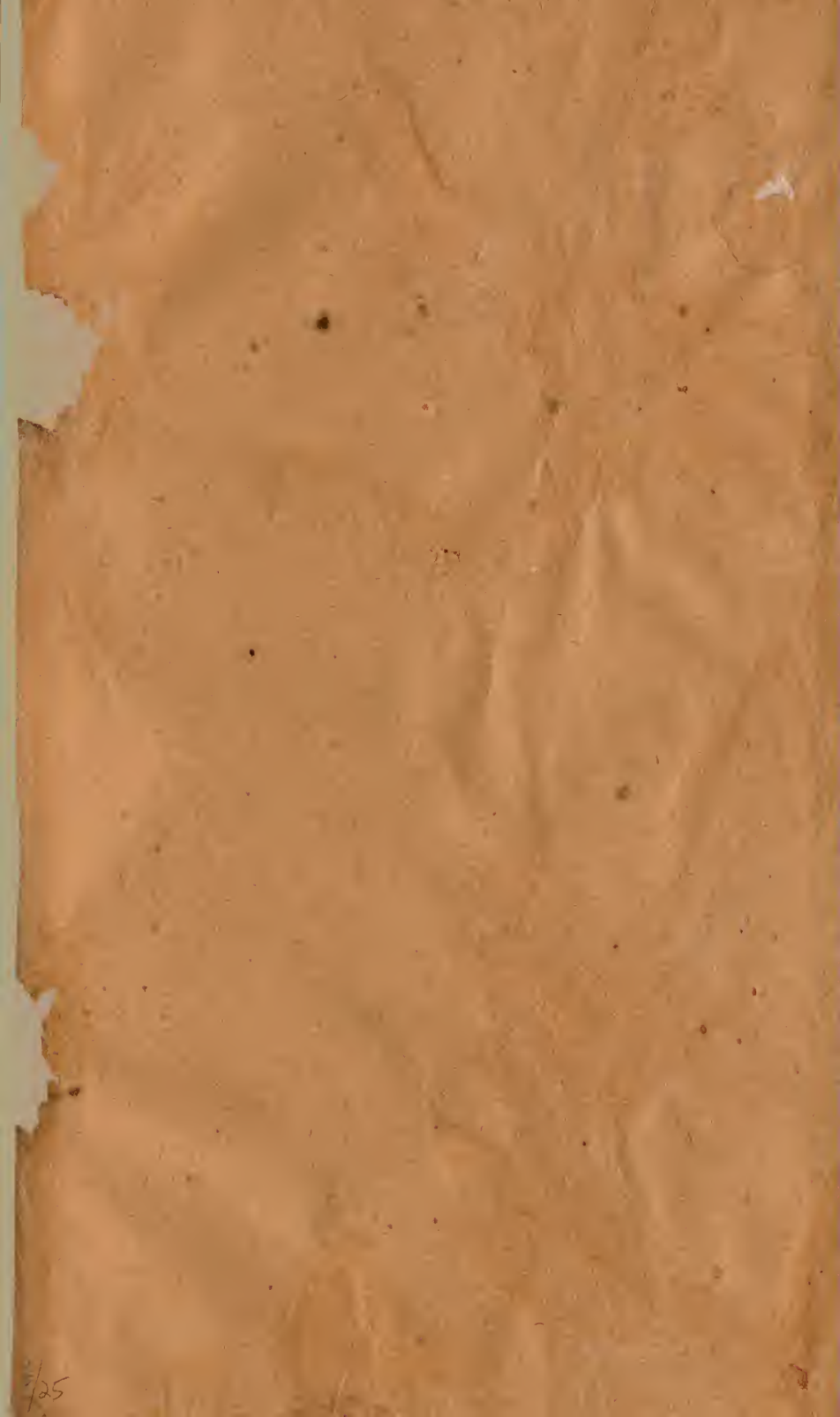
PARTICULARS

42 RUBBER PRODUCING COMPANIES

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

COMPANY.	Situating in.	Paid-up Capital.	Number of Trees.	YEARS OLD.						SECRETARIES.	OFFICES.	DIRECTORS.
				1	2	3	4	5	6 and upwards.			
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	V. Euing 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 acres	...	...	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 Highlands and Lowlands Para Co.	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.
Inch Kenneth Estates ...	M.	15,000	135,300	...	...	Part bearing	...	...	...	Greenhill & Clapperton ...	6 a, George St., Edinburgh	Sir Frank A. Swettenham, John A. Maitland, Hon. Richard Douglas Denman, and Wm. Wellington Bailey.
Java Rubber and Produce Co. ...	Java.	17,480	44,535	17,000	and 27,335, of 3 to 6 years	...	...	15,000	are from old	C. O. Naftel ...	20, Eastcheap, E. C.	David Harris, George B. Thornton, and Capt. H. W. S. Kindersley.
Jugra Land and Rubber Estates ...	M.	88,000	...	Being planted	...	...	...	...	...	Macdonald, Stewart & Stewart ...	102, Hope St., Glasgow	Gustavus Arthur Talbot, H. K. Rutherford, and Richard Caldicott Wright.
Kapar Para Rubber Estates Co. ...	M.	29,802	...	(1,367 acres planted)	...	...	...	...	...	Nevett Oswald & Co. ...	81, Gracechurch St., E. C.	Wm. W. Campbell, Lawrence Dougal, Wm. W. Maclellan, Sir Wm. Hood Treacher, and E. V. Carey, John Wishart. (Chairman).
Klanang Produce Co. ...	M.	22,000	...	(1,300 acres planted)	...	...	...	...	...	James Miller ...	36, Basinhall St., E. C.	J. Douglas Fletcher, William Nevett and Edward S. Grigson.
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.	Edmund Walker, E. J. Davies, and J. L. Anstruther.
Kuala Lumpur Co. ...	M.	180,000	199,044	10,897	6,809	81,664	49,064	25,299	25,311	John Gardon ...	9, Arundel St., Strand	C. Williamson Milne, Herbert Wilford Brett, Lawrence T. Boustead, John E. A. Dick-Lauder, William F. de Bois Maclaren.
Langkon North Borneo Co.	B.	22,500	...	Being planted	...	...	...	...	...	Harington G. Forbes	37, Threadneedle St., E. C.	Hon. Everard Fielding, Edward Bunge, Alfred Gosar, Methold Sidney Parry, and Stewart's Foot.
Linggi Plantations ...	M.	73,000	629,100	375,300	50,800	141,000	...	62,000	...	Guthrie & Co., Ltd.	5, Whittington Av., E. C.	Colonel Sir Augustus Fitzgeorge, The Right Hon. Lord Armstrong, Wm. C. Cowie, Colonel Arthur Montgomery Harington, and Charles Ernest Morrison.
Malacca Plantations ...	M.	260,625	485,286	108,401	39,411	114,390	126,688	3,200	66,617	J. A. H. Jackson...	4, Sun Court, Cornhill, E. C.	Sir Wm. Hood Treacher, K.C.M.G., Keith F. Arbuthnot, W. Forbes Lawrie, Gilbert F. Traill, and R. F. McNair Scott.
Malay Peninsular (Johore) Rubber Concessions ...	M.	8,000	...	To be planted	...	...	...	...	...	Arthur C. Plowman	13, Rood Lane, E. C.	Geo. B. Dodwell, J. Malcolm Lyon, Wm. Charles Punchard, and Arthur Wood Copeland.
Matale Ceylon Co. ...	C.	28,125	87,000	...	...	...	...	...	16,000	P. E. Hervey ...	30, Mincing Lane, E. C.	George Gray Anderson, William Gow, K. Kirchberger, and A. H. Bagnall.
Monerakelle Estates ...	C.	16,450	...	Being planted	...	...	...	...	...	Robertson, Bois & Co. ...	12, Fenchurch St., E. C.	George Hathron, H. A. Barrett, and Wm. Dunn.
Pataling Estates Syndicate	M.	20,000	130,500	64,000	22,000	5,000	6,000	33,500	...	H. Eric Müller ...	11, Idol Lane, E. C.	Alexander Bethune and Charles Gordon Bois.
* Pelmadulla Co. ...	C.	25,750	256,403	146,303	93,187	11,760	4,500	...	653	McMeekin & Co.	10, Lime St., E. C.	J. L. Anstruther, H. W. Brett, F. W. Chaine, and T. Ritchie.
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.	George Gilbert Anderson, John McEwan and H. K. Rutherford.
Rubber Estates of Ceylon	C.	68,050	Being planted	there are 11,100 trees from 3 to 6 years old	...	...	...	...	...	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 Johore	J.	38,750	...	...	...	...	...	...	...	H. Eric Müller ...	11, Idol Lane, E. C.	Charles E. Strachan, Theodore C. Owen, J. R. Hugh Pinckney, and T. W. Shaw.
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.	Sir Frank A. Swettenham, Colonel Algernon George Durand, Edward Snape Grigson, Arthur Lampard, and Reginald Heber Macaulay.
Sagga Co. ...	M.	6,311	...	Being planted	...	...	...	...	...	Walter Smith ...	18, Laurence Pountney Lane, E. C.	R. J. Hoffmann, W. Radcliffe, T. W. Wellsted, and F. A. Govett.
Scottish Malay Co. ...	M.	8,750	...	To be planted	...	...	...	...	...	J. A. Pattullo ...	8, Hill St., Edinburgh	J. H. Starey, George Moody Stuart, and R. N. G. Bingley.
Selangor Co. ...	M.	29,075	...	Part bearing	...	...	...	...	...	Gibson & Anderson	124, St. Vincent St., Glasgow	Thomas Wedderspoon, R. Colville Bowie, and James Adam Hunter.
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	Thomas Johnston, Hugh Neilson, and T. A. Gallie.
Straits Settlements (Bertam) Co. ...	M.	150,000	46,287	26,097	4,711	4,324	800	7,130	3,220	H. Read Smith ...	16, St. Helens Place, E. C.	Sir John Ure Primrose, Bart., Lawrence Twentyman Boustead, Wm. W. Campbell, Lawrence Dougal, and Wm. W. Maclellan, P. H. A. Hankey, W. F. de Bois Maclaren.
Sungei Kapar Rubber Co.	M.	...	223,243	112,468	66,600	43,320	855	...	...	Moncrieff & Horeburgh, C. A. ...	46, Castle St., Edinburgh	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.
Sung Way (Selangor) Co.	M.	15,670	...	Being planted	...	...	...	...	...	Gibson & Anderson	124, St. Vincent St., Glasgow	E. A. Davidson, W. W. Bailey, A. R. Wilson Wood, and J. MacLachlan.
The Temom (Borneo) Co.	B.	21,550	...	Being planted	...	...	...	...	...	Alexander F. Douglas	22, Renfield St., Glasgow	Thomas Johnston, Thomas A. Gallie, Sir Wm. 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 P. D. Jeffreys, and Capt. C. B. Oldfield.
Woodend (Kelani Valley) Co. ...	C.	20,640	11,500	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.



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.,
Director of Agriculture & Government Botanist, F.M.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 valuation 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 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 4s. 4d. 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

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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 CROS, 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 GUTINEZ, Consul for Colombi,
Southampton.
SEÑOR A. ALDANA, Consul for Venezuela,
Cardiff.

MONSIEUR E. THIROUX, London Editor
Le Caoutchouc et la Gutta-Percha, Paris.
SEÑOR 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: "MALTERMAS," 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 Gutierrez, 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, Mattress 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.

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Telephone : 3523 CENTRAL.

Telegrams : "MALTERMAS," 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.

* * * * *

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 $1\frac{1}{2}$ 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 inadequate, 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 from 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.

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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 gm. of sulphur, and a loss of 0.05 gm. 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 5s. 1d. 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	13.4	8.7
62		3133	12.7	8.0
74		2882	13.9	—
77 Q	6	3015	13.3	9.4
79		2910	13.2	9.4
80		2927	13.1	10.2
83		3164	12.4	8.2
85 R	6	3263	12.4	8.0
87		3366	12.7	9.5
99		3320	13.3	8.5
104 T	6	3168	12.5	8.2
92		3499	13.1	7.9
94		3410	12.9	8.2
143 D2	6	3260	13.4	10.2
144		2981	13.4	10.6
101		3138	13.7	10.4
45 K	5	3428	14.3	9.5
139		3169	13.9	10.4
110 X	8	3324	12.0	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	12.2	9.2
97 U	6	3541	12.8	8.3
114		2646	13.3	10.1
115 Y	6	2970	12.4	9.8
124 S	6	3118	12.9	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 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.

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 $6d.$ 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	6/9 $\frac{3}{4}$	3/8	5/5	5/11
Fine Para (Amazon)	5/2	5/5	5/9	3/3 $\frac{3}{4}$	5/-	5/0 $\frac{1}{4}$

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 Gesneriaceæ 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.

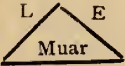



CEYLON, STRAITS AND MALAY STATES Plantation Rubber Report.

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 .. ..	.. 2/1½
S K R Co. Ld. B & D K	7 "	Fair dark block, some barky pt. sold .. ..	.. 3/-
	1 "	Mottled crepe .. ..	.. 3/7
	2 "	Pale crepe .. ..	.. 3/10½

MARK.	PKGS.	DESCRIPTION.	PRICE
			PER LB.
 Muar	57	No. 1 block	bought in
	51	No. 2 block	"
Straits.			
 V R Co., Ltd. Klang FMS	4	Fine amber sheets	"
	9	Brown mottled crepe	3/4 $\frac{1}{2}$ at 3/5 $\frac{3}{4}$
	5	Dark crepe	3/4
	8	Block, black fair to good	3/2 $\frac{3}{4}$
P S E	3	Large reddish ball	bought in
 S	3	Palish amber sheets, little rough	"
	2	Good pressed scrap	2/7 $\frac{1}{2}$
K M	2	Dark scrappy pieces, rather dirty	2/4 subject
	1	Amber sheets, some rather dark rough	bought in
Bila	12	Good amber sheets	"
	10	Brown scrap, some dark .. part sold ..	2/9 $\frac{1}{2}$
Linggi Plants	3	Dark scrap	2/8
	15	Fine pale crepe, little mottled	bought in
Highland Estate	17	Greyish crepe	"
	8	Brown crepe, some mottled	3/5 $\frac{3}{4}$ at 3/6 $\frac{3}{4}$
	15	Block, dark rather soft	bought in
	34	Rolled sheets	"
B N S	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
	16	Dark sheets, some rough	bought in
K M A	8	Palish and greyish blocked crepe	"
<i>Ceylon.</i>			
Tallagalla	2 Cases	Darkish and dark amber biscuits	bought in
Warriapolla	2	Brownish and whitish scrap	2/11
	2	Loose barky scrap	1/8 $\frac{1}{2}$
Northumberland	2	Pale amber biscuits	bought in
	1	Amber and darkish biscuits	"
K K	1	Brown barky scrap	2/8
	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
Densworth	1	Block black, mixed little white and rather soft	2/10
	4	Block, dark, little white	3/- bid
	1	Brown barky scrap	2/8
	1	Virgin and scrappy block, wet	2/3
Matang	1	Blocked scrap, rather dirty and barky	2/3
	4	Dark biscuits, rather rough	bought in
Doranakande	2	Rough dark sheets, some black, not properly cured, wet and some stick together	"
	2	Ordinary brown scrap	2/8
Ayr	1	Dark scrap, dirty and barky	2/6
	4	Virgin nuggets and pieces	2/7 $\frac{3}{4}$
	1	Darkish amber biscuits, rather soft, very weak, some stuck together	3/10
Waharaka	1	Large amber sheets	bought in
	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 ..	.. 3/5 $\frac{1}{2}$
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 4/4 $\frac{1}{2}$ 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 4/2 $\frac{3}{4}$ 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.	Plantation.		
							Hard Fine Para.	Fine.	Scrap.
To-day ...	1,001	11 $\frac{1}{2}$	37 $\frac{1}{2}$	49	481	3/7 $\frac{1}{2}$	3/8 $\frac{1}{2}$	3/11 to 4/4 $\frac{1}{2}$	2/6 to 3/0 $\frac{1}{2}$
Corresponding Sale Last Year ...	289	4	12	16 $\frac{1}{2}$	217	5/2 $\frac{1}{2}$	5/2	5/7 $\frac{1}{2}$ to 5/8 $\frac{1}{2}$	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	599½	786½	7,180	about 4/10½
Same period 1906	6,116	89½	235½	325	3,830	5/6½

TO-DAY'S QUOTATIONS.

Sheet, etc.		Crepe.		Unwashed Scrap.	
Fine Block	None sold.	Very Pale	4/1 to 4/2½	Good	2/9 to 3/0½
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 4/2½				

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	4/0½
	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	3/2½ to 3/8
	12	Good sheet	4/2½
	3	Wet pressed crepe and scrap	pt. sold.. 3/-
Sorana	6	Good biscuits	4/2½
Gonakelle	1	Good biscuits	4/2½
	2	Fine scrap and cuttings	2/7½ to 2/11
	7	Good biscuits and sheet	4/- to 4/0½
	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	4/2½
	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
	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
	3	Good and medium biscuits..	..	..	..	3/9
Culloden	13	Very fine pale crepe	..	..	..	4/1
	5	Fine palish and brownish	..	..	..	3/7½ to 4/-
	11	Good dark	..	..	..	3/5
	2	Dark block	..	..	..	3/3
Arapolakande	1	Very fine pale crepe	..	..	..	4/2½
	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	..	..	..	4/1½
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
	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/-





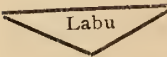


	66	Very fine block	..	..	..	bought in
	54	No. 2 block	..	..	..	" "



	5	Fine sheet	}	withdrawn
	1	Fine pale crepe				
	1	Darkish "				

MARK.	PKGS.	DESCRIPTION.	PRICE PER LB.
	4	Good block	bought in
	2	Scrap	" "
B & D	10	Good sheet	4/- to 4/2
	1	Rejections	2/10
	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
Damansara	1	Good biscuits	3/11
	1	Good sheet	4/1
	1	Scrap	3/6
	17	Fine sheet	4/1 1/2
S K R Co Ld.	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/-
A G & Co.	17	Good palish crepe	" " .. 3/6 to 3/10
	7	Good dark block	bought in
	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	pt. sold .. 3/7 1/2 to 3/7 1/2
	10	Dark	" .. 3/1 1/2 to 3/4 1/2
E A C	15	Very fine pale crepe	4/0 1/2
	11	Good brownish and 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	pt. sold .. 4/1 1/2
	2	Scrap	bought in
P S E	8	Fine sheet	4/2 1/2
	3	Ball	bought in
B S	18	Fine sheet	4/2
Bila	19	Good scrap and rejections	2/7 1/2 to 3/0 1/2
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 2/10 1/2
	11	Dark pressed crepe and scrap	pt. sold .. 2/4
	1	Mottled crepe	3/7 1/2
	6	Good sheet	bought in
Highlands	20	Fine sheet	4/3 1/2 to 4/4 1/2
	36	Good palish to darkish crepe	3/3 to 3/8 1/2
	1	Fine block	3/8
	1	Good dark block	3/3 1/2
Glenmarie	7	Good sheet and biscuits	4/- to 4/1
	1	Dark pressed crepe	2/11

6/45




MARK.	PKGS.	DESCRIPTION.	PRICE PER L.B.
	2	Darkish to dark crepe pt. sold ..	3/2½
	36	Fine sheet	bought in
	1	" " (damaged)	" "
H E A	2	Good scrap	bought in
	9	Fine palish crepe	bought in
	3	Darkish to dark blocked crepe	bought in
	31	Fine pale and palish crepe	bought in
	2	Darker	bought in
	5	Darkish	bought in
Terentang	9	Fine palish crepe	bought in
Linsum	9	" "	bought in
Shelford	6	Fine and medium block	3/3¼ 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.

	66	Cases	No. 1 block	bought in
	54	"	No. 2 "	"
Straits				
	5	Pkgs.	Palish and darkish amber sheets	"
	4	Cases	Wet whitish and brown block	"
	10	"	Palish and darkish amber sheets some rough	4/- at 4/1½
	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	4/1½

MARK.	PKGS.	DESCRIPTION.	PRICE PER LB.
S K R Co. Ltd.	1 Bag	Rambong block soft ..	bought in
	2 ..	Fine pale crepe ..	"
	13 ..	Mottled crepe, some darkish ..	3/10
	2 ..	Dull mottled crepe ..	3/6
	7 ..	Black block softish ..	bought in
	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 ..	4/0 $\frac{1}{2}$
	2 ..	Fine black block ..	3/-
	35 ..	Fine pale crepe ..	bought in
	5 ..	Mottled crepe ..	3/7 $\frac{1}{2}$ at 3/7 $\frac{1}{2}$
	6 ..	Palish and grey mottled crepe ..	3/7 $\frac{1}{2}$ at 3/7 $\frac{1}{2}$
	10 ..	Dark crepe ..	3/1 $\frac{1}{2}$ at 3/4 $\frac{1}{2}$
E A C	15 ..	Fine pale crepe ..	4/0 $\frac{3}{4}$
	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 ..	4/2 $\frac{1}{2}$
P S E	8 ..	Large amber sheets ..	4/2 $\frac{1}{4}$
	3 ..	Large waxy ball ..	bought in
Bila	18 ..	Amber sheets ..	4/2
	13 ..	Brown scrap ..	3/- at 3/0 $\frac{3}{4}$
	2 ..	" " dirty ..	2/7 $\frac{1}{2}$
	4 ..	Scrappy virgin biscuits ..	2/8 $\frac{3}{4}$
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 ..	2/10 $\frac{1}{2}$
	3 Pkgs.	Blocked scrap, part sold ..	2/4
	1 Case	Mottled crepe ..	3/7 $\frac{1}{2}$
	5 Cases	Block, brown and dark ..	bought in
Highland Estates	20 ..	Rolled sheets ..	4/3 $\frac{3}{4}$ at 4/4 $\frac{1}{2}$
	2 ..	Pressed crepe, good pale ..	3/8 $\frac{1}{2}$
	9 ..	Brown pressed crepe, some black ..	3/7 at 3/8
	14 ..	Thick mottled crepe ..	3/8 at 3/8 $\frac{1}{2}$
	11 ..	Brown crepe ..	3/4 $\frac{1}{2}$ at 3/7 $\frac{1}{2}$
A R	1 ..	Darkish crepe ..	3/2 $\frac{1}{2}$
P Co.	1 ..	Soft brown crepe ..	2/- bid
S	37 ..	Large darkish amber sheets ..	bought in
BNS	2 ..	Dark barky scrap ..	"
H E A	10 ..	Crepe palish and darkish, some mottled ..	"
	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 ..	3/4 $\frac{1}{2}$
	2 ..	Soft black block ..	3/3 $\frac{1}{2}$

MARK.	PKGS.	DESCRIPTION.	PRICE PER LB.
<i>Ceylon.</i>			
Matang	6 Cases	Mottled crepe, some dark ..	3/6 @ 3/8
	6 "	Amber crepe, some very dark ..	3/2½ @ 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 ..	4/2½
	V S	Biscuits mixed colours, rather inferior, some struck together ..	4/-
	K M	Sheets, mixed colours ..	4/0½
	3 "	Soft blocked crepe, sticky ..	2/4
Waharaka	1 "	Good dark blocked worms ..	bought in
	MAK	Dark biscuits ..	4/-
Taldua	2 "	Dark amber biscuits ..	4/2½
	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 ..	3/10½ @ 4/-
Marakona	1 "	Good amber sheets ..	4/1½
Glanrhos	1 "	Soft black crepe ..	bought in
Gikiyankande	10 "	Fine pale pressed worms ..	" "
	3 "	Good brown crepe ..	3/8
	4 "	Dark crepe ..	3/2½ @ 3/5½
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 ..	4/0½
Culloden	13 "	Fine pale crepe ..	4/1
	4 "	Very thick crepe ..	4/-
	11 "	Brown and black crepe ..	3/5
Arapolakande	1 "	Fine pale crepe ..	4/2½
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 ..	3/5½ @ 3/7½
G M	8 "	Dark barky scrap, slightly heated ..	2/5
	2 "	Lumps and nuggets ..	2/6
Sorana	6 "	Dark amber biscuits ..	4/2½

CEYLON, STRAITS AND MALAY STATES Plantation Rubber Report.




January 10th, 1908.

The following lots, comprising about 43 tons Straits and 10 tons Ceylon, were offered at auctions to-day and sold as follows:—

Straits and Malay Straits.

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

MAKK.	PKGS.	DESCRIPTION.		PRICE PER LB
S. K. R. Co. Ld.	18	"	"	3/6½ @ 3/9
B. & D.				
K.	3	"	"	3/1 @ 3/6
B. & D.				
H.	2	"	"	3/6½ @ 3/8
B. & D.	3	"	"	3/0½ @ 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	3/0½
B. & D.	6	"	Sheet	3/9
	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 3/5½
	1	"	Pressed crepe	2/2½
	7	"	"	3/4 @ 4/3
	57	"	Block No. 1	bought in
	51	"	" No. 2	"
B. M. & Co.	7	"	Sheet	3/8½
P.	6	"	Crepe	bought in
	3	Bags	Black block	"
	11	Cases	Crepe	"
	2	"	Sheet	3/8
	2	"	Scrap	2/3½ @ 2/8½
V R Co. Ld.	18	"	Crepe	3/7½ bid
Klang	2	"	"	3/5
FMS	10	"	"	3/6½ bid
	30	"	"	3/4½ @ 3/5½
M. A. B.	1	"	Sheet	bought in
R. R.	17	"	"	"
	4	"	Scrap	2/4½ @ 2/6½
P. S. E.	6	"	Sheet	3/8½
	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 3/0½
	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 3/0½
	5	Sheet	bought in
	3	Crepe	2/7½ @ 3/3½
Jebong	6	"	3/10
	80	"	One case sold 3/10
	15	Sheet	bought in
	5	Crepe	"
Highland Estate	24	Sheet	bought in
	10	Crepe	3/5 @ 3/6½
	10	"	3/6½ @ 3/5½
	9	"	2/11 @ 3/4½
	9	"	3/5½ @ 3/6½
	7	"	3/4 @ 3/4½
<i>Ceylon.</i>			
Sorana	12	Block	bought in
Tallagalla	3	"	"
	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	2/11½
S. L. S.	3	"	2/11½
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	3/5½
	2	Cases Block	3/8
	4	" Scrap	2/6 @ 2/7½
Warriapolla	1	"	2/3
Tallagalla	7	Biscuits	3/8½ @ 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	2/4½ @ 2/7
	1	Brownish and grey block	2/4
Old Haloya	1	Ceara biscuits	bought in
Gikiyanakande	18	Worms	"
	4	Crepe	3/6½ bid
	1	"	bought in
	5	"	part sold at 3/3 bid for rem. 2/11
A	R	3	"
P	Co	1	"
	3	"	part sold at 3/6, 3/- bid for rem. 3/6
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	"	3/4 ³ / ₄
	2	Black block	bought in
Ellakande	3	Crepe	3/5 @ 3/5 ³ / ₄
Heatherly	2	"	3/6
	1	"	bought in
Hatangalla	2	Biscuits	3/8 ³ / ₄
	1	Crepe	3/5 ³ / ₄
Tudugalla	10	" part sold ..	3/9 ³ / ₄
	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	3/8 ¹ / ₄
	1	Scrap	2/9 ³ / ₄
Warriapolla	6	Pkgs. Biscuits	4/1 ³ / ₄ @ 4/1 ³ / ₄
	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 1¹/₂d. 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 3/8³/₄.

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.	Scrap.
To-day 1017	11½	41¾	53½	430	3/4½	3/4	3/8 to 4/3	2/7 to 3/0½
Corresponding Sale Last Year ... 357	8½	12½	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.			No. of Packages Sold.	Average Price Paid.
		Ceylon.	Malaya.	Total.		
1907	15,380	192½	621½	814	7,388	4/9½
Same period 1906	6,462	98½	250½	348½	4,130	5/6½

TO-DAY'S QUOTATIONS.

Sheet, etc.		Crepe.		Unwashed Scrap.
Fine Block	None sold.	Exceptionally Pale ...	4/3	Fine 2/10 to 3/0½
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.



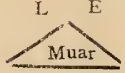


Exports from 1st Jan. to 16th Dec. From Ceylon.			
1907 ..	..	..	502,696 lbs.
1906 ..	..	..	303,102 lbs.
1905 ..	..	..	140,132 lbs.
1904 ..	..	..	67,623 lbs.

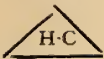




(The Singapore and Penang figures are taken from statistics published by Messrs. Barlow & Co., of Singapore).

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.. 3/8 $\frac{1}{2}$
MAK	2	Pressed scrap and rejections	2/9 $\frac{1}{2}$
	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	2/11 $\frac{1}{4}$
S L S	3	Fine scrap	2/11 $\frac{1}{4}$
A L W	2	Fine scrap	2/10
Glenesk	3	Good to fine scrap	2/7 to 2/10
Sunnycroft	1	Fine sheet	3/8 $\frac{1}{2}$
Warriapolla	1	Good scrap	2/9 $\frac{1}{2}$
	7	Very fine biscuits	part sold.. 4/1 $\frac{1}{2}$ to 4/1 $\frac{3}{4}$
Clara	2	Scrap	2/3 to 2/8
	1	Good biscuits	3/8
Waharaka	1	Scrap	2/8
	1	Good scrap	2/6
Rangbodde	1	Blocked worm	bought in
	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	3/8 $\frac{1}{2}$
Tudugalla	10	Very fine palish crepe	3/9 $\frac{1}{2}$
	1	Black pressed crepe	bought in
	1	Fine block	"
Gikiyanakande	18	Fine pale worm	"
Gikiyanakande	9	Good brownish to black crepe	"
	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	2/4 $\frac{3}{4}$
	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	3/4 $\frac{3}{4}$ to 3/6
Ellakande	4	Soft block	bought in
	6	Brownish crepe	3/5 to 3/6 $\frac{1}{2}$
Heatherley	6	Brownish crepe	3/5 $\frac{3}{4}$ to 3/6 $\frac{1}{2}$
Hattangalla	1	Black crepe	bought in
	3	Good biscuits	3/8 $\frac{3}{4}$
D M	3	Brown pressed crepe	3/2 to 3/5 $\frac{1}{2}$
	4	Scrap and lumps	bought in
Verulapitiya	1	Good sheet	3/8 $\frac{3}{4}$
Welkandala	1	Good biscuits	3/8 $\frac{3}{4}$
	2	Good brown crepe	3/6
Marakona	1	Good sheet	3/8 $\frac{3}{4}$
Aberdeen	1	Good biscuits	3/8 $\frac{3}{4}$
Glanrhos	1	Good scrap	2/8
	6	Good biscuits	bought in

MARK.	PKGS.	DESCRIPTION.	PRICE PER LB.
Clontarf	2	Fine biscuits	3/8 $\frac{1}{2}$
<i>Malaya.</i>			
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.. 3/0 $\frac{1}{4}$
	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.. 3/0 $\frac{1}{4}$
	3	Pressed crepe .. .. .	.. .. 2/7 $\frac{1}{4}$
	1	Fine pale crepe .. .. .	.. .. 3/10
Merton	5	Good sheet .. .. .	.. .. bought in
Highlands	24	Fine sheet .. .. .	.. .. bought in
	44	Good palish and brown crepe .. .. .	.. .. 3/3 $\frac{3}{4}$ to 3/6 $\frac{3}{4}$
	2	Darkish to black crepe .. .. .	.. .. 2/11 to 3/-
	10	Good to fine palish and brownish crepe .. .. .	.. .. 3/6 to 3/9 $\frac{3}{4}$
	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 .. .. .	.. .. 3/6 $\frac{1}{4}$ to 3/9
B & D	7	Darkish to dark crepe .. .. .	.. .. 3/1 to 3/6
	4	Good brownish to fine palish crepe .. .. .	.. .. 3/6 $\frac{3}{4}$ to 3/10 $\frac{3}{4}$
	3	Good sheet .. .. .	.. .. 3/8
	1	Good rejections .. .. .	.. .. 3/0 $\frac{1}{4}$
	1	Fine pale pressed sheet .. .. .	.. .. 3/7 $\frac{3}{4}$
	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.. 3/8 $\frac{1}{4}$
	6	Dark crepe .. .. .	.. .. bought in
Matang	19	Good and medium crepe .. .. .	.. part sold.. 3/5 $\frac{1}{4}$
	1	Pressed undried .. .. .	.. .. 2/2 $\frac{1}{2}$
	57	Fine block .. .. .	.. .. bought in
Straits	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 "

MAR K.	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	2/8½ to 2/10¾
Sungei Krudda	9	Good sheet part sold ..	3/8 to 3/8¾
	1	Good brownish crepe	3/6½
	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
Pearl Tapioca, Small	338	8.50	5.30 fine
Medium	534	6.90	6.50
Bullet	45		8.00
Tin	3,358	63.75	60.62½

Closing fair.

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

6/52

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	125
Do	do	London	—
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 31st 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



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.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 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 valuation 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 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.* 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.

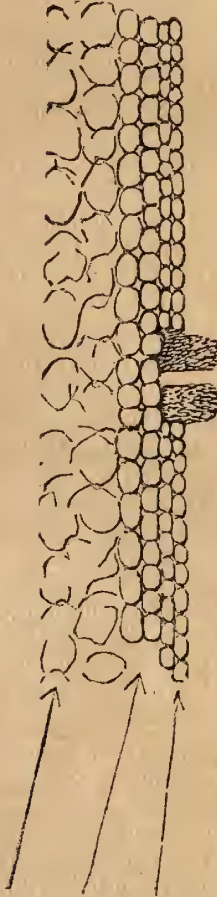
H. N. R.

REPORT ON DISEASED RUBBER TREES FORWARDED FROM PUAKE.

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 sterilized 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 reputation at home, so has the "Danzys," 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 Bulletin" 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 dissident.

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 Tamils 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," 19th 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 $\frac{1}{8}$ 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 bark 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 1s. to 1s. 3d. 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 1s. 9½d. per lb., Negrohead 1s. 1½d., Caucho ball 1s. 6d. (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. Matogrosso 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.* 10½*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 3s. 4d., fine soft 3s., scrappy 2s. 8 $\frac{3}{4}$., Cameta 1s. 10 $\frac{1}{4}$ d., ball 2s. 7d. In early December there was a recovery of 4d. in fine, 2d. per lb. on other qualities, but at the close our quotations are lower—fine hard 3s. 5d., soft 3s. 2d., Negrohead scrappy 2s. 10d., Cameta 2s. 0 $\frac{1}{2}$ d., Island (scarce) about 2s., Caucho ball 2s. 9d., showing a fall in value for the twelve months of 1s. 9 $\frac{1}{2}$ d. on fine, 1s. 1 $\frac{1}{2}$ d. on Negrohead. Soft cure has been abundant, and during recent months the value receded from the former difference of 2d. on hard, to 4d., whilst soft entrefine has been most difficult of sale at a serious reduction. Balata was in regular supply. Sheet advanced to 2s. 6 $\frac{1}{2}$ d., but closes at 2s. 2 $\frac{1}{2}$ d. Block was up to 1s. 11d., closing at 1s. 6 $\frac{1}{2}$ 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 3s. 5 $\frac{1}{2}$ d. for week ending December 27th to 3s. 5d. on January 3rd, and 3s. 4d. 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 2d. per lb. lower. Fair to fine Malay sheet sold at 3s. 7 $\frac{1}{4}$ d. to 3s. 9d., and crêpe at 3s. 8d. to 4s. 10 $\frac{3}{4}$ d.: 40 lb. very fine white, however, realised 4s. 3d. Superior pale Ceylon biscuits fetched 4s. 1 $\frac{1}{2}$ d. to 4s. 2d., and fair to good sheets and biscuits, 3s. 7d. to 3s. 8 $\frac{3}{4}$ d. Fine pale crêpe sold up to 3s. 11d.

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
„ { 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 STANFORTH 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 store⁹ 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 garoenioides.

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, Sansevieria 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, *Sansevieria* (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 <i>Amorphophallus Titanum</i>
German Consul, Padang	...	1 case of Palms
Mr. Tong Takin, Kwala Lumpur	...	6 <i>Adiantums</i>
Mr. Beauclerk do.	...	1 box of <i>Cannas</i>

Received in exchange from:—

Plantations Department, Perak	...	20 packets of Seeds
Do., do.	...	48 Ferns and Bulbs
Botanic Gardens, Jamaica	...	1 packet of seeds <i>Cyphomandra betacea</i>
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 <i>Phalæ nopsis</i>
C. Curtis Esq.	...	1 packet of seeds and 25 Bulbs
Dr. Wright, Perak	...	20 Bulbs, <i>Caladiums</i>
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 <i>Caladiums tubers</i>
D. Logan Esq.	...	25 seeds, <i>Spondias lutea</i>
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 dur- ing 1908.	Export dur- ing 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 $3/7\frac{3}{4}$ 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	10 $\frac{3}{4}$	28 $\frac{1}{2}$	39 $\frac{1}{4}$	404	3/2 $\frac{1}{8}$	3/1	3/5 to 3/7 $\frac{3}{4}$	2/1 to 2/6 $\frac{1}{4}$
Corresponding sale last year ...	362	7 $\frac{1}{2}$	13 $\frac{1}{4}$	20 $\frac{3}{4}$	226	5/5	5/2 $\frac{1}{4}$	5/8 $\frac{3}{4}$ to 5/10 $\frac{1}{2}$	4/3 $\frac{1}{4}$ to 4/7 $\frac{1}{2}$

TO-DAY'S QUOTATIONS.

SHEET, ETC.

Good to Fine Sheet	3/6 to 3/6 $\frac{3}{4}$
Very Fine Pale Biscuits	3/7 $\frac{3}{4}$
Good to Fine Biscuits... ..	3/5 to 3/6 $\frac{3}{4}$

CREPE.

Fine Palish and Pale	3/5 $\frac{1}{4}$ to 3/6 $\frac{3}{4}$
Medium and Brown	3/- to 3/4 $\frac{3}{4}$
Dark and Block	2/5 to 2/10

UNWASHED SCRAP.

Fine	2/5 to 2/6 $\frac{1}{4}$
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	... 3/3 $\frac{1}{2}$ to 3/5 $\frac{3}{4}$.
	3	Block	... 2/7.
Ellakande	1	Crepe	... 3/4 $\frac{3}{4}$.
Heatherley	3	„	... 3/- to 3/4.
Nikakotua	9	„	... 3/3 $\frac{1}{4}$.
Halgolle	7	Scrap and Cuttings	... 1/10 to 2/5 $\frac{3}{4}$.
Katugastota	2	Scrap and Cuttings	... 2/5 to 2/5 $\frac{1}{4}$.

Ceylon.—Continued.






MARK.	PKGS.	DESCRIPTION.	PRICE.
Arapolakande	9	Fine biscuits	... 3/6½ to 3/6¾.
	5	Crepe	... 3/3¼ to 3/4.
Sirigalla	1	Black block	... 2/7.
	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.
Ballacada	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.
	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  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	3	Sheet & scrap	... 2/9½.
W S			
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.
	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	... 3/1 $\frac{1}{4}$ to 3/4 $\frac{3}{4}$.
S K R Co. Ld.	16	Crepe	... 3/5 $\frac{1}{4}$.
	5	Block	... 2/8.
B M & Co.	2	Fine pressed sheet	... 3/6.
	2	Scrap	... 2/6.
	2	Rejections	part sold, 2/4 $\frac{1}{2}$.
B & D	14	Biscuits, sheet and crepe	... 2/- to 3/6 $\frac{3}{4}$.
	7	Sheet	... bought in.
	1	Biscuits	... bought in.
	2	Good scrap & rejections	... pt. sold, 2/4.
	1	Good rejections	... 2/6.
	2	Scrap	... 2/1 to 2/6.
	1	Scrap	... 2/-
L & P	1	Block	... 3/0 $\frac{1}{2}$.
	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.

9/1/9

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,

S. LUCY,

13th February, 1908.

Assistant Surgeon.

*Senior Medical Officer,
Penang.*

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.			
General Hospital, Kuala Lumpur	Ins. 29'877	°F 137'0	°F 78'9	°F 89'3	°F 70'2	°F 19'1	°F 75'8	°F 0'828	°F 73'7	% 84	S.W.	Ins. 18'92	Ins. 3'65
Pudoh Gaol Hospital	3'43
District Hospital	2'11
" Klang	85'8	69'9	15'9	...	...	...	...	...	...	3'50
" Kuala Langat	3'50
" Kajang.	83'3	75'0	8'3	...	...	...	...	...	...	2'17
" Kuala Selangor	88'3	78'7	9'6	...	...	...	...	...	...	3'77
" Kuala Kubu	3'77
" Serendah	2'80
" Rawang	3'22
Beri-beri Hospital, Jeram	87'5	71'1	16'4	...	...	...	...	...	...	1'80
Sabak Bernam	1'02

STATE SURGEON'S OFFICE,
KUALA LUMPUR, February, 1908.

A. J. McCLOSKEY,
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	°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	4.62	1.20
Beri-beri Hospital, Jeram	91.2	71.4	19.8	...	...	...	...	...	5.70	1.35
Sabak Bernam	3.21	0.80

STATE SURGEON'S OFFICE,

KUALA LUMPUR, 28th February, 1908.

A. J. McCLOSKEY,

State Surgeon, Selangor.

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, 25th February, 1908.

The Duff Development Company, Limited, Kelantan.

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

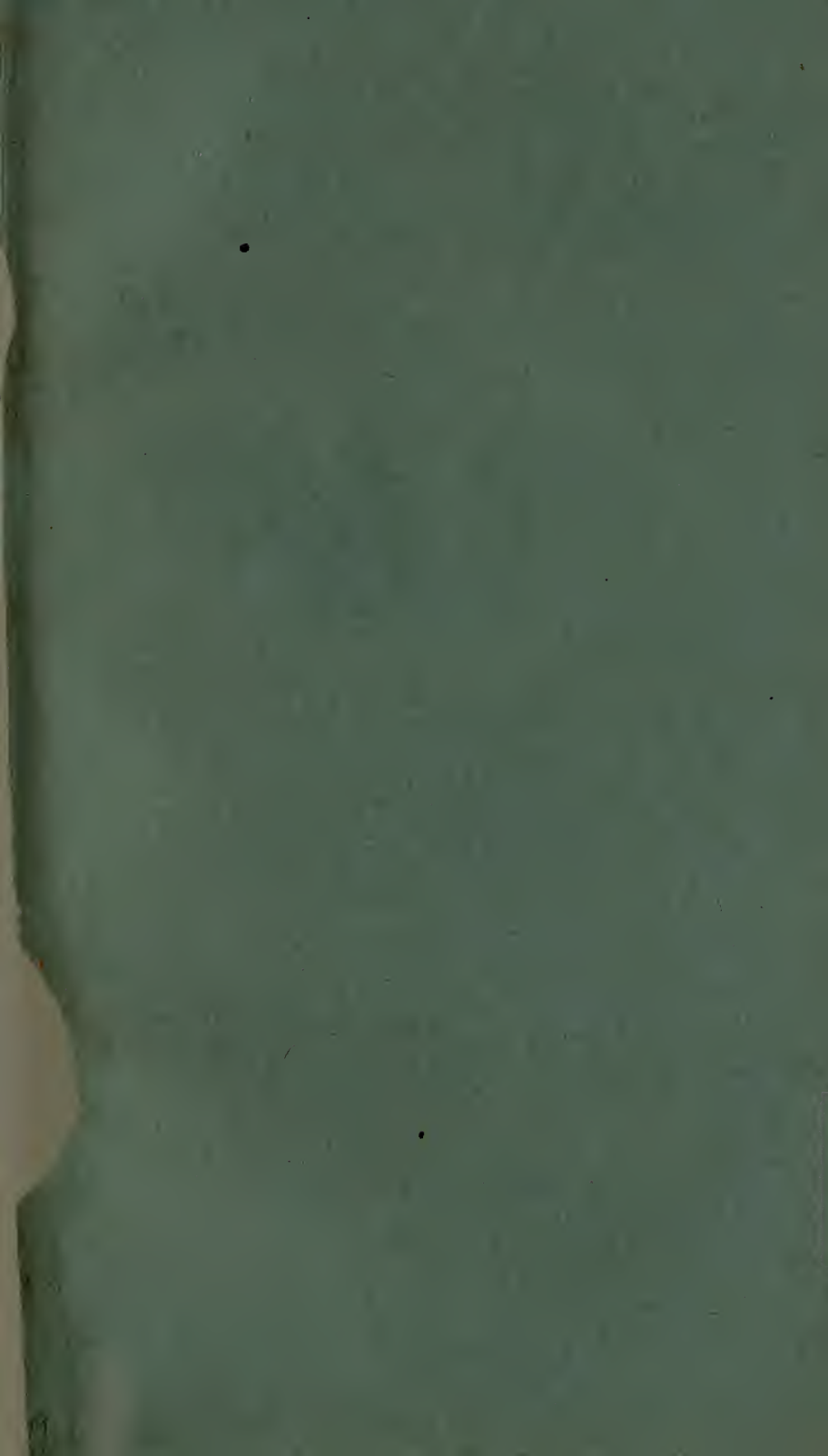
DISTRICT.	TEMPERATURE.			RAINFALL	
	Maximum.	Minimum.	Range.	Total Rainfall.	Greatest Rainfall during 24 hours.
	Mean. °F	Mean. °F	Mean. °F	Inches.	Inches.
Kuala Lebir ...	85·4	71·3	13·9	8·69	5·36
Kuala Kelantan ...	81·3	72·4	14·9	5·35	2·29
Kuala Pergan ...	...	...	...	9·12	4·73
Taku Plantation ...	...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

SURGEON'S OFFICE,

KUALA LEBIR, 21st February, 1908.

JOHN D. GIMLETTE,

Surgeon.



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.,
Director of Agriculture & Government Botanist, F.M.S.

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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.

<i>Heliconia indica</i> , Lam. Loc.	...	...	uncertain
<i>H. buccinata</i> , Roxb. ...	...	...	Amboina
<i>Heliconiopsis Amboinensis</i> , Miq.			
<i>H. austro-caledonica</i> , Vieill....	...	...	New Caledonia
<i>H. aureo-striata</i> , Bull. ...	...	...	uncertain
<i>H. illustris</i> , Bull. ...	...	...	uncertain
<i>H. rubro-striata</i> , Hort.			
<i>H. triumphans</i> , Lind. ...	...	...	Sumatra
<i>H. spectabilis</i> , Lind. ...	...	...	South Seas
<i>H. Micholitzii</i> , Ridl. ...	...	...	New Ireland
<i>H. viridis</i> , 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 $\frac{3}{16}$ 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. Perianth 1½ inch long curved acuminate greenish and red. Sepals ½ 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 across pale-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 $\frac{1}{2}$ 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 $\frac{1}{2}$ inch long, pedicel $\frac{1}{2}$ 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 $6\frac{1}{2}$ inches) was made in a sloping direction.

In (b) the cut was 22 centimetres (about $8\frac{3}{4}$ 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 = $2\frac{1}{2}$ 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.

IPPECACUANHA.

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 Liège 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 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 ferruginous 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 *Grammatophyllum*, 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 forward to you by this mail was printed, a further large number of well known gentlemen 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					
Do., do. Corner position (2 frontages)	...	...	£7	0	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)...					
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.

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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
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
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

Closing fair.

Closing fair.

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.

Forinight 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 Hites	"	do.	do.	...
Pineapples	"	do.	do.	cases 2,000
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

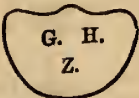
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Do.	do.	North	do.	50
White Pepper	Singapore	South	do.	5
Do.	do.	North	do.	85
Do.	Penang	South	do.	5
White Pepper	Str. Penang	North Continent		Tons. 20
Copra	„ Singapore & Penang	Marseilles		840
Do.	„ do.	Odessa		1,000
Do.	„ do.	Other South Continent		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.	„ Penang	do.		
White Pepper	„ do.	do.		
T. Flake & Pearl	„ do.	do.		
Nutmegs	„ do.	do.		
tons Gambier	„			260
„ Black Pepper	„			500

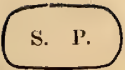
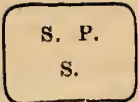
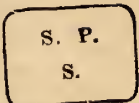

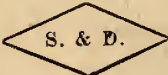

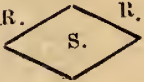

**CEYLON, STRAITS & MALAY STATES
PLANTATION RUBBER REPORT.**

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
	6	Biscuits	...	withdrawn
	9	Crepe	...	withdrawn
	2	Block	...	withdrawn
	5	Scrap	...	withdrawn
	2	Virgin	...	withdrawn
B. & D.	22	Sheets	...	bought in
	4	Scrap	3 sold ...	1/9
Matang	8	Sheets	...	bought in
L. E.	6	Crepe	...	bought in
	53	No. 1 Block	...	bought in
	15	No. 2 Block	...	bought in
	11	Sheets	...	bought in
	3	Scrap	...	bought in
	2	Sheets	...	bought in
	6	Scrap	...	2/-
	3	Sheets	...	bought in
Damansara } Selangor }	2	Biscuits	...	bought in
	35	Crepe	...	bought in
	2	Sheets	...	bought in
K. P. C. } Beaumont Estate }	3	Sheets	...	bought in
	5	Crepe	...	2/8½ at 2/10½
	22	Sheets	...	bought in
	68	Crepe	41 sold ...	2/7¼ at 3/4¼
	7	Sheets	...	bought in
	5	Crepe	...	2/10 at 2/11¼
	2	Crepe	...	2/3½
	1	Sheets	...	bought in
Jebong	59	Crepe	...	bought in
Golconda	22	Sheets	...	bought in
	4	Block	...	bought in
	3	Crepe	...	bought in
	13	Sheets	...	bought in

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 rates, 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.	Scrap.	
To-day	682	12	23¼	35¼	480	3/3	3/1½	3/3 to 3/10	1/7 to 2/6
Corresponding Sale Last Year)	649	8	29¼	37¼	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 ...	3/6 $\frac{1}{4}$		
Very Fine Pale Biscuits.	3/9 $\frac{1}{2}$ to 3/10	Fine Palish...	3/4 $\frac{1}{2}$ to 3/5 $\frac{1}{2}$	Good to Fine	2/4 $\frac{1}{2}$ to 2/6
Good to Fine Biscuits.	3/3 to 3/5 $\frac{1}{2}$	Brown and Medium.	2/11 to 3/4 $\frac{1}{2}$	Low and Medium.	2/- to 2/3
Good to Fine Worm.	3/- to 3/2 $\frac{1}{2}$	Dark ...	2/7 to 2/10 $\frac{3}{4}$		

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 obtainable. 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	1906 Tons	1905 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 ... 14 $\frac{1}{2}$ 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 rejections	... 2/- to 2/4½
M. A. C.	1	Lumps	... 2/3¼
	4	Scrap	... bought in
Dolahena	1	Scrap and rejections	... 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 scrap	... 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 3/3¼
	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
Nikakotna	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

Haiwitura	10	Fine pale worm	... bought in
Delwita	5	Dark worm	... 3/2 $\frac{1}{2}$
	1	Scrap	... 2/3
Alupolla	1	Amber worm	... bought in
	1	Scrap	... 2/4
Edengoda	4	Biscuits	... 3/4 $\frac{1}{2}$
	1	Scrap	... 2/3
Rasagalla	4	Bi-cuits	... 3/4 $\frac{1}{2}$
Galatna	5	Scrap	... 2/3 to 2 4 $\frac{1}{2}$
Medampe	3	Biscuits	... 3/4 $\frac{1}{2}$
	1	Scrap	... 2/6
	1	Block	... bought in
Dea Ella	2	Biscuits	... bought in
	1	Scrap	... 2/4 $\frac{1}{2}$

MALAYA.

MARK.	PKGS.	DESCRIPTION.	PRICE.
B. & D.	2	Good sheet (41 lbs.)	... 3/- to 3/2
	1	Pres ● l sheet	... 3/1
	1	Cuttings	... 2/4 $\frac{1}{2}$
	2	Fine crepe	... 3/5
	2	Sheet and cuttings	... 2/10 $\frac{1}{2}$ to 3/2 $\frac{1}{2}$
	3	Darkish crepe	... 2/11 to 3/3 $\frac{1}{4}$
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 3/4 $\frac{1}{2}$
	4	Good crepe	... 3 4 $\frac{1}{2}$
	5	Darkish	... 3/- to 3/2 $\frac{1}{4}$
	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, 1 $\frac{1}{2}$
	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	... 3/2 $\frac{1}{4}$ to 3:4 $\frac{1}{2}$
	19	Dark crepe pt. sold	... 3/0 $\frac{1}{4}$ to 3:2 $\frac{1}{4}$
B. R. R. Co. Ltd.	53	Fine sheet	... 3/3 $\frac{1}{2}$

B. R. R. Co. Ltd.	9	Palish crepe	...	3/5½
	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	...	3/5½
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

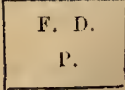
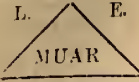
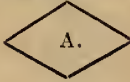
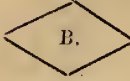
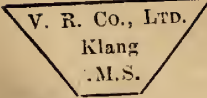
March, 6th 1908.

The following Lots, comprising about 23 Tons Straits and 11½ 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
	8	„ Crepe	4 sold ... 3 5
E. L. & Co.	8	„ Sheets	... 3 3 at 3 4½
	9	„ Crepe	... 2 2½ at 3 4½
	2	Pkgs. Worms	... 3-
S. K- R. Co. Ltd.	28	Cases Crepe	... 3- at 3 4¾
	9	„ Crepe	... 3 4 at 5 5
	2	„ Sheet not offered	...
	1	„ Ball „ „	...

B. & D.

	3	Scrap	bought in
Damansara } Selangor }	3 7	Block Crepe	bought in 3|1½ at 3|4
	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
	1	Biscuits	3|4¼
	2	" "	3|3
	22	Sheets	3|4½
	60	Crepe	3|9¾ 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
Doranakanale	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
Sorata	4	" Biscuits	3|4¾ and 3|5
	1	" Scrap	2|6
Tallagalla	1	" Biscuits	3|5
	2	" Scrap	2|1½ at 2|5½
Warriapolla	8	Pkgs. "	2|1 at 2|5
	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|4 $\frac{1}{4}$
Neboda	14	.. ..	...	2|6 $\frac{1}{4}$ at 3|5 $\frac{1}{4}$
Hattangala	3	.. Biscuits	...	3|4 $\frac{3}{4}$
	2	.. Crepe	...	2|10 $\frac{3}{4}$ at 3|3 $\frac{3}{4}$
	7	.. Sheets	...	3|5 $\frac{1}{4}$
V. S.	19	.. Scrap	...	bought in
	2	Pkgs. Block	...	bought in
	2	Cases Crepe	...	bought in
Arapolakande	17	.. Biscuits	...	3|5 $\frac{1}{2}$
Kalagalla	8	.. Crepe	...	3|2 at 3|4 $\frac{1}{4}$
	7	.. Worms	...	3|2 $\frac{1}{2}$
	2	.. Crepe	...	bought in
Halwatura	10	.. Worms	...	3|2 $\frac{1}{2}$
Delwita	5	.. "	...	3|2 $\frac{3}{4}$
Alupolla	1	.. "	...	bought in
Edengoda	4	.. Biscuits	...	3|4 $\frac{1}{2}$
Rasagala	4	.. "	...	3|4 $\frac{1}{2}$
Galatura	5	.. Scrap	...	2|3 at 2|4 $\frac{1}{2}$
Edengoda	1	.. "	...	2|3
Delwita	1	.. "	...	2|4
Alupolla	1	.. "	...	2|4 $\frac{1}{2}$
Madampe	3	.. Biscuits	...	3|4 $\frac{1}{2}$
	1	.. Scrap	...	2|6
Dea Ella	2	.. Biscuits	...	3|3 $\frac{1}{4}$ bid
	1	.. Scrap	...	2|4 $\frac{1}{2}$

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.

155

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	°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 Meteorological 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.

155

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing 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	3.00
FudohGaul 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

6/95

6/75

Pahang.

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

156

DISTRICT.	Mean Barometrical Pressure at 32° Fan.	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	76.85	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.



6/96

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.

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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 AND
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EDITED BY

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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 Lumpur 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 *Termes 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 Lumpur.

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 well 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 mandibles. 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 $\frac{1}{4}$ 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 $\frac{1}{4}$ 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 three 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 in 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 $3\frac{1}{2}$ 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 unable 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 they commence from the outside and work towards the centre. I have made careful observation on this point, and it is obvious to me that *Termes 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 than 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 $3\frac{1}{2}$ 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 continually 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 multiplication of this serious pest.

As long as such a practice is continued any reduction in the numbers of this pest cannot reasonably 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 as 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 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 is 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 be 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 its 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, combined with destruction of the source of their infection is sufficient to prevent 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	$\frac{1}{2}$ 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 should 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 development 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 symptoms 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 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 there 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 *Sapotaceae* 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 Molleyana*.

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 *Bucea sumatrana* and bark and fruits of *B. antedysenterica*, 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 *Bucea* 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 is 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 be 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 Pharmacopœa Nederlandica (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 situ, 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 Lumpur, 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 honour 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	Highest	Lowest
	sold.	price.	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
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
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

Closing
fair.Closing
fair.

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	Marsilles	1,100
Do.	" do.	Odesa	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 & Pear	" 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
do. Black Pepper				1,000

**CEYLON, STRAITS AND MALAY STATES
PLANTATION RUBBER REPORT.**

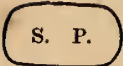
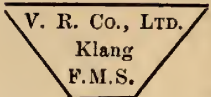
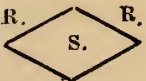
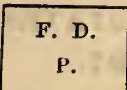

March 20th, 1908.

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 Estate	8	Cases Rolled Sheets	... bought in
	23	do. Crepe	...
	1	do. do.	...
Sinpang	1	do. do.	...
Pataling	17	do. do.	...
Linggi	9	do. do.	...

11/13

MARK.	PKGS.	DESCRIPTION.	PRICE.
	8	Cases Sheets	bought in
 S. P.	13	" "	" "
Sungei Krudda	4	" Biscuits	" "
	29	" Crepe	" "
	4	" Sheets	" "
Glanrhos	28	" Crepe	" "
	3	" Biscuits	" "
Linggi Plants Ltd.	1	" Crepe	3/3 $\frac{1}{4}$ at 3/4
B. R. R. Co., Ltd.	29	" Sheets	bought in
	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 3/1 $\frac{1}{2}$ at 3/7 $\frac{1}{2}$
S. R. Co.	33	" Sheets	bought in
	37	" Crepe	" "
 R. S. R.	13	" Sheets	11 sold 3/5, 3/5 $\frac{1}{4}$
	9	" Crepe	6 sold 3/-
Perhentian Tinggi Estate	14	" Sheets	bought in
B. & D.	16	" Crepe	" "
 F. D. P.	19	" Sheets	2/8 at 3/5 $\frac{1}{2}$
B. & D.	5	" Crepe	bought in
Matang	7	" Sheets	" "
	32	" Crepe	" "
	5	" Scrap	" "
B. M. & Co., Ltd.	10	" Sheets	" "
H. T.	5	" Scrap	" "
P.			
 L. MUAR E.	53	" Block No. 1	" "
M. B. E.	17	" " No. 2	" "

MARK.	PKGS.	DESCRIPTION.	PRICE.
R.			
M. P.	7	Cases Crepe	... 3/4½ at 3/5½
Ltd.			
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.

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.

Aberdeen

	13	„ Crepe	... „
	4	„ Sheets	... „
	1	„ Scrap	... „

G. H.
Z.


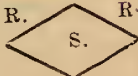
	8	„ Biscuits	... „
--	---	------------	-------

P.

W.

Clontarp	2	„ „	... 3/3¼
Glanrhos	9	„ „	... 3/3½ at 3/4
	26	„ Crepe	... bought in
Welkandala	2	„ Biscuits	... „
	1	„ Crepe	... „
Ambaganga	2	„ Sheets	... „
	2	„ Biscuits	... „
	2	„ Block	... „
Dangan	4	„ Biscuits	... 3/4½
	2	„ Scrap	... 1/9 & 2/4

6 sold

MARK.	PKGS.	DESCRIPTION.	PRICE.
Kahagalla	12	Cases Crepe	... bought in
Galatura	4	" Scrap	... "
Kayigam	8	" Biscuits	... 3/5
D. M.	2	" Biscuits	... bought in
			
	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
			
	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	... 2/7½
Kumaradola	3	" Biscuits 2 sold	... 3/5
	2	" Scrap	... 21¼ at 2/4¼
Tudugalla	6	" Crepe	... bought in

6/115

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.

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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No. 6.]

JUNE, 1908.

[Vol. VII.

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 nodes: 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 $1\frac{1}{2}$ to $2\frac{1}{2}$ years old. The cuttings are from $1\frac{1}{2}$ 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 $2\frac{1}{4}$ to $2\frac{1}{2}$ years old the first crop is over, the yield being estimated at from 1 to $1\frac{1}{2}$ catties of white pepper per vine (four to six catties of green pepper). By the end of another year, the vine being $3\frac{1}{2}$ 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 entire 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 proportion 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 custom 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 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 in 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 cymōsa*, 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 species 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* cannot 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 flowered 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 Graeocens* 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 exhibit 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'être*.

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 Lumpur 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.	1907.
	Tons.	Tons.
Perak	67	114
Selangor	304	535
Negri Sembilan	88	236
	<hr/>	<hr/>
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	7,260	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. Lumpur	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				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				9			9	4,630	10
K. Langat	1,493	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 Bearing.	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.	Un-cultivated Acres.	Total Acreage.	
Johore					7½	7½				610	5,191	5,801	15	811¼	826¼	6,634¼	65,426¼	72,061½	15
Batu Tiga										2,247	7,439½	9,686½				9,686½	10,126¼	19,812¼	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	5
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	10
Kuala Selangor				152		152	127		127	92	11,516½	11,608½				11,887½	20,280½	32,167½	22
Negri Sembilan					8	37	248		248	1,540½	9,109½	10,650	20	6	26	10,969	26,902½	37,871½	23
Kalang				20	71	91	30		30	1,555½	7,295½	8,851		10	10	8,982	27,820½	36,802½	14
Total	7,985	863	8,848	2,430	6,222½	8,652½	1,997	942	2,939	12,978¼	99,563¼	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.

MINUTES OF ANNUAL GENERAL MEETING.

*Held at 11.15 a.m. on April 28th, 1908, at the Masonic Hall,
Kuala Lumpur.*

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 Lumpur 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 proxy J. 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 Lumpur, 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 Lumpur, *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 Government 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 sufficiently 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	
		<hr/>	
		35	Voters present.
		<hr/>	
and Mr. Zacharias	... polling	32	
Mr. H. M. Darby	... "	1	
Abstentions ...	... "	2	
		<hr/>	
		35	Voters present.
		<hr/>	

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 await 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 Committee 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.

I 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 : especially 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 ultimo 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		
	<hr/>		<hr/>
	\$5,400		\$5,400
	<hr/>		<hr/>

XIII. The following correspondence *re* Loans to Planters is read.

THE RESIDENT-GENERAL, F. M. S.,
Kuala Lumpor.

29th February 1908.

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, which 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.	Chula.	Rubber and Coffee.	Other Products.	Uncultivated.	Total Area.
8,857	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.			RECEIPTS.		
	\$	cts.		\$	cts.
Subscription of the P. A. M.	140	00	Balance brought forward	82	54
Stationery and Postage. etc.	36	41	Subscriptions from 26 Estates	466	95
	176	41	Entrance fees from 2 Estates	50	00
Balance of Receipts over Expenditure	403	08			
	579	49		579	49

BALANCE SHEET.

As on February 29th, 1908.

	Liabilities.		Assets.	
	\$	cts.	\$	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;—

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. Hamerton, 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 read by 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 Lumpur, 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 Lumpur 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 this 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 Lumpur 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 Lumpur 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 on 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 Lumpur 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. If 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
Sub: to P. A. M. for 4 months 1907-08	140	00	Refund from P. A. M.	90	53
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. Masee reports on the specimens. "The fungus is *Polystictus occidentalis*, Klotzsch. and the mycelium belongs to it as proved by examination of specimens in the herbarium. *P. occidentalis* is cosmopolitan in the warmer regions, 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
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

Closing fair.

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	Marstilles	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	169
Do.	"	do.	U. K. &/or Continent	125
Cube Gambier	"	do.	United Kingdom	29
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.	Scrap.	
To-day	832	11	32 $\frac{1}{4}$	43 $\frac{1}{4}$	530	3/2 $\frac{1}{4}$	3/3	3/4 to 4/-	1/- to 2/7 $\frac{1}{4}$
Corresponding Sale Last Year	557	9 $\frac{3}{4}$	16 $\frac{1}{3}$	26	240	5/4 $\frac{1}{4}$	4/11	5/7 to 5/10 $\frac{1}{2}$	4/1 to 4/6 $\frac{1}{2}$

TO-DAY'S QUOTATIONS.

SHEET AND BISCUITS.		CREPE AND BLOCK.		UNWASHED SCRAP.	
Good to Fine Sheet.	3/4 $\frac{1}{4}$ to 3/6 $\frac{1}{2}$	Fine Pale ...	3/8		
Very Fine Pale Biscuits.	4/-	Fine Palish...	3/5 to 3/7	Good to Fine	2/2 to 2/7 $\frac{1}{4}$
Good to Fine Biscuits.	3/4 to 3/6 $\frac{1}{2}$	Brown and Medium.	2/10 to 3/4 $\frac{1}{2}$	Low and Medium.	1/- to 1/4 $\frac{1}{2}$

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.
18,635 tons	... 29,435 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	8½ tons

MALAYA.—1st January to 22nd February.

1908	...	...	...	Singapore.	Penang.	Total.
1907	...	...	...	132½ tons	41½ tons	177 tons
				74½ tons	4½ tons	78¾ tons

Particulars and Prices as follows :—

CEYLON.

MARK.	PKGS.	DESCRIPTION.	PRICE.
Medampe	3	Biscuits	... 3/6½
	1	Scrap	... 2/4
Dea Ella	1	Block	... bought in
	2	Biscuits	... 3/5 to 3/6½
Pallagodda	2	Scrap	... bought in
	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
Ambatenne	4	Biscuits (small quantities)	... 2/10 to 3/1½
	3	Fine biscuits	... 3/6½
M. A. K.	2	Good to fine scrap	... 2/4¾ to 2/7
	3	Biscuits and sheet	... 3/4½ 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	... 3/4½ to 3/6
	7	Fine Scrap	... 2/7¼
	9	Good scrap and rejections	... 2/6 to 2/7¼
	2	Fine biscuits and sheet	... 3/6
Ayr	6	Crepe	... 3/2¾
Ballacadua	2	Biscuits	... 3/6
Tallagalla	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.	36	Crepe	... bought in
Blackhill	1	Pressed sheet	... 3/6
Mudumana	4	Scrap	... 2/2¾
	2	Good scrap and rejections	... 2/2¾ to 2/3
C. W. M. & Co.	6	Darkish crepe	... 3/-
	12	Brownish crepe	... 3/2¾ to 3/4¾
Culloden	5	Black crepe	... bought in
	2	Crepe	... 3/3½
Heatherley	9	"	... 3/3 to 3/3½
Nikakotua	2	Fine biscuits	... 3/6
Hattangalla	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

PERAK GOVERNMENT GAZETTE.

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 LUMPUR,

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 moderate scale although there has been a three week's interval, on account 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 1b. per lb. on last sale quotations. The better grades of Crépe

and Sheet were mostly well competed for, but Block and the darkest kinds of Crepe were again somewhat difficult to quit.

NUMBER OF PACKAGES ADVER- TISED.	Quantity in Tons.			Average Price of Plantation Rubber.		Comparative Prices.			
	Ceylon.	Malaya.	Total.	No of Packages Sold.	Price	Hard Fine Para.	Plantation.		
							Fine.	Scrap.	
To-day	326	9½	33½	43	355	3/3½	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.	
Good to Fine Sheet.	3/5½ to 3/7¼	Fine Pale ... Fine Palish ...	3/8½ 3/5½ 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 Me- dium.	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.			Penang				Total.
			Tons.			Tons.				Tons.
1908	..	...	215¾	...	...	89¾	...	...	...	305½
1907	..	...	93¼	..	...	6¾	...	...	...	100

PARTICULARS AND PRICES OF TO-DAY'S SALE.

CEYLON.

MARK.	RKGS.	DESCRIPTION.	PRICE.
Kahagalla	3	Fine crepe	... 3/8
	4	Black "	... bought in
Galatura	4	Scrap	... bought in
Kumbukkan	5	Biscuits	... bought in
	2	Scrap & lumps	... 2/4 to 2/7 ³ / ₄
Yattewatte	1	Dark biscuits	... bought in
Ellakande	7	Fine crepe	... 3/7 ³ / ₄
	2	Brown "	... 3/3
Heatherley	3	" "	... 3/2 ¹ / ₂
	1	Black "	... 2/6
Nikakotua	6	Crepe	... 3/2 to 3/5 ¹ / ₂
Ingoya	8	Biscuits and sheet	... 3/6 to 3/6 ¹ / ₂
	10	Blocked sheet	... 3/5 ³ / ₄
	4	" scrap	... 1/8 to 2/3 ¹ / ₂
Langsland	8	Biscuits	... 3/6 ¹ / ₂ to 3/6 ³ / ₄
	2	Scrap	... 1/10 ³ / ₄
Glendon	2	Biscuits	... 3/6 ¹ / ₂
Palli	11	Very fine biscuits and sheet	... 3/6 ¹ / ₄ to 3/7
Deusworth	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	... 2/4 ¹ / ₂
Tallagalla	2	Dark biscuits	... 3/5 ¹ / ₂
	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	... 3/6 ³ / ₄
Ayr	1	Sheet	... 3/4 ¹ / ₄
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	... 3/6 to 3/6 ¹ / ₂
D. G. H. & Co.	1	Lumps	... 2/6
	20	Dark to black crepe	... 2/6 ¹ / ₄
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. Ltd.	28	Good and medium crepe	... pt. sold 3/5
	13	Dark crepe	... bought in
	41	Fine sheet	... bought in
F. (S) R. Co. Lt.	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 3/0 $\frac{1}{4}$
	2	Fine sheet	... 3/6 $\frac{1}{4}$
V. R. Co., Ltd.	27	Good to fine crepe	... 3/3 $\frac{1}{2}$ to 37/4
Klang	29	Mottled to dark crepe	... 2/10 $\frac{1}{4}$ to 3/2
F. M. S.	40	Fine thick crepe	... 3/5 $\frac{1}{4}$
K. P. C.	21	Sheet	... 3/6 $\frac{1}{2}$ to 3/6 $\frac{3}{4}$
	1	Scrap	... 2/5 $\frac{1}{2}$
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	... 3/6 $\frac{1}{4}$
	10	Dark crepe	... 2/1 $\frac{1}{4}$
S. B	8	Very fine sheet	... 3/7 $\frac{1}{4}$
P. R.	4	Scrap	... 1/7 $\frac{1}{4}$ to 2/4 $\frac{1}{2}$
R. S. R.	25	Sheet	... 3/5 $\frac{1}{8}$ to 3/6 $\frac{1}{2}$
	7	Scrap and rejections	... 22 to 24
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	... bought in
	3	Good to fine crepe	... 32 $\frac{1}{2}$ to 34
	1	Dark sheet	... bought in
	3	Fine sheet	... 36 $\frac{1}{2}$
B. D.	13	Crepe, rejections, scrap, etc.	26 $\frac{1}{2}$ to 36
	1	Block	... bought in
B. M. & Co. Ltd.	10	Sheet	... bought in
Perhentian	14	Sheet	... bought in
Tinggi	16	Dark crepe	... bought in
S. S. B. R. Co. Ltd	22	Darkish to dark crepe	... 3. to 3/2
	7	Sheet	... bought in
Goleonda	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
Snnige Krndda	15	Good crepe	... bought in
	1	Block	... bought in

JAVA.

MARK.	PKGS.	DESCRIPTIONS.	PRICE.
Rasir	1	Fine sheet	... bought in
Oetjing	2	Scrap	... 21 $\frac{3}{4}$


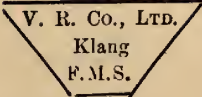
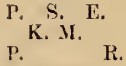
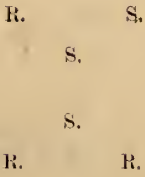
CEYLON, STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

April 3rd, 1908.

The following Lots, comprising about 30 $\frac{3}{4}$ Tons Straits and 12 $\frac{1}{4}$ 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.	39	Cases Crepe	9 sold ... 3/3 $\frac{1}{2}$ at 3/7
Damansara	6	„ Sheets	4 sold ... 3/6 $\frac{1}{4}$
	21	„ Crepe	7 sold ... 3/0 $\frac{1}{2}$
	1	„ Block	... bought in
Yam Seng	6	„ Sheets	... „
	1	„ Scrap	... 2/5 $\frac{1}{2}$ „
Shelford	6	„ Sheets	... bought in
Merton	7	„ Biscuits	... „
	1	„ Crepe	... 3/1 $\frac{3}{4}$ „
F. S. R. Co., Ltd.	4	„ Sheets	... bought in
	1	„ Crepe	... „
N. H. R. Co., Ltd.	1	„ „	... 3/- „
B. R. R. Co., Ltd.	9	„ „	... 3/0 $\frac{3}{4}$ at 3/ $\frac{1}{2}$
	37	„ „	... 3/0 $\frac{3}{4}$ at 3/3 $\frac{3}{4}$
D.	2	„ Block	... 3/6 $\frac{3}{4}$
	13	„ Sheets	... 3/6 $\frac{1}{2}$
R.			
M. P. Ltd.	6	„ Crepe	... 3/2 at 3/3
B. & D.	8	„ Sheet	... 3/6 $\frac{1}{2}$
F. D.			
P.			
S. K. R. Co., Ltd.	12	„ Crepe	... 3/3 $\frac{3}{4}$ at 3/6
R. R.	10	„ Sheets	... 3/6 $\frac{1}{4}$
S. & D.	5	„ Scrap	... 2/5 $\frac{1}{4}$
R. R.			
L. E. D.	3	„ Sheets	... 3/6
R. S.			
L. E. D.	3	„ Scrap	... 1/- at 2/6 $\frac{1}{4}$
S. R.			
R. A. G.	1	„ Biscuits	... 2/9 $\frac{1}{2}$
R. R.			
C. W.	3	Pkgs. Biscuits	... 2/8 at 3/-

MARK.	PKGS.	DESCRIPTION.	PRICE.
Perhentian	14	Cases Sheets	... 3/6½ 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
			
	51	„ Block No. 1	... bought in
Highland Estate	7	„ Sheets	... 3/6¼
	32	„ Crepe	... 3/0¼ at 3/4¼
			
	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
			
	17	„ Sheets	... 3/5¼
	2	„ Sheets	... bought in
			
	6	„ Sheets	... bought in
	6	„ Sheets	...
	5	„ Scrap	... 3/6 2/4 at 2/6
T. A. & Co.	7	„ Crepe	... bought in
	5	„ Scrap	... „
Beverlae	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
Pallaodda	7	„ Scrap	... 1/4½
Kumbakkau	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	... 2/4¼ at 2/7
M, A. K.	5	Pkgs. Biscuits	... 2/3 at 2/5½

MARK.	PKGS	DESCRIPTION.	PRICE.
Hylton	1	Case „	... 3/6½
Clara	2	Cases „	... 3/- at 3/6½
Doranakande	5	„ „	... 3/4½ at 3/6
	7	„ Sheets	... 2/7½
	9	„ Scrap	... 2/7½
Ayr	1	„ Biscuits	... 3/6
	1	„ Sheet	... 3/6
Ballacadua	6	„ Crepe	... 3/2¾
Tallagalla	2	„ Biscuits	... 3/6
	4	„ Scrap	... 2/4 at 2/7½
Warriapolla	7	„ Biscuits	... 3/- at 4/-
	4	„ Scrap	... 2/2 at 2/7
D. G. H. & Co. } Elkadua } G. D. J. } Blackhill }	1	„ Biscuits	... bought in
	36	„ Crepe	... „
V. S.	4	„ Scrap	... 2/2¾
M. A. K.	10	„ Crepe	... bought in
Culloden	14	„ Crepe	... 3/2 at 3/4½
Heatherley	2	„ Crepe	... 3/3½
Nikakotua	9	„ Crepe	... 3/3 at 3/3½
Hattangalla	2	„ Biscuits	... 3/6½
	2	„ Crepe	... 3/4½
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	... 2/4 at 2/7

Plantation Rubber in London for March :—
Stock.



Imported Delivered 1908, 1907 and 1906.

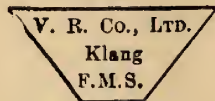
118 TONS, 91 TONS, 805 TONS, 108 TONS AND 36 TONS.

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 3/6½
	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	... 2/5 $\frac{1}{2}$
Shelford	6	Sheet	... bought in
Merton	7	"	... bought in
	2	Crepe and sheet	... pt. sold 3/1 $\frac{1}{2}$
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 3/3 $\frac{1}{2}$
	7	Dark crepe	... 3/0 $\frac{3}{4}$
	23	Fine crepe	... 3/3 $\frac{1}{4}$
	18	Darkish to dark	... 2/8 to 3/2 $\frac{1}{2}$
	2	Block	... 3/6 $\frac{3}{4}$
	1	Rambong scrape	... 2/2 $\frac{1}{2}$
	13	Sheet	... 3/6 $\frac{1}{2}$
	1	Rough biscuits	... (20 lbs.) 2/9
	6	Brown crepe	... 3/2 to 3/3
B. & D.	9	Fine sheet	... 3/6 $\frac{1}{2}$
S. K. R. Co. Ltd.	12	Good to fine crepe	... 3/3 $\frac{3}{4}$ to 3/6
	3	Biscuits	... 3/- to 3/3
	1	Crepe	... 3/1 $\frac{1}{2}$
	4	Scrap and rejections	... 2/6
	7	Fine sheet	... 3/6 $\frac{1}{4}$
	5	Scrap and rejections	... 1/3 to 2/5 $\frac{1}{4}$
	6	Fine sheet	... 3/5 $\frac{1}{2}$ to 3/6
	9	Scrap and rejections	... 1/- to 2/8 $\frac{1}{4}$
Perhentian	14	Sheet	... 3/6 $\frac{1}{4}$
Tinggi	16	Darkish crepe	... bought in
B. & D.	1	Palish crepe	... 3/4
K. T.	10	Pressed sheet and crepe	... 2/6 to 3/1 $\frac{1}{2}$
Matang	14	Crepe	... 3/4 $\frac{1}{2}$ to 3/5
	11	Darkish crepe	... 3/1 to 3/1 $\frac{1}{2}$
	1	Block	... 2/1
B. M. & Co. Ltd.	11	Sheet	... bought in
	3	Scrap and rejections	... 2/7 $\frac{1}{2}$
	51	Fine block	... bought in
Highlands Est.	10	Fine sheet	... 3/6 $\frac{1}{4}$
	29	Good to fine crepe	... 3/1 to 3/4 $\frac{1}{2}$
	9	Darkish to dark	... 3/3 $\frac{1}{4}$
	1	Block	... 2/8
	21	Fine sheet	... bought in
	20	Good to fine crepe	... 3/3 $\frac{1}{2}$ to 3/8
	25	Darkish to dark	... 2/8 $\frac{3}{4}$ to 3/2 $\frac{1}{2}$
K. P. Co. Ltd.	11	Fine sheet	... 3/5 $\frac{3}{4}$
	1	Crepe	... bought in
Metang	3	Good crepe	... 3/4 $\frac{1}{2}$
	9	Darkish to dark crepe	... pt. sold 2/11
	13	Fine sheet	... 3/5 $\frac{3}{4}$
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.

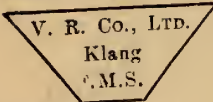

MARK.	PKGS.	DESCRIPTION.	PRICE.
Tjidjerook	7	Pressed sheet and block	... bought in
	1	Scrap	... bought in

CEYLON STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

April 24th 1908.

The following Lots comprising about 30½ Tons Straits and 12½ 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	... 33 at 37½ bid 3 Cases sold at 33
Shelford	8	Cases Crepe	... 27 at 32 bid
B. R. R. Co., Ltd.	37	„ Crepe	... 31 at 35 bid 10 Cases sold at 35
	41	„ Sheets	... 210 at 36 bid
F. (S). R. Co., Ltd.	17	„ Crepe	... 31 at 35 bid
Highland	13	„ Sheets	... 36½ bid
Estate	23	„ Crepe	... 31 at 35 bid
	27	„ Sheets	... 36¾
	68	„ Crepe	... 210¼ at 37¼
K. P. C.	9	„ Sheets	... 36 at 36¾
Beaumont	1	„ Scrap	... 25¼
	3	„ Crepe	... 26 at 34
K. P. Co., Ltd.	12	„ Sheets	... 36½
	5	„ Crepe	... 211 at 3
	8	„ Scrap	... 21 at 26
P. S. E.	5	„ Sheets	... 36½
	10	„ Crepe	... 211¼
S. P. R. B.	4	„ Sheets	... 32¼
& Co.	2	„ Scrap	... 110 at 24
S. R.	25	„ Sheets	... 36½ at 6½
S. S. R.	7	„ Scrap	... 22 at 24
S. P. R. B.	6	„ Sheets	... 37¼
& Co.	2	„ Scrap	... 24½
L. E.	81	„ Block No. 1	... bought in
			

MARK.		PKGS.	DESCRIPTION.		PRICE.
M.	B.		Cases	Block No. 2	
	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
<div style="border: 1px solid black; padding: 5px; display: inline-block; transform: rotate(-15deg); transform-origin: center;"> S. S. B. R. CO., LTD. </div>		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		22	Cases	Sheets	... 3/6½ at 3/7
S. P.		6	"	Scrap	... 2/5½ at 2/6
Bila		1	"	Crepe	... bought in
R. P.		16	"	Crepe	... 3/6¼ bid for 14 Cases.
X. X. XL.					... 2/3 at 3/6 bid
Sungei Krudda		7	"	Crepe	... 2/1½ bid
Kahagalla		4	"	Scrap	... 3/6 bid
Galatura		2	"	Biscuits	... 2/4 at 2/7¾
Kumbukkan		2	"	Scrap	... 3/6 bid
		3	"	Biscuits	... 3/6 bid
Yattewatte		1	"	Biscuit	... 3/3 at 3/7¾
Ellakaunde		9	"	Crepe	... 2/2¼ at 2/6
Heatherly		4	"	"	... 3/2 at 3/5½
Nikakotua		6	"	"	... 3/6 at 3/6½
Ingoya		5	"	Biscuits	... 1/8½ at 3/5¾
		14	"	Block	... 3/1
		3	"	Sheets	... 3/6½ at 3/6¾
Langsland		8	"	Biscuits	... 1/10¾
Glendon		2	"	Scrap	... 3/6¾
Palli		2	"	Biscuits	... 3/6¼
		9	"	"	... 3/7
Densworth		2	Pkgs.	Biscuits	... 3/4 at 3/5
		2	Cases	Scrap	1 sold ... 2/3
Imboolpittia		1	"	Sheets	... 3/6
New Peradeniya		1	Bag.	Scrap	... 2/4
		1	Case	Biscuits	... 3/5
		1	Bag.	Scrap	... 2/4½
Tallagalla		3	Cases	Biscuits	... 2/8 at 3/5½
Clara		1	"	Scrap	... 2/4
		1	"	Biscuits	... 2/6
Waharaka		2	"	Scrap	... 2/5 at 2/7
Gonakelle		2	"	Biscuits	... 3/6
		1	"	"	... 3/7
Ayr		1	"	Scrap	... 2/6
		1	"	Sheets	... 3/6¾
	S. L.	2	"	Biscuits	... 3/4¼
Sunnycroft		9	"	Scrap	1 sold ... 2/6, rem 2/4 bid
		1	"	Sheets	... 3/4

MARK.	PKGS.	DESCRIPTION.	PRICE.
D. G. H. & Co.	20	„ 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
Kunradola	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
Tadugalla	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.

6/1/77

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.

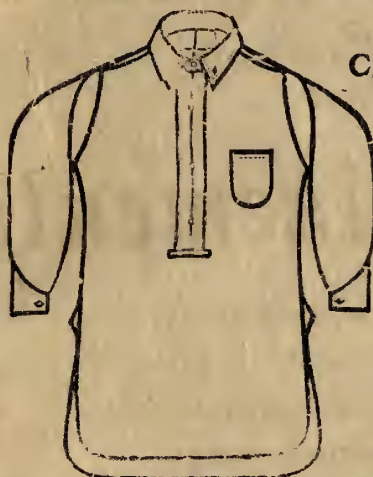
DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
				Means F°	Means F°	Means s						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

OF THE
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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 No. 32 Raffles Place, and 194 Orchard Road, Singapore.

SINGAPORE:
 PRINTED AT THE METHODIST PUBLISHING HOUSE.

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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 putting 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 preceding 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 in 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 across 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.

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Young trees should be shaded, by planting bananas between. One occasionally comes across 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 $16\frac{1}{2}'$ x $16\frac{1}{2}'$, 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 tomatoes. 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 latexiferous 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 be-thought 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 once 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 operations 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 in 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 sporangium 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 *Peronosporae*. 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 overshadowed 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 sansevieria 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 rhinoceros 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 saccharine juice of the sugar palm, *Arenga saccharifera*, 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 known 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 saccharine 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."

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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 $\frac{1}{2}$ to 2 inches long and from $\frac{1}{4}$ 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 $\frac{1}{4}$ 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 "Té 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 cholera; 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 Lumpur.*

Present. For the Perak P. A., Mr. C. L. Gibson. For the Kuala Lumpur 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 Lumpur 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.

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Batu Caves, May 13th, 1908

DEAR SIR,

At the last meeting of the Planters' Association of Malaya, in Kuala Lumpur, 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 Committee 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 Lumpur, 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 24th, 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 mouldy 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:—

	<i>Fresh seed.</i>	<i>Dried seed.</i>
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. 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 outset 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, caoutchouc 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 manufacturing 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 elastica* 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	27,439	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,

15th June, 1908.

J. R. O. ALDWORTH,

Commissioner of Trade and Customs.

AGRI-HORTICULTURAL SHOW OF 1908

The show this year will be held at Kuala Lumpur, 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 Lumpur, 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,*

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 *vin*o. 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 *caua*. 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 *caua* is consumed as a beverage almost entirely, but the bulk of all other spirits produced in the islands after rectification is used in the manufacture 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 coming 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 suppose 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 employed 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 Japonica* 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 "7" 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 $3\frac{1}{2}$ 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.	Average square inches excised.	Pounds per tree per annum.	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 134	lbs. 134	287.4	1.64	1407	0.011	159	7,834	1 —inch. 15	
30	21½ inch.	Half herring bone.	Every alternate day for 12 months.	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 Lumpur, 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 5th 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 $4/3\frac{1}{2}$ per lb., and the highest price for Crepe, viz., $4/0\frac{3}{4}$ 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 ADVER- TISED.	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	1230	10 $\frac{3}{4}$	52 $\frac{1}{2}$	63 $\frac{1}{2}$	754	3/8 $\frac{1}{2}$	3/9	3/11 to 4/3 $\frac{1}{2}$	2/6 to 3/-
Corresponding) Sale Last Year)	357	5	13	18	158	5/4 $\frac{1}{2}$	4/9 $\frac{1}{2}$	5/6 to 5/8 $\frac{1}{4}$	3/9 to 4/5 $\frac{1}{2}$

TO-DAY'S QUOTATIONS.

SHEET AND BISCUITS.		CREPE AND BLOCK.		UNWASHED SCRAP.	
Good to Fine Sheet.	3/11½ to 4/0¼	Fine Pale ...	3/10 to 4/0¼		
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 4/3¼	Dark and Medium. Fine Block	2/4 to 3/7 4/1	Low and Medium.	2/1 to 2/6

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	43½
1906	27
1905	53½

MALAYA.—1st January to 17th March.

	Singapore.	Penang	Totals.
	Tons.	Tons.	Tons.
1908	215½	89½	305½
1907	93½	6½	100

PARTICULARS AND PRICES OF TO-DAY'S SALE.

CEYLON.

MARK.	PKGS.	DESCRIPTION.	PRICE.
Culloden	5	Very fine thick crepe	... 3/10½
Glanrhos	3	Biscuits	... 3/11½
T.	11	Scrap & rejections	... pt. sold 2/5½
	25	Sheet & biscuits	... 3/10 to 3/11½
Rangalla	1	Fine biscuits	... 4/1¼
	1	Rejections	... 2/6
Halwatura	19	Fine palish worm	... bought in

MARK.	PKGS.	DESCRIPTION.	PRICE.
Delwita	3	Dark worm	... 3/7½
Kahagalla	3	Good to fine crepe	... bought in
	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	... 2/11½
	2	Scrap	... 2/11½
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	... 3/10¼
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	... bought in
G. D. J.	13	Dark crepe	... bought in

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., Ltd.	8	Good to fine thick crepe	... 3/8 to 3/9
Klang	5	Good to fine crepe	... 3/7½ to 3/11½
F. M. S.	44	Mottled to dark crepe	... 2/11½ 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., Ltd.	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	... 3/11 $\frac{3}{4}$
	1	Rejections	... 2/9 $\frac{1}{2}$
V. S.	1	Biscuits	... bought in
Linggi Plants.	18	Dark pressed crepe	... pt. sold 2/8
	2	Pale block	... 3/4
Bila	10	Sheet	... 4/0 $\frac{1}{4}$
	3	Dark pressed crepe	... pt. sold 3/4
	1	Rejections	... 2/9 $\frac{1}{2}$
Sungei Krudda	18	Sheet	... 3/11 $\frac{1}{2}$
C. M. R. E. Ltd.	7	Fine pale crepe	... 4/0 $\frac{3}{4}$
	28	Good mottled & dark crepe	pt. sold 3/7 to 3/9
Damansara	8	Fine sheet	... 4/-
	12	Fine pressed crepe	... 3/8 $\frac{1}{4}$
	11	Dark	... 2/10 $\frac{1}{2}$ to 3/4 $\frac{1}{4}$
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 3/8 $\frac{1}{4}$
B. R. R. Co., Ltd.	46	Fine sheet	... 3/11 $\frac{1}{2}$ to 3/11 $\frac{3}{4}$
	43	Good to dark crepe	... 3/0 $\frac{1}{4}$ to 3/8 $\frac{1}{2}$
	1	Block	... bought in
S. K. R. Co., Ltd.	45	Palish crepe	... 3/10 $\frac{1}{2}$ to 3/11 $\frac{1}{4}$
	17	Brownish crepe	... 3/2 $\frac{1}{2}$ to 3/7 $\frac{1}{4}$
E. K. K. P.	3	Sheet	... 3/11 $\frac{3}{4}$
	2	Sheet and rejections	... 2/6 $\frac{3}{4}$
B. M. & Co., Ltd.	5	Sheet	... 3/11 $\frac{1}{2}$
	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 3/11 $\frac{1}{2}$
Tingi	32	Dark crepe	... pt. sold 3/4
B. & D.	1	Fine sheet	... 3/11 $\frac{1}{2}$
S. & D.	15	" "	... 3/11 $\frac{1}{2}$ to 3/11 $\frac{3}{4}$
	5	Scrap	... 2/10 $\frac{1}{2}$ to 2/11 $\frac{1}{2}$
R. A. G.	3	Scrap & rejection	... 2/1 to 2/10 $\frac{1}{2}$
Matang	12	Fine sheet	... 3/11 $\frac{1}{2}$
	13	Good & medium crepe	... 3/2 to 3/7
	1	Palish crepe	... 3/8 $\frac{1}{2}$
L. E. D.	3	Sheet	... 3/11 $\frac{1}{2}$
	2	Good scrap	... 2/10 $\frac{1}{4}$
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 3/11 $\frac{1}{2}$
S. S. B. R. Co., Ltd.	25	Darkish to dark crepe	... bought in
	10	Fine sheet	... 3/11 $\frac{1}{2}$
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 3/7 $\frac{1}{4}$
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

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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 ADVER- TISED.	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	751	10½	26½	37	381	3/8¾	3/10½	4/1 to 4/4½	2/5 to 3/-
Corresponding Sale Last Year)	709	7½	28	35½	265	5/2½	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.	4/2½ to 4/2½	Fine Pale ...	4/2½ to 4/4½	Good to Fine	2/9 to 3/-
Good to Fine Biscuits.	4/1 to 4/3	Fine Palish ... Dark and Medium. Dark Block...	3/8½ to 4/- 3/4 to 3/7 2/11 to 30¼	Low and Medium.	2/5 to 2/8½

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.			
1908 ...	...	...	93 tons	Singapore. Penang. Total.			
1907 ...	...	...	65½ tons	1908 ...	239 tons	110 tons	349 tons
1906 ...	...	...	38½ tons	1907 ...	160 tons	14 tons	174 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	... 2/8½
Craighead	1	"	... bought in
Yattewatte	1	Dark rejected bisenit	... 2/11
Gikiyanakande	6	Good crepe	... 3/7½ to 38½
	1	Dark	... bought in
C. L.	1	Worm	... bought in
	1	Dark pressed worm	... 3/8½
Taldna	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	... 4/2 $\frac{1}{4}$
	4	Scrap	... 2/3 to 2/6 $\frac{3}{4}$
M. A. K.	1	Rejected biscuits	... 2/7
	5	Black crepe	... bought in
D. G. H. & Co.	5	Biscuits	... 3/6 to 4/0 $\frac{3}{4}$
	2	Block	... bought in
	3	Scrap and rejections	... 2/5 $\frac{1}{2}$ to 3/0 $\frac{1}{4}$
	2	Rambong	... bought in
	4	Crepe	... 3/1 to 3/5 $\frac{3}{4}$
	3	Dark crepe	... bought in
J. C. & Co.	3	Biscuits	... 4/1 to 4/1 $\frac{3}{4}$
	2	Dark crepe	... bought in
	3	Fine to dark scrap	... 2/- to 2/10 $\frac{1}{2}$
J. C. & Co.	3	Good to black crepe	... bought in
C. P. H. & Co.	5	Sheet, and biscuits	pt. sold ... 4/1 to 4/1 $\frac{1}{2}$
	6	Crepe	... 2/8 to 2/11 $\frac{1}{2}$
	9	Scrap	... 4/2 $\frac{1}{2}$
Ambatenne	1	Biscuits	... 2/11 $\frac{3}{4}$
	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 ... 3/9 $\frac{1}{2}$ to 4/2 $\frac{1}{2}$
	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	... 4/2 $\frac{1}{4}$
	10	Good crepe	pt. sold ... 3/10 $\frac{3}{4}$
	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 3/10 $\frac{3}{4}$
F. M. S.	17	Dark crepe	... 3/4 to 3/5 $\frac{1}{2}$
	51	Block	... bought in
S. R. & Co.	25	Dark crepe	... bought in
	1	Block	... 2/11
P. S. E.	14	Fine sheet	... 4/2 $\frac{1}{2}$
S.	10	Sheet	... 4/2 $\frac{1}{4}$
	1	" (rejected)	... bought in
	5	Fine to dark scrap	... 2/5 to 2/11
Linggi Plants.	11	Fine crepe	... 4/3 $\frac{1}{4}$
	37	Good to dark crepe	pt. sold ... 3/6 to 3/8 $\frac{1}{2}$
	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	... 2/9 $\frac{1}{2}$ to 3/0 $\frac{1}{4}$

MARK.	PKGS.	DESCRIPTION.	PRICE.
	5	Dark Crepe	pt. iald ... 2/9
	3	Fine to dark Rambong (pressed)...	bought in
J. C.			
B. B.			
B. P.	2	Block	... 2/9
Perhentian Tinggi	8	Good to fine crepe	... 4/2 to 4/2 $\frac{3}{4}$
	18	Dark crepe	... 2/10 to 3/5 $\frac{1}{2}$
S. K. R. Co., Ltd.	1	Fine crepe	... 4/2 $\frac{1}{4}$
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 4/2 $\frac{3}{4}$
	2	Scrap	... 2/5 $\frac{1}{2}$ to 2/6 $\frac{1}{2}$
	1	Crepe	... 3 ^p
R.	2	Darkish crepe	... 3/8 to 3/9 $\frac{1}{2}$
M. P.	4	Good to fine crepe	... 4/- to 4/1 $\frac{1}{2}$
Ltd.			
D. R. E.	21	Fine to dark Rambong	... 2/9 to 2/10 $\frac{1}{4}$
B. C.	1	Crepe	... bought in
	1	Rejection	... bought in
B. M. & Co., Ltd.	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 52 $\frac{1}{2}$ Tons Straits and 9 $\frac{1}{2}$ Tons Ceylon, were offered at Auctions to-day and sold as follows:—

STRAITS AND MALAY STATES.

MARK.	PKGS.	DESCRIPTION.	PRICE.
Highland Estate	16	Cases Sheets	... bought in
	19	„ Crepe	... 3/5 $\frac{1}{2}$ at 3/9
V. R. Co., Ltd.			
Kalang F.M.S.	57	„ Crepe	... 2/11 $\frac{3}{4}$ at 3/11 $\frac{1}{4}$
K.	15	„ Sheets	... 3/9 at 4/0 $\frac{1}{4}$
	8	„ Crepe	... 3/7 $\frac{1}{4}$ at 7 $\frac{1}{2}$
J.	1	„ Sheets	... 3/9
S. R. Co.	61	„ Crepe	... bought in
	52	„ Sheets	19 sold ... 3/11 $\frac{1}{2}$
P. S. E.	12	„ Sheets	... 3/11 $\frac{1}{2}$
	4	Bales Scrap	... 3/2
S.	2	Cases Sheets	... 4/-
R.	R.	3	„ Scrap ... 2/3
O. G. S.	3	„ Sheets	... 3/11 $\frac{3}{4}$
Linggi Plants Ltd.			
	20	„ Crepe	part sold .. 2/8 at 3/7 $\frac{3}{4}$
R.	10	„ Sheets	... 3/8 at 4/0 $\frac{1}{4}$
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	... 3/0½ 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. Ltd.	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.			
E. B.	15	" Block No. 2	... bought in
L.			
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 3/11 $\frac{3}{4}$
	3	„ Scrap 1 sold ...	2/10 $\frac{1}{4}$
Rangalla	1	„ Biscuits ...	4/1 $\frac{1}{2}$
Halwatura	10	„ Worms ...	bought in
Delwila	3	„ Worms ...	3/7 $\frac{1}{2}$
Kahagalla	4	„ Crepe ...	bought in
Edengoda	1	„ Crepe ...	„
Dangan	3	„ Biscuits ...	3/11 $\frac{1}{2}$
Merton	3	„ Sheets ...	3/11 $\frac{1}{2}$
M. A. K.	5	„ Crepe ...	bought in
D. G. H. & Co.	6	„ Biscuits ...	3/11 $\frac{1}{2}$
	24	„ Crepe ...	bought in
	3	„ Scrap ...	„
Warriapolla	5	„ Biscuits ...	3/10 at 4/3 $\frac{1}{2}$
	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 3/0 $\frac{1}{2}$
	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 Preat)

CEYLON, STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

May 22nd, 1908.

The following Lots, comprising about 27 $\frac{1}{2}$ 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.	4	„ Sheets	... 4/2/
C.			
S. P.	4	„ Crepe	... 2/9 at 3/4
	2	„ Block	... 2/9/ at 2/11 $\frac{1}{2}$
	1	„ Rambong	... bought in
C. M. R. E. Ltd.	66	„ Crepe	... 3/9/ at 4/2 $\frac{1}{2}$

MARK.	PKGS.	DESCRIPTION.	PRICE.
Shelford	8	Cases Crepe	part sold ... bought in
S R. Co. Ltd.	15	„ Sheets	... 4/2 $\frac{1}{4}$
S. R. Co.	54	„ Crepe	... 3/9 at 3/10 $\frac{3}{4}$
V. R. Co. Klang	37	„ „	... 3/4 at 3/11
F. M. S.	44	„ Block	... bought in
S. R. & Co.	25	„ Crepe	... 3/5 $\frac{1}{4}$ bid
P. S. E.	31	„ Sheets	14 sold ... 4/2 $\frac{1}{2}$
K. P. Co., Ltd.	7	„ Block	... bought in
B. R. R. Co. Ltd.	13	„ Crepe	... 3/6 $\frac{3}{4}$ at 3/7 $\frac{3}{4}$
Linggi Plants	33	„ „	... 3/6 at 4/3 $\frac{1}{4}$
Linggi Plants Ltd.	15	„ „	... bought in
Perhentian	8	„ Sheets	... 2/10 at 4/2 $\frac{3}{4}$
Tinggi Estate	20	Pkgs. Crepe	... 2/10 at 3/5 $\frac{1}{2}$
B. & D.	13	Cases Crepe	... 2/7 at 4/-
	3	„ Sheets	... 3/10 at 4/2 $\frac{1}{2}$
	3	Pkgs. Scrap	... 2/5 $\frac{1}{2}$
M. R. P.	6	Cases Crepe	... 3/9 at 4/1 $\frac{1}{2}$
Taldna Ltd.	7	„ Biscuits	... 4/- at 4/2
	5	„ Worms	... 3/9 at 4/-
	2	„ Scrap	... bought in
Yattewatte	1	„ Biscuits	... „
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	... 3/7 $\frac{3}{4}$ at 3/8 $\frac{1}{2}$
C. L.	2	„ Worms	... 3/4 at 3/8 $\frac{1}{2}$
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	... 4/2 $\frac{1}{4}$ at 4/2 $\frac{3}{4}$
	13	„ Biscuits	... 4/1 $\frac{1}{4}$ at 4/2 $\frac{3}{4}$
	79	„ Crepe	part sold ... 2/6 at 3/8 $\frac{1}{4}$
	5	„ Scrap	... 2/6 at 2/7 $\frac{3}{4}$
Taldna	7	„ Biscuits	... 4/2
	5	„ Worms	... 3/9 at 4/-
	2	„ Scrap	... 2/9 at 2/11
Ayr	2	„ Biscuits	... 4/2 $\frac{1}{4}$
	1	„ Sheet	... 4/2 $\frac{1}{4}$
M. A. K.	4	„ Scrap	... 2/3 at 2/6 $\frac{3}{4}$
	6	Pkgs Biscuits	... 3/- at 4/1
D. G. H. Co.	9	„ Crepe	... 3/0 $\frac{1}{4}$ at 3/5 $\frac{3}{4}$
	1	Case Scrap	... 2/5 $\frac{1}{2}$
J. C. & Co. Ltd.	5	„ Crepe	... bought in
	3	„ Biscuits	... 4/1 at 4/1 $\frac{3}{4}$
	2	„ Scrap	... 2/10 $\frac{1}{2}$
C. P. H. Co.	3	„ Sheets	... 4/1 $\frac{1}{2}$
	1	„ Biscuits	... 4/1
	7	„ Crepe	... bought in
	9	„ Scrap	... 2/8 at 2/9 $\frac{1}{2}$
Ambatenne	1	„ Biscuits	... 4/2 $\frac{1}{2}$
	2	„ Scrap	... 1/6 at 2/11 $\frac{3}{4}$
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 320 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.

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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.				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. Lumpur	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 Lumpur, 26th May, 1908.

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

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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. Lumpur	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 Lumpur, 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 Lumpur, 20th June, 1908.

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

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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.

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. 8.]

AUGUST, 1908.

[VOL. VII.

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 execution.

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 ascertain 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 is 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, acuminate 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 confrères 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.

Bougainvillea glabra. Belongs to a genus of plants popular by reason of their brilliant bracts which envelop the flowers. This species has panicle inflorescences producing cordate-ovate acute rosy bracts arranged in threes. The leaves are bright green and smooth.

Bougainvillea glabra var sandariana. Is a very floriferous variety of dwarfer habit.

Bougainvillea 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 acuminate.

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 axillary 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.

Fagraea 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 malvifolius. 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 acuminate 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.

Lagerstroemia 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.

Mussaenda 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 Oleander 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 elongated 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 roseo. 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 *Bougainvilleas*. 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 axillary 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 year's shoots. The leaves are cordate-ovate, acuminate, entire and downy. The old wood should be occasionally pruned.

Clerodendron splendens. Is a 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 pendulous 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 jasminoides* 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 existence may be referred to *Croton pictum* correctly *Codiaeum 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 recurved, 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 nevilleæ. 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, $\frac{1}{2}$ 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 $1\frac{1}{2}$ 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 $1\frac{1}{2}$ 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. *Victorie* 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 *Victorie*, 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 vermilion 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 pinnæ 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 acuminate 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 trifoliolate, 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 Erythrinæ. 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 mimosifolia. 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 bearing 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 Brownias. The flowers are arranged in bushy heads and are a very rich orange colour with much exerted 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 reginae. "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 acuminate 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.

Petrocarpus 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 too 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 Botanic 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 our trees and shrubs.

GERMINATION OF PARA-RUBBER SEED.

The subject of the germination of the seeds of the Para rubber is studied by Mr. Vernet in "Le Contehou 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 preservative. 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 distribution 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 as 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 *Erythroxylon coea*. 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 purchase 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 Palearctic 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 seem to me to 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 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 coconuts 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 thoroughly, 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 transversely, 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 $\frac{1}{2}$ 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 to them. Seaweed, too, makes an excellent 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
	<hr/>
	£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
	<hr/>
	£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
	<hr/>
	£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
	<hr/>
	£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
	£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 Department'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 Pará Rubber (*Hevea Braziliensis*). 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 Para 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 3½ 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

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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 Lumpur 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 Lumpur, 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 Lumpur.

I have the honour to be,

Sir,

Your obedient Servant,

J. W. CAMPBELL.

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 sepd hard 65/- to 75/-. Unsorted to half sepd 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 $3\frac{1}{2}$ d to $3\frac{1}{4}$ d.

For arrival July/September shipment, buyers at 3d and sellers at $3\frac{1}{16}$ d. 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 $1\frac{7}{8}$ d, June/August shipment at $1\frac{3}{4}$ d. October/December at $1\frac{11}{16}$ d c.i.f.

Pearl Tapioca:—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 $2\frac{3}{4}$ d. Singapore 2d. $2\frac{5}{8}$ d. Java common to fine 1d. to $2\frac{1}{8}$ d.

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	Highest	Lowest
	sold.	price.	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 Jeloton $\frac{3}{4}$ ... ..	...	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	19.12 $\frac{1}{2}$
Pearl Sago, Small	147	4.05	3.90 fair.
Medium ... ..	...	...	...
Large ... ..	...	...	...
Sago Flour, No. 1	2,346	3.02 $\frac{1}{2}$	2.92 $\frac{1}{2}$
No. 2	210	1.07 $\frac{1}{2}$	1.05
Tapioca Flake, Small	536	7.12 $\frac{1}{2}$	6.95 fair.
Medium	37	...	...
Pearl, Small	350	5.65	5.60 fair.
Medium	438	6.85	5.52 $\frac{1}{2}$,,
Bullet	20	8.25	8.12 $\frac{1}{2}$
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	19.37 $\frac{1}{2}$	17.80
Pearl Sago, Small ...	154	3.90	3.75
Medium ...	...	...	...
Large ...	...	...	...
Sago Flour, No. 1 ...	3,002	3.10	2.87 $\frac{1}{2}$
No. 2 ...	345	1.05	1.05
Tapioca Flake, Small ...	634	6.90	5.77 $\frac{1}{2}$ 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	7.37 $\frac{1}{2}$
Tin ...	2,630	65.50	63.12 $\frac{1}{2}$

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
do. 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	...	...
do.	"	do. Glasgow	100	130
do.	"	do. London	225	...
do.	"	do. Liverpool	25	25
do.	"	do. U.K. & or Continent	10	10
Cube Gambier	"	do. United Kingdom	50	10
Black Pepper	"	do. do.	60	150
do.	"	Penang do.	40	15
White Pepper	"	Singapore do.	10	...
do.	"	Penang do.	100	35
Pearl Sago	"	Singapore do.	375	250
Sago Flour	"	do. London	1,700	...
do.	"	do. Liverpool	50	50
do.	"	do. Glasgow	230	45
Tapioca Flake	"	do. United Kingdom	260	60
T. Pearl & Bullet	"	do. do.	160	100
Tapioca Flour	"	Penang do.	45	...
Gutta Percha	"	Singapore do.	100	...
Buffalo Hides	"	do. do.	55,000	18,250
Pineapples	"	do. do.	175	875
Gambier	"	do. U. S. A.	30	70
Cube Gambier	"	do. do.	250	100
Black Pepper	"	do. do.	150	50
do.	"	Penang do.	35	60
White Pepper	"	Singapore do.	10	...
do.	"	Penang do.	55	175
Tapioca Pearl	"	Singapore do.	36	39
Nutmegs	"	S'pore., Penang do.	50	170
Sago Flour	"	Singapore do.	9,750	19,750
Pineapples	"	do. do.	2,000	4,500
do.	"	do. Continent	50	25
Gambier	"	do. South Continent	75	...
do.	"	do. North Continent	55	30
Cube Gambier	"	do. Continent	375	120
Black Pepper	"	do. South Continent	180	140
do.	"	do. North do.		

			Tons.	
Black Pepper	Str. Penang	South Continent	30	10
do.	do.	North do.	...	10
White Pepper	do. Singapore	South do.	30	15
do.	do.	North do.	10	160
do.	do. Penang	South do.	20	...
do.	do.	North do.	5	20
Copra	do. 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	do. Singapore	Continent	825	110
Tapioca Flake	do.	do.	100	240
do. Pearl	do.	do.	35	25
do. Flake	do.	U. S. A.	...	...
do. 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	do. Penang	do.	10	240
Copra	do. 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.	do. Penang	do.	...	...
White Pepper	do.	do.	...	...
T. Flake & Pearl	do.	do.	...	...
Nutmegs	do.	do.	...	...
Tons Gambier			850	1,500
do. 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 ADVER- TISED.	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	1157	9½	54	63½	593	3/8½	3/9	4/- to 4/6	2/9½ to 3/0½
Corresponding Sale Last Year)	748	4½	35¼	39¾	192	4/10½	4/7	5/- to 5/8	3/10

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 Me- dium.	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.				MALAYA.—1st JANUARY TO 30th APRIL.		
				Singapore.	Penang.	Total.
1908 ...	...	...	106½ tons			
1907 ...	...	...	74 tons			
1906 ...	...	...	43 tons	1908 ...	291½ tons ...	155 tons ...
1905 ...	...	...	17½ tons	1907 ...	184½ tons ...	21 tons ...
						446½ tons
						205½ tons

6/214

PARTICULARS AND PRICES OF TO-DAY'S SALE.

CEYLON.

MARK.	PKGS.	DESCRIPTION.	PRICE.
Rosebury	2	Biscuits	... 4/0 $\frac{1}{2}$
Palli	4	„	... 4/-
Taldna	1	Worm	... 3/8 $\frac{1}{2}$
Waharaka	1	Biscuits	... 4/-
	1	Scrap	... 3/0 $\frac{1}{2}$
Rangbolde	2	Very fine pale biscuits	... 4/5
Warriapolla	4	Very fine pale biscuits	... 4/6
Warriapolla	2	Scrap	... 2/7 to 3/11 $\frac{1}{2}$
	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	... 3/8 $\frac{1}{2}$
	9	Scrap and rejections	... 2/10 to 3/0 $\frac{1}{2}$
Ayr	2	Biscuits and sheet	... 4-
	1	Scrap	... 2/9 $\frac{1}{2}$
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 ... 3/0 $\frac{1}{4}$
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 4/2 $\frac{1}{2}$
	2	Darkish	... 3/1 to 3/2 $\frac{1}{2}$
Heatherley	4	Darkish to dark crepe	... 3/2 $\frac{1}{2}$ to 3/5 $\frac{1}{4}$
Hattangalla	2	Biscuits	... 3/11 $\frac{3}{4}$
	3	Good to dark crepe	... 3/2 $\frac{3}{4}$
O. B. E. C.	1	Lace	... 2/8 $\frac{1}{4}$
Nikakotna	3	Good to very fine pale crepe	... 4/1 $\frac{1}{4}$ to 4/2 $\frac{1}{2}$
	3	Darkish to dark crepe	pt. sold ... 3/4
Arapolakande	7	Biscuits	... 4/- to 4/0 $\frac{1}{2}$
	3	Crepe	... 3/3 $\frac{1}{2}$ to 3/4 $\frac{1}{2}$
Glencorse	2	Biscuits	... 3/11 $\frac{1}{2}$ to 4/0 $\frac{1}{2}$
	2	Scrap	... 2/10 to 3/0 $\frac{1}{2}$
Dangan	3	Biscuits	... bought in
	1	Scrap	... bought in
Kumbukkan	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 Straits	65	Fine block	... bought in
M. B. E. Straits.	8	Darkish crepe	... 3/1 to 3/5
R.	4	Fine pale crepe	... 4/1 $\frac{1}{4}$
M. P. Ltd.	8	Good and brown crepe	... 3/3 $\frac{1}{4}$ to 3/11 $\frac{1}{2}$

MARK.	PKGS.	DESCRIPTION.	PRICE.
D. R. E.	16	Good to dark Rambongerepe, 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.	3	Sheet	... 4/1
P.			
B. C.	1	Sheet	... bought in
	1	Rambong	... bought in
S. P.	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.	1	Crepe	... bought in
Klang	21	Fine sheet	... 4/-
F. M. S.	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.
Jehong	53	Very fine pale crepe	... bought in
	4	Mottled	... bought in
	22	Darkish to dark crepe	... bought in
Goleonda	1	Fine crepe	... bought in
	12	Fine sheet	... 4/-
	1	Good crepe	... 3/4
	2	Dark crepe	... bought in
S. S. B. R. Co., Ltd.	20	Good sheet	... 4/0½
	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 ADVER- TISED.	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	1070	4½	50¾	55½	448	3/8	3/10½	4/- to 4 4¾	2/3 to 3/-
Corresponding } Sale Last year }	602	4¼	32	36¼	283	4/11¾	4/7¾	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.		Fine Pale ...	4/- to 4 3/4	Good to Fine	2/7 to 3/-
Good to fine Biscuits.	4/4 2/3	Medium and Palish.	3/5 to 3/11	Low and Medium.	2/2 to 2/3
Good to fine Sheet.	4/1 to 4/2 1/4	Dark	2/5 to 3/4		
	4/1 1/2 to 4/2 1/4				

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	111 3/4 tons	1908 .. 348 tons	172 tons	520 tons
1907	77 1/2 tons	1907 ... 215 tons	23 tons	238 tons
1906	18 1/4 tons			

PARTICULARS AND PRICES OF TO-DAY'S SALE.

CEYLON.

MARK.	PKGS.	DESCRIPTION.	PRICE.
Densworth	3	Biscuits	... 4/1 to 4/1 1/2
Vicartons	1	Biscuits	... 4/1 1/2
	1	Scrap	... 2/2
C. R.	14	Scrap (heated)	... bought in
Hilton	1	Biscuits	... 4/1 3/4
Ambatenne	5	"	... 4/2 to 4/2 1/4
	1	Fine scrap	... 2/11 3/4
J. C. & Co., Ltd.	5	Dark crepe	... bought in
D. B.	1	Block	... bought in
A.	7	Black crepe	pt. sold ... 2/4 to 2/7 1/2
Sunnyeroff	1	Dark sheet	... 4/0 1/4
Glanrhos	7	Good to fine biscuits	... 4/2 to 4/2 1/4
Clontarf	3	Good to fine biscuits	... 4/2
Verulapitiya	1	Sheet	... 4/1 1/2
Ambaganga	3	Pressed sheet	... bought in
	1	Block "	... bought in
Gikiyanakande	6	Good crepe	pt. sold ... 3/4 to 3/4 1/4
	5	Dark "	pt. sold ... 2/6
	9	Fine pale worm	pt. sold ... 4/4 3/4
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 ... 3/2½ 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
	13	Fine crepe	... 4/0½ to 4/3¼
	5	Darker crepe	... 2/8¼ to 3/9¼
R.			
M. P.			
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
	2	Scrap	... bought in
S. Y. D.	4	Scrap and rejections	... 1/- to 2/9½
Mc. I.	3	Dull biscuits	... 3/10½
Q. W.	3	Scrap, etc.	... 2/7 to 3/-

MARK.	PKGS.	DESCRIPTION.	PRICE.
S. P.	2	Scrap	... bought in
Bila	19	Sheet	... 3/11 to 4/2 $\frac{1}{4}$
	3	Rejected sheet	... bought in
	30	Scrap	... 2/11 $\frac{1}{2}$ to 2/11 $\frac{3}{4}$
Sungei Krudda	13	Darkish to dark crepe	pt. sold ... 3/2 to 3/5 $\frac{1}{2}$
	10	Rough sheet	... bought in
Glenmaric	1	Crepe	... bought in
	7	Sheet	... 4/1 to 4/2
	1	Crepe	... 3/4 $\frac{1}{4}$
	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.	11	Sheet	... bought in
S.			
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 8 $\frac{1}{2}$ 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.	65	Cases No. 1 Block	... bought in
M.	B.		
	E.	8 " Crepe	... 3/1 at 3/5
	R.		
M.	P.	12 " Crepe	... 3/3 $\frac{1}{4}$ at 4/1 $\frac{1}{4}$
	Ltd.		
Damansara	11	" Sheets	... 4/-
	31	" Crepe	... bought in
S. K. R. Co. Ltd.	57	" Crepe	... 3/0 $\frac{1}{4}$ at 4/-
	B. & D.		
	F. D.	14 " Sheets	3/11 $\frac{1}{2}$ at 4/1 $\frac{1}{2}$
	P.	13 Pkgs. Crepe	... 3/2 at 4/0 $\frac{1}{4}$
	B. & D.	5 " Crepe	... 3/6 at 3/10 $\frac{3}{4}$
		5 " Sheets	... 3/4 $\frac{1}{2}$ at 3/11 $\frac{1}{4}$
	E.		
	K. K.	3 Cases Sheets	4/1
	P.		
E. L. & Co. Ltd.	9	" Sheets	... 4/0 $\frac{1}{2}$
	7	" Crepe	... 3/2 at 3/3 $\frac{3}{4}$
	1	" Rambong Scrap	... bought in
Matang	27	" Sheets	... 4/0 $\frac{1}{2}$
Matang	8	" Crepe	... 3/2 at 3/5 $\frac{1}{2}$
C. M. R. E. Ltd.	13	" Crepe	10 sold ... 3/11 at 4/1
Yam Seng	13	" Sheets	... 4/0 $\frac{1}{2}$
	2	" Scrap	... 3/0 $\frac{1}{4}$

MARK.	PKGS.	DESCRIPTION.	PRICE.
Shelford	5	Cases Sheest	... 3/10
	7	" Crepe	... bought in
Pasir Oetjing	9	" Sheets	... "
R.	5	" Sheets	... 4/0 $\frac{1}{4}$
S. P.	26	" Scrap	... 3/0 $\frac{1}{2}$ at 3/0 $\frac{3}{4}$
Linggi	64	" Crepe	... 3/8 at 3/11 $\frac{1}{4}$
	5	" Scrap	... bought in
Sungei Krudda	14	" Sheets	... 3/10 $\frac{3}{4}$
V. R. Co., Ltd.			
Kalang	17	" Sheets	... 4/-
F. M. S.	63	" Crepe	... 3/- at 3/10 $\frac{3}{4}$
K. P. C. Ltd.	12	" Sheets	... 3/11 $\frac{1}{2}$
	5	" Crepe	... 3/3 $\frac{1}{2}$
S. B.			
P R. & Co. Ltd.	5	" Sheets	... 4/0 $\frac{1}{2}$
	2	" Scrap	... 3/0 $\frac{1}{2}$
K.	6	" Sheets	... 4/0 $\frac{3}{4}$ at 4/1 $\frac{1}{2}$
	6	" Crepe	... 3/2 at 3/4 $\frac{1}{4}$
P. S. E.	11	" Sheets	... 3/10 $\frac{1}{2}$ at 4/-
	6	Bales Crepe	... 3/2 $\frac{1}{4}$ at 3/5
S. R. & Co., Ltd.	17	Cases Crepe	... 3/2 $\frac{1}{2}$ at 3/7 $\frac{1}{2}$
B. R. R. Co. Ltd.	47	" Sheets	... bought in
	45	" Crepe	... "
F. (S.) R. Co., Ltd.	11	" Sheets	... "
	12	" Crepe	... 3 sold ... 3/5 $\frac{1}{2}$
Highland Estate	31	" Sheets	... 4/- at 4/0 $\frac{1}{4}$
	57	" Crepe	... part sold ... 3/4 $\frac{1}{2}$ at 3/7 $\frac{1}{2}$
R. A. B.			
Jebong	80	" Crepe	... bought in
Golconda	12	" Sheets	... 4/-
	3	" Crepe	... 1 sold ... 3/4 $\frac{1}{4}$
S. S. B. R. Co., Ltd.	20	" Sheets	... 4/0 $\frac{1}{2}$
	6	" Crepe	... bought in
Q.			
A. X. E.	5	" Crepe	... "
L. A. B. U.			
M.	18	" Crepe	... "
F. S.			

CEYLON.

Rosebury	2	Cases Biscuits	... 4/0 $\frac{1}{2}$
No. 1			
Palli	4	" "	... 4/-
Waharaka	1	" "	... 4/-
Warriapolla	4	" "	... 4/6
	3	Pkgs. Scrap	... 2/7 at 2/11 $\frac{1}{2}$
Yatipauwa	4	Cases Crepe	... 3/- at 4/-
Doranakande	7	" Biscuits	... 3/8 $\frac{1}{2}$ at 4/-
	6	" Scrap	... 2/9 $\frac{1}{2}$ at 3/0 $\frac{1}{2}$
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	... 3/0 $\frac{1}{2}$
Sorana	6	" Biscuits	... 4/-
T.			
F. W.	4	" Crepe	... bought in
Culloden	27	" "	... 7 sold ... 3/3
Ellakande	13	" "	... 3/1 at 4/2 $\frac{1}{2}$

MARK	PKGS.	DESCRIPTION.	PRICE.
Hattangalla	2	Cases Biscuits	... 3/11 $\frac{3}{4}$
	3	" Crepe	... 3/2 $\frac{3}{4}$
Heatherly	4	" "	... 3/2 $\frac{1}{2}$ at 3/5 $\frac{1}{4}$
Nikakotua	6	" "	... 3/3 at 4/2 $\frac{1}{2}$
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 7 $\frac{1}{2}$ at 4 3
Damansara	8	" Sheets	... bought in
	25	" Crepe	... "
P. S. E.	1	" Sheets	... 4/1 $\frac{1}{2}$
Selaba			
S. R. Co.	12	" Crepe	... bought in
Highland Estate	40	" Sheets	... "
	29	" Crepe	part sold ... 3 2 $\frac{1}{2}$ at 3 6 $\frac{1}{2}$
	2	" Scrap	1 sold ... 2/11 $\frac{3}{4}$
S. R. Co., Ltd.	14	" Sheets	... 4/2
	76	" Crepe	part sold ... 3 6 $\frac{1}{4}$ at 4 0 $\frac{1}{4}$
V. R. Co. Ltd., Kalang			
F. M. S.	60	" "	... 3 3 $\frac{1}{2}$ at 3 11 $\frac{3}{4}$
K. P. Co. Ltd.	19	" "	... bought in
K.	11	" Sheets	... 4/2
	11	" Crepe	... 3 0 $\frac{1}{2}$ at 3/10
P. S. E.	7	" Sheets	... 4/2
K. M.	1	" "	... 4 1 $\frac{1}{2}$
S.	6	" Scrap	... bought in
	2	" 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 1 $\frac{1}{2}$
	23	" Crepe	3 sold ... 3 5 $\frac{3}{4}$
F. (S) R. Co., Ltd.	8	" "	... bought in
L.			
M. U. A. R.	200	" Block	... "
M.			
B.			
E.	12	" Crepe	... 3 5 $\frac{3}{4}$
A.			
S.			

MARK.	PKGS.	DESCRIPTION.	PRICE.
D. R. E.	11	Cases Rambong Crepe	3/1 $\frac{1}{4}$
M. R. P.	18	„ Crepe	3/8 $\frac{1}{4}$ at 4/3 $\frac{1}{4}$
Ltd.			
L. P.	12	„ „ 9 sold	2/8
D.			
Sungei Kapar			
S. K. R. Co., Ltd.	9	„ „	2/6 at 4/1 $\frac{3}{4}$
B. & D.	4	„ Scrap	1/1 at 2/6
	9	„ Crepe	2/5 at 3/11 $\frac{1}{2}$
	18	Pkgs. Sheets	3/6 at 4/2 $\frac{1}{2}$
S. Y. D.	2	Cases Scrap	bought in
S. R.	4	Pkgs. Biscuits	2/9 $\frac{1}{2}$ at 3/10 $\frac{1}{2}$
C. W.			
R. 4	12	Cases Sheets	3/8 $\frac{1}{4}$ at 4/2 $\frac{1}{4}$
S. P.	30	„ Scrap	2/6 at 3/4 $\frac{1}{4}$
Bila	9	„ Crepe	„
R. P.			
Sungei Krudda	11	„ Sheets	„
Glenmari	7	„ Sheets	1/1 at 4/2
	4	Pkgs. Crepe	3/ at 3/4 $\frac{1}{4}$
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 4/1 $\frac{1}{2}$
C. R.	14	„ Scrap	bought in
Hylton	1	„ Biscuits	4/1 $\frac{3}{4}$
Ambatenne	5	„ „	4/2 at 4/2 $\frac{1}{4}$
	1	„ Scrap	2/11 $\frac{3}{4}$
J. C. & Co., Ltd.	5	„ Crepe	bought in
A.	7	„ „ part sold	2/4 at 2/7 $\frac{1}{2}$
Glanrhos	4	„ „	4/2 $\frac{1}{4}$
	3	„ Biscuits	bought in
Clontarf	3	„ „	4/2
Veralupitiya Estate	1	„ Sheets	4/1 $\frac{1}{2}$
T.			
F. K. F. W.	7	„ „	bought in
Ribu			
Ambanganga	3	„ „	„
Gikiyanakande	11	„ Crepe part sold	2/6 at 3/4 $\frac{1}{4}$
	8	„ Worms	4/4 $\frac{3}{4}$
Allawatte	8	„ Serape	bought in

(Lewis and Peat)

*Comparative Statement of Cultivated Rubber Exported from the
Federated Malay States During the Years 1907 & 1908.*

	Exported during June 1908.	Previously.	Total ex- port during 1908.	Export dur- ing 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	529,633

*Excluding Pahang export for June.

KUALA LUMPUR,

7th July, 1908.

J. R. O. ALDWORTH,

Commissioner of Trade and Customs.

Penang.

Abstract of Meteorological Readings in Criminal 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 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	29.902	153.2	83.0	92.2	74.3	17.9	78.5	86.9	75.5	77	S. 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

CRIMINAL 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		PANG-KEN		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 320 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 ₀ 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. Lumpur	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 Lumpur, 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	TEMPERATURE OF RADIATION				WIND DIRECTION			TEMPERATURE OF COMPUTED EVAPORATION VAPOUR TENSION			RELATIVE HUMIDITY		CLOUDS 0 TO 10			CLOUDS & WEATHER INITIALS			RAIN			
	9	15	Mean		Sun	9	15	Mean		9	15	Mean		9	15	21	9	15	21	Inch	Cents	
	H	H	H	H		H	H	H	H	H	H	H	H	H	H	H	H	H	H			
1	79	85	82		141	55	W	S	W	75.6	76.7	76.1	888	922	905	90	97	03.5				
2	79	86	82.5		147	60	N	E	N	W	73.9	77.5	75.2	839	955	897	85	76	80.1			
3	78	85	81.5		145	60	N	E	N	W	76.3	73.4	74.8	906	826	866	94	68	81			
4	76	85	80.5		139	53	N	W	S	W	74.3	78.4	76.3	848	973	911	25	80	87			.42
5	77	85	81		136	51	W	S	W	W	71.9	79.7	4.4	783	990	886	84	85	84.5			.68
6	76	85	80.5		145	59	W	S	W	W	74.3	73.4	73.8	848	826	837	94	68	81			.08
7	77	86	81.5		147	60	N	S	W	W	71.9	77.5	74.7	783	955	869	84	76	82			
8	76	87	81.5		142	55	N	S	W	W	72.6	78.8	75.7	801	985	893	80	77	83			.32
9	77	88	82.5		145	57	N	W	S	W	70.2	79.8	7.5	7391	018	878	79	77	78			.54
10	75	82	78.5		119	36	W	S	W	W	73.3	77.7	5.1	820	926	873	94	85	89.5			
11	77	85	81		141	55	W	S	W	W	73.6	78.4	7.6	829	973	876	89	80	84.5			.38
12	77	86	81.5		144	57	W	N	E	W	73.6	72.8	73.4	829	888	858	89	64	76.5			
13	77	83	80		140	52	W	N	E	W	71.9	74.7	74.3	783	856	819	84	76	80			
14	78	85	81.5		143	57	N	W	N	E	74.6	78.4	76.5	847	975	910	89	80	84.5			.16
15	77	87	82		146	57	N	W	N	W	73.6	78.8	76.2	829	985	907	89	77	79.5			
16	78	88	83		149	60	N	W	W	W	72.9	79.8	76.3	8101	018	914	84	77	80			
17	77	88	82.5		148	59	N	W	S	W	71.9	78.2	75.1	783	964	893	84	73	84.5			
18	77	87	82		146	58	N	W	S	W	75.3	78.8	77.1	877	985	931	94	77	83			
19	78	84	81		140	53	N	W	S	W	72.9	74.7	3.5	810	840	825	84	23	80.5			
20	77	87	82		192	54	N	W	S	W	71.9	78.8	75.3	783	985	884	84	77	78.5			
21	78	88	83		144	55	N	W	S	W	72.9	79.8	76.3	8101	018	914	84	77	85.5			
22	77	87	82		143	55	W	S	W	W	70.2	78.8	74.5	739	985	862	79	77	78			
23	78	88	83		145	56	W	S	W	W	71.2	79.8	78.5	7651	018	891	79	77	80.5			
24	79	89	84		147	57	N	W	S	W	72.9	79.2	75.5	839	998	918	85	73	80.5			
25	78	88	83		137	46	N	W	S	W	71.2	78.2	74.7	705	964	864	79	73	76			
26	78	89	83.5		139	48	N	W	S	W	70.2	79.2	74.7	839	998	868	79	73	76			
27	77	84	80.5		143	57	N	W	S	W	71.2	72.4	71.8	705	995	775	79	68	79.5			
28	78	86	82		145	57	W	W	W	W	71.2	77.5	74.4	705	955	860	79	76	77.5			
29	77	86	81.5		144	55	S	W	W	W	70.2	79.4	74.8	7391	008	873	79	80	79.5			
30	77	85	81		140	54	N	W	N	W	71.9	80.7	5.9	7831	026	904	84	85	84.5			
Total	77.3	85.8	81.5		142.4	55				72.6	77.2	74.9	895	954	879	85.4	77.3	81.3			3	.54

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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,

W. H. FRY,

Raub, 18th July, 1908.

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.

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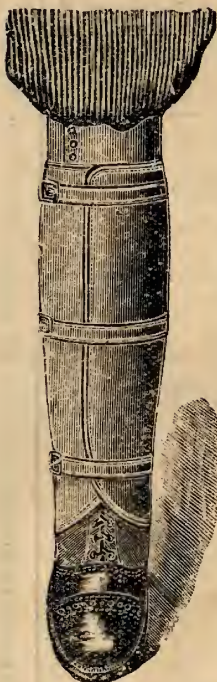
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Agricultural Bulletin

OF THE
STRAITS

AND
FEDERATED MALAY STATES.

EDITED BY

H. N. RIDLEY, M.A., F.R.S., F.L.S., F.R.H.S.,
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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H. N. RIDLEY, M.A., F.R.S., F.L.S., F.R.H.S..

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J. B. CARRUTHERS, F.R.S.E., F.L.S.,

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AGRICULTURAL BULLETIN

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No. 9.]

SEPTEMBER, 1908.

[VOL. VII.

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 produce 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 too 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 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 ofalang 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 $\frac{1}{4}$ 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 neighbours with no hours 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 2½ 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	4½' to 6'	"
do.	III	3' to 4½'	"
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 map 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 4½' 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 4½' in girth.

Class. II. 4½' 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 4½' 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'—4½'	27 "
"	4½'—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	4½'	"	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 class III, 30 years to pass through 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 (*Azelia*) 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"

These 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 eliminated more or less after several years of measurement.

100 *Getah Taban* trees (*Gutta percha*, *Palaquium gutta*) have been measured near the waterfall at Taipeng, of girths varying from 18 to 65 inches.

These show 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 seedling has to struggle for existence 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 uncleared. 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 overshadowing 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 Cochinchine 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 *Sansevieria* 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 centimeters 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 *Sansevieria* 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 *Sansevieria*, 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, *Sansevieria* 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 *Sansevierias*, 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 *Sansevieria*. 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 thoroughly 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. <i>In lbs.</i>	VALUE f.o.b. <i>In milreis.</i>
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-Caucho	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.
	<i>In lbs.</i>	<i>In milreis.</i>
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 $\frac{1}{22}$. 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 33,679 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
	<i>lbs.</i>	<i>lbs.</i>
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
	<i>lbs.</i>	<i>lbs.</i>	<i>lbs.</i>
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 $13\frac{1}{2}$, Mangabeira by only $2\frac{1}{2}$.

The exports in 1906 and 1907 were distributed among foreign countries as follows:

1906

	QUANTITY.	VALUE.
	<i>In lbs.</i>	<i>In milreis.</i>
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.
	<i>In lbs.</i>	<i>In milreis.</i>
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 $15\frac{1}{2}$ 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 Hekmeyer*, 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 cocoon 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 cocoon.

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 arrangements 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 deplures 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 kanganics 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 Lumpur.

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 2 $\frac{3}{4}$ 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 than 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 Association 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 Lumpur *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 re-valued 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 Committee 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.

Seafeld 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. Solbè.
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
	<hr/>
	\$570
	<hr/>

REVENUE.

By 19 Votes at \$30	\$570
	<hr/>
	\$570
	<hr/>

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. Solbè 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 Lumpur 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.

<i>Assets.</i>		<i>Liabilities.</i>	
	\$ c.		\$ c.
Cash in Bank ...	360 19	Messrs. Fraser & Neave, Print- ing 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
	<u>\$661 12</u>		<u>\$661 12</u>

Dr. Revenue Account, June 30th, 1908.

Dr.

		\$ c.				\$ c.	
To 23 Entrance Fees at \$10	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		
	<u>\$559 40</u>			" Balance in Bank	360 19		
							<u>\$559 40</u>

Estimated Income and Expenditure, 1908-9.

<i>Income.</i>		<i>Expenditure.</i>	
	\$ c.		\$ 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 ...
	<u>\$595 60</u>	Cont. agencies	54 67
			<u>\$595 60</u>

W. N. GAWLER,

Honorary Secretary.

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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” Enactment.

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 Lumpur 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 seven or eight 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	613,530	417,465
Negri Sembilan	28,847	325,953	354,805	254,453	100,347
Pahang	nil	nil	nil.	nil	
Total	226,102	1,382,158	1,603,260	981,295	626,965

KUALA LUMPUR,
11th August, 1908.

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

SINGAPORE MARKET REPORT.

August, 1908.

Articles.	Quantity	Highest	Lowest
	sold.	price.	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 ADVER- TISED.	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 521	9	18¾	27¾	383	3/10½	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...	2/6 $\frac{1}{4}$ to 3/6 $\frac{1}{4}$
Ellakande	7	Fine pale crepe	4/3 $\frac{1}{4}$ to 4/7 $\frac{1}{2}$
	2	Dark "	3/1
Heatherley	5	Palish thick crepe	4/2 to 4/2 $\frac{1}{2}$
	14	Pale to dark crepe	2/5 $\frac{3}{4}$ to 4/4 $\frac{1}{4}$
Ingoya	4	Rolled sheet	4/3 to 4/3 $\frac{1}{2}$
	1	Biscuits	4/3 $\frac{1}{2}$
Arapolakande	12	Fine biscuits	4/3 $\frac{1}{2}$
	4	Brown and dark crepe	3/2 $\frac{1}{2}$ to 3/5 $\frac{1}{2}$

MALAYA.

MARK.	PKGS.	DESCRIPTION.	PRICE.
Jebong	39	Fine pale crepe	bought in
	18	Mottled and brown	bought in
Golconda	9	Sheet	4/3 $\frac{3}{4}$
	6	Darkish and black crepe	bought in
S. S. B. R. Co., Ltd.	14	Dark sheet	4/3 $\frac{3}{4}$
	1	Brown crepe	bought in
C. M. R. E., Ltd,	11	Fine pale & palish crepe pt. sold	4/6 to 4/6 $\frac{1}{2}$
	9	Medium crepe	3/9 $\frac{1}{2}$ to 3/11 $\frac{1}{2}$
	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	4/3 $\frac{1}{2}$
	6	Palish crepe	3/9 $\frac{3}{4}$
	16	Medium and dark crepe	3/2 to 3/8 $\frac{1}{2}$
B. R. R. Co., Ltd.	5	Good palish crepe	bought in
B. & D.	2	Biscuits sheet scrap and rejections	1/8 to 4/1 $\frac{1}{4}$
Perhentian	19	Dark sheet	4/3 $\frac{1}{4}$ to 4/3 $\frac{3}{4}$
Tinggi	11	Medium and dark crepe	1/3 to 3/4 $\frac{1}{2}$
S. & D.	7	Sheet	4/3 $\frac{1}{2}$
	4	Scrappy	2/10 $\frac{1}{4}$ to 3/0 $\frac{1}{2}$
S. Y. D.	2	Scrappy sheet	1/9
S. P.	1	Scrap	2/7 $\frac{1}{2}$
S.			
Vallambrosa	8	Brownish crepe	3/9 $\frac{1}{4}$ to 3/11 $\frac{1}{4}$
	22	Darker "	3/1 to 3/5 $\frac{3}{4}$
S. R. & Co.	14	Dark sheet	4/3 $\frac{1}{2}$
	6	Palish crepe	4/3
	25	Medium and dark crepe	3/0 $\frac{1}{2}$ to 4/0 $\frac{1}{2}$
Matang	11	Sheet	4/3 $\frac{1}{2}$ to 4/3 $\frac{3}{4}$
	10	Palish and brown crepe	3/2 to 4/-
K. P. Co., Ltd.	15	Brown and dark crepe	3/3 to 3/3 $\frac{1}{2}$
S. R.	9	Sheet	3/3 $\frac{1}{4}$
S.	2	Scrap, etc.	2/7
K. M.	1	Scrap, etc.	bought in
S. R.			
S. B.			
P. R. & Co.	1	Scrap	bought in
P.	7	Biscuits	4/2 $\frac{1}{4}$
A. R.			

JAVA.

MARK.	PKGS.	DESCRIPTION.	PRICE.
Pasir Oetjing	3	Pressed Rambong sheet	3/0 $\frac{1}{2}$
	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.	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	5/1¾	4/10½	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.

* STOCKS.

†1908—1st Jan. to 31st May	8,999 tons	†1908—at 31st May	... 3,480 tons
1907—1st Jan. to 30th June	7,907 tons	1907—at 30th June	... 2,047 tons
1906—1st Jan. to 30th June	6,656 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.				MALAYA.—1st JANUARY TO 31st MAY.		
				Singapore.	Penang.	Total.
1908	...	...	137 tons	1908...413 tons	207 tons	...620 tons
1907	...	...	93½ tons	1907...268 tons	27½ tons	...295½ tons
1906	...	...	62¼ tons	1906... 80¾ tons	14¼ tons	... 95 tons
1905	..	..	22¼ 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
Deansworth	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 3/4½
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 3/11 $\frac{1}{4}$
	4	Good to very fine sheet pt. sold	... 4/7 $\frac{1}{2}$
T. B. S.	17	Crepe	... 3/3 $\frac{1}{2}$ 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 4/1 $\frac{1}{4}$
D. R. E.	18	Rambong	... bought in
B. M. & Co., Ltd.	4	Rejections and scrap	pt. sold ... 2/8 $\frac{1}{2}$
L. E. Muar	120	Very fine pale block	... bought in
Straits K. B. E.	21	Darkish to dark crepe	... 3/1 $\frac{1}{2}$ to 3/4
Straits. R.	3	Fine crepe	... 4/2
M. P. Ltd.	6	Darkish	... 3/4 $\frac{1}{2}$
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	... 3/0 $\frac{1}{2}$ to 3/6 $\frac{1}{4}$
	2	Rambong crepe	... 2/9
V. R. Co., Ltd. Klang	10	Darkish to black crepe	... 3/- to 3/7 $\frac{3}{4}$
F. M. S. P. R.	4	Sheet	... 4/1 $\frac{1}{2}$
	2	Scrap	pt. sold ... 2/10
P. S. E.	12	Sheet	... bought in
	14	Dark crepe	... 2/6 $\frac{1}{2}$ to 2/8 $\frac{3}{4}$
	16	Black crepe	... 2/7
M. P. & Co., Ltd. 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 ... 3/6 $\frac{3}{4}$
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 18 $\frac{3}{4}$ Tons Straits and 11 $\frac{1}{2}$ Tons Ceylon, were offered at Auctions to-day and sold as follows:—

STRAITS AND MALAY STATES.

MARK.	PKGS.	DESCRIPTION.	PRICE.
R. A. B.	57	Cases Crepe	... bought in
Jebong	9	„ Sheets	... 4/3 $\frac{3}{4}$
Golconda	6	„ Crepe	... bought in
S. S. B. R. Co., Ltd.	14	„ Sheets	... 4/3 $\frac{3}{4}$
C. M. R. E. Ltd.	32	„ Crepe	part sold ... 3/4 at 4/6
Shelford	8	„ „	... bought in
Highland	7	„ Sheets	... 4/3 $\frac{1}{2}$
Estate	21	„ Crepe	... 3/2 at 3/9 $\frac{3}{4}$
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 4/1 $\frac{1}{4}$
	3	„ Crepe	... 3/9 at 3/10
Perhentian	19	„ Sheets	... 4/3 $\frac{1}{4}$ at 4/3 $\frac{3}{4}$
Tinggi Estate	10	„ Crepe	... 1/3 at 3/4 $\frac{1}{2}$
S. & D.	7	„ Sheets	... 4/3 $\frac{1}{2}$
	4	„ Scrap	... 2/10 $\frac{1}{4}$ at 3/0 $\frac{1}{2}$
S. Y. D.	2	„ „	... 1/9
V. R. Co., Ltd.			
Kalang	30	„ Crepe	... 3/1 at 3/11 $\frac{1}{4}$
F. M. S.			
S. R. & Co., Ltd.	14	„ Sheets	... 4/3 $\frac{1}{2}$
	31	„ Crepe	... 3/0 $\frac{1}{2}$ at 4/3
Matang	11	„ Sheets	... 4/3 $\frac{1}{2}$ at 4/3 $\frac{3}{4}$
	10	„ Crepe	... 3/2 at 4/-
K. P. C. Ltd.	15	„ Crepe	... 3/3 at 3/3 $\frac{1}{2}$
	9	„ Sheets	... 4/3 $\frac{1}{2}$
S.			
R. R.	2	„ Biscuits	... 2/7
P.			
A. R.	7	„ Sheets	... bought in

CEYLON.

MARK.	PKGS.	DESCRIPTION.	PRICE.
Crapolakande	12	Cases Sheest	... 4/3 $\frac{1}{2}$
	4	„ Brepe	... 3/3 $\frac{3}{4}$ at 3/5 $\frac{1}{2}$
Kumaradola	8	„ Biscuits	... 4/3 $\frac{1}{2}$
J. J. V. & Co., Ltd.	12	„ Scrap	... 2/7 bid
Putupaula	3	„ Crepe	... bought in
A. R.	1	„ „	... 2/10
P. C.			

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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	... 4/3 $\frac{1}{2}$
	2	" "	... 4/3 $\frac{1}{2}$
Warriapolla	1	" Scrap	... 3/-
Doranakande	4	" Biscuits	... 4/8
	3	" "	... 4/3 $\frac{1}{2}$
Waharaka	4	" Scrap	... 2/10 $\frac{3}{4}$ at 2/11 $\frac{3}{4}$
	2	" Biscuits	... 4/3
No. 1	1	" Scrape	... 2/11 $\frac{1}{2}$
Palli	4	" Biscuits	... 4/2
C. R.	4	" Sheets	... 4/3 $\frac{3}{4}$
	14	" Scrape	... bought in
J. C. & Co., Ltd.	3	" Crepe	2 sold ... 2/10 at 3/5
Culloden	11	" "	... 2/6 $\frac{1}{4}$ at 3/6 $\frac{3}{4}$
Ellakande	9	" "	... 3/1 at 4/7 $\frac{1}{2}$
Heatherley	20	Pkgs. "	... 3/3 $\frac{1}{4}$ at 4/4 $\frac{1}{4}$
Ingoya	4	" Sheets	... 4/3 at 4/3 $\frac{1}{2}$
	1	" Biscuits	... 4/3 $\frac{1}{2}$

CEYLON, STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

July 24th, 1908.

The following Lots, comprising about 25 $\frac{1}{2}$ 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	... 3/6 $\frac{1}{2}$ at 4/7 $\frac{1}{2}$
	6	" Crepe	... 2/6 at 3/11 $\frac{1}{4}$
	4	" Scrap	... 1/6 at 2/7
T. B. S.	17	" Crepe	... 3/3 $\frac{1}{2}$ at 3/5
R. B.	2	" Scrap	... bought in
S. K. R. Co., Ltd.	13	" Crepe	... 2/9 at 4/1 $\frac{1}{4}$
S.			
D. R. E.	18	" "	... bought in
Ltd.			
B. M. & Co., Ltd.	2	" Scrap	... 2/8 $\frac{1}{4}$
L.			
M. U. A. R.	120	" Block	... bought in
M.			
E.	21	" Crepe	... 3/1 $\frac{1}{2}$ at 3/4
R.			
P.	9	" "	... 3/4 $\frac{1}{2}$ at 4/2
M.			
Ltd.			
Golconda	5	" "	... bought in
S. S. B. R. Co., Ltd.	6	" Sheets	... "
	4	" Crepe	... "
Jugra Estate	5	" Sheets	... 4/0 $\frac{1}{4}$ bid
	10	" Crepe	... 2/9 at 3/6 $\frac{1}{4}$
V. R. Co., Ltd., Kalang	10	" "	... 3/- at 3/7 $\frac{3}{4}$

MARK.	PKGS.	DESCRIPTION.	PRICE.
F. M. S.			
S. B.	4	Cases Sheets	... 4/1 $\frac{1}{2}$
P. R.	2	Scrap	1 sold ... 2/10
& Co., Ltd.			
P. S. E.	12	Sheets	... bought in
	14	Crepe	... 2/6 $\frac{1}{2}$ at 2/8 $\frac{3}{4}$
K. P. Co. Ltd.	16	Crepe	... 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	... 4/1 $\frac{1}{2}$ bid
	2	Scrap	... 2/6 $\frac{1}{2}$ bid
Taldua	8	Crepe	... 2/3 at 3/11
Sorana	4	Biscuits	... bought in
Ayr	1	Sheet	... 4/2
	1	Biscuit	... bought in
	2	"	... 4/0 $\frac{3}{4}$
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 4/1 $\frac{3}{4}$
Ellakande	6	"	... bought in
Langsland	11	Biscuits	... "
Glendon	2	"	... 4/0 $\frac{1}{4}$
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 ... 3/6 $\frac{3}{4}$
	6	Sheets	... bought in
Hanipha	3	Biscuits	... "

The price of FINE HARD on the spot to-day is 3/11 $\frac{1}{2}$ per lb.

(Lewis Peat, London.)

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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
Kampa ¹	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.

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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,

W. H. FRY,

Raub, 29th July, 1908.

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	79·0	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° Fab.	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	...

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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.	Vapour 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 Lumpur, 14th August, 1908.

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

Seremban.

Table Showing the Daily Results of the Reading of Meteorological Observations taken at the General Hospital Seremban for the Month of July, 1908.

DATE.	TEMP. OF RADIATION.				TEMP. RA- DIATION. Sun. Diff. & Shade.	WIND. DIRECTION.		TEMP. OF EVAPORATION.		COMPUTED VAPOUR TEN- SION.			RELATIVE HUMIDITY.		CLOUDS 0 TO 10			WEATHER INITIALS.			RAIN.		
	Mean.		Range.			9	15	9	15	9	15	H.	H.	9	15	21	9	15	21	Inch		Cents	
	9	15	H.	H.		H.	H.	H.	H.	H.	H.	H.	H.	H.	H.	H.	H.	H.	H.	H.	H.	H.	H.
1	77	84	80.5	16	55	W	W	68.5	80	1.026	861	75	85	2	3	5	S	S					
2	76	85	80.5	15	57	N	W	67.4	74.9	74.2	697	75	65	1	1	2	S	S					
3	74	80	80.5	15	57	W	E	69.2	81.7	71.1	672	75	65	3	4	3	C	C					
4	78	83	80.5	11	59	N	W	69.2	75.4	75.4	1.023	79	90	1	3	8	S	S				25	
5	77	85	81	13	54	W	W	68.5	71.6	75.8	697	79	58	2	2	2	S	S					
6	77	85	80	13	57	W	W	74.3	79.7	74.1	848	94	95	1	1	2	S	S					
7	76	84	80	13	53	W	W	76.3	83.4	78.8	897	99	95	2	2	2	S	S					
8	75	84	80	13	56	N	W	72.3	81.7	78.8	973	100	95	1	1	2	S	S					
9	79	85	80	13	57	W	W	69.2	78.4	75.3	703	82	80	1	1	2	S	S				.05	
10	75	85	80	14	57	W	W	69.2	80.1	75.3	713	82	80	0	1	3	S	S					
11	77	85	80	13	56	N	W	73.3	80.1	74.6	820	85	82	1	1	3	S	S					
12	78	83	80.5	13	58	N	W	75.3	81.7	78.5	898	85	80.5	0	1	3	S	S					
13	75	82	78.5	15	63	W	W	70.5	78.7	70.7	748	89	90	4	2	3	S	S					
14	74	83	78.5	15	59	W	W	71.6	78.7	75.1	978	89	90	4	2	2	S	S					
15	73	83	78.5	15	59	N	W	69.5	78.7	75.1	748	89	90	0	1	8	S	S				.97	
16	75	86	80.5	13	59	W	W	69.8	83.3	76.5	731	89	85	2	3	4	S	S					
17	74	85	79.5	14	60	N	W	70.5	83.4	76.9	944	89	95	0	2	1	S	S				.78	
18	74	83	78.5	13	60	W	W	68.8	79.7	74.2	705	84	95	2	3	5	S	S					
19	75	81	78.5	12	59	W	W	73.3	76.5	74.9	802	89	92	2	2	4	S	S				.07	
20	74	82	78	11	61	W	W	60.2	77	68.6	522	94	90	3	4	4	S	S					
21	76	84	80	14	58	N	W	72.6	75.7	74.1	888	84	80	0	3	2	S	S					
22	74	80	77	14	67	W	W	73.6	75.7	73.6	793	89	76	3	3	3	S	S					
23	77	85	81	15	60	S	W	75.3	80	77.6	877	85	89.5	4	5	4	S	S					
24	75	85	80	15	63	W	W	70.9	78	74.4	756	94	85	2	3	2	S	S					
25	76	83	79.5	15	63	W	W	89.8	81.1	85.4	731	85	84.5	4	5	2	S	S					
26	75	80	80.5	15	60	W	W	70.5	86.1	78.3	748	85	80.5	2	3	2	S	S					
27	74	88	81	15	60	N	W	68.8	80	74.4	705	84	85	3	2	2	S	S					
28	74	89	79.5	15	60	N	W	69.8	86.4	78.1	1.258	84	80	2	3	2	S	S					
29	75	81	68	13	64	N	W	73.0	72.3	72.9	731	89	80	5	6	5	S	S				.08	
30	77	84	80.5	17	59	N	W	66.5	77.4	72.9	697	89	80	2	4	5	S	S					
31	74	84	79	16	58	W	W	70.5	75.7	73.1	748	89	76	3	4	4	S	S					
Total..	75.7	83.8	79.75	13.6	58.8			70.2	72.3	75.4	764	83.4	82.2	86.7	3	3						20	

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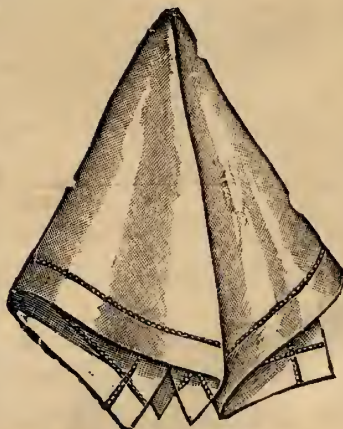
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Even an indirect or implied command requires *jangan* as a negative, for instance,

suruh 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,

staya kaki-nya jangan kotor.
so that his feet should not get dirty.

VOCABULARY.

NOOMS.
anjing, dog.
eliabi, washerman.
ikan, fish.
itek, duck.
lipas, fan.
meja, 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

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83

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. *yatin*.

Pi'chek, narrow, confined, limited. Cf. *smpit*.

Pi'chit, *m-m'chit*, to pinch, nip.

Pi'hak, side, quarter, flank, party.

Pihutary, see *lutary*.

Pi'jak, *m-m'jak*, to tread on, stamp on. Cf. *injak* and *irek*.

Pi'jat, a bed-bug; also *kutu busuk*.

Pi'kat, a horse-fly.

Pi'kat, *m-m'kat*, to catch birds with birdlime.

P-m'kat, a decoy bird; a bird catcher.

Pikir, see *fitir*.

Pikul, *m-m'kul*, to carry on the shoulders or back; a measure of weight, being about what a man can carry on the shoulders = 133 lbs.

Pileh, *m-m'leh*, to choose, select, elect.

Pile-han, chosen, elect.

Pi'lu, moved, affected, troubled, agitated. Cf. *rawan*.

Pim'pin, *m-min'pin*, to hold or lead by the hand, guide, lead.

Pi'nang, *m-m'nang*, the betel-nut palm; to ask in marriage, make an offer of marriage.

Puluu 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. *spi*.

Pin'jam, *m-min'jam* (149), to borrow.

B-r' 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. *rintas*.

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'kui 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-m'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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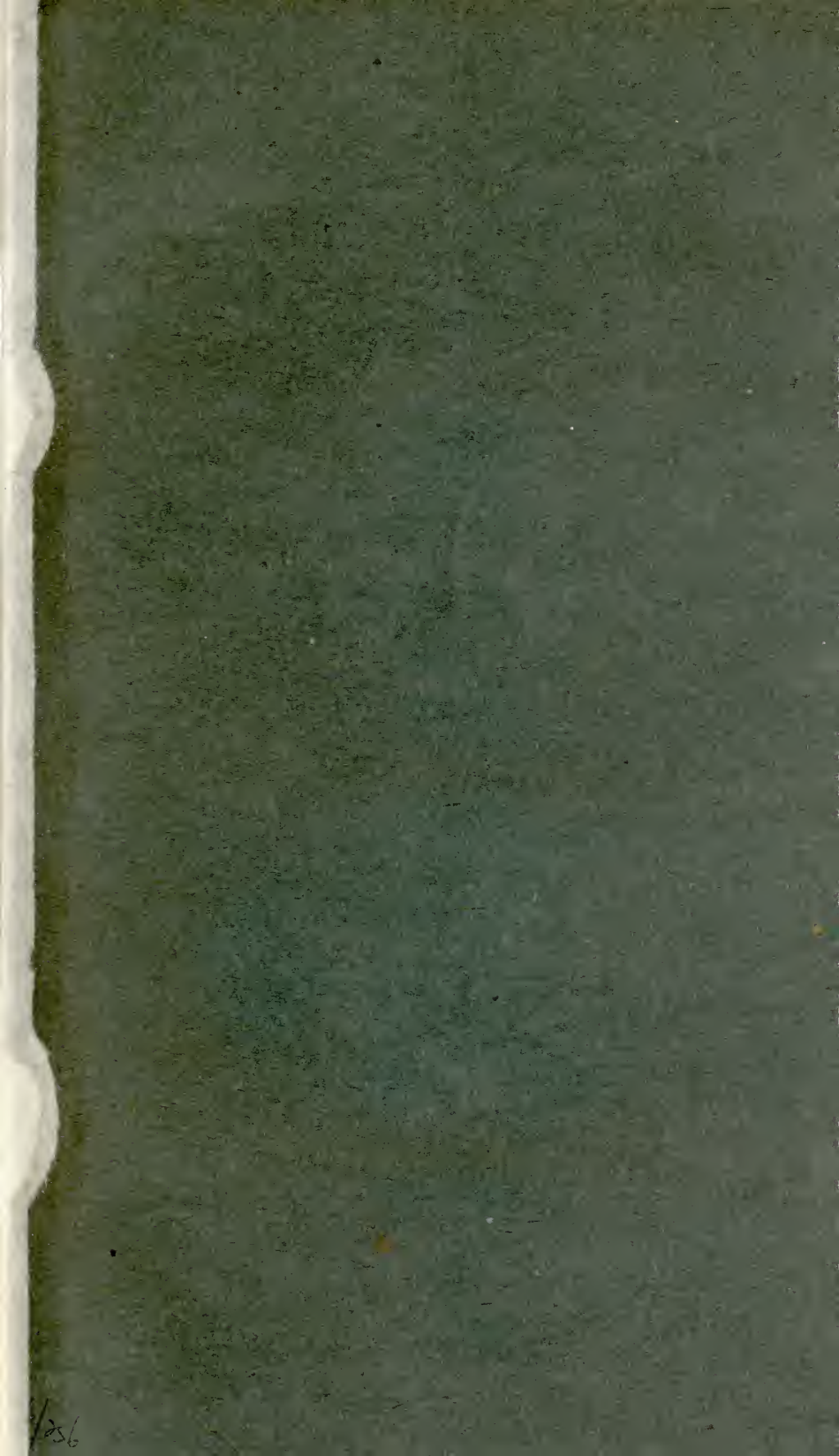
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Furthermore the industry has been almost abandoned in places, notably Singapore, and many of the old plantations in other parts of the Peninsula have been almost abandoned for so long that the quality and quantity of their produce is decidedly poor.

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-

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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 advisability 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

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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 bushy 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:—

<i>Malay Name.</i>	<i>Scientific Name.</i>	<i>English Name.</i>
Nona-Kapri	<i>Anona squamosa</i>	Custard apple
Durian-Blanda	<i>Anona muricata</i>	Sour-sop
Buah S'ri Kayah	<i>Anona reticulata</i>	Bullock's heart
Rukum	<i>Flacourtia cataphracta</i>	
Mangis	<i>Garcinia mangostana</i>	Mangosteen
Mundu	<i>Garcinia dulcis</i>	
Asam Gelugur	<i>Garcinia atroviridis</i>	
	<i>Caryocar nuciferum</i>	Butter-nut
Durian	<i>Durio zibethinus</i>	Durian
Blimbing	<i>Averrhoa Bilimbi</i>	
Carambola	<i>Averrhoa carambola</i>	Carambola
	<i>Malpighia urens</i>	Barbados Cherry
Limau Bali	<i>Citrus decumana</i>	Forbidden Fruit (Pumelo)
Limau Keah	<i>Triphasia trifoliata</i>	Lime-berry
Limau Manis	<i>Citrus aurantium</i>	Orange
Limau Nipis	<i>Citrus limonium var acida</i>	Sour Lime
Limau Kasturi	<i>Citrus medica var</i>	
Limau susu	do.	
Limau Puru	<i>Citrus hystrix</i>	
Buah K'nah	<i>Canarium commune</i>	Kenari-nut
Sentol	<i>Sandoricum indicum</i>	
Kechapi	<i>Sandoricum radiatum</i>	
Langsat	<i>Lansium domesticum</i>	
Rambutan	<i>Nephelium lappaceum</i>	
Pulassan	<i>Nephelium chryseum Bl.</i>	
Mata Kuching	<i>N. longana</i>	
Litchi	<i>N. Litchi</i>	Litchi
Manga	<i>Mangifera indica</i>	Mango
Bachang	<i>M. foetida</i>	
Binjai	<i>M. caesia</i>	
Lanjut	<i>M. lagenifera</i>	
Kwini	<i>Mangifera odorata</i>	
Rumeniya	<i>Bouea burmanica</i>	
Kundanggan	<i>B. macrophylla</i>	
Kajus	<i>Anacardium occidentale</i>	Cashew-nut
	<i>Spondias dulcis</i>	Hog-plum
Nam-Nam	<i>Cynometra cauliflora</i>	

<i>Malay Name.</i>	<i>Scientific Name.</i>	<i>English Name.</i>
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	
Tampune	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 Lumpur 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 Néerlandaises, No. 12. III, Dr. Bernard gives an interesting article on diseases of rubber plants under the title of "Sur quelques 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 Bandung, 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 *Irpea flava* in the Straits and *Poria vineta* 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 *Irpea*).

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. guypini* 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 rhizomes 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 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 Lumpur, 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 Luehch	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 $\frac{1}{4}$ 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 Selangor. 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 $\frac{1}{4}$ inch or more long. Leaves deeply cordate acuminate 6 inches long and as wide, the cusp $1\frac{1}{2}$ inch long, nerves eleven radiating from the base and ascending to the cusp, transverse nervules prominent and numerous; petiole 4-5 inches long thorny along the upper edge.

The flowers as is so often the case in this genus must be 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 Maxwell's Hill (Ridley 5,229.) It has also been obtained in Kemaman by Vaughan Stevens.

Kechubong in the well known *Datua 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 ago 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 owners 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):—

Nos.	Quality.	SINGLES.		DOUBLES.				
		Woft.	Warp.	Twisting	Twisting			
		Flat and round	tight to 100	extra tight	to 125			
			to 90	to 75				
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 $\frac{1}{2}$ d. 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 *Bahmeria* 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.

6/20/08

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 feasibility 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 gardens 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' x 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 Lumpur 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' x 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' x 50' allotted to them. A similar shed (100' x 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 were 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 Lampor, 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 Lumpur, who was awarded a Diploma for his exhibit collectively.

Division 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 miniature 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 Lumpur, 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 by 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 criticism 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 Lumpur.

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 Lumpur. 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 Lumpur 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 Pavilion 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 fifth 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 Lumpur 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 Lumpur 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 Lumpur, 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 at 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 considering 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 be interesting. But he thought 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 Lumpur, 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 the 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) agreed 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 Lumpur.

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 Semmah Ulu, Langat.
17. Coconuts, husked, best sample.
 1st prize. R. M. Connolly, Ipoh, Perak.
 2nd prize. Penghulu Haji Nasau, 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 prize. 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 cattles.
 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 cattles.
 1st prize. Mohamed Arsat, Penang.
 2nd prize. Penghulu Abdul Raman, Penang.
 3rd prize. Raja Tahir, Kuala, Langkat.
34. Sugar, kabong, best sample. 2 cattles.
 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 cattles.
 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 cattles.
 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 cattles.
 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 Lumpur.
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. Mchamed 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 Kangsar.

69. Oils, best collection $\frac{1}{4}$ 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. $\frac{1}{2}$ catty of each.
 1st prize. No award.
 2nd prize. Penghulu Ijok SImah 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 Comanded. Long Kong Yew, Kuala Langat.
73. Dragon's blood, best sample $\frac{1}{2}$ 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 $\frac{1}{2}$ 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 Well-eseley.
 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 Comanded. 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 Buai, 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 Lumpur.
 2nd prize. Mrs. Carruthers, Kuala Lumpur.
85. Coleus. 3 plants.
 No entry.
86. Crotons. 3 plants.
 1st prize. Lee Kong Lam, Kuala Lumpur.
 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 Lumpur.
 3rd prize. No award.
89. Ferns, Adiantum, distinct.
 1st prize. No award.
 2nd prize. Mrs. Carruthers, Kuala Lumpur.
 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 Lumpur.
 2nd prize. Lee Kong Lam, Kuala Lumpur.
 3rd prize. Lee Kong Lam, Kuala Lumpur.
93. Palms best specimen. 1 plant.
 1st prize. No award.
 2nd prize. Lee Kong Lam, Kuala Lumpur.
 Highly Commended. Tong Tak In, Kuala Lumpur.
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 Lumpur.
 2nd prize. N. Siew Hin, Kuala Lumpur.

96. Foliage plant, any kind, best specimen. 1 plant.
 1st prize. Choo Kia Peng, Kuala Lumpur.
 2nd prize. No award.

DIVISION B. II.

97. Amaryllis and Lilies. 3 plants.
 Mrs. Spooner, Kuala Lumpur.
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 Lumpur.
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 Lumpur
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 Lumpur.
 2nd prize. Mrs. Carruthers, Kuala Lumpur.
 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 Lumpur.
 2nd prize. No award.
115. Group of Chinese plants, fantastic shape.
 1st prize. T. Seow Teng, Kuala Lumpur.
 2nd prize. No award.
 Special prize. Tong Tak In, Kuala Lumpur.
 Special prize. Chian Ah Peng, Kuala Lumpur.

DIVISION B. IV.

116. Asters, optional.
No entry.
117. Chrysanthemums, optional.
1st prize. No award.
2nd prize. Mrs. Burn Murdoch, Kuala Lumpur.
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 Lumpur.
2nd prize. Mrs. Carruthers, Kuala Lumpur.
3rd prize. No award.
124. Table decoration.
1st prize. Miss V. Grey, Kuala Lumpur.
2nd prize. Mrs. Nutt, Kuala Lumpur.
3rd prize. Mrs. Walsh, Kuala Lumpur.

DIVISION B. V.

125. Pisangs (Bananas) best collection. 6 of each kind.
1st prize. Kulop Mat Jin, Kuala Kangsar.
2nd prize. Haji Mohamed Nasir, Lower Perak.
3rd prize. Mat Bin Hasin, Penang.
Commended, Usop, Batu, Kuala Lumpur.
126. Pisangs (Bananas) best bunch, any kind. 1 bunch.
1st prize. Saleh, Kuala Lumpur.
2nd prize. Talib, Kuala Lumpur.
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. Pomeles. 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 Bardar, 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 Lumpur.
2nd prize. Girls' School, Taipeng, Perak.
157. Pickles, best sample, any Method. Optional.
1st prize. F. Alexander, 2½ mile, Pahang Road. Kuala Lumpur.
2nd prize D. Podusingho Trolak, Tapah.
158. Jellies, best sample, any Method. Optional.
1st prize. (Bronze Medal) F. Alexander, 2½ mile, Pahang Road, Kuala Lumpur.
2nd prize. (Bronze Medal.) Girls' School, Jernam Perak.

159. Honey, in comb. 1 lb.
 1st prize. Abdullah Ali Lower Perak.
 2nd prize. Penghulu H. Ahmat, Malacca.
160. Butter, 1 lb.
 1st prize. Shaik Hussain, Penang.
 2nd prize. Rahamathullah, Penang.
161. Eggs, best collection, fowls, ducks, or turkeys. Optional.
 1st prize. Kung Thean Sung, Penang.
 2nd prize. Ahmat, Kuala Lumpor.
162. Artichokes, best sample. 12 tubers.
 1st prize. No entry.
163. Beetroot, best sample. 6 specimens.
 1st prize. Ahmat Ulu Yam.
164. Benny fruits or chocho. 6 specimens.
 No entry.
165. Brinjals. 6 specimens.
 1st prize. Penghulu. Abdulgany, Malacca.
 2nd prize. Straits Settlements Bertam Rubber Company,
 Province Wellesley.
166. Radishes. 10 specimens.
 1st prize. Cheng Hun, Penang.
 2nd prize. No award.
167. Ladies' fingers. 6 specimens
 1st prize. Mohamed Arshat, Penang.
 Highly Commended. Brahim, Penang.
168. Cucumbers. 6 specimens
 1st prize. Straits Settlements Bertam Rubber Company, Pro-
 vince Wellesley.
 2nd prize. Mohamed Tahib, bin Mohamed Nor, Penang.
 Highly Commended. Mohamed Arshat, Penang.
 Commended. Ahmat, Lower Perak.
169. Tomatoes, best dish. 6 specimens.
 1st prize. R. M. Conolly, Ipoh. Perak.
 2nd prize. No award.

DIVISION B. VII.

170. Beans, best collection. Optional.
 1st prize. Jayah, Penang.
 2nd prize. Ahmin, Kuala Kangsar.
171. Cabbages, 3. Optional.
 1st prize. P. Y. Seow Teng, Kuala Lumpor.
 Highly Commended. R. M. Conolly, Ipoh.
172. Lettuces, 6. Optional.
 1st prize. Cheng Hun, Penang.
 2nd prize. Said Ahmad, Penang.
173. Onions, shallots and garlic, best collection. One bundle of each.
 1st prize. Kung Thean Sang, Penang.
 Highly Commended. Musim, Rawang.
174. 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 collection. 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 Lumpur
 3rd prize. No award.
181. Yams, kladies, best collection. 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 Lumpur.
 2nd prize. K. T. Koomarasawmy Pillai, Kuala Lumpur.
184. Cow and calf.
 1st prize. No award.
 2nd prize. K. T. Koomarasawmy Pillai, Kuala Lumpur.
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 Lumpur.
187. Pair of draught bullocks with cart, (Indian).
 1st prize. K. T. Koomarasawmy Pillai, Kuala Lumpur.
 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 Lumpur.
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 Lumpur
2nd prize. J. G. Dragon Kuala Lumpur.
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 Lumpur.
2nd prize. Laiman, Kampong Buaia, Kuala Kangsar.
209. Pair of pigeons.
1st prize. W. W. Douglas, Kuala Lumpur.
2nd prize. J. Carrol, Recreation Club, Kuala Lumpur
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 Lumpur.
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 prize. 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 measurement of each exhibit not to exceed 4 sq. ft.
 1st prize. Mohamed Mansur, 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 Lumpur
 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 Lumpur.
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. Tunku 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 Moriten, 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 Sélangor
259. Mat (tikar bangka).
No award.

260. Mat (tikar hampar).
 1st prize. Datoh Paduka Raja, Lower Perak.
 2nd prize. Sow Thok, Ampang, Kuala Lumpur.
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-Kanau 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 Lumpur.
 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 Panjanglis, 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 Lumpur.
 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 Lumpur.
 Commended. Datoh Puduka Raja, Lower Perak.
 Highly Commanded. F. E. Co., Kuala Lumpur.
285. Agricultural implements, European made.
 1st prize. Federated Engineering Company, Kuala Lumpur.
 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 Lumpur
287. Spraying apparatus. Optional.
 1st prize. No award.
 2nd prize. No award.
 Commended. Federated Engineering Company, Kuala Lumpur.
288. Best tools for tapping rubber. Optional.
 1st prize. Federated Engineering Company, Kuala Lumpur
 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, Nagri Sembilan.

Special prize. Tan Ong Pin, Kuala Lumpur. (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 Lumpur. 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 Lumpur 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 LUMPUR, 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 dribblet.

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 been 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	Highest	Lowest
	sold.	price.	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 $1\frac{1}{2}$ d. 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 obtaining this distinction, the next highest price was $4/4\frac{1}{2}$ 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	Scrap.
To-day 977	9	42	51	457	3/8 $\frac{1}{2}$	4 value	4/1 to 4/6	2/4 to 2/11 $\frac{1}{2}$
Corresponding } Sale Last year }	853	10	35	45	427	4/10 $\frac{1}{4}$	4/9 $\frac{1}{2}$	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 4/4 $\frac{1}{2}$	Good to Fine
Good to fine Biscuits.	4/1	Medium and Palish.	3/5 to 4/-	2/8 to 2/11 $\frac{1}{2}$
Good to fine Sheet.	4/0 $\frac{3}{4}$ to 4/1 $\frac{1}{2}$	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.			MALAYA—1st January to 26th June.		
			Singapore.	Penang.	Total.
1908	... ..	135½ tons	1908...453½ tons...	223½ tons...	676¾ tons
1907	... ..	95½ tons	1907...281¾ tons...	27½ tons...	309¾ tons
1906	... ..	64½ tons	1906...115 tons...	18 tons...	133 tons
1905	... ..	23 tons			

PARTICULARS AND PRICES OF TO-DAY'S SALE.

CEYLON.

MARK.	PKGS.	DESCRIPTION.	PRICE.
Nikakotua	4	Good to fine crepe	... 3/2½ to 4/2
Gikiyanakande	4	Darkish crepe	... bought in
Keptigalla	1	Rejected sheet scrap, etc.	... bought in
C. L.	1	Dark serap	... 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	Serap (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
Tudnagalla	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	Serap 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	Serap and rejections	... 2/8 to 2/8½
Ayer	1	Biscuits	... 4/1
	2	Serap	pt. sold ... 2/7½
Warriapolla	5	Very fine pale biscuits	... 4/6
	4	Serap, 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	... 2/11 $\frac{3}{4}$ to 3/5
	4	Black "	... 2/5
Ellakande	3	Pale pressed crepe	pt. sold ... 3/10 $\frac{3}{4}$ to 4/-
	2	Dark pressed crepe	... bought in
Heatherley	2	Dark pressed crepe	... 2/10 $\frac{3}{4}$ to 3/3 $\frac{1}{4}$
Arapolakande	8	Biscuits	... 4/1
	6	Pale crepe	... 4/3
	5	Darkish crepe	... 3/2 to 3/6 $\frac{1}{4}$
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
Batang 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 ... 4/1 $\frac{1}{2}$
	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	... 2/8 $\frac{1}{2}$ to 2/10 $\frac{1}{4}$
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	... 4/0 $\frac{3}{4}$
	12	Good and dark crepe	... bought in
S. S. B. R. Co., Ltd.	11	Sheet	... 4/1
	1	Dark crepe	... 2/8 $\frac{3}{4}$
Goleonda	9	Sheet	... bought in
	5	Crepe	... bought in
Linggi	77	Good to fine crepe (1 case sold	... 4/0 $\frac{1}{4}$)
	45	Darkish to dark crepe	... bought in
Highland Est.	68	Fine sheet	... 4/1
	47	Good crepe	pt. sold ... 3/2 $\frac{1}{2}$ to 3/6
	7	Darkish pressed crepe	... 3/1 $\frac{1}{2}$ to 3/4 $\frac{1}{4}$
S. K. R. & Co., Ltd.	23	Fine to darkish crepe	pt. sold ... 3/- to 4/0 $\frac{1}{4}$
	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	... 4/0 ³ / ₄ to 4/1
Tinggi	7	Good to dark crepe pt. sold	... 2/11 to 3/5 ³ / ₄
S. & D.	17	Sheet	... 4/1
	1	Rejections	... 3/-
L. E. D.	7	Sheet	... 4/1
Senawang	3	"	... 4/1 ¹ / ₄
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 4/1 ¹ / ₄
	4	Dark crepe	... 2/9 ¹ / ₂
K.	7	Sheet	... 4/1 ¹ / ₄
G.	1	"	... 4/1
S.	7	"	... 4/1
V. R. Co., Ltd.	1	Rejections	... 2/1 ¹ / ₂
Klang	50	Good crepe	... 3/4 ³ / ₄ to 3/8 ³ / ₄
F. M. S.	23	Dark "	... 3/1 to 3/2 ³ / ₄

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 4/4¹/₂ was paid for a small lot of Inch Kenneth Crepe.

Biscuits and Sheet ruled from 4/1 to 4/2 showing an advance of ¹/₄d. 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. Scrap.		
To-day	684	5¼	30¼	35½	376	3/7½	4/0¾	4/1 to 4/6	2/8 to 2/11¼
Corresponding Sale Last Year}	693	7	29½	36½	219	5/0½	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 JULY.

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	32½ tons	336½ tons
1906	139½ 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	... 4/1½
	2	Scrap	... 2/10 to 3/0¼
Northumberland	1	Biscuits	... bought in
Clara	1	Biscuits	... bought in
	2	Scrap	... 2/11
Taldna	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 2/10¼
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	... 4/0¼ 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.	7	Good to dark crepe	... 3/1½ to 3/10
R.	1	Very fine pale crepe	... 4/6
M. P. Ltd.	23	Fine palish	... 4/1¼ to 4/4
B. & D.	14	Fine sheet	pt. sold ... 4/1½
F. D.	5	Rejections and scrap	pt. sold ... 2/9
P.	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 4/1 ³ / ₄
	1	Scrap	... 2/4
S. K. R. Co., Ltd.	2	Crepe	... 3/10 ³ / ₄
B. & D. F. D. M.	1	Pressed sheet	... 3/8
B. B., etc.	19	Darkish crepe	pt. sold ... 3/7 to 3/8 ¹ / ₄
	4	Scrap and rejections	pt. sold ... 2/10 ¹ / ₂
Perhentian Tinggi	1	Crepe	... 3/1 ¹ / ₂
V. V., etc.	6	Rejections, scrap, etc.	... bought in
C. M. R. E. Ltd.	43	Fine pale and palish crepe	pt. sold 3/11 ¹ / ₂ to 4/4
	40	Good darkish to dark crepe	... 3/1 to 3/11 ¹ / ₂
	4	Rambong	... bought in
Inch Kenneth	9	Good to fine pale crepe	... 3/11 ¹ / ₂ to 4/4 ¹ / ₂
	5	Darkish to dark crepe	... 3/1 ¹ / ₂ to 3/9
	1	Rambong	... bought in
S. S. C.	7	Fine sheet	... 4/1 ³ / ₄
P. S. E.	2	" "	... 4/1 ³ / ₄
Selaba Damansara	17	Good sheet	... 4/1 ³ / ₄
	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 3/7 ¹ / ₄
F. (S) R. Co., Ltd.	11	Sheet	... 4/1 ¹ / ₂
	8	Good to dark crepe	pt. sold ... 2/10 ¹ / ₄ to 3/7 ¹ / ₄
Jebong	32	Very fine pale crepe	... bought in
	1	Fine palish	... 4/2 ¹ / ₂
Golconda	9	Sheet	... bought in
S. S. B. R. Co., Ltd.	5	Sheet	... 4/1 ¹ / ₂
	3	Darkish to black crepe	... 2/9 to 3/2 ¹ / ₂
V. R. Co., Ltd. Klang	1	Thick pressed crepe	... bought in
F. M. S. O. & H.	3	Fine sheet	... 4/1 ¹ / ₂
	2	Good scrap	pt. sold ... 2/10 ³ / ₄
Linggi	1	Black crepe	... bought in
S. R. Co., Ltd.	17	Good sheet	... bought in
	2	Good crepe	... 4/0 ¹ / ₂
	9	Dark to black	pt. sold ... 3/1 to 3/6
V. R. Co., Ltd. Klang	20	Sheet	... 4/1 ¹ / ₂ to 4/1 ³ / ₄
F. M. S.	30	Block	... bought in
K. M., etc.	24	Sheet	... 4/- to 4/1 ³ / ₄
	13	Good and dark crepe	... 3/1 ³ / ₄ to 3/9
L. C. Y. Y. L.	1	Pressed sheet etc.	... bought in
K. R. 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.	
			15th.	31st.
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.	...	...

	Str.	Singapore	U. S. A.	Tons.	
				15th.	31st.
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; O1 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, Biscuits 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 lare. August/October a 2/29d to 2¾d. c.i.f. London or Continent and August/October New York at 2 ⅜½d. 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 4½d. 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 2½d; of 764 Bags Penang 107 Bags sold, dull grayish at 1½d; 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 1½d to 1¾d 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 wet.

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 pickings 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 2/1

MARK.	PKGS.	DESCRIPTION.	PRICE.
B. C.	6	Cases Crepe	... 3/1½ to 3/10
R.			
M. Ltd.	P. 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 4/1¼
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	... 4/1¼
P. S. E.	2	" "	... 4/1¼
Damansara	17	" "	... 4/1¼
	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	" "	... 4/½ to 4/1¾
P. R.			
S. R.	2	" "	... 4/1¾
R. R.			
K.	13	" Crepe	... 3/1¼ 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 Ambatenne	2	" Biscuits	... 4/1 $\frac{1}{2}$
	1	" "	... 4/1 $\frac{2}{3}$
Clara Taldua	2	" Scrap	... 2/10 to 3/0 $\frac{1}{4}$
	1	" Biscuits	... 4/3 bid
C. R. Wavena	9	" Crepe part sold	... 3/3 $\frac{1}{2}$ to 4/0 $\frac{1}{4}$
	14	" Scrap	... bought in
Kumlukkan	9	" Sheets	... 4/- to 4/1 $\frac{1}{2}$
	4	" Scrap	... 2/8 to 2/11 $\frac{1}{4}$
Udapolla Elston	3	" Crepe	... 3/3 to 3/3 $\frac{1}{2}$
	5	" Biscuits	... 4/1 $\frac{1}{2}$ bid
Tudugalla Heatherley	4	" "	... 4/1 $\frac{1}{2}$
	2	" "	... 4/1 $\frac{1}{4}$
Nikakotua Ingoya	4	" Scrap	... 2/8 $\frac{1}{4}$ to 2/10 $\frac{1}{2}$
	7	" Crepe	... 3/4 to 3/11
Ellakande	4	" "	... 3/3 to 3/7
	8	" "	... 3/1 to 4/-
Ellakande	4	" Biscuits	... 4/1 $\frac{1}{2}$
	4	" Sheets	... 4/1 $\frac{1}{2}$
	2	" Crepe	... 3/1 $\frac{1}{4}$

The price of FINE HARD to-day on the spot if 4/0 $\frac{3}{4}$ per lb.

CEYLON, STRAITS AND MALAY STATES PLANTATION RUBBER REPORT.

August 7th, 1908.

The following Lots, comprising about 40 $\frac{1}{2}$ 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/-
	3	" Sheets	... 4/1
B. & D.	4	" Scrap	... 2/4
	3	" Sheets	... 3/6
	4	" "	... 3/10
B. B.	4	" Crepe	... bought in
	8	" "	... "
	5	" "	... "
R. M. B. Perhentian	3	" Rambong Crepe	... "
	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	... 4/1 $\frac{1}{4}$
S. K. R.	2	" Crepe	... 4/0 $\frac{3}{4}$
	3	" "	... 4/-
	2	" "	... 3/8 $\frac{1}{4}$
R. B.	2	" Scrap	... bought in
P. S. E.	11	" Sheets	... 4/1 at 4/1 $\frac{1}{4}$
K.	8	" "	... 4/1 $\frac{1}{4}$
S.	7	" "	... 4/1
V. R. Co., Ltd.	6	" Crepe	... 3/7 $\frac{3}{4}$
Kalang	12	" "	... 3/8 $\frac{3}{4}$
F. M. S.	34	" "	... 3/4 $\frac{3}{4}$ 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	... "
Yanseng	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	... 4/4 $\frac{1}{2}$
Nikakotua	2	" "	... 3/10
Doranakande	2	" Biscuits	... 4/1
	2	" Scrap	... 2/8 $\frac{1}{2}$
Warriapolla	5	" Biscuits	... 4/6
Sorana	4	" "	... 4/1
Culloden	4	" Crepe	... 3/4 $\frac{1}{4}$
Arapolakande	8	" Biscuits	... 4/1
	6	" Crepe	... 4/3
Culloden	7	" "	... 3/5
	5	" "	... 2/11 $\frac{3}{4}$
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,

Taiping, 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.

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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	29.884	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 Lumpur, 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
Jelevu	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.						TEMP. RADIATION.			WIND DIRECTION.			TEMP. OF EVAPORATION.			COMPUTED VAPOUR TENSION.			RELATIVE HUMIDITY.			CLOUDS 0 TO 10.			WEATHER INITIALS.			RAIN.	
	9	15	Mean.	Maxi- mum.	Mini- mum.	Range.	Sun.	Differ- ance Sun & Shade.	Sun & Shade.	9	15		9	15	Mean.	9	15	Mean.	9	15	Mean.	9	15	21	9	15	21	Inch	Decr.
	H.	H.								H.	H.		H.	H.		H.	H.		H.	H.		H.	H.	H.	H.	H.	H.		
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	N	W	75.3	85.4	80.3	877	1.219	1.048	94	95	94.5	2	4	3	S	S	S			
3	79	86	82.5	89	68	21	143	54	W	W	W	77.3	86.3	81.9	937	1.180	1.058	94	95	95	2	4	5	S	C	C			
4	76	89	82.5	89	66	20	144	55	W	W	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	W	74.3	83.1	78.7	848	1.134	991	94	85	89.5	2	2	0	S	S	S			
6	77	87	83	88	66	19	143	55	W	W	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	W	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	W	73.6	82.7	78.1	829	1.121	975	89	90	89.5	1	2	6	S	S	S		.18	
9	76	80	78	87	68	19	140	53	W	W	W	74.3	76.6	75.4	848	916	882	94	90	92	2	4	4	S	S	S			
10	78	83	80.5	86	69	17	143	57	S	W	W	74.6	81.3	77.9	857	1.067	962	89	95	92	0	1	2	S	S	S			
11	77	86	81.5	88	68	20	144	56	N	W	W	71.9	80.1	76	783	1.064	923	84	85	84.5	2	4	5	S	S	S			
12	77	86	81.5	87	68	19	143	56	N	W	W	73.6	82.7	78.1	829	1.121	975	89	90	89.5	3	5	3	S	S	S			
13	80	84	82	85	69	16	144	59	N	W	W	77.7	82.3	80	947	1.103	1.025	90	95	92.5	2	3	4	S	S	S			
14	79	85	82	86	69	17	143	57	N	W	W	73.9	83.4	78.6	839	1.141	990	85	95	90	2	3	5	S	S	S		.06	
15	78	81	79.5	84	68	16	139	55	N	W	W	72.9	76	74.4	810	897	853	84	85	84.5	4	5	4	S	S	S			
16	79	83	81	86	68	18	140	54	N	W	W	73.9	81.3	77.6	839	1.067	953	85	95	90	6	1	4	S	S	S		.32	
17	78	85	81.5	86	69	17	140	54	N	W	W	76.3	83.4	79.8	906	1.141	1.023	94	95	94.5	3	2	5	S	S	S			
18	77	85	81	84	68	16	139	55	N	W	W	73.6	83.4	78.5	829	1.141	985	89	95	92	4	2	3	S	S	S		.15	
19	73	85	79	86	69	17	140	54	N	W	W	71.3	81.7	76.5	766	1.082	924	89	90	92	3	2	6	S	S	S			
20	77	86	81.5	88	70	18	147	59	N	W	W	73.6	80.1	76.8	829	1.064	946	89	95	92	2	4	5	S	S	S			
21	76	87	81.5	88	71	17	145	57	N	W	W	72.6	83.7	78.1	801	1.158	979	89	90	89.5	2	4	5	S	S	S			
22	78	88	83	89	70	19	144	55	N	W	W	72.9	81.5	77.2	810	1.075	942	84	81	82.5	2	3	2	S	S	S			
23	77	87	82	88	69	19	143	55	N	W	W	73.6	85.4	79.5	829	1.219	1.024	89	95	92	4	4	3	S	S	S			
24	78	87	82.5	89	70	19	145	56	N	W	W	74.6	83.7	79.1	857	1.158	1.007	89	90	89.5	3	5	4	S	S	S		.08	
25	79	86	82.5	88	69	19	144	56	N	W	W	75.6	82.3	78.9	888	1.180	1.034	90	95	92.5	4	6	7	S	S	S			
26	77	87	82	89	70	19	146	57	N	W	W	73.6	85.4	79.5	829	1.219	1.024	89	95	92	3	5	7	S	S	S		.42	
27	78	84	81	86	69	17	145	59	N	W	W	74.6	75.7	75.1	851	888	872	89	76	82.5	4	4	6	S	S	S			
28	76	85	80.5	88	70	18	144	56	N	W	W	74.3	81.7	78	848	1.082	965	94	90	92	2	4	2	S	S	S			
29	77	84	80.5	87	69	18	145	58	W	W	W	71.9	80.7	76.3	783	1.045	914	84	90	87	4	4	5	S	S	S		.62	
30	76	85	80.5	88	70	18	146	58	W	W	W	72.6	81.7	77.1	801	1.082	941	89	90	89.5	2	3	5	S	S	S		.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	S	S		.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

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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

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MALAY-ENGLISH VOCABULARY.

89

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. *sempit*.

Pi'chit, *m-m'chit*, to pinch, nip.

Pi'hak, side, quarter, flank, party.

Pihutarg, see *lutarg*.

Pijak, *m-m'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-m'kat*, to catch birds with birdlime.

P-m'kat, a decoy bird; a bird catcher.

Pikir, see *fikir*.

Pi'kul, *m-m'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-m'leh*, to choose, select, elect.

Pi'le-han, chosen, elect.

Pi'lu, moved, affected, troubled, agitated. Cf. *rauca*.

Pim'pin, *m-mim'pin*, to hold or lead by the hand, guide, lead.

Pi'ng, *m-m'ng*, the betel-nut palm; to ask in marriage, make an offer of marriage.

Pi'ng, *Pi'ng*, Penang.

Pin'dah, *ber-pin'dah*, to move from one place to another, migrate, move house. Cf. *alah*.

Pin'dah-kan, to remove a thing, transport, transplant.

Pin'gan, a large plate, a dish. Cf. *piring*.

Pin'garg, the waist.

Bu'ah pin'garg, the kidneys.

P'kat pin'garg, belt, girdle.

Pin'gir (Jav.), edge, border, shore. Cf. *tepi*.

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. *rahlat*.

Pin'tas, *m-min'tas*, to make a short cut, cut across. Cf. *rintas*.

Pin'tu, door, gate.

Pin'tu ger'bang, the gate of a fort or city.

Pin'tu pa'gar, a gate in a fence.

Ba'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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Even an indirect or implied command requires *jangan* as a negative, for instance,

suruh 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,

supaya kaki-nya jangan kotor.
so that his feet should not get dirty.

VOCABULARY.

NOUNS.

anjing, dog.
dhobi, washerman.
ikan, fish.
itik, duck.
kipas, fan.
kemeja, shirt.
kolam, pond
kucing, cat.
nama, name.

obat, medicine.
pagar, fence.
pokok, plant, tree.

VERBS.

bayar, pay.
kuyak, 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 "Habisi."

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

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Agricultural Bulletin

THE

STRAITS

AND

FEDERATED MALAY STATES.

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H. N. RIDLEY, M.A., F.R.S., F.L.S., F.R.H.S.
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AND

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AGRICULTURAL BULLETIN

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II.]

NOVEMBER, 1908.

[VOL. VII.]

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 disease a tree frequently loses its firm hold in the soil and is shaken about by the wind causing a cup-shaped depression around 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, is treated as infected and incurable.

The following extracts taken at random from reports 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."