Agricultural Bulletin

OF THE

— STRAITS —

AND

FEDERATED MALAY STATES.

FOUNDED BY

H. N. RIDLEY, C.M.G., M.A., F.R.S., &c., in 1891, and edited by him up to 1911.

AND CONTINUED BY

The Botanic Gardens Department Singapore.

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CONTENTS.

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THIRD SERIES.

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SINGAPORE:
THE STRAITS TIMES PRESS, LIMITED.

INTRODUCTION

AS the Bulletins contain much material of great interest to Planters and Horticulturalists in general, I have endeavoured to form as complete an index as possible by including each article under its special heading. This has been a matter of extreme difficulty as many articles had no title so that in many cases one article may be found under one of two or three headings.

Many of our readers may be interested in some special subject and may not want to purchase a complete volume to obtain the necessary literature, so that I have given the Volume, the Month and the page in nearly every case. Should they desire some particular article, it will now only be necessary to write to the Botanic Gardens giving Volume and Month *(by the way, enclosing the cost of same).*

As the Bulletin has been edited largely for the help of Planters in general, I have also endeavoured to keep all the articles on Para Rubber by themselves. This method should greatly facilitate the reference to articles required by Planters which have appeared in the Bulletins.

I trust this has not been a labour in vain and that it will supply a long felt want.

JAS. W. ANDERSON.
Assistant Curator.

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AGRICULTURAL BULLETIN

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No. 2.] FEBRUARY, 1912. [Vol. 1

VITALITY OF RUBBER SEEDS.

By F. G. Spring, Superintendent, Government Plantations, F.M.S.

Seeds of Hevea braziliensis do not retain their vitality for a long period and the consequent difficulty of forwarding them successfully to distant countries is well known. This year several hundred thousand Para seeds from tapped trees were packed in Venesta chests with charcoal and forwarded to Trinidad. The results obtained were far from satisfactory although the seeds were most carefully selected and packed.

There is no doubt that seeds picked immediately on falling, and carefully packed, give the best results. If they are allowed to be on the ground, or if badly packed, a smaller percentage of germination will be obtained. It must be borne in mind however, that no matter how the packing has been done, the vitality of Para seeds cannot be retained for any length of time if they are not gathered immediately. The seeds must not be packed too many in a box, otherwise fermentation starts and the whole mass heats and loses its vitality; the packing material must be just sufficiently moist to prevent the seeds from drying out and not moist enough to encourage the growth of moulds and bacteria. For the same reason the packing must be fairly tight and yet not quite air-tight. Small boxes seem better than larger cases.

Experiments have been carried out as mentioned in a previous article* at the suggestion of the Director of Agriculture to compare the germinating power of seeds from tapped and untapped trees (Expt. I.) and to see if by coating the surfaces of the seeds with various substances (Expt. II.) the germinating power could be retained for a longer period. The tapped and untapped trees selected for the experiments are 12 years old; the first mentioned have been tapped for the past 2 years, the seeds were collected fresh each morning and treated as mentioned in the following list.

Experiment I.

The Vitality of Seeds from Tapped and Untapped Trees.

All seeds were packed with burnt padi husk in biscuit tins, each containing 200 seeds. The tins were wrapped in brown paper and sealed.

Boxes Nos. 1, 2, 3, 4, 5 and 6 were kept 3, 5, 7, 8, 9, and 10 weeks respectively then opened, and the seeds planted in well prepared nursery beds. It will be seen from the tables that seeds from untapped trees gave on an average 50 per cent. higher germination than those from tapped trees reckoned on the absolute percentage. In each test the former showed from two to three times as many germinations as the latter.

A record of similar experiments is published in the Circulars and Agricultural Journal of the Royal Botanic Gardens, Ceylon, Volume IV., No. 11, May 1908. This circular states that "seeds from tapped trees kept for five weeks did not germinate but those kept for four weeks showed 28 per cent. germination while seeds from untapped trees kept for four weeks did not germinate and those kept for three weeks showed only 3 per cent. germination. Both in percentage, germination, and time of germination the seeds from tapped trees are better throughout." No information is given regarding the manner in which the seeds were kept previous to planting.

It will be seen that the Ceylon figures are at variance with those obtained here, but it is difficult to say why this should be.

The Ceylon Circular also states that seeds from tapped trees are smaller, weigh less per 1000 seeds than those from untapped trees. This agrees with the figures obtained here, namely, seeds from untapped trees were found to be on an average 10.7 per cent. heavier than those from tapped trees of similar ages. The figures in Experiment I. are of interest not only as regards the suitability of exporting seeds from untapped trees but they also tend to show the effect tapping has on the vitality of the seed. Tapping lessens the weight and size of the seeds, and according to the present experiments reduces the germinating power.

* Agricultural Bulletin of the Straits and Federated Malay States Vol. X. No. 11, p. 345, November 1911.

It is evident that seeds which are to be exported are best selected from untapped trees.

Experiments are to be conducted to compare the growth of plants resulting from seeds of tapped and untapped trees.

Table 1.

Percentage of Seed Germination obtained from Tapped and Untapped Trees.

No of box.	No. of seeds in box.	Length of time the seeds were in boxes.	No. of plants obtained.		Percentage of seed Germination.	
			Tapped.	Untapped.	Tapped.	Untapped.
1	200	3 weeks	67	156	33	78
2	200	5 „	46	133	23	66
3	200	7 „	48	100	24	50
4	200	8 „	40	167	20	83
5	200	9 „	40	164	20	82
6	200	10 „	49	165	24	82

Experiment II.

The Preserving of Rubber Seeds from Tapped Trees.

The seeds in these experiments were collected and packed in a similar way to those in the first experiment but they were coated respectively with bees wax, hard paraffin, and vaseline. The bees wax and hard paraffin were melted and the seeds dipped into their respective liquids, allowed to solidify and then packed. Previous to planting the seeds, the hard paraffin, bees wax, and vaseline were removed.

The percentage of germination of untreated seeds from tapped trees can be seen by referring to experiment I. On comparing this with the seeds coated with bees wax it will be seen that the latter showed an increased germination to the extent of approximately 30 per cent. The seeds coated with hard paraffin gave better results than untreated seeds from tapped trees but not as good as those coated with bees wax.

The seeds treated with vaseline did not germinate. The coating of rubber seeds with any substance is undoubtedly an expensive treatment but if seeds have to be sent to countries which take from 1½ to 2½ months to reach and seeds from untapped trees cannot be obtained, then, I think that the extra percentage of germination resulting from seeds being coated with bees wax would more than repay the extra expense entailed by this system of treatment.

Table II.

Percentage of Germination of Seeds from Tapped Trees coated with Bees Wax and Paraffin.

No of box.	No. of seeds in box.	Length of time the seeds were in boxes.	No. of plants obtained.		Percentage of seed germination.		
			Bees Wax.	Paraffin.	Bees Wax.	Paraf-fin.	Untre a-ted. *
1	180	3 weeks	107	62	59	34	33
2	180	5 „	108	71	60	40	23
3	180	7 „	94	74	52	41	24
4	180	8 „	82	66	45	37	20
5	180	9 „	100	61	55	34	20
6	180	10 „	86	58	47	32	24

* Untreated seeds from tapped trees (see Expt. I.)

In no case was there apparent a large falling off in germinating power from the third to the tenth week.

It is hoped to repeat both experiments in 1912.

GOGO VINE.

(*Entada scandens*, Benth).

In the "Board of Trade Journal," September 14th last, reference is made to samples of "soap bark," the prepared bark of the Gogo Vine recently received from H. M. Consul at Manila, with the information that the material is suitable for the manufacture of soap and hair-washes.

From small specimens of the stem and prepared bark obtained from the Board of Trade, it has been possible to determine the material as the produce of *Entada scandens*. This is an immense climber cosmopolitan in the tropics, and may be readily recognised by its spirally twisted stems and huge pods which are from two to four feet long, containing hard polished flat circular seeds of a chestnut colour. So long ago as May, 1855, the late Mr. T. C. Archer presented to the Museum a similarly prepared sample of the bark under the same vernacular name, with a note to the effect that it contains saponaceous properties, forms a lather with water, and is much used by Manila ladies for cleaning the hair. The following particulars as to the mode of preparing the bark and its local applications are gathered from "The Medicinal Plants of the Philippines,"

by T. H. Pardo de Tavera, p.106:—"The use made of the mashed bark of this tree is well known throughout the Philippines. Cut in strips and beaten thoroughly between stones it is sold under the name of 'Gogo,' it is macerated in water to which it imparts a reddish colour, and forms a substitute for soap. The Filipinos use this preparation for bathing especially the hair, for which purpose there is no more useful or simple preparation. It cures pityriasis, and renders the hair very soft, without drying it too much as is usually the case with soap. The natives use it in treating the itch, washing the affected parts with the maceration and at the same time briskly rubbing them with the bark; in this way they remove the crusts that shield the acari. The treatment is successful in direct proportion to the energy of rubbing. . . The maceration of gogo is emetic and purgative; it is used in the treatment of asthma; it is exceedingly irritating, the slightest quantity that enters the eye causing severe smarting and a slight conjunctivitis for one or two days."

The seeds, which contain saponin, are stated to be used by the Nepalese in the preparation of a hairwash. According to Watt (Dict. Econ. Prod., India,) the most general use to which the seeds are applied in India is for crimping linen. The Dhobis cut one side of the seed and scoop out the kernel then they introduce two fingers into the cavity, and quickly stroke the damp linen forwards with its polished su-face. This crimps it beautifully crossways. The seeds are made occasionally into snuff-boxes and other articles, and are often carried long distances by ocean currents.—(*Kew Bulletin*, page 474—No. 10 1911)

J. M. H.

The subject of the preceding note (*Entada scandens*) is a fairly common plant throughout the Malay Peninsula where it is known under the native name of "Akar Beluru." The flowers are borne on spikes 6-10 inches long but are not attractive. The pod which is said to be 1-3 feet long is spirally curved into a mass in the Malay plants, and has the appearance of being far too heavy for so slender a climber, which however, depends on its tendrils for support. There is a model of the fruit in the collection at Raffles Museum.

R. DERRY.

FACTORIES ON PLANTATIONS.

The Selection of a Site.

The selection of a suitable factory site requires, in some countries, considerable thought. On hilly estates, it is customary to select some area as low, while as central, as possible. This generally enables the manager to economise in transport and sometimes to use water power.

On such properties, sites which are swampy, liable to flood, or unhealthy, should be avoided. It is often much cheaper to select a site at some altitude, and pump water up to the factory, than to choose a place convenient only for water and transport. In considering the site in relation to transport, it should be borne in mind that carrying the latex—which may contain more than 50 per cent. of water—to the factory is more expensive than subsequent transport of dry rubber to the nearest cart road. The selection of a site is also partly determined by the accessibility of the area for passengers and cart traffic, proximity to a good, clean supply of water, exposure to wind, and the character of the subsoil.

One difficulty frequently experienced, especially when artificial heating apparatus is not employed, is that of getting a good supply of cool air through the building. This defect is often due to the site not being at a sufficient altitude and to the building being closely surrounded by forest trees of the Hevea type.

Types of Factories Required.

The type of factory to be erected depends upon many conditions, such as the amount of the crop and the methods of curing and washing.

In order to meet crop requirements, care should be taken to ensure that extensions can be easily and economically made from time to time. This is particularly the case where small and similar acreages come into bearing regularly each year for many years in succession. Where the whole of the area is in bearing, the building need not provide for extensions to the same degree, though an annual increase in yield per acre must be allowed for.

The method of curing also has a bearing on the type of factory required. If vacuum driers are used, the size of the factory can be reduced. If artificial heating apparatus is provided the rubber is dried more quickly, and less space is therefore required in the curing section. The installation of heating apparatus, fans, etc., generally necessitate the erection of a two-storey building. Smoking must also be considered, though in many cases a separate building is erected for this phase of the curing process. Frequently, however, the rubber is smoked, while being cured, in a part of the factory permanently set aside for this work.

The kind of washing machine and position of shafting must also be considered in the erection of the walls and floor of a factory. There are some washing machines which have double or treble the working capacity of others, and which demand comparatively less space. Shafting, if overhead, may require wall brackets, which frequently necessitate an entirely different construction. Floor shafting, on the other hand, may be erected more or less irrespective of the materials used in the construction of the building.

Type Now Used on Plantations.

Though in the types of factories now used on plantations there is considerable variation, there is some ground for hoping that standardisation will ultimately be recognised. If rubber plantation factories were standardised, the cost would be appreciably lessened, and additions more easily made. A width of forty feet, with bays ten feet, has been suggested (Davidson, Souvenir, I. R. J.) as the standard to adopt.

On Eastern estates the factories are either: (1) entirely on ground floor, (2) two-storeyed (or more) throughout, or (3) two-storeyed only in the curing section. They are provided with a space for the engines inside the factory, or a separate building adjoining the factory is reserved as the power station.

Materials Used in Construction.

Most factories are steel-framed and covered with galvanized corrugated-iron sheets. Where the roof is not provided with a timber ceiling, the air is apt to get very warm in the tropics. The sides, or walls, are usually made of corrugated-iron sheets, similar to those used for the roof. On some estates timber is sometimes favoured, in which case it is advisable to use wood which has been impregnated with creosote, in order to preserve it against the attacks of white ants. Brick walls, between the iron columns, are not often erected, though they are always cool, durable, and neat.

Ventilation of Factories.

Apart from health reasons, there are many others why rubber factories should be well ventilated. Rubber contains a proportion of putrescible matter, and if the air is not kept pure, bacteria may appear in large numbers and lead to deterioration of the rubber during curing. Furthermore, drying is, even in dry weather, expedited if a good draught of fresh air is maintained through the building. The majority of factories rely upon open windows and doors, together with a fan, for their supplies of fresh air; expanded metal, which is so constructed as to allow of air currents, is now used, near the eaves or floor level.

Floors of Factories.

The ground-floor is, for durability and cleanliness, usually made of cement. It is, however, not uncommon to find white ants boring their way through thin layers of cement, and it is therefore necessary to see that this work is properly executed. In order that water may be carried rapidly away from the washing machines and drip racks, channels should be freely provided. The floor requires washing at regular intervals (preferably with water containing some cheap disinfectant) and it is therefore necessary to construct it with a slope of, say, one in eighty, to hasten drying.

Where one-storey buildings are installed with artificial heating apparatus, a timbered floor is often necessary. This may be provided with spaces for the passage of air, and be raised above the level of the ground to enable steam or hot-air pipes to be laid and to create a hot-air chamber in this region.

Light and Windows in Factories.

The bad effect of light on rubber, and the necessity of having abundance of light in the machinery sections, necessitate the adoption of a different arrangement in various parts of the factory. There can hardly be too many windows near the engines and washing mills. These should therefore be provided and constructed so as to open inwards for draught purposes.

In the curing room, however, windows must either be supplied with red glass, or curtains, to stop the chemical rays from reaching the rubber, or with wooden or corrugated iron doors—which can be opened from the inside to allow light to enter during inspection of the rubber. It is necessary that the rubber in the curing room be frequently inspected in order that the development of moulds and tackiness may be arrested in the initial stages; hence the desirability of having even the curing room well supplied with light under control.

Doors and windows should, whenever possible, be made to close on the inside in order that draughts of fresh air can enter the building without check.—(*India Rubber Journal.*)

POTATOES AND JERUSALEM ARTICHOKES FOR PIGS.

"In his valuable work on "Pigs and their Management," Mr. H.W. Potts, Principal of the Hawkesbury College and Experiment Farm, Richmond, New South Wales, gives a chapter on "Crops for Pigs." Amongst the roots and tubers he considers Jerusalem artichokes as a most valuable food. Why this crop has been so much neglected by Queensland pigbreeders is hard to understand, seeing that its cultivation is simple and the yield of tubers considerable.

Concerning roots and tubers generally as pig-food, Mr. Potts says that:—"All these, when fed continuously and exclusively to pigs, have a lowering tendency on the digestive functions, but that this is a matter which, in intelligent hands, can be controlled. The value and importance, he says, of root crops for pigs, particularly in our warm climate, are now widely recognised, in so far as they are used only as a succulent and relishable adjunct to other classes of food, richer in protein, and containing less moisture. A normal nutritive ratio must be maintained, and the success of feeding largely depends on the right interpretation of the balanced ration. We find that many root crops form excellent aids to the standard feeds.

"Amongst the domestic animals, none respond so readily to root crops as pigs. We have to admit that, under some conditions of climate, they are costly crops to raise, as they require large quantities of water. All things being equal, however, they provide a high percentage of digestible dry matter. Their value is chiefly emphasised in making available, during the hot, dry months of summer, and the cold months of winter, a succulent, relishable fodder, when our natural pastures and herbage are dry and scarce.

"Seeing they contain high percentages of water, starches, and sugars, it is essential, in the maintenance of a maximum growth in fattening swine, that they be combined judiciously with cereals, maize, flesh food, lucerne, pollard, skim milk, cowpeas, peas, beans, and other similar foods.

"A too wide nutritive value may create waste and check good growth by preventing the complete digestion of the protein, as well as permitting some of the starches to pass from the body as manure."

On the subject of

Potatoes

as pig food, the author says: "When fed to pigs, potatoes appear to agree with them better than other root crops, particularly when the ration is balanced with barley, maize, or oats and skim milk. The Danes secure very high returns with this class of food. The starchy matter of the potatoes is combined with the protein of the skim milk and cereals to formulate a well-arranged diet. The bacon made from pigs fed on these rations has a notable reputation.

"At the Wisconsin Experiment Station it was ascertained that 1 bushel of maize is equal in food value to 4½ bushels of cooked potatoes. In numerous experiments it was found that pigs always secured better flesh gains by being fed on cooked potatoes in comparison with those given raw.

"The use of potatoes as pig-feed can only be determined by the current market values. When potatoes are low in price, their use as a pig-food is justified; but, where potatoes are grown as a staple crop on the farm, there is always an unmarketable residue, and these can be fed to pigs with advantage. Pork raised solely from potatoes has a tendency to be very fat, and wasteful in cooking. In every instance they must be fed with other foods in which the percentage of protein is prominently high."

Artichokes.

"This is a flowering, perennial plant which has, in the past, been overlooked as a valuable food for pigs. It grows from 6 to 9 feet high, and when in bloom, seen from a distance, the crop looks like one of miniature sunflowers.

"The stalks are frequently used for feeding sheep or conversion into silage, and the tubers afford a palatable and succulent food for pigs. The plant is very persistent in growth, and, if raised, in suit-

able soil, is difficult to eradicate. Enough tubers, as a rule, are left each year to continue the crop; hence it is wise to set apart a permanent paddock for it, or the odd corners of a farm, or waste places of little value for other crops may be used for growing artichokes.

"The plant is extremely hardy; it resists frost and drought. Whilst the best crops are raised on good mellow loam, profitable yields are secured on stiff clay lands, light sandy or gravelly soils. The land is best suited where the drainage is good; in fact, any soil suitable for potatoes will answer for artichokes. It is a crop that requires little attention when it is established.

"The soil needs thorough cultivation. It should be deeply ploughed about May or June. During the winter it may be harrowed occasionally, lightly reploughed about September, and well manured as if for sweet potatoes. The tubers are then planted by dropping them into furrows 3 ft. apart, with a space of 2 ft. between the tubers. If the sets are small, plant whole, while large ones may be cut. Cover by turning a furrow over them. About 4 cwt. of tubers will plant an acre.

"The crop matures in five months. Should rain fall immediately after planting, the harrow may be run over the land to fine the surface. This should be repeated when the plants are about 4 in. high. It checks evaporation, destroys, weeds, and will not injure the crop. Later on, the cultivator should be kept moving between the rows about once a month.

"When the crop flowers and the tops droop and die, about April or May, it is ready for harvesting. The average yield will be from 7 to 8 tons per acre."

"Two varieties were tested at Hawkesbury College, and gave the following results:—

Jerusalem White	...	...	9 tons 1 cwt. per acre.
Jerusalem Pink	...	..	6 tons 16 cwt. per acre.

"For feeding pigs it is best to turn them into the crop to root out the tubers. It must be remembered that, where it is desired to continue the crop, the pigs should be removed before all the tubers are eaten.

"Few foods are more relished by pigs. The tuber in the raw state is very nutritious, more especially for pregnant sows, and also sows reduced in weight and condition after suckling and weaning big litters.

"This class of food acts as a diuretic, or promotes a healthy action of the kidneys in secreting urine; it relieves constipation and stimulates liver function. One acre will support twenty sows from four to six months. Young growing pigs evidence considerable growth on being fed with them for a short period. The exercise obtained in harvesting or rooting up the tubers has a beneficial influence. It is especially notable that artichokes are very digestible.

"The outcome of a number of tests goes to show that, for fattening purposes, these tubers must be given with grain, and have a similar result to feeding with ordinary potatoes; 325 lbs. of wheat fed with 820 lbs. of artichokes gave 100 lbs. increase. The average composition of the artichokes is shown here in contrast with the potato":—

	Water.	Ash.	Protein.	Carbo hydrates.	Fat.	Nutritive Value.
Artichoke ...	79.5	1.0	2.4	16.7	0.2	1 : 7
Potato ..	78.9	1.0	2.1	17.9	0.1	1 : 8.6

JERUSALEM ARTICHOKE.

The culture of Jerusalem Artichokes (*Helianthus tuberosum*) has long been neglected in the Malay Peninsula. It is difficult to imagine why this should be so as their cultivation is of the easiest. Beyond deep changkoling of the soil and the keeping down of weeds, little further attention is required.

The tubers are used as a vegetable, sometimes as a dish but more usually for flavouring purposes. They are very popular with many Europeans, and as good vegetables are difficult to obtain, this plant ought to be more widely cultivated than it is at present. Plants will grow in almost any situation but the best results and largest tubers are obtained when they receive plenty of room and liberal treatment. Deeply changkol the soil and add to it a little well decayed cow manure about a fortnight before planting. Avoid using horse manure for various reasons.

The roots or tubers are planted in rows 2 feet apart and it is often as well to shade the plants when the leafshoots first appear. The stems do not grow to the height they do in Europe but they usually produce flowers, which is the exception in England. When the plants are about four feet high (usually their full height) the leaves wither and die. It is then that the tubers are in an edible condition.

When artichokes are grown as a vegetable for European consumption, it is not advisable to plant up a large area at once as the resultant tubers soon become discoloured and uneatable if lifted and stored, and if left in the ground for very long they would commence to sprout again. If a small bed is planted with tubers at the above mentioned distances and three weeks are allowed to elapse between each successive planting, a continuous supply of fresh tubers can be obtained. It usually takes from three months from the time the tubers are planted until the next crop is available.

The plant is really a Canadian sun flower.

J. W. A.

HORTICULTURAL NOTES.

Euphorbia pulcherrima or, as it is commonly called, Poinsettia pulcherrima is a plant frequently met with in the East. Its beauty does not so much reside in the flowers as in the bracts with which they are surrounded. It may be successfully grown in tubs or large pots, and small plants are admirably adapted for table decoration.

Owing to the amount of latex which exudes when a shoot is cut, the propagation of this plant is attended with considerable difficulty. It is practically useless to attempt to strike newly made cuttings, as the greater percentage will shrivel and die. Cuttings of Poinsettia, and this applies to many other lacticiferous plants, require to be slightly dried before they are inserted. Remove the shoots which can be spared from a plant and allow them to lie for about a fortnight in a shady, dry situation. The soft, sappy, useless shoots will immediately shrivel but the firmer wood at the base of the shoots remains sound. At the end of about a fortnight cuttings can be made and inserted in pots.

The size of the cuttings should be about four inches and it is essential that the base of the cutting be cut slightly below a node or bud, *i.e.*, where the stem is solid. The internodes or other parts of the stem are hollow and the shoot has generally to rot away until a solid piece of stem is reached. As may readily be imagined it is a matter of considerable difficulty to arrest the growth of this rot.

Insert the cuttings in six inch pots using a sandy compost. Cuttings root much more readily when placed round the side of a pot so that only four or five should be inserted round the side of the above mentioned size of pot. Until the cuttings are rooted, the soil requires to be kept slightly drier than is usually the case with other plants. Pot off singly into small pots and provide the same treatment afforded other plants of a like nature.

J. W. A.

EXPORTS TELEGRAM TO EUROPE AND AMERICA.

	Steamers.		Wired. Jan. 15 Tons.	Jan. 31 Tons.
Tin	Singapore & Penang to	U. Kingdom &/or	1,276	1,192
Do.	do.	U. S. A.	335	816
Do.	do	Continent	250	128
Gambier	Singapore	Glasgow	...	...
Do.	do.	London	35	10
Do.	do.	Liverpool	300	...
Do.	do.	U. K. &/or Continent	125	275
Cube Gambier	do.	United Kingdom	30	10
Black Pepper	do.	do.	10	...
Do.	Penang	do.	...	...
White Pepper	Singapore	do.	10	95
Do.	Penang	do.	...	...
Pearl Sago	Singapore	do.	5	15
Sago Flour	do.	London	150	175
Do.	do.	Liverpool	975	...
Do.	do.	Glasgow	...	50
Tapioca Flake	Singapore	United Kingdom	80	85
Tapioca Pearl & Bullet	do.	do.	190	75
Para Rubber	Straits & Malaya	do.	550	625
Gutta Percha	Singapore	do.	35	40
Buffalo hides	do.	do.	290	...
Pineapples	do.	do.	14.500	8,000
Gambier	do.	U. S. A.	225	85
Cube Gambier	do.	do.	30	80
Black Pepper	do.	do.	...	45
Do.	Penang	do.	...	20
White Pepper	Singapore	do.	35	70
Do.	Penang	do.	...	5
Tapioca Pearl	Singapore	do.	...	...
Nutmegs	Singapore & Penang	do.	9	22
Sago Flour	Singapore	do.	125	100
Pineapples	do.	do.	2,750	1,000
Do.	do.	Continent	2,750	2,500
Gambier	do.	South Continent	160	...
Do.	do.	North Continent	250	30
Cube Gambier	do.	Continent	45	30
Black Pepper	do.	South Continent	80	25
Do.	do.	North do.	15	25
Do.	Penang	South do.	10	20
Do.	do.	North do.	...	...
White Pepper	Singapore	South do.	10	...
Do.	do.	North do.	50	20
Do.	Penang	South do.	10	5
Do.	do.	North do.	...	5

		Steamers.		Wired. Jan. 15 Tons.	Wired. Jan. 31 Tons.
Copra	Singapore & Penang		Marseilles	400	800
Do.	do.		Odessa	160	280
Do.	do.		Other South Continent	600	...
Do.	do.		North Continent	880	1,275
Sago Flour	Singapore		Continent	1,500	825
Tapioca Flake	do.		do.	95	55
Do. Pearl	do.		do.	35	15
Do. Flake	do.		U. S. A.	...	...
Do. do.	Penang		U. K.	...	50
Do. Pearl & Bullet	do.		do.	150	85
Do. Flake	do.		U. S. A.	...	...
Do. Pearl	do.		do.	25	350
Do. Flake	do.		Continent	10	...
Do. Pearl	do.		do.	75	270
Copra	Singapore & Penang		England	150	...
Gutta Percha	Singapore		Continent	75	50
Tons Gambier }	...	...	...	100	1,050
„ B. Pepper }				...	270
Para Rubber	Straits and Malaya		U. S. A.	25	30
Do.	do.		Continent	55	55

SINGAPORE MARKET REPORT.

January, 1912.

	Tons.	Highest	Lowest.
Copra	4,237	$10.85	$10.00
Gambier Bale	1,150	10.50	10.10
„ Cube No. 1 & 2 ...	398	16.00	13.50
Gutta Percha 1st quality ...	...	275.00	200.00
„ medium ...	...	140.00	90.00
„ lower ...	...	70.00	17.00
Gutta Jelotong	...	9.87½	8.25
Nutmegs 110s.	...	25.00	24 00
„ 80s.	...	27.00	26.00
Black Pepper	270	23.00	21.00
White „	149	34.00	30.50
Sago Pearl, small	181	5.40	5.30
„ Flour No. 1	5,173	4.30	4.25
„ „ No. 2	979	1.60	1.35
Tapioca Flake, small ...	578	9.10	8.90
„ Pearl „ ...	129	11.00	7.60
„ „ medium ...	267	9.10	8.50
Tin	2,410	96.45	92.00

PERAK.

Abstract of Meteorological Readings in the various Districts of the State of Perak for the month of November, 1911.

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	...	105	79.35	91	70	21	76.09	856	...	87	...	23.24	2 56
Kua'a Kangsar	...	...	78.45	93	69	24	75.08	826	...	86	...	10.03	4.71
Batu Gajah	...	95	79.81	90	71	19	76.46	867	...	87	...	15.43	2.33
Gopeng	...	...	78.88	90	68	22	74.71	807	...	82	...	15.38	4.19
Ipoh	...	...	80.29	91	70	21	75.78	830	...	80	...	8 52	1.62
Kampar	...	...	79.31	91	70	21	75 99	853	...	86	...	15.20	3.00
Telok Anson	...	...	79.64	93	71	22	76.47	869	...	87	...	14.03	3.20
Tapah	...	...	79.12	91	68	23	75.89	851	...	86	...	22.08	2.98
Parit Buntar	...	...	80.60	88	71	17	76.15	844	...	82	...	11.00	2.53
Bagan Serai	...	...	80.61	89	71	18	76.87	874	...	85	...	13.36	2.40
Selama	...	...	79.31	94	70	24	75.39	827	...	84	...	22.30	4.69
Lenggong	...	...	78.93	89	70	19	75.51	840	...	86	...	12.29	2.30
Tanjong Malim	...	...	80.17	92	69	23	77.24	897	...	89	...	9.93	1.77
Grit	...	...	77.34	91	67	24	73.55	779	...	84	...	9.01	1.84
Klian Intan	...	...	...	...	...	...	...	...	...	...	...	11.24	1.73
Pulau Bangkor Laut	...	...	...	...	...	...	...	...	...	...	...	9.14	1.78
Kuala Kurau	...	...	...	...	...	...	...	...	...	...	...	11.59	1.49
The Cottage	...	...	...	...	...	...	...	...	...	...	...	22.33	3.78
Maxwell's Hill	...	...	...	...	...	...	...	...	...	..	...	19.11	4.23

OFFICE OF THE SENIOR MEDICAL OFFCER,
TAIPING, 14th December, 1911.

S. C. G. Fox.
Senior Medical Officer.

PERAK.

Abstract of Meteorological Readings in the various Districts of the State of Perak for the month of December, 1911.

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	...	105	80.11	91	70	21	76.43	863	...	85	...	18.97	3.48
Kuala Kangsar	...	...	78.89	91	69	22	75.42	837	...	86	...	9.97	2.62
Batu Gajah	...	96	81.08	91	71	20	76.30	845	...	80	...	12.79	2.40
Gopeng	...	...	78.98	90	69	21	74.59	799	...	82	...	13.22	2.02
Ipoh	...	...	80.98	93	71	22	76.57	856	...	82	...	10 62	1.93
Kampar	...	...	79.84	90	70	20	75.87	842	...	84	...	17.01	4.62
Telok Anson	...	...	80.50	93	70	23	76.77	875	...	85	...	16.57	3.55
Tapah	...	...	79.36	91	68	23	75.90	852	...	86	...	25.11	5.91
Parit Buntar	...	...	80.63	88	71	17	76.28	848	...	82	...	6.66	1.96
Bagan Serai	...	...	80.94	91	70	21	76.81	868	...	82	...	10.72	4.86
Selama	...	...	79.97	92	70	22	75.27	813	...	80	...	9.00	2.68
Lenggong	...	...	78.52	91	69	22	75.08	825	...	86	...	6.88	1.90
Tanjong Malim	...	...	79.72	92	69	23	76 82	885	...	89	...	12.09	2 67
Grit	...	...	76.69	92	66	26	72.78	756	...	84	...	11.80	3 37
Klian Intan	...	...	...	...	...	...	...	...	...	...	...	9.40	1.95
Pulau Pangkor Laut	...	...	...	...	...	...	...	...	...	...	...	11.46	1.87
Kuala Kurau	...	...	...	...	...	...	...	...	...	...	...	6.96	2.40
The Cottage	...	...	...	...	...	...	...	...	...	...	...	11.02	1.78
Maxwell's Hill	...	...	...	...	...	...	...	...	...	...	...	12.11	2 20

Office of the Senior Medical Officer,
Taiping, 19th January, 1912.

S. C. G. Fox,
Senior Medical Officer.

SELANGOR.

Abstract of Meteorological Readings in the various Districts of the State of Selangor for the month of November, 1911.

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 ...	29.897	144.3	81.1	85.4	73.2	12.2	76 1	81.0	72.8	76	Calm.	12.25	2.46
Prisons „ „	...	...	...	...	...	...	...	...	...	...	...	12.09	2.10
District Hospital „	...	...	...	...	...	...	...	...	...	...	...	9.59	2.38
„ Klang	...	...	...	88.8	69.9	18.9	...	...	...	...	...	13.51	3.81
„ Kuala Langat ...	...	...	...	85.9	73.7	12.2	...	...	...	...	...	9.98	2.95
„ Kajang	...	...	...	85.1	74.9	10.2	...	...	...	...	...	11.56	2.18
„ Kuala Selangor ...	...	...	...	86 9	71.6	15.3	...	...	...	...	...	4.80	1.05
„ Kuala Kubu	...	...	...	89.8	70.5	19 3	...	...	...	...	...	17.94	3 90
„ Serendah	...	...	...	92.1	70.3	21.8	...	...	...	...	...	14.68	2.06
„ Rawang	...	...	...	90.9	72.4	18 5	...	...	...	...	...	13.43	2.08
Sabak Bernan	...	...	...	...	...	...	...	...	...	...	...	13.47	1.88

OFFICE OF THE SENIOR MEDICAL OFFICER,
KUALA LUMPUR, 3rd Jan,, 1912.

G. D. FREER,
Senior Medical Officer,
Selangor, Negri Sembilan & Pahang.

KELANTAN.

Abstract of Meteorological Readings in Kelantan for the Month of November, 1911.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Mean Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 4 hours.
			Mean Dry Bulb.	Mean Maximum.	Mean Minimum.	Mean Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
	° *F.*	° *F.*	° *F.*	° *F.*	° *F.*	° *F.*	° *F.*	° *F.*	° *F.*	%		Ins.	Ins.
Kota Bharu	...	142.0	78.4	81.88	74.03	7.85	76.2	.857	74.6	89.4	...	48.43	10.68
Kuala Lebir	...	...	75.8	83.9	72.4	11.5	74.5	.832	73.7	93.3	...	23.27	4.59
Kuala Kelantan	...	...	...	80.33	74.26	6.07	...	...	...	...	...	44.07	8.79
Kuala Pahi	...	...	...	80.76	72.53	8.23	...	...	...	...	...	23.54	3.55
Kuala Val Estate	...	...	...	80.53	72.70	7.83	...	...	...	...	...	31.71	6.12
Taku Plantation	...	...	...	...	...	...	...	...	...	...	...	26.79	4.10
Kenneth Estate	...	...	...	...	...	...	...	...	...	...	...	31.67	6.51
Pasir Jinggi ...	...	...	...	...	...	...	...	...	...	...	...	23.04	3.76
Chaning Estate	...	...	...	...	...	...	...	...	...	...	...	23.76	3.55
Pasir Gajah Estate	...	...	...	...	...	...	...	...	...	...	...	35.66	6.54
Pasir Besar	...	...	...	...	...	...	...	...	...	...	...	36.96	6.75
Pasir Puteh	...	...	...	...	...	...	...	...	...	...	...	39.37	8·37

Residency Surgeon's Office,
Kota Bharu, 28th November, 1911.

John. D. Gimlette.
Residency Surgeon, Kelantan.

KELANTAN.

Abstract of Meteorological Readings in Kelantan for the month of December, 1911.

DISTRICT.	Mean Barometrical Pressure at 32° F.	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.	Vapour Tension.	Dew Point.	Humidity.			
	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	%		Ins.	Ins.
Kota Bharu	...	148.0	77.5	81.22	73.77	7.45	75.6	.829	73.6	89.4	...	50.72	11.05
Kuala Lebir	...	...	74.9	83.6	72.00	11.5	73.9	.810	72.9	93.4	...	23.55	4.30
Kuala Kelantan	...	...	...	79.93	74.16	5.77	...	...	...	...	...	47.95	11.39
Kuala Val	...	...	...	79.32	72.25	7.06	...	...	...	...	...	25.71	3 95
Kuala Pahi	...	...	...	80.00	71.83	8.17	...	...	...	...	...	23.49	2.86
Taku Plantation	...	...	...	...	...	...	...	...	...	...	...	24 64	3.57
Pasir Besar	...	...	...	...	...	...	...	...	...	...	...	28.16	6.80
Kenneth Estate	...	...	...	...	...	...	...	...	...	...	...	27.90	5.85
Chaning Estate	...	...	...	...	...	...	...	...	...	...	...	24.35	3.83
Pasir Jinggi	...	...	...	...	...	...	...	...	...	...	...	23.40	3 68

RESIDENCY SURGEON'S OFFICE,
KOTA BHARU, 20th January, 1912.

JOHN D. GIMLETTE,
Residency Surgeon, Kelantan.

NEGRI SEMBILAN.

Abstract of Meteorological Readings in the various Districts of the State of Negri Sembilan for the month of October, 1911.

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	29.898	145.0	79.5	88.8	72.6	16.2	76.0	0.832	73.6	82	Calm	16.77	3.17
Pudoh Gaol „ „	...	...	...	...	...	...	...	...	...	...	...	18.26	3 27
District Hospital „	...	...	...	...	...	...	...	...	...	...	...	13.20	4.09
„ „ Klang	...	...	...	88.3	70.3	18.0	...	...	...	...	...	13.05	3.63
„ „ Kuala Langat	...	...	...	85.9	73.4	12.5	...	...	...	...	...	9.56	1.95
„ „ Kajang	...	...	...	84.4	74.9	9.5	...	...	...	...	...	15.34	2.88
„ „ Kuala Selangor	...	...	...	86.2	72.2	14 0	...	...	...	...	...	13.35	2.90
„ „ Kuala Kubu	...	...	...	89.4	70.5	18.9	...	...	...	...	...	19.63	2 78
„ „ Serendah	...	...	...	91.4	70.5	20.9	...	...	...	...	...	19.72	2.54
„ „ Rawang	...	...	...	90.7	72 8	17.9	...	...	...	...	...	14.77	1.89
Sabah Bernam	...	...	...	...	...	...	...	...	...	...	...	14.25	2.85

OFFICE OF THE SENIOR MEDICAL OFFICER,
KUALA LUMPUR, 14th Dec., 1911.

A. J. McCLOSKY,
Ag. Senior Medical Officer,
Selangor, Negri Sembilan & Pahang.

NEGRI SEMBILAN.

Abstract of Meteorological Readings in the various Districts of the State of Negri Sembilan for the month of November, 1911.

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.			
District Hospital, Seremban	...	14.59	79.6	87.1	71.8	15.3	76.9	.874	75.1	85	N W.	8.77	1.45
,, ,, Kuala Pilah	...	...	78 5	87.1	71.9	15.2	75.3	.819	73.2	84	...	10.90	3.14
,, ,, Mantin	...	...	...	...	...	...	...	...	...	...	...	11.05	1.65
,, ,, Jelebu	...	...	...	...	...	...	...	...	...	...	...	8.67	1.82
,, ,, Tampin	...	...	...	...	...	...	...	...	...	...	...	11.43	3.72
,, ,, Port Dickson	...	...	...	...	...	...	...	...	...	...	...	10.39	1.65
Beri-beri Hospital	...	...	...	...	...	...	...	...	...	...	...	11.83	2.56

Office of the Senior Medical Officer,

Kuala Lumpur, 3rd Jan., 1911.

G. D. Freer,

Selangor, Negri Sembilan & Pahang.

PAHANG.

Abstract of Meteorological Readings in the various Districts of the State of Pahang for the Month of November, 1911.

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.			
District Hospital, Kuala Lipis	...	...	78.7	85.8	67.9	17.9	75.0	...	...	...	...	11.67	2.00
„ „ Raub	...	...	81.8	90.9	67.6	23.3	72.8	...	...	...	...	18.76	2.19
„ „ Bentong	...	...	80.2	88.3	71.2	17.1	75.0	...	...	...	...	19.64	3.80
„ „ Pekan	...	...	79.3	85.2	72.7	12 5	76.3	...	...	...	...	18.44	2.72
„ „ Kuantan	...	...	78.1	87.3	71.1	16.2	76.2	...	...	...	...	19.41	2.81
Dispensary, Temerloh	...	...	...	88.1	66.1	22.0	...	...	...	...	...	10.21	2.10
Sungei Lembeng	...	...	...	85.5	72.5	13.0	...	...	...	...	...	18.99	3.23
	...	...	...	...	...	...	...	...	...	...	...	...	...

Office of the Senior Medical Officer,
Kuala Lumpur, 2nd January, 1912.

G. D. Freer,
Senior Medical Officer,
Selangor, Negri Sembilan & Pahang.

MINUTES OF A MEETING OF THE PLANTERS' ASSOCIATION OF MALAYA.

Held at 10.15 a.m. on January 7th, 1912, at the Selangor Club, Kuala Lumpur.

Present:

MR. E. B. SKINNER, Chairman.
MR. H. C. E. ZACHARIAS, Secretary.
MR. W. G. DOBSON, Legal Adviser.

and the following delegates:—

From Kuala Lumpur District Planters' Association:—Messrs. F. G. Harvey, H. F. Dupuis, A. J. Fox.

„ Klang District Planters' Association:—Messrs. J. Gibson, E. B. Prior, C. A. Buxton.

„ Kuala Langat District Planters' Association:—Messrs. E. Macfadyen, F. J. Dupuis.

„ Johore Planters' Association:—Mr. H. E. Burgess.

„ Taiping Planters' Association:—Mr. E. R. Salisbury.

„ Batu Tiga District Planters' Association:—Mr. H. L Jarvis.

„ Negri Sembilan Planters' Association:—Mr. A. Dupuis Brown.

„ Kapar District Planters' Association:—Mr. E. D. King Harman and the following visitors:—

Messrs. L. Lewton-Brain, Director of Agriculture, J. Rea, C. K. Harrison, L. Morecambe.

1. The Notice convening the meeting having been read, the minutes of the previous meeting are taken as read, and on the motion of Mr. Gibson, seconded by Mr. Fox, confirmed.

2. Quarantine.

The Secretary reads the following letter:—

Kuala Lumpur, 23rd November, 1911.

Sir,—I have the honour to inform you that plans are being prepared for a quarantine station to supplement the accomodation at Pulau Jerejak which has been found to be quite inadequate. It is suggested that the site of the new Station should be at Port Swettenham but before coming to a final decision on the subject I should like to ascertain the views of the Planting Community who are directly interested in this matter, and I would suggest that a small Committee of the Planters' Association of Malaya should meet me in consultation with

the Principal Medical Officer and Director of Public Works with a view to discussing the plans and site.

I have, etc.,
(Sd.) E. L. BROOKMAN,
Chief Secretary, F.M.S.

The Secretary,
Planters' Association of Malaya,
Kuala Lumpur.

The Secretary reports that on December 3rd a deputation, consisting of Messrs. E. B. Skinner, E. B. Prior, F. G. Harvey, Dr. Watson, Macfadyen and H. C. E. Zacharias, met the Chief Secretary at Carcosa, Dr. Sansom, Mr. E. G. Broadrick and Mr. J. Trump being also present; that the site and plans of the prepared Quarantine Camp at Port Swettenham were discussed; and that a unanimous agreement on all points was arrived at.

Mr. E. B. Prior says the permanent quarantine camp, the Government had decided to construct at Port Swettenham, would be under the control of the Principal Medical Officer, Dr. Sansom, who had a large experience of quarantine camps in other parts of the world. He would therefore suggest that H. E. the High Commissioner be asked that the control of the quarantine camp at Pulau Jerejak be also under the control of the F.M.S.

The Chairman agrees with Mr. Prior regarding the quarantine camp at Penang, but said the great difficulty was that Pulau Jerejak belonged to the Colony, but he had already suggested that the F.M.S., should take a lease of the land, to get over the difficulty.

Mr. Macfadyen says the Port Swettenham camp was really the outcome of a sort of compromise; the Association asked that the Pulau Jerejak camp be placed under F.M.S. control; the Government could not see their way to do so and as an alternative consented to the Port Swettenham camp being built.

Mr. Prior: Hardly an alternative, Port Swettenham camp was an absolute necessity.

The Chairman's suggestion is embodied in Mr. Prior's motion, which is carried.

The Secretary reads the following correspondence, which is noted with satisfaction:

Kuala Lumpur, 6th December, 1911.

Principal Medical Officer,
Kuala Lumpur.

Sir,—I have the honour to enclose for your information copy of minutes of this Association, held on October 29th and would draw your attention to the last but two paragraphs on page 5.

I have etc.,
(Sd.) A. C. E. ZACHARIAS,
Secretary.

1251/1911 Kuala Lumpur, 7th December, 1911.

Sir,—I have the honour to acknowledge your letter of December 6th, 1911, enclosing copy of the minutes of a meeting of your Association held on October 29th, 1911. I have noted the suggestion made by the Chairman in the paragraph on page 5 and I shall have much pleasure in meeting with the wishes of your Association.

I have, etc.
(Sd.) C. L. SANSOM,
Principal Medical Officer, F.M.S.

The Secretary,
The Planters' Association of Malaya,
Kuala Lumpur.

3. Chinese Labour.

The Secretary reports that since the last meeting the Government had issued a notification that all Indentured Chinese Sinkeh labour would have to cease on July 1st, 1914. The Sub-Committee had not yet been convened and he was trying to arrange for them to meet the Protector of Labour and the Secretary of Chinese Affairs.

Mr. Jarvis would take this opportunity to bring to the notice of the meeting the exhorbitant wages paid at present to Chinese tappers, who in his district made as much as $1.20 a day, if he tapped 400 trees. He would propose—"That all Constituent Associations be circularized, to find out the rates paid to Chinese tappers with the object of endeavouring to standardize rates."

Mr. Gibson seconds the proposition.

Mr. Skinner considers the matter a purely local one and points out that conditions differ on different estates even in one and the same district.

Mr. Harvey thinks it more to the purpose if the employers of Chinese tappers were to meet and arrange these matters amongst themselves.

The motion is then put to the meeting and declared carried.

4. Javanese Labour.

The Secretary reads the following report, as received from Mr. H. J. Cooper on behalf of the Sub-Committee appointed.

The Secretary.
Planters' Association of Malaya.

Sir,—We, the members of the Sub-Committee appointed to enquire into the question of recruiting Javanese coolies have the honour to report:—

We were unable to arrange a meeting till the 3rd of December, when we met in Singapore and the same day had an interview with the Consul General for the Netherlands Indies and the Vice Consul.

We explained to the Consul at some length that our objects were to facilitate the importation of Javanese coolies, to reduce the cost by doing away with the middle-man's profit and also to secure a better class of labourer than many supplied by the present agents.

The Consul General received us very favourably and enquired from us the details of the present system for the recruiting of Indian labourers and the regulations of the Immigration Department. He advised us to see the authorities in Java as soon as possible and to take with us a detailed statement of the Indian Immigration system and copies of the enactments in force. It was possible that a similar system might be approved by the Dutch Government, but this could not be for some considerable time as it would mean the revision of all the existing enactments.

He then referred to the present system in Java by which certain firms were allowed to recruit coolies from the agricultural districts and said that he had no doubt that if we were to open an agency of our own in Java, in charge of approved persons, his Government would grant a licence, and we could then send out our own recruiters who would be registered at this agency and work under its supervision, more or less on the lines of the Madura Co. in India, but of course the coolies would be under the present system of indenture

The Consul General further advised that it would help us very much if we went to Java accredited by the Government of the Federated Malay States, in the same way as a similar mission under Mr. Carey some years ago.

We thanked the Consul General for his advice and suggestions, and on the 4th saw the Colonial Secretary who said that the High Commissioner would probably have no objection to giving us a letter to the Governor General if he first received an official letter from the Planters' Association of Malaya, appointing us as their delegates and mentioning the object of our mission, and we, therefore, suggest that this letter should be sent at once and that we should go over to Java at the beginning of February.

We need hardly point out that the establishment of some system of free recruiting in Java would be of incalculable benefit to the planters of Malaya, and now that we have received so much encouragement it behoves us to go ahead as quickly as possible and in connection with this the Consul General mentioned to us that the Sumatra planters were already moving in the matter and had sent a deputation.

We have the honour to be, Sir,
Your obedient servants,
H. J. COOPER and
(for Messrs. Maude and Pears,)
MEMBERS OF SUB-COMMITTEE.

The Chairman draws attention to the fact that no mention is made of the incidence of the expenses of the suggested visit to Java; and that the P.A.M. had no funds to meet this expenditure.

Mr. Gibson thinks every effort should be made to broaden the base of their labour force.

Mr. Macfadyen proposes that the letter referred to by Mr. Cooper be obtained from Government, provided the expenses of the Sub-Committee's visit to Java do not fall on this Association.

Mr. Fox seconds the proposal which is carried unanimously.

5. H. N. Ridley Fund.

The Secretary reports that $300 had been received to date.

The Chairman suggests that sufficient should be collected, enabling them to present a really valuable piece of plate to Mr. Ridley.

The Secretary is instructed to circularize again the various District Associations and to bring up the matter at the subsequent meeting.

6. London Exhibition, 1911.

The Secretary submits the following accounts received from the Under Secretary:

MALAY STATES DEVELOPMENT AGENCY.

STATEMENT OF RECEIPTS AND DISBURSEMENTS ON ACCOUNT OF THE INTERNATIONAL RUBBER EXHIBITION.

RECEIPTS.	£	s	d	PAYMENTS.	£	s	d
Received from Crown Agents for the Colonies	138	16	0	Actual Disbursements as per Schedule B ...	984	3	6
Contributed by Rubber Companies	845	7	6				
	984	3	6		984	3	6

I certify that the above is a correct statement of actual Receipts and Disbursements.

(Sd.) W. T. TAYLOR,
18th August, 1911.

I certify this is a true copy.

(Sd.) H. VANE,
Treasurer, F. M. S.
28th December, 1911.

28/54

INTERNATIONAL RUBBER EXHIBITION EXPENSES FUND CONTRIBUTIONS.

Name of Contributors.	Amount. £	s	d
Bukit Rajah Rubber Company Ltd.	26	13	4
The Selangor Rubber Company Ltd.	50	0	0
Bukit Mertajam Rubber Company Ltd	10	10	0
The Rembia Rubber Estates Ltd.	10	10	0
Shelford Rubber Estate Ltd.	25	0	0
Straits Settlements (Bertam) Rubber Company Ltd. ...	25	0	0
Batu Caves Rubber Company Ltd.	25	0	0
The Klanang Produce Company Ltd.	25	0	0
The Sungei Salak Rubber Company Ltd.	20	0	0
The Johore Rubber Lands (Malaya) Ltd.	25	0	0
The Penang Sugar Estates Company Ltd.	20	0	0
The Rubana Sugar Estates Ltd.	10	0	0
The Straits Rubber Company Ltd.	20	0	0
Seafield Rubber Company Ltd.	50	0	0
The Carey United Rubber Estates Ltd.	25	0	0
The Damansara (Selangor) Rubber Company Ltd. ...	50	0	0
Harpenden (Selangor) Rubber Company Ltd. ...	25	0	0
Linggi Plantations Ltd.	117	14	2
The Kapar Para Estates Company Ltd.	25	0	0
The Ulu Rantau Rubber Estates Company Ltd. ...	10	0	0
The Federated (Selangor) Rubber Company Ltd. ...	25	0	0
The North Hummock (Selangor) Rubber Company Ltd...	25	0	0
The Kuala Selangor Rubber Company Ltd.	25	0	0
The Edinburgh Rubber Estates Selangor Ltd. ...	25	0	0
The Scottish Malay Rubber Company Ltd.	10	0	0
Riverside (Selangor) Rubber Company Ltd.	10	0	0
The Strathmore Rubber Company Ltd.	5	0	0
The Sungei Kapar Rubber Company Ltd.	25	0	0
The Tremelbye (Selangor) Rubber Company Ltd. ...	25	0	0
The Batu Tiga (Selangor) Rubber Company Ltd. ...	25	0	0
The Vallambrosa Rubber Company Ltd.	50	0	0
Total ...	845	7	6

I certify this is a true copy.

(Sd.) H. Vane,
Treasurer, F. M. S.

28th December, 1911.

B

Payments made by the Malay States Development Agency on account of the representation of British Malaya at the International Rubber Exhibition, Islington.

No.	Date.	Service.	Amount. £ s d	Total. £ s d
9	June 13.	L. H. Taylor, Petty Expenses	0 2 10	
10	15.	Do. do. ...	0 1 9½	
15	20.	Post Office—Postage ...	4 0 0	
15		L. H. Taylor—Tea for Special Typist	0 2 6	
16		L. Wray—Sundry Expenses	1 5 8	
17	21.	T. H. Reid—Postage ...	1 0 0	
17		Post Office do. ...	4 0 0	
18		C. S. S. A. Visitors' book for Exhibition	0 6 0	
19		M. R. Peacock—Postage ...	2 0 0	
20		Do. do. ...	1 0 0	
21		F. J. B. Dykes, Petty Expenses	0 2 0	
25	28.	L. H. Taylor do.	0 13 9	
26		Commissionaires employed at Exhibition June 19th to 25th	5 14 0	
27		Gratuity to Messrs. Pollitzer's men	0 15 0	
28	30.	Gratuities to Waiters at reception	1 12 0	
29		Refreshments provided at reception	21 5 11	
30		Payment on account to Cinematograph operator ...	2 2 0	
31		F. J. B. Dyke's Sundry expenses June	2 9 3	
				48 12 8½
8	July 1.	Puddicombe and Kay, cleaning stand June 24th to July 1st ...	1 10 0	
9	3.	Commissionaires employed at exhibition, June 26th to July 2nd	7 4 0	
11	6.	H. J. Badcock, mounting exhibits	1 18 6	
12		J. D. Hewett & Co., charges on railway frames ..	2 4 8	
13		Oliver Typewriter Co., Special Typists	5 0 0	
14		Raines & Co., enlarging photographs	35 5 0	
15		Townson and Mercer—Glass jars	1 8 0	
		Carried forward	54 10 2	48 12 8½

No.	Date.	Service.	Amount. £ s d	Total. £ s d
		Brought forward	54 10 2	48 12 8½
18	July 6.	Post Office rent of Telephone	4 0 0	
24	10.	L. H. Taylor, Petty Expenses	0 10 10	
26		Hill Siffken & Co., Invitation cards	7 10 0	
27		Piggott Bros. & Co. Ltd., on account	300 0 0	
32		Pathe Freres Cinematograph Film	18 6 4	
33		Commissionaires employed at exhibition, July 3rd to 9th...	7 4 0	
34		Puddicombe and Kay, cleaning stand to July 7th ...	1 10 0	
35		Lewis and Peat Transport ...	0 2 6	
38	15.	Commissionaires employed at exhibition to July 15th ...	7 4 0	
39		Cinematograph operator, balance of account ...	4 4 0	
40		Puddicombe and Kay, cleaning stand to July 14th ...	1 10 0	
43	17.	T. Cox & Son—Carpentering work	4 3 0	
44		International Rubber Exhibition Tickets	6 8 0	
45		Gratuities to Commissionaires and others	1 6 0	
46	19.	Union Bros., Printing ...	25 10 0	
47		Stroud and Co., Foliage plants	18 0 0	
48		Lanadron Rubber Estates Ltd. Refund insurance ...	1 0 0	
50		L. H. Taylor Petty Expenses	0 9 4	
53	21.	L. Wray do. ...	0 6 6	
54		F. J. B. Dykes do. ...	0 17 4	
56	26.	Agricultural Hall Coy. Electric power Cinematograph...	4 15 0	
57		L. Wray, Hotel Expenses, etc.	15 19 10	
				485 6 10
8	Aug. 12.	The Tella Camera Coy., photographs	1 1 0	
9	14.	International Rubber Exhibition, Banquet Guarantee ...	4 8 7	
10		Piggott Bros. & Co. Ltd., balance of account	182 17 6	
11		W. T. Taylor, Stamps ...	0 2 7	
13		Lanadron Rubber Estates Ltd. Mitchell's Expenses ...	72 0 0	
		Carried forward	260 9 8	533 19 6½

NO.	DATE.	SERVICE.	AMOUNT. £ s d	TOTAL. £ s d
		Brought forward	260 9 8	534 4 6½
25	18.	Executor of Thomas Drew, rent of store	7 10 0	
26		Beck & Pollitzer, accounts ...	113 3 8	
				381 3 4
	☞	Cost of Pamphlets and post-cards distributed by the F. M. S. Information Agency ...		69 0 7½
		Total ...		984 3 6

I certify this is a true copy

(Sd.) H. VANE,
Treasurer, F. M. S.
28th Dec. 1911.

The Secretary further reports that the total cost of this exhibition had been $14,501.66, as compared with $9,031.92, the cost of the 1909 Exhibition.

The following contributions had been made:

The Government of the Straits Settlements ...	$ 2,000.00
„ F. M. S. ...	4,000.00
Rubber Companies: collected in London, £845 7s. 6d.	7,246.07
„ „ K. Lumpur ...	1,010.64
	$ 14,256.71

leaving a deficiency of $244.95, which had been defrayed by the P. A. M. This sum included $98.35 due by various exhibitors for duty; but the various amounts were so small that he considered it impracticable to recover same.

Mr. Gibson proposes, Mr. Harvey seconds, and it is resolved unanimously, to pass the accounts as above set out and to pay the deficiency of $244.95 out of the funds of the Association.

7. Standing Committee.

Mr. A Dupuis Brown proposes: "That in view of the rapid expansion of the rubber industry and the great importance of keeping the planting community informed of all legislative or other measures which may in any way affect its interests, the P. A. M. appoint a Standing Committee of five from amongst its members in addition to the Chairman and Secretary, to consider such measures and communicate its opinions to the district associations, also to act as a consultative body for dealing with the current work of the P. A. M." and submits the following elaboration of the scheme:

REASONS FOR ITS PROPOSED CREATION.

1. The Meetings of the P. A. M. are held at irregular intervals and in the interim the Secretary has no opportunity of consulting the representatives of the Association.

2. He is, therefore, unable to proceed with negotiations on a given subject until he has received fresh instructions from a subsequent meeting. For this reason such negotiations are likely to be unduly protracted.

3. Under present arrangements the delegates to the P. A. M. are expected to pass very important resolutions, affecting the entire planting community, without any opportunity for mature reflection or for consultation with their respective district associations.

CONSTITUTION.

1. I think the first and chief consideration is to get men who are willing and able to attend the meetings of the standing committee.

2. For this reason I should advocate the appointment of those who live within a fairly easy distance of Kuala Lumpur.

3. At the commencement the standing committee could be formed of 5 of the delegates with power to add to their number, the Chairman and the Secretary of the P. A. M. being *ex-officio* members.

4. The standing committee should meet at least once every month. Additional meetings to be convened on the requisitions of the Secretary of the P.A.M. or of two members of the standing committee.

FUNCTIONS.

1. To consider all draft enactments of the F.M.S. Government and to take steps to call the attention of the P.A.M. delegates to any proposed legislation which is likely to affect the interests of the planting community.

2. To authorise the Secretary of the P.A.M. to continue negotiations and correspondence if in accordance with the policy determined at the meeting of the P.A.M.

3. To sift and prepare the matter intended for discussion at the meetings of the P.A.M.

Mr. Macfadyen is afraid that the creation of this committee would emphasize still further the preponderance of Kuala Lumpur. He would therefore suggest that members from other States be eligible, and if that was agreed to, he had much pleasure in seconding the proposition

Mr. Burgess thinks that Johore would certainly like to be represented.

Mr. Skinner suggests one member for each State.

Mr. Gibson considers, that if the Association found the intervals between meetings too long, a better plan than appointing a committee, which would in a way usurp the rights of delegates, would be to hold meetings of the Association oftener.

Mr. Dupuis Brown says even if the Assoiation did meet twice every month he still thought a standing committee should be formed to boil everything down and prepare it for the Association meetings.

The motion is then put to the meeting and carried by 8—2.

Mr. Dupuis Brown proposes that the Committee be forthwith appointed.

Mr. Gibson is in favour of leaving this over until the Annual General Meeting.

The Meeting decides in favour of Mr. Gibson's suggestion by 9 votes to 5.

8. New York Exposition.

The Secretary submits the following correspondence:—

Malay States Information Agency,
London, E.C., 3rd November, 1911.

Dear Sir,—I beg to forward for the consideration of your Association copy of a letter received from Mr. A. Staines Manders, regarding a Rubber Exhibition to be held in New York in September and October, 1912.

Mr. Staines Manders calls attention to the fact that the charge for space will be 8/4*d.* a square foot as against 4/- a square foot which was charged at the Agricultural Hall, Islington. Other expenses also would probably be higher than in London.

Mr. Staines Manders is very insistent as to the benefits likely to result from Plantation Rubber being made better known in the U.S.A.

I have communicated Mr. Staines Manders' letter to the F.M.S. and to the Straits Governments.

The Secretary,

Planters' Association of Malaya,
Kuala Lumpur.

I am, Dear Sir,
Yours faithfully,
(Sd.) W. T. TAYLOR.

London, W.C., 2nd November, 1911.

The Secretary,
Malay States Development Agency,
88, Cannon Street, E.C.

Dear Sir,—I have recently returned from New York, U.S.A., which I visited by invitation of several gentlemen, for the purpose o[f]

discussing the matter of a Rubber Exposition in New York. After numerous meetings and on the advice of Mr. Henry C. Pearson, Editor of the "India Rubber World," New York, it was decided to hold an Exhibition under the above title in Sept. of 1912, Mr. Pearson being the active Vice-President, and under the auspices of the International Exposition Company, an incorporate body of New York. All necessary finances for the organisation have been provided and the Exposition will comprise the following sections, and will be one of considerable importance.

1. Crude Rubber—indigenous and plantation.
2. Manufacturers, and Machinery Makers.
3. Kindred Trades.

Mr. Pearson is of opinion that it is a unique opportunity (see his remarks *re* Brazilian rubber) for the producers of plantation rubber to come forward and secure a much larger proportion of the trade of America.

From enquiries I made, and conversations I had with experts I found the one opinion general, *viz.*, that the manufacturers are eager for more knowledge than they now possess regarding plantation rubber. Further, my experience was that they were thirsting for information, and as the "India Rubber Journal" says, the opportunity will not occur again for a while. My advice is that planting countries should take part, though there will be no necessity to make the expensive display they did in London this year. What they require is a good, comprehensive exhibit of plantation rubber, plenty of literature, and above all, a good Representative able to give full information, and to be able to write up a report on the details he received as to the requirements of manufacturers, etc.

The Exposition will be open for ten days; Conferences will be held under the Presidency of Mr. Henry C. Pearson, but no Conference book will be published though full reports will appear in the "India Rubber World," New York.

Indigenous rubber countries will be well represented, and plantation should also. There is no doubt in my mind, and I should not say so unless I believed it, that the prospects for plantation rubber in the States are enormous if it is shown to the manufacturer in a proper way. We shall have the American manufacturers at the Exposition, and those who do not exhibit will be there to seek information regarding plantation rubber as they know all that is possible *re* Brazilian.

The rates for space will be slightly higher than in London but this is counterbalanced by the fact that we lay down the platforms and cover them for exhibitors, so that they only have the fitting up of the stands to do.

I shall be glad if you will kindly take up the matter with your Colony and hoping they will exhibit,

I am, etc.,
(Sd.) A. STAINES MANDERS.
Organising Manager.

Rate for space = $2 (8/4d) per square foot which includes covered platform specially laid for each exhibitor.

H. C. E. Zacharias Esq., New York, November 6th, 1911.
Secy., Planters' Assn. of Malaya,
Kuala Lumpur, F.M.S.

Third International Rubber and Allied Trades Exposition.

Dear Sir,—I take pleasure in informing you that the Third International Rubber and Allied Trades Exposition will be held at the New Grand Central Palace, 46th to 47th Street and Lexington Avenue, New York City, from the 23rd day of September, 1912, to October 3rd, 1912. You will probably remember my name as the organizer of the successful rubber expositions in London in 1908 and 1911. Further particulars will be sent you in due course, and I trust that you will give the exposition your kind support.

Yours very truly,
(Sd.) A. STAINES MANDERS,
Organising Manager.

P. S.—My friend, Mr. Henry C. Pearson, Editor of the "India Rubber World" has very kindly consented to become the Vice-President of the exposition.

No. 3 in 7950/1911. Kuala Lumpur, 12th December, 1911.

Sir,—I am directed to inform you that a Rubber Exhibition will be held in New York in October next and that the Government has under consideration the advisability of arranging for the Federated Malay States to be officially represented. I enclose a copy of a letter which has been received from Mr. A Staines Manders, Organizing Secretary, and I am to enquire what prospect there is of Planters in the Federated Malay States taking part in the Exhibition and what financial support may be expected from them towards defraying the necessary expenses.

2. A letter has been received from Sir. W. Taylor stating that he has been making enquiries as to how the proposal is regarded by the Rubber Growers' Association and others in Great Britain connected with the industry, and he is informed that the proposal has been received with favour generally and that the impression appears to be that Plantation Rubber interests might be benefited.

3. The expenses are likely to be greater than the expense incurred in connection with the recent exhibition in London.

4. If it is decided to take part it is hoped that a good display of exhibits from the Federated Malay States will be guaranteed.

The Secretary,
Planters' Association of Malaya,
Kuala Lumpur.

I have etc.,
(Sd.) F. E. TAYLOR,
Ag. Under-Secretary, F.M.S.
13th December, 1911.

Under-Secretary, F.M.S.
Kuala Lumpur.

Sir,—I have the honour to acknowledge receipt of your letter 3/7950 dated yesterday, contents of which I will place on the agenda of our next meeting to be held on the 7th proximo.

I have etc.,
H. C. E. ZACHARIAS,
Secretary.

Mr Harvey: May I suggest the Association be not represented in New York.

Mr. Macfadyen: seconds.

Mr. Gibson: I think the New York Exposition will be fruitful of good results and it will be foolish indeed not to be represented. We know perfectly well that America is a big consumer and is likely to increase, and I think if we made a good show in America it would be to our own benefit. I feel confident of the fact that we have only to get the Yankee to take to using our rubber in real earnest, to see another rubber boom. We have only to show him we can produce goods as good as are produced in other parts of the world. It would be wanting in energy and enterprise if we were not represented.

Mr. Dupuis Brown supports Mr. Gibson's contention.

The Chairman thinks it would be a great pity to decide that the Association be not represented and suggests circularizing the various Planting Companies, to get their views on the subject.

Mr. Macfadyen explains that he had seconded the proposition, not because he thought it undesirable that the Malay Peninsula should be represented, but because he had misgivings that it would be well represented. The last Exhibition in London had strained their resources and he was afraid that contributions might not come forward as readily as was necessary, to get their industry adequately represented.

Mr. Harvey's motion is put to the Meeting and declared lost by by 8—4.

Mr. Gibson then proposes and Mr. Fox seconds that the Secretary communicate with the Government of the F.M.S and S.S. and with the Rubber Growers' Association and solicit their co-operation in the matter.

The motion is carried by 10—2.

9. The Labour Enactment, 1911.

The Secretary informs the meeting that at a meeting of the Taiping Planters Association held on the 8th ultimo the following resolution was passed: "That the Labour Enactment, 1911, be cancelled or at least considerably modified."

He explains that previous to this he had received notice of a motion from Mr. Macfadyen on the same subject and had consequently placed Mr. Macfadyen's motion on the Agenda

Mr. E. Macfadyen, proposing "that this Association strongly deprecates the precipitancy with which the Labourer,s Enactment, 1911, was passed through the Federal Council, said that for a law conferring such wide and far reaching powers upon the executive, the Labour Enactment, 1911, appears to have been passed after only the most perfunctory deliberation. No one would suggest that Government resorted to secrecy in order to faciliate its passage. We are under no delusion as to the real powers of Government in regard to legislation whatever fictions may be maintained about their sharing such powers with Councils or Committees. There may be limits to the powers of Government in administering some of their laws; but in the making of them they are absolute. The burden of my complaint is that Government has no moral right to pass a law such as this, whatever its actual power, without giving members of Council an opportunity to consider its nature and probable effects.

The official apology for a degree of haste admitted to require apology was that the law would only be applied in one instance. Surely this is an aggravation rather than an extenuation of the circumstances. If Government may take an employer into court when they see their way to a conviction; and when they did not, may make a new law to meet his special case, it must be patent that there ceases to be any guarantee for commercial enterprise at all. The whole proceeding appears to be against any right principle. This very instance might be so handled as to do infinite damage to the reputation of our government for fair play; which is one of the chief commercial assets of this country.

I am not concerned to argue that the powers conferred should not, in the peculiar conditions of the labour situtation here, be in existence. My contention is that such powers ought not to be exercised by government officers on the advice of other government officers alone. To remove the labour force from an estate, by a stroke of the pen, is to annihilate that estate as a profit-earning concern; and I urge upon the members of Council to secure the provision of adequate safeguards against the possible misuse of such extreme powers. Whether the necessary safeguard should take the form of a reference to the council itself or to a Committee of the council or to somebody appointed *ad hoc*—is not for me to say: but I do say emphatically that without such a reference, the perpetuation of this enactment would be highly dangerous. If unofficial opinion

had to be consulted in some form or other the position of government would be strengthened; the public would be given the security it has a right to demand and it is more than probable that in most cases a resort to extreme measures would be rendered unnecessary by the pressure which might in this way be brought to bear. Some such machinery would have been elaborated, I feel sure, had even 48 hours been allowed on deliberation: and that this could not have been granted, it is impossible to believe, seeing that eight days were allowed to elapse before the powers conferred were made use of I move "that this Association strongly deprecates the precipitancy with which the Labour Enactment, 1911, was passed through Federal Council."

The Chairman thinks every member of that Association would have voted for the Bill after having heard the guarantee of the Government, who were about to redraft the Bill. The conditions of the Tamil labour force on the estate referred to were an absolute disgrace. All the unofficial members of the council objected to the procedure, but it was felt it was not right to vote against the measure after receiving the Government's guarantee that the enactment would only be applied to one group of estates, and that a fresh Bill would be submitted to them at the next Federal Council. He felt confident from what Sir Arthur Young and the Chief Secretary to Government had said that they had every intention of consulting the planting community on the steps they proposed to take in this direction in future.

Mr. Gibson regarded the Government's actions from another standpoint. If this Enactment went home, the man in the street, who had invested his money and did not know exactly the position or conditions of the country where his investmen was, but got to know the Government of that country could turn round and take away the labour of the estates he had invested his money in, it might be the means of bringing about a panic and doing tremendous harm to the rubber industry. Those were the far reaching effects of such an action on the part of the Government and it was the bounden duty of the Association to impress on the Government that such high-handed legislation was intolerable.

He had great pleasure in seconding Mr. Macfadyen's motion.

Mr. Macfadyen's motion is then put to the meeting and carried unanimously.

10. Honorary Members.

The Secretary reports that Mr. A. C. Corbetta has applied for Honorary Membership and explains that the present rules do not provide for this.

Mr. F. G. Harvey proposes, Mr. A. J. Fox seconds, and it is agreed to, that a new rule to that effect be drafted and submitted to the forthcoming Annual General Meeting.

11. Medical Staff on Estates.

The Chairman informs the Meeting that the Government had under consideration a scheme, whereby they would provide all the necessary staff and second same for service on the various estates, as required. This would do away with all the present difficulties the planters were labouring under. The Secretary might write in and find out, how far this matter had progressed.

The Secretary is instructed accordingly.

Mr. Burgess asks for details of the Bailey Memorial Fund.

The Secretary, being unable to give these particulars without reference to his books, is instructed to submit these at the next meeting.

12. Absconding.

Mr. Jarvis asks whether the Enactment making absconding a criminal offence has yet come in force.

The Chairman understands that the Enactment, as originally gazetted, did not meet the views of the Secretary of State for the Colonies, and that another Bill is in preparation.

13. Indian Labour.

Mr. Harvey enquires whether it is legal for the Indian Immigration Department to demand the discharge of a coolie on tendering themselves a month's wages in lieu of notice.

The Legal Adviser is requested to look into this point and to give his opinion thereon.

Mr. Gibson enquires whether a coolie recruited for an estate from India, but who has worked previously on another estate, is considered to belong to the former or to the latter estate.

The Chairman says that undoubtedly the coolie belonged to the estate who recruited him.

14. Recruiting Commission.

Mr. Gibson suggests that something be done to remove the discrepancy between the amounts paid to kanganies by the various estates for recruiting purposes. Some estates paid their kanganies as much as three and four times as much as others, and it was found these well-paid kanganies stayed at the depôts in India and waited the arrival of other kanganies bringing coolies forward from up country. An equal rate should be authorized by the Immigration Committee and thus prevent this anomaly.

The Chairman recommends that the amount be stated on the licence, and that the Indian Immigration Committee be asked to fix a maximum commission.

15. Sitiawan and Dindings Planters' Association.

The Secretary places on the table the first Annual Report of this Association and is instructed to inform the said Association, in response to private enquiries, that the P.A.M. will greatly welcome the application of this new body.

16. Brussels Exhibition.

The Secretary submits account from Messrs. Lewis and Peat, showing balance still due of $499.37.

17. General.

The Secretary lays on the table copy of By-laws and Regulations of the Selangor Chamber of Commerce Rubber Association.

The Meeting terminates at 12-30 p. m.

H. C. E. ZACHARIAS,
Secretary.

The Planters' Association of Malaya.
In Account with
The Planters' Stores & Agency Co., Ltd.

		Dr.	*Cr.*
1910.		$ cts.	$ cts.
Aug. 19	To samples of Rubber for Brussels Exhibition (by our London Office)	703 39	.. ...
Dec. 31	Antwerp charges	75 17	... ...
1911.			
Jan. 31	By Proceeds of Rubber sent to Exhibition		279 19
„ „	By Balance		499 37
		778 56	778 56
	To balance	499 37	

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49 lbs.	Block	
15 „	Sheet	
10 „	Sheet	
20 „	Crêpe	
20 „	Crêpe	
9 „	Crêpe	
123 lbs.	at 5/7¾ 14 Dec. 11.	Exhibition Samples from Brussels.

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THIRD SERIES.

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OF THE

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AND

FEDERATED MALAY STATES.

EDITED BY THE

Botanic Gardens Department, Singapore.

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AGRICULTURAL BULLETIN

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No. 3.] MARCH, 1912. [Vol. 1

THE THIRD INTERNATIONAL RUBBER EXHIBITION.

There is much to commend the proposal of holding the Third International Rubber Exhibition in New York during the current year and it is gratifying to learn that what appeared to be lukewarm interest in London and the East is being replaced by active support. The India Rubber Journal of February 17 states that "at a special meeting of the Rubber Growers' Association held at the London Chamber of Commerce this week, it was resolved to present to the New York Rubber Exposition, which opens in September next, a series of gold, silver and bronze medals for free competition open at all the rubber plantation countries in the world exhibiting at the exposition."

"The condition of the competition is that at least one hundredweight of rubber—to be a commercial, not an exhibition, sample—mustbe shown for each entry made, and planters are to have the privilege of making more than one entry if they wish."

Every one will be aware that of all industries those pertaining to agriculture are the slowest to mature, although the rapid development of plantation rubber has been amazing, and where events have moved so quickly it cannot be complained that the industry is suffering from a plethora of exhibitions; while the stimulus of the preceding exhibitions have materially assisted development.

Writing on the scope and utility of the proposed exhibition Mr. Pearson, Editor of The India Rubber World, says :—

"Steps have been taken to secure exhibits of crude rubber from every rubber producing country in the world.

There is also in process of formation an advisory committee, made up of the most influential manufacturers, chemists, importers, and scientists in every way connected with the trade.

There will be notable loan exhibits, European and American, exhibits of laboratory and factory appliances, etc., etc.

There will be a series of conferences at which essays on various subjects of interest to the trade will be read.

When one considers that the United States not only uses one half of the world's crude rubber, but manufactures much more than one half of the world's rubber goods; when one further considers the very general interest that the press and the people of the country are today evincing in rubber, it would appear that the exhibition was timely. That it can be made broadly informing to every trade and profession, to business organizations and to schools, goes without saying, and Mr. Manders' past record furnishes no reason to doubt his complete grasp of the possibilities as well as his ability to carry his plans through to a successful finish."

A Rubber Exhibition in New York offers an opportunity to planters to emphasise the real position of the present and prospective magnitude of plantation rubber in the East, which financial statements showing the area under cultivation and the output of rubber fail to convey, as is evidenced by the American manufacturers, and delegates from Brazil, who have visited Singapore and the Federated Malay States during the past few months.

Hitherto manufacturers (the real masters of the rubber market) held large stocks of crude rubber, and this policy is slowly changing in favour of forward contracts with estates. It only remains to convince all manufacturers that the plantation industry is an established one, and that the output of over 10,000 tons for Malaya during 1911 will be largely exceeded year by year. It would therefore be of direct advantage to estates to earn a good name on the market.

Another advantage is offered, which should not be lost sight of, by displaying plantation rubber in bulk, it furnishes an opportunity of conveying to all concerned the improbability of synthetic rubber replacing raw rubber. Synthetic rubber is a scientific fact so far as the laboratory is concerned, and it may not be long before the commercial proposition is before the world. Rubber displayed in bulk would be more convincing than figures. It could be seen what the substitute would have to replace in both wild and cultivated raw rubber, and also, what is usually forgotten, reclaimed rubber. Both, governments and financiers, might pause to think that rubber trees can be brought into bearing in a few years, while turpentine, the base of synthetic rubber and the product of fir trees, approach a century. Two results are apparent, the gradual destruction of forests which could not be replaced; the consequent increased price of turpentine, and the improbability of producing synthetic cheaper than raw rubber.

The converse of synthetic rubber is overproduction of plantation rubber—also a possibility. Outside Malaya there is more real activity in planting rubbers at the present time than at any previous

period; Brazil is both planting and fostering natural reproduction; the West Indies have embarked on a strong rubber planting policy; all tropical Africa is actively engaged in planting Para and Ceara; from India Ceara is expected to be largely exported; Mexico expects to increase her output in the near future.

Where so many countries are engaged different systems of cultivation and methods of preparation naturally follow, and the opportunity presents itself at the forthcoming exhibition of studying the real position in all its latest developments.

"Entries for the competition close on August 1, and are to be made direct to Mr. A. Staines Manders, c/o the Grand Central Palace, 46th to 47th Streets, Lexington Avenue, New York city."

It is inferred that exhibits not intended for competition would be received later, as the exhibition opens during the last week in September 1912.

The following suggestions are made from experience and to avoid errors and save delay:

1. All cases of exhibits should be fastened by screws and not nails. Nailed cases frequently split and are spoiled for returning.
2. The name of the estates, settlement or state, should be stencilled or printed on 2 or 3 faces of the case. Consignee's address on top of case.
3. Cases to be returned should have the addresses printed on a board and screwed face downwards on top of the case when consigned to New York.
4. Full instructions; if for competition; description of contents; number of cases; weight of rubber; whether offered for sale or to be returned; address for returning; should be communicated to the local secretary, or direct to the Commissioner.
5. Instructions should not be enclosed in the cases of rubber.
6. Instructions, part to local secretary or Commissioner, and part to agent or friend, should be avoided.
7. Cases should be numbered and contents described on case, as well as mentioned with instructions.

The matter is receiving the attention of Government, and it only remains for plantations to come forward with rubber in bulk to place Malaya in the front of rubber producing countries.

R. DERRY.

IPECACUANHA.

(Cephaelis Ipecacuanha.)

The superior claims of rubber have so absorbed the attention of planters during recent years that only occasional enquiry is made of other plants. With many economic plants, particularly drugs, the demand is temporary only and a fascinating price is best measured

by the possible demand for the product and the probable extent of its cultivation.

At the present time enquiry is again being made respecting Ipecacuanha, and considering the consumption and consequent demand for the drug, the limited sources of supply, its slow reproduction and cultivation, there does appear a prospect for further development. In most instances, however, enquiry is based on the suitability of the plant for a Catch-crop, and the object of this note is to indicate its inadaptability for cultivation under such conditions.

Cephaelis Ipecacuanha is a dwarf, half shrubby, shade loving plant indigenous to many parts of Brazil, and sparsely in New Granada and probably Bolivia. It was first introduced to Europe about 1830 and to India 30-40 years later. Ipecacuanha is prepared from the dried roots of the plant which are exported from Brazil, Cartagena, Selangor and Johore, and India *(an analysis showing the relative value of the commercial drug from the first three countries mentioned is published in the Agricultural Bulletin p. 364, Vol. 8.)* Its cultivation—owing to its special requirements—is still limited while the demand for the drug is increasing.

Bentley and Trimen describe the process of collection in Brazil as follows:—"The roots of the Ipecacuanha plant are collected more or less all the year round, but less during the rainy season from the difficulty then experienced in drying them properly. The collectors are called Poayeros from the Brazilian name Poaya by which this plant is known. A Poayero collects the roots by grasping in one hand as many stems as he is able, and with the other he pushes a pointed stick obliquely with a see-saw motion in the ground beneath the plants, by which he is able to pull up a lump of earth with the inclosed roots in an almost unbroken state. The earth is then shaken from the roots which are placed in a bag brought for that purpose, and the same process is repeated with other plants. When the Poayera pulls up the roots, he breaks them at certain points, and from these broken parts of the roots which are left in the soil, young plants are subsequently produced, and thus the total destruction of the plant is avoided."

In the East the plant is reproduced by root cuttings (so far as I know it does not seed locally, but where well matured plants are available old enough to flower, seeds could be produced by artificial fertilization) but such cuttings are not easy to establish, and if the root is subdivided into numerous cuttings due protection to prevent loss from excessive damp is necessary. On virgin soils, or where there is a depth of vegetable humus and the situation is moist and shady, the plant grows well when established but the properties of the root deteriorate with continued cultivation. Such deterioration might be minimised, if not avoided, by mulching with leaf-soil and burnt-earth, especially burnt-humus, as the lime contained in burnt-earth and applied in this form, although the proportion is small, is easy of absorption. Careful cultivation is necessary as the alkaloid or active principal of the drug, only amounts to about 1 per cent. of the root.

The Brazilian plant is variable in habit, and the Cartagena or Colombian variety is distinct and of less commercial value.

R. DERRY.

Mr. R. H. True (Bureau of Plant Industry of the U. S. Department of Agriculture) has been supplied with the following information from the American Consul at Cartagena regarding the cultivation of Ipecacuanha, and this we publish from the "Oil Paint and Drug Reporter" Ipecac, a trailing plant thrives best in clay soil along the banks of rivers. While it requires a great deal of moisture, it cannot live under water, and consequently in Colombia it is found in its best development in regions where the rainfall is abundant, but where the rivers do not overflow.

The Sinu River is the ideal region for ipecac. The plant is found in abundance from near the head-waters of this river . . . The growth extends to a distance of several miles on each side of the river and also to the more important tributaries of the Sinu, the Esmeralds, Verde and Manso rivers. In regions where the water is excessive, such as the valleys of the Atrato, the plant though found, has a poor growth and is of an inferior quality. In gathering ipecac the whole plant is up-rooted and the thin and soft rootlets are thrown away, and these discarded rootlets serve as a means of reproduction, becoming in a year well-developed plants having valuable roots of their own. The present demand for ipecac is good, for the average price in Cartagena is about $1.80 per lb. and $2.20 per lb. can be obtained in some of the foreign markets for the dry roots. The European demand is especially strong. France paying from 10c. to 20c. more than can be obtained in the United States. The total shipment of ipecac from this port during the calendar year 1910 amounted to 14,181 kilos. The area from which Cartagena ipecac is derived is very extensive and somewhat scattered, though by far the most important region is that of the Sinu River and its tributaries. It is thought that the land actually covered by the plant must embrace several hundred square miles, though any attempt at an accurate estimate would be useless. A relatively small amount of Cartagena ipecac comes from the Atrato, and it is of inferior quality. In addition to the two regions mentioned, there is still another, nearer than either of them to Cartagena, called San Onafre. Ipecac is not an object of cultivation in Columbia, though there is no reason why it should not be, except the fact that it is found wild in such abundance."

(*The Chemist and Druggist*, Feb. 24, 1912, p. 73).

CALABAR BEAN.

(Physostigma Venenosum).

A plant allied to the runner-beans (Phaseolus) and native of Nigeria and the Congo where it is used as an ordeal, but owing to its poisonous properties the production has been discouraged.

The drug, which is obtained from the ripe seed, has been recognized in different Pharmacopæias for many years as a valuable poison and for external use in cases of Myopia. Quite recently a further chemical examination by the Wellcome Chemical Research Laboratories has resulted in the isolation of a new alkaloid which will doubtless add to the value of the plant although the demand may be limited.

R. D.

COCAINE.

(Erythroxylon Coca.)

In the Agricultural Bulletin of the Straits Settlements and Federated Malay States page 336 vol. VII. there is an account of this plant as grown in the Botanic Gardens Singapore and a report from the Imperial Institute on a sample of dried leaves submitted by the late Mr. Machado for analysis and valuation. The colour of the leaves was not quite good but "the percentage of alkaloids present was equal to the average amount found in commercial supplies of Coca leaves from other sources." Planters are also cautioned that the demand is small and that leaves would be over-produced if extensively cultivated.

At the present time the price is high and leaves from the East appear to be exported from Java only. The plant is exceptionally hardy and is grown as a hedge-plant in the Singapore Gardens. There would be a great saving in handling and freight if anyone cared to try the production of Cocaine instead of exporting leaves.

R. D.

The Production of Cocaine in Peru.

This subject receives attention in a recent number of *The Engineer*, in an article which is reproduced in *Peru To-day* for September 1911: In introducing the article, the latter publication points out the importance of the cocaine industry in Peru; this is shown by the circumstance that the value of the annual production of the drug is £2,500,000. A great part of this is exported, while most of the rest is consumed by the native Indians.

The account in *The Engineer* states that the processes employed in Peru for the extraction of cocaine from the leaves of the coca plant *(Erythroxylum Coca)* are crude, owing to the fact that the treatment takes place in the interior, on account of the expense of transport of the leaves; the extent of this expense is illustrated by the fact that 200lb. of coca leaves are required for the manufacture of 1lb. of cocaine. Doubtless, improved means of communication will bring the manufacture nearer the coast, and then better methods will be employed.

For the extraction of the drug from the leaves, three operations are employed: (1) maceration, (2) intermediate precipitation, and (3) final precipitation. For maceration, the leaves are placed in four tanks, in the first of which they are treated with a 0.5 per cent. solution of sulphuric acid. After twenty-four hours, the liquid is allowed to flow into the second tank and the first is again filled with new leaves and the acid solution. After another interval of 24 hours, the contents of the second tank are run off into the third while the former is filled from the first as before, the first again receiving a new charge. The fourth tank, after another period of twenty-four hours, is filled from the third, and the preceding processes with the other tanks are repeated. In this way, leaves in a state for further treatment, namely, those originally put into the first tank, are obtained at the end of four days. The tincture thus obtained is next placed in a strainer, for the purpose of filtration, after which the processes of maceration is complete.

For the intermediate precipitation, the tincture is subjected to the action of sodium carbonate in cylindrical vessels. At this stage, in order to test if precipitation is complete, a small quantity of the tincture is removed, filtered from the cocaine, and the filtrate tested with ammonia, when there should be no precipitate formed. The obtaining of a precipitate indicates the necessity for the addition of sodium carbonate to the tincture in the cylindrical vessels.

The first operation for the final precipitation is the addition of petroleum, the mixture being stirred carefully for three to four hours at a very slow rate. At the end of this period the oil, which now contains the cocaine, is washed with acid-free water, and then treated with acidulated water, the proper amount being determined by the testing for precipitation of an aliquot part. During this process, the mixture is stirred vigorously for half an hour to forty minutes, with the result that the cocaine is transferred from the oil to the acidulate water, which can be separated from the former after the mixture has been allowed to stand for about a quarter of an hour.

At this stage, the extract is ready for final precipitation, which as before is effected with sodium carbonate, the amount required being determined by a test with an aliquot part of the solution. The mixture is then allowed to settle for twelve hours and, filtered while being washed with distilled water, to remove any excess of sodium carbonate. The wet residue of cocaine is finally subjected to pressure, when the drug is obtained as a white paste containing 87 to 93 per cent. The usual yield is about 2¼lb. of cocaine per day of twenty-four hours.

When inferior leaves are used, the product is brownish in colour and has to be subjected to further treatment, similar to the above; this results, however, in the loss of some of the cocaine. A last matter of interest is that the approximate cost of producing 1 lb. of cocaine is about £5—an amount which naturally varies with the price that has to be given for the leaves.—*Agricultural News, West Indies.*

INDIGO.

(Indigofera tinctoria.)

The following paper read before the Ceylon Agricultural Society on the possibility of producing natural Indigo to compete with the synthetic dye is of especial interest for its latent possibilities.

Synthetic Indigo is a bye-product of coal-tar and although extensively used it has not entirely replaced the natural indigo.

For silks and high class textile goods the natural dye is still preferred for its durability as a fast dye.

As the indigotine, or blue colouring matter, varies with cultivation and preparation from 20 to 90% there does appear an opportunity for producing an improved standard dye. It is very probable too, that in preparing the Indigo in the form of paste there is considerable saving over solid or cube Indigo which is the result of sterilizing. (Singularly, some years ago, great efforts were made in Singapore to produce solid or stick Indigo which failed).

Locally, the plant is grown from cuttings and not seeds, so that it may improve the cultivated product if seeds were tried instead of cuttings.

Formerly the cultivation was extensive but has gradually dwindled to almost nil, possibly due to a combination of causes.

When Indigo was extensively cultivated in Java and Sumatra it was known that its cultivation improved the soil for tobacco, sugar and other crops.

It certainly deserves careful experimental trials for green soiling with rubber, but if intended as a Catch-crop, a good water supply is essential and prospective crops assured before embarking on the apparatus necessary for its preparations.

R. D.

Ceylon as an Indigo Country.

Interesting Paper.

Baron Schrottky—then read an excellent paper entitled, "The cultivation of Indigo in Ceylon," in which he said:—

The object of the paper on Indigo, which you have permitted me to read to you to-day, is to arouse interest in an industry which, for some time past, has been considered moribund, if not dead.

The natutal indigo industry, at one time one of the most prosperous industries in the East, has been practically ruined by the competition of a synthetic dye.

Adolf von Bayer discovered in 1880 a method of producing from coal tar products a substance identical in every respect with indigotine, the chief dyeing principle in the indigo of commerce, in which it is found to the extent of about 60 per cent.

The Badische Soda and aniline Fabrick acquired Bayer's patents, and in 1897 brought into the market a synthetic indigotine at a price

low enough to compete with the natural dye. The Badische Company was able to sell their product at a profit at the cost price of natural indigo, which was then about Rs. 120 to Rs. 150 per maund of 74 lb.

This competition naturally resulted in the closing of most indigo factories in Bengal and Northern India which were dependent for financial assistance on Calcutta houses and only those planters who had land of their own, on which they could very profitably utilize the excellent manure which indigo refuse yields, were able to keep their heads above water.

The export of indigo, which in 1896 was 187,337 cwt, valued at nearly 4 million pounds sterling, had fallen in 1910 to 18,061 cwt. valued at a little over 200,000 pounds sterling.

Indigo continued to be grown in Behar and elsewhere in India, but chiefly for the sake of manure it yields, the dye coming to be looked upon almost as a by-product. It was at the darkest period of the Indian indigo industry that Sir Edward Law, Finance Member of the Indian Council, in his Budget speech, March, 1904, spoke hopefully of a possible revival of the industry, if planters would only put their factories on a sounder financial basis, practise economy in the management of their estates, select the best yielding variety of the indigo plant, and adopt more scientific methods of manufacture. It is due to a few of the more enterprising planters of Behar that progress has been made in these directions.

The great increase in the yield of dye obtained by the latest developments of the industry will be more fully realised by comparing a maximum outturn of ¼ lb. of dry from 100 lb. green plant in 1887, which was then spoken of as "marvellous," with the ¾ lb. of dry dye which 100 lb. of green plant can be made to yield now, an increased outturn which, 20 years ago, would have been regarded as impossible. But quite as important has been the advance in the marketing of the dye in the more convenient form of a paste of such qualities and of such an atomically fine division of the dye that—speaking from practical experience—as much yarn can be dyed a certain shade with one pound of Indigotine in the Standard Natural Indigo paste than can be dyed with 1½ lb. of Indigotine in the synthetic dye.

We arrive now at the question of how this development of the indigo industry affects Ceylon, where it has never been considered profitable to grow the plant, even at the flood tide of prosperity in that industry. In those days the yearly outlay of an indigo factory—for supervision, rent of land, cultivation, manufacture, and the marketing of the dye—used to be in Behar about Rs. 36 per acre, and the outturn was 24 lb. of the dye per acre, selling at Rs. 3 per lb. This gave a cent. per cent. profit.

Cheapness of labour and cheapness of land were then the essential elements in the profitable cultivation of indigo, and on this basis Ceylon could not hope to compete with India. But now these items are not of such importance, since the industry has developed on lines

which make it necessary to treble the outlay, so that the cost of labour and land is now proportionately much smaller. It is this change which enables Ceylon planters to take up indigo cultivation with every chance of success and profit. The increased outlay is chiefly due to the cost of scientific methods of manufacture, and the very large additional outturn of dye obtained thereby has reduced the cost of natural indigo of average quality (60 per cent. indigotine) to 1s. per lb. whereas the synthetic dye costs 1s. 6d. to manufacture, and is sold at present at 8d. per lb. of 20 per cent paste equal to 2s. per lb. of 60 per cent. indigotine.

The way is, therefore, open for a revival of the natural indigo industry on a better basis than ever before, for it is well-known that the cost of the synthetic dye cannot be further reduced. It is generally acknowledged that natural indigo has better dyeing properties than the synthetic product, and dyers will give preference to the natural dye if they can get it at the same price of a standard quality and in the more convenient form of a paste. Such a standard natural indigo paste of keeping qualities has now been produced ; it has been tested by practical dyers, it has met with the approval of Mincing Lane brokers, and it finds a ready demand and sale at a remunerative price.

It will, of course, take some time before an indigo industry on these up-to-date lines is established even in Behar. But a beginning has been made there and it is to be hoped Ceylon will follow suit, for here there is no lack of enterprising men with a command of credit and ready money, which is essential. The climate is favourable, the soil is suitable, and, in short, we have here all the elements that should ensure success.

The indigo plant grows better in Ceylon than in Behar. It grows wild in the low-country and at high altitudes, it is found up to 5,000 feet, it grows in the dry districts and in the wet districts, and there are some sixteen varieties of *Indigofera* indigenous to the Island. The plant grows in Ceylon for the greater part of the year (excepting the very dry districts), and will yield three to four cuttings in the twelve months; whereas in Northern India, where there are four months of cold weather and three months of drought, only one good cutting can be obtained, the second cutting depending much on the season, and, at the best, yielding only a half crop.

Mr. Teixeira de Mottos, General Secretary of the Midden Java Planters' Association, has given me the crop outturn of *Indigofera arrecta* in Java as amounting per acre to 32,000 lb. per year for three cuttings, the yearly outlay being Rs. 100 per acre. This crop outturn of green could, I feel certain, be reached here also in Ceylon, wherever the rainfall is over 60 inches for the year, and where the fall is well divided between the south-west and north-east monsoons.

In the dry districts of the Island, with only one monsoon, and a rainfall of only about 40 inches spread over four to five months of the year, we can only expect two cuttings, which might be estimated to yield about 20,000 lb. of crop per acre, for in Behar I have the

statistics of a crop of *Indigofera arrecta* sown on March 20, and yielding before the middle of September, within a period of six months two cuttings amounting to 21,600 lb. per acre.

If we take for Ceylon a rather higher outlay per acre than in Java, say Rs. 120 per acre, and add to this the expenditure in working according to scientific methods of manufacture (say Re. 1 for every 400 lb. of crop treated) we arrive at a total outlay, for a yield of 32,000 lb. per acre of Rs. 200 per acre, and for a yield of 20,000 lb. crop Rs. 170 per acre. The outturn of dye for Ceylon may be safely estimated at about the same as that obtained in Behar by scientific methods of manufacture, *i.e.*, 2½ lb. of standard indigo paste per 100 lb. of green plant, though actual manufacture from plants grown in Ceylon has shown that the yield of dye is higher than in Behar. Arrangements have been made with a Mincing Lane firm to take over this standard paste at the rate of 50 cents per lb. c.i.f. Colombo.

The outturn of standard paste per acre yielding 32,000 lb. green plant may therefore be estimated at 800 lb. of paste, value Rs. 400, plus Rs. 148, the estimated value of the residual manure which the decomposed plant yields after the dye has been extracted, making a total of Rs. 548 against an expenditure of Rs. 200. In the districts where only 20,000 lb. of green plant can be cut per acre, the outturn of standard paste will be 500 lb., value Rs. 250, plus Rs. 100, the value of the manure, or a total of Rs. 350, against an expenditure of Rs. 170.

There must further be deducted rent of the land (or interest on the capital represented by it) and also the interest on the capital invested in the building of a factory and depreciation.

With the assistance of a few enterprising men in Colombo, this question of the possibility of successfully pioneering in Ceylon an indigo industry on up-to-date lines has been brought nearer torealisation. *Indigofera arrecta* and *Indigofera sumatrana* have been experimentally cultivaed during the last six months in gardens within Colombo city, as well as at higher elevations on coconut and rubber estates. The plants have grown satisfactorily, as could not otherwise have been expected, for indigo is a weed which will flourish well with ordinary cultivation in all tropical and semi-tropical countries. Even where it was sown broadcast on totally unprepared hard laterite soil a crop has been obtained, though the growth is irregular.

What was sown in Colombo in July last has already yielded two cuttings (the second cutting at the rate of 14,500 lb. per acre), and the plants are shooting out well for a third cutting.

Plant grown in the Kalatara district has been manufactured in a miniature factory according to scientific methods and has yielded well, the outturn of dye being much greater than the Behar plant yields, and was equal to 3¾ lb. of standard paste for 100 lb. of green leaf.

You will have noted that I have added to the value of the dye the estimated value of the manure, which is a by-product of indigo manufacture. This is a most valuable asset, especially for Ceylon, where the soil cries out for manure more and more every year. The

fact that indigo cultivation and manufacture will yield as a by-product one of the most valuable of natural manures is one pregnant with the greatest possibility for this Colony.

We know from the experience gained in India and Java that this manurial matter trebles the outurn of tobacco; that it doubles the outurn of paddy, in grain as well as in straw; and it will also be found very suitable for coconut cultivation, for cacao, and for tea.

The manure, consisting of the fermented green leaves and stalks, is put into heaps and kept in pits, and can be further improved in value by running the waste liquid after fermentation over it. The bacterial life, set going by the fermentation, helps to decompose the plant, and turns the whole mass into a brown friable mould. Sir George Watt, in his *Dictionary of the Economic Products of India,* specially refers to the great value of this manure, and you will find the fact mentioned there that experience has shown that land cutltivated in indigo is greatly benefited thereby.

Indigo is one of the few plants which enrich the soil on which it is grown, (1) by the exudation into the soil of nitrogenous matter from peculiar root-nodules in which through bacterial action the inert nitrogen of the air is worked up into assimilable nitrogenous products; (2) by the fall of leaf; and (3) by the droppings of the millions of insect life which an Indigo field harbours, while the long tap roots of the plant draw nourishment from strata of soil not reached by ordinary crops.

This Indigo refuse is called "seet," and closely approximates in its general composition good English Farmyard manure, though it is decidedly richer in its chief constituent—nitrogen. From 100 maunds of green plant about 80 maunds, or about 3 tons, of well-rotted "seet"are obtained. Mr. Pawson, from whose report to the Behar Planters' Association, pages 9-12, I quote, says that without taking into consideration the very valuable manurial qualities of the decomposed organic matter in the "seet," its principal plant food constituents per ton would be equivalent to 103 lb. sulphate of ammonia, 36 lb., sulphate of potash and 13 lbs., tribasic phosphate of lime.

Compared with oil cake, which contains only 14 per cent. of moisture, while "seet" contains 70 per cent., one ton of "seet" is equivalent in manurial value to about 5 cwt, of castor cake. The actual results are, however, even greater in the case of "seet," as the plant food there is in a more assimilable and subdivided form than in either farmyard manure or oil cake. Composition of Indigo refuse or "seet":—

		Per cent
Water	...	72·56
Organic matter	...	22·88
Mineral matter	...	4·56†
		100·00

Containing nitrogen	...	0·98	
Equal to ammonia	...	1·19	
†Containing—			
Silica	...	1·04	
Lime	...	1·09	
Magnesia	...	0·21	
Potash	...	0·89	
Phosphoric acid	...	0·27	
Phosphoric acid equal to tri-basic phosphate of lime		0·58	(Rawson)

Rawson gives the actual money value of the "seet" from 100 maunds (=8,000 lb.) of green plant as amounting to Rs. 37.

From an outurn of 32.000 lb. of green plant per acre we may therefore expect, in addition to the dye, a residual manure worth Rs. 148. The amelioration of the soil, as a concomitant of indigo cultivation, has been recognised as one of the most important elements of the industry in India, and should receive the same recognition in Ceylon.

I trust that the data I have given will draw the attention of Ceylon planters to the cultivation of a product which, even grown as a subsidiary crop, opens such large possibilities for the more successful cultivation of the present stable products of the Island.—*Ceylon Observer*, March 7, 1912.

PRUNING.

Pruning consists in removing any part of a tree, either stem, branches or root with a view to repressing its growth in one direction, and directing the course of sap towards other parts of the tree or shrub, etc, which are better situated and constituted for performing the natural functions.

In this country, trees and shrubs generally, produce an over-abundance of branches, half of which are sufficient for all purposes required, decorative or otherwise. It is therefore essential that pruning be resorted to. By pruning I do not mean to infer that in the case of such trees as Cassia fistula, etc., wholesale, ruthless cutting out of branches is required, far from it, but if a few of the weaker branches were removed, the sap which would have been utilised by the removed branches, is directed into the remaining branches, strengthening and enlarging them so that they are better able to continue the satisfactory growth of the tree.

In fruit trees generally, pruning has a most beneficial effect on the yield of crop, enlargement of the fruit, general productiveness of branches hitherto barren, and admission of more light and air to the remaining branches are some of the immediate results attained.

Pruning may be performed with a pruning knife, secateurs, parang, or small hand-saw, but in all cases the branch should be removed as close to its base as possible leaving a clean, slightly sloping cut. Cover the scar completely over with coaltar, taking care that no tar is allowed to trickle down the bark of the tree. As any unprotected wound or scar is liable to introduce fungi to the tree, it is better to apply the tar two times, i.e., once immediately the branch has been removed and again about a fortnight later. Never leave scars or cuts unprotected for any length of time.

If it is decided to remove some of the branches say of a Mangosteen tree, then immediately the fruit has been gathered is the best time to do so. This allows the remaining branches to enjoy, during the whole of the following growing period, the additional supply of sap thus caused, and consequently the tree produces larger and better fruits the ensuing season. When one sees the numerous inferior Mangosteens placed on the market, it is surprising that some such method of thinning out of the branches has not been practised. Neglecting to thin out the weaker branches is one of the causes by which we get an enormous crop of medium-sized fruits one season followed by a more or less dearth during the next season. Even in this country where growth is extremely rapid, a tree cannot be expected to yield large crops of first class fruits regularly each season, unless some such method of thinning out of branches is adopted. The Chiku (Achras sapota) is another fruit which would be immensely improved by the judicious removal of many of the weak branches

The first thing to be done when pruning trees, shrubs or any sort of plant is commenced is the removal of all dead and dying branches (even if nothing else is done, all such branches should be removed as soon as they appear.) All the weak and useless shoots should then be removed. In pruning ornamental trees or shrubs one must endeavour to preserve the natural symmetry of the plant, but if as is often the case, one branch has a tendency to outgrow its neighbours, then it may be pruned about two feet lower than the tips of the others. If, however, on branching again it still has the same tendency, it should be removed altogether as this excess of growth is probably due to its being in direct contact with a large and strong root.

Shade trees and roadside trees in particular require frequent prunings to obtain the necessary amount of shade with the minimum amount of waste branches. To do this, one must commence pruning shortly after they are removed to their permanent quarters. In many instances, young trees are lifted from the nursery beds and planted without the least care and forethought. Preparations should be made some time beforehand so that the roots are exposed to as few drying influences as possible.

Seedling trees have usually one main shoot which varies in length according to the vigour of each particular variety. If such a tree as this be lifted and planted, in all probability the leaves shrivel and die, causing the death of the shoot two three feet from the tip. It takes some considerable time for the tree to recover from such a check and also produces an unnecessary amount of lateral

branches. If, however, the tip of such a tree be removed until firm wood is obtained (usually about 6 inches) some ten days before planting, the axillary buds will have become plump and active. Planting may then be carried out with much less danger of checking the growth of the tree and almost immédiately continue its growth.

The subsequent lateral branches must be pruned or removed according to the purposes the tree is desired to fulfil, but in order that there be as little waste of sap as possible, they should be removed when quite young.

Ornamental and flowering shrubs require frequent pruning. In the case of the former, sufficient only should be removed to preserve the shape of the shrub unless it has become scraggy, when severe pruning is necessary. For the latter the secateurs may be used frequently and more drastic treatment may be given them.

The pruning of flowering shrubs can be done immediately the flowers have faded but the best and most favourable time to do so is is at the commencement of the rainy season. They may then receive a severe pruning without causing so great a check as when done at any other time of the year.

When a shrub or tree has been pruned, it should immediately receive a liberal dressing of manure, either by mulching or by digging it lightly into the soil. Well decayed leaves and old cow-manure mixed together is the most suitable manure for this purpose.

The following list comprises a few Ornamental and, flowering plants which require such pruning:—*Acalyphas; Angelonia salicaraefolia; Aristolochias* (a few); *Beloperone oblongata; Bougainvilleas*; *Brunfelsia; Clerodendrons; Congeas; Crossandra; Daedalacanthus; Duranta; Eranthemum* (except *E. Malaccensis*); *Cryptostegia; Excaecaria bicolor; Galphimia glauca; Graptophyllum* (Caricature plant); *Hibiscus* (all); *Holmskioldia; Ipomoea carnea; Ixoras; Jasminum* (slight); *Jatropha; Lantanas; Murraya* (slight); *Mussaendas; Quisqualis indiga* (Drunken sailor); *Nerium; Palicourea gardenioides; Petraea volubilis; Plumbago rosea* (frequently); *Rondoletia odorata* (slight) *Russelias; Sanchezia nobilis; Panax fruticosus* (all vars.); *Strobilanthes Dyerianus; Tecoma stans; Thunbergia erecta;* and *Wormias.*

J. W. ANDERSON.

IN UNKNOWN PAPUA.

MR. STANIFORTH SMITH'S TOUR.

London, Feb. 16.

Mr. Staniforth Smith, Administrator of the Territory of Papua, lectured this week before the Royal Geographical Society on his recent adventurous journey through the Western District of Papua. Here are some notable results of his adventures which prove that the terra incognita consisting of huge up-raised coral beds has a larger area of elevated land than any other discovered in the territory.

The Natives.

The description of the country given postulates a somewhat sparse population over this elevated portion of the Western Division. At Sambregi, immediately to the north-west of Mount Murray, are a cluster of villages with an aggregate population of about 1,000 people. Throughout our trip we saw only one other village of any size, which we reached on December 27th. This was on a large tributary of the Kikor flowing south of east. In every other instance the tribe or clan lived in one communal dwelling, varying in dimensions according to the size of the community, and capable of housing from ten to seventy people. These dwellings, especially the smaller ones, are generally hidden away or perched on steep ridges, that are not easy of access, probably from motives of defence. The population of this area of elevated land is estimated at 15,000 inhabitants, or about one and a quarter persons to every square mile.

The native inhabitants of the interior do not appear to be a homogeneous people; racial distinctions are apparent that seem to indicate a mingling of Papuans and Papuo-Melanesians, to use the terminology of Dr. Seligmann. Some of the inhabitants of a village were dark-skinned, dolichocephalic men, with wiry frames and somewhat slender limbs, and, in disposition, rather morose and unemotional. In not a few instances the somewhat prominent nose was arched, presenting the appearance of the so-called Semitic type. Other villagers again were unusually light skinned—more the colour of a Samoan. The high altitude might accentuate this. I was unable to obtain the cephalic indices of any of the natives, as they were very shy, and we could not afford to make a long stay anywhere. The faces of the light-skinned men were broader and shorter than their darker neighbours, their limbs stouter, and they appear to be more vivacious and intelligent, and also to be fonder of ostentation in the shape of ornaments and paint. The Melanesian migration into New Guinea is believed to have advanced along the north-east coast as far as Cape Nelson, where their progress was stopped by the warlike Binandili tribes; and along the southern coast till they reached the populous villages of the Gulf country. It is, however, not yet known how far the immigrant race penetrated inland. Certain of the inhabitants of the main range near the Gap, at Mount Albert Edward, and on the Chirima, as well as in the neighbourhood of Mount Yule, are lighter skinned and broader headed than the Papuan, and it is possibible that the Melanesians have gradually diffused themselves inland along the southern slopes of the main range, where the original inhabitants were few in number, and therefore less able to successfully resist the advance. The greatest obstacle would be the natural features of the country, which would necesitate very slow progress. This might account for the marked distinction in physical characteristics which have not yet been obliterated by miscegenation. The light skinned people were nearly always in a minority. Mr. J. P. Thompson, in his book, 'British New Guinea,' speaks of the

"remarkably light bronze colour," of some of the natives of the upper Fly river.

I obtained a small vobabulary—principally substantive nouns—from the Sambregi tribes, immediately to the northwest of Mount Murray, in the hope that it would contain sufficient information to enable philologists to determine if the language was Papuan or Melanesian; unfortunately, this was lost with all other papers in the Kikor river.

By exercising great forbearance and patience, we were fortunately successful in making friends with these bushmen everywhere. As they had never seen white men before, our arrival caused great excitement. At the first small communal dwellings we reached they all turned out with their bows and arrows, and stood shouting their war cries. They naturally thought we were a marauding party, and naturally, and rightly they were prepared to defend their wives and children and homes. While they were in this condition of extreme excitement our party sat down, and, although our arms were ready for any emergency, appeared to take no notice of them, except to hold up some red cloth. They then retired, and, when some presents were sent up to the house, we found that they had all fled, the hostile demonstration being probably to allow the women and children time to get away into the jungle. Great care was taken that nothing was touched, and a tomahawk, a knife, and some red cloth were left in the house. Not seeing them return, we started on our march next morning, and in the afternoon were overtaken by the natives, who, when they found that we had no desire to hurt them, evinced the greatest joy, and made us presents of food. After that for some days we experienced little trouble in establishing friendly relations with the natives we met. Possibly, by some bush telegraphy they had notified the other tribes that we had no desire of injuring them. In many instances the friendship of the natives was of great service to us. Not only were we able to buy food, but they showed us native tracks, and, in one instance, took the whole party over a wide river in their canoes.

The inhabitants of the Sambregi villages were particularly interesting as they live at an elevation of 6,000 feet above the sea-level, the highest elevation, I believe, of any Papuans so far visited. The physique of some of the young men was magnificent, the Kagi men of the main range approaching most closely to them in this respect. While the tracks between the villages of Sambregi were in wretched repair, and the houses below the standard of native dwellings in Papua, these people excelled in drainage schemes. The gardens in the rich low-lying portions of the valley are drained into the Sambregi creek by water channels varying in depth with the contour of land. In some cases the drains are as much as 8 feet in depth; no water lodges in them, and they are kept in excellent repair. With the exception of the native irrigation channels near Dogura in the Eastern Division, in no other part of the territory do the natives show such knowledge of channel construction. Although it is most

improbable that any of these bushmen have ever seen the sea, it is evident that they are able to carry on some trade with the coastal men, probably through many intermediate tribes, as we found them wearing sea-shell ornaments, and possessed, in some instances, of iron implements, such as a much used axe blade and plane irons. They also knew the names of the Kikor, Turama, and Bamu rivers, but their ideas as to the directions of same were sometimes far from correct.

While these far-inland bushmen are probably cannibals, we were unable to find any direct evidence. At Sambregi, one youth had a skull hung round his neck, and one man a pair of human jawbones; these, however, many have been the remains of relatives. In their dubus, or communal dwellings we saw no skulls or other human bones, although the jaws of pigs and other trophies of the chase were in evidence.

It appears that the natives bury their dead, and, at any rate in some instances, dig up the bones at a later period and put them on platforms. In one instance we saw a tiny house like a small dove-cot built on piles about 6 feet from the ground. In this was a skull painted with red ochre, and some bones. We also saw a platform recently erected, and the natives indicated that it was for human bones. In a rock shelter we saw two skulls and bones placed side by side in a circle of stones; close by were evidences of a grave having been opened and bodies exhumed.

For clothing the natives wear a piece of netted cloth hung down from the waist in front from a wide girdle of bark; at the back dried grass or the bright coloured leaves of a plant. In other instances, tapa cloth was hung from the waistband. As a head-dress they wore the black plumes of the cassowary, or the feathers of the white cockatoo; very occasionally we saw the plumes of the raggiana bird of Paradise. Their hair was usually worn short in front and long behind, clotted into tags and rolls, either with oil or honey and wax of the little black stingless bees. The hair is not bleached with the lime as in other parts of the territory. They wore cane armlets, anklets, and waistbands. These canes were used for fire making. The septem of the nose is pierced and the lobes of the ear, and various things hung thereon from a pencil of bone to circular pieces of cane and the claws of birds. It is remarkable that during our whole trip we saw no evidence of tattooing nor any cicatrices or mutilation of the body. Skin disease was exceedingly rare, and only seen in one or two instances in the adults, and rather more frequently amongst the children. In fact, the natives generally were a remarkably healthy lot of people. In time of war, and probably on festive occasions, they paint themselves either wholly or in part with yellow or red clay, or with ground charcoal and oil. The women wore a tapa cloth rami from waist to knee. They also have tapa cloth cloaks which cover the head and reach to the ground; this I have seen nowhere else in the territory. In their dubus or communal dwellings they keep rolls of tapa cloth blankets as the nights are cold on the great plateau.

They have no pots or cooking vessels and consequently all their food is roasted over the fire; the only exception I saw was in the case of the leaves of an oleaginous plant which they boil as a vegetable in bamboos. We saw no evidence of polygamy, and the probability is that it is not largely practised. From the inhabitants we saw, the women folk seemed less numerous than the men but this may have been owing to the warriors keeping them in the background. Children seemed fairly plentiful. The time of the men is principally occupied in clearing ground for gardens, hunting the pig, cassowary, and flying fox, building houses, making weapons, and cutting down sago trees. The women make all the sago—a continuous and exacting occupation —look after the gardens, do the cooking, and carry water required for household purposes in bamboos. They also hammer out the tapa cloth from the bark of a tree, and look after the rising generation.

These bushmen are certainly not a nomadic people. Their buildings are substantial, and, in every instance, they had a considerable garden and a number of village pigs. Their weapons consist of the bow and arrow, a heavy pig spear which is not used for throwing, and a man-killing club. Very rarely we saw stone clubs; these had probably been introduced from the coastal districts. The bow and arrow men wore plaited gauntlets from wrist to elbow on the right arm. The stone axe and adze are largely used. The natives do little carving except on their arrows (which are made of bamboos often tipped with bone or a cassowary's claw), spears, and wooden clubs. They also carve out wooden bowls to hold water; these have no ornamentation. The tribes on the western portion of the plateau seemed to be at war with each other during our visit; they were frequently met in full war paint; with bundles of arrows and killing clubs; in one instance they informed us by signs that they were on their way to fight a neighbouring tribe. Possibly, constant internecine strife keeps their numbers down, and accounts for the comparatively sparse population, as the climate is bracing and healthy and the natives singularly free from disease and full of vigour.

Their method of making fire is superior to the usual Papuan system. They get a piece of dry soft wood, split one end and insert a piece of tapa cloth, then taking a piece of cane, which they carry twisted round their waists, they place it under the wood on which they stand. Grasping each end of the cane, they pull it backwards vigorously; when it has eaten halfway through the wood to the tapa cloth the heat generated is so great that the cloth smoulders and is blown into flame. The whole process is accomplished in ten or fifteen seconds. I am informed that certain natives on the main range about Kagi adopt this system also; if so, it is interesting as possibly shewing some connection between them.

With the exception of two large villages, all the natives we saw were split up into small tribes, and each community has one communal dwelling, varying in size, according to their numbers, which would probably range from ten or fifteen up to seventy or eighty.

The dwelling is erected on a forest of piles composed of thin but durable wood, and is elevated from 10 to 12 feet above the ground. The sides of the great living room are only about 4 feet high, and the pitch of the roof is low. The roof is made of the fronds of the sago palm, each separate leaf being doubled round the rafters (which are only about 6 inches apart), and sown with native fibre to keep it in its place. At one side of the entrance is a partition, which does not reach as high as the roof; this divides the house lengthways into the men's quarters on the one side, and the women's and children's on the other. In each subdivision there is a gangway the whole length, and on one side of each a raised floor which is sub-divided alternately into sleeping platforms and fireplaces, each about a yard in width: above the fireplace is a platform filled with wood, and above each sleeping place another platform on which the men keep their weapons and other effects, and the women their tapa cloth, bamboo drinking vessels, and food supply. The dogs share the buildings with the natives. The house is generally surrounded by a garden. Variations of the above were seen. Near Mount Murray there were two additional rows of sleeping platforms and fireplaces on the ground level, one on each side with a separate entrance for each. Again, about 300 miles up the Kikor at the largest dubu we had seen (which we estimated was 70 yards in length) the partition, instead of running lengthways, was across the centre of the building dividing the men's and women's quarters. We have travelled down the Kikor about 116 miles to this point before we came upon the first coconut trees we had seen on our journey, nor did we see any more until we reached the mouth of the Kikor. We found that the language or dialect of the people was continually changing as we advanced. At the Sambregi a vocabulary of the most useful words, principally substantive nouns, was compiled; this, besides being of philological interest, we hoped would be of use to us in communicating with the natives we subsequently met; we found, however, that after advancing about 20 miles, the dialect changed, and very few of the words could be understood. Further on the language was quite different.

While the many tribes of natives we met on our exploration showed no suspicion and absolute confidence in us, after we had succeeded in establishing friendly relations, frequently coming to our camp and sitting round the fire at night, and bringing their women and children to see the "pale faces" during the daytime, they all without exception, refused even to taste any food we offered them, although they would take it and wrap it up in leaves, probably as a curiosity. This refusal may indicate that they possessed a knowledge of poison (we saw a fish-poison tree in one of their gardens), it may, on the other hand, have risen from a fear of "pouri-pouri" or witchcraft, or again, it may be that they were conservative in their commissariat and did not care to eat new foods they were not accustomed to.

Climate.

The climate of the plateau was cool and bracing, the nights being sharp and cold. This doubtless accounts for the healthy appearance of the people who also gave evidence of greater activity than the coastal races. The rainfall on the eastern portion of the plateau was heavy and of almost daily occurrence, generally commencing about four o'clock in the afternoon. As we advanced west the rainfall became less frequent and torrential, only falling on an average about three or four times a week. This might be accounted for by the great distance we were from the sea.

Coal.

There is every probability of beds of good coal being found on the borders of the great plateau, although I do not think that any minerals of value will be found in the elevated region caused by the upheaval of the coral beds. Coal has been found on the upper waters of the Purari by the Mackay expedition, and it was found by us both on the lower and upper waters of the Kikor river. On the upper waters of the Kikor there is undoubtedly a very extensive field of excellent coal. Unfortunately, the large number of specimens we were bringing down were lost when the rafts capsized. We followed down a creek for some days that brought us to the Kikor. Everywhere the beds were strewn with lumps of good-looking, bright, hard coal, and for about 15 miles down the Kikor coal was seen in almost every little creek and waterway, as well as on the banks of the river. The attempt to develop this field by the Kikor waterway is evidently impossible, as for 120 miles the river is one succession of rapids, whirlpools, and gorges. There is no reason why this coalfield should not extend further west, in fact a seam of coal was seen on the western side of the river, and, if so, it might be worked from the Strickland river, which it was estimated could not be more than 20 miles distant.

The coal we found on the lower Kikor was one isolated lump considerably weathered. However, as the creek was a very small one, running northward for only a few miles, it is evident that the seam from which it came could not be far off, and, when a magisterial station is established on that river, a fuller investigation might be made. If a large bed of good coal could be found here, I believe barges might be brought up the river to within 6 or 7 miles of it, although two very small rapids occur on the route. These run swiftly when the river is high, but are barely noticeable when the river is not in flood.

Flora.

The whole of the country traversed was covered by dense jungle and scrub, and we literally had to cut our way through the 374 miles traversed on foot, except where we occasionally met a native track going in the desired direction. It was surprising that over rough coral ranges and valleys, trees of considerable size and dense scrub could find a roothold and sufficient nourishment. The roots spread all over the surface of the rocks, constituting steps and ladders up

the steep mountain-sides, without which their ascent would have been most difficult. A remarkable fact was that we saw no grass whatever, except a little reedy grass near the rivers during our whole trip.

Of the economic flora, by far the most important was sago (Sagus Rumphii). We found these useful storehouses of nourishing food growing as far north as we penetrated, and up to an elevation of 3,500 feet. It had previously been considered that sago only grew along the coast and in the alluvial mud of riverbanks near the sea-level. This constitutes the staple food of all the inland natives we met, except the inhabitants of the Sambregi villages, who live principally on sweet potatoes, the elevation (6000 feet) being too great for sago. Wild breadfruit trees are fairly numerous. The fruit, unlike the Samoan breadfruit, is full of large seeds nearly the size of walnuts. These, when roasted, are palatable and make a good substitute for potatoes. The natives when hungry eat the pith of a small palm that grows plentifully over a large area of the country traversed by us. In time of scarcity our police and carriers consumed a good deal of this. To our palates it had a watery and woody taste that was far from agreeable; in fact, when hungry I tried to eat it, but in each instance it made me sick. I collected the seeds of several indigenous fruits, which, while not palatable, might have been improved by cultivation, but these were lost with other things.

Cultivated in the native gardens we found sweet potatoes, taro, yams, sugarcane, bananas, betel-nuts and ginger, the last-named cultivated as a medicine. Maize is unknown. No coconut trees were seen on the whole trip until we reached the lower waters of the Kikor river, nor are there any mango trees or tapioca. The natives grow a green vegetable, the leaves of which they boil in bamboos. It makes a very good substitute for cabbage and appears to contain a lot of vegetable oil.

Tobacco is cultivated in every native garden, which might lead one to suppose it was indigenous; the name, however, tends to show that it is an introduced plant. It is universally called "Saku" by the bushmen, which is evidently derived from "Kuku," the coastal name. In one of the gardens on the headwaters of the Kikor I found a Kava plant (Macro-piper methysticum) although I saw no evidence of the manufacture of the beverage.

Fauna.

The wild pig, judging by the amount of ground that is rooted up, is plentiful everywhere. It is the chief source of meat-supply for the natives, and is continually being hunted with dogs, the killing weapons being bow and arrow and spear. The only animals domesticated are the pig and the dog. The wallaby is very scarce, owing to the absence of grass. Cassowaries are fairly plentiful, their back plumes forming a favourite head-dress. Flying foxes are very numerous. Their flesh is much relished by the bushmen. Tree-rats were occasionally seen, and the streams abound in fish of excellent quality. Two or three were shot with a rifle, but as we had neither fishing lines

nor nets, this luxury was usually denied us. The natives catch the fish by spearing them and by fish-traps composed of stones or pickets across the streams. The little black stingless bee is common everywhere, and the honey and comb is much prized for food and as a dressing for the hair.

Cockatoos, both black and white, and pigeons were plentiful. Those wonders of avian architecture, the play grounds of the bower bird (Amblyornis subalaris), were seen on Mount Murray, at an elevation of 7000 feet. Of insect pests, the land leeches were very troublesome. The feet of the police and carriers were often red with blood from their bites. We tried painting their feet with sulphur ointment, but it proved quite useless. Scrub itch was very bad, except in the valley of the upper Kikor. The scrub itch is caused by a minute red insect that buries itself under the skin. Mosquitoes did not trouble us while on the highlands, but both they and sandflies were very troublesome on the Kikor river.

The "leaf" or "stick" insects were fairly plentiful, and in some instances their resemblance to the plant life in their immediate environment was wonderfully accurate. One insect resembled a stick covered with green moss; the green colouring appeared so exactly like moss, that a member of our party refused to believe it was not actually moss until he had examined it with a magnifying glass.

On the map accompanying this report the course of that portion of the Kikor river lying to the west of the 114th meridian of east longitude is only approximate, as, while descending this river, most of our instruments were lost, and the compass-bearings and estimated speed could not be checked by observations for latitude. In addition to which the great difficulties that beset us on our return journey did not permit of the careful mapping previously undertaken.

The most important results of the exploration were:—

(1) We went practically right across the centre of the unexplored portion of the territory of Papua, travelling approximately 524 miles through totally unexplored country (374 miles on foot and 150 by river.)

(2) We ascertained that instead of the Western Division of Papua being low-lying recent alluvial country, as previously supposed, it is (except along the coast and in the vicinity of its navigable rivers) an upraised plateau having an area of approximately 12,000 square miles, the lowest valley being over 2,000 feet above sea-level.

(3) The upper waters and watersheds of the great rivers emptying into the Papuan Gulf are now roughly defined, thus completing our knowledge of the river system of the territory.

(4) We have now data for estimating the population of the whole territory with some accuracy, the hinterland of the Western Division being formerly an unknown quantity.

(5) We found coal deposits in two places along the watershed of the Kikor river, the coal country along its upper waters being very extensive.

(6) We found sago growing inland as far as we penetrated and at an elevation up to 3,500 feet.

(7) We established friendly relations with the natives everywhere, and were successful in avoiding all fighting. *Singapore Free Press*, 15th and 16th March, 1912.

Before proceeding to Papua as Administrator Mr. Staniforth Smith spent some time in Ceylon and Singapore, studying the agriculture and Economic Botany. From Singapore many cases of useful plants were taken for introduction to Papua and seeds are periodically communicated.

LEWIS AND PEAT'S RUBBER REPORT.

February 15th, 1912.

The market since our last report has been very steady and a fair business done.

Hard Fine done up to 4/7½ for March/April, delivery and 4/7¾ for April/May. At the close, however, prices are a little easier and there are sellers of these positions at a farthing per lb. less.

Soft Fine—very quiet with nothing offering under 4/7 per lb.

Peruvian Fine—value to-day 4/6. Ball—sellers of spot 4/–, March/April 3/11, buyers 3/10½ per lb.

Medium grades are in good demand, but there is very little offering.

Plantation Grown Para—a fair business done privately at very steady prices. Feb./March done up to 5/3½, Feb./July 5/3, April/June 5/2 and 5/2½, July/Sept. 5/– and 5/0½ per lb.

Particulars of the Auction as follows:—

INAMBARI.—26 Pkgs. offered and sold. Fair average unsorted 4/3¼, fair scrappy part sticky 3/6½ per lb.

MANGABEIRA.—88 Pkgs. offered and 16 sold. Pressed sheet fair 2/9½ per lb.

MOZAMBIQUE.—253 Pkgs. offered and 153 sold. Rough Nyassa.

NYASSALAND, ETC.—Biscuits 4/8¾ and 4/9¼, red and whitish pressed ball 4/3 and 4/4, washed rooty 3/6 and 3/9½, washed crêpe 4/5, thin rather rough Ceara sheet 4/5½ per lb.

CENTRAL AMERICAN.—32 Pkgs. offered and 16 sold. Dark Brown rather barky scrap 3/8½ and 3/8¼ per lb.

MANIHOT.—85 Pkgs. offered and sold. Good clean pressed crepe 4/8½ and 41¼, dark pressed mixed whitish 4/3, pressed whitish smoked 3/9¼ per lb.

CONGO.—30 Pkgs. offered and sold. Pressed red and whitish ball, part heated 3/6¾ per lb.

The following were offered and bought in:—

MANICOBA 200, MADAGASCAR 18, AFRICAN 35, PERNAMBUCO 20, & MALAYSIAN 28 PKGS.

PLANTATION. At the sales held on the 13th and 14th inst., about Grown Para, 9241 Pkgs. comprising about 400 tons Malay, 110 tons Ceylon and 5 tons Java were offered. Prices opened about a penny under those prevailing at the last Auctions; later however, rates hardened and the decline was fully regained, although at the close prices were again slightly easier.

CREPE.—Fine blanket 5/3¼ and 5/4¼, pale and palish 5/2½ and 5/4¼, light 5/1¾ and 5/3¾, light brown and mottled 5/1½ and 5/3½, brown and dark brown 5/1½ and 5/3, dark and black 4/10½ and 5/½, specky and barky 4/9¼ and 5/–, smoked 4/11¾ and 5/2¼ per lb.

BISCUITS & SHEET.—Fair smoked sheet 5/2½ and 5/4¾, fair average 5/2 and 5/3, rather rough 5/1¼ and 5/2, per lb.

SCRAP.—Fair 4/5¾ and 4/6¼ per lb.

RAMBONG.—Crepe 4/5¾ and 4/7¼ per lb.

LANADRON.—Block 5/4 and 5/4¼ per lb.

CASTILLOA.—Sheet 4/3½ per lb.

GOW, WILSON & STANTION, LTD.

India Rubber Market Report.

February 15th, 1912.

Since the last auction the market has assumed a rather quieter tone, but prices have only shown very slight variations.

At the sale held this week, the amount advertised was about 120 tons less than a fortnight ago.

In sympathy with the private market, the sales opened with rather quiet competition, but all through the auction the tone steadily improved, and while at the beginning quotations were 1d. to 1½d. below those of a fortnight ago, by the end of the sale the whole of this discount was made up, and rates, especially for Crepe, often marked a slight improvement on those of the end January sale.

The highest figure was 5/4¾ for one parcel of Highlands sheet, 5/4¼ being frequently paid for light Crepe on the second day of the sale.

As will be seen from the figures published overleaf, the total exports of Plantation Rubber from the East during 1911 amounted to nearly 14,000 tons.

		Malaya Etc.	Ceylon.	Total.	No. Pkgs. Sold.	Average Price Plantation Rubber.	Fine Hard Para.		Fine Plantation.
February 13th and 14th							Tues.	Wed.	
	No. Pkgs.	7124	2150	9274	9080	5/1⅞			5/2¼ to 5/4¾
	,, Tons	411	98	509			4/7	4/7¼	
Corresponding Sale Last Year	No. Pkgs.	4994	1086	6080	5150	6/1⅞	6/2½	6/2½	6/1 to 6/11¾
	,, Tons	277	48	325					

EXPORTS TELEGRAM TO EUROPE AND AMERICA.

Month of February.

	Steamers.		Wired. Feb. 15 Tons.	Feb. 29 Tons.
Tin	Str. Singapore & Penang	to U. Kingdom &/or	1,660	1,455
Do.	do.	U. S. A.	1,056	405
Do.	do	Continent	395	285
Gambier	Singapore	Glasgow	...	10
Do.	do.	London	10	...
Do.	do.	Liverpool	120	...
Do.	do.	U. K. &/or Continent	25	125
Cube Gambier	do.	United Kingdom	10	15
Black Pepper	do.	do.	...	...
Do.	Penang	do.	...	15
White Pepper	Singapore	do.	125	5
Do.	Penang	do.	30	5
Pearl Sago	Singapore	do.	50	15
Sago Flour	do.	London	75	200
Do.	do.	Liverpool	1,300	...
Do.	do.	Glasgow	125	...
Tapioca Flake	Singapore	United Kingdom	260	...
Tapioca Pearl & Bullet	do.	do.	120	...
Para Rubber	Straits & Malaya	do.	725	625
Gutta Percha	Singapore	do.	110	20
Buffalo hides	do.	do.	180	5
Pineapples	do.	do.	17,500	3,150
Gambier	do.	U. S. A.	275	150
Cube Gambier	do.	do.	...	10
Black Pepper	do.	do.	5	5
Do.	Penang	do.	25	...
White Pepper	Singapore	do.	20	15
Do.	Penang	do.	...	15
Tapioca Pearl	Singapore	do.	110	45
Nutmegs	Singapore & Penang	do.	40	4
Sago Flour	Singapore	do.	50	25
Pineapples	do.	do.	4,500	300
Do.	do.	Continent	8,750	2,250
Gambier	do.	South Continent	225	60
Do.	do.	North Continent	340	50
Cube Gambier	do.	Continent	30	35
Black Pepper	do.	South Continent	55	85
Do.	do.	North do.	20	35
Do.	Penang	South do.	75	30
Do	do.	North do.	...	...
White Pepper	Singapore	South do.	5	...
Do.	do.	North do.	15	5
Do.	Penang	South do.	5	10
Do.	do.	North do.	15	...

		Steamers.		Wired. Feb. 15 Tons.	Wired. Feb. 29 Tons.
Copra	Singapore & Penang		Marseilles	400	150
Do.	do.		Odessa	...	50
Do.	do.		Other South Continent	540	150
Do.	do.		North Continent	300	580
Sago Flour	Singapore		Continent	1,700	550
Tapioca Flake	do.		do.	210	55
Do. Pearl	do.		do.	40	5
Do. Flake	do.		U. S. A.	...	...
Do. do.	Penang		U. K.	...	...
Do. Pearl & Bullet	do.		do.	170	250
Do. Flake	do.		U. S. A.	...	...
Do. Pearl	do.		do.	30	290
Do. Flake	do.		Continent	...	10
Do. Pearl	do.		do.	225	110
Copra	Singapore & Penang		England	50	...
Gutta Percha	Singapore		Continent	15	40
Tons Gambier } ...	...	...	...	250	200
„ B. Pepper }				280	230
Para Rubber	Straits and Malaya		U. S. A.	50	10
Do.	do.		Continent	50	40

SINGAPORE MARKET REPORT.

February, 1912.

	Tons.	Highest	Lowest.
Copra	3,198	10.70	10.20
Gambier Bale	460	10.45	9.95
„ Cube No. 1 & 2 ...	102	15.85	13.50
Gutta Percha 1st quality ...	...	275.00	200.00
„ medium ...	...	140.00	90.00
„ lower ...	...	70.00	17.00
Gutta Jelotong	...	10.00	8.40
Nutmegs 110s.	...	25.00	24 00
„ 80s.	...	26.00	25.00
Black Pepper	511	22.62½	21.75
White „	94	32.75	30.50
Sago Pearl, small	41	5.35	5.00
„ Flour No. 1	3,820	4.36	4.15
„ „ No. 2	628	1.75	1.60
Tapioca Flake, small ...	356	9.25	8.60
„ Pearl „ ...	126	8.20	7.60
„ „ medium ...	225	9.00	8.50
Tin	2,145	96.90	96.00

SELANGOR.

Abstract of Meteorological Readings in the various Districts of the State of Selangor for the month of December, 1911.

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 ...	29.872	147.5	81.4	89.6	73.9	15.7	76.7	0.821	73.3	77	Calm.	11.06	2.66
Prisons „ „ ...	...	...	...	...	...	...	...	...	...	...	...	14.23	2.27
District Hospital „ ...	...	...	...	...	...	...	...	...	...	...	...	9.44	3.20
„ Klang	...	...	...	88.7	69.6	19.1	...	...	...	...	...	15.34	4.65
„ Kuala Langat ...	...	...	...	86.1	73.7	12.4	...	...	...	...	...	11.43	2.00
„ Kajang	...	...	...	84.5	74.8	9.7	...	...	...	...	...	15.28	1.74
„ Kuala Selangor ...	...	...	...	87.3	71.3	16.0	...	...	...	...	...	13.27	2.50
„ Kuala Kubu	...	...	...	89.4	70.9	18.5	...	...	...	...	...	13.92	2.82
„ Serendah	...	...	...	92.0	70.4	21.6	...	...	...	...	...	16.00	2.35
„ Rawang	...	...	...	91.6	72.5	19.1	...	...	...	...	...	13.66	1.75
Sabah Bernan	...	...	...	...	...	...	...	...	...	...	...	9.24	1.19

OFFICE OF THE SENIOR MEDICAL OFFICER,
KUALA LUMPUR, 30th Jan., 1912.

G. D. FREER,
Senior Medical Officer,
Selangor, Negri Sembilan & Pahang.

SELANGOR.

Abstract of Meteorological Readings in the various Districts of the State of Selangor for the month of January, 1912.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Max'mum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
General Hospital, Kuala Lumpur ...	29.883	148.3	81.4	89.2	73.1	16.1	76 5	.826	73.2	77	Calm.	4.76	2.21
Prisons „ „	...	...	...	...	...	...	...	...	...	...	...	3.68	2.73
District Hospital „	...	...	...	...	...	...	...	...	...	...	...	4.58	1.57
„ Klang	...	...	...	90.4	69.6	20.8	...	...	...	...	...	3.25	0.93
„ Kuala Langat ...	...	...	...	88.0	73.0	15.0	...	...	...	...	...	5.73	2.24
„ Kajang	...	...	...	87.1	74.4	12.7	...	...	...	...	...	2.12	0.46
„ Kuala Selangor ...	...	...	...	89.5	71.6	17.9	...	...	...	...	...	1.66	0.60
„ Kuala Kubu	...	...	...	91.8	71.6	20 2	...	...	...	...	...	2.42	0.73
„ Serendah	...	...	...	93.3	70.8	22.5	...	...	...	...	...	7.81	2.92
„ Rawang	...	...	...	90.5	70.9	19 6	...	...	...	...	...	9.30	4.30
Sabak Bernan	...	...	...	...	...	...	...	...	...	...	...	2.65	2.15

OFFICE OF THE SENIOR MEDICAL OFFICER,
KUALA LUMPUR, 26th Feb, 1912.

G. D. FREER,
Senior Medical Officer,
Selangor, Negri Sembilan & Pahang.

PAHANG.

Abstract of Meteorological Readings in the various Districts of the State of Pahang for the Month of December, 1911.

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.			
District Hospital, Kuala Lipis	...	...	78.2	85.1	67.4	17.7	74.5	...	...	...	...	12.52	3.10
,, ,, Raub	...	...	82.9	90.9	67.6	23.3	73.1	...	...	...	...	13.04	2.48
,, ,, Bentong	...	...	80.3	88.5	70.5	18.0	74.0	...	...	...	...	17.07	3.00
,, ,, Pekan	...	...	78.4	83.6	72.2	11.4	76.0	...	...	...	...	47.57	9.52
,, ,, Kuantan	...	...	78.6	86.6	69.8	16.8	76.5	...	...	...	...	35.11	6.52
Dispensary, Temerloh	...	...	...	87.0	67.0	20.0	...	...	...	...	...	11.28	2.14
Sungei Lembing	...	...	...	84.0	73.6	10.4	...	...	...	...	...	35.44	86.2
Kuala Tembling	...	...	...	...	...	...	...	...	...	...	...	11.22	2.43

Office of the Senior Medical Officer,
Kuala Lumpur, 23rd January, 1912.

G. D. Freer,
Senior Medical Officer,
Selangor, Negri Sembilan & Pahang.

PAHANG.

Abstract of Meteorological Readings in the various Districts of the State of Pahang for the month of January 1912.

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.			
District Hospital-Kuala Lipis	...	...	79.5	87.0	67.1	19.9	74.5	...	...	...	...	7.09	1.95
,, ,, Raub	...	...	82 6	91.8	67.5	24.3	73.3	...	...	...	...	5.52	1.92
,, ,, Bentong	...	...	80.5	89.1	70.1	19.0	75.2	...	...	...	...	4 09	2.27
,, ,, Pekan	...	...	80.3	84.9	72.2	12 7	74.6	...	...	...	...	8.31	2 68
,, ,, Quantan	...	...	78.5	89.1	70.9	18.2	74.2	...	...	...	...	9 54	4.30
Dispensary, Temerloh	...	...	...	87.9	67.3	20.6	...	...	...	...	...	3 35	0 85
Sungei Lembing	...	...	...	85.8	72.7	13.1	...	...	...	...	...	10.66	2.44
Kuala Tembling	...	...	...	...	...	...	...	...	...	...	...	3.46	1. 3

OFFICE OF THE SENIOR MEDICAL OFFICER,
KUALA LUMPUR, 4th March, 1912.

G. D. FREER, *Senior Medical Officer,*
Selangor, Nrgi Sembilan & Pahang.

PERAK.

Abstract of Meteorological Readings in the various Districts of the State of Perak for the month of January 1912.

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	...	105	82.22	93	69	24	77.13	865	...	79	...	12.49	4.94
Kuala Kangsar	...	...	80.61	92	68	24	75.06	809	...	80	...	5.09	2.32
Batu Gajah	...	95	80.63	92	70	22	75.47	813	...	78	...	4.31	1.85
Gopeng	...	...	80.11	92	67	25	74.06	760	...	74	...	8.72	3.79
Ipoh	...	...	81.91	93	69	24	76.27	830	...	77	...	4.09	2.00
Kampar	...	...	81.09	93	69	24	75.84	824	...	78	...	7.04	2.13
Telok Anson	...	...	81.50	93	69	24	77.18	875	...	83	...	3.96	2.67
Tapah	...	...	81.48	92	65	27	76.17	831	...	78	...	13.75	5.70
Parit Buntar	...	...	81.68	93	68	25	76.26	833	...	78	...	2.47	1.00
Bagan Serai	...	...	81.96	92	70	22	76.76	850	...	78	...	1.35	.54
Selama	...	...	80.94	94	66	28	75.07	792	...	76	...	7.57	2.96
Lenggong	...	...	79.90	90	65	25	75.07	816	...	78	...	5.88	1.50
Tanjong Malim	...	...	80 83	94	66	28	76.62	861	...	82	...	9.06	3 74
Grit	...	...	77.61	94	62	32	71.82	708	...	75	...	4.81	2.54
Klian Intan	...	...	...	...	...	...	...	...	...	...	...	4.87	2.37
Pulau Pangkor Laut	...	...	...	...	...	...	...	...	...	...	...	5.15	2.78
Kuala Kurau	...	...	...	...	...	...	...	...	...	...	...	2.65	1.75
The Cottage	...	...	...	...	...	...	...	...	...	...	...	8.46	2.70
Maxwell's Hill	...	...	...	...	...	...	...	...	...	...	...	8.71	2 30

Office of the Senior Medical Officer,
Taiping, 16th February, 1912.

S. C. G. Fox,
Senior Medical Officer.

PERAK.

Abstract of Meteorological Readings in the various Districts of the State of Perak for the month of February, 1912.

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	...	106	82.28	94	70	24	77.13	864	...	79	...	10.57	1.58
Kuala Kangsar	...	...	82.00	94	70	24	75.83	811	...	74	...	5.17	1.75
Batu Gajah	...	...	82.11	93	70	23	76.27	828	...	77	...	9.01	3.86
Gopeng	...	...	80.87	92	68	24	74.80	784	...	74	...	6.88	1.97
Ipoh	...	...	82.87	94	70	24	76.23	816	...	73	...	5.74	1.86
Kampar	...	...	81 47	93	68	25	76 34	839	...	78	...	14.43	3.38
Telok Anson	...	...	81.68	93	69	24	77.18	867	...	81	...	10.41	2.10
Tapah	...	...	81.69	92	66	26	76.54	845	...	78	...	9.05	1 79
Parit Buntar	...	...	82.33	92	69	23	76.44	834	...	77	...	3.62	1.26
Bagan Serai	...	...	82.39	92	69	23	77.26	867	...	79	...	6.92	1 85
Selama	...	...	80.95	94	61	33	76.23	842	...	80	...	10.94	3.84
Lenggong	...	...	80.91	94	65	29	75.43	810	...	78	...	7.70	3.22
Tanjong Malim	...	...	81.82	94	65	29	77.11	863	...	81	...	5.31	1.75
Grit	...	...	79.33	97	62	35	71.75	680	...	68	...	3.82	1 79
Klian Intan	...	...	...	...	...	...	...	...	...	...	...	4.54	2.50
Pulau Bangkor Laut	...	...	...	...	...	...	...	...	...	...	...	9.66	1.96
Kuala Kurau	...	...	...	...	...	...	...	...	...	...	...	4.55	1.30
Maxwell's Hill	...	...	...	...	...	...	...	...	...	...	...	7.97	1.78
The Cottage	...	...	...	...	...	...	...	...	...	..	...	4.28	1.10

Office of the Senior Medical Officer,
Taiping, 16th March, 1912.

S. C. G. Fox,
Senior Medical Officer.

NEGRI SEMBILAN.

Abstract of Meteorological Readings in the various Districts of the State of Negri Sembilan for the month of December, 1911.

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.			
District Hospital, Seremban			79.6	87.8	72.1	15.7	76.0	.834	73.9	82	N.W.	11.64	3.30
„ „ Kuala Pilah			77.9	86.7	71.9	14.8	75.0	.816	73.1	85	...	15.88	4.23
„ „ Mantin			...	...	...	...	...	...	...	...	...	16 93	3.70
„ „ Tampin			...	...	...	...	...	...	...	...	...	10.19	2.65
„ „ Jelebu			...	...	...	...	...	...	...	...	...	7.22	2 57
„ „ Port Dickson			...	...	...	...	...	...	...	...	...	8.90	1.50
Beri-beri Hospital „ „			...	...	...	...	...	...	...	...	...	7.97	1.20

77.

Office of the Senior Medical Officer,
Kuala Lumpur, 24th Jan., 1912.

G. D. Freer.
Senior Medical Officer,
Selangor, Negri Sembilan & Pahang.

NEGRI SEMBILAN.

Abstract of Meteorological Readings in the various Districts of the State of Negri Sembilan for the month of January, 1912.

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.			
District Hospital, Seremban	...	146.8	80.0	89.0	70.7	18.3	75.7	.820	73.1	79	N. W.	3.26	0.88
,, ,, Kuala Pilah	...	...	78.9	87.8	70.3	17.5	74.6	.783	71.8	80	...	2.11	0.76
,, ,, Mantin	...	...	...	...	...	...	...	...	...	...	...	2.97	0.56
,, ,, Tampin	...	...	80.2	86.6	73.0	13.6	74 2	...	...	...	...	2.31	0.83
,, ,, Jelebu	...	...	...	...	...	...	...	...	...	...	...	3.17	1.28
,, ,, Port Dickson	...	...	...	...	...	...	...	...	...	...	...	.94	0.60
Beri-beri Hospital	...	...	...	...	...	...	...	...	...	...	...	.81	0.45

OFFICE OF THE SENIOR MEDICAL OFFICER,
KUALA LUMPUR, 24th Feb., 1912.

G. D. FREER,
Senior Medical Officer.
Selangor, Negri Sembilan & Pahang.

Agricultural Bulletin

OF THE

— STRAITS —

AND

FEDERATED MALAY STATES.

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AGRICULTURAL BULLETIN

OF THE

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AND

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No. 4.] APRIL, 1912. [Vol. 1

NOTES FOR A DEMONSTRATION CONCERNING THE IMPROVEMENTS IN, OR RELATING TO, THE CURING OF PARA RUBBER.

(PATENTED).

1. This invention relates to improvements in the curing of Para Rubber and refers more particularly to apparatus for coagulating and curing the latex of Para Rubber known as Hevea Braziliensis.

2. It is an anti-metal process and as will be apparent, the apparatus has been designed to accommodate the process of coagulating latex as it is brought from trees, without the addition of chemicals. In this first respect the process differs from all others that obtain, viz:—the machinery or apparatus has been modified so as to coagulate latex direct *and not latex treated or manipulated to suit the machine.*

3. At the time of the first Rubber Exhibition held at Olympia, London, I inquired of some of the leading manufacturers (the real masters of the rubber market) what they wanted from Plantation rubber and wherein it differed from fine hard Para. Plantation rubber was considered softer; the addition of chemicals was disliked; and there was serious objection to variation in the character of the rubber. Not only did the rubber from different estates vary from one another but even from any one estate there was considerable want of uniformity. What manufacturers required was "latex as it came from the tree, cured by smoke as was done in Brazil, without the aid of chemicals."

4. It is not asserted by manufacturers that fine hard Para is always of an uniform character—indeed, I was informed that different results has been obtained from the same ball of such rubber when treated in Hamburg, Harburg, and Vienna—but it is claimed that the variation with Brazilian is far less than with Plantation rubber. It is obvious that climatic differences have to be considered—and due allowance should be made for the much shorter period of tapping in Brazil (April to September) as compared with the almost-all-the-year-round seasons in Malaya—this difference is all the more important if it is remembered that the dry season in Brazil, April to September

(although occasional showers and storms occur) is more pronounced and the rainfall less equable than the driest months in Malaya. Thus, the latex during this period in Brazil would contain the minimum quantity of water and in the more rarified air, or, air containing less water-vapour than in the rainy months, there would be less tendency for latex coalescing too rapidly through atmospheric conditions.

5. The more material advantage, however, lies in the circumstance that trees in tropical * countries conform to their natural periodicities with most regularity where the dry season is sufficiently marked to represent a true resting period. Here in Malaya, between mid-January and March on the western coast of the Peninsula—the season of rice harvest—there occurs a short dry season when most of the deciduous trees shed their leaves and produce flowers. It is so with Hevea braziliensis when the conditions are normal, but when, after heavy rains from September to mid-January the rains still continue, then the rubber trees may not, or only partially defoliate and the floral periodicity may be scant or suppressed. The flowers too, through heavy rains may be poorly pollinated only, and such trees, whether partially defoliated or lightly pollinated, may perform their foliar and floral function during the following August or September † thus providing what is called the Spring crop of seeds, but the result is an irregular and uncertain crop of latex; as a matter of fact, a wet season at the time of year under review is represented by the trees in every physiological phase common to the species at different periods instead of the real season (February). I believe every planter is aware that there is a fall off in the yield of latex at the time of trees wintering, and the diversity of yield in the following tabulated statements will be more apparent when it is reflected that every gradation of difference may have been exhibited by the trees at the time of tapping.

6. In table I the diversity of yield within the same group of 200 trees during a period of 5 years is shown. The diversity of resulting rubber is more variable than the yield of latex.

Table I.

Experiment.	No. of trees tapped.	No. of times tapped.	Season.	Fluid ozs. c/c obtained.	Weight of dry rubber.	Comparative yield of fluid ozs. to ozs. dry rubber advoirdupois.
					lbs. ozs.	
1905	200	25	Oct.-Nov.	11746	199 0	$3\frac{11}{16}$ ozs. c/c
1906	200	25	Mar.-Apr.	10943	154 0	$4\frac{7}{16}$ „
1909	200	32	Aug.-Sept.	11323	181 15	‡$3\frac{14}{16}$ „

* In all countries when the dry season is not an absolute drought.
† It is so with other trees.
‡ Reduced to 25 tappings the result would be much less favourable.

7. The diversity that may occur within one year is represented in the following table 2, but it should be mentioned that Experiment 7 were overcrowded inside trees in which the increment of growth was fractional only and the bark poor as a consequence.

No. of Experiment.	Total fluid.	Total dry rubber avoirdupois		Comparative yield of fluid ozs. to ozs. of dry rubber advoirdupois.	Season 1909.
	ozs. c/c.	lbs.	ozs.	ozs. c/c.	
7	2826	21	10½	8 1/8	February—March
Old trees) 1	3323	75	4	2¾	April—May
2	7718	128	7	3 1/4	May, June—July
3	7861	115	7	3 3/8	May, June—July
4	(1st) 11323	181	15	3 7/8	August—Sept.
4	(2nd) 5575	75	12	4 9/16	Dec.—January
6	18748	251	8	4 5/8	Nov.—December
(Young trees) 9	† 3433	43	0	4 15/16	Oct.—November
Young trees) 8	† 3981	48	0	5 3/16	September
5	11957	175	8	5 5/16	Sept.—October
Young trees) 10	† 3511	37	0	5 1/16	Nov.—December

8. This diversity is further disclosed in table 3, viz:—Not only s the yield of latex variable but the latex is variable per se. From the same group of trees 30 fluid ozs. of latex was taken from the bulk daily, coagulated and weighed separately, with the following result:—

Table 3.

Date	Rainfall inches parts.		Total latex obtained Daily.	Dry weight of Sheet of 30 ozs. latex after Coagulation.	Remarks.
1909.			Ozs. C/C.	(Ozs. avoirdupois).	
Dec. 29	...	60	114	6	From the latex obtained daily 30 ozs. C/C. was kept apart and weighed dry in the form of Sheet.
„ 30	...	...	187	6	
„ 31	...	...	145	7	
1910					
Jan. 3	...	38	210	7	
„ 4	...	85	200	6	
„ 5	...	43	252	7 1/8	
„ 6	...	47	270	7½	
„ 7	...	...	291	8	
„ 8	...	...	304	7½	
„ 10	...	...	338	8¼	
„ 11	...	...	272	7½	
„ 12	..	...	276	6¼	
„ 13	...	36	268	7½	
„ 14	...	...	340	7¼	
„ 15	...	30	304	6¾	
„ 16	...	...	288	8	
„ 17	...	...	316	6½	
„ 18	...	...	326	6½	
„ 19	...	89	308	7	
„ 20	...	...	292	6¾	
„ 21	...	...	284	6¾	

Half, not full herring bone tapping, although large trees yield better than young trees pro rata.

24/86

9. Another reason of variation may be caused by mixing the latex of trees of different age and size. It is frequently asserted that there is no difference in the latex from trees of different age—a statement which could not be supported by fact. Under normal conditions the water contained in latex may vary from 55° to 65°. It may however, in very wet weather and with young trees, contain a much higher per centage as is shown in the following experiments:—

Table 4.

SMALL TREES.

Number of Trees Tapped.	Aggregate girth at 3 ft. from ground.	Number of times tapped.	Fluid oz. of latex.	Dry weight of rubber.	Ratio of fluid to ozs. Adoir-dupois.	*Including some added water.*
90	220′ 5″	24	3,511	37 lbs.	$5\frac{15}{16}$	Nov.-Dec.
120	276′ $10\frac{3}{4}$″	26	3,433	43 „	$4\frac{15}{16}$	Oct.-Nov.
100	276′ $10\frac{1}{2}$″	28	3,981	48 „	$5\frac{3}{16}$	Sept.
310	774′ $2\frac{1}{4}$″	26 (average)	10,925	128 lbs.	Total small trees.	

LARGE TREES.

150	713′ $4\frac{1}{8}$″	30	18,748	lbs. ozs. 251 8	$4\frac{5}{8}$	Nov.-Dec.

It may be noted that the diversity is greater in the resulting rubber than in the volume of latex from young and old trees

10. Considering the variability of latex which has been referred to, and the objection of manufacturers to the same cause in the resulting rubber, such results are not astonishing when the system of treatment is examined. In Malaya all the latex obtained is coagulated by some chemical re-agent, usually Acetic acid, and as will be evident by glancing at Table 4 different results were obtained from approximate volumes of latex in three experiments, while almost double the weight of rubber was obtained from a less area of bark in another experiment. If therefore, in one instance a given quantity of Acetic acid is necessary to precipitate one pound of dry rubber from one gallon of latex, in another instance the same quantity of acid would be used to precipitate double the weight of resulting rubber. The most that could be claimed for such a system is that it is an empirical one.

11. It should be observed too, that Acetic acid is far from being a perfect re-agent—unless an inordinate quantity of acid is used—there is always some water left, which, if again treated with Acetic acid will precipitate more coagulated latex

12. As a matter of fact, under the system which obtains on nearly all estates, very little latex is coagulated, the process only amounts to coalescing. The globules of caoutchouc suspended in the latex have partially clotted without separating or disposing of much water and that such coalesced latex is fitted to pass through heavy machines is no more rational than milling unripened wheat—except that it would be more evident in the latter instance.

13. The time however is fast approaching when Plantation rubber will have to stand a severer test than has yet been applied. Once the supply of raw material reaches demand and stocks accumulate the value and test of raw rubber, must as with tea, depend on its keeping qualities. It is true a fair proportion of Plantation rubber is superficially smoked, but in effect there is no comparision between smoke-cured and smoke-dried rubber. Superficial smoking is an antidote against most fungi if commenced in good time, and the life of rubber kept free from mould is preserved, but such smoking cannot re-cure raw material of which the constituent elements are already fixed

14. If the practice of using chemical re-agents was discontinued and all possible care taken over latex from trees of different ages, there is little doubt that Plantation rubber could be brought up to the stan dard of fine hard Para, which it may be remarked represents only a small part of the bulk of rubber which reaches the markets by way of Brazil. Smoke-cured Rubber from Malaya has been declared comparable with fine hard Para and a small sample sent to the recent Exhibition in London cured by myself 14 years ago was perfectly sound. A sample submitted to the Imperial Institute (really as a test for packing smoked rubber) was analaysed and furnished the following result:—

"The results of the chemical examination were as follows:—

	Per cent.
Moisture	04
Caoutchouc	95.01 *
Resin	2.2
Proteid	2.2
Ash	0.6

15. As an instance of the keeping qualities of smoked rubber it may be interesting to remark that, at one time a large manufacturer reported on a sample sent for his opinion as a retrogressive step and subsequently—after keeping the same rubber twelve months—that he had tried it again and obtained much better results and considered it equal to fine hard Para for all practical purposes.

16. In the use of smoke there are already several misconceptions but in the method of application as adopted nothing could be more primitive. Let it be remembered from the outset that smoke is a result of imperfect combustion; that it is not the elementary consti-

* Including 1.3 per cent. of insoluble Caoutchouc."

tuents contained in the fuel but the compound which is formed with sufficient heat in the process of combustion that acts as the real re-agent and coagulates latex; that volumes or clouds of smoke are not only unnecessary but are* positively harmful; that a smoke house should be well ventilated and the temperature kept as low as possible; that the furnace or heat should always be generated outside the smoke house; that smoke from a furnace should never go direct on latex or rubber; that fuel (wood or coconut husk) be always dry in view of furnishing comparatively dry smoke; that all smoke be passed through the furnace chimney until the fire is established or burnt through and the temperature very high; that the fire is well stoked and not choked with too much fuel or allowed to fall too low.

17. How these various items are arranged in the apparatus I am exhibiting will be explained, but I wish to pause here to emphasise the importance of maintaining a regular supply of smoke from a well consumed fire. Of all the constituents contained in wood-fuel water is the most troublesome. However perfect the combustion water-vapour has to be disposed of, and excess smoke-vapour results in condensation within the house and a steamy atmosphere which is fatal to good coagulation. (The fat and oil ever present on superficially smoked biscuits and sheets is really a deposit of wood napthaline and other impurities conveyed by excess vapour in smoke due to wet fuel and the smoke passing direct on to the rubber—an error easily avoided). In the process of coagulation it is essential that the evaporation of water within the thin layers of latex shall be commensurate with the heat supplied (not a high temperature at which caoutchouc perishes), and this cannot occur in an atmosphere surcharged with steam or vapour, and the result is, the water and caoutchouc coalesce and the resulting rubber is uncured.

18. The real problem of the treatment of Hevea latex is one of separation between the water and caoutchouc. With Castilloa and some other latices which contain an acid reaction this can be done by centrifugal motion at high speed, the caoutchouc separates into a mass and can be skinned off. With Hevea latex however, although remarkably flocculent—perhaps more so in Malaya than in South America—such methods are futile. Hevea latex is alkaline to litmus and the process of coagulation, whether with or without a re-agent, is really one of coalescing into an agglutinated mass and the variable water residuum, is I suspect, more the result of pressure than separation or precipitation of caoutchouc. *(Under normal conditions Hevea latex coalesces by natural means satisfactorily if placed in a cylinder of which the height is three or four times that of the diameter and the water residuum is about the same as when treated with a re-agent such as acetic acid. In certain phases of the Hevea tree, at the time of this writing, 29-1-1912, all the latex in a cylinder 7 ins. by 2¼ ins. coalesced in fifteen hours without leaving a drop of fluid. Such re-agents as acetic-acid*

* It is paradoxical. Volumes or clouds of smoke imply excess water-vapour.

merely expedite the process of coalescence). Both by volume and weight water is the larger and heavier body in the composition of latex, from 55°—75°, and even more at certain seasons. If too, it is remembered that the specific gravity of water is heavier than latex, the refinement of the arrangement of partial separation between the water and caoutchouc contained in latex by mechanical means in the process of coagulation by heat and smoke, now to be described, will be apparent.

19. Heat is generated in a furnace supplied with wood, coconut husk, or similar fuel and should be quite dry. The furnace is placed outside the smoke-house and a large pipe is led from the furnace along the ground of the house into a smoke-box, a row of smaller pipes is led from the smoke-box back to the funnel of the furnace, the rate of combustion and also the passage of smoke being controlled by separate dampers. The pipes are perforated underneath so that the smoke in passing through the perforations strike a recovery trough placed beneath which acts, like the smoke-box, as a filter, as the water vapour in the smoke condenses in the trough and deposits various impurities and this liquid is drained away.

20. Latex is exposed to the action of heat and smoke by the employment of an endless flexible band or belt which passes through an adjustable receptacle containing latex placed outside the smoke chamber and continually removes the surface layer of latex out of this supply vessel into which the band dips.

21. The arrangement of belts is such that one or any number can be carried on the same machine, and the belt is carried on pulleys. One pulley (or more) supported by brackets is inside the chamber, and one attached to the driving gear outside the chamber.

22. These brackets are adjustable in two directions, vertically, to allow of lowering or lifting the belts independently, horizontally, to allow of any sagging being taken up, or, if necessary, the removal of same; automatic belt adjusting gear is also attached, which can be easily put in or out of action.

23. The driving machine carries one, or as may be desired, any number of pulleys. These are driven by a worm and worm wheel, and this worm shaft can be driven by either hand or motor power as required. This machine is also adjustable vertically so that the distance between the belts and smoke pipes can be controlled.

24. The supply vessels below the belts are supplied from cylindrical reservoirs carried by movable supports. The supports are controlled vertically by a wheel and screw so that the flow of latex into the supply vessel can be regulated. The reservoirs and support is easily detached from the supply vessel and can be readily removed for the purpose of stripping the belt after coagulation.

25. Smoke and heat is concentrated on the belts by the receiving trough and the temperature of the smoke chamber is regulated by ventilation.

26. Before commencing to coagulate, it is essential that the necessary heat and smoke has been raised and that the furnace fire is burning briskly. The rate of combustion is then controlled by dampers and the requisite heat can be maintained by a slow fire, which, with a heated furnace, dries up most of the moisture in the fuel while affording sufficient smoke on the belt in its passage over the pipes. The smoke chamber is constructed with a raised or lantern roof providing sufficient ventilation for the air and smoke surcharged with vapour from evaporation of moisture in the latex on the belt, thus excluding condensation within the smoke chamber. (It is best to admit air at the bottom of the chamber too, and blanket the smoke. Free circulation of air allows induced draught and the ready escape of smoke from the supply pipes, such dry filtered smoke is then retained sufficiently long to take up all the moisture evaporated during the chamber. When these factors are all in harmony perfect coagulation is assured.)

27. For the process of coagulation the supply vessel, through which the travelling belt passes, is made shallow and to contain very little latex so as to preclude the possibility of coalescence from a smoky belt. This supply vessel is supplied from a reservoir at about the same rate that the latex is removed by the belt, and both vessels are specified to be placed outside the smoke chamber in view of preventing coalescence from the proximity of smoke.

28. The belts may be made of canvas, or other similar material, dipped in rubber solution and vulcanized so as to obtain a smooth outside surface, which is necessary for the easy stripping of the belt after coagulating. The length of the belts is estimated at forty-two feet overall, and the width may vary from a few inches to two feet a greater width is considered unwieldy.

29. As the belt passes through the supply or feeding vessel a thin layer of latex adheres to the belt in its most expanded form and is then exposed to the action of smoke and this re-agent immediately separates much of the water in the latex on the outside of the belt, The pulleys, too, which support the weight of the belt—if maintained at slight tension,—afford sufficient pressure on the belt to express out most of the remaining water left in the latex on the outside of the belt, from where some drops off as clear water, while the the remaining moisture is evaporated by heat and smoke and the resulting caoutchouc is coagulated into a concentric film of rubber. Smoke is therefore the host in three different functions of the process; (a) it is the host which carries the compound re-agent which separates the water from the caoutchouc in the latex; (b) it is the host which absorbs and carries off excess moisture within the chamber; (c) it is the host which fixes the re-agent in the coagulated latex and thus resists oxidization. The process, therefore, consists of coagulation by separation of water from the caoutchouc in the latex by heat and smoke in concentric layers between films of smoke on a travelling belt in which every

component particle, even the molecule, is exposed to the action of smoke and is so polymerised, and thus the keeping quality of the resulting rubber is assured, and the subsequent vulcanizing test satisfactory for years afterwards.

30. It will be evident that the process differs from all others that obtain, and it is asserted that perfect coagulation and curing of Hevea latex can only be effected when the water within the latex is separated and disposed of at the same time. Whatever the re-agent may be, when Hevea latex is treated in volume, the process is one of coalescing (smoke applied to latex in volume furnishes the same result). In volume the re-agent diffuses too slowly, and the particles of caoutchouc flock into an agglutinated mass, leaving a residuum of caoutchouc in the mother liquor. Such coalesced rubber not only oxidises and moulds after preparation, but is also faulty in the vulcanizing process. Smoke coagulated rubber on a belt, where the particles and globules of caoutchouc are expanded, so that even the molecule is exposed and polymerised, improves in keeping, while coalesced rubber which has not been cured but merely agglutinated, deteriorates.

31. The process differs too from the Brazilian method in the application of dry filtered smoke as compared with the water vapourish smoke used in Brazil. In Brazilian smoke the three elements of Hydrogen, Oxygen and Carbon are excessively high, while other elements are only partially generated. The more material difference however, lies in the separation of water by this process against its absorption in the Brazilian one.

32. Mention has already been made of vertical adjusting gear to accommodate the sag of the belt as it becomes loaded, the weight however, is in inverse ratio to the latex supplied, as owing to the separation of water and caoutchouc there is considerable drip and evaporation of moisture.

33. It is estimated that a belt one foot wide would coagulate 7½ gallons of latex in 3 to 4 hours. Before removal from the belt the rubber should be surface dry or slightly hardened for stripping. It can then be readily removed and passed through rollers in the same operation of stripping, when the remaining water is expressed out, and complete drying is effected in a few days, if the rubber is smoked daily, for which purpose the smoke chamber could be utilized. (A sample of such rubber analysed at the Imperial Institute was reported to contain 0.04% moisture and arrived in excellent condition free from mould). On estates where there is washing and preparing machinery the process would be considerably expedited if the belt was stripped at intervals, as the water separates and evaporates quicker the less the belt is loaded. It is estimated that a belt one foot wide and stripped at intervals would coagulate from 4 or 5 gallons of latex per hour. An adjustable rubber brush is attached to the driving gear which scrapes off the freshly coagulated rubber and leaves the surface of the belt comparatively dry. The rubber is brushed into a funnel and drops into a

collecting basin. It can be immediately treated by washing, and prepared in any desired grade. Such smoke coagulated rubber would surpass any plantation rubber that has yet reached the market. In this latter instance a belt two feet wide would be practicable, in the former instance an one foot belt is considered more serviceable.

34. Whether it is better to add some water in the collecting cups, as is done for latex intended to be acid-coagulated, I am not able to say without further observation, but I am inclined to think that the addition of water helps to eliminate resin. The best fine hard Para contains 15% of moisture on arrival in European markets when it is probably one year old, so that the addition of some water, which is expressed within a few hours, is not abnormal. It is very important, however, that the density of latex be taken into consideration. In the dormant or wintering season, mid-January to mid-March, latex reaches its greatest density. With the appearance of flowers, and, as the leaves mature, all the functions of the tree are most active and the consistency of latex changes with the higher percentage of water. At such a time additional water may be superfluous, and also on rainy days or following continuous rain storms when the ground is saturated. Supposing the wintering season to have been normal and the trees to have conformed to their period of defoliation, the best tapping months are from May to November during which time (exclusive of exceptional weather) latex may be of a fair average density and *vice versa* when the seasons have not been favourable.

35. The value, too, of commencing tapping at break of day—with the first streak of dawn should not be overlooked. It cannot be too well known that on warm dry days, Hevea trees contract, through exhalation of moisture, as the day advances, and the tension pressure which sustains the flow of latex is partial only, and the loss of first latex from coalescence increases.

36. It should not be overlooked that latex travels best when strained. Lumps or clot left in latex produce natural coalescence, even the smallest particle of clot or foreign matter furnishes a tendency for latex to flock, some days more than others.

It is suggested :—

(1) That additional drying houses could be supplied with smoke from the smoke-chamber furnaces and that the smoke be applied by piping perforated underneath which should be received in a filter trough before dispersing, care being taken that the fuel is dry. By this system of applying smoke uniform results can be obtained. The drying house would only require slight ventilation during smoking and additional ventilation at other times. A few days' smoking would suffice.

(2) That the process under review could be carried out in existing or central factories, and is also adapted for decentralised factories with hand or motor power, or portable buildings.

It is claimed :—

(1) That the weight of the resulting rubber of a given volume of latex is increased by this process as there is no loss of caoutchouc which occurs when latex is treated in volume.

(2) That it is a perfect system of coagulation, and by the thin accumulation of films of latex and separation of water in the process, coalescing is avoided, and the minutest component particles down to the molecule are exposed to the action of smoke and smoke-curing, thus precluding the possibility of subsequent oxidisation.

(3) That the inherent characteristic of Hevea latex to foul when in contact with another body (a spout, a funnel, or when flowing or dripping) has been overcome in the method adopted in supplying the belt by dipping outside the smoke area.

(4) That the process disposes of the whole difficulty of fungoid attacks whether in the latex; in drying; in store; or in transit.

(5) The keeping quality is assured, a fair sized sample one year old was reported by a large manufacturer "to be equal to fine hard Para for all practical purposes," and the specimens of smoked spindles prepared by myself and analysed at the recent Rubber Exhibition in London and reported comparable to fine hard Para, were three years old.

(6) In the arrangement of combustion, draft, filtration, and ventilation, wood napthaline and other impurities in the smoke injurious to latex are disposed of; the excessive water and the resulting water vapour in wood fuel is exhausted, and a concentrated smoke containing the necessary elements in a compound form is produced.

(7) That the variation in latex, already referred to, is largely overcome by the method of supplying latex on a travelling belt from outside the smoke chamber, where the amount of latex taken up by the belt can be regulated by the adjustable feed pans so as to ensure consistent separation of water and the action of smoke. The variable consistency of latex is disposed of and the resulting rubber is of a standard form.

(8) Finally a standard rubber which will keep for years and prove superior in the vulcanizing process, the real test, to any other Plantation Rubber.

R. DERRY,
Botanic Gardens, Singapore

28/90

EXPORTS TELEGRAM TO EUROPE AND AMERICA.

Month of March.

		Steamers.		Wired. Mar. 15 Tons.	Mar. 31 Tons.
Tin	Str. Singapore & Penang	to U. Kingdom &/or		1,501	1.698
Do.	do.	U. S. A.		506	730
Do.	do	Continent		380	330
Gambier	Singapore	Glasgow		...	...
Do.	do.	London		...	...
Do.	do.	Liverpool		70	...
Do.	do.	U. K. &/or Continent		125	25
Cube Gambier	do.	United Kingdom		25	20
Black Pepper	do.	do.		5	...
Do.	Penang	do.		45	...
White Pepper	Singapore	do.		45	...
Do.	Penang	do.		5	5
Pearl Sago	Singapore	do.		100	10
Sago Flour	do.	London		50	260
Do.	do.	Liverpool		1,700	...
Do.	do.	Glasgow		25	25
Tapioca Flake	Singapore	United Kingdom		130	...
Tapioca Pearl & Bullet	do.	do.		200	65
Para Rubber	Straits & Malaya	do.		350	700
Gutta Percha	Singapore	do.		35	60
Buffalo hides	do.	do.		150	...
Pineapples	do.	do.		25,000	8,500
Gambier	do.	U. S. A.		375	190
Cube Gambier	do.	do.		110	35
Black Pepper	do.	do.		110	10
Do.	Penang	do.		10	30
White Pepper	Singapore	do.		90	...
Do.	Penang	do.		...	25
Tapioca Pearl	Singapore	do.		15	40
Nutmegs	Singapore & Penang	do.		6	29
Sago Flour	Singapore	do.		100	125
Pineapples	do.	do.		5,750	800
Do.	do.	Continent		6,750	1,250
Gambier	do.	South Continent		80	75
Do.	do.	North Continent		140	80
Cube Gambier	do.	Continent		40	10
Black Pepper	do.	South Continent		180	70
Do.	do.	North	do.	75	...
Do.	Penang	South	do	15	...
Do	do.	North	do.	5	...
White Pepper	Singapore	South	do.	10	10
Do.	do	North	do.	10	...
Do.	Penang	South	do.	10	...
Do.	do.	North	do.	20	5

		Steamers.		Wired. Mar. 15 Tons.	Mar. 31 Tons.
Copra	Singapore & Penang		Marseilles	681	221
Do.	do.		Odessa	1,275	1,025
Do.	do.		Other South Continent	50	...
Do.	do.		North Continent	2,300	1,000
Sago Flour	Singapore		Continent	2,000	600
Tapioca Flake	do.		do	50	25
Do. Pearl	do.		do.	45	...
Do. Flake	do.		U. S. A.	5	...
Do. do.	Penang		U. K.	...	...
Do. Pearl & Bullet	do.		do.	75	85
Do. Flake	do.		U. S. A.	...	...
Do. Pearl	do.		do.	100	470
Do. Flake	do.		Continent	...	...
Do. Pearl	do.		do.	575	70
Copra	Singapore & Penang		England	50	100
Gutta Percha	Singapore		Continent	35	30
Para Rubber	Straits and Malaya		U. S. A.	60	20
Do.	do.		Continent	10	40
Tons Gambier (	...	...	...	300	300
„ B. Pepper (				310	130

SINGAPORE MARKET REPORT.

March, 1912.

	Tons.	Highest	Lowest.
Copra	3,714	11.10	10.40
Gambier Bale	560	10.75	10.20
„ Cube No. 1 & 2 ...	236	15.90	13.75
Gutta Percha 1st quality ...	...	275.00	200.00
„ medium ...	...	140.00	90.00
„ lower ...	...	70.00	17.00
Gutta Jelotong	...	11.75	8 75
Nutmegs 110s.	...	26.00	25 00
„ 80s.	...	28.00	26.00
Black Pepper	399	23.25	22.00
White „	79	33.75	31.75
Sago Pearl, small	1	5.40	5.30
„ Flour No. 1	4,321	4.60	4.17
„ „ No. 2	95	1.90	1.70
Tapioca Flake, small ...	339	9.45	9.25
„ Pearl „ ...	133	8.30	7.85
„ „ medium ...	211	9.20	9.10
Tin	1,830	96.37½	94 00

PAHANG.

Abstract of Meteorological Readings in the various Districts of the State of Pahang for the Month of February, 1912.

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.			
District Hospital, Kuala Lipis	...	...	80.3	89.0	67.3	21.7	74.9	...	...	...	...	5.25	1.50
,, ,, Raub	...	...	83.2	90.2	74.2	16.0	73.6	...	...	...	...	10.70	2.40
,, ,, Bentong	...	...	83.0	90.2	70.6	19.6	76.0	...	...	...	...	7.51	1.70
,, ,, Pekan	...	...	81.3	86.0	72.7	13.3	76.6	...	...	...	...	10.07	2.55
,, ,, Kuantan	...	...	79.7	89.8	70.0	19.8	76.5	...	...	...	...	7.33	2.73
Dispensary, Temerloh	...	...	...	89.7	68.3	21.4	...	...	...	...	...	4.40	1.03
Sungei Lembing	...	...	...	82.7	74.8	7.9	...	...	...	...	...	6.85	1.01
Kuala Tembling	...	...	...	...	...	...	...	...	...	...	...	5.72	2.10

Office of the Senior Medical Officer,
Kuala Lumpur, 28th March, 1912.

G. D. Freer,
Senior Medical Officer,
Selangor, Negri Sembilan & Pahang.

PAHANG.

Abstract of Meteorological Readings in the various Districts of the State of Pahang for the month of March, 1912.

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.			
District Hospital, Kuala Lipis	...	...	82.0	90.8	67.7	23.1	75.7	...	...	...	...	2.44	0.70
„ „ Raub	...	...	83 0	91.6	70.4	21.2	73.6	...	...	...	...	3.20	1.47
„ „ Bentong	...	...	82.8	90.9	70.7	20.2	75.8	...	...	...	...	7.30	2.76
„ „ Pekan	...	...	82.4	89.0	71.7	17.3	77.5	...	...	...	...	2.18	1 30
„ „ Kuantan	...	...	78.1	89.8	...	...	73.4	...	...	...	...	1.24	.62
Dispensary, Temerloh	...	...	...	92.0	67.5	24.5	...	...	...	...	...	2 31	1.03
Sungei Lembing	...	...	...	92.9	74.1	18.8	...	...	...	...	...	7.61	3.44
Kuala Tembling	...	...	...	...	...	...	...	...	...	...	...	3.00	1.27

OFFICE OF THE SENIOR MEDICAL OFFICER,
KUALA LUMPUR, 24th April, 1912.

G. D. FREER,
Senior Medical Officer,
Selangor, Nergi Sembilan & Pahang.

PERAK.

Abstract of Meteorological Readings in the various Districts of the State of Perak for the month of March, 1912.

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	...	106	82.67	93	70	23	78 01	898	...	81	...	12.18	1.57
Kuala Kangsar	...	...	82.63	94	69	25	76.7	842	...	77	...	5.02	.65
Batu Gajah	...	...	82.99	94	69	25	76.45	823	...	73	...	8.61	1.65
Gopeng	...	...	81.46	93	68	25	75.31	797	...	74	...	13.69	2.42
Ipoh	...	...	82.83	94	70	24	76.81	842	...	75	...	5 88	1.96
Kampar	...	...	82.28	94	71	23	77.11	864	...	79	...	11.08	1.98
Telok Anson	...	...	82.42	93	70	23	77.87	892	...	81	...	7.78	1.77
Tapah	...	...	82.39	92	68	24	77.25	867	...	79	...	12.41	2.60
Parit Buntar	...	...	83.21	92	73	19	77 83	883	...	79	...	8.92	3.17
Fagan Serai	...	...	83.29	93	72	21	78.40	908	...	81	...	4.74	1.37
Selama	...	...	81.87	94	69	25	77.87	899	...	83	...	5.96	1.23
Lenggong	...	...	82.14	94	66	28	76.12	821	...	75	...	6.79	1.95
Tanjong Malim	...	...	81.92	94	68	26	77.72	894	...	83	...	7.03	2.12
Grit	...	...	80.33	96	62	34	73.91	755	...	74	...	6.25	2.80
Klian Intan	...	...	...	...	...	...	...	...	...	...	...	1.18	.55
Pulau Pangkor Laut	...	...	...	...	...	...	...	...	...	...	...	6.19	1.58
Kuala Kurau	...	...	...	...	...	...	...	...	...	...	...	3.60	1.50
The Cottage	...	...	...	...	...	...	...	...	...	...	...	10.46	2.01
Maxwell's Hill	...	...	...	...	...	...	...	...	...	...	...	7.43	1.90

Office of the Senior Medical Officer,
Taiping, 15th April, 1912.

S. C. G. Fox,
Senior Medical Officer

NEGRI SEMBILAN.

Abstract of Meteorological Readings in the various Districts of the State of Negri Sembilan for the month of February, 1912.

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.			
District Hospital, Seremban	...	...	80.4	90.0	72.0	18 0	76.2	.826	73.4	79	...	6.48	1.30
„ „ Kuala Pilah	...	...	79.0	87.8	70 3	17.5	74 5	.775	71.5	79	...	9.02	2 24
„ „ Mantin	...	...	...	...	...	...	...	...	...	...	...	7 77	2.02
„ „ Tampin	...	159.4	80.7	87.7	74.1	13.6	75.0	.771	71.2	73	...	4.27	1.10
„ „ Jelebu	...	...	...	...	...	...	...	...	...	...	...	6.37	1.54
„ „ Port Dickson	...	...	...	...	...	...	...	...	...	...	...	4.07	1.04
Beri-beri Hospital „ „	...	...	...	...	...	...	...	...	...	...	...	4.54	0 77

OFFICE OF THE SENIOR MEDICAL OFFICER,
KUALA LUMPUR, 23rd March, 1912.

G. D. FREER.
Senior Medical Officer,
Selangor, Negri Sembilan & Pahang.

NEGRI SEMBILAN.

Abstract of Meteorological Readings in the various Districts of the State of Negri Sembilan for the month of March, 1912.

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.			
District Hospital, Seremban	...	151.0	82.2	90.4	72.4	18.0	76.9	.845	74.3	79	N. W.	4.69	0.99
,, ,, Kuala Pilah	...	...	81 8	91.0	72.9	18.1	76.4	.812	73.6	75	...	4.2	2.24
,, ,, Jelebu	...	...	...	...	...	...	...	...	...	...	...	3.40	1.30
,, ,, Tampin	...	155.9	82.4	89.3	74.2	15.1	76 3	.797	72.2	71	...	3.19	1.14
,, ,, Mantin	...	...	...	...	...	...	...	...	...	...	...	5.48	1.25
Town Hospital Port Dickson	...	...	83.8	90.0	75.0	15.0	76.6	...	...	...	...	1.06	0 32
Beri-beri Hospital ,, ...	...	...	...	...	...	...	...	...	...	...	...	0.59	0.40

OFFICE OF THE SENIOR MEDICAL OFFICER,
KUALA LUMPUR, 24th April, 1912.

G. D. FREER,
Senior Medical Officer,
Selangor, Negri Sembilan & Pahang.

SELANGOR.

Abstract of Meteorological Reading in the varions Districts of the State of Selangor for the month of February, 1912.

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 Dry Bulb.	Vapour Tension.	Dew Point.	Humidity,			
General Hospital, Kuala Lumpur ...	29.872	143.2	80.4	89.2	72.5	16.7	76.7	0.825	73.4	75	Calm.	10.50	2.50
Prisons „ „	...	...	...	...	...	...	...	...	...	...	...	9.93	1.98
District Hospital „	...	...	...	...	...	...	...	...	...	...	...	5.89	2.22
„ Klang	...	...	...	90.6	70.0	20.6	...	...	...	...	...	6.93	1.38
„ Kuala Langat ...	...	...	...	88.6	74.4	14.2	...	...	...	...	...	7.16	2.25
„ Kajang	...	...	...	88.1	75.2	12.9	...	...	...	...	...	8.38	1.89
„ Kuala Selangor ...	...	...	...	89.7	71.9	17.8	...	...	...	...	...	4.16	1.63
„ Kuala Kubu	...	...	...	91.5	70.9	20.6	...	...	...	...	...	6.38	2.10
„ Serendah	...	...	...	92.4	70.3	22.1	...	...	...	...	...	6.59	2.45
„ Rawang	...	...	...	92.3	71.5	20.8	...	...	...	...	...	11.08	2.61
Sabah Bernan	...	...	..	...	...	...	...	...	...	...	...	9.71	1.85

OFFICE OF THE SENIOR MEDICAL OFFICER,
KUALA LUMPUR, 22nd Mar., 1912,

G. D. FREER,
Senior Medical Officer,
Selangor, Negri Sembilan & Pahang.

SELANGOR.

Abstract of Meteorological Readings in the various Districts of the State of Selangor for the month of March, 1912.

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 ...	29.891	143.0	82.9	91.5	72.6	18.9	76 7	.807	72.7	72	Calm.	6.79	1.30
Prisons „ „ ...	...	...	...	...	...	...	...	...	...	...	...	8.60	3.24
District Hospital „ ...	...	...	...	...	...	...	...	...	...	...	...	4.88	1.40
„ Klang ...	...	...	...	91.4	68.7	22.7	...	...	...	...	...	5.29	1.18
„ Kuala Langat ...	...	...	...	91.2	74.4	16.8	...	...	...	...	...	1.16	0.50
„ Kajang ...	...	...	...	89.0	76.4	12.6	...	...	...	...	...	7.03	1.71
„ Kuala Selangor ...	...	...	...	90.8	72.0	18.8	...	...	...	...	...	1.69	0.72
„ Kuala Kubu ...	...	...	...	93.0	71.0	22 0	...	...	...	...	...	6.61	1.37
„ Serendah ...	...	...	...	92.6	70.5	22.1	...	...	...	...	...	7.03	1.65
„ Rawang ...	...	...	...	92.5	72.2	20.3	...	...	...	...	...	7.49	1.68
Sabak Bernan	...	...	...	...	...	...	...	...	...	...	...	8.15	2.38

Office of The Senior Medical Officer,
Kuala Lumpur, 26th April, 1912.

G. D. Freer,
Senior Medical Officer,
Selangor, Negri Sembilan & Pahang.

KELANTAN.

Abstract of Meteorological Readings in Kelantan for the Month of January, 1912.

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.	Vapour Tension.	Dew Point.	Humidity.			
	° *F.*	° *F.*	° *F.*	° *F.*	° *F.*	° *F.*	° *F.*	° *F.*	° *F.*	%		Ins.	Ins.
Kota Bharu	...	144.0	78.4	88.10	72.54	10 56	75.5	.810	72 9	84.5	...	14.13	4.00
Kuala Lebir	...	...	76.2	87.08	71.69	15.39	74.3	.801	72.6	89 2	...	6.76	2.51
Kuala Kelantan	...	...	...	82.06	73.38	8.68	...	...	...	...	...	13.84	4.50
Kuala Val	...	...	...	82.90	71.77	11.12	...	...	...	...	...	8.06	2.60
Kuala Pahi	...	...	...	83 84	70.77	13.07	...	...	...	...	...	6.88	2.09
Taku Estate	...	...	...	...	...	...	...	...	...	...	...	6.63	2.48
Chaning Estate	...	...	...	...	...	...	...	...	...	...	...	7.13	2.14
Pasir Jinggi	...	...	...	...	...	...	...	...	...	...	...	6.35	2.26
Kenneth Estate	...	...	...	...	...	...	...	...	...	...	...	10.07	3.34
Pasir Besar	...	...	...	...	...	...	...	...	...	...	...	8 88	3.75
Pasir Gajah	...	...	...	...	...	...	...	...	...	...	...	9.54	3.25
Semerah Estate	...	...	...	...	...	...	...	...	...	...	...	12.13	4.92
Tuko Ayer Merah	...	...	...	...	...	...	...	...	...	...	...	15 17	5.20
Ulu Kusial	...	...	...	...	...	...	...	...	...	...	...	10.16	4.72

RESIDENCY SURGEON'S OFFICE,
KOTA BHARU, 17th February, 1912.

JOHN. D. GIMLETTE,
Residency Surgeon, Kelantan.

KELANTAN.

Abrtruct of Meteorlogical Readings in Kelantan for the Month of February, 1912.

DISTRICT.	Mean Barometrical pressure at 32° F.	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.	Vapour Tension.	Dew Point.	Humidity.			
	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.		Ins.	Ins.
Kota Bharu	...	139.0	79.7	84.74	72 82	11.91	76.4	.820	73.3	80.1	...	9.84	4.01
Kuala Lebir	...	...	76.4	87.9	72.0	15.8	74.4	.812	73.0	89.3	...	3.02	1.24
Kuala Kelantan	...	...	...	83.82	73.44	10.38	...	...	...	...	...	7.89	3.75
Kuala Pahi	...	...	...	85.03	71.31	13.72	...	...	...	...	...	3.79	1.00
Kuala Vai Estate	...	...	...	83.82	72.10	11.72	...	...	...	...	...	6.64	2.32
Semerah Estate	...	...	...	...	...	...	...	...	...	...	...	8.00	3.29
Pasir Jinggi	...	...	...	...	...	...	...	...	...	...	...	2.91	1.43
Chaning Estate	...	...	...	...	...	...	...	...	...	...	...	4.02	1.22
Pasir Gajah Estate	...	...	...	...	...	...	...	...	...	...	...	6 49	1 98
Taku Plantation	...	...	...	...	...	...	...	...	...	...	...	3.44	.97
Pasir Besar	...	...	...	...	...	...	...	...	...	...	...	6.71	2.14
Sokor Kenneth Estate	...	...	...	...	...	...	...	...	...	...	...	4.80	1.44

RESIDENCY SURGEON'S OFFICE,
KOTA BHARU, 19th February, 1912.

JOHN. D. GIMLETTE,
Residency Surgeon, Kelantan.

KELANTAN.

Abstract of Meteorological Readings in Kelantan for the Month of March, 1912.

DISTRICT.	Mean Barometrical pressure at 32° F.	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.	Vapour Tension.	Dew Point.	Humidity.			
	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	%		Ins.	Ins.
Kota Bharu	...	147.0	81.2	87.50	73.33	14.17	78.2	.897	76.0	84 8	...	1.40	1.23
Kuala Lebir	...	...	79.3	29.8	73.0	18.8	76.0	.832	73.7	83.2	...	2.63	1.16
Kuala Kelantan	...	...	...	86.35	74.77	11.58	...	...	...	...	...	1.41	1 24
Kuala Val	...	...	...	87.90	73.12	14.77	...	...	...	...	...	2.25	0.80
Kuala Pahi	...	...	...	88.06	72.06	16.0	...	...	...	...	...	3.29	1.45
Pasir Gajah Estate	...	...	...	...	...	...	...	...	...	...	...	0.59	0.29
Taku Plantation	...	...	...	...	...	...	...	...	...	...	...	2.63	1.17
Pasir Besar Estate	...	...	...	...	...	...	...	...	...	...	...	2.00	1.00
Kenneth Estate	...	...	...	...	...	...	...	...	...	...	...	2 16	1.19
Pasir Jinggi	...	...	...	...	...	...	...	...	...	...	...	2.7	0.97
Chaning Estate	...	...	...	...	...	...	...	...	...	...	...	2 84	1.45

RESIDENCY SURGEON'S OFFICE,
KOTA BHARU, 23rd April, 1912.

JOHN. D. GIMLETTE
Residency Surgeon, Kelantan.

MALACCA.

Abstract of Meteorological Readings in Malacca for the month of January, 1912.

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.	Ins.
Durian Daun Hospital	29.923	156.2	82.3	89.3	72.7	16.6	77.7	.886	...	81	N.	.86	.27 on 7th

MALACCA, 4th April, 1912.

E. W. DE CRUZ,
Assistant Surgeon.

MALACCA.

Abstract of Meteorological Readings in Malacca for the month of February, 1912.

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.	Ins.
Durian Daun Hospital	29.910	156.7	82.6	89.0	73.1	15.9	78.0	.890	...	80	N.	3.13	1.50 on 20th

Malacca, 4th April, 1912.

E. W. De Cruz,
Assistant Surgeon.

MALACCA.

Abstract of Meteorological Readings in Malacca for the month of March, 1912.

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.	Ins.
Durian Daun Hospital	29.894	157	83.3	90.3	73.5	16.8	78.7	.914	...	81	N.	2.51	1.04 on 20th

Malacca, 30th Apr 1912.

E. W. De Cruz,
Assistant Surgeon.

MINUTES OF A MEETING OF THE PLANTERS' ASSOCIATION OF MALAYA.

Held at 10.45 a.m., on March 3, 1912, at the Selangor Club, Kuala Lumpur.

Present:

MR. E. B. SKINNER, Chairman.

MR. H. C. E. ZACHARIAS, Secretary.

MR. W. G. DOBSON, Legal Adviser.

and the following delegates:—

From the Kuala Lumpur District Planters' Association:—Mr. F. G. Harvey.

„ Kuala Langat District Planters' Association:—Mr. R. W. Munro.

„ Negri Sembilan Planters' Association:—Messrs. A. Dupuis Brown, T. G. Hickley, P. W. N. Farquharson.

„ Batu Tiga District Planters' Association:—Messrs. H. L. Jarvis, H. E. G. Solbe, H. R. Quartley.

„ Klang District Planters' Association:—Messrs. C. A. Buxton, W. H. Trotter, John Gibson.

„ Kapar District Planters' Association:—Messrs. E. H. King-Harman, J. G. Cruickshank.

„ Batang Padang Planters' Association:—Mr. F. J. Ayris.

„ Kuala Selangor District Planters' Association:—Messrs. A. Irving, F. G. Souter.

Visitors:—Mr. L. Lewton-Brain, Dir. of Agriculture, Dr. Ch Lane Sansom, P.M.O., Mr. T. J. Cumming.

1. The Minutes, having been taken as read, are confirmed, after the additon of the word "last" on line 18 p. 13.

2. Quarantine.

The Secretary reads the following correspondence:

Chief Secretary, F.M.S.,
Kuala Lumpur.

Kuala Lumpur,
12th January, 1912.

SIR,—I have the honour to inform you that at a Meeting of this Association, held on the 7th instant, the control of the Quarantine Camp on Pulau Jerejak was discussed.

The Meeting was unanimously in favour of this Camp being placed under the control of the Principal Medical Officer of the F.M.S., and that, if necessary, the Camp be leased from the Government of the Straits Settlements ; and I was intructed to submit that H. E. the High Commissioner be approached by you accordingly.

I have etc.,
(Sd.) H. C. E. ZACHARIAS,
Secretary.

No. 2 in 516/1912. Kuala Lampur,
The Secretary, 13th February, 1912.
The Planters' Association of Malaya,
Kuala Lumpur.

Sir,—I am directed to refer to your letter dated the 12th January, 1912, on the subject of the control of the Quarantine Camp at Pulau Jerejak and to inform you that the question has been referred to the Colonial Government, and a reply has been received to the effect that the Colonial Government regrets its inability to meet the views of the Planters' Association in this mater.

I have etc.,
W. H. MACKRAY,
For Under Secretary, F.M.S.

Mr. E. B. Skinner reports that this matter had again been brought before the Indian Immigration Committee, who had been promised a number of improvements by the Colonial Government. He was in favour of giving them a trial until the end of the recruiting season in September; and to take up the matter again then, if no permanent improvement had resulted. In the meantime he proposed that the matter stand over.

Mr. Cruickshank seconds the suggestion, but wished to know whether there was an inspection committee of planters.

Mr. Skinner replies that the planting members of the Indian Immigration Committee were the officially appointed visitors.

Mr. Skinner's suggestion is agreed to.

3. Chinese Labour.

The Secretary reads the following Report of the Sub-Committee of their Meeting held on January, 21st 1912, there being present Mr. H. R. Quartley (in the chair), Mr. Choo Kia Peng and Mr. H. C. E. Zacharias ; also the Hon. C. J. Saunders and Messrs. L. H. Clayton and J. R. O. Aldworth.

REPORT.

The feeling of the Meeting was that there was a sufficiency of Chinese Labour in the country to do all the work required, but that it was desirable to introduce more labour, in order to lower rates of pay. The Planting Industry is really not at all

in need for a large influx of Chinese, but the Mining Industry no doubt is short of labour; Mr. Choo Kia Peng instancing that whereas formerly naichang gangs consisted of 50-80 men, now their maximum number was 30.

The Government having decided to make indentured sinkeh labour illegal after July 1st 1914, the question is what would become of the 25,000 sinkehs, that annually arrived in Singapore? By far the greatest majority went to the Dutch Indies and that transit traffic will doubtless be deflected from Singapore. Of the balance, only very few go to estates in the Peninsula. About a year ago, there was a great and acute demand for Chinese labour, mainly for lalang weeding, but the demand has subsided as suddenly as it started, and latterly there have been great difficulties to place even a few hundred sinkehs then in the depots at Singapore; and the Hon. C. J. Saunders corroborated that at the present moment he knew practically of no sinkehs in the Singapore depots: all of which goes to show, that there is no urgent demand for this class of labour on the estates.

To supply the requirements of planters, the latter, if desirous of getting Chinese labour, will now have to get a kangany connection in China, in the same as way they all have already in India. The kangany system of recruiting in small batches is quite feasible, when not in the hands of professional recruiters, but of the individual estates.

What can be done, if a planter knows how to handle Chinese labour and how to go about the recruiting in the right way, was shown by Mr. Choo Kia Peng, who has recently sent one of his estate kapalas to Amoy, whence he has returned with 15 men of a most desirable stamp. The advances given out amounted to $200, which sum represented the total—irrecoverable—expenditure. The coolies were put on day pay at the rate of 58 cents out of which 2 cents goes to the kapala. These coolies have now been on the estate for ten months and show no inclination of absconding.

Another point, on which there seemed to be a consensus, was that just now in the troubled times China is going through, planters have the best opportunity of making a start with kangang recruiting. People over there finding now neither work nor safety, are apparently only too anxious to emigrate to the Malay Peninsula, and this applies particularly to the better class people and includes families.

Until there is a Chinese Government to treat with, the Government of this country is of course unable to move in the matter anyhow; and unless planters are anxious to see constituted a machinery analogous to the Indian Immigration Committee and Fund, there is at present no object in asking for any Government assistance.

Kangany recruiting in China is possible; it is anyhow the only means of obtaining satisfactory labour from there; and it now rests with the planter, whether or not he can adapt himself to the circumstances of the case.

(Sd.) H. R. QUARTLEY.

Mr. Skinner takes it that the feeling of the Association, after the sub-committee's report, would be that for the present the question of approaching Government should be dropped and the matter left to private enterprise.

4. Chinese Tappers.

The Secretary reports having received the following replies from the various Constituent Associations regarding pay earned by this class of labour, calculating the rate as per 100 trees:

Batu Tiga—			26—30 cents
Johore:		2 estates	20 ,,
		2 ,,	24 ,,
		1 ,,	30 ,,
		1 ,,	32 ,,
Province Wellesley	...	1 estate	12½ cents
	...	1 ,,	17 ,,
	...	1 ,,	23 ,,
Klang:	...	1 ,,	35 ,,
K. Lumpur	...	3 ,,	20 ,,
	...	1 ,,	21 ,,
	...	2 ,,	22 ,,
	...	1 ,,	30 ,, (basal V)
	...	1 ,,	32 ,, ,,
	...	1 ,,	32 ,, (two cups per tree)
	...	1	35 ,,
	...	1 ,,	39 ,,
	...	1 ,,	45 ,, (40 cts. for young trees.

Kuala Selangor Kapar reported that no Chinese tappers were employed in these districts; and from the remaining six associations, no reply had been received.

Mr. Skinner thinks the figures important and useful although they were not complete: when tabulated that might induce planters to reduce the rates generally.

Mr. Quartley thinks it should be stated whether the tappers scrapped the trees and did everything else necessary themselves; and how many cuts they did.

Mr. Dupuis Brown considers the number of cups ought also to be given; the present information was too vague.

Mr. Irving suggests in order to simplify matters that each employer should show the cost per lb. of his dry rubber.

Mr. Jarvis points out that the ages of the trees should be shown, otherwise, for purpose of comparison, the value of the figures would be lost.

Resolved that the information, as received, be published, and that the Secretary circularize all constituent Associations again, requesting specific replies as to

1. Whether the price paid includes collecting and scrapping.
2. The number of cuts.
3. The number of cups.

5 Javanese Labour.

The Secretary reads the following correspondence:

Chief Secretary, F.M.S., Kuala Lumpur,
Kuala Lumpur. 12th January, 1912.

Sir,—I have the honour to inform you, that three members of this Association, Messrs. H. J. Cooper, M. Maude and F. Pears, were some time ago asked to form a Sub-Committee to go into the possibilities of recruiting Javanese coolies.

The said gentlemen have since had an interview with the Consul General of the Netherlands at Singapore and are now desirous of proceeding to Java on a mission of further enquiry.

As the Consul General advised the gentlemen that it will be a great help to them, if they went to Java accredited by the Government of the F.M.S., I have been instructed to ask whether H. E. the High Commissioner would be kind enough to furnish them with a letter to the Governor General of the Netherlands Indies.

I have etc.,
(sd.) H. C. E. ZACHARIAS,
Secretary.

No. 517/1912. Kuala Lumpur,
The Secretary, 27th January, 1912.
The Planters' Association of Malaya,
Kuala Lumpur.

Sir,—Referring to your letter dated the 13th January, 1912, I am directed to forward a letter addressed by His Excellency the High Commissioner to Hsi Excellency the Governor General of the Netherlands Indies.

I have, etc.,
(Sd.) W. H. MACKRAY,
for Under Secretary, F.M.S

Under Secretary, F.M.S.
Kuala Lumpur.

Kuala Lumpur,
29th January, 1912.

JAVANESE LABOUR.

Sir,—I have the honour to acknowledge receipt of your letter 517 dated the 27th instant and to thank H. E. The High Commissioner for his letter to the Governor General of the Netherlands Indies.

I have etc.,
(Sd.) H. C. E. ZACHARIAS,
Secretary.

H C. E. ZACHARIAS Esq.,
Secretary,
Planters' Association of Malaya,
Kulala Lumpur.

Telok Anson,
10th January, 1912.

JAVANESE IMMIGRATION.

Dear Sir,—I shall be much obliged if you will let me know what action was taken by the P. A. M. on our preliminary report on the question of Javanese recruiting.

It is of course most important that we should go straight ahead with the matter now but neither Mr. Maude nor myself are prepared to pay all the cost of the visit to Java.

I have so far only seen the newspaper reports of the Meeting.

Yours faithfully,
(Sd.) H. J. COOPER,

H. J. COOPER, Esq.,
Telok Anson.

Kuala Lumpur,
15th January, 1912.

Dear Sir,—I thank you for your favour of the 10th instant *re* Javanese Immigration.

The Association at their last Meeting received your preliminary report and instructed me to thank the Sub-Committee for the pains taken and to address H. E. The High Commissioner in accordance with your wishes regarding a letter from himself to the Governor General of the Netherlands Indies; and I have since written to H. E. accordingly.

As regards your visit to Java, the Meeting was unanimous as to its desirability, but as this Association has no funds available for any but current expenditure, they are unfortunately precluded from offering to bear its cost.

Believe me, dear sir,
Yours faithfully,
(Sd.) H. C. E. ZACHARIAS,
Secretary.

The Secretary,
Planters' Association of Malaya,
Kuala Lumpur.

Telok Anson,
19th January, 1912.

Dear Sir,—Your letter of the 15th addressed to Mr. H. J. Cooper has been brought before my Committee, and I am instructed to express their regret that the parent Association is unable to finance the proposed visit to Java, and that not having themselves the necessary funds. They did not see their way to initiate an appeal for the raising of the money amongst the estates of the F. M. S.

My Committee are so impreesed with the general benefit which will accrue by the completion of the work your Sub-Committee have so far advanced that they propose to circularize the estates, and at a Meeting held here yesterday nearly one half of the necessary funds were provided.

It is hoped however that there will be such a ready response to a general appeal that the subscription for each estate will be very small.

I am, dear sir,
Yours faithfully,
The Lower Perak Planters' Association.
(Sd.) F. S. PHYSIC,
Secretary.

F. S. PHYSIC, Esq.,
Lower Perak Planters' Association,
Telok Anson.

Kuala Lumpur,
22nd January, 1912.

Dear Sir,—I have your favour of the 19th instant *re* Sub-Committee's visit to Java.

In the absence of any information to the contrary the Meeting did not feel justified in assuming, that the three gentlemen in question did not propose defraying themselves the cost of this visit to Java, any more than *e.g.*, in the case of Mr. Pears' visit to Hongkong *re* Chinese labour.

As already intimated, this Association has no funds available, except for current expenditure; but had there been any question of the immediate necessity for further funds, an appeal to that effect would no doubt have been decided upon. It is therefore much to be regretted, that neither of the three gentlemen appointed could make it convenient to be present at our last Meeting and lay their case personally before the members present.

Am I correct in saying, that it is now proposed to defray the total cost of the proposed visit out of the funds of the Lower Perak District Planters' Associatian, or do you propose to circularize all other Associations likewise; and what do you estimate is the total sum required?

Believe me, dear sir,
Yours faithfully,
(Sd.) H. C. E. ZACHARIAS,
Secretary.

H. C. E. ZACHARIAS, Esq.,
Kuala Lumpur.

Telok Anson,
27th January, 1912.

Dear Sir,—I thank you for your letter of the 15th instant *re* Javanese Immigration, which has been laid before the District Association.

I shall be greatly obliged if you will inform me as soon as possible whether H. E. the High Commissioner has addressed the Government of the Netherlands Indies or whether he will give to us the letter for presentation to the Governor Ceneral.

We propose to leave for Java about the 11th February.

Yours faithfully,
(Sd.) H. J. COOPER.

H. J. Cooper, Esq.,

Kuala Lumpur,
29th January, 1912.

Dear Sir,—I thank you for your favour of the 27th instant and now beg to enclose letter, just received from H. E. The High Commissioner on your mission to Java addressed to the Governor General of the Netherlands Indies.

Trusting that your visit will be highly successful.

I remain,
Yours faithfully,
(Sd.) H. C. E. ZACHARIAS.

Mr. Skinner remarks that nothing further could be done at present and that they must await the return of the sub-committee.

6. H. N. Ridley Fund.

The Secretary reports having received to date the following contributions:

from	The Malay Pen. Agr. Ass:	$1,305.00
„	Johore Planters' Ass:	470.00
„	Kuala Lumpur D. P. Ass:	300.00
„	Batang Padang Pl. Ass:	200.00
„	Batu Tiga D. Pl. Ass:	170.00
„	Klang Dist. Pl. Ass:	25.00
	Total	$2,470.00

From further promises received, he hopes that a total of 500 guineas will be collected.

The Secretary is instructed to inform all Constituent Associations, that the fund will be closed on the day of the Annual Meeting, and to express a hope that the expected total of 500 guineas will be reached.

7. Standing Committee.

The Secretary reports that the creation of a Standing Committee, decided upon at their last Meeting, constituted an addition to the Rules and would therefore have to be dealt with under Rule 15 at the ensuing General Meeting.

The Legal Adviser had suggested as follows:

"That the following rules be added to the Rules of the Planters' Association of Malaya, viz.,

1. The Association shall at every Annual Meeting elect five of its members as a Standing Committee with power for such Standing Committee to add to its number.

2. The duties of such Committee shall be the following:

   A. To consider all measures (legislative or otherwise) which may be of interest or affect the Planting Community in the Malay Peninsula.

   B. To inform the District Associations of such measures and give them its opinion thereon.

   C. To act as a consultative body for dealing with the current work of the Planters' Association of Malaya.

3. The President and Secretary of the Planters' Association of Malaya shall be ex-officio members of the Standing Committee in addition to the five before-mentioned elected members.

The Secretary is instructed accordingly, to place these draft rules on the Agenda of the General Annual Meeting.

8. New York Exposition.

The Secretary reads the following correspondence:

C. Taylor, Esq.,
Secretary,
Rubber Growers' Association,
1, Oxford Court,
Cannon Street, London, E.C.

Kuala Lumpur,
12th January, 1912.

NEW YORK EXPOSITION, 1912.

Dear Sir,—The question of being represented at this Exhibition has been considered by this Association at their last Meeting held on the 7th instant, when the general consensus seemed to be that it would be very impolitic for this Peninsula not to be adequately represented.

We have asked the Government for an indication of the extent of their support, but before going any further, should be glad to have the views of your Association on the subject.

If any action is eventually decided upon, we trust that we may count on the same hearty co-operation, that your Association was kind enough to render us at the London Exhibition of last year.

Believe me, dear sir,
Yours faithfully,
(Sd.) H. C. E. ZACHARIAS,
Secretary.

Sir William Taylor,
Malay States Information Agency,
88, Cannon Street,
London, E.C.

Kuala Lumpur,
12th January, 1912.

NEW YORK EXPOSITION.

Dear Sir,—I thank you for your favour of November 3rd and enclosures, all of which have been submitted to the members of this Association at their last Meeting on the 7th instant, when it was decided that this Association should take part in the said Exposition, provided the adequate co-operation of the Governments of the Peninsula could be secured.

Believe me, dear sir,
Yours faithfully,
(Sd.) H. C. E. ZACHARIAS,
Secretary.

UNDER SECRETARY, F.M.S
Kuala Lumpur.

Kuala Lumpur,
29th January 1912.

Sir,—I have the honour to acknowledge receipt of your letter 3 in 7950 of the 12th ihstant, which has been submitted to the members of my Association.

In reply I am directed to inform you, that this Association is prepared to give its support to the New York Exposition but before going any further, would like to know, whether and to what extent the various Governments of the Malay Peninsula would co-operate.

I have etc.,
(Sd.) H. C. E. ZACHARIAS,
Secretary.

The Secretary,
Planters' Association of Malaya,
Kuala Lumpur, F.M.S.

London,
5th January, 1912.

Dear Sir,—I am sending for your information a copy of a letter, and particulars and plan of suggested spaces that I have sent to-day to Sir William Taylor, as he will probably send his letter on to the Colonial Secretary, who will forward it again to you, thus causing a slight delay-and it will save time for you to have the letter in advance. The letter is, of course, to be regarded as private, and is sent you so that you may receive some additional information.

Ceylon are making a very fine show, and British Malaya will do the same, I hope. It will be greatly to their advantage, if they wish to get the trade with America. So far we have received favourable responses from nearly every rubber country, including Trinidad and British Guiana.

As you will know from particulars previously sent you, other tropical products may be exhibited at this Exposition, for the purpose of trade and commerce, that are cultivated in rubber growing countries. By this means your Colony will have a chance of obtaining trade for its other products in addition to rubber.

Hoping to receive your support, I am,

Yours truly,

(Sd.) A. STAINES MANDERS,

Organising Manager.

(ENCLOSURE.)

SIR WILLIAM TAYLOR, K.C.M.G.
Malay States Advertisement Agency,
88, Cannon Street,
London, E.C.

London,
4th January 1912.

PRIVATE.

Dear Sir,—I beg to send you herewith plan of the Crude Rubber Section of the International Rubber & Allied Trades Exposition, to be held in New York next September.

You will see that I have marked two blocks, one of which I would suggest for British Malaya in case they should decide to exhibit. I hope they will do so, as in my opinion it would be a suicidal policy if this important opportunity of bringing before the Manufacturers and Investors of the United States of America the vast resources of Malaya as a Rubber producing country were neglected and the chance of displaying the quality and the quantity of rubber they can produce as suitable for the American market.

I may mention that Ceylon will be making a fine show, likewise most of the other rubber producing countries of the world.

I also attach for your information, the exact cost of space, in case British Malaya should prefer to arrange for the building of their own Stand in New York, and I also quote on inclusive price for stands, stand-fittings, both for showing photographs and other products, as well as rubber, and for generally furnishing the stand. This inclusive charge consists of everything which would be necessary for the credit of the Colony with the exception of freight and cartage to the Exposition. I may add that the price includes the unpacking and repacking of the exhibits that may require to be returned.

I understand that exhibits from British Malaya can be shipped by Ceylon direct to New York. It is possible that there may be direct steamers from your Colony to New York.

As arranged at a Meeting recently held in New York, and at the request of several countries exhibiting, it will be permissible to show for the purposes of Trade and Commerce, other products cultivated in rubber growing countries.

I am taking the liberty of sending this letter in duplicate, to save you time in having it copied, and in the hope that you may be able to forward it by this mail, and I should be glad if it could be arranged to have a reply before the end of February as to the space required, as I am leaving for New York, at the date. I return again to London in the early part of April, leave for New York about the middle of May, and remain there until the close of the Exposition. At the same time any matters that require attention will be promptly dealt with at the London Office during my absence.

I am,
Yours truly,
(Sd.) A. STAINES MANDERS,
Organising Manager.

NEW YORK EXPOSITION.

COST OF SPACE ONLY.

No. 1.	67½ x 27feet=1809 sq. feet total cost including covered platform the whole length ...	£ 723.12.0
No. 2.	1,179 sq. feet total cost including covered platform	£ 468. 0.0
No. 1.	Stand complete-will fit up necessary stand, tables, screens for pictures, artistic signs and all that may be necessary to give British Malaya a bold display. Unpack exhibit, supply attendant for distributing literature and repack exhibit at the close for a total sum of	£1,200. 0.0
No. 2.	Fit up as described in No. 1 repack and supply attendant for a total sum of ...	£ 855. 0.0

Stands guaranteed to be in good style with special screens for photos etc.

These prices have been cut down very fine, and if more money can be allowed it will be used for special fitting up, and for the benefit of British Malaya.

The Secretary reports that he is still without a reply from the Under Secretary and is instructed to press for an answer.

9. Labour Enactment 1911.

The Secretary reads the following correspondence :

Kuala Lumpur,
6th February, 1912.

H. E. Sir Arthur Young, K.C.M.C., High Comm., F.M.S.
Singapore.

Your Excellency,

I have the honour to inform Your Excellency that at a Meeting of this Association held on January 7th the following resolution was unanimously passed :

"That this Association strongly deprecates the precipitancy with which the Labour Enactment 1911 was passed through the Federal Council".

I have the honour to enclose copy of our Minutes and to refer Your Excellency to Section 9.

I have etc.,
(Sd.) H. C. E. ZACHARIAS,
Secretary.

Misc. 179-1912.
Singapore,
2nd March, 1912.

The Secretary,
Planters' Association of Malaya,
Kuala Lumpur.

SIR,—I have the honour to acknowledge receipt of your letter of 6th February and to inform you that the delay in replying thereto is due to His Excellency the High Commissioner's desire to send you a copy of the Minutes of the Federal Council. This copy has only just been received and is forwarded herewith. *(v. Appendix.)*

2. I am to say that His Excellency is confident that on a perusal of these Minutes those members who considered that the Government passed this bill after perfunctory deliberation or who thought that the provisions of the bill were too drastic will agree that the measure was one which in the circumstances it was necessary to carry out not only in the interests of the coolies themselves but also in the interests of the whole planting community.

3. I am to add that it is the firm conviction of His Excellency that if the condition of the labourers on this estate had been brought to the notice of the Indian Government and if no efficient action had been taken by the Federated Malay States Government to remedy the state of affairs it might have led to the Indian Government seriously considering whether restrictions should not be placed on the immigration of coolies into the Federated Malay States.

I have etc.,
(Sd.) H. MARRIOTT,
Secretary to High Commissioner for the Malay States.

The Secretary reports that he had addressed similarly all other members of the Federal Council, and that he had received the following further replies:

The Secretary,
Planters' Association of Malaya,
Kuala Lumpur.

Kuala Lumpur,
8th February, 1912.

SIR,—I have the honour to acknowledge the receipt of your letter dated the 6th February informing me that at a Meeting of the Planters' Association of Malaya held on the 7th January a resolution was unanimously passed to the effect that the Association strongly deprecated the precipitancy with which the Labour Enactment 1911 was passed through the Federal Council, The resolution is one with which I think I may say generally that I am entirely in accord.

Nothing but the most urgent necessity could justify the passing of such an important measure in the manner in which it was passed Such necessity did, in the opinion of the Government, exist, and subsequent events showed that opinion to be well founded.

I have etc.,
(Sd.) E. L. BROCKMAN,
Chief Secretary, F.M.S.

The Secretary,
Planters' Association of Malaya,
Kuala Lumpur.

Kuala Lumpur,
12th February, 1912.

Dear Sir,—Your letter of the 6th instant duly received, and the contents are noted.

Yours faithfully,
(Sd.) E. B. SKINNER.

The Secretary,
Planters' Association of Malaya,
Kuala Lumpur.

Tronoh,
14th February, 1912.

Dear Sir,—I beg to acknowledge with thanks your favour of the 6th instant covering Minutes of the Association's Meeting.

I am in accord wilh the resolution regarding the passing of the Labour Enactment. As you may remember I strongly protested against its passing at the Federal Council, and was the only one who would not vote for it.

Yours faithfully,
(Sd.) H. D. GRIFFITHS.

No. 2 in 923/1912.

The Secretary,
Planters' Association of Malaya,
Kuala Lumpur.

Taiping,
13th February, 1912.

Dear Sir,—I am directed to acknowledge the receipt of your letter of 6th February current, forwarding a resolution passed at a Meeting of the Planters' Association of Malaya held on January 7th.

I have etc.,
(Sd.) W. E. PEPYS,
for Ag. Secretary to Resident, Perak.

The Secretary,
Planters' Association of Malaya,
Kuala Lumpur.

Kuala Lumpur,
22nd February, 1912.

Dear Sir,—I beg to acknowledge receipt of your letter of February 6th referring to section 9 of the minutes of your Meeting held on January 7th 1912.

2. I quite agree that the precipitancy with which this Labour Enactment was passed through the Council is to be deprecated. Another member and myself expressed this opinion in Council. I asked if there was no existing legal power to enable the Government to deal with what was obviously, on humanitarian grounds, a matter of urgency. The reply given was that the Legal Adviser had been consulted and that the answer was in the negative.

3. In view of all the circumstances and the fact that your own representative on the Council offered no opposition, I did not feel justified in voting against the Enactment.

4. Your letter raises rather an interesting point. It may be read as an expression of disapproval on the part of your Association that I did not vote against this particular Enactment. Had I voted against a proposal, affecting planting interests, endorsed by your own representative on the council, I could not complain if your Association thought fit to express disapproval. But so long as the selected representative of the Planting Community, who is your own elected chairman, is present at a Council Meeting, you can hardly in fairness blame the other un-official members for taking any sort of action which meets with the planting member's approval.

5. It is so obviously to the interests of the general public that the small unofficial minority on the Council should be united that I think you will find the other un-official members supporting the planting representative even when not altogether in favour of some specific detail. For instance, personally I objected to two sections in a recent enactment which compel employers of labour to keep a check roll showing names, days worked and rate of pay drawn by

coolies employed by an outside contractor, but the planting representative on the Council was satisfied, so I did not vote against the enactment.

I have etc.,
(Sd.) J. H. M. ROBSON.

10 Honorary Members.

The legal adviser submits that the following be the new rules for

HONORARY MEMBERS.

The Association shall be empowered to elect as Honorary Members such persons as it shall think fit, but such person shall not be entitled to vote at any Meeting of the Association. Notice of any proposal for the admission of an Honorary Member, together with the names of the proposer and seconder of such Honorary Member shall be given to the Secretary of the Association at least a fortnight previous to the Meeting at which the election of such Honorary Member shall take place and the Secretary shall put on the Agenda for such meeting the name and address of such person and the names of the proposer and seconder.

The Secretary is instructed accordingly, to place this draft rule on the Agenda of the Annual General Meeting.

11. Bailey Memorial.

The Secretcry reports that $1629.28 have been collected to date as follows:—

BAILEY MEMORIAL FUND.

Date paid.			$ c.
1910			
Dec. 2	Harpenden Estate		15.00
23	Johore Rubber lands		200.00
1911			
Jan. 10	Petaling Estate		214.28
17	H. Irving		50.00
Feb. 6	Anglo Malay Rubber Co.		250.00
	Seaport (Selangor)		50.00
15	Selaba Rubber Estate Ltd.		50.00
	Golden Hope Rubber Estate Ltd.		50.00
	Sungkai Chumor		50.00
Mar. 1	Bugit Rajah Estate		100.00
9	London Asiatic		50.00
	Bikam		50.00
20	Selangors Rubbers Co. Ltd.		200,00
Apl. 1	Johore P. A.		50.00
May. 8	Bukit Khjang		150.00
Aug. 19	Sungei Way (Selangor) R. Co. Ltd. ...		100.00
		Total	$1,629.28

The Secretary is instructed to write to the Principal of the Straits Medical School at Singapore and ask his opinion as to how the money could best the expended in connection with the school, the final allocation of the fund being left to the next Meeting.

12. Medical Staff on Estates.

The Secretary reads the following letter:

Principal Medical Officer,
Kuala Lumpur.

Kuala Lumpur,
29th January, 1912.

Sir,—I understand that a scheme is under consideration, providing for the seconding of Medical Officers and Subordinates for service in estate hospitals.

As the present position of affairs is very acute, the members of my Association trust that the necessary steps will be expedited as much as possible.

Will it be possible for me to submit something definite to our next Meeting early in March?

I have etc.,
(Sd.) H. C. E. ZACHARIAS,
Secretary.

and reports that he had an interview with Dr. Sansom, whom he had asked to be present to-day.

The Meeting goes into Committee and is addressed by Dr. Sansom.

Open Meeting having been resumed, it is resolved after some discussion, that a Sub-Committee of members of the P. A. M. be appointed to go into the question of the supply of dressers for estates and to report as early as possible thereon.

Mr. Skinner proposes, Mr. Farquharson seconds and it is passed unanimously that the Sub-Committee consist of Messrs. F. G. Harvey, H. Dupuis Brown, J. G. Cruickshank, H. E. Burgess, F. J. Ayris, H. R. Quartley, W. H. Trotter, A. Irving and W. Dell.

13. Indian Labour.

RECRUITING COMMISSION.

The Secretary says that at the last Meeting Mr. Gibson suggested a fixed maximum rate should be authorised by the Immigration Committee to do away with the evils resulting from the discrepant and excessive amounts paid to the kanganies by various estates for recruiting purposes. This opend up a very wide question and after correspondence with the Chairman and Mr. Gibson he had deferred communicating with the Indian Immigration Department.

Mr. Gibson says he was convinced that the question he had raised was one of great importance. Coolies that were being recruited by kanganies for estates paying small advances were not reaching these estates. Some planters had been trying to keep down advances to the ordinary rate of about Rs. 10, but other Superintendents were giving their kanganies Rs. 20, Rs. 30 and even Rs. 40. The result was that when the coolies recruited up country on the low advances were brought to the depots in India they were simply bought up by the kanganies who were paid bigger advances and who stuck at the depot doing no real recruiting on their own account. There were many evils arising out of this Coolies came down from the villages believing that they were going to rejoin friends on particular estates, but, being transferred to another kangany, not the original recruiter, found themselves on different and often remotely situated estates. That conduced to a great amount of dissatisfaction. If the Immigration Department fixed a uniform rate, some of the represent anomalies would be removed. He recognised that there were objections to extended powers being given to the Department but this course was the lesser evil and would tend to improve the conditions of recruiting. The present system did not add an additional coolie to the labour forces of the country, but it demoralised the kanganies and put money in their hands which might be better devoted to other purposes. The time had come for controlling the advances in some way.

Mr. Skinner agrees that advances should be kept down, but he thought it rather early to ask for legislation. Latterly a certain number of recruiters' licences had been stopped in India because the kanganies had been discovered buying coolies from others. Power was given to the Immigration Committee, on finding such a thing going on, to caneel the licence. But the kangany thus treated often did not care: he simply went to another licensed kangany and worked the business through him, the coolies coming over under the latter's protection. Further steps had been taken to deal with this move on the part of the kanganies and it was advisable to see how the new system operated to stop the buyers of coolies before advocating fresh legislation.

Mr. Gibson was glad to get this information and was quite prepared to leave the matter in abeyance for a time, seeing that the Immigration Committee were awake to the evils to which he had drawn attention.

14. Indian Labour.

DISCHARGE OF COOLIES.

Mr. W. G. Dobson reads the following opinion given by him on the point raised at the last Meeting:

> "As we understand it, the point on which our opinion is desired is as to whether the Superintendents of Immigrants can require an employer to discharge a coolie provided a month's

wages is deposited in his (the Superintendent's) hands. It is quite clear that a coolie on himself paying a month's wages to the employer can determine the contract without notice. If the cooly is anxious to stay on the estate and has not personally given the employer notice we think the Superintendent of Immigrants would be exceeding his functions in demanding that a coolie should be given up and we therefore think that the employer is not bound to deliver up the coolie in these circumstances. In the event of a coolie under 15 we think that the parents will probably have the right to demand the custody of the child and that therefore the employer could not retain him.

(Sd.) HEWGILL & DAY.

15. Constituent Associations.

The Secretary reads the following letters :

Bagan Datoh Coconut Planters' Association,
Lower Perak,
29th February, 1912.

The Secretary,
The Planters' Association of Malaya,
Kuala Lumpur.

Dear Sir,—The Planters of this District have formed themselves into an association under the above title and I have been instructed by the Committee to write to you and ask for details of subscriptions, delegates etc. to the Planters's Association of Malaya. They also asked me to point out that as it is a new and small association in such case perhaps a reduced subscription could be arranged.

I am, dear sir,
Yours faithfully,
(Sd.) A. J. GILLESPIE,
Hon. Secretary.

The Malacca Planters' Association.
Malacca,
21st February 1912.

The Secretary,
Planters' Association of Malaya,
Kuala Lumpur.

Dear Sir,—We have pleasure in advising that at a Meeting of this Association held on 11th instant it was unanimously agreed to rejoin your Association and we shall be glad if you will advise us what the annual subscription per delegate now is.

Kindly also send us say 6 copies of your rules.

Yours faithfully,
(Sd.) SIME, DARBY & CO., LTD.,
Secretaries.

S. Arden Esq.,
Chairman.
Sitiawan & Dindings Pl. Association,
Sitiawan.

Kuala Lumpur,
12th January, 1912.

Dear Sir,—The question of affiliating your Association was con sidered at the last Meeting of this Association held on the 7th instant, when I was instructed to inform you that this Association would greatly welcome such affiliation.

As our financial year closes on the 31st of March, I presume that this matter in any case had better stand over until our Annual General Meeting, which this year will be held on April 18th. We trust that yourself and as many of your members as possible, will personally attend on that occasion, when I hope some definite steps will be taken.

Believe me, dear sir,
Yours faithfully,
(Sd.) H. C. E. ZACHARIAS,
Secretary.

Mr. Hickley proposes and Mr. Quartley seconds that the Malacca Planters' Association be not re-affiliated for one year.

This motion having been lost, the Malacca Planters' Association is declared re-affiliated amidst applause.

The Chairman remarks that apparently their Rules made no reference whatever to the affiliation of constituent Associations and suggests that a rule be drawn up by their Lagal Adviser and be placed on the Agenda of the General Meeting.

16. Agricultural Bulletin.

The Secretary reads the following correspondence:—

No. 7 in 1021/1911.
The Secretary,
Planters' Association of Malaya,
Kuala Lumpur.

Kuala Lumpur,
16th January, 1912.

Sir,—I have the honour the enquire whether in the event of the monthly Agricutural Bulletin of the S. S. and F. M. S. being continued by this Department the Planters' Association of Malya is prepared to continue its present annual subscription.

2. I should be glad if you would send me a reply at your earliest convenience.

I have etc.,
(Sd.) B. J. EATON,
for Director.

Director of Agriculture
Kuala Lumpur,

Kuala Lumpur,
17th January, 1912.

Sir,—I have the honour to acknowledge receipt of your letter 7/1021 dated the 16th instant.

I am unable to reply to your query without submitting same to the Annual Meeting (to be held this year on April 28th) which passes the budget of our financial year (April 1st to March 31st).

Perhaps you could make it convenient to be present at this Meeting and place personally your views before the members.

I have etc.,
(Sd.) H. C. E. ZACHARIAS,
Secretary.

Mr. Cruickshank proposes, Mr. Gibson seconds and it is carried unanimously that the sum of $1,000 appear again under this heading in the estimates for the ensuing year.

17. Imperial College of Technology.

The Secretary places the following letters on the Table:

The Secretary,
Planters' Association of Malaya,
Kuala Lumpur.

Muar,
18th January, 1912.

Dear Sir,—I enclose copy of a circular received from the Rector of the Imperial College of Science and Technology, South Kensington, which I think should be brought to the notice of your members and I should be much obliged if you could further the objects of the scheme outlined in the circular.

For some years past the Botanical Division of the College has endeavoured to meet the demands for men, who, by special training, are fitted to deal with the problems involved in agriculture both at Home and more particularly in the Tropics. With the rapid growth of tropical agriculture, and the increasing complexity of the many problems associated with the cultivation and the sanitation of plants (rubber, cocoa, coffee, cotton, etc.), an extension of the Department has become a matter of necessity.

The College has been impressed by the magnitude of the issues at stake in connection with the modern developments of Agriculture in the Tropics and it has resolved to meet the need for a thorough training of those who are to undertake the duties of advisors and sanitation officers, by founding a new Department of Plant Physiology and Pathology, under the immediate charge of a man specially selected for his eminence in the branches of science more directly concerned.

Trusting you will give this matter attention.

I remain,
Yours faithfully,
(Sd.) J. MITCHELL.

(ENCLOSURE).

"The Imperial College of Science and Technology desires to increase the facilities for the training of young men for plant sanitaton work especially in the Tropics. The Department of Botany in the College, of which Plant Pathology forms a part, is overcrowded, and it has not been found possibe (having regard to the commitments in respect of other departments of the College Work) to provide out of existing capital the full amount of the funds necessary to place Plant Pathology on a footing commensurate with the industrial importance of the subject. The College has already made arrangements for the maintenance of a teaching staff to deal with the subject, and to vestigate the problems which are continually arising to confront those who are directly concerned with plant sanitation. But the work is seriously hampered by the inadequate space and equipment which can be placed at the disposal of the Department.

A sum of £18,000 is required for building and equipping the laboratories, and of this sum the college is prepared to find £10,000, while a further sum of about £1,000 has been given or promised, leaving about £6,000 still to be raised.

The College therefore appeals to those who are interested in the great plant industries of the Tropics to enable it to obtain this £6,000 and thus to provide the means for proceeding with the work here indicated. Furthermore, it is believed that the existence in London of a trained and active laboratory staff will prove of use in helping to solve in the laboratory many problems that are, for various reasons (e. g. absence of suitable equipment, books etc.,) difficult to attack with much hope in the field. In this, as well as in other ways, the Department will continue to be of direct use to, and in direct contact with, the industries aboard.

Advisory Board: It is also anticipated that it may be possible to form an Advisory Body, largely drawn from those who are directly concerned in the Plant Industries. This would serve as a further means of ensuring that the Pathological Department was placed in immediate contact with the current needs of research, and would add to its usefulness.

Nomination of Students: In view of the influx of students which has now rendered immediate expansion necessary, it is evident that a selection must be made for admission, and it is recognised as reasonable that qualified students nominated by those who may have contributed towards the defraying of the expenses that must be incurred, should have prior claims to attend the courses of training they wish to join.

Donations or subscriptions to the fund for the Plant Pathological Department may be sent to.

THE RECTOR OF THE IMPERIAL COLLEGE,
South Kensington.

18. R. G. A. Research Fund.

The Secretary reads the following letter:

The Secretary,
Planters' Association of Malaya,
Kuala Lumpur.

Kuala Lumpur,
18th February, 1912.

MALAYA RESEARCH FUND.

Dear Sir,—Acting on instructions from the Local Committee of the Malaya Research Fund, and confirming my recent interviews with you on the question of your Association co-operating with the Malaya Research Fund to assist in continuing and extending the work carried on by Mr. Morgan, the Resident Chemist of the above Fund, I shall be glad if you will kindly place the undernoted resolution of the Trustees (in London) of the Research Fund and let me know what support your Association would be prepared to give to the Reséarch Fund financially or otherwise.

RESOLUTION. "That the Planters 'Association of Malaya be invited to support the Rubber Growers' Association scheme with a view to obtaining additional subscriptons in the Federated Malay States."

I remain, dear sir,
Yours faithfully,
(Sd.) J. MORTION.

(ENCLOSURE.)

Rubber Growers' Association.
(Malay Section.)
1, Oxford Court, Cannon Street,
London, E. C., 6th January, 1912.

MALAY RESEARCH FUND.

Dear Sir,—I am instructed by this Association to refer to the arrangements made in June, 1909, by which rubber-producing companies possessing estates in the F. M. S. co-operated in the expense of employing research chemists to conduct experiments with regard to the curing and preparation of plantation rubber for the market, for the guidance of those subscribing to the scheme.

Many companies who were producing rubber at the time guaranteed sums of $50 and $25 per annum for the three periods of twelve months ending respectively June 30th, 1910; June 30th, 1911; and June 30th 1912.

These guarantees will therefore expire on June 30th next, and the work of the chemists in London and their assistant in the F. M. S. terminates, under the present agreement, six months later, viz., December 31st, 1912.

In these circumstances the Council of the Association have discussed whether it would be advisable for these research schemes to be continued and extended, and referred the matter to the Trustees of the Research Fund, who adopted the following resolutions:—

"That it would be desirable to ask the guarantors to continue their subscriptions for a further space of three years, and furthermore, to issue an invitation to all other members of the Rubber Growers' Association with estates in the F. M. S. to become guarantors.

"That the guarantors should not be recommended to allow the reports to be issued to all members of the Rubber Growers' Association, but to continue the existing system of issuing reports only to guaranteeing Companies, their Directors, Agents, etc.

"That the Planters' Association of Malaya be invited to support the Rubber Growers' Association scheme, with a view to obtaining additional subscriptions in the Federated Malay States.

"That existing and potential guarantors be asked to express an opinion as to whether it would be desirable, should the renewed funds permit, to develop the research work by employing Mycologists and additional scientists in other branches.

"That it would be desirable to exchange information with other Associations or Companies who were employing scientific investigators, with a view to obtaining interchange of information."

It will be seen from the foregoing resolutions that the existing guarantors are invited to continue their subscriptions for another period of three years and that companies and other proprietors of estates in the F. M. S. who are now producing rubber should be invited also to guarantee.

It is hoped that this will result in a considerably larger sum being subscribed for the purpose of research work, and should this anticipation be realized, the Trustees will place a revised scheme before the guarantors.

During the past two years the work has been carried out by Messrs. Clayton Beadle & Stevens in London who, under agreement with the Trustees, have employed an Assistant Chemist working in the F. M. S., and have themselves conducted standard tests on manufacturing lines of the samples prepared and sent home by the Assistant Chemist. The Assistant Chemist has also personally visited Estates and rendered advice and assistance.

The Trustees feel that it would be desirable, should increased funds allow, to consider, before the present agreement expires, in what manner the research work can be extended in the future. For instance, it has been suggested that a Mycologist and an Entomologist should be engaged and that the question of soils and manuring should receive expert attention.

The Laboratory at the Agricultural Station at Kuala Lumpur has been available for the use of the Assistant Chemist by the kind permission of the Government up to the present time, but the Government now require it for their own use and the Trustees have therefore to build a Laboratory—the arragements for this are already made.

I have written, by instructions, to the Secretary of the Local Committee in Kuala Lumpur asking to be favoured with their opinion regarding the manner in which the research work should be continued and extended. In the meantime I am instructed to ask that you will consider this matter, and that you will guarantee up to a maximum of £50 for each of the three periods ending respectively June 30th, 1913, June 30th, 1914, and June 30th, 1915, in order that the Trustees may be able to submit a scheme to all the guarantors when local opinion in the F. M. S. has been ascertained.

I enclose form of guarantee.

Yours faithfully,
C. TAYLOR,
Secretary.

Mr. Gibson and Mr. F. G. Harvey having spoken in support of the letter, it is resolved, "that this association heartily endorses the scheme and recommends all estates to join it."

19. Land Legislation.

The Secretary reads the following letter:

No. (12) in 909/1912.

The Secretary,
Planters' Association of Malaya,
Kuala Lumpur.

Kuala Lumpur,
27th February, 1912.

Sir,—I have the honour to inform you that a Committee has been appointed to consider the existing Land Enactment with a view to deciding what amendments may be necessary and desirable and to state that the Committee will be obliged if the Committee of the Planters' Association of Malaya will appoint a member of the Association to draw up a memorandum in regard to any points in the Enactment which deserve consideration.

I have etc.,
(Sd.) E. G. BROADRICK,
Acting British Resident, Selangor,
Chairman of Committee.

After a short discussion, Mr. E. Macfadyen is appointed to serve on the Committee as representative of the P. A. M.

20. Education on Estates.

The Secretary reads the following letter:

No. 2 in 1516/1912, Kuala Lumpur,
The Chairman, 27th February, 1912.
The Planters' Association of Malaya,
Kuala Lumpur.

Sir,—With the increase in the number of Tamil Immigrants many of whom bring their children with them it has become necessary to consider the question of affording such children facilities for acquiring in this country the rudiments of education in their own vernacular.

That the absence of such provision is likely to have some effect in keeping out of the country desirable immigrants can hardly be doubted apart from the consideration of the welfare of the children themselves and the main point to be considered seems to be the best method of making such provision.

The better course would appear to be for the schools to be provided and maintained by the employers of Tamil Labour the Government undertaking the necessary supervision and rendering such assistance in the way of contributions to the cost of the schools as may be considered fair and reasonable but the matter is one upon which the Government would be glad to have the views of the planters generally and I am to ask you to be good enough to bring it before your Association.

I have, etc.,
(Sd.) A. H. LEMON,
Under-Secretary, F.M.S.

Mr. Cruickshank explains at length the existing system of night schools in Ceylon.

Mr. Skinner bears out the usefulness of having the children on estates taught the three R's in the vernacular; but feels strongly that both English and Religion should be severely left alone.

Resolved that this Association is in favour of Night Schools, as already existing on several estates, that Reading, Writing and Arithmetic be taught in Tamil, and that the estates should provide the teacher and building; and the Secretary is instructed to reply accordingly to the Under Secretary, F.M.S.

The Meeting terminates at 1.15 p.m.

(Sd.) H. C. E. ZACHARIAS,
Secretary.

APPENDIX.

Federal Council, Tuesday, 14th November, 1911.

PRESENT:

H. E. the High Commissioner, Sir Arthur Henderson Young, K.C.M.G.
The Chief Secretary, Mr. Edward Lewis Brockman, C.M.G.
H. H. the Sultan of Selangor, Alaedin Suleiman Shah, C.M.G.
H. H. the Yam Tuan of Negri Sembilan, Tunku Muhammed, C.M.G.
The Acting Resident of Perak, Mr. Reginald George Watson, C.M.G.
The Acting Resident of Selangor, Mr. Edward George Broadrick.
The Acting Resident of N. Sembilan, Mr. Cecil William Chase Parr.
The Resident of Pahang, Mr. Edward John Brewster.
Mr. John Henry Matthews Robson, Mr. Edmund Becher Skinner, Mr. Harry Denis Griffiths, Towkay Foo Choo Choon.

ABSENT:

H. H. the Sultan of Perak, Sir Idris Mersid-el Aazam Shah G.C.M.G.
H. H. the Regent of Pahang, Tungku Mahmud bin Sultan Ahmad, C.M.G.

The Acting Legal Adviser, Mr. Hastings Rhodhs, was present.

THE LABOUR ENACTMENT, 1912.
READING.

The Chief Secretary addressed the Council, and moved that a Bill entitled "An Enactment to make provision for the proper supervision and treatment of Labourers" be read. He said:

This Bill will necessarily be only a temporary measure because the new Labour Code is now in course of preparation and the provisions of this Bill will be corporated in it. We asked the Council to pass this Bill as special circumstances have arisen which make it a matter of urgency. The first part of the Bill follows on the lines of the Bill recently introduced in the Legislative Council in the Colony and which has now been read a second time. I believe, as a matter of fact, the second reading was taken without opposition. Necessity for the second part of the Bill has arisen in the Federated Malay States. Shortly, the facts are as follows:

On a certain estate in the Federated Malay States matters have reached a stage at which the manager is unable to control the labour force there. There has been terrible mortality on the estate, the labour force of which consists of 1,100 men. On a recent visit of inspection, about 500 were found sick about the estate. The hospital accommodation is absolutely insufficient and the medical staff is quite unable to look after the coolies. The manager has been directed to carry out certain works but has failed to carry out promises which have been made. He states that matters have been reported to the Directors but that they have objected to the expenditure necessary to

remedy the state of affairs. He admits that matters have got beyond his control and he has also informed me that he has sent in his resignation. He has been frequently absent from the estate on other business and no one is left in charge who has power to deal with emergencies. In these circumstances it is necessary to ask the Council to confer powers on the Government to see that this state of things shall exist no longer. This is the only the possible way to deal with such a case. As I stated before this is only a temporary measure, because the Labour Bill will soon be before the Council.

The Acting Resident of Perak seconded the motion.

Mr. Parr translated the Bill into the Malay language.

Mr. H. D. Griffiths: I do not see my way clear to support this Bill, and in saying so I think I have quite sufficient reason. The Chief Secretary has given us the outline of the Bill, pointing out the necessity there is for the Bill to go through. I did not hear the whole of his speech, but I gathered enough to understand that the Government consider the proposed measure absolutely necessary. My first point of objection to the reading of the Bill is that it has never been submitted to us before this meeting. As a rule a Bill is submitted to the Unofficial Members and then published in the Gazette.

By that means a Bill becomes generally known and an opportunity is given to the people it affects to discuss it. In the present circumstances we have not been given the slightest inkling. It has been sprung upon us. The Government cannot expect an Unofficial Member to study such a Bill as this one in five minutes and pass it. It is asking too much. As far as I can see from its working the Bill is likely to have far-reaching effects on all employers of labour and will affect them, to my mind, in a detrimental manner. It is only fair that the people interested—people who employ large forces of labour in this country—should be given an opportunity to see the Bill. Why are we compelled to make a special Bill? Would not the Government make rules under the present Enactments to deal with this particular estate without framing a special Enactment? I understand the Government have instituted a special Labour Department, and I suggest this department might deal with the case. The difficulty I see if this Bill is passed into law is, that it will be difficult to upset it again when we find it does not work properly.

I think it would be a gracious act on the part of the Government to give us time to consider it. If there is danger, as the Chief Secretary states, will the Government give us time to bring this Bill to the highest pitch of perfection.

Mr. J. H. M. Robson said: I sympathise with the remarks made by Mr. Griffiths. It is very hard for us to be suddenly presented with this Bill and be asked to pass it right away. We have not had time to consider it in all its bearings. On the other hand, I quite sympathise with the Government and should not like to do anything

to prolong the present state of affairs. I happen to know something about the estate, I think something ought to be done, and that the Government should take steps to do everything necessary.

Mr. Foo Choo Choon was of opinion that the existing law was quite good. If a towkay misbehaved himself the coolies could go to the Protector of Chinese.

Mr. E. B. Skinner: I quite agree with what the Unofficial Members have said about the short notice given. In such a case as the present it is very difficult to express an opinion; but in view of the urgency of the case I, personally, think this Bill should be passed provided we have the assurance of the Government that only very urgent cases will be dealt with until the new measure is ready.

The Chief secretary: It is only because the Government is advised that there is nothing in the existing laws to enable us to deal with the present case that this measure has been introduced. It has necessitated our coming to the Council and applying for this measure which has been considered purely as a temporary one. The labour Code is now in course of preparation. If hon. members give their votes in favour of it to-day we shall not take them as an unqualified approval of the measure we are going to pass. Its provisions will only be applied to cases of a very serious nature and of great emergency. I am perfectly willing to give an assurance that I will only enforce it in cases of great emergency.

The High Commissioner: When I arrived at Kuala Lumpur for this meeting I had no idea this Bill was to be brought before the Council to-day. I did not know there would be any question of emergency. It was only when I arrived that the Chief Secretary showed me the reports that he had about this particular estate. I agreed with him that it was a question of emergency, and Members who have seen the report agree. I am sure that as regards that particular estate it is a question of emergency.

I agree with what the Chief Secretary has said, as regards the provisions of the Bill being enforced against any other estate; and I will go further and given an assurance that its provisions will not be enforced against any other estate until the Unofficial Members of the Council have seen the report upon which we propose to act, that is until we pass a permanent Bill. I consider further this Bill will strengthen the hands of managers of estates. I believe managers are quite willing to help in every way if they see that the Government rules and laws are necessary. But when you get men thousands of miles away they do not see eye to eye with the Government and with the manager. It will strengthen the hands of the managers and lead to Directors at home carrying out what they advise.

The Chief Secretary said with regard to clause 2 of the Bill that it was practically similar to the one that had been read a second time in the Legislative Council in the Colony. That is so.

At the second reading of any Bill in the Colony the Unofficial Members express their views on the principles of the Bill; but in this case not a single Unofficial Member spoke. The Bill comes into Committee on Friday. Clause 3 has not been brought before the Council in any way. I hope the hon. member will withdraw his opposition after we have told him there are no rules in the Enactment in force to secure for the Government what is required by the present Bill and also after I have told him that we will not apply clause 3 to any estate, except in the case of this particular estate, until the Unofficial Members have seen the report upon which the Government propose to act. The Bill will remain in force until it is repealed by a general consolidating law which will be prepared.

Mr. Griffiths: I do not want to take a division in the least, but the Bill seems rather ambiguous and I cannot quite grasp the meaning of it. It seems by the Bill it will be possible to move away a certain kind of labour that does not get on well on a particular estate, and in cases of trouble that the Government can step in, send the labourers away, and prohibit their return. This is giving an enormous amount of power to the Government and will have great consequences to employers of labour. I will withdraw my opposition by not voting if it is absolutely necessary and will not press for a division.

The motion was agreed to.

COMMITTEE.

On the motion of the Chief Secretary the Council went into Committee to consider further the provisions of "The Labour Enactment, 1911."

PASSING.

The Bill having been settled in Committee, was reported to the Council without amendments, and passed.

On the montion of the Chief Secretary the Council adjourned at 12.30 p.m., sine die.

PLANTERS' ASSOCIATION OF MALAYA.

Fifth Annual Report for the year ending 31st March, 1912.

TO THE MEMBERS OF THE
PLANTERS' ASSOCIATION OF MALAYA.

GENTLEMEN,

Five meetings of the Association were held during the past year, four in Kuala Lumpur and one in Ipoh.

I am glad to be able to report that the Malacca Planters' Association has rejoined us, bringing up the number represented to 14 again, as before. The affiliation of four further Associations also appears to be imminent, viz:—

The Ulu Selangor District Planters' Association.
The Bagan Datoh Coconut Planters' Association.
The Dindings Planters' Association.
The Ulu Langat District Planters' Association.

If these Associations join, as it is sincerely hoped they will, the only planting districts not represented will be Kinta and Kedah.

It is felt by members living in the North and South of the Peninsula, that meetings of this Association should sometimes be held in Perak, Negri Sembilan, and Johore. Although there is no doubt that Kuala Lumpur is the most central place for both Northern and Southern members, it might be advisable, in order to induce all parties to shew greater interest in the working of the Association, to hold one meeting in the North, and one in the South, each year.

INDIAN LABOUR.—The figures for the past year shew a great increase on those for the previous two years, and are as follows:—

	Immigrants.	Emigrants.	Percentage of column 2 to column 1.
1908	54,522	30,920	56·71%
1909	49,817	31,374	62·98%
1910	83,723	39,080	46·66%
1911	108,471	48,103	44·35%

These figures are very satisfactory, and it is expected that those for 1912 will be equally as good. The number of Immigrants in January, 1912 was about 12% more than in January, 1911.

CHINESE LABOUR.—Large numbers of this class of labour came into the country during the past year. The question of recruiting Chinese was gone into by a Sub-Committee, which came to the conclusion that no combined system of recruiting could be resorted to at present, and that it must be done by private enterprise.

THE LABOUR ENACTMENT, NO. 12 OF 1910.—The Association has felt the want of this Enactment greatly, and they regret that

there should have been such a delay in bringing it into force. Owing to there being one or two points in it which did not meet with the approval of the Secretary of State, a new Enactment is being drafted, which it is hoped will be published shortly.

LABOUR ENACTMENT OF 1911.—A special Enactment was passed on November 14th, 1911, giving the Government certain powers to remove any class of labour from an Estate, if it were thought necessary. The Association deprecated the hasty passing of this Enactment, and forwarded a resolution to this effect to the Government. A new Enactment is being drafted now, which will replace that of 1911, and we understand the draft will be submitted to the Planting Community to consider, before it becomes law.

MEDICAL STAFF ON ESTATES.—The present conditions of obtaining Dressers for Estates are obviously and hopelessly unsatisfactory. A scheme is now being prepared and considered by a Sub-Committee, appointed to go into the matter, and it is hoped that Government will see their way to co-operate with us on the lines to be suggested.

COCONUTS.—The interest in this cultivation is continued, and the public at Home is beginning to realize the soundness of the investment. It is to be hoped that during the coming year, no artificial boom will spoil the present satisfactory condition of this industry, and that considerable areas will be put under cultivation on the same sound financial lines as has been the case in the past.

PESTS AND DISEASES OF RUBBER.—There are still people in the country who do not realise the importance of dealing with outbreaks of these when they occur, and the remarks made in the last year's report, viz:—that too much stress cannot be laid on the importance of all planters seeking the advise of the mycologist and entomologist, and generally keeping up to date with regard to precautionary measures to deal with any outbreaks which may occur, still hold good to-day.

PREVENTION OF PLANT DISEASES.—In order to avoid running any risk of the cultivation of rubber suffering from the neglect of diseases or pests on any particular area, it is advisable that Government be approached, with a wiew to protecting the rubber industry in the same way as they have already protected the coconut industry. It is hoped that the Association will take this matter up during the coming year.

QUARANTINE CAMP.—During the past year a very serious outbreak of cholera occurred in the Penang Camp, which greatly affected the health of the labour on the Estates. A deputation was appointed to meet the Government and discuss the Quarantine question, and, thanks to the immediate efforts of the Government, the planters in the Coast Districts of Selangor and to Dr. Watson, a temporary Camp was erected at Port Swettenham, and all chance of recruiting being stopped, was avoided thereby. It is very satisfactory to be able to record that a large sum of money has been passed in this year's

Estimates by Government, for the construction of a permanent camp at Port Swettenham. Since the outbreak of cholera, the Penang Camp has been improved very considerably, and is now in a satisfactory position to deal with any outbreaks. From the beginning of 1912, quarantine expenses will be paid out of the funds at the disposal of the Immigration Committee.

LOCAL LABOUR.—An effort was made during the year to induce the Government to introduce a Registration Fee of $1 per Tamil cooly engaged locally. This scheme was, however, deferred, as the Government first desired to see what will be the effect of the present local labour tax of $4 her head per annum, and if it induces employers to recruit freely from India.

MR. RIDLEY.—This gentleman, who was truly the Father of the Rubber Industry in this Peninsula, has retired and left the East, after having devoted many years of his life to benefitting the planting industry. The Association wishes to put on record its great appreciation of the services which he has rendered, and hopes to be able to forward him shortly some permanent and useful token of their sentiments.

WICKHAM TESTIMONIAL.—A sum of £135-1-4 was forwarded to London to be presented to this gentleman, in appreciation of the services which he rendered in the past to the Rubber Planting Industry.

RUBBER EXPORTS.—The following are the figures for the past three years:—

EXPORTS IN PARA RUBBER IN TONS AND DECIMALS OF A TON.

FROM	To U.K.	To BRT. POSS.	To FOREIGN COUNTRIES.	TOTAL TONS.
Singapore ...	961	67.4	48.6	1,077
Port Swettenham	1,285.7	190.8*	307.5	1,784
Penang ...	762.3	67.4	104	933.7
Total 1909 ...	3,009	325.6	460.1	3,794.7
Singapore ...	1,219.5	83.9	183.9	1,487.3
Port Swettenham	2,815.7	314.5*	471	3,601.2
Penang ...	1,109.8	111.9	5.9	1,227.6
Total 1910 ...	5,145	510.3	660.8	6,316.1
Singapore ...	2,005.4	103.2	703.5	2,812.1
Port Swettenham	4,139.4	380.7*	553.5	5,073.6
Penang ...	2,176.5	164.6	5	2,346.1
Total 1911 ...	8,32.13	648.5	1,262	10,231.8

* Exclusive of exports to Straits Settlements.

ESTATE POPULATION.—At the census taken in March, 1911, the Estate Population as such of the F.M.S. and Kedah was taken according to race. In the Colony and Johore, however, no such census was taken according to race: on the other hand occupation was distinguished, and the figures compiled under the headings "Betel Nuts," "Coconuts," "Rubber," "Tapioca" and "Gambier" have therefore been taken as the equivalent of the "Estate Population" in the other States. The totals thus arrived at are as follows:

	MALES.	FEMALES.	TOTAL.
Selangor	52,128	14,887	68,015
Perak	48,607	14,271	62,878
Negri Sembilan ...	23,537	3,151	26,688
Kedah and Perlis ...	9,536	631	10,167
Malacca	5.426	612	6,038
P. Wellesley ...	3,877	285	4,172
Johore	3,619	12	3,771
Pahang	1,872	185	2,057
Penang Island ...	,1914	1	1,915
Dindings	785	38	823
Singapore Island ...	628	26	655
	152,929	34,250	187,179

STANDING COMMITTEE.—After due consideration, it was decided to appoint a Committee who would be able to consider thoroughly all matters which crop up from time to time, affecting this Association, in order to avoid any risk of resolutions being passed before matters have been considered on all their merits. It is hoped that this Committee will be of great use to the Association.

AGRICULTURAL BULLETIN.—It is a great satisfaction to hear that arrangements have been made for this paper to be edited and published in Kuala Lumpur, as it is one of great use to the Planting Community.

EXHIBITIONS.—During the year,. a successful Rubber Exhibition took place in London. Another Exhibition is shortly to take place in New York, to which it is hoped that members of this Association will give their fullest support, in order to shew America the value of this country as a rubber producer.

KUALA LUMPUR,
April 17th, 1912.

E. B. SKINNER,
Chairman.

ANNUAL MEETING OF APRIL 28TH, 1912.

ACCOUNTS AND ESTIMATES.

REVENUE ACCOUNT FOR THE YEAR ENDING 31ST MARCH, 1912.

To General Charges ..	$ 111.83	By Subscriptions:	
,, Secretary	2,400.00	,, Batang Padang D.P.A.	$ 170.00
,, Library-written off ..	16.48	,, Batu Tiga D.P.A. ..	255.00
,, Furniture	50.00	,, Johore P.A.	340.00
,, Brussels Exhibition ..	499.37	,, Kapar D.P.A. ..	170.00
,, London Exhibition ..	275.95	,, Kelantan P.A. ..	170.00
,, Postages and Cables..	175.88	,, Klang D.P.A. ..	340.00
,, Subscription to Wickham Fund £50 ..	428.33	,, Kuala Langat D.P.A.	170.00
,, Printing & Stationery	487.00	,, Kuala Lumpur D.P.A.	425.00
,, Legal Adviser.. ..	500.00	,, Kuala Selangor D.P.A.	170.00
		,, Lower Perak D.P.A.	255.00
		,, Malay Pen. Agr. Association	170.55
		,, Negri Sembilan P.A.	340.00
		,, Taiping P.A.	255.00
		,, Last Year's subscrip- Kapar D.P.A. ..	400.00
		,, Excess of expenditure over income ..	1,314.84
	$4,944.84		$4,944.48

BALANCE SHEET 31ST MARCH, 1912.

To Bailey Memorial Fund		$1,629.28	By Library:		
,, Ridley Testimonial Fund ..		2,984.62	As per last account	$100.00	
,, Revenue Account			,, Additions ..	16.48	
,, Balance from last year ..	$3,693.08			116.48	
,, Less Deficit	1,314.84	2,378.24	,, Less W/A ..	16.48	$ 100.00
			,, Furniture as per last account ..	100.00	
			,, Less W/A ..	50.00	50.00
			,, Cash at Bank ..		6,842.14
		$6,992.14			$6,992.14

KUALA LUMPUR,
11th April, 1912.

H. C. E. ZACHARIAS,
Secretary.

We have examined the accounts of the Planters' Association of Malaya for year ended 31st March, 1912 and found same in order. We hereby certify that the foregoing Statement shows a true and correct view of the Association's affairs at 31st March, 1912, as shown by the books.

NEILL & BELL,
Chartered Accountants.

BENEVOLENT FUND.

REVENUE ACCOUNT FOR THE YEAR ENDING 31ST MARCH, 1912.

To Grants:		By Balance from last year	$5,893.85
£25	$ 213.33	,, Donations:	
£26	213.10	P. S. Murray ..	25.00
£60	426.19	E. B. Skinner ..	50.00
,, Discount on cheques	.50	Sungei Kapar Rubber Co., Ltd. ..	169.91
,, Balance in hand ..	5,462.89	Sungei Salak Rubber Co., Ltd. ..	75.00
		Bank Interest ..	102.25
	$6,316.01		$6,316.01

H. C. E. ZACHARIAS,
Secretary.

We have examined the above statement with the Bank Pass Book and vouchers and certify same to be in order and in accordance therewith.

NEILL & BELL,
Chartered Accountants.

ESTIMATES FOR 1912-3.

Dr.		Cr.	
To Bulletin	$1,000.00	By Subscription at $112.50 per delegate:	
,, Charges	150.00	2 Bagan Datoh Coco. Pl. Ass.	$ 225.00
,, Secretary	2,400.00	2 Batang Padang Pl. Ass.	225.00
,, Legal Adviser ..	500.00	3 Batu Tiga D.P.A. ..	337.50
,, Printing and Stationery	500.00	4 Johore Pl. Ass. ..	450.00
,, Postages	100.00	2 Kapar D.P.A. ..	225.00
,, Depreciations ..	50.00	2 Kelantan Pl. Ass. ..	225.00
,, Contingencies ..	700.00	4 Klang D.P.A. ..	450.00
		2 Kuala Langat D.P.A.	225.00
		3 Kuala Lumpur D.P.A.	337.50
		2 Kuala Selangor D.P.A.	225.00
		3 Lower Perak Pl. Ass.	337.50
		3 Malacca Pl. Ass. ..	337.50
		2 Malay Pen. Agr. Ass.	225.00
		4 Negri Sembilan Pl. Ass.	450.00
		2 Stiawan and Dindings Pl. Ass.	225.00
		3 Taiping Pl. Ass. ..	337.50
		3 Ulu Langat D.P.A. ..	337.50
		2 Ulu Selangor D.P.A.	225.00
	$5,400.00	48 delegates	$5,400.00

Agricultural Bulletin

OF THE

— STRAITS —

AND

FEDERATED MALAY STATES.

EDITED BY THE

Botanic Gardens Department, Singapore.

No. 5. MAY, 1912. Vol. I.

CONTENTS.

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THIRD SERIES

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OF THE

STRAITS

AND

FEDERATED MALAY STATES.

EDITED BY THE

BOTANIC GARDENS DEPARTMENT, SINGAPORE.

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AGRICULTURAL BULLETIN

OF THE

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FEDERATED MALAY STATES.

No. 5.] MAY, 1912. [Vol. 1

THE EUCALYPTUS.

From time to time a considerable number of letters appear in the local papers commenting on the desirability of planting varieties of the Eucalyptus as suitable roadside trees, and also, on account of their supposed value in purifying localities where severe fevers are prevalent.

We have received many letters asking for advice on the same subjects, and in order to give a general answer to all such correspondents, I shall endeavour to outline the success which has attended the efforts of this Department, to introduce any of the Eucalyptus family.

A Few General Characteristics of Eucalypts.

As is probably well known, the Eucalyptus or Eucalypts are natives of Australia and a few of the adjacent Islands. The genus is a large one, comprising over 150 species. Many of the species are trees varying in height—some of them being amongst the largest in the World, while others are small shrubs which thrive in desert and alpine regions. A number of the species are vigorous growers. The Blue Gum *(Eucalyptus globulus)* is one of the fastest growing of the genus.

From the middle of the last century, the Eucalypts have been distributed all over the World with various degrees of success. As is only to be expected, the most marked success has been attained in countries having a somewhat similar climate to Australia. Eucalypts have been successfully established in Algeria, South Africa, on the Nilghiri and Palui Hills and in North and South America. It is interesting to note that during the last few years, the chief product of the Eucalypts *i.e.*, Eucalyptus Oil has largely been produced in California.

In Australia, the Eucalypts grow in a great variety of soils and climates, varying from deserts or dry mountainous regions to low swamps and moist mountainous ones. It would therefore seem possible to select species which would be suitable to a great variety of situations. All the larger arboreal forms delight in a warm climate but other conditions must also exist to enable them to become successfully established.

Prof. Charles Naudin in his memoir on the genus says:—"The first condition of success in the culture of Eucalypts is a climate appropriate to their nature; that is to say, for a great majority of the species, warm summers, a *moderate amount of rain, a certain amount of atmospheric dryness,* plenty of sunlight and very temperate winters."

I have placed in italics the portion of the quotation from Prof. Naudin's memoir which particularly applies to the Straits and Federated Malay States. It cannot be said that with an average annual rainfall of 96 inches we enjoy a *moderate supply* of rain, nor for the same reason can we lay claim to the certain amount of *atmospheric dryness* in our climate necessary to their successful culture.

Most Eucalypts are benefited by occasional heavy rainfalls which thoroughly saturate the soil, as indeed most arboreal plants are, but frequent heavy rains and the subsequent very humid atmosphere are not conducive to their healthful growth. As has already been mentioned, a few of the species grow in swampy, humid regions, but the majority, though able to absorb large quantities of water by means of their roots, prefer for their aboveground parts a dry atmosphere, at least for a considerable portion of the year.

In Australia, the Eucalypts are generally found forming large forests and indeed many of them do not form very desirable shade trees when planted for that purpose.

As I shall endeavour to show, the raising of Eucalypts is attended with no little difficulty and in view of the fact that the soils and conditions our present roadside trees are subject to, would destroy any chance the Eucalypts might have (provided climatic conditions were suitable) it would seem that we must be content for the present at any rate, with the large and excellent variety of other trees that are available.

It is generally believed that Eucalypts have a most benefiting influence on the climate of those regions in which they are planted to any large extent. There seems to be a great diversity of opinion on this point, however, as the following quotations will show.

The American Consul at Florence, in 1894, writes in his Consular Reports, "It is this latter quality (the property of distributing a balsamic atmosphere) which has brought the Eucalyptus into such prominence in Italy, and has been the cause, not only of the planting of thousands of trees by private individuals and public corporations, but of its receiving the indorsement of the Italian Government as well."

It seems strange that the American Consul at Rome, should take an altogether different view of the subject. In his Consular Report for 1894, he says: "In Italy, although the newspapers had persuaded everyone that the farm of the Tres Fontane, near Rome, had become healthful by means of the Eucalypti, it proved a disagreeable surprise to learn of a sudden outbreak of malaria in 1882 that caused much sickness among the farm hands, while the rest of the Campagna remained perfectly healthy . . . . Dr. Montechiare, a practising physician of Rome, who for many years was physician to the penal colony at Tres Fontane, tells me that his experience justifies him in declaring that no beneficial results against malaria has been derived from the planting of the Eucalypts."

Mr. A. J. McClatchie, M.A., in a Bulletin published by the Bureau of Forestry of the United States Department of Agriculture gives a few reasons why such a property has been attributed to the Eucalypts and though it does not decide the question one way or the other it may be worth while to repeat them here. "It is probable that a great part of the change in the sanitary condition of those places, said to have been benefited by Eucalypts, has been due to other causes, such as the making of drainage ditches, etc., and this will partially account for the conflicting opinions on the subject. When, however, the nature and habit of the trees are considered, it is entirely reasonable to believe that, to a certain extent, they beneficially affect the atmosphere in the region of their growth. The grounds for this belief are: First, their great capacity for absorbing moisture from the soil, and thus reducing the quantity of stagnant water in the ground at their roots; second, their corresponding power of giving off fresh from their foliage, the water thus taken up by their roots; third, exhalation from their leaves and other parts, of volatile oils, which affect the climate not only directly but by changing the oxygen of the atmosphere to ozone; fourth, the purification of germ-infested matter by the foliage dropped upon the ground or in pools of standing water. From the combined action of these four characteristics it seems reasonable to believe that the trees would be beneficial to many climates."

Mr. Ridley did not believe for an instant that, in so far as the Straits and Federated Malay States were concerned, the Eucalypts would influence climatic conditions in any way whatever. We may take it, however, that, unless the Eucalypts thrive exceedingly well and are planted in the form of large forests, no benefits can possibly be derived therefrom. It is not to be expected that a few Eucalyptus trees planted in a swamp, would change the whole climatic conditions of that swamp just as a few nodules on a leguminous plant cannot be expected to have the effect of enriching a large area in nitrogen, to any appreciable extent.

Eucalypts in the Botanic Gardens.

The earliest record of the introduction of Eucalypts to the Botanic Gardens, Singapore was on January 4th, 1876, or practically

12 months after the founding of the Gardens. They were presented by Dr. Schomburg of Adelaide and consisted of packets of seed of the following varieties:—*E. alpina*; *E. amygdalina*; *E. calophylla*; *E. coriacea*; *E. empetrifolia*; *E. ficifolia*; *E. globulus*; *E. Lehmanni*; *E. marginata*; *E. oblique*; *E. piperita*; *E. unifera* and an unnamed species from Tasmania.

Seed of *E. tereticornis* were received in June, 1876, from the Botanic Gardens of Rockhampton and at the same time plants were received of *E. eugenoides* from the same Gardens. In addition to the already mentioned varieties, the following were received from time to time:— *E. citriodora, goniocalyx, rostrata, siderophloia* and *viminalis* from the Gardens, Brisbane in July, 1877. *E. Baileyii* from the Queensland Arboricultural Society in 1878; plants of *E. longifolia and cornuta* in 1878, from the Botanic Gardens, Brisbane; *E. callosa, haematostoma, pilularis and paniculata,* from the Botanic Gardens, Adelaide, in 1879 and so on, practically every year, in ever increasing variety down to the present year. (I have enumerated a few of the many varieties received in order that there may be no doubt about all or nearly all the varieties, which had any likelihood of success in this climate, being tried.)

It would seem quite permissable therefore, to imagine that there ought to be a considerable number of large trees in the Gardens at the present time, but such is indeed far from being the case. Out of the many hundreds of packets of seed which must have been presented to the Gardens during their existence, only one specimen of any dimension is to be found in the Upper Garden *i.e.*, E. intermedia? was planted on rising ground adjacent to the bandstand. It is now a tree of about sixty feet tall and has a circumference of six feet at a distance of three feet from the ground.

The situation must be described as being dry and favourable to the growth of plants requiring such an one (I have been unable to trace "intermedia" in any of the treatises on the genus but as this tree has lately flowered, specimens have been prepared in order that the correct determination may be arrived at).

In the Economic Garden, eleven trees are to be found. Seven of those were planted adjacent to Bukit Timah Road. It is probably well known that this land is frequently covered with water and at no time is the water deeper than about eighteen inches from the surface. The trees do not look healthy and all that can be said of them is that they have merely existed. They are about forty feet in height unbranched and with extremely few leaves on the crowns.

The other four were planted adjacent to the Subordinates Quarters *i.e.* on rising ground. They are practically in a similar state to the other seven and all are slowly dying. No particulars can be obtained as to when those 11 trees were planted nor have I been able to identify them (specimens have also been prepared for identification).

None of those twelve trees can be said to be suitable shade trees as they do not possess one of the essential requirements of a first class shade tree *i.e.*, a good spreading head of branches.

Some six or seven years ago, Mr. Ridley selected the driest part of the Garden for Australian plants; Callistemons, Grevilleas, Acacias and three Eucalypts were planted therein. The present condition of those Eucalypts is as follows;— E. citriodora is now about fifteen feet high, of slender growth, the lower branches continually dying off and altogether not in a very healthful condition; E. gomphocephala is now about eight feet high and in a similar condition to last; E. robusta on the other hand, as the name implies, is of more robust growth. The specimen is now about eighteen feet high and in this case, the lower branches remain on the plant for a much longer period than on any of the other two. It is the most healthy specimen of the three and it will be interesting to note its future growth.

It will be seen therefore, that little or no success has resulted in the endeavour to establish Eucalypts in Singapore.

Why?

Eucalypts are only and can only be propagated from seed, and it is to the inability of the seedling to withstand our humid climate, that the failure of establishing Eucalypts must be attributed. I have personally sown the seeds and attended them in every way possible and after the seedlings have produced their second leaf they suddenly die, damping off at the neck. This happened to all varieties with but one exception *i.e.*, E. citriodora. We have now seven or eight fairly healthy plants in small pots and it is intended to try those at a later date in a variety of situations and note results.

In support of my experience with seed and seedlings I may quote from one of our correspondents. He says:—"I may say that the Eucalyptus has so far shewn no sign of being a success. The seeds were bedded out in the same manner as Tobacco seeds—in "tempat bibits". Only one variety (*E. hemiphloia*) germinated at all in numbers, but these, with a doubtful one here and there in other beds, seemed to be eaten away rapidly and completely. No broken leaves were seen—they simply vanished!"

It may not be amiss to repeat what the late Mr. Murton said in his Report of Botanic Gardens in 1878. He said:—

I have been very successful during the first year in raising the various species of Eucalyptus, which hitherto have proved very difficult to raise from seed in this climate. A number of plants of Eucalypts as well as other plants have been supplied to the Public Works Department for planting in the reservoir grounds near Government Hill and also for the reservoir grounds at Thompson Road.

In his Report for 1878, he said:—

Eucalypts—My anticipation about the Eucalypti when I wrote my last Annual Report, have not been verified; for, although they germinated freely enough, the majority of these species die as they get a few inches high.

E. globulus appears to be the worst species for this climate, *E. citriodora*, *E. amygdalinus*, *E. goniocalyx*, *E. pilularis* and *E. calophylla* do best. I attach very little importance, however, to this, as the belief in their prophylactic virtues is now considerably weakened and they are quite unsuited, owing to their straggling, ragged appearance, for garden ornaments.

In his report for 1880, he said :—

When sown *in situ* they seem to thrive fairly well in Singapore' but do not appear to stand transplanting. *E. siderophloia*, *E. Baileyii* and one or two other species are growing well in the nursery. (none of those are now to be found).

One must perforce come to the conclusion that the Eucalypts (with rare exceptions) are not suited to our climate, and taken for granted that all the useful and healthful effects which are attributed to the Eucalypts, in so far as influence on climate is concerned, be perfectly true, I think it has been proved conclusively that the tree will not grow in sufficient quantities to warrant further trials.

J. W. ANDERSON.

NOTE.

Since writing the above note on the Eucalypts, I have been able to obtain the correct determinations of the eleven large Eucalypts mentioned therein. Specimens were sent to Mr. Maiden, Director of the Botanic Gardens, Sydney and Government Botanist, who most kindly identified them for me. The one adjacent to the bandstand and under the name of *intermedia* has been identified as E. corymbosa, Sm., while those in the Economic Gardens are probable specimens of E. terminalis, F. & M., but owing to incomplete specimens being sent (no seed being available), Mr. Maiden was unable to say for certain as to whether this was correct or not.

A SACCHARINE CONSTIUTENT OF PARA RUBBER.

In October, 1909, two small specimens of smoked Para rubber from the Botanic Gardens at Singapore, representing a consignment offered for sale in the United Kingdom, were forwarded for examination to the Imperial Institue by brokers in London, who stated that the rubber had been prepared experimentally by the Brazilian method

of smoking. On examination in the usual manner, it was found that the rubber contained a very high percentage of "resin" (*i.e.*, matter soluble in acetone), amounting to 5.2 per cent on the dry material. This proportion of resin is very much higher than is usually present in Para rubber from the East, but owing to the smallness of the samples supplied to the Imperial Institute it was not possible to investigate the matter in detail. Subsequently, however, a large specimen of smoked rubber, carefully prepared from the latex of a single tree by the same process as that employed for the earlier specimens, was forwarded for further examination to the Imperial Institute by the Director of the Botanic Gardens at Singapore.

The specimen consisted of a spindle-shaped piece of smoked rubber, weighing 6 lbs., which was almost black externally but whitish within when cut. The rubber was rather moist, and a quantity of brown viscous liquid was present between the concentric layers.

An analysis of the rubber gave the following results:—

	Rubber as received.	Composition of dry rubber.
	per cent.	*per cent.*
Moisture	7.4	—
Caoutchouc	84.6	91.4
"Resin"	4.4	4.8
Proteid	2.9	3.1
Ash	0.7	0.7

The percentage of "resin" present in the dry rubber was a little lower than that found in the previous samples (4.8 per cent. compared with 5.2 per cent.), but was still very much higher than the amount usually present in plantation rubber from the East.

An examination was made of the portion of the rubber dissolved by hot acetone, and it was found that a large quantity of a solid crystalline substance, which was soluble in hot water, was included with the resin. The substance amounted to no less than 2.7 per cent. of the dry rubber, so that the true figure for the percentage of resin in dry rubber was only 2.1 per cent. instead of 4.8 per cent.

The crystalline substance was submitted to a detailed examination and proved to be a carbohydrate, which was identified as *laevo*-methylinosite. The presence of this substance in the aqueous portion of the latex of *Hevea brasiliensis* remaining after the coagulation of the rubber has been previously recorded by de Jong, and closely allied carbohydrates are known to occur in other latices. The presence of such a large amount of the *l*-methylinosite in this specimen of Para rubber is no doubt to be attributed to the method of preparation employed, whereby the whole of the solid constituents of the latex remain in the rubber, whereas in the usual method of coagulation adopted in the East, the rubber separates from the aqueous portion of the latex, which retains the soluble constituents in solution.

In order to complete the investigation, a supply of the latex of the same tree from which the rubber had been prepared was obtained from Singapore. The aqueous portion of this latex, after separating the rubber, was found to contain a quantity of the *l*-methylinosite, amounting to 0.46 per cent. of the total latex. The presence of this carbohydrate has also been proved in fine hard Para rubber from South America.

The results of this investigation are of considerable practical interest as showing that in the analysis of rubber prepared by the Brazilian method (or by any method which leads to the inclusion in the rubber of all the solid constituents of the latex) it will be necessary to take into account the possibility of other substances besides resin being extracted from the rubber on treatment with hot acetone.

A preliminary note on the results of this investigation has been communicated to the Chemical Society of London, by Dr. S. S. Pickles and Mr. B. W. Whitefeild, of the Scientific and Technical Department of the Imperial Institute.—(*Bulletin of the Imperial Institute, April, 1912.*)

PARA RUBBER IN ST. LUCIA.

Ten thousand seeds of Para Rubber *(Hevea brasiliensis)* were obtained from Ceylon and arrived in October. Some of them were distributed to purchasers and the remainder were sown at the Experimental Station nursery. Only 10 per cent. of the whole consignment germinated. At the station 780 plants were raised and some of the number will be reserved for planting in a plot. About 600 will be available for distribution.

Para rubber planting in St. Lucia is at present only on experimental lines, but the trees planted in 1908-09 appear to be making very satisfactory growth, and some interest in the cultivation is developing. A more extended trial is desirable, to test the suitability of different soils and localities for the successful cultivation of this tree.

Experiments have been carried out to test the hardiness of Para rubber plants for distribution in the Island, when they are packed, with the view of reducing the bulk in and therefore the cost of transporting parcels of them, at the same time ensuring that they shall arrive at the various estates in sound condition. The trial was carried out as follows: Twelve plants were lifted from the seed beds, the tops cut back leaving the plants a little over a foot in length and all the leaves were removed. The soil was then shaken from the roots leaving them quite bare. The plants were then divided into two bundles and wrapped up in banana trash, which had previously been thoroughly soaked in water; each bundle containing six plants. One bundle was placed in a dry close potting shed, the temperature of which often reached 95° F., and the other bundle was placed in the Office.

After eight days the plants were examined and found to be in a fresh and healthy condition. The plants placed in the potting shed had been badly gnawed by rats, but were otherwise healthy. The whole twelve were then planted out in the ordinary way, and no special attention or treatment given to them. The plants commenced to grow readily with one exception, and this was the plant that had almost been denuded of bark by rats.

The results are very satisfactory, inasmuch as they prove that Para plants can be sent to any estate in the Island, packed in the way described, without fear of permanent injury, or loss, provided that they receive proper attention upon arrival at their destination. *(Report on the Botanic Station and Experiment Plots, St. Lucia, 1910-11)*

RUBBER IN THE SEYCHELLES.

The following extracts are taken from the Report of the Gurator (M. Dupont) on the Botanic Station, Seychelles. for 1911.

The total number of treess now in Seychelles is estimated at 70,585, of which 4,511 have reached tappable size. The tapping experiments on Hevea trees were continued. Several kinds of tapping knives were tried, but it was found that successful tapping depended more on the skill of the operator than on the instrument employed. The Barrydo knife proved a less dangerous implement in the hands of inexperienced tappers than either the Bowman—Northway or the Eagle knife, both of which produce deep wounds. The "half-herring-bone" method of tapping was used in most cases on the "opposite quarters" system, *i. e.*, one-quarter of the surface of the bark of the tree is tapped during one year, and it takes four years to tap the whole tree before beginning on renewed bark. The full spiral system was adopted in one set of experiments where trees were overcrowded, and although the death of few trees may follow this drastic method, the Curator considers that the greater yield obtained when prices are high fully compensates for this loss. He also suggests that in Seychelles it may be better to tap by this method for three months during the rainy season, when young trees can withstand the effects of serious wounds, than to employ any other method which would necessitate extending the tapping period into the dry season to obtain the same quantity of rubber.

Five-and-six-years-old trees were in one instance tapped by the full spiral method for five or six months, without any apparent check to the growth of the trees or to the fulfilment of their natural functions.

The following table shows the daily yield of latex obtained in one experiment designed to compare the two methods.

	Half-herring-bone Method.			Full Spiral Method.		
Girth of tree at 3 ft. from ground	18 ins.	18 ins.	16 ins.	18 in.	18 in.	16 in.
Date	16.3.11	17.3.11	16.3.11	16.3.11	17.3.11	16.3.11
Latex collected	660 cc.	730 cc.	515 cc.	1075cc.	1045cc	650 cc.
Number of trees	41	41	60	34	34	60
Latex per tree	16 cc.	18 cc.	8 cc.	32 cc.	31 cc.	10 cc.

The latex was coagulated with acetic acid, ammonia solution having been previously added to prevent coagulation on the cuts and in the collecting cups. One cubic centimetre of glacial acetic acid diluted with 250 cubic centimetres of water, was used to each litre of diluted latex.

The rubber was dried slowly in a cool chamber and exported in biscuit form. The slow drying tends to induce the growth of mould, and to prevent this, steps are being taken to effect the drying in a special drying room, after using a smoking machine.

Experiments carried out on a small estate near the Botanic Station serve to indicate to what extent and in what time a Para rubber estate comes into bearing in the hilly districts of Seychelles The estate in question contains 1,800 trees planted in 1905 and 600 trees planted in 1907 and 1908. The soil is rocky and inferior, the trees overcrowded and irregularly planted 10 or 12 feet apart; yet in spite of these adverse conditions about 10 per cent. of the five-year-old trees have reached tappable size, 16 in. and over in girth at 3 feet from the ground. On marshy land about 50 per cent. reach tappable size in five years. The average yield of latex, on the twenty-third day of tapping, from trees 18 in. in girth was 16 cc. per tree by the half-herring-bone method and 24 cc. by the full spiral method The best tree, 23 in. in girth, yielded nearly 100 cc. of latex daily during forty-two days, and this large yield had not decreased at the time the report was drawn up.

No fungoid disease has yet appeared on the Hevea in Seychelles, but as several diseases of other plants, which have spread to Hevea in Ceylon and other countries are present, precautions are being taken against infection.

An attempt was made to introduce rubber stumps from Ceylon, but the experiment was not very successful. The proportion of plants raised from stumps in two consignments received was 30 per cent. and 50 per cent. respectively. The number of plants raised from local seeds is steadily increasing, and it is anticipated that in two or three years it will be unnecessary to import Hevea seed for planting purposes

A NEW COCONUT PEST.

Yet another pest of the Coconut has been discovered in the Philippines and from all accounts it will prove a serious menace to plantations in the Colony and Federated Malay States unless sufficient precautions are taken immediately. So far, it seems to be restricted to certain areas in the Philippines, and the Department of Agriculture are fully aware of the danger arising from this insect, and we may be sure that they will use every means in their power, to prevent its spreading throughout the Philippines and ultimately to the Straits Settlements.

It has been considered advisable to prohibit the importation of palms, etc., from the Philippines.

We reprint the description, etc., of this pest as it has appeared in The Philippine Agricultural Review, together with the copy of the Ordinance as it appeared in the S. S. Gazette, May 31st, 1912.

"A parasite of the coconut palm, which may prove to be the most serious pest of this crop in the Philippine Islands, was discovered in May, 1911. This insect is related to the White Fly of the citrus orchards of Florida, and this fact alone is sufficient to cause the coconut planters considerable anxiety. For the present, however, it appears that this insect, which may be termed the Coconut White Fly, is confined to a district in Negros Oriental, extending from the barrio of Tabon on the north and the barrio of Zamora on the south, range of some 35 kilometers in length. Most of the coconut groves in this area, which extends from the sea-coast back to a range of hills to the west, are infested with the parasite.

The first specimens were collected on the hacienda of Mr. Henry Gardner in the vicinity of Guijulgant. It appears that this is the first occurence of any insect of this genus in the Philippine Islands, and, further more, the species itself is new to science. It has been described by Mr. Quainstance of the Bureau of Entomology, United States Department of Agriculture, D. C., as *Aleyrodicus destructo* a similar species (*A. cocois*, Westw.) occurs in the West Indies and has caused immense damage there to the coconut groves, some districts having even been abandoned largely on account of it attacks.

Like all of the so-called "White Flies" (which are, of course, not flies) and the related "scales," the individuals are very small and not readily noticeable except when present in large colonies. The general color of the older individuals is white or grayish; at first the larvae are nearly naked and of a pale brownish shade, but when about half grown they develop a fringe of white waxy material around the edge of the body. This waxy substance, as the insect grows, gradually covers the entrie body with a mass of cottony thread-like appendages and waxy flakes.

The minute eggs are laid on the under surface of the leaflets, usually on the young leaves of the palm. Thus far it appears the insect is attacking by preference only the young palms, that is, those under 6 or 8 years of age, but unless checked it will probably soon spread to all the palms in the vicinity.

Soon after the eggs are hatched the young insect begins walking about on the underside of the leaf in the endeavour to find a suitable position for its attack, satisfying itself as to location, it inserts its beak through the epidermis of the leaf and begins to suck the sap from the soft inside tissue; after becoming thus attached, the young insect seldom moves, unless disturbed, until it attains its full size. Shortly before emerging as a winged insect it stops feeding, but remains attached to the leaf. Though comparatively weak fliers, the danger of their passing through the air from one tree to another is greatly increased by the action of winds, since when the insect may only wish to fly from one leaf to another, it may be accidently borne by the wind to a considerable distance.

Some of the colonies contain scarcely more than a dozen individuals, while others contain many thousands and form an irregular white area over the underside of the leaf. This feature of their colour is exceedingly valuable to the coconut planter, since it allows him to readily determine the presence of a colony in his grove.

Although a hymenopterous insect, evidently a parasite of this coconut pest, was observed in the act of laying eggs in or upon the immature White Flies, it is not likely that any natural parasites will be of much avail in checking the spread of this pest. Therefore the coconut planters in the infested district should immediately go through their groves, cutting off and burning all attacked leaves, or portion thereof, and by the same token, it would be well for all coconut planters to carefully look over their young groves, and if any white insects are discovered, they should report the fact at once to the Director of Agriculture and should remove and burn all traces of the parasite. In certain cases it might be advisable to treat the pest with kerosine emulsion, or some similar spray, but unless the grower has had experience with such remedies, the use thereof would probably be in vain, if not actually injurious to the tree itself. Fumigation could be recommended only for extreme cases and then only for young trees.

If this pest is taken in hand immediately, there is very little chance of its spreading to other districts of the Philippines; and it is earnestly hoped that coconut planters throughout the Visayas and Tayabas will make a strenuous effort to prevent the spread of this pest, which, although apparently new to these Islands may within a few years become an exceedingly important factor in the coconut industry of the Far East.

(By D. B. Mackie, in *The Philippine Agricultural Review*, Vol. V. p. 142)

"Whereas it is provided by "The Destructive Pests Ordinance 1908" that the Governor in Council may from time to time make such Orders as may to the Governor in Council appear expedient for preventing the introduction into the Colony of any insect, fungus or other pest destructive to agricultural or horticultural crops, or to trees, or plants and for preventing the spreading in the Colony of any such insect, fungus, or other pest"

"AND WHEREAS information has been received to the effect that a disease of the coconut palm, believed to be the disease known as "WHITE FLY" (Aleyrodicus destructor) has apppeared among coconuts in the Philippines Islands."

"NOW, THEREFORE the Governor in Council in exercise of the powers conferred on him by the aforesaid Ordinance prohibits until further notice the landing in the Colony of any palms, alive or dead, or any stems or foots or parts of stems or roots of palms or of any products of palms other than such as are expressly exempted from the operation of this Order, from the Philippine Islands, and authorizes the destruction of any such article, if landed in the Colony from the Philippine Island. This Order does not apply to dried copra or to oil expressed from coconuts."

(Sd.) M. S. H. McArthur,
Clerk of Councils.

Council Chamber,
Singapore, 28th May, 1912.

THE CASTOR OIL PLANT.

Having received enquiries from Planters as to the suitability or otherwise of the Castor Oil Plant as a "Catch Crop" for Rubber, it may be helpful to others with like ideas, if a few of the details of this plant are enumerated for their guidance.

The Castor Plant (*Ricinus communis*) is probably well known to many Planters in the Peninsula, as scattered plants are generally to be found growing round Tamil Coolie Lines, the coolies sowing a few seeds in order to obtain the oil from the plants thus sown.

Belonging to the Natural Order Euphorbiaceae, it is thus related *Hevea brasiliensis* and many other plants yielding valuable oil seeds. It is generally believed to have been originally a native of North Africa, but the plant is now largely cultivated throughout the world, in Tropical and sub-tropical and occasionally in Temperate regions.

It is said to occasionally attain a height of from 20 to 30 feet, but it rarely if ever attains a larger size than from 5 to 7 feet in the Peninsula.

As a purely decorative plant it appeals to many and is largely cultivated in temperate countries for this quality alone, but the chief product derived from this plant, as perhaps every one knows, is the valuable oil obtained from the seeds.

There are many varieties of this plant—the seeds varying in size and shape, but for all practical purposes, the numerous forms may be grouped into two classes, *i.e.*, the large-seeded and small-seeded kinds. The former are more prolific in yield of seeds and the oil obtained from them is largely used as a lubricating oil, and in India it is used as an illuminant and is commercially called " Lamp Oil ". The latter, *i.e.*, the small seeded kinds, yield a much finer oil and this is preferred for use in medicine.

The soil best suited to the Castor Plant is, a rich well-drained sandy or clayey loam. Owing to its well developed root system the Castor plant demands a deep rooting medium. The Castor plant soon exhausts the soil and if virgin land is not available for the crop, natural or artificial manures are necessary. It will be readily seen that round coolie lines is an ideal situation for this plant, in so far as food is concerned as decaying matter of all kinds is ever to be found in such places.

One of the most valuable manures for this plant is the residual cake left after the expression of the oil from the seeds.

In the tropics the cultivation of this plant seems to be restricted by excessive rainfall, while in Malaya it is attacked and often denuded of leaves by a Caterpillar (Ophiusa sp.).

Before sowing the seeds it is advisable to steep them in slightly warmed water for about 24 hours. This treatment soften the hard seed coat and tends to ensure quick and uniform germination. The large seeded kinds are generally planted in rows from 5 to 5 feet apart with a similar distance between the plants in the row. The small seeded kinds are planted closer, *i.e.*, about 3 feet between the rows and 18 inches from plant to plant. It is advisable, to secure an event crop, that 2 or 3 seeds be planted at the distance mentioned above.

After germination, the weaklings one be removed and the strongest one in each case allowed to continue its growth.

In India the Castor Plant is seldom grown as a pure crop, it being usually interplanted with cereals or some leguminous crop. It is often planted as a border to cotton or sugar fields, when planted as a pure crop, about 10 lbs. of seeds of the large seeded varieties are required to plant an acre and about 14 lbs. in the case of the small seeded kinds.

After thinning, it is advisable to slightly mould up the plants by drawing the soil up round the stem, this preventing moisture from collecting at the base.

The capsules of the small seeded varieties commence to ripen in from 4 to 6 months from the time of sowing and those of the large seeded varieties from 7 to 10 months according to variety and the prevailing climate conditions. Owing to the irregular ripening of this crop, the harvesting is a somewhat tedious process, but as the work involved is not laborious, it could be done by women and children.

As the capsule dehisces and scatters the seed immediately they are ripe, it is necessary to look over the plants at least once a week, collecting those sufficiently ripened. The seeds after collecting require drying and may then be stored in bags in a dry place until sold or pressed for oil.

The average yield per acre (pure crop) is given as 4 to 6 cwt. of seeds average good crop.

From the foregoing it would seem that it is not altogether a suitable Catch Crop for rubber owing to its habit of exhausting the soil. When practical, however, this plant could be planted as a border to rubber, but this is largely a question of the quality of soil in individual Estates.

J. W. A.

MR. H. A. WICKHAM COMING OUT TO CEYLON WITH A CURING MACHINE.

The father of the plantation rubber industry, Mr. H. A. Wickham, is due in Colombo towards the end of the month, the chief purpose of his visit being to introduce a machine which embodies his ideas, acquired in the home of Hard Fine Para, as to the curing of rubber. Mr. Wickham has every hope that his machine will have a great effect upon the plantation rubber industry. During his stay in England, Mr. Wickham has been making arrangements with regard to the machine, but owing to the time it has taken to settle matters, has been delayed longer than he expected, otherwise he would have been in the Island now.

We understand that Mr. Wickham claims that his machine imitates the well-known smoking process employed by the natives on the Amazon, each layer of rubber being smoked and the article consequently thoroughly permeated by the disinfectant fumes. It is Mr. Wickham's contention that under the present processes some of the best qualities of the rubber are lost, carried away in the washing, and it will be interesting to watch how far he will be able to substantiate his claim by the production of samples of superior resiliency and tensile strength than the present first quality rubber turned out on estates. It is also claimed that the machine will turn out a perfectly uniform quality, whereas at present the rubber from the same estate varies considerably. *(Times of Ceylon 6th June, 1912).*

CLEARING WITH EXPLOSIVES.

The Value of Explosives in Clearing.

It will be found that the chief uses to which explosives can be put with economy in clearing land, are in the removal of stumps, and in so shattering logs or standing trees that they burn more readily. Trees can be blown right out of the ground; but, owing to their greater weight they take more explosive than stumps. I therefore consider it more economical to put sufficient explosive under them to blow the earth out from around the roots, at the same time cracking and breaking the roots and butt of the tree. The cracks will extend from 4 to 15 feet up the trunk of the tree; and after a week's exposure to the air in dry weather, even bad burning timber will then burn readily. I have burnt down trees 7 feet in diameter at the ground in six to twenty four hours having used 5s. worth of explosive on some. These trees would have taken a week to burn down in the ordinary way, that is, digging the earth away from them, and drawing timber around them with horses or bullocks.

The economy of the method will be realised when I state that I have cleared 12 acres of land at a cost of £3 per acre, whereas an adjoining block of similar land cost me about £6 per acre to clear in the old way. This was on light red volcanic soil, overlying light clayey loam.

The method cannot be recommended in cases where timber burns right out of the ground, leaving no roots. But in this district I have found the saving in cost to vary from 25 to 50 per cent. on the usual methods of grubbing and burning. With practice, much better work can be done at less cost with explosives. The procedure should be varied to suit different timbers and different soils; the exercise of a little judgement will be found profitable.

Sound timber, whether trees, stumps, or logs, will be shattered with better effect than hollow or rotten timber, as it offers more resistance to the explosives.

Condition of the Soil.

To obtain best results I find that the ground requires to be fairly dry. If it is very dry, the explosion is not quite so effective; whilst if it is too wet, the force seems to act too deeply in the earth, instead of near and above the surface. In some districts, I am informed, best results are obtained when the ground is wet; but that is not my experience and I do not know to what degree it holds good.

Explosives Recommended.

For firing, a battery *guaranteed* to fire five or more shots is absolutely necessary for best results. It is possible to work in small timber with fuse and caps, but the method is not so satisfactory as the use of a battery.

The explosives which I have used are rackarock and rendrock. I consider the latter the better for earth holes, as it seems to take more roots with the stump; but I can recommend both. I have used a little gelignite, and it seems very good; I intend to give it further trials. Other explosives are worthy of trials, but I should not advise farmers to use dynamite, as it is more subject to chemical changes, particularly in hot climates.

If rackarock is used, insert the detonator in half a plug of gelignite for earth holes. Much better combustion will result if this is done.

Bursting the Timber.

When it is desired to burn trees or stumps level with the ground, or to burn sound logs, bore holes 1 to 2 feet deep into the soundest part of the timber, with 1 inch to 1½ inch auger, and charge same with ½ lb. to 1 lb. of explosive. A number of shots fired simultaneously with the battery will do very much better work than when they are fired singly with fuse. This method is suitable for Yankee grubbing, as it uses less explosive; but is not as good as the next method for getting rid of trees and stumps.

Clearing for the Plough.

To remove trees and stumps for the plough, put holes under the heaviest and soundest parts of same, 12 inches or more in depth, with a 3-inch earth auger or small bar and scraper. When placing the charges, take into consideration the lay of the main spur roots. Best results are obtained by using three charges or more according to the size of the tree. Place each charge up against a big strong root, or better still in the fork of two roots. If it is not easy to get the charge against a root, ram small stones into the bottom of the hole, so as to make a sound bottom for the charge, as the more resistance obtained the better the results of the explosion. Do this before any explosive is put in the hole, or there would be great danger.

In some cases it is better to use both earth and wood holes, placing the latter in big spur roots; but I rarely do so, as it snaps the roots and leaves portion in the ground.

The charges should be carefully tamped with damp clay or earth observing the proper rules, as there is considerable danger if they are neglected. Water tamping is not at all effective in wood, though it is in rock.

In earth holes I find 1 lb. of explosive about the minimum effective charge for large trees and stumps; but I have blown out small stumps with as little as ¼ lb. With well-placed charges stumps frequently come out, shattered into many pieces, leaving few if any roots. When any remain they are so shattered that they burn easily

A Warning.

A beginner will require 50 lbs. of explosive to give the method a thorough trial. He should start on medium-sized sound stumps, as they are easier to operate on. Necessary case should be observed when handling explosives, and he should be extremely careful of the detonators. He should also bear in mind that large bits of wood will sometimes fly 150 yards. Detonators should never be *stored and kept* with explosives in the same receptacle.

(*H. B. Faviell, Bonville, in the Agricultural Gazette of New South Wales, May 2, 1912.*)

NOTICE.

A CATALOGUE of all the plants in the Botanic Gardens, Singapore, has been compiled and is ready for issue.

It contains plants of Economic, Decorative and Botanical Interest. Copies may be obtained direct from the Botanic Gardens or from Messrs. Kelly & Walsh, Singapore, post free on receipt of one dollar.

Early application is essential as only a limited number of copies have been printed.

EXPORTS TELEGRAM TO EUROPE AND AMERICA.

Month of April.

	Steamers.		Wired. Apl. 15. Tons.	Apl. 30. Tons.
Tin	Str. Singapore & Penang	to U. Kingdom &/or	725	1,758
Do.	do.	U. S. A.	380	825
Do.	do.	Continent	120	427
Gambier	Singapore	Glasgow	...	...
Do.	do.	London	...	25
Do.	do.	Liverpool	10	...
Do.	do.	U. K. &/or Continent	...	50
Cube Gambier	do.	United Kingdom	5	10
Black Pepper	do.	do.	...	5
Do.	Penang	do.	...	10
White Pepper	Singapore	do.	40	10
Do.	Penang	do.	...	...
Pearl Sago	Singapore	do.	10	40
Sago Flour	do.	London	100	375
Do.	do.	Liverpool	1,200	160
Do.	do.	Glasgow	50	75
Tapioca Flake	Singapore	United Kingdom	75	10
Tapioca Pearl & Bullet	do.	do.	150	120
Para Rubber	Straits & Malaya	do.	550	800
Gutta Percha	Singapore	do.	60	95
Buffalo hides	do.	do.	110	60
Pineapples	do.	do.	17,500	17,500
Gambier	do.	U. S. A.	140	175
Cube Gambier	do.	do.	40	110
Black Pepper	do.	do.	160	45
Do.	Penang	do.	...	...
White Pepper	Singapore	do.	80	25
Do.	Penang	do.	...	15
Tapioca Pearl	Singapore	do.	...	...
Nutmegs	Singapore & Penang	do.	9	27
Sago Flour	Singapore	do.	550	650
Pineapples	do.	do.	4,500	2,750
Do.	do.	Continent	1,500	2,750
Gambier	do.	South Continent	50	75
Do.	do.	North Continent	125	190
Cube Gambier	do.	Continent	45	10
Black Pepper	do.	South Continent	60	95
Do.	do.	North do.	...	...
Do.	Penang	South do.	...	...
Do.	do.	North do.	...	...
White Pepper	Singapore	South do.	10	...
Do.	do.	North do.	...	...
Do.	Penang	South do.	5	10
Do.	do.	North do.	...	...

		Steamers.	Wired. Apl. 15. Tons.	Apl. 30. Tons.
Copra	Singapore & Penang	Marseilles	500	400
Do.	do.	Odessa	780	780
Do.	do.	Other South Continent	100	240
Do.	do.	North Continent	480	1,700
Sago Flour	Singapore	Continent	1,500	1,100
Tapioca Flake	do.	do.	75	35
Do. Pearl	do.	do.	10	30
Do. Flake	do.	U. S. A.	...	...
Do. do.	Penang	U. K.	...	...
Do. Pearl & Bullet	do.	do.	80	50
Do. Flake	do.	U. S. A.	...	...
Do. Pearl	do.	do.	10	420
Do. Flake	do.	Continent	...	...
Do. Pearl	do.	do.	180	25
Copra	Singapore & Penang	England	50	...
Gutta Percha	Singapore	Continent	5	35
Para Rubber	Straits and Malaya	U. S. A.	85	40
Do.	do.	Continent	45	55
Tons Gambier } ...	...	...	...	400	700
„ B. Pepper }				150	320

Month of May.

		Steamers.	Wired. May.15. Tons.	May.31 Tons.
Tin	Str. Singapore & Penang to	U. Kingdom &/or	1,840	1893
Do.	do.	U. S. A.	645	960
Do.	do.	Continent	120	295
Gambier	Singapore	Glasgow	...	...
Do.	do.	London	60	...
Do.	do.	Liverpool	70	...
Do.	do.	U. K. &/or Continent	...	...
Cube Gambier	do.	United Kingdom	10	15
Black Pepper	do.	do.	...	...
Do.	Penang	do.	...	...
White Pepper	Singapore	do.	...	10
Do.	Penang	do.	...	...
Pearl Sago	Singapore	do.	10	5
Sago Flour	do.	London	175	200
Do.	do.	Liverpool	1,400	...
Do.	do.	Glasgow	...	100
Tapioca Flake	Singapore	United Kingdom	35	170
Tapioca Pearl & Bullet	do.	do.	160	30
Para Rubber	Straits & Malaya	do.	525	540
Gutta Percha	Singapore	do.	20	75
Buffalo hides	do.	do.	100	50
Pineapples	do.	do.	25,000	16,250

		Steamers.	Wired. May 15. Tons.	Wired. May 31. Tons.
Gambier	United Kingdon	U. S. A.	25	450
Cube Gambier	do.	do.	...	50
Black Pepper	do	do.	30	230
Do.	Penang	do.	...	55
White Pepper	Singapore	do.	5	50
Do.	Penang	do.	...	45
Tapioca Pearl	Singapore	do.	...	30
Nutmegs	Singapore & Penang	do.	6	40
Sago Flour	Singapore	do.	...	400
Pineapples	do.	do.	2,250	7,500
Do.	do.	Continent	1,500	2,250
Gambier	do.	South Continent	100	...
Do.	do.	North Continent	325	210
Cube Gambier	do.	Continent	15	40
Black Pepper	do.	South Continent	75	190
Do.	do.	North do.	...	...
Do.	Penang	South do.	...	15
Do.	do.	North do.	...	...
White Pepper	Singapore	South do.	10	5
Do.	do.	North do.	5	...
Do.	Penang	South do.	...	...
Do.	do.	North do.	...	...
Copra	Singapore & Penang	Marseilles	100	50
Do.	do.	Odessa	...	900
Do.	do.	Other South Continent	100	150
Do.	do.	North Continent	3,100	2,200
Sago Flour	Singapore	Continent	700	875
Tapioca Flake	do.	do.	60	55
Do. Pearl	do.	do.	...	20
Do. Flake	do.	U. S. A.	...	...
Do. do.	Penang	U. K.	...	100
Do. Pearl & Bullet	do.	do.	85	225
Do. Flake	do.	U. S. A.	...	...
Do. Pearl	do.	do.	120	550
Do. Flake	do.	Continent	...	...
Do. Pearl	do.	do.	370	85
Copra	Singapore & Penang	England	100	150
Gutta Percha	Singapore	Continent	40	35
Tons Gambier	... ...	... ...	700	700
„ B. Pepper			340	225
Para Rubber	Straits & Malaya	U. S. A.	30	85
Do.	do.	Continent	55	25

SINGAPORE MARKET REPORT.

April, 1912.

	Tons.	Highest	Lowest.
Copra	3,736	11.20	10.60
Gambier Bale	1,126	10.45	10.00
„ Cube No. 1 & 2 ...	169	16.00	13.62½
Gutta Percha 1st quality ...	...	275.00	200.00
„ medium ...	...	140.00	90.00
„ lower ...	...	70.00	17.00
Gutta Jelotong	...	11.60	9.25
Nutmegs 110s.	...	25.00	23 00
„ 80s.	...	27.00	25.00
Black Pepper	518	22.12½	20.75
White „	119	32.50	30.50
Sago Pearl, small	...	6.00	5.30
„ Flour No. 1	3,179	4.75	4.35
„ „ No. 2	251	1.70	1.60
Tapioca Flake, small ...	186	9.40	8.90
„ Pearl „ ...	140	9.00	7.80
„ „ medium ...	178	9.40	9.00
Tin	1,950	100.62½	95.37½

May, 1912.

	Tons.	Highest.	Lowest.
Coffee Bali	10	...	...
Copra	4,752	11.80	10.50
Gambier Bale	1,465	10.20	9.85
„ Cube No. 1 & 2 ...	307	15.85	13.60
Gutta Percha 1st quality ...	...	275.00	200.00
„ medium ...	...	140.00	90.00
„ lowest ...	...	70.00	17.00
Gutta Jelotong	...	11.25	8.50
Nutmegs 110s.	...	25.00	...
„ 80s.	...	27.00	...
Black Pepper	468	22.00	21.12½
White „	144	33.00	31.00
Sago Pearl, small	25	6.75	5.75
„ Flour No. 1	4,403	5.07½	4.40
„ „ „ 2	...	2.10	2.00
Tapioca Flake, small ...	684	9.70	8.90
„ Pearl „ ...	199	8.50	7.90
„ „ medium ...	221	9.85	9.00
Tin	2,295	105.00	100.75

PENANG.

Abstract of Meteorological Readings in District Hospital, Penang, for the month of April, 1912.

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.	Ins.
PENANG.	29.812	15.5	85	95	72	not recorded.	82.4	.895	74.8	73.2	not recorded.	5.48	79

Senior Medical Officer's Office,
Penang, 30th May, 1912.

B. Dane.
Senior Medical Officer, Penang.

NEGRI SEMBILAN.

Abstract of Meteorological Readings in the various Districts of the State of Negri Sembilan for the month of April, 1912.

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.			
District Hospital, Seremban	...	153.9	82.4	91.5	73.5	18.0	76.9	.821	73.2	74	N	2.60	1.60
„ „ Mantin	...	...	...	...	...	...	...	...	...	...	...	4.97	1.82
„ „ Tampin	...	150.6	83.1	90.2	75.3	14.9	76.7	.805	72.8	71	...	2.41	1.64
„ „ Kuala Pilah	...	...	82.6	91.3	74.3	17.0	77.7	.855	74.3	77	...	5.78	2.31
„ „ Jelebu	...	...	...	...	...	...	...	...	...	...	...	2.24	1.42
„ „ Port Dickson	...	164.0	84.4	90.3	75.5	14.8	78.3	8.52	74.4	72	...	2.19	0.71
Beri-beri Hospital „ „	...	...	...	...	...	...	...	...	...	...	...	1.77	0,90

Office of the Senior Medical Officer,
Kuala Lumpur, 28th May, 1912.

G. D. Freer.
Senior Medical Officer,
Selangor, Negri Sembilan & Pahang.

KELANTAN.

Abstract of Meteorological Readings in Kelantan for the Month of April, 1912.

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.	Vapour Tension.	Dew Point.	Humidity.			
	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	%		Ins	Ins.
Kota Bharu	...	142.0	82.2	88.4	75.0	13.4	79.2	.927	77.0	84.8	...	4.04	1.38
Kuala Lebir	...	...	80.6	92.6	74.6	18.0	77.3	.871	75.1	83 5	...	4.21	1.60
Kuala Kelantan	...	...	...	86.43	74.20	12.23	...	...	...	...	...	2.09	0.76
Kuala Pahi	...	...	...	88.80	73.76	15.04	...	.	...	...	...	3.09	1.06
Kuala Val	...	...	...	89 00	74.76	14.23	..	...	...	...	...	1.96	1.20
Chaning Estate	...	...	...	91.00	74.00	17.00	...	...	...	...	...	3.63	1.03
Pasir Jinggi	...	...	...	...	...	...	...	...	...	...	...	2.68	.72
Semerah Estate	...	...	...	...	...	...	...	...	...	...	...	2.77	.50
Toko Ayer Merah	...	...	...	...	...	...	...	...	...	...	...	2.34	.50
Pasir Gajah Estate	...	...	...	...	...	...	...	...	...	...	...	1.05	0.70
Taku Plantation	...	...	...	...	...	...	...	...	...	...	...	1.61	1.09
Pasir Besar	...	...	...	...	...	...	...	...	...	...	...	1.94	1.25
Kenneth Estate	...	...	...	...	...	...	...	...	...	...	...	.31	.23

RESIDENCY SURGEON'S OFFICE,
KOTA BHARU, 18th May, 1912.

JOHN. D. GIMLETTE,
Residency Surgeon, Kelantan.

PERAK.

Abstract of Meteorological Readings in the various Districts of the State of Perak, for the month of April, 1912.

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	...	106	83.18	93	71	22	78.43	909	...	81	...	14.50	2 67
Kuala Kangsar	...	...	82.52	95	71	24	77.19	862	...	79	...	11.18	3.42
Batu Gajah	...	...	83.46	95	70	25	78.27	898	...	79	...	15.80	4.15
Gopeng	...	...	82.05	94	70	24	76.42	836	...	77	...	13.31	3.46
Ipoh	...	...	83.37	95	72	23	77.88	882	...	79	...	10 77	3.41
Kampar	...	...	82 46	94	68	24	77.54	879	...	81	...	13.16	4.72
Telok Anson	...	...	82.21	94	69	25	77.96	900	...	83	...	7.94	1.55
Tapah	...	...	82.75	93	68	25	77.61	879	...	79	...	21.59	3.22
Parit Buntar	...	...	83.93	92	73	19	78.62	908	...	79	...	4.23	1.25
Bagan Serai	...	...	83.66	92	72	20	79.16	935	...	81	...	7.33	2.18
Selama	...	...	82.64	94	71	23	78.52	920	...	83	...	19.19	3.62
Lenggong	...	...	82.69	94	63	31	77.30	868	...	79	...	5.48	1.75
Tanjong Malim	...	...	82.43	95	68	27	78.34	915	...	83	...	13.68	2.56
Grit	...	...	82.25	96	68	28	76.02	816	...	75	...	11.02	2 37
Klian Intan	...	...	...	...	...	...	...	...	...	...	...	3.97	1.68
Pulau Bangkor Laut	...	...	...	...	...	...	...	...	...	...	...	5.45	1.74
Kuala Kurau	...	...	...	...	...	...	...	...	...	...	...	6.07	2.95
The Cottage	...	...	...	...	...	...	...	...	...	...	...	12.54	4.60
Maxwell's Hill	...	...	...	...	...	...	...	...	...	..	...	9.39	2.05

OFFICE OF THE SENIOR MEDICAL OFFCER,
TAIPING, 14th May, 1912.

S. C. G. FOX,
Senior Medical Officer.

PERAK.

Abstract of Meteorological Readings in the various Districts of the State of Perak, for the month of May, 1912.

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	...	106	81.88	92	72	20	77.96	905	...	85	...	25.22	5.34
Kuala Kangsar	...	...	81.14	93	73	20	77.26	885	...	85	...	8.87	2.15
Batu Gajah	...	111	81.88	92	73	19	77.88	899	...	83	...	11.20	2.75
Gopeng	...	...	80.75	91	70	21	76.36	851	...	82	...	22.53	4.74
Ipoh	...	...	81.81	92	72	20	77.56	888	...	83	...	12.65	2.00
Kampar	...	...	81.78	92	71	21	77.76	896	...	83	...	18.56	2.50
Telok Anson	...	...	81.40	93	69	24	77.59	894	...	85	...	11.15	1.88
Tapah	...	...	81.27	92	70	22	77.41	891	...	85	...	25.50	3.10
Parit Buntar	...	...	82.62	92	72	20	78.06	899	...	81	...	9.49	2.03
Bagan Serai	...	...	82.64	91	72	19	78.69	927	...	85	...	19.73	3.87
Selama	...	...	82.01	92	72	20	78.58	931	...	87	...	23.17	5.52
Lenggong	...	...	81.32	93	73	20	77.38	887	...	85	...	8.83	2.33
Tanjong Malim	...	...	81.09	93	68	25	78.30	934	...	89	...	17.80	3.62
Grit	...	...	80.67	94	72	22	76.66	863	...	82	...	11.03	1.16
Klian Intan	...	...	...	...	...	...	...	...	...	...	...	5.09	.72
Pulau Pangkor Laut	...	...	...	...	...	...	...	...	...	...	...	10.10	1.82
Kuala Kurau	...	...	...	...	...	...	...	...	...	...	...	16.25	3.10
The Cottage	...	...	...	...	...	...	...	...	...	...	...	27.75	4.38
Maxwell's Hill	...	...	...	...	...	...	...	...	...	...	...	24.04	3.10

Office of the Senior Medical Officer,
Taiping, 14th June, 1912.

S. C. G. Fox,
Senior Medical Officer.

SELANGOR.

Abstract of Meteorological Readings in the various Districts of the State of Selangor, for the month of April, 1912.

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 Dry Bulb.	Vapour Tension.	Dew Point.	Humidity,			
General Hospital, Kuala Lumpur ...	29.884	148.5	83.2	92.2	74.3	17.9	77.6	0.845	74.2	74	Calm.	10.76	3.60
Prisons „ „	...	...	...	...	...	...	...	...	...	...	...	10.48	3.62
Dist ct Hospital „	...	...	...	...	...	...	...	...	...	...	...	12.07	3.22
„ Klang	...	...	...	94.1	71.3	22.8	...	...	...	...	...	6.27	1.90
„ Kuala Langat ...	...	...	...	92.3	75.5	16.7	...	...	...	...	...	3.43	.90
„ Kajang	...	...	...	89.9	76.9	13.0	...	...	...	...	...	5.96	1.78
„ Kuala Selangor ...	...	...	...	91.0	72.7	18.3	...	...	...	...	...	3.77	0.80
„ Kuala Kubu	...	...	...	94.1	71.6	22.5	...	...	...	...	...	8.19	1.50
„ Serendah	...	...	...	93.2	70.6	22.6	...	...	...	...	...	10.26	1.75
„ Rawang	...	...	...	92.4	71.8	20.6	...	...	...	...	...	15.54	3.30
Sabah Bernam	...	...	..	...	...	...	...	...	...	...	...	7.65	2.10

Office of the Senior Medical Officer,
Kuala Lumpur, 28th May, 1912.

G. D. Freer,
Senior Medical Officer,
Selangor, Negri Sembilan & Pahang.

MALACCA.

Abstract of Meteorological Readings in Malacca, for the month of April, 1912.

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.	Ins.
Durian Daun Hospital	29.901	156.6	83.5	89.6	73.6	16.0	79.5	.919	...	83	N.	5.85	2.60 on 29th

Malacca, 22nd May, 1912.

E. W. De Cruz,
Assistant Surgeon.

PAHANG.

Abstract of Meteorological Readings in the various Districts of the State of Pahang, for the month of April, 1912.

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.			
District Hospital, Kuala Lipis	...	...	81.8	90.9	68.6	22.3	75.9	...	...	...	...	5.39	1.05
„ „ Raub	...	...	82.4	92.4	71.0	21.4	73.0	...	...	...	...	9.87	1.89
„ „ Bentong	...	...	82.1	90.9	70.9	20.0	76.3	...	...	...	...	5.55	1.94
„ „ Pekan	...	...	81.9	88.3	72.8	15 5	77.5	...	...	...	...	7.29	1.95
„ „ Kuantan	...	...	78.5	90.7	...	...	73.7	...	...	...	...	7.43	2.28
Dispensary, Temerloh	...	...	...	92.9	67.5	25.4	...	...	...	...	...	1.61	0.80
Sungei Lembing	...	...	...	89.2	75.0	14.2	...	...	...	...	...	11.07	3.22
Kuala Tembling	...	...	...	...	...	...	...	...	...	...	...	10.68	3.50

OFFICE OF THE SENIOR MEDICAL OFFICER,
KUALA LUMPUR, 24th May, 1912.

G. D. FREER,
Senior Medical Officer,
Selangor, Negri Sembilan & Pahang.