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JOTTINGS FROM A PLANTER'S NOTE BOOK.*

A TEA planter without a pocket notebook would almost cease to be a planter, so consistent is the practice of carrying one. Verily, was the man who invented them sensible, for many interesting items find space therein which would otherwise escape from a fleeting memory.

After a few years' absence from the country one of the most striking features noticeable is the damage done by WASH, more especially in the older and steeper districts. Though the harm done so far has scarcely been felt, I feel the gravity of it is worthy of more consideration than is given it. On every hand on sees the roots of grevilleas and tea exposed in a way that ought to cause alarm. The feeding roots of the bush are often to be seen, whereas they ought to be hidden just under the surface soil. This is not due to the growth of the trees, because the general tendency of roots is to keep under the soil. Then again we see the wash instanced on what were once good smooth roads. The earth around stones has been gradually carried away and roots have become exposed which are now traps for unwary pedestrians. As each year goes by more earth is swept away, so little that residents scarcely notice it and pay no heed. But this in the sum of years amounts to a very great deal, for it is in this manner that the physical features of a country are changed, through the slow process of countless years which are unnumbered by eternity.

The working expenses and profits of most tea estates will not admit of TERRACING, which was resorted to in the old coffee days. Something might be done in the way of coppicing with *mana* grass, but this is not always feasible. Trees have been very generally planted through the tea, not so much with the idea of preventing wash, but they do so to no small extent. For this purpose grevilleas appear to be the most suitable, when other important matters, such as nutrition taken out of the soil, are considered. They provide a more plentiful, but not so fine a litter as *toonas* or *albizzias*.

In clearing out drains a little help can be given by throwing the silt upwards into the tea, instead of downwards as the general custom is. I feel safe in prognosticating that in a decade or two the question will become very acute in some places. Capital will be required that the difficulty may be met by re-planting—as is found necessary in most tea countries, or by terracing or other expensive methods that may be advanced for alleviating the situation. Where new land is available the point will arise, whether it is not better to open it up and to abandon the old.

On many estates too little attention is given to PRUNING and there is a general tendency to reduce the cost below a figure at which good pruning can be done. In fruit-growing countries the importance of this item is fully realized, it having been found that if the work is not well done, the trees cease to fruit proportionately. It is the same with tea. Where knots and old unproductive branches are not taken out of the bush, the sap has not a free course and is hindered if not stayed. This inevitably results in a smaller yield than would have otherwise been obtained. Non-paying estates would do well not to reduce the cost of pruning indiscriminately, for it stands to reason that if crop cannot be secured, profits will be all the more hardly obtained.

MANURING seems to me to be being carried too far. In a few years the present forcing manures will cease to affect tea as they do now and still more invigorating stimulants will be required. When these are no longer forthcoming a reaction must set in and a serious crisis will arrive on all highly manured properties. Then will come the turn of those, who, without injuring the industry by inordinate yields, apply a mild manure and are content with reasonable results It will probably be futile to sound a word of warning to the owners of estates of medium elevation as well as to those who are extensively planting up the low country with rubber. Still it is well to draw their attention to the fact that rubber will be obtainable, as soon as it is

* Specially written for the *Tropical Agriculturist*.

available in Ceylon, in enormous quantities from Burma. The Straits, Borneo, the vast regions of the Congo and the, as yet, unexplored basins of huge Amazonian tributaries to which the rubber tree will undoubtedly be found endemic. They will probably prefer to believe the pessimistic rumours that the present supplies are nearly exhausted in S. America and that the demand for the commodity must ever be insatiable.

VANILLA is an article which should not be dealt in extensively. There must always necessarily be but a small demand, so that if it were largely planted up, it would very soon share the same fate as cinchona. Planters who take interest in new products might do well in an attempt to naturalize trees producing cork and paper. If they were found suitable to the country, our cheapness of labor should make them very profitable products. An interesting experiment would be for planters at different elevations to ascertain the length of time taken by a tea shoot to develop according to the Fish, Half and Full leaf systems of packing and to compare results. I should be happy to give a basis to work on and data.

It may be useful to mention here that at a medium elevation PARA RUBBER seeds take about 20 days from the time of planting, to appear above ground.

Also, that it is ill-advised to grow vanilla vines on grevilleas as the suckers cling to the bark, which cracks and splits them. In Tahiti they are grown very successfully on guava trees, which growing wild, are very handy for the purpose.

A. T. FARMER.

VANILLA CULTIVATION.

The following are the remainder of Mr. Galbraith's miscellaneous notes on Vanilla cultivation in the Seychelles, and are in continuation of those given on page 375 :—

SUN CURING.

During early crop gathering, before ripe pods are numerous enough to make it worth while using the hot room they are cured under blankets in the sun, but have to be taken in at the hottest part of the day if sunshine is continuous. This used to be the sole method of curing here and when used now gives excellent results in favourable weather ; but dependence upon the sun is risky, and upon the whole the process is cumbersome and costly. Hand trays that can be piled up on top of each other and carried between two men, are used to spread the blankets on, a fold being below as well as above the pods, and these are supported on low double rails to keep them clear of the ground. In unsettled weather showers have to be watched for, and the trays carried under shelter till the weather again becomes fair.

If there is a pinch for space in the curing house, pods in the hot room may be spread two or three or more deep on the shelves and tumbled up daily, that is such of them as are not taken off and re-sorted.

MULCHING AND SHADE.

In mulching vanilla roots, and especially at crop time, the plants are much more benefited if the mulch be of two sorts, well-rotted leaf mould being put on first for immediate action, and above it a layer of withered fern or the like, which decays more slowly. When heavy top dressings of quick-decaying manure, grass, etc , have rotted down, they get beaten away by rain, the net-work of roots becomes exposed, and may with advantage be lightly covered with a thin sprinkling of good soil. Obviously it is better to apply this before the roots become bare or visible. The vanilla roots delight in twisting among stones, large and small, and flattening against their lower surface when not embedded in the soil. When these are of a convenient size and handy in a plantation, the root circuit allowed to each vine may be ringed with them. Vanilla may be grown on trees of thick foliage if there are of a sort that will stand being well pruned annually. Wild cinnamon, which gives dense shade, is sometimes used for this purpose, the branches being nearly all cut off each year about pod-ripening time, which also lets the sun get at the vines for flowering. The contrast between the former somewhat dense shade, which has grown since last branch trimming, and the strong light let in by the pruning seems to help toward blossoming.

Under large, high trees, wide apart, where to plant vines on other small-growing wood between them would make the shade too close, vanilla may be fixed on tripods of durable wood, the three stakes being tied with wire crosswise some little way from their top ends, so as to furnish forks over which the vine creepers may climb. High up in the hills here the plants may be grown in this way without any shade at all, but the plan is only suitable for level grounds or moderate slopes.

SUMMARY.

The foregoing account of vanilla cultivation, being the outcome of experience gained in the Seychelles alone, and there chiefly in the hills, may need many modifications to adapt it to different circumstances pertaining to other lands, and, indeed, possibly may be of little use for such. For instance, in a drier climate irrigation might be needful, and it would not be necessary with a reliable, sufficient annual dry period to prepare vines for flowering by checking their sap flow in certain branches, as it is in this colony. This is not found necessary in certain districts where the rainfall is not such as to keep plants growing continuously, for they stop growing of themselves and come into flower without coaxing.

Again, under less favourable growing conditions the vines would need more nutriment and attention to stimulate growth.

These and similar considerations which will suggest themselves to the reader may serve to save a brief summary from appearing too dogmatic.

The following conditions of climate, method of growing, etc., appear to the writer to be most favourable to the successful cultivation and handling of the vanilla crop.

Climate.—With shade temperature ranging about 80° F., never much above or below it, and a humid, still atmosphere ; a rainfall of 80 to 100 inches or more, evenly distributed through ten months in the year, the remaining two months being dry, with occasional short and very light showers—the ten wet months for continous luxuriant growth, the two dry ones to check it and bring vines into flower.

Soil.—A skin of rich vegetable mould resting on a porous substratum. Failing that, with the above climate, vanilla should do well on any soil if the roots are kept covered with decaying vegetation.

Situation.—Moderate slopes.

Shades.—Small-leafed trees to let checkered sunlight through.

Plants.—Cuttings 10 to 12 feet long of growing shoots, which should not cease growing if planted after the dry season, but go straight on and flower fully in two years.

Planting.—Either in line on posts and bars, or on shrubs of suitable size and leafage, at the risk of whole sale destruction from disease ; or plants well kept apart, each on its own support, so that any vine showing signs of sickness may be removed before infecting its neighbours.

Culture.—Plantations to be gone through bi-monthly shoots on the ground looped up ; climbing branches brought down ; decayed leaves, etc., laid on roots for manure, when needed. Preparations for flowering according to climate

Cropping.—Flowers to be pollinated in forenoon, preferably such as will hang clear and grow straight pods, quantity regulated according to mass and vigour

of each vine, but not such as to hinder the start of new growth for more than two or three months Pods should be gathered every other day.

Curing.—The slower, the better, beginning in a heated room at abont 1I3° F. for some days, then in a cooler one, 90° to 100° F., finishing at ordinary temperature ; humidity of air kept down if need be by charcoal braizers.

Marketing.—Qualities and lengths kept distinct, made up in packets of 50 pods, and neatly packed in tins holding abont 12 pounds each,

Labour.—Cheapness and intelligence are of the greatest importance in vanilla production. The cultivator must himself have his eyes everywhere ; the best of labour known here deteriorates quickly if left by itself.—*West Indies Agricultural News.*

CEYLON TEA IN AMERICA.

IMPORTANT ALLEGATION REGARDING RE-COLOURED CEYLON TEAS.

(By T. Gossupp, of New York.)

It may be of interest to many of the planters of India and Ceylon to know a certain amonnt of actual facts about the American tea trade without being puzzled by a lot of figures.

In the first place, Ceylon teas are coming rapidly into favour here, and without doubt Ceylon green teas are slowly replacing Japan teas. Unfortunately, however, the Ceylon green teas are offering at rather higher prices than the buyers of sun-dried Japan are accustomed to pay, except for Japan sun-dried teas of really fine liquors.

Your writers may not be aware that there are three classes of Japan teas sold here, the "sun-dried" being similar to our uncoloured Ceylon greens but of much better make, having a darker colour and of rather more delicate flavour in the cup. Then there is the "pan-fired" Japan which is similar to a coloured Ceylon green, but the basket-fired Japan, to my mind as a tea expert, is far superior to anything I have seen with the exception of perhaps one invoice of Ceylon greens which came, I believe, from Bloomfield estate, but which was only a very small parcel.

I advocated some time ago that the Ceylon planters, in order to cope with the over-production of tea (from which they have been suffering) should endeavour to make an "Oolong" tea similar in flavour and style to the Formosa Oolongs which are in general use here. It would be very easy for any of your planters to write to Formosa or to Japan and get samples from these two countries in order that they may see from an actual sample the kind of tea which is wanted in America. The price of Oolongs to-day is 10d. per lb. c-i-f N. Y.

To take the United States first, it is necessary to remember that it is about 73 times as large as Great Britain and has a population of 76,000,000 people as against Great Britain's 40,000,000, so that you see if we can once indnce the Americans to become tea-drinkers on the same scale as the British people generally, or even, say, they take three lbs. of tea per head, in a very few years to come we shall have no fear of over-production as Americaa alone will be able to take nearly all the output of Indian and Ceylon. It is, therefore, a field we have to consider and during the last few months (when Japan teas have been very high), we had a chance of getting Ceylon green teas into favonr, but the price held ont for by the planter or merchant in Colombo, has prevented them from being more readily taken.

The grades wanted here are Hyson No. 1 and Hyson No. 2, and for these people are willing to pay from 6½d. to 7d. for the Hyson No. 1, and about 5½ to 6d. for the Hyson No. 2. The Young Hyson grade is generally coloured in New York, which can be done for ½d., per lb. and it is then sold as China green tea.

A great many of the Ceylon greens sold in the States are coloured, repacked, and either sold as coloured Japans or as China green teas, being packed in China packages and faced with the nsual paper, *exactly*, to represent them as or China Japan teas.

With regard to Canada: this country is different, as there is a large population who have now become accustomed to Ceylon uncoloured greens, and the loyalty that exists in Canada prompts the consumer to support British tea in preference to Japan tea. Here again the question of price comes in, and the only way that Ceylon greens can oust China and Japan is by selling them at reasonable prices, as the grocer will always push the teas that show him the largest profit.

The labour in Ceylon and India is cheaper than in Japan, so one would think that the planters would have a great deal in their favour. The duty of 10 cents per lb, which was a war tax, is to be repealed on the 1st January, 1903, and it is anticipated that a much larger trade will be done.

Some of the favourite grades here are the Norwood, Labukellie, Condegalla, Meeriabeddie, Warwick, and similar liqnoring teas so this will guide many of the planters (who are in these districts where this class of tea can be made), to get samples and follow them very carefully and closely, as there is regular demand for the light liquoring, flavoury, good quality (so called lemon-flavoured) Ceylon teas.

If a few of the estates shipping desirable and suitable teas for the American market were to create a demand here by shipping direct they would find that in a very short time the venture, would pay as the writer has seen tea sold here 2d. and 3d. per lb. above the price that they sold for in the London auction.

There are other matters I could write abont in connection with the tea planters of Ceylon and India, the tea cess, the packages that are required for this market, the question of shipment, and several other matters which I will touch upon in my next letter.—Local "Times."

JOURNEY TO A RUBBER PLANTATION ON THE ISTHMUS OF COLUMBIA.

By C. O. Weber, Ph. D.*

(*Concluded from page 371.*)

The Latex I have already stated that the latex obtained from Castilloa elastica at Las Cascadas does not flow like milk, but issnses from the cnts in the form of a thick cream containing a very high percentage of india-rubber. This is certainly curious in view of the fact that the same tree in other districts produces a fairly thin milk although I have been told that the Castilloa trees in certain districts of Guatemala and Venezuela exhibit the same peculiarity. I have not been able to discover any reason for this difference. It cannot be due to a difference of species, nor to the elevation at which the trees are growing, nor to the temperature limits of the respective districts, as in other districts, at both higher and lower elevations, and higher and lower temperature limits, *e.g.*, Mexico on the one part, and Ecuador on the other, the Castilloa trees produce a perfectly fluid latex. It is not impossible that the condition of the soil, and the annual rainfall may have some influence upon this point, but in the absence of any positive proof I prefer to leave this matter for the present undecided

The latex of castilloa at the moment of issuing from the cnts forms an almost pnre white, thick creamy mass, which, however, almost immediately begins to discolonr, assuming at first a pale drab colouration, which, in the course of a very short

* From the *India Rubber and Gutta-Percha Trades' Journal*, Sept. 29, 1902.

time darkens into a brownish black. This phenomenon, which is at least one of the causes of the very bad colour of all the Central American rubbers of the present day, in fact, of all the rubbers obtained from Castilloa elastica, I found to be due to the presence in the latex of an oxidising ferment (oxydase and it is, therefore obvious that in attempting to) produce a high-class, pure rubber from Castilloa latex the presence of this ferment has to be taken into consideration.

The taste of the Castilloa latex is intensely bitter. This appears to be due to the presence in it of a substance of the class of bodies chemically described as glucosides. It is this same body which is the cause of the intense dark green colouration produced by the addition to the latex, or better to its aqueous vehicle, of a few drops of a solution of ferric chloride. I presume that this reaction has been observed before, and led the observers to the altogether erroneous assumption that the Castilloa latex contains tannic acid, which latter as is well known, produces much the same colouration with ferric-chloride. As a matter of fact, there is not the slightest trace of tannic acid to be found in this latex, and I doubt whether it occurs in the latex of any other rubber tree. It is really only necessary to state that the latex of Castilloa elastica, beside the bodies already named, contains a very large proportion of albumen, and to remind the reader that albumen may be quantitatively precipitated with tannic acid, in order to prove that the presence of tannic acid in the latex is an impossibility. Indeed, on adding to a solution of the aqueous vehicle of the the latex of Castilloa a few drops of a dilute solution of tannic acid, a most copious precipitate of albumen tannate is at once obtained. Considering that all the different specimens of rubber latex I have so far as an opportunity of examining contain albumen in varying quantities, though none as much as the latex of Castilloa elastica, is at the same time sufficient proof of the absence of tannic acid in every case.

A quantitative determination of the amount of albumen and albuminous matters in general in the latex yielded the rather surprising result that there is as much as 11 per cent. of these bodies present. This, I believe, is the cause of the extreme ease with which the latex of Castilloa elastica can be coagulated. I am quite aware that this has been attributed to the comparatively large size of the rubber globules in the Castilloa latex, but for reasons, based upon evidence, I shall produce in another paper on this important suject, I believe this assumption to be erroneous.

In my communication I showed that the latex of an 11 year old Castilloa tree contains 31 per cent. of pure rubber, and it will, therefore, be seen from the above statement regarding the amount of albuminous matter) in the latex that if we coagulate the latter without first removing from it this albuminous matter we obtain a rubber containing over 25 per cent. of albuminous matter. The native rubber collectors prepare the rubber from the latex in such a way that at least part of the aqueous vehicle of the latex is drained away before coagulation takes place, and consequently we never find a Central American rubber (crude) which coutains as much as the above stated quantity (25 per cent. of albuminous matter), but lots containing from 9 to 13 per cent. are quite common. It is, indeed, the presence of such a large amount of albuminous matter in the Central American and some other Castilloa rubbers which is largely responsible for their frequently reaching American and European ports in a state of pronounced putrid fermentation, of the atrocious smell they emit on washing, and of their often very unsatisfactory behaviour in the process of vulcanisation. When such rubber in a state of advanced putrid fermentation is subjected to the washing process a very considerable proportion of the coagulated albuminous matter, rendered soluble by the fermentation, is removed, but the rubber, although not taking itself an active part in this fermentation, is, nevertheless, found to have suffered more or less severely from it, to possess little strength, and, after vulcanisation, only very moderate distensibility (elasticity). If, on the other hand, the rubber reaches the factory in fair condition, it contains practically the whole of the albuminous matter in an insoluble condition and so intimately intermixed with the rubber that the washing altogether fails to remove more than a mere trace of it. We obtain than a washed rubber, which contains a very large proportion of albuminous matter, the presence of which in the washed and dried rubber is scarcely noticeable, but which is the cause of such rubber forming invariably a peculiarly "short" and none-resilient vulcanisation product. It will thus be seen that whatever happens to such rubber during transit it is always a very inferior product from what it might be if the albuminous matter were kept out of it. In fact, I scarcely think I want any further justification for the statement that the Castilloa rubber of the present day owing to the above discussed defect, occupies a much lower position than it would hold considering the intrinsic quality of the pure rubber it contains. I am, indeed, of the opinion that properly prepared Castilloa rubber is superior to most of the present day Para grades.

Incidentally I may remark here that the presence of substantial quantities of albuminous matter not only in Castilloa rubber, but also in some other (African) brands, and the odour they produce owing to fermentation has given rise to the now almost ineradicable nursery tale that in certain districts the rubber is coagulated by means of one of the by-products in the economy of the human body, the use of which would be far more commendable on account of its inexpensive character than for its attractiveness. This fable has never been substantiated, and I believe that its origin is simply to to be found in the offensive urinal smell developed on the fermentation of the albuminous matter in crude rubber.

The methods followed by the native collectors for the coagulation of the Castilloa latex vary considerably:

1. The latex is washed with water, but just as often this is neglected, and then treated with a decoction of the crushed stem of the moon-plant, Calonyction speciosum. This, according to Dr. Morris, is the process practised in British Honduras.

2. The latex is treated with the juice expressed from Ipomœa bona nox which is stated to be highly alkaline. (?)

3. The latex is collected in shallow holes dug in the ground and mixed with a boiling solution of soap in water. This process is exteusively practised in the Isthmus of Panama.

5. The latex is treated with a solution of alum.

These various methods call for the following remarks:—All of them effect the so-called coagulation by adding to the latex substances—acids, or alkalies—capable of coagulating the albumen. In other words there is no such thing as the coagulation of the *indiarubber itself*. What takes place is that through the addition to the latex of either an acid, or faintly alkaline solution the albumen, of which I have shown there is such a large amount in the Castilloa latex, is coagulated and carries down with it the rubber globules suspended in the latex. If the latex is entirely freed from all albuminous matter by a carefully conducted series of washings it may still be diluted with water, and then forms a liquid milky liquid of a some what lighter colour than the original latex, but otherwise indistinguishable from it. But if we now try to coagulate this albumin-free liquid with any of the above named coagulants we find that the rubber remains quite uneffected, no coagulation taking place. Therefore, whenever we coagulate the rubber, we can only do

so by coagulating it in conjunction with the albumen present, and we have at once a product possessing all the irremediable drawbacks which above we discussed at some length.

On the plantation at Las Cascadas, Calonyction speciosum is very common, and I ascertained that decoctions prepared from it have a strongly acid reaction. Therefore, coagulation with such a decoction is simply the wellknown coagulation of solutions of albumen with acids. I have not been able to discover at Las Cascadas Ipomoea bona nox, but I very much doubt the highly alkaline character of its juice which it is almost certain to possess likewise a distinctly acid reaction. The treatment with alum, a process due to H. A. Strauss, and purchased from him by the local government of the province of Pernambuco, owes its coagulating action entirely to the strongly acid reaction of that salt. This process is a bad one from every point of view. The removal of the alum solution from the coagulated rubber is physical impossibility, and the pernicious action of an alum solution upon the drying rubber is quite sufficient to render its continued employment most deplorable. The coagulation with soap as practised in the Isthmus of Panama is barbarous in the extreme, and it is not surprising that it yields a product of very bad quality indeed.

Amongst the above-named processes I have not enumerated a process said to be practised in Mexico, and simply consisting in the boiling of the latex in earthen vessels (jacaras). If this process is actually used, it can certainly not be carried out with the fresh latex for the simple reason that over and over again have I satisfied myself that even on very prolonged boiling of the slightly diluted latex furnished by the tree at Las Cascadas no coagulation can be obtained. The cause of this is to be found in the fact that the aqueous vehicle of this latex, although it certainly contains a large amount of albuminous matter when rapidly separated from the latex immediately after this has been obtained, is of a very light olive green colour and even on very prolonged boiling does not coagulate, nor even become turbid. On standing exposed to the air this aqueous vehicle very rapidly assumes a darker colour, and eventually forms an almost inky liquid. This, on boiling, undergoes immediate coagulation, and a most copious deposit of insoluble albumen is obtained. In entire agreement with this observation is the fact that if the Castilloa latex be allowed to stand for sometime until it has assumed a very dark colour it will now be found that on short boiling rapid and complete coagulation takes place. I have not yet succeeded in ascertaining the cause of this curious phenomenon, but it is obvious that unless the Castilloa latex obtained in Mexico differs very considerably from the latex yielded by the same trees in the Isthmus coagulation by boiling in Mexico, must be preceded by an ageing of the latex as otherwise no coagulation would take place.

It is not very easy to see that the chief point in attempting to prepare a pure rubber from the latex of Castilloa elastica, and as a matter of fact, from the latex of any other rubber tree, must consist in the elimination from the rubber, prior to its "agglutination," of all albuminous matter, The first step in this direction is the diluting of the crude latex with water, of which at least five times the volume of the latex treated should be used. In the case of the thick, cuidy latex yielded by the trees at Las Cascadas it is preferable to use actually boiling water, but in how far this applies to the latex obtained in other districts or from different trees is a matter for experiment. Boiling water at once converts this latex into a thin, very fluid milk which through a common cotton gauze is strained in order to remove from it any insoluble impurites such as earth, wood, bark, and the like. This milk is best strained into thoroughly well-washed petroleum barrels. As soon as the barrel is completely filled, about 8 ozs. of formaldehyde are added, the whole well stirred, and allowed to stand for 24 hours. The action of the formaldehyde appears to be twofold. In the first instance, it effectually prevents any tendency of the albumen to coagulate in the hot solution, and thereby to cause mischief. But, as comparative experiments showed beyond any doubt, it also has a most distinct effect upon the india-rubber, which collects on the top of the washwater in the form of a snow-white cake of rubber of such strength and toughness that it can in one mass be lifted out from the barrel, On cutting this cake open, it will be found that it is rather spongy, being full of little holes which are still filled with some of the albuminous, though very dilute, mother liquor. If, therefore, the rubber were dried in this state it is obvious that it would still contain a small quantity of the objectionable albuminous matter. For this reason the rubber contained should at once be taken, cut into strips, and subjected to a thorough washing upon an ordinary rubber washing machine. As all albuminous matter present is still in a state of perfect solubility there is no difficulty whatever of completely removing every trace of it by carrying out the washing with a plentiful supply of water on the washing rollers.

The ruber thus obtained is a product of a degree of purity in which no rubber, not even the finest brands of Para, has ever been offered to the manufacturer. It is absolutely free from solid impurities of any description, it contains no trace of either solube or insoluble organic or inorganic impurities. Of course it contains a small amount of resinous matter combined with only a trace of the constituents known as "ash." The amount of these resinous matters is extremely small, and they are of an entirely innocuous nature, so that any attempts to remove them, which would call for a somewhat energetic chemical treatment, would be altogether out of place. In a further communication I intend to give the analytical data of this pure Castilloa rubber.

When dry, the condition in which the owners of the Las Cascadas, plantations intend to ship this rubber, it forms a product which requires no preparatory operation on the part of the rubber manufacturer, but which may at once be taken into operation for the manufacture of rubber goods of every description. Nor need any fear be entertained that rubber of this description is in the least liable to suffer such detrimental changes during transit in the ships' holds, which are at present so common owing to the "heating" (fermentation) of the rubber during transit. Indeed, a considerable lot of this which was purposely packed and shipped in the excessively wet condition in which it came off the rubber washer, had not undergone the least change, still less any deterioration on reaching this country.

An analysis of a sample taken of one of these dry sheets of rubber gave the following results:—

Resinous Matter	.. 2·61 p.c.
Ash	.. 0·44 p.c.
Nitrogenous Constituents	.. Nil.
Insoluble Constituents ..	.. Nil.

The sheets themselves are extremely light in colour, semi-transparent, and when dissolved in the usual rubber solvents form almost glass clear solutions. The characteristic rubber smell is almost entirely lacking, certainly much less noticeable than in even the finest Para rubber. The strength of these sheets is distinctly superior to that of washed and dried sheets of Para rubber. How this Castilloa rubber after vulcanisation compares with Para rubber, and how in general it behaves in the vulcanising process as compared with Castilloa rubber in its present day crude and impure form, I have not been able yet to ascertain. This work is, however, in progress, and in due course I will report the results obtained.

The amount of resin in Castilloa rubber shown above is absolutely unobjectionable, and does not in the least affect the quality of the rubber. I am quite aware that now and then all sorts of sinister actions are ascribed to the presence of resins in india-rubber, but there is not the least particle of evidence to show that they are intrinsically detrimental. As a matter of fact, in the manufacture of quite a number of rubber goods resins are deliberately added to the mixings.

It is highly interesting to observe that the amount of resin increases in the trees from the root upwards, as the following table will show :—

RESINS IN RUBBER DRAWN FROM

	Per cent.
Trunk	2·61
Largest branches	3·77
Medium ,, ...	4·88
Young ,, ...	5·86
Leaves ,, ...	7·50

A similar increase is observed the younger the trees from which the rubber is drawn :—

RESINS IN RUBBER FROM TREES.

	Per cent.
2 years old	42·33
3 ,, ...	35·02
4 ,, ...	26·47
5 ,, ...	18·18
7 ,, ...	11·59
8 ,, ...	7·21

It will therefore be seen that my advice not to tap the trees until they are at least 8 years old is not only justified in the interest of the life and development of the trees, but also in the amount of resin which may safely be admitted in rubber of high quality.

There are very few such observations on the amount of resin in rubber trees at different periods of their life, and in different parts of the tree, but it can scarcely be doubted that other kinds of rubber trees will exhibit similar conditions, although the amount of resin accompanying the rubber in different trees appears to vary not inconsiderable. But they never are entirely absent, and I am inclined to think that the usual view of them as oxidation products of the india-rubber is altogether erroneous.

PURITY.—As far as can at the present moment be seen, the fact is amply demonstrated that it is possible to prepare from the latex of Castilloa elastica a rubber which for purity is absolutely without a rival, and the physical properties of which place it at least on the level with the finest grades of Para rubber. And this result is obtainable in working upon the milk of a tree, which so far has only been conspicuous for yielding the worst of all American rubbers. This is all the more gratifying, as these results are obtained at quite a trifling addition to the cost of production, which addition, on the other hand, is compensated for by an increased value of the final product by at least 40 per cent.

COST OF RUBBER.—From what I have shown in an earlier section of this article it will be seen that the Castilloa tree should not be tapped until it is 8 years of age. The cost of clearing the land for planting, transplanting the seedlings, and keeping the planted plots for seven years clear from undergrowth, is astonishingly small, and does not exceed, at the utmost, £25 per 1,000 trees for the whole period until they are 8 years old. If, therefore, at the end of the seventh year the trees are tapped for the first time, and only half a pound of rubber taken per tree, we obtain from these 1,000 trees 500 lb. of rubber, which at the very lowest estimate would be worth at least 3s. per lb. in Liverpool. Deducting, therefore, the cost of collection, preparation, and shipment of the rubber, a return of about 100 per cent. would be obtained in the eighth year. This, with careful management, would steadily increase for a number of years.

COST OF LAND.—Of course, the cost of the land will play a not unimportant part in such a calculation. I do not know under what conditions and at what price land suitable for rubber cultivation may be obtained in the various Central American States. In Colombia, at any rate in the territories adjoining the Isthmus, land is obtained on the old Roman principle, "res nullius cedit prius occupanti," or, in elementary English, "first come, first served." That is to say, any land not in private occupation may be taken legal possession of by "denouncing" it before a land commissioner, a very simple procedure involving merely payment of a nominal registration fee. For the maintenance of the title it is sufficient to prove the working of the grant. Labour to any amount is easily obtainable from Jamaica, and if the steady influx from this island should not suffice, the authorities of Barbados would be only too glad to grant facilities for the drafting of labour into Colombia from their enormous coloured surplus population, for whom no work can be found in Barbados. Wages for plantation workers (machete men) range at about $ 1.20 per day (Colombian money), equal to $0.50 gold, say, 2s., the men finding their own food.

PLANTING.—In planting Castilloa, it would appear that great care is required to make quite sure that the seeds used, or the seedlings obtained, are really those of the best variety of Castilloa elastica. It appears that there are at least three varieties of this Castilloa, which are respectively distinguished as Castilloa alba, Castilloa negra, and Castilloa rubra. There is not the slighest difference between these three varieties as regards the general form of the tree and its branches, and also the flowers and seeds are in all three apparently identical. The above descriptions refer to the colour of the bark. The difference even there is, however, so small that it requires a practised eye to recognise the different varieties. These, differ nevertheless, very greatly in their value to the rubber planter.

ALBA.—Castilloa elastica alba produces a thick creamy milk. It is the hardiest of all Castilloa trees, and suffers very little from the tapping operation. It also yields the largest quantity of rubber. The bark of this variety is white, with a distinct yellowish or pinkish cast.

NEGRA.—Castilloa elastica negra is characterised by a very rough dark bark. It yields very readily a thin milk producing a good rubber, but the tree in tapping easily bleeds to death.

RUBRA.—Castilloa elastica rubra has a reddish bark which is very smooth, thin, and brittle; nor does it show the longitudinal furrows which are noticeable in the two first-named trees. This variety yields a very small quantity of milk, but the rubber obtained from it is good. The tree is very common all over Central America, and I am afraid that in a number of instances it was this tree which was planted instead of the white Castilloa. Indeed, Koschny is inclined to think that it is this variety with which the experiments in the botanical gardens of Ceylon and Java were made which gave such discouraging results.

SHADE OR OPEN.—The question whether Castilloa should be planted in the shade, or in open land has been answered both ways. It is possible that the climatic conditions of the district in which the plantation is situated may have some influence upon this point. However, all the reliable evidence seems to show that the trees grow badly in dense forests, and produce a poor yield of rubber when grown on open ground. They appear to prosper best when growing up together with other trees, so that the trunk is always shaded, whilst the top of the tree at least, for a certain time during the day, receives the direct rays of the sun. From what I have seen at Las Cascadas I entertain no doubt whatever the the last named condition is the most favourable for the growth of the trees.

CLEARING.—This being admitted, it is obvious that in planting Castilloa in open land it is necessary to plant at the same time trees to protect and partly shade it. As this adds very greatly to the cost of planting, it stands to reason that in selecting land for the cultivation of Castilloa, preference should be given to forest land. The larger trees are cut out—there are generally plenty of uses for them on the plantation—only the smaller trees being left standing between which the rubber trees are planted.

SOIL.—As regards the configuration of the land, and the best quality of the soil, some little discrimination is also required. Regarding the soil, it may be said that Castilloa is very modest indeed, but, of course, this does not mean that just any soil is good enough. The best results are undoubtedly obtained on a deep, loamy, only moderately sandy soil. Whether Castilloa should be planted on level or on hanging ground is a rather more important question. In Mexico, I believe, rather large level tracts have been planted, but then the rainfall in Mexico is considerably less than what it is in Colombia. It is quite certain that the trees require well-drained land, and this with a rainfall of 130 inches, the figure for the Isthmus, means hanging land. There are immense traces of unappropriated land of this description north and south of the Isthmus.

CLIMATE.—The climate of Colombia more particularly the districts north and south of the Isthmus, is a very great deal better than its reputation. I am inclined to think that the villainous climate of the stretch of land between Colon and Panama, and the frightful death-rate amongst the canal workers, has been taken to apply without distinction to the high-lying land adjoining the district. But it must not be forgotten that the susceptibility of the negro, at any rate those hailing from the West Indies, for zymotic diseases, is nothing short of extraordinary, the death rate amongst them even from measles being simply appalling. The white races under the same conditions enjoy comparative immunity. Moreover, the higher-lying districts adjoining the Isthmus are incomparably healthier. There is, therefore, no reason why in the next 10 or 20 years rubber cultivation in Colombia should not attain to huge dimensions. Land is to be had practically for the asking, the establishing of even a large rubber plantation is incredibly cheap, and the returns are large, certain, and permanent.

AMERICAN SWEET POTATOES FOR INDIA.

TO THE EDITOR, "INDIAN GARDENING AND PLANTING."

DEAR SIR,—I imported three American varieties of sweet potatoes last year, *viz.*, Nausemond, New Jersery, and Virginia. These were first tried on the Bombay Farms. The first Bombay crop was propagated from imported tubers, the second crop was propagated in the usual way from cuttings. It was planted on the 8th of April and was lifted at the end of July. A large number of cuttings were distributed from the first crop to various parts of India, therefore only about ¼ acre was planted for the second crop. The area was too small for very reliable outturn figures. I give however, the results as under:—

	lbs. per acre.
Nansemond	14,470
New Jersey	16,782
Virginia	21,113

The land was not directly manured, but was in good condition. The produce from the whole plot (21·80 acre) was sold for R 90, or R 330 per acre.

The crop also yielded a very large number of cuttings which have been used for distribution and for planting an extended area at the Bombay Farms. I have now seen these varieties growing on various descriptions of soil in the Punjab, Bengal, Central Provinces and Bombay. The plants everywhere show great vigour of growth. I believe the introduction of these varieties to be an undoubted success. It is important, therefore, to have these American varieties tried in all districts where the crop is important. Cuttings can be supplied during October for experimental trials if applications are made to my office at Nagpur.

The crop does best on deep alluvial soil of a sandy or loamy character, but will also do well on any free working naturally dry soil of fair depth. The best crops are grown under irrigation in the *rabi* season, but in districts where the cold of winter is severe and the total rainfall is not excessive, the crop will probably do best if planted in June-July. The American varieties are not likely to thrive on deep black soil.

The results reported from Poona show that the tubers were all sound and of good shape and size. They were proved to cook well and have good flavour. The Virgina variety produced four or five tubers from each plant. These tubers were larger than those usually obtained from indigenons varieties The Nansemond and New Jersey varieties produced, 16 to 18 tubers from one plant. These tubers were smaller than those from ordinary indigenous varieties but were all of good marketable size. Tubers of each variety grew not far from the surface in clusters and were much easier to dig than those of ordinary Indian varieties.

The cultivator of sweet potatoes is put to no particular expense for seed. He simply uses as cuttings the haulms of a previous crop. These cuttings may have to be planted in a nursery. A small nursery planted in March when the *rabi* crop is harvested will provide cuttings for planting a *kharif* crop in July, and this crop will, in its turn, provide cuttings for the next *rabi* crop, which should be planted in October-November.

Full details regarding methods of cultivating this crop are given in Vol. III of my Agricultural Text-Book, but for easy reference I may refer to important points here.

The soil should be of suitable class and be well worked by repeated ploughings and harrowings. Beds should be formed if irrigation is required. The crop can be propagated from tubers, but more economically from cuttings or pieces of mature stem having four nodes to each cutting. The best cuttings are got from the middle portion of the stems. The date of planting the main crop will depend upon the usual custom in any particular district. The main crop is sometimes planted in flat beds and sometimes in ridges made about 18 inches apart. The latter method is preferable. The cuttings if planted in ridges should be buried halfway between the base and the apex and on each side of each ridge, each cutting should be planted with two nodes buried and two ends above ground. A vigorous growth of long trailing stems is soon produced if the crop is healthy, and very little hand weeding is required. No irrigation is given in the rains, but if planted in the *rabi* season, irrigation is necessary every 8 to 15 days according to the character of the soil.

The stems when in contact with wet soil after rain or irrigation become attached to the soil by rooting at the nodes. This must be prevented, otherwise small thin tubers of no marketable value form at each point of attachment. The tubers which form at the main root, moreover, will not grow so large as when the stems are kept quite free. The stems during growth must be repeatedly lifted clear from the ground and turned over to prevent the formation of these roots. These operations must be done often if the crop is good and the foliage luxuriant, and always with care so that the stems and leaves are damaged as little as possible.

In a luxuriant crop the growing points of the long trailing stems may be pruned off without damaging

the crop in any way. These prunings provide a delicate vegetable.

The crop should be lifted when the stems near the growing point get hard and fibrous and the leaves turn yellow. The vines should be reaped close to the ground and cuttings selected for a nursery, such of the vines or portions thereof as are green and succulent can be used as cattle fodder. Irrigation water should be withheld as the crop approaches maturity. When the tubers are ripe, they should be lifted at once, otherwise much damage will be done by rats and white-ants, etc.

Yours faithfully,
JAS. MOLLISON,
Inspector-General of Agriculture in India NAGPUR,
13th October 1902.—*Indian Gardening and Planting.*

PAPAYA CUTIVATION.

It is, of course, well known that natives pluck the fruit in a green state and ripen it artificially. This system is responsible for the absence of flavour and quality so common in the fruit sold in the bazaars. If readers will observe the following direotions, every one may grow and gather his or her own papayas, of really good quality.

Firstly, obtain seed of a good variety from the Superintendent of the State Gardens, Bangalore. Sow the seeds in pots or pans in common garden soil, say in July. As soon as the young plants are about six inches high transplant them simply into 12-inch pots, filled with a fairly rich soil. When these pots are filled with roots, transfer the plants bodily to ordinary tubs, or the largest sized pots obtainable, filled with good, rich soil. Water them in dry weather, and let them grow. If you have sufficient ground, put out the young plants into the open, in rich soil, and water in dry weather. In the following April and May you may gather your fruit and enjoy a really good Papaya. The tree fruits well when grown in tubs or large pots. In order to get fruits of large size, it is necessary to thin them out, and so give them a chance of swelling and developing.

The reason why I have recomended the procuring of seed from Bangalore is that is it the best variety of Papaya I have yet seen.

There is one point, however, which the grower must make himself acquainted with. The Papaya tree carries the male and female on separate trees. The male tree bears its flowers in large, loose bunches which hang down, and the stems on which the flowers are borne are from one to three feet long. The female tree bears stemless flowers, attached close to the main stem or trunk of the tree. Therefore, as soon as the trees show flowers, all the male trees except one, should be uprooted and thrown away. Some trees bear what botanists call "hermaphrodite" flowers, that is, they carry the two sexes in the same flower. These are no good as fruit bearers, and should be treated as males and thrown away, unless you wish to grow a plant or two as a curiosity. It is important to bear the foregoing in mind and thus avoid much disappointment. I have often heard my friends say that their Papaya trees never bear fruit, though they are covered with flowers. On looking at them, I have always found the trees to belong to the "male persuasion."

If you like the Papaya fruit and wish to get it of good quality, follow the foregoing hints. There is no reason why everyone should not have his or her own Papaya trees in pots and tubs, if there is no garden or grounds to grow the tree in. The tree fruits in one year from the time of sowing the seed, so it is easy enough.—Local "Times."

RUBBER IN CEYLON.

Mr. J. B. Tennant, of Berredewelle, Matale, went down to Kalutara in September to inspect the Para rubber cultivation on Culloden Estate Neboda. A "Standard" representative, who was in Kalutara on Saturday, in a brief conversation with Mr. R. W. Harrison, the manager of the estate, learnt that the prospects of Para rubber in the low country were very bright. Recent sales in London fetched exceedingly good prices. All the trees have been tapped, and are yielding very freely. Trees have been planted in all parts of the estate. (Culloden), which belongs to the Rosehaugh Tea Company of Ceylon, and is the best estate in the low country where Para Rubber has been fully planted, Arrapolakande (also in Neboda) coming next. Mr. Harrison informed our representative that he expects an output of nearly ten thousand ponnds this year, which is considered a splendid record. Large quatities of seed have been sent to Southern India, and several local estates have also been supplied. Mr. Harrison used to do a tremendous business all over Java, Sumatra, the Cape, North Borneo, Thursday Island and Queensland. Small quantities have also been shipped to London and Paris, but the foreign is now practically over.—*Indiarubber and Guttapercha Trades' Journal*

THE MOSQUITO BLIGHT OF TEA.

Mr. H. H. Mann's important note to the Indian Tea association has the following summary and appendix.—

SUMMARY.

In summary, therefore, I think we may say with regard to methods of dealing with mosquito-blight in serious cases, that the greatest promise is held out by the method of spraying the bushes with a solution of Chiswick Compound, or kerosene Emulsion in the spring within three or four weeks of pruning—save at the end of February, as described in the Appendix. The crux of the whole question lies not in the material used so much as in the time selected for spraying the bushes. The method is one of prevention not one of cure. It will be advisable to experiment in the coming year on a far larger scale with this method, and by the end of next season data enough ought to be in existence, to show whether indeed the blight can satisfactorily be dealt with by the system in question.

APPENDIX.

Kerosene Emulsion is prepared as follows:—

From one to two pounds of ordinary country soap are boiled with one gallon of water till thoroughly dissolved*. To this while still almost boiling, two gallons of low quality Kerosene are added slowly, the whole being thoroughly mixed with a syringe during the mixing. It then forms a creamy, almost butterry mass. The mixture is then allowed to cool, and when cool is made up with water to thirty gallons, and after thorough mixing can then be applied.

Cheswick Compound.—With this substance, which we understand is prepared from sulpher and soap, the spraying liquid is merely obtained by dissolving 30 lbs. in 200 gallons of water.

If either case 150 gallons per acre will be required if properly sprayed on the plants. It is no use to syringe the bushes with a garden syringe, the fine cloud-like form of the spray is far more effective and less wasteful, The best prayer for the purpose at present on the Indian market is one made by the Gould's Manufacturing Co, of Seneca Falls, New York, and sold by Messrs. Jessop and Co., Calcutta. It is made to be fitted to a barrel, and should be furnished with much longer hose than has been the case hitherto, and the specification should include Vermorel nozzles. No other nozzle is as good as the Vermorel for the present purpose. The Chiswick Compound is apt to injure the rubber ann metal of the sprayer, and it should hence be very carefully used every time of using. The Kerosene Emulsion will not injure, the sprayer at all.—Local "Times."

* The quantity of soap needed depends on the hardness of the water. The softest water available should be used.

REDUCED OUTPUT OF TEA IN CEYLON AND INDIA: UNANIMITY AMONG PLANTERS AT LAST: NATURE'S DOING?

For a long time now, the air of Ceylon has been filled with the advice to "reduce the output of tea," if the situation was to be saved at all; but the plans, which were proposed to effect this, were more numerous than practical. There was a number of ingenious brains at work both here and at home on the subject, and when a happy idea flashed across one of them, there arose the cry of "Eureka"; but in spite of the enthusiasm nothing was done. Now and again the idea formulated was taken up by the minds of the many, turned over, talked about, discussed, even voted on; but while some men swore by it as a sure remedy for the plague of over-plenty, others swore at it as certain to make matters worse, and aggravate the already intolerable situation. So we have seen the proposal to have a certain acreage of each estate lie fallow, grow in distinctness and favour till it all but touched the point when it should pass into an embodied fact, and then betake itself to the limbo of the might-have-been; the bold policy of closing down the factories of the island for a month, which savoured more of the practice in a cotton manufacturing district than the usual methods which obtain in tropical agriculture, rose for a short time to the surface, but soon sank again; and even "finer plucking" which caused least disturbance to every-day rules and methods was by no means universally supported, although it had the suffrages of very many and left its mark on the year's figures of the total output of tea. It seemed impossible to attain unanimity, or to devise a plan which would be universally adopted, or even approved. Every planter is so much accustomed to think and act for himself that it is hard for him to take a broad general view of any line of policy; and when he is called on for the sake of the many to march to the music of others' selection, and which has no echo of the lilt with which he has hitherto kept step, he is apt to decline, and so weaken the force of the desired general demonstration. All are, however, agreed that less tea would result in better prices and the re-appearing of the gilt on the ginger-bread. Only the question as to *whose* tea is to be lessened has never been settled! What, however, planters have been unable to do for themselves, nature is now doing for them, and the wet sponge whose persistent drip has been in such evidence for the last two months or more, is bringing about a *nolens volens* unanimity of short crops all over the country. This sponge has wiped out many fair figures in estate estimates—has done more to reduce the tea outturn, than could ever have been attained by any scheme that appealed to the willing suffrages of the planters of Ceylon, and it has alike affected all manner of estates under whatever classification they may elect to be ranked. The figures for recent local sales are telling this story eloquently enough, while the total sum of the tea shipped fully corroborates. Planters tell us that the diminished returns do not mean that the tea bush is in a less healthy condition than formerly; for estates look well. But, even manured fields which they were wont to assert were independent of weather, and could be reckoned on as certain, have this season been niggardly in their response to the liberal treatment they have received, though they look equal to anything. As to tea which is far from pruning, it amounts to almost a despair, there being a struggle even to produce "banji," and a poor tale at the end of the day.

From what we can learn we do not think that this going back means that if the conditions had been favourable the results would have been the same, and that the shortage represents—what some have asserted—that high water is past and that the ebb has set in. It is simply the effect of the weather, and given less cloud and more sunshine the tea bush would have asserted its right to grow, and the coolies instead of easily keeping up with its march would have been at the "double" long ere this, and considerably pressed to keep up the pace.

With the better reports from home of stocks and prospects, the probability that the island's tea estimates will be short, added to the early closing of the Indian gardens, has begun to have a hardening effect on the course of prices, and so we anticipate to some extent the incoming of those better times, which are so sadly needed, and whose advent has been heralded alike by those immediately interested, as well as by the observant on-looker. London private advices have for some time now spoken of a general existing feeling anticipatory of a rise in the near future, which will tend to consolidate itself in time and replenish the empty coffers of the much-tried tea planter; and His Excellency in his opening Address to Council agrees with this: "I hope," he said, "that I am not over-sanguine when I seem to see a silver lining in the dark cloud which has hovered so long over the tea industry, and in believing that in a year hence this brighter era will have fully dawned." Ceylon planters are often so very energetic, that what their hands find to do, is too frequently over-done, and when their zeal has turned out to their disadvantage and undoing, they are unable to agree among themselves as to a remedial plan of action.

To successfully lay down the lines for a general reduction of the tea-crop has been proved impossible. Nature, however, has this season taken up this work for them; and by means of cloudy days and weeks of constant rain has solved the problem of how to bring about a generally reduced output.

PROGRESS OF GOLD COAST COLONY: INCREASING EXPORTS OF CACAO AND OF COCONUT PRODUCTS.

Until our perusal of the Report of the Botanical Department of this Colony for 1901, received by a recent mail, we had no idea of the importance which the Gold Coast has suddenly assumed as a producer and exporter of Cacao. The development of the trade in this product since 1891 and especially within the last four years, as may be seen from the following figures, is phenomenal:—

Quality and value of Cocoa exports from Gold Coast Colony:—

Year.	Quality. lb.	Value. £	s.	d.
1891 ...	80	4	0	0
1892 ...	240	4	5	0
1893 ...	3,460	93	17	10
1894 ...	20,312	546	17	4
1895 ...	28,906	470	11	7
1896 ...	86,854	2,275	13	3
1897 ...	156,672	3,195	14	7
1898 ...	414,201	9,616	4	0
1899 ...	714 929	16,063	19	5
1900 ...	1,200,794	27,280	9	7
1901 ...	2,195,571	42,837	0	0
	Lb. 4,821,919	£102,388	12	7

The export for last year in the above list is about equal to what Ceylon produced in 1891; but if the Gold Coast goes on advancing, it will soon overtake our 50,000 cwt. (5,600,000 lb.). Evidently cultivation is extending on the African Coast, for 16,000 pods of cacao were sold for planting from the Gardens last year and the rest of the crop was distributed free. Twelve plants of the new species *Theobroma pentagona* had been received from the Kew and were growing satisfactorily. Here is an interesting fact:—

The Native planters have discovered another use for the Cocoa plants, other than the fruit; the young leaves are boiled and administered as a remedy for dysentery and diarrhœa, and, they state, with very beneficial results.

A good deal is being done with different kinds of coffee, cardamoms, fibres and tobacco; but it is still the day of small things with these. A new native fibre like jute had been valued in Liverpool at £12 to £13 per ton. The great advantage all the West African Colonies have is proximity to the Liverpool and London markets, and a trade in fruit is likely to be successfully established. But next to Cacao, the really important industries are for the present to be in Coconuts and Rubber. With reference to the former we are told:—

The coconut industry is in every respect adapted to the West African native, and the soil and climate along the Coast line are excellently suited to the successful cultivation of the tree, which is amply exemplified by the numbers of trees which already abound in a semi-cultivated state on the littoral lands of the Colony. Its most important product is the copra-oil, which is expressed by machinery from the dry, edible portion of the nut, known in commerce as copra, and which requires no other preparation for market than simply drying in the sun; the demand for this oil far exceeds the supply. Another valuable product of the coconut palm is the fibre prepared from the husk of the fruit, commonly called Coir, and for which there is likewise a great demand. It is estimated that civilized, temperate countries would consume all the produce of the coconut palm that tropical countries are likely to produce. The tree does not commence to bear fruit until about the eighth year, but after that, with proper attention, the tree will continue productive for sixty or seventy years. Notwithstanding the rude methods of cultivation adopted by the natives in this country, the trees are reputed to yield from 75 to 100 nuts per year; while in countries where the tree is cultivated in a systematic manner, the reported annual average yield is 120 nuts, but has been known to reach 200. About twenty nuts yield one pound of copra; so that if we estimate the average yield at 75 nuts per year, the trees in the Christiansborg plantation may be expected to produce half a ton of copra per year per acre, value £15 per ton; or, if the oil is expressed locally, 66 gallons of oil, value £14, as 60 nuts yield about 1 gallon of oil, value 4s. 2d.; but this would, however, necessitate the employment of machinery.

A yield of 75 nuts per tree is very high for an average over any considerable area, especially as we see trees in the experimental Christiansborg plantations along the sea coast, are being planted ten yards apart, or about 45 trees only to the acre, against 50 to 70 the usual number in Ceylon.

In respect of Rubber, we are not told anything of a trade in the product of indigenous trees, but rather of the growth of plots of Para (200 trees), Castilloa (from seeds in 1898 now 9 feet high, 10 inches circumference, 3 feet from ground), Assam Ficus, and finally West Africa "Funtumia elastica," of which we read:—

One of these trees planted out in the Gardens in 1897 was tapped this year as an experiment to test the amount of rubber it was capable of producing at this age. The tree operated on had grown 25 feet high with a trunk of 1 foot 7 inches in circumference at 3 feet from the ground, and was about 2 years old when planted. After the moisture from the latex obtained by this experiment had been evaporated off, the dry rubber weighed ½ lb. The result of this experiment is rather important from a financial point of view, as it has been pretty generally stated that no return from plantations of these trees could be expected until about the eighth or ninth year; whereas it is quite evident they are ready for tapping at the seventh year, and that trees planted at 15 feet apart, *i.e.*, 193 to the acre, would yield 48 lb of rubber per acre, value about £6 at the seventh year. Information with regard to the amount of rubber yielded, and the proper age to commence tapping *Funtumia elastica*, is much needed by persons interested in rubber plantations; and this experiment is the first of a series which it is proposed to conduct in order to determine these problems.

Mr. Biffen's patent rubber-separating machine is spoken of highly for its good work:—

The machine in question is made in a convenient size for transport, and only weighs about 40 lb. The latex to be operated on is poured into a receiver, which is capable of performing 10 to 15,000 revolutions per minute; the rubber globules being separated by centrifugal force. The machine can be manipulated by hand, and a man, or even a boy, could with ease separate 48 lb. of rubber per hour by this means; and all that would be then necessary to prepare this rubber for market would be to press and dry it in the sun; the resulting product being an exact reproduction of what is asked for by manufacturers *i.e.*, clean, dry, and free from decomposition.

One of the latest uses for rubber is said to be in the manufacture of waterproof paper in which to pack goods for export!

IN WEST AFRICA.

Here is a true picture by an old student of the Colonial College who, after six months, found himself and another, the only Europeans left of a party of ten who had arrived on the Gold Coast half-a-year before. Writing from Axim, he says:—

The first thing is the *climate*, which take it as you will is bad for a European, and 99 out of every 100 that land must have fever whether they like it or not; live as they may, they cannot escape the toll demanded by the coast. Of course fever does not necessarily mean death, but it is very unpleasant while it lasts. Most of our party had it within three weeks, and out of ten only two are left; one dead and the rest are back in England. I held out for four months in splendid health, and then went down with a crash that made up for lost time. The climate also affects the memory, and the term "coast memory" is not the sarcasm I took it to be, but a fact.

Next he gives an interesting account of the country and products:—

As the country was hundreds of years ago so it is at the present day, a dense jungle, so luxuriant that vines, trees, and undergrowth are so entwined that it is impossible to leave the bridle-paths (called roads) unless you cut your way with a matchet, and the ground proper is covered with a leafy soil of ages, and is many feet deep. Almost any tropical fruits will grow here, but I have never been to any part of the world where fruit has been so scarce; occasionally I have had oranges, but they have a bitter taste; limes are indifferent; pine-apples are excellent,b ut scarce; Pau Pau, a native only of here, is more plentiful. Principal products are:—palm oil, palm kernels, rubber, ground nuts, kolo nuts, and mahogany. All these grow naturally, or I am afraid they do not figure in the exports. Mahogany perhaps is difficult to work, and is generally floated down in the rainy season from up-country. A log of wood is often paid for by the trader two years before he sees it at the coast, and some times he never gets it. I have myself seen good logs in the bush that have been cut down and squared, and probably paid for, and then the natives could or would not get them to the stream.

Coffee, rice, and cocoanuts will grow here, but at present no trouble is taken with them: a good trade could be made here with copra, as well as from the South Seas. The soil of the forest is very rich, in fact too strong for ordinary English vegetables. Lettuce grows from seed so quickly and runs to waste, radish grows right out of the ground, onions the same; these I have tried myself,but no doubt if the soil was worked and turned it would in time grow anything. In my work I had tracks cut through the bush for miles, and I noticed that nearly every shrub or bush, tree or creeper that was cut bled some kind of liquid; some indeed gave forth a very unpleasant odour, and to that, combined with the soil (which had lain for ages) being disturbed, and the smell of the fetid swamps, I attribute all the fever that fell to my share. The smell in the forest is what is known as the "West coast smell" of decayed vegetation and wood, and is at times almost overpowering to the senses.

Finally we find two more passages of some interest:—

The whole length of the Gold Coast is most inhospitable to shipping, not a single harbour; the steamers have to lie off a considerable distance from the shore, and everything is landed in surf-boats. Some places, such as Accra and Cape Coast Castle, are very dangerous at times owing to the heavy surf that breaks on the beach, and occassionally some one is killed by the capsizing of a boat in the surf. Secondi and Axim are more favourable for landing, but even here merchandise is often spoiled by sea water. The great questions on the coast at present are transport and labour. I have read many ideas on the subject, but I think myself that railways are the only thing for *transport*, but of course that is impossible at present, and the next then is elephants; these animals can climb the hills, cross swamps and rivers, and probably could find food in the vegetation of the country. In the matter of labour some propose Chinese, Indian coolies, or Malays, but the climate will affect all nationalities that are brought here, for even the natives themselves find the country hard on them in the wet seasons; small-pox and fever carry off hundreds at a time; whole villages are swept away by the dread disease. The native of the country himself in time will provide all the labour that is required by his own free will; in the coast towns it is noticeable that the native is aping the white man, and to do this he must work.

There is practically speaking, no game in the Gold Coast Colony: leopards there are certainly, but so timid, prowling at night and keeping to the jungle, that they are never seen; there is also a small deer, and the same can be said for that; making a rifle a useless article for anyone to carry.

TEA-PLANTING IN TEXAS AND ON THE CAUCASUS.

On page 463 will be found an extract from a Texas paper showing that the American Secretary to the Department of Agriculture is ready to encourage an experiment in tea culture in that State and to offer very liberal terms. This paper is sent to us by an ex-Ceylon planter who, writing from Beaumont, Texas, under date 29th October, says:—"As I happen to be here for a few days on business, I read with some interest the enclosed which I think will form interesting news for your many readers. From what I can learn I believe were a few Ceylon tea planters to come to this locality they would soon make an immense fortune." We cannot understand how any one acquainted with the labour conditions in Ceylon and India, and again with those prevalent in the States can speak of a "fortune" from growing tea with negro or any labour available in America. We believe our correspondent had no experience in "tea" before leaving Ceylon, and so does not understand how much of the work—plucking especially—depends on cheap labour.

The same remark very much applies to "tea-growing on the Caucasus": the Russian Government is not likely to throw away much money in trying to grow a product which can be bought of a better quality for a fraction of the price it will cost to produce.

SOIL SURVEYS.

Field Operations of the Division Soils, 1900. By Milton Whitney, Chief (U.S. Department of Agriculture). Pp. 474+a case containing 24 maps. (Washington, 1901.)

Perhaps one of the greatest services which the scientific man can render to the agricultural community in any country is the classification of the soils into certain types, defined by their chemical or physical properties, and the allocation of these types to their appropriate areas, so as to obtain a soil map of the district in question.

Despite disturbing factors, certain types of soil persist over wide stretches of country and are characterised by a general physical and chemical resemblance and also by a corresponding similarity in natural flora, appropriateness to particular crops and responsiveness to certain kinds of manure. The constancy of these soil types is the result of a common origin from the same kind of rock, and the difficulty lies less in recognising the type than in tracing its boundary line

As a fundamental basis comes the geological survey, particularly the "drift" maps showing the superficial deposits due to running water, ice, &c., which, though of no great geological importance, are the origin of soil survey of the soil proper. But for the purposes of a soil survey a little more than even a "drift" map is wanted; further subdivisions must be introduced to show changes in soils on the same formation due to variations in the lithological character of the formation, or those due to the sorting action of water in the case of soils of transport.

These variations, in fact soil classification generally must be based upon physical structure, must amplify and give exactitude to the practical man's division into clays, loams and sands; the chemical properties of the soil may very concurrently, but are too much subject to casual change to serve as prime means of distinction. As an instance, the upper beds of the Lower Green sand in east and mid Kent give rise to rich loams, on which many fine hop and fruit plantations are situated; further west the formation gradually changes, until in west Surrey and Hampshire it is barren heath land the soil of which is alike wanting in the finer "clay" particles, carbonate of lime and the soluble salts which go to feed the plant. Again, in the book under notice many examples will be found of two or more distant soils of the same origin, *e.g.* the maricopa soils (p. 302), described as consisting of "colluvial materials . . . largely granite: . . divided into four soils, depending upon the degree of comminution of the rock."

The volume before us represents a year's work of the Division of Soils of the United States Department of Agriculture in this particular direction of constructing a series of soil maps; twenty-four of the maps are given on a scale of 1 inch to the mile, and show, by a system of colouring similar to that of a geological map, the type to which the soil belongs. The accompanying text gives a mechanical analysis of the type soil *i.e* its division into fractions each consisting of particles of a certain size, and in some cases a chemical analysis, also such information collected on the spot as the distance to ground water, climatic features, characteristic crops or natural flora and other local economic conditions.

It was found, according to Mr. Whitney's preliminary review, that it was quite possible to map these soil areas, independently of the geology of the area, or the exact chemical or physical character of the soil; that the proper course was to construct maps in the field showing the area and distribution of the

SOIL TYPES;

to explain as fully as possible from geological considerations the origin of the soil and to leave the soil chemist and physicist study the differences. The fact is recognised that these chemical and physical properties of soils are so complex and difficult that it may take many years to explain them through laboratory investigation; but, pending this complete investigation, the maps themselves will be of the utmost value to agriculturists in indicating the areas over which certain soil conditions are found to prevail. . . . The recent successful growing of Sumatra tobacco on a certain soil in the Connecticut Valley is a very striking instance of the possibilities growing out of the detailed soil survey in any given locality.

The whole work is an excellent example of the thoroughness with which America carries out her State services; the maps themselves are clear and distinct; some of them, like the Saint Ana (California) sheet, represent a very complex distribution of soils, the survey of which must have involved no light amount of field work, while the accompanying text is most liberally illustrated with analyses, sketch maps and sections, and photographs illustrative of scenery, crops or vegetation, the ease with which photographic illustrations are now produced being perhaps responsible for the trivial nature of one or two of the objects selected.

Several of the sections of the survey deal with that interesting factor in all arid or semi-arid areas, the existence of alkali soils and their extension under irrigation, which is, unfortunately, almost the only method of farming possible.

Alkali is used in a generalised sense as indicating any predominance of soluble salts, generally sulphates and chlorides of sodium, magnesium and calcium, in the ground water, so that vegetation is destroyed or restricted to certain "salt" plants, and on occasion the salts effloresce in a white powder on the surface. Sometimes carbonates of the alkalis are also present, which by their injurious action upon the texture of the soil and their solution of the humic acids give rise to "black alkali" spots, more dreaded even than the white. These "alkalis" probably represent nothing more than the normal products of the weathering of the fundamental rock minerals, but owing to the limited rainfall there is no percolation through soil and subsoil, to wash everything soluble into the rivers. Instead the salts remain in the subsoil, and irrigation, by raising the level of the ground water, may easily bring the salts so near the surface that they rise in the capillary water to the surface and there are crystallised out. An instance of the damage due to careless irrigation and the rise of the subsoil water is given in the report before us in the account of the Salt River Valley, Arizona.

The phenomena of

ALKALI SOILS

and their increase through irrigation are neither new nor confined to the United States; any arid climate where the products of weathering are not removed in the "country drainage" shows the same problem. Our irrigation engineers in India and Egypt are regularly confronted with the problem, for which there is only one solution, underdrainage so that the cultivated soil may be washed from time to time, and careful cultivation to minimise all evaporation from the soil except through the leaves of the crop. But though the 'alkali" problems are common in the old world, it has not been until the time of Hilgard, Whitney and the present Division of Soils in the U S Department of Agriculture that we have had any real knowledge of their composition, or any study of the physical and chemical principles underlying the movement of the injurious material in the soil.

The character of the information provided by a soil survey must largely depend upon the nature of the country; in many parts of the United States agriculture is so recent that there is no accumulation of experience as to suitable crops, hence the survey, by comparison of the texture of the soil, the climatic features, depth to ground water, &c., with the conditions prevailing in known areas, can directly advise the settler with what crops he is most likely to succeed.

But in a country like our own, the land has been under cultivation so long that a great mass of local information, based upon experience, exists as to the character even of individual fields. Hints as to methods of cultivation or cropping based upon analysis are likely to be too general to be of any service; the chief application is rather the information that can be afforded as to the use of manures, for enormus economies could still be effected in the manurebill of nearly every farmer who buys artificial manures, if they were properly adapted to his soils and crops.

In Britain, the great initial want is the publication of drift maps of the Geological Survey on the six-inch-to-the-mile scale; were this in existence, it could be rapidly supplemented by the work of the local agricultural colleges until every farmer could be put in possession of that exact knowledge of his soil which is fundamental for all farming operations. A. D. H. —*Nature*, Nov. 6.

THE GUANO DEPOSITS OF THE SEYCHELLES.

In the report on the Seychelles for 1901 recently issued by the Colonial Office, the Curator of the Botanic Station states that, with regard to the manuring of the soil, it is very fortunate that, in a granitic country like Seychelles, guano deposits are found in many of its islands. This guano constitutes at the same time a mineral wealth of the Colony. The deposits are almost invariably ancient, and guano beds are in process of formation only in the distant islands where immense flocks of birds are still to be found. On many islands the guano is found in dusty layers on the surface of the soil. This surface guano is dark in colour, especially when it is moist. There are numerous tints, which vary between yellowish brown and reddish black. The lighter-coloured guanos are richer in phosphoric acid, and the dark ones are full of organic matters which increase the percentage of nitrogen. All this surface guano is now more or less mixed with vegetable decay.—*Board of Trade Journal*, Oct. 30.

LEASE OF GOVERNMENT LAND FOR CARDAMOM CULTIVATION.

The following appears in yesterday's *Gazette*:—Application having been made by Major Gordon Reeves, C M I, of Ratnatenna estate, Madulkele, to the Government Agent, Central Province, for the lease of land lots 13,683, 13,684, and 13,685 in preliminary plan No. 5,128, containing in extent 45A 1R 21P, situated in the village Kaludella in Palis pattu west of Pata Dumbara, for the purpose of cultivating cardamoms, it is hereby notified under regulation No 52 of Land Regulations, published in *Gazette* dated January 17, 1902, that the said lands will be leased to the said applicant under the following conditions:—

1. The rent to be R2 per acre, per annum.
2. The lease to be for ten years with the option of renewal at expiry.
3. No timber above 2 ft. in circumference to be felled, and any valuable timber under that size felled to be paid for at Government rates.
4. Cardamoms only to be planted on the land leased.
5. That the land shall be forfeited to and vested in the Crown if at any time such land or any building thereon be applied, without the written consent of the Governor, to other purposes than those specified in the grant or lease, or if within a reasonable time the necessary steps have not been taken to apply the land to the purpose for which it was granted.
6. No permanent building to be erected on the land without the written consent of the Government Agent.

POPULAR SCIENTIFIC LECTURES.

DR. CHALMERS ON "HOW ANIMALS CAUSE AND SPREAD DISEASE."

The lecture was most interesting and the learned lecturer (who was cordially received) with the aid of beautifully clear lantern illustrations, placed before his audience the deepest medical truths and theories in the most lucid and simple manner.

The Synopsis of the Lecture furnished to those present was more comprehensive than usual. It stated:—

In this Lecture I propose to consider the *role* of animals as a means of causing and spreading disease, and, therefore, it will be instructive first of all to know what is meant by disease. Disease may be defined as that deviation from the normal in the structure, the chemical composition, or the functions of a part or the whole of the body which exceeds physiological variation. This deviation may be brought about by the agency of—(1) Physical causes; (2) Chemical causes; (3) Biological causes. The biological causes may be either alteration in functions in the body itself, such as over-use or disuse of a part, or may be parasitic. The parasites are classified into—(1) The vegetal; (2) The animal. Disease once started in a human being or an animal may be spread by various agencies, such as air, food, water, &c., and among these by animals. We shall see how mosquitoes spread malaria, yellow fever, and filarial diseases; rats, mice, &c., spread plague; flies spread typhoid fever, &c.

The animal kingdom may be divided into two great sub-kingdoms:—A.—Protozoa: unicellular animals. B.—Metazoa: multicellular animals. The Protozoa are the lowest known animals, and among them we must look for the first beginnings of disease. The Protozoa: The unicellular animals may be arranged in four classes —Class 1.—Sarcodina, with movable changeable processes; Class 2.—Mastigophora, Motile organs, flagella (whips); Class 3.—Infusoria, Motile organs, cilia; Class 4.—Sporozoa, Parasites without motile organs.

CLASS I.—As an example of this class may be taken Amboeba Coli, one of the causes of dysentery, which is probably introduced into the body by water, and which would not enter the body if the water was filtered, and which would be killed if the water was boiled.

CLASS II.—Mastigophora.—The Mastigophora which interest us are two:—A.—Trypanosoma Brucii. B.—Trypanosama Gambiense. A.—Trypanosoma Brucii.—This is the cause of Surra or Nagana in the horses, mules and camels of

India. It is spread by a fly rather like the common house fly, called the Tse-tse fly (Glossina Morsitans). B.—Trypanosoma Gambiense.—Only discovered last year in the blood of man, on the Gambia, West Africa, by Dr. Dutton. Since the discovery it has been seen several times, and is associated with disease characterised by puffiness of the face, especially of the lower eyelids, enlarged spleen, irregular fever and congested areas of skins. How it enters the human body is not known,

CLASS III.—Infusoria.—There are some parasites of not much importance in this class, which may be passed over.

CLASS IV.—Sporozoa.—All these animals are parasitic, and are most important, including among them the malarial fever micro-organisms. Two orders of the Sporozoa will concern us to-night :—A.—The Coccidiдæ. B.—The Hæmosporidæ. A.—Coccididæ.—The Coccididæ, as Coccidium oviforme, may be found in the cells of the alimentary canal and liver of man, rabbits and other animals. The life history of a typical Coccidium is divided into two different cycles :-(1) The asexual, called Schizogony ; (2) The sexual, called Sporogony.

Proceeding the lecturer showed on the screen and explained the asexual cycle and the sexual cycle, and went on to deal with the Hæmosporidæ.—The Hæmosporidæ are Sporozoa which live in the red blood cells of vertebrate animals. They may have evolved, in the struggle for existence, from the Coccididæ. The Hæmosporidæ include many animals which cause disease in frogs, birds, cattle, bats and man.

The Hæmosporidæ of Man.—These are the organisms which cause malarial fever, and are classified into :—Genus 1.—Hœmamœbidœ.—The Gametocytes are similar to the Schizonts. Species A.—Hœmamœba Malaria.—The parasite of quartan malarial fever. Species B.—Hœmamœba Vivax.—The parasite of tertian malarial fever.

GENUS 2.—HÆMOMENAS.—The Gamaetocytes are dissimilar to the Schizonts.—Species.—Hæmomenas Præcox.—The parasite of Aestivoautumnal, or tropical fever.

LIFE HISTORY OF THE MALARIAL PARASITE.

The chief interest in the lecture centred under this head and after explaining A.—Schizogony, assexual reproduction, or cycle of Golgi; B.—Sporogony, sexual reproduction, or cycle of Ross, he showed how the Anopheles hit the man and sent the Sporozoites into his blood. Proceeding he said :—The mosquitoes in which the malarial germs develop are called Anopheles (hurtful). These Anopheles can be distinguished from the more common Culex by—(1) Their pose while resting —They stand on their heads on a horizontal surface and horizontally out from a vertical surface. (2) Their palpi are long in both sexes. (3) The second and third long veins of their wings project into the basal cells of those organs.

LIFE HISTORY OF AN ANOPHELES.

The Anopheles starts its life as an egg, which is laid in the early hours of the morning by its mother in water, which may be brackish or fresh, still or running (but not too swiftly), which contains green algæ for the future larvæ to feed upon, and which is exposed to sunlight. In three to four days the egg hatches and out comes a curious little object called a larva, with a most healthy appetite. This larva differs from the Culex larva by swimming on the surface of the water while breathing, and not hanging down from it. In about three weeks the larva turns into an extraordinary shaped object called a pupa. In about four days the pupa gives birth to the imago or insect which starts on its nuptial flight, after which it enters some house, and by means of its stilette, two knives and two saws, makes a hole in the tough skin of a human being, and through its long tube or proboscis sucks the blood by means of a little pump into the stomach. While it is making the holes its saliva is being injected into the human being, and along with the saliva the malarial germ. The blood which it sucks may contain the malarial germ, which thus gains an entry into the mosquito. The female mosquito alone sucks blood, but the reason, why it does this, is not clear. In the daytime the mosquito retires into some dark recess in the house, or into some shady retreat out of doors. The best time for mosquoesy is after the heavy rains are over, hence December and January are the great months for them in Ceylon. In the very dry weather they hibernate in shady nooks. Anopheles are very common in Ceylon, being found in Colombo, Kurunegala and its district, from Dambulla to Jaffna, in fact everywhere where I have looked for them I found Anopheles. Therefore one would expect that malaria would be fairly common in Ceylon. Luckily, however, the malarial germ is not very common in the Anopheles in Colombo.

MALARIA IN CEYLON.—Malaria is one of the commonest diseases of Ceylon. When the curve to total disease in Ceylon is compared with that of malaria, a great similarity is seen, especially in the region of the north-east monsoon.

CURVES OF MALARIA.—The curves illustrating malaria in Ceylon are divided into two charts, one representing the disease in the part of the Island affected by north east and south-west monsoons, and another representing the part affected by the north-east monsoon only. It will at once be seen that malarial fevers are most numerous in January, which is also the most unhealthy month in Ceylon. People ought not to visit places like Anurdhapura in December or January, as they are the worst months of the year, Yet unfortunately those are the months during which they are advised to go there.

RELATIONSHIP TO THE RAINFALL.—It will be noticed that the rains are always before the great increase of malaria.

The rise of the malarial curve is at first slow, due no doubt to the persons already infected getting chills and fever, for chill is a great predisposing cause of disease. During the rains the mosquito can only get about in the intervals, but when the rains cease and the ground is everywhere water-logged many pools exist : then is the time for the mosquito, and out they come ; hence December and January are the great months for mosquitoes. Now the mosquitoes find the old cases of malarial fever ready for them with germs fresh from the chills of the rains. They swallow these germs and propagate them to new cases, hence the rapid rise in December and January.

PRACTICAL APPLICATION.—If we pay no heed to the spread of malaria by Anopheles, then the work of Manson, Ross, &c., might never have been done. Precautions should be taken to avoid malaria, for prevention is better than cure.

THE PREVENTION OF MALARIAL FEVERS.—Protect yourself as much as you can by mosquito curtains. If you are compelled to live in malarial districts in the worst times of the year, render your house gnat-proof. If this is too expensive, take quinine about twice a week, and an occasional purgative during the worst season. See that no water in little pools is allowed to remain in your compound, especially in December and January.

HÆMOSPORIDIUM IN CATTLE.—Pyroplasma Bigeminum is one of the Hæmosporidæ which causes Hæmoglobinuric or Texas fever in cattle, and is spread by a tick called Rhipicephalus Annulatus, which, sucking the blood of the animal, transfers the parasite to its eggs, and by the larvæ the parasite is injected into the cattle.

THE METAZOA.—These are multicellular animals, and can be divided into two groups:—A.—The Invertebrata, without bones; B.—The Vertebrata, with bones.

A—THE INVERTEBRATA.—Those invertebrata animals which mainly interest us with regard to disease belong to the groups of—I.—Vermes; II.—Arachnidæ; III.—Insectæ; IV.—Mollusca.

I.—VERMES.—A great many worms are parasitic and cause more or less disease in man, but of these I only wish to cousider two:—Anchylostoma Duodenale; Filaria Bancrofti.

ANCHYLOSTOMA DUODENALE.—This is the cause of a great deal of disease and death in Ceylon among various classes, but especially among coolies. Its life history is most complicated, and unfortunately the way in which it gains access to man is at present quite unknown.

FILARIA BANCROFTI.—You must all have noticed the numbers of people who go about the streets of Colombo with an enormously enlarged foot and leg. This disease, which is common in Galle, is called Elephantiasis, and is due in the first instance to a worm called Filaria Bancrofti, which lives in the lymphatics, and the young of which enter the blood stream at night, being called the Filaria Nocturna. Very many people have filariæ in their systems, and they suffer no inconvenience from them till they injure a part, say the leg; then comes fever, and an attack like erysipelas, and when the attack is over the leg is found to be a little larger than it originally was. This is repeated till the large legs you know so well are produced. The embryos of Filaria Bancrofti are very small, and though none of them are to be found in the blood in the day time, yet many are found about midnight. Night is the time when the female mosquito is on the war path, but now it is the Culex (*Culex ciliaris*) which sucks the blood, and with it the young filariæ, into its own stomach. In the stomach they cast off their sheaths and pierce their way into the thoracic muscles of the mosquito, and then gradually, in about sixteen to twenty days, they undergo a metamorphosis. Then they pierce their way into the proboscis, and lie there among the stilette, knives and saws until they get the chance of entering a suitable subject. In this way the filarial worm is spread from man to man by the agency of a Culex.

II.—THE ARACHNIDAE.—This is the class to which scorpions, spiders, mites and ticks belong and among them there are many parasites, some at present but little known. The ticks are interesting, as they are said to cause 'Tick fever' in Central Africa, a disease characterised by symptoms somewhat like dysentery associated with fever.

III.—THE INSECTA.—Of insects, the Diptera or flies are the most important in causing diseases. The common house fly is now proved to be one of the means of spreading typhoid fever. In Ceylon it often has filarial worms in its mouth parts, as was pointed out to me by Mr Green of Peradeniya, but only in the so-called Mad flies; but I am afraid all the wickedness of the common house fly is not yet known. The mosquitoes belong to the Diptera and of these, Anopheles is the spreader of malaria, Culex of filaria and another, called Stegomyia fascita, has been proved to be the means of spreading yellow fever. A wingless Dipteron, called the Chigœ, started on its travels from South America in 1850, and having crossed Africa from west to east has arrived in India and causes much trouble by penetrating the feet. Another group called the Hymanoptera includes the ant which has been accused of spreading a plague in India.

IV.—THE MOLLUSCA.—Among molluscs, oysters, mussels and cockles have been convicted of spreading typhoid fever.

B.—THE VERTEBRATA.—Among the vertebrata, rats, cats, mice, squirrels and monkeys may spread the plague; horses may infect men with a disease called glanders; parasites may be introduced from fish, dogs, pigs and oxen; and man himself may spread disease to other men.

The Lecturer was loudly applauded on resuming his seat.

Dr. GRIFFIN, in proposing a vote of thanks to the lecturer, said:—Your Excellency, Ladies and Gentlemen,—I have the honour and pleasure of proposing a vote of thanks to Dr Chalmers for the very interesting lecture he has given us tonight. My only justification, or rather excuse, for taking this duty upon myself is that, perhaps, I am better aware than most of you what great interest and considerable labour Dr Chalmers has undertaken to inaugurate this series of lectures and more particularly to give us an interesting and instructive lecture tonight. Dr Chalmers has travelled in many lands and has well availed himself of the opportunity of studying the habits of these animals which spread disease; and I think not the least important of these lectures is this one tonight which gives us an outline of how many diseases are spread, and it will, I hope, be the means of interesting you and the rest of the public of Ceylon in measures to stop the spread of these diseases. (Applause.)

INDIAN PATENTS: TEA.

The 27th June 1902.—applications in respect of the undermentioned inventions have been filed. No 249 of 1902.—David Reid, Tea Planter, and John Dale, Engineer, both of Baraoora, South Sylhet, Assam. *A tea-drying and glazing machine, called "Reid and Dale's tea-drying and glazing machine."* No 253 of 1902.—Horace Drummond Deane, Tea Planter, of Stagbrook Tea Estate, Peermaad, Travancore, and Charles George Landseer Judge, Journalist, of 47, Free School Street, and No 5-1, Council House Street, in the Town of Calcutta, both in British India *An improved method and apparatus for manufacturing green tea.—Indian Engineer*, Nov. 29.

TEA, COFFEE AND CACAO.

It requires either a philosopher or a cynic to extract humour out of a serious situation, and perhaps our correspondent, "A simpleton," who writes to us on the subject of a communication we published last week claims to be either one or the other. We admit that the suggestion for

IMPROVING THE POSITION OF TEA

growers put forward in our last week's issue reads like a fairy tale or a jest, but we believe it was sent to us as a serious contribution, and we printed it. So many theories have been offered for the consideration of members of that tea industry of late that it would have been unfair to deprive our correspondent of publicity and the chance of competing with his neighbours. The idea that tea garden proprietors and their friends would, or could, subscribe the sum mentioned by our correspondent for the purpose indicated is, we allow, indicative of a sanguine temperament, but there is something refreshing about pure, unalloyed optimism, and as a sample of the real thing in that line our contributor's communication deserved publicity. We therefore leave to others the task of criticising a project which is bold, if nothing else, in its conception, and on that score deserves in recognition in some form.

COFFEE PLANTERS

will not, we imagine, drop a tributary tear over the woes of chicory growers, who are memorialising the Government about their troubles, but they may be interested in some particulars of this product which frequently masquerades as coffee. The memorial sets forth that between the year of its introduction in 1840 and the year 1860 and growth and cultivation of chicory root in Yorkshire and neighbouring counties was not only an important item of agriculture, but was a source of considerable profit to the former. The quantity grown in England was then about equal to the quantity imported from abroad. In the year 1860, however, a Customs duty of 6s per cwt was placed on imported chicory, and an excise duty of 3s per cwt on home-grown chicory; and in the year 1863 these duties were increased to 26s 6d and 21s 9d per cwt respectively; and in the year 1864 the excise duty on English chicory was further increased to 24s 3d, but no increase was made on foreign-grown chicory. The memorial states that as a result of such duties, during the period from 1860 to 1872 the importation of foreign chicory largely increased and the growth of English chicory diminished, and stood in the relation of four tons of the former to one ton of the latter. The memorial further points out that chicory is the only dutiable article grown in this country (the registration of wheat being confined to imports only), and that in the year 1901 the whole of the quantity of English chicory on which duty was paid was 89 tons, and that the revenue obtained therefrom is small and costly to collect. It is further urged that the reduction of the home excise duty of ½d per lb on present returns shows a loss of £412 only. This, it is argued, would do much to revive the industry and help to restore the prosperity formerly enjoyed.

On the subject of the import of chocolate and cocoa into Egypt, the "Monitieur Officiel du Commerce," says: "The import of

CHOCOLATE AND COCOA

into Egypt is relatively restricted for a country which numbers nearly ten millions of inhabitants; it amounts in fact only to 104,000 kg., which is an insignificant quantity per head. Egypt possesses no chocolate factories, although sugar is very cheap there. This is, no doubt, due to the small consumption. It is clear that the Arab does not patronise either cocoa or chocolate, consequently the buyers are only Europeans. Among the importing countries France occupies the first place with 50,000 kg, next comes Italy with 22,000 kg., and then England with 19,000 kg. Whence arises this abstention, this repugnance, to an article which is a favourite with everybody generally? We have tried to find out, and the statement is that chocolate is only 'damaged coffee." We do not think that all Arabs are of the same opinion, but rather think that their aversion arises from the circumstance that their confectionery is specially prepared to please their taste, containing almonds, nuts, &c.; they have also 'loukoums,' a kind of delicate pastry made with starch and perfumed with sundry essences. These sweets, which are sold very cheap, are more within reach of their means than the chocolates, the qualities of which, even the most inferior, are by far dearer than their best productions."—*H and C Mail*, Nov. 21.

The cost of producing them is not a heavy one, so that there is every reason to anticipate that the new discovery will lead to a sensible diminution in, the price of the formerly precious stones. The rubies are obtained by a new process, in which the, blow-pipe plays an important part, and the stones are both beautiful and of a goodly size. The specimen shown at the meeting of the Academy was much admired by the savants.—*Daily Mail*, Nov. 12.

RUBBER AT MANAOS.

New rubber fields have been discovered on Jurua, but the tree does not appear to be the *Hevea*, answering more nearly to the description which the India Rubber World has given of the Mexican *Castilloa*. The rubber obtained is said to be weak—*i e* to break easily on tension, but the captain of one of the river steamers informs me that the *sernamby* (coarse) is excellent and even better than that obtained from the *Hevea*. I hope to visit the new rubber fields in October and to send you a fuller description of the same.

Some of last year's product of Upriver rubber was of rather poor quality, which, in the opinion of some, was due perhaps to the fact that the floods last season were less extensive than usual and rapidly subsided. It is held here that the longer the rubber fields are under water in any year, the better will be the quality of the rubber and the greater the amount obtained. If there is anything in his theory it may be that the irrigation of plantations may prove desirable where the same species of rubber is cultivated.—*India Rubber World*, Nov. 1.

COTTON-GROWING IN EGYPT.

The Egyptian cotton crop this season is expected to be a very large one, and it is estimated that it will be about 6,500,000 cantars, one cantar equalling about 99 lb., but the quality has been greatly damaged by fogs and rain. There has been a noticeable falling-off during the last few years in the quality of Mount Affifa cotton, but some of the cultivators are giving great attention to the improvement of the cotton and to a more careful selection of sowing seed. The total exports of cotton seed for the year ending December 31, 1901, were 393,804 tons, as against 378,702 in 1900 and 379,285 tons in 1899. Seed-crushing in Egypt continues active, and a new mill of thirty-two presses has, according to the annual report of the British Chamber of Commerce of Egypt, been erected at Kafr Zayat.—Zanzibar *Gazette*.

CRUDE RUBBER.

ANGOLA.—The most important African Colony belonging to Portugal, and the one in which the large t fortunes have been made within the last thirty years' is Angola. The Colony of Angola compries 517,000 square miles, and has a sea line of 870 miles. The climate, if tropical along the coast, has proved healthy enough for Europeans nearly everywhere in the interior. I speak from practical experience. There is no soil on the surface of the globe more fertile than that of Angola, and only a few years ago this colony was practically the second largest producer of rubber in the world. In 1899 it exported rubber, in the face of grave difficulties, to the value of 4,500,000 dols, besides large quantities of coffee and other products. The climate, topography, and soil of Angola would render comparatively easy the cultivation on a very large scale, of such crops as tobacco, coffee, rubber, and certain cereals. Native labour is ridiculously cheap, and, when intelligently directed, is most excellent. A man who for twelve years was at the head of a mercantile house, which at the time did the largest business with the African Colonies of Portugal, writes as follows:—

"The question of labour about which you ask, is not difficult to solve. The nergoes are good workmen and the Portuguese colonists are hard-working, sensible men. The great product of these colonies for the present moment is rubber. There are apparently inexhaustible snpplies of it. You ask me, then, if this is so, why Portuguese Africa has not prospered like the Congo country, which is administered by the Belgian Government. I will tell you. The whole difficulty is one of administration. The rubber in the Portuguese Colonies is brought down from the remots interior districts by bearers, who have sometimes a journey of two months to the coast to exchange their produce for money or goods.

"As soon as one gets into the interior, there is an absence of roads and a great paucity of Government military stations or trading posts. The country is slightly policed. The consequence is that the negro bearer who carries his rubber has a long, dangerous difficult jonrney, and is robbed of a portion of his stock from time to time. . . . . Notwithstanding all these grave difficulties and disadvantages of a practical nature, the trade in the Portuguese Colonies thrived enormously until the Congo State appeared. Then system, order, and far-seeing patience began to tell, as they always do. With admirable foresight, the Government of the Congo State developed a vast notwork of trading stations in the interior of its territory, and built flat launches to bring the produce to the tide water *via* the water ways and rivers of the country. This sort of navigation costs very little. In short, the Congo Government brought the market close to producer; and as a consequence of this system and organisation, it is able to underbid in the rubber trade the very country where rubber most abounds. The rubber is purchased on the spot, and the native is spared the danger and toil of a long journey to the coast.

"In this connection it should be observed that both the Congo and Angola only export rubber produced by wild-growing plants, and though the field is still an enormous one, and may be exploited in the present manuar for thirty or forty years longer, the ultimate system will be to cultivate the rubber plant systematically. Already, a good beginning in the way, of setting out rubber plantations has been made in the Congo, but I think nothing of this sort has been done in Angola.

"With the highly-organised and scientific methods of the Congo State, the Portuguese merchants and dealers have found themselves unable to cope profitably. The negroes refuse to come to the coast with rubber; they prefer to sell on the spot, as it were, in the Congo.

'The rubber trade in Angola could readily be revived by proper combination and management. The various existing interests would have to be consolidated in some well-working way, and this would be a comparatively easy matter."

The main difficulties which foreign investors in the African Colonies of Portugal are likely to encounter will arise from the variety of constructions put upon the law governing the creation and management of corporations formed for the purpose of transacting business in the Colonial possessions of that Kingdom. This law is not at present thought to be wholly favourable to the investment of foreign capital in the Colonies.—*India-Rubber and Gutta-Percha Trades' Journal*, Nov. 10.

THE TRADE IN COTTON SEED.

A few months ago we drew attention to the growing development of the Indian trade in Cotton seed with Europe. As food for cattle, the seed had long been popular in India; and both Sinhalese and Tamil cattle-owners here believe in it for its nutritious qualities, and specially as increasing the yield of milch cows. The popularity of cotton seed is greatly enhanced by the fondness of cattle for it. Draught cattle, which have toiled all the week and have been fed with poonac-water, often poured down their throats with a bamboo, and not unfrequently of an age which makes itself felt to the olfactories, are allowed by some owners a feed of cotton seed on Sundays; and the rush they make to the weekly dainty is a sight to be seen. But it is the export trade in the article and its growing appreciation in Europe, which is now attracting special attention. The European importer, as we said when we last touched on the subject, is more concerned with the potentialities of cotton seed, as food for man, rather than for cattle; and as we are ourselves pressing for cotton cultivation in the Northern Districts of the Island, as one means of rescuing the Northern Railway from persistent financial failure, the information which is to hand in an Indian paper is of special interest.

Mr. Sly, the Director of Agriculture in the Central Provinces of India, is reported to be working hard to restore the agriculturists of that sorely tried region to a condition of normal prosperity, and at the same time to promote its economic welfare. One of the means which he has adopted, and with which we have become familiar since the appointment of our own energetic Director to the Botanic Gardens, is the issue of "bulletins," brimful of information, valuable to the agriculturist and the statistician. The latest bulletin deals with the prospects of the cotton seed industry in the Central Provinces—the exports having risen from 46,000 cwt. in 1896 to 225,000 in 1900, and to 2,036,000 cwt. last year. It is not the least satisfactory feature of this increase that practically the whole quantity was shipped to the United Kingdom, which had previously long drawn its supplies from Egypt To what extent it is still supplied from that source we are not told, but America uses up all its own seed, and has none to spare for export. That is probably one of the causes of the phenomenal demand—another

being that the high price to which linseed has risen, has driven dealers to look out for a substitute. That India has been able to meet the heavy demand is due, in a great measure, alas! to the recent famines which have materially reduced the number of cattle which remain to be fed; but the urgency of the demand may be gathered from the fact that Egyptian seed continued to rise, despite the quantities which India was able to throw into the London market. The appreciation of the seed in America seems to have been as recent as it has been ancient in India. In Texas there was a law making it penal to dump cotton seed into streams—a provision which would scarcely have been called for, had Yankee cuteness discovered the value of the seed earlier. Now, at least 500 mills are said to be crushing the seed, and the estimate of the annual value of the product is over £10,000,000!

The extent to which cotton seed is used in feeding cattle in India will militate against its rivalling America in the erection of mills, or in the export of the raw material to anything like that value; but, given the demand, it might utilise the seed in manufactures to an appreciable extent. We read that the seed "is used in Europe in the manufacture of innumerable products, such as lard, butter, candles, dyes, paints and general oils," and if there is no present demand for all these products in India, the crude oil might be exported with greater profit than the seed; but the local demand, especially for the oil, as food, is sure to grow. The present average price of cotton seed is given at R7 per candy of 658 lb., and the calculation is that a profit of 17·14 per cent is to be made on its conversion into oil which is now selling at £20 per ton in England. If America can no longer supply the London market, the price of oil is scarcely likely to fall, and India may find it profitable to retain the residuary products and ship the oil to Europe. Can the continuance of high prices for Ceylon Coconut Oil be connected with the active demand for Cotton Seed Oil which must be coming into competition with it in some directions?

THE POSITION IN THE TEA TRADE.

BY. J. INNES ROGERS.

[SPECIAL FOR THE "INDIAN DAILY NEWS."]

London, Nov 7.

For several months past there has been a dispute in the tea trade upon a point which is of vast importance to the growers of tea in India and Ceylon. It has to do with what is known as the Clearing House, and institution where the home tea trade lodge their papers for the purpose of obtaining deliveries, instead of taking them round to the various wharves where the goods themselves are stored. A central office of this sort is, of course, a considerable convenience, and to its principle there can be no objection whatever. It was created some 14 years ago in consequence of the then existing difficulties, and at that time the whole of the home trade and of the wharves and docks storing tea joined it. A condition of membership was inserted, among others of an ordinary character, which passed without much notice at the time, and was in fact then of no importance because the whole of those interested formed part of the Clearing House. It was to the effect that the home tea trade agreed only to buy teas lying at wharves and docks, the owners of which were members of the Clearing House. As was stated above, no particular importance was attached to this condition and up till quite recently the whole of the wharves storing, tea were members of the

CLEARING HOUSE.

In the early part of last year, however, a wharf called Gun Wharf, obtained a bond from the Customs which enabled it to store tea. This was entirely a new departure, for the Customs had for some years past, in accordance with an agreement with the Clearing House, declined to issue fresh bonds for the warehousing of tea, thus giving the wharfingers a monopoly. This monopoly has recently been worked to create a pool or trust, among the warehouse keepers for a certain number of years of which the members agree to maintain the existing charges and to divide the profits or losses among themselves in certain proportions. The customs naturally resented this attempt to use Government facilities as a means of boycotting, and representations were made to them by some members of the home trade that they were desirous to no longer oppose the issue of bonds to fresh warehouses, and in fact that they desired competition because of the existing high charges on tea which had become increasingly burdensome as the price fell. The result of this was the issue of a bond to

GUN WHARF.

The proprietors of that place were refused admission to the Tea Warehouse pool or to the Clearing House, and they thereupon elected to fight on their own account, and to receive and distribute tea at prices some 30 per cent below those charged by the pool.

The appearance of Gun Wharf upon the scene placed the home trade in a position of some difficulty, for they were not as a whole directly interested in cheapening the import rates on tea, because, generally speaking, they buy in London after the parcels are landed. It was felt, however, that although this was the case, the crushing weight of the import charges, and of rent and sampling on tea, indirectly interested the home trade very much. They were, in fact, part of the excessive cost of distributing tea which has rendered the home trade so unprosperous. They were anxious also to come into touch more than hitherto, with the growers of tea and the large Indian and Ceylon importers in this market, and they felt that as the wharf charges formed so important a question for India and Ceylon, it was desirable to take up the question in the interests of our fellow countrymen abroad as well as indirectly in their own. The first step that was taken by

THE HOME TRADE

in this matter was to approach an Indian and Ceylon Association in London, and to hold private conferences with a number of leading importers. These, however, led to no results whatever. The trade were desirous of opening up the whole question of the cost of distributing tea in connection with the wharf charges, but no progress was made. Several large distributors of tea, after

some months of discussion, decided that they would cut the Gordian knot by giving the Clearing House notice that they intended to deal with tea lying at Gun Wharf. The reply of the Clearing House was to expel the members in question from their body, and to charge them increased rates for sampling and other matters besides withdrawing the facilities of monthly accounts for charges, and compelling the boy messengers of the firms in question to carry about a small amount in cash to pay each 2d or 3d in charges as it was incurred. Several leading brokers who had been entrusted with the sale of teas by a leading Indian emporter who had placed his goods at Gun Wharf were also expelled from the Clearing House, deprived of its facilities and exposed to higher charges amounting in the case of some of the firms mentioned to a good many hundred pounds a year. In this position the

ANNUAL MEETING

took place at the London Tea Buyers' Association, a body which contains four-fifths of the buying power of the trade in this market. At this meeting after full discussion, a request was unanimously forwarded to the Clearing House to strike out the boycotting clause in its rules, and to enable buyers to purchase tea where they thought it desirable to do so. In reply to this the Clearing House refused point blank to do anything of the sort, This refusal was followed up by more notices to the Clearing House that buyers intended to purchase teas at Gun Wharf, and also by the appearance of two or three fresh wharves upon the scene who had not previously stored tea and who are now prepared to do so. The last stage of the controversy is that the Clearing House have asked the Tea Buyers' Association to meet them in conference to discuss the questions at issue. The Committee of the Tea Buyers' Association were to meet on Wednesday to agree upon their reply, which will probably be to the effect that they will be pleased to discuss the whole situation with the Clearing House, but the boycotting clause must first be removed as requested by the trade. The general feeling is that the trade are quite prepared to pay any reasonable sum for the facilities of the Clearing House, but that that institution in itself should have absolutely nothing to do with any pool arrangement. A considerable section of the home trade, however, think that the Clearing House might very reasonably form a central place of meeting for the use of tea growers, importers, brokers, dealers, blenders and other market buyers. If some meeting place, of this sort could be arranged, the whole question of the organisation of the tea trade, which sadly requires improving, could be discussed at leisure and in a friendly way. At presens there is no communication whatever between the importers of tea and its distributors in this market, and the result has been most disastrous. The importers do not know even the names of their chief buyers, and the distributors in the same way are ignorant of whom they are buying. It is true that the brokers who sell from the importers to the distributors know these facts, but this is an entirely different matter to direct communications between the parties interested, especially as the brokers are completely satisfied with the existing position of things, and are unwilling to come forward as reformers with the risk of embroiling themselves with either one side or the other.

As is well known, tea in common with other

EASTERN PRODUCE,

was for many years a monopoly on the East Indian Company; that Company drew up a very complete and a most able system of dealig with the different articles of produce under its control. By degrees all other Eastern trade has shaken off the clever but antiquated and monopolist system imposed upon buyers three or four generations ago by the East Indian Company. Tea however, remains under the old rules, which have, become absolutely useless in many respects, while they entail prodigious and unnecessary cost upon all who have to deal in it. The prompt (or time within which payment has to be made) is kept up on the old East India terms of three months, whereas all the similiar articles of produce have now to be settled for within one month. To provide against the risk of what may happen to the market in so long a period as three months the buyers pay on purchase a deposit of £1 per package, which now amounts in some cases to more than half the value of the tea. To carry out this system, and to get security for the deposits, a document called the Weight Note is employed which is a contract, an invoice, a security for deposit, a delivery note, and other things besides. In other trades a single invoice is made out for the whole parcel, and if necessary the landing account is supplied by which it may be checked. In tea, however, (at an enormous aggregate cost which is perfectly useless), an invoice is made out for every six or nine packages, and its contents also bear all sorts of fribbling particulars of a useless character which simply add to cost without giving any corresponding advantage. The whole of this complicated system requires to be swept away, and to be replaced by a reasonable and modern way of doing business. Again, the conditions of public sale require revision and to be brought up to date. Considerable reforms were, some time ago, actually agreed to by a committe, of importers and the home trade but they were blocked by the action of the brokers who do not desire any changes to be made, and there was not sufficient cohesion between the importers and the buyers to insist upon the alterations. If, however, the Tea trade is to be modernised these conditions of sale will have to be dealt with. At the same time the unnecessary cost of catalogues might be seen to. This suggests a point which may be interesting to the planters, especially in India and that is the enormous

COST OF SAMPLING

and dealing with the small parcels, or breaks, which they send to this market. In the old China days a chop might represent from six to seven hundred packages, the cost of dealing with the details of which was precisely the same as the 30, 40 and 60 chest lots which are now sent us from India and Ceylon.

Closely allied with this question of small breaks is that of bulking on the gardens. At present nearly all Indian Tea has to be rebulked in London at an enormous cost to the planters, and to the great injury of the tea. In Ceylon this cost and damage is commonly avoided, and there is no question at all that the same steps ought to be taken in India. Even careful and complete bulking in the gardens, so that the quality of a parcel should be uniform, would be insufficient, however, unless the different chests or empty packages

themselves have an even tare, that is, unless their weight is approximately regular. Unless this is the case, every chest of tea has to be turned out here in order that the Customs may ascertain the tare. In China Tea, with the much inferior appliances of the Chinese, this was never necessary, and the Customs simply had to tare a few packages out of hundreds to ascertain the actual weight of the chest. In further connection with the question of

BULKING,

it may be suggested to the tea-growers to consider whether the separation of their produce into so many different sized leaves pays them, and whether it would not be much better and more economical for all parties to obtain larger breaks, whether it would save not to sort out the tea at all. As a matter of fact all the tea elaborately separated out into different sized leaves in India has again to be rebulked here in the same small breaks at a tea warehouse, and then the different qualities after delivery are all mixed together in one blend, either by the wholesale or the retail blenders. This as a whole constitutes an immense addition to the cost of tea. The great fall in value of late years has not been distributed proportionately over the different qualities, but the fall has been greatest in the best teas, so that whereas the margin between the highest and lowest price in former years used to be very great indeed, the difference between the best and the commonest qualities is now very small. To a large degree this is due to the system of unrestricted public sales, the results of which with the cost of each lot are sent out broadcast to all the chief small, wholesale, and retail distributors throughout the Kingdom. One reason for this extreme publicity was that the planters were under the impression that what they called "Mincing Lane," that is the old established wholesale dealers in tea, were thought to obtain too heavy a profit at the cost of the planters. This was a very great delusion. The result of the present system of unregulated and enormous

TEA SALES,

has been practically to abolish the class of dealers whom the Planters had in mind. With their disappearance or retirement millions of capital have been withdrawn from the wholesale tea trade, which money was formerly employed in better prices being paid at a time when supplies were large, and keeping them up later in the season. The capitalists who conducted such operations naturally expected a fair return for their money, but with the present system this is impossible, and it pays no one to buy and hold the better classes of tea, because, in the first place, all their important customers are acquainted with the cost of each particular parcel, and secondly, because there is no security that at any moment similar tea may not be forced off without reserve upon the market, without the slightest consideration for the interests of previous holders. With the partial or entire departure of the old style of merchants dealing in tea, fresh classes of wholesale distributors have grown up. The first is that of wholesale blenders, who do not, as the old dealers did, sell a particular parcel on its merits, but mix a number of teas together, so that their identity is lost, and they can obtain, therefore, such prices as the merits their mixture enable them to get without being limited, as in original teas, to a certain small proportion on a cost which their customers know. Several important blending houses are public Companies, and their returns are published. Further than this, it is a matter of common knowledge that their gross and net profits infinitely exceed those of the old fashioned tea dealers whom the planters ignorantly put under the name of "Mincing Lane." Another great departure from the tea trade has been the introduction of

PACKET TEA

by wholesale firms who advertise largely. Here again the profits are very heavy indeed, and together with the cost of advertising, have largely to come out of the pockets of the tea planters. This is the price which the latter are paying for the abolition of what they call "Mincing Lane," and if it goes far enough, tea will fall or rise to the position of cocoa, where half the cost of a cup represents the expense of advertisements. Some efforts were made a short time ago to stop this condition of things by obtaining some privacy in the published prices of individual parcels at public sales. The question was entirely misrepresented to the planters, and it was held to be an attempt to help Mincing Lane to get back its old monopoly. Thereupon the proposal fell through, to whose detriment it has yet to be seen. The final result of the present system is that the average retail price of Tea throughout the country and the chief sale there of is at 1s 4d. per lb. If 6d. be taken off this for duty, and 3d. for the retailer's profit, it leaves 7d. per lb. for the cost of blending, and in the case of packet tea of packing and advertisement, without allowing in either case for the wholesale profits. It will be seen that if this state of things continues, the average price of tea, supposing the present duty is maintained must fall to something like 5d. per lb., and every day the finer teas will become relatively cheaper than the common ones, so that this disastrous tendency is progressive. The interest of the tea growers in this question is a vital one, but whether they, on full consideration, favour or do not favour any alteration in the system of distributing tea through dealers, blenders, or packers, they are every one of them most vitally interested in reducing the cost of importing and distributing tea to the wholesale buyers of and whatever class. It is to be hoped, therefore, that their support will be secured for the system by which economies will be effected in the warehousing and other import charges on tea. One way another some £250,000 a year in the aggregate might be saved in these respects by careful reforms. —*Indian Daily News*, Nov. 25.

GIFTS OF THE TROPICS.

Chief O P Austin of the U. S, Treasury Bureau of Statistics contributes to the June *Forum* an article on the growing importance of tropical imports, from which we abstract as follows :—

Tropical products which earlier generations considered luxuries are now necessaries of life everywhere. The average consumption of sugar has risen from thirty-three pounds per capita in 1870 to sixty-eight pounds in 1901 ; coffee from six to nearly twelve pounds per capita ; cocoa has increased six times ; despite these gains of its rivals, consumption of tea is still as great ; silks and satins are no longer luxuries ; and rubber, a generation ago almost unknown, is now used everywhere.

The great railways have turned right angles and are facing towards the equator, bringing tropical products more into reach. The effect is

readily observed in the temperate zones in greater comfort, more variety of food, better health and longer life.

This is especially the case in the United States, which now imports over 1,000,000 dol of tropical products every day. This is more than for most other countries, since most of our sugar comes from the tropics, the others depending on beet. Our recent consumption is near one-half the cane sugar and more than one-half the coffee of the world. In 1901 our imports of tropical goods were over 400,000,000 dol, against 143,000 000 dol thirty years ago.

These figures fail to show the real growth because of the reduction in value per unit of quantity. The cost of sugar in the country exporting has since 1870 fallen from 5 to 2·3 cents; that of coffee from twelve to eighteen cents to seven cents; tea from twenty-four to thirty-seven cents to 12·3 cents; raw silk from over five dol to a little more than three dol a pound.

There are four ways to measure this growth, all bringing identical results. The first is to consider imports by grand divisions. Imports from Asia, Africa, Oceanica, and America south of the United States were in 1870, 157.000,000 dol; 1875 224,000,000 dol; 1880, 265,000,000 dol; 1890, 298,000,000 dol; 1895, 310,000,000 dol; 1901, 414,000.000 dol. Total imports meanwhile were: 1870, 436,000,000 dollars; 1875, 533,000,000 dollars; 1880, 668,000,000 dollars; 1890, 789,000,000 dollars; 1895, 740,000 000 dol; 1901, 880,000,000 dol. The share of tropical imports thus rose from 36 per cent in 1870 to 47 per cent in 1901. Further, the population of the United States has increased meanwhile from 38,000,000 to 76,000,000, exactly doubling, while tropical imports increased from 167,000,000 dol to 414,000,000 dol, or 165 per cent. Meanwhile non-tropical imports increased 55 per cent.

Taking tropical products by articles, we find that the most important are: Sugar, coffee, raw silk, Indian rubber, cocoa, fibres, fruits and nuts, tobacco, cotton and tea. In 1901 these aggregated 340,954,707 dol or 84 per cent of total tropical imports of 414,000,000 dol. Since 1870, sugar rose from 70,000,000 dol to 114.000,000 dol; coffee from 24,000,000 dol to 70,000,000 dol; rubber from 3,500,000 dol to 28,000,000 dol; raw silk, from 3,000,000 to 40,000,000 dol; fibres, from 6,000,000 dol to 25,000,000 dol; fruits and nuts, from 7,500,000 dol to 20.000,000 dol; cotton, from 500,000 dol to 8,500,0000 dol; tea has fallen from near 14.000,000 dol to 9,000,000 dol.

The total value of all tropical imports was in 1870, 144,000,000 dol; 1875, 207,000.000 dol; 1880, 246,000,000 dol; 1890,. 333,000,000 dol; 1895, 325,000,000 dol; 1901, 405,000,000 dol, corresponding closely to the figures by grand divisions.

A study by articles shows a great variation in increase measured by values. Sugar increased only sixty-six per cent in value, while population increased one hundred per cent, yet consumption is twice as great as in 1870; coffee, however, increased nearly two hundred per cent and cocoa over one thousand per cent, tea decreased thirty-three per cent, though per capita the consumption was the same as in 1870.

Considering manufacturing articles, fibres and tobacco show nearly four times the value in 1870, rubber seven times, silk over twelve times, and cotton over twenty-five times, though the United States is now the greatest cotton-producing country.

It is only by quantities that one can realize the real growth much more rapid than indicated by values. Since 1870 sugar increased from 1,196,000,000 to 4,569,000,000 pounds, about three hundred per cent, against an increase in value of sixty-six per cent; coffee from 235,000,000 to 1,074,000,000 pounds, or ever three hundred per cent, against an increase in value of two hundred per cent; silk from 500,000 to over 12,000 000 pounds; rubber from less than 10,000,000 to over 55,000,000 pound; tobacco from 6,250,000 to nearly 29,000,000 pounds; cotton from less 2,000,000 to over 68,000,000 pounds; dye goods from 43,533 tons to 255,771 tons; cocoa from less than 4,000,000 to over 50,000,000 pounds; tea decreased in value thirty-three per cent, but increased in quantity fifty per cent.

The largest increase is thus in materials for manufacturing Foods increased two hundred to three hundred per cent, materials for manufacturing three hundred to three thousand per cent, while population was increasing one hundred per cent.

In the fourth method of measurement we may make three groups—foods, raw material for manufacturing and manufactures and luxuries. Foods show a growth in value of ten per cent, which inclusion of Hawaii and Porto Rico for 1901 would raise to twety-five per cent, manufactures and luxuries of thirty-three per cent, and manufacurers' materials of ninety per cent.

The chief growth in our imports is tropical products, and there must be a growing demand for these, since we lack the necessary climate, while manufactures and luxuries our own producers will supply in increasing quantities.

In the light of these figures is it not possible we have builded better than we know in our recent unsought tropical acquisitions? The products of Hawaii have increased over twenty fold since the reciprocity treaty of 1876, and exports to the United States twenty-five times. Porto Rico shows over three times the average before the new relationship. Our exports to Hawaii have multiplied twenty times, and to Porto Rico five times. In 1901 the Philippines supplied over twice the total of 1899; their nearest neighbours, the Dneth Indies supply us with more sugar than any other country save Cuba, with the Philippines twenty times as large as Hawaii and fifty times as populous, their possibilities are worthy of consideration.—*American Cultivator.*

POPULAR SCIENTIFIC LECTURES.

MR. J. B. CARRUTHERS, F.L.S., ON SEA-WEEDS.

The second of the series of popular scientific lectures inaugurated by the Hon. Mr. Cooper some weeks ago was delivered in the Ceylon Medical College Hall on December 6th by Mr. J B Carruthers, F.L.S. The attendance was comparatively small, but when regarded in the light of the fact that those present made their way to the Hall in a downpour of rain was decidedly satisfactory. The lecture was on "Sea-weeds," and the lecturer treated his subject in a masterly and interesting manner which, indeed, at times, de-

veloped into raciness. Each subject, which he referred to was beautifully illustrated by a powerful lantern, and the revelations of the wonders of the deep, thus afforded the audience-repaired for their presence.

The lecturer was briefly introduced by Dr the Hon. A J Chalmers to the audience, among whom were the Hon Mr G M Fowler, Mr and Mrs. E E Green, Mr and Mrs Wackrill, Mr and Mrs. F Lewis, Mr. J Ferguson, Mr. and Mrs. F C Roles, Mr Cottle, the Hon. Mr. and Mrs. F A Cooper, Mr. C D Vigors, Dr. and Mrs. W H de Silva and Mr. W H Davies.

The synopsis of the lecturer provided to those present and which gives a fair idea of the lines taken by Mr. Carruthers was as follows:—

SEAWEEDS, or, to use their Latin and scientific name, Algæ, are of interest from many points of view. They are, in nearly all cases, things of beauty both in form and colour; they are of great economic importance as the basis of the nutrition of marine animal life; and they are in their structure and life-history among the most interesting of organisms that science investigates.

Colour, which is not available as a character for grouping other large classes of plants, coincides in the case of algæ with the natural classification—

Red seaweeds, or Rhodophyceæ.
Brown seaweeds, or Phœophyceæ.
Green seaweeds, or Chlorophyceæ.
Blue-green seaweeds, or Cyanophyceæ.

These primary divisions of algæ show also the distribution of the plants they include with regard to the depth of the sea where they are found. The green algæ are seen, as a rule, near to shore and at no distance from the surface; lower down we find the brown forms, and the red seaweeds occur at the greatest depths.

Light is essential to the life of algæ. At a depth of about three-quarters of a mile there is total darkness, and consequently no living seaweeds; but at a much less depth, not one-quarter of a mile, the light is of such a kind that the plants cannot grow. The most numerous algæ are those which from their size and habit are the most difficult to observe, *i.e*, the free-floating or pelagic forms. These are not anchored to rocks, stones, ships' bottoms, &c., like the better known and larger seaweeds, but live in great quantities in the upper layers of water away from land, in some cases giving a green or red colour to lakes. They are of microscopic dimensions, and are usually captured by pumping sea water through fine silk gauze, when they remain as a scum, and can be placed for examination under the microscope. Many have hard, siliceous shells, the Diatoms, of which some 10,000 species are known, having in past ages formed the immense chalk beds. The continuous rain of dead shells which falls down to the bottom of the sea as these small organisms die, make the diatomaceous ooze, or deposit, which in the course of time becomes a hard stratum.

Algæ are perhaps easier to identify than other groups of plants; they are dried and preserved with very little trouble. The collection and study of seaweeds is therefore attractive and easy for the amateur, and in Ceylon will be sure to repay any time spent on them.

The lecturer concluded by remarking—I only hope these few remarks I have made may induce some people to find out for themselves a good deal more than I am capable of telling you about sea-weeds, and I can assure anyone at all who has been about the subject that it would repay them, were they to take up this subject. I should be very glad to see any such up at Peradeniya where we have quite a respectable collection of sea-weeds—many of which, I regret to say, are still unnamed. I can only add that I shall be quite satisfied if from this lecture every one is bitten with the love for sea-weeds. (Applause.)

The Hon. Mr G M FOWLER—in proposing a vote of thanks to the lecturer said, I was quite unprepared to be called on to propose a vote of thanks to the lecturer for his most interesting lecture, but have now the greatest pleasure in doing so. I am sorry to say I arrived so late that I did not hear his introductory remarks, but the remainder —I really forget now at what stage I entered—(laughter)—was most interesting. I am sure all of you are most interested in what you have heard and I hope there are a good many here who will profit by what we have heard and extend their research in that direction. I was rather startled by recognising a certain sea-weed on the screen which I thought had not been yet discovered. I came across it many years ago in Mannar and I treasured it. Tonight I heard it described as one of the many common sea-weeds. (Laughter), Excuse this personal reminiscence, but it is only one instance. I am sure I am expressing the sentiments of all present in thanking Mr Carruthers most heartily for his interesting lecture. (Applause).

INDIAN AND CEYLON TEA SHARE VALUES.

From the following figures, compiled, as usual, by Mr George S-ton, of the Indian Tea Share Exchange, 120, Bishopsgate-street, E.C., it will be seen that the market value of the shares of 45 representative companies, registered in this country, has again risen slightly during October, and now shows an advance of £175,000 from the lowest point touched on 1st Sept. The rise is pretty well distributed all along the line.

Face value of 45 Companies		...	£9,500,000
Market value 1st July, 1897 (highest point)			£12,000,000
Do	1st Jan., 1902		£7,000 000
Do	1st July 1902	(correoted	£6,225,000
Do	1st Aug., 1902		£6,125,000
Do	1st Sept., 1902	(lowest point)	£6,050.000
Do	1st Oct., 1902		£6,150,000
Do	1st Nov., 1902		£6,225,000

As the total share and debenture capital of about 170 of such Companies, registered in the United Kingdom, with sterling capital, amounts to nearly £19,000,000, the fluctuation of the whole, based on the above figures, may be estimated as follows:—

Face value of about 170 sterling Cos.		£19,000,000
Highest value, 1st July, 1897	...	£24,000 000
Lowest value, 1st Sept., 1902	..	£12,100,000
Present market value	...	£12,450,000

or still a depreciation of £11,550,000; or about 48 per cent. from the highest point.

Even these augmented figures, it may be observed, take no account of either the privately-owned estates nor of the Calcutta, Madras and Colombo Companies, with rupee capital, in which the depreciation has frequently been still greater. Mr Seton adds, as a ride

to his figures, that the tendency to recovery shown during the previous month has been further accentuated during the month just closed, and there are not wanting signs of further material improvement. —*Financial News.*

MICA IN GERMAN EAST AFRICA.

Mica has hitherto only been produced in German East Africa by persons possessed of very limited plant, and the supply has, in consequence, been restricted. A German firm in Mannheim dealing in mica, who had purchased the five mica mines in the Alugaru Mountains, have now formed a company for the further working of the same, under the name of the "Deutsch-Ostafraka Glimmerund Minen Werke," with a preliminary capital of 200,000 marks. Under the management of the former owner the production was 1,200 kilos, monthly; the new company reckon a production of at least 60,000 kilos, yearly, a quantity which, according to specialists, can easily be obtained by proper working. The import of mica into Germany last year through Hamburg was about 120,000 kilos., valued at 500,000 marks, and the demand for mica in the electrical industry is continually increasing. Mining is now going on uninterruptedly under the supervision of two engineers, with thirty natives, and it is probably that even in the first year the expected production of 60,000 kilos. will be achieved. By means of proper instruction to the natives, and the opening of new workings, the firm hope to reach an output of 100,000 kilos. per annum. Investigations conducted by the Government in 1897 showed that the existing mines in the Inbakana district were rich enough to warrant moderate working, whilst a cursory survey of the land disclosed numerous rich lodes, an indication that the deposits were richer than generally supposed.—London *Chamber of Commerce Journal*, November.

PROFITS FROM A RUBBER PLANTATION.

Mention has been made more than once in the "India Rubber World" of a rubber plantation in the state of Chiapas, Mexico, from which shipments of rubber have actually been made. About thirteen years ago a Mexican planter set out a number of rubber trees (*Castilloa elastica*) as a shade for cacao, which grew so rapidly that in time the cacao was practically starved out and of these trees some 5,000 are now standing, in a various condition. A few years ago Mr O H Harrison, engaged in coffee planting in Chiapas, bought this property including adjacent lands containing wild rubber trees, for $12,000, Mexican. Within eight months he had sold in London enough rubber from the wild and cultivated trees to pay the purchase price for the property. This formed the basis for La Zacualpa rubber plantation. A like amount of rubber has been sold from the property each year since, and more land has been purchased, the cost of the whole having been met by the proceeds of the rubber sold. During this time there has been no outlay for labour in caring for the cultivated trees, beyond the collection of rubber. The land having been paid for, the proceeds of rubber sales will be devoted to dividends on La Zacualpa shares. Mr Harrison reports that these trees yield an average of at least 2 pounds of rubber a year—tapped once—and is convinced that a good profit could be made with a yield of half as much, which would give from 2 0 to 300 pounds of rubber per acre, according to the number of trees. The new planting on la Zacualpa plantation has been done with seeds from the productive trees referred to so that no doubt can exist as to the variety that is being planted.

PLANTING "CEARA RUBBER" IN NICARAGUA.

La Victoria Rubber Plantation has been formed at La Paz, Nicaragua, for the cultivation on a considerable scale of the Ceara rubber tree (*Manihot Glaziovii*). The location is on the Pacific slope where the rainfall is slight as compared with that in Eastern Nicaragua, and in other respects the conditions resemble those of the Brazilian state of Ceara, the native *habitat* of this species of rubber. La Paz is on the railway extending frow Grenada, on lake Nicaragua through the city of Managua to the Pacific coast, and is favourably situated for trade and transporation. This is a private enterprise, owned by George Adler, who for a number of years has given close study to the different species of rubber. Mr Adler is now in Nicaragua. The plantation manager is Fredrico Wagner. Alfred C Adler, of Waltham, Massachusetts, is also interested in the plantation. About 300 acres have been planted to date, and with such results in the growth of the trees that the work is to be extended.—*India Rubber World*, Nov. 1.

RUBBER IN AFRICA AND SOUTH AMERICA.

The following extracts are taken from an article by Emile Bonnechaux, explorer, published in "Le Vieux Corsaire":—

With the extending use of rubber and its thousand and one applications, a serious question presents itself. Will the forests producing rubber and bind weed become exhausted? Several trips to Madagascar and two voyages to Brazil for the purpose of exploring the forests may permit me to express an opinion on this subject. I believe that certain species will disappear in Africa, Madagascar and Brazil—in fact, in all the regions producing rubber now exploited.

Landolphias will disappear both in Madagascar and on the continent of Africa, by reason of the barbarous methods of extraction employed by the natives, which consist in tapping the bind weed close to the place where it issues from the ground, dividing it afterwards into sections about 20 inches in length, from which the milk is drained by placing the sections upright in a gutter of split bamboo supported above the receiving pail by two wooden forks. The *Euphortiacée intisy* will also be exterminated in the southern part of Madagascar. The *intisy* yields a milky juice, as rich as that furnished by the *Hévea brasiliensia*, but it is impossible to obtain it pure, as the natives allow the juice to flow to the ground, where it at once makes an amalgam elastic only in name. Besides, in their greed to obtain the maximum yield, the natives do not hesitate to tap even the tubercles of the roots, thus killing in one moment what nature has taken a century to produce.

Other varieties will also disappear. But there is one not indigenous to either Africa or Madagascar, which will not. It lives in the forests which are included between 8° north latitude and 8° south latitude. It is a native of Brazil, Peru, Bolivia, Ecuador, Colombia and Venezuela. The species is called Seringa in the Brazilian tongue. The botanical name is *Hévea*, one of the large family of the *Euphortiacées* which comprises a dozen varieties. The product of these trees is known on the markets of Europe by the name of Para fin, from the town of Para, near the mouth of the Amazon, through which all the gum passes. The denomination Para fin is, however, incorrect. The State of Para produces some rubber, but the greater part comes from the district of Amazonas, from Pern, etc.

In these countries, the *Hévea* has fortunately been protected. The extractors have every incentive to preserve the trees from injury, in order to insure an annual yield, which I estimate at from $290 to $347 for one hundred days of actual labour. Some affirm that the gatherers average from $8 to $10 per day. This estimate is exaggerated. The exploitation of the *Heveas* and other rubber trees of South America supports some 100,000 people. One can judge from this of the importance of this industry. The rubber tree is carefully treated here. Already the two States of

Brazil, Para and Amazonas, have regulations for the distribution of lands. Both have taken measures to protect their natural resources, in order to preserve the immense revenues obtained from them. Manaos, the capital of the State of Amazonas, a town of 60,000 inhabitants, alone receives 48,000,000 francs ($9,264,000) revenue from the export duty.

I can affirm with certainty that the States of South America included within these latitudes have inexhaustible riches, if they continue to protect them. Brazil and Peru in particular would alone be able to satisfy the consumption of the entire world in rubber. The time is not come for the exhaustion of these immense treasures. Although we penetrate now to the very sources of the large rivers, only the great arteries easily accessible have been explored; the small affluents, which, in my opinion, are even richer in rubber, are yet unknown. Yet it must be acknowledged that Brazil is less known in France today than Central Africa. The whole world has had its eyes turned toward the Dark Continent. The boundless forests on the other side of the Atlantic contain forests accessible to anyone desiring to go there. Marseilles is the port plainly indicated to become the headquarters of this trade and an important market for rubber.

Why should we not go to Brazil, to Peru, and bring gums of the first quality, so necessary for our new industry—motocycles and automobiles? The English and the Germans do this and are making fortunes. I know of one German house in Manaos which has realised from commissions alone more than $20,000 profit. There is also an opening for a French line of navigation. One English house—Singlehurst Broklurst, of Liverpool—had, twenty-five years ago, a few sailing vessels coasting along the eastern shore of South America, which touched at Para. Today, under the name of the Red Cross Line, this house has made a fortune. Within the year, the Germans of Hamburg have successfully established a line touching at Havre; the Italians have inaugurated a line from Genoa, touching at Marseilles. The French should learn the lesson.—*India Rubber Trades' Journal*, Nov. 10.

THE TRADE OF CEYLON.

A MADRAS REVIEW AND CRITICISM.

A LECTURE PROPOSED.

The present financial condition of Ceylon is attributable to a large extent to the centrical position that the island occupies at the southern extremity of Hindustan, with China to the East, Africa to the West, and Australasia to the South of it, but it is mainly due to the world's demand for the varied products of its fertile soil. Its prosperity depends, therefore, not so much on the large revenue that it earns as a port of call and coaling station, as on its trade. The success of that trade hinged during the latter half of the late century on two great staples, not simultaneously, but in succession. The first of these was coffee, in the production of fine descriptions of which Ceylon for some time distanced all competitors for the world's favour. For a considerable period, therefore, "coffee was king" in the island, and there seemed every prospect of its reign being extended for many a decade. But, at first little by little, and ere long by leaps and bounds, the production of other lands disturbed the status of Ceylon coffee, while diseases of the tree itself added to the downfall; and then, almost with a rush, coffee was deposed from its pre-eminence in the island. It looked at that crisis as though the beautiful island, with its unexhausted soil, and its variety of climates, would be, for most intents and purposes ruined. There was a limit to the world's requirement of cinnamon, cocoanut products, cacao, cardamoms, camphor, rubber, citronella oil, and other articles that Ceylon was in a position to grow to a large extent, and for a while, therefore, the outlook was grave indeed.

But eventually the prospect brightened, for it was perceived that salvation might be found in tea. The tentative efforts to grow tea from both China and Indian seed were so successful that estate owners and planters, who but recently had been almost on the brink of despair, not only pulled themselves together, but also pulled up the coffee bushes, and planted tea instead. Here a little, there a little, was the drastic experiment tried, and the more it was tried the more did the conviction gain ground that tea would yet pay "hand over fist." Thus it was that energies, numbed by unlooked-for failure in one direction, revived; and that Banks which had been compelled by the instinct of self-preservation to put the screw on planters in their distress, not only relaxed their severity, but gaily offered "facilities." So it came to pass that tea was escorted with all honour to the throne vacated by coffee, and was

PROCLAIMED KING.

As years glided by, tea increased and coffee decreased, until in 1900 the export of the former reached the great total of 149¼ million lb, while the export of coffee dwindled to 10,777 cwt. In other directions Ceylon did well, but it was chiefly owing to tea that the Colonial Secretary was able to conclude his Report or 1900 with the signifiant paragraph:—"The last year of the century was the most prosperosd in the history of the Island, and was marken by affluence and progress."

Ceylon is still affluent and progressive, but a change has come over its commercial position which it is easier to deplore than to repair; and one is irresistibly reminded of the cruel fate of its former fine trade in coffee, and therewith of the instability of human affairs. The Colonial Secretary, when reporting last; August on the year 1901, stated:—"Though the past year showed no such pronounced increase of revenue as the phenomenal year 1900, the general prosperity of the Colony is unimpaired." This can hardly be the opinion of shareholders in Ceylon Tea Companies. For example, on the 29th ultimo, at the Annual Meeting in London of the Associated Tea Estates of Ceylon (Limited), the adoption of the Report was moved by Sir Alexander Wilson, the Chairman, and Mr Bethune, in seconding the motion, said that "it was evident that little could be done in the way of dividends with present level of prices." Tea is illustrating the truth of the maxim that one can have too much of a good thing. There is a limit to all mundane things, and the limit has been reached, for the present at least, of the capability of markets to absorb teas at prices that cover the cost of production. In a word, supply has more than overtaken consumption, and the planter pays the piper.

It can hardly, therefore, be the case that the general prosperity of Ceylon is "unimpaired." It would be more consistent with regrettable fact to say that it has been not a little impaired by the Colony's disregard, in common with India, of the immutable laws of supply and demand. Ceylon is suffering from the very defects of its virtue, its energy, its enterprise. It cut in bravely for a share in a great trade, and by sheer merit it won

all but the most prominent position in that trade. It assisted India to oust China from her indigenous trade, and it then vied with India in a race that could have but one issue. The more the two countries grew of the staple the more were markets at a distance depressed, and prices drooped and fell, while the mischief of over-production increased as new estates or new "extensions" came into bearing. The pace was fast: the cry of "the De'il tak' the hindmost" was in the air; and the inevitable came to pass.

The Colonial Secretary was not as optimistic on the 1st September, 1902, as he was on the 8th August last, though there might have been some excuse for his being so, since he then had to relate how the last year of the century had crowned the edifice. He was put on his guard by the knowledge that while the year had witnessed an increase in the export of 20 million lbs., "the price realised in London fell 10 per cent. to 7·20*d.* per pound." He then proceeded to say:—"Cultivation is extending in Southern India, Java, and elsewhere, and it is feared that the full effect of over-production has not yet been felt, and that the tea industry has a trying period before it. The remedy would appear to be in selecting specially-trained managers, plucking for quality rather than quantity, improvement of the *jat* of tea planted, careful protection against disease, and improved methods of manufacture." The Colonial Secretary's forecast was borne out in 1901, and, notwithstanding his remark about the "unimpaired" prosperity of the Colony in that year, he had to report that, though the export of tea had fallen eight million lb. in the year, and that consequently the stock of Ceylon tea in England had been considerably reduced "the average price is the lowest as yet recorded, 6·861 against 7·20 in 1900." He could not disguise from himself that the new century had opened unsatisfactorily, or with a "year of depression, but he entertained the hope that "prospects are more favourable," as "towards the end of the year prices were considerably improved." But tea prospects are still calculated to cause much anxiety. It is well to put a good face on matters, to hope for the best, yet it is still undeniably true that "the tea industry has a trying period before it."

If tea should fail Ceylon she cannot fall back upon coffee, or, so far as can be seen, on any other great product. What then will she, what can she do in such a cruel dilemma? The Colonial Secretary remarks blandly, with special reference to 1901, that "there has been a slight revival in plumbago and no improvement in the prospects of tea, but coconuts continue to do well, and the many minor products in the Island are not unremunerative." It is true, he admits, that "the value of the trade of the Colony has fallen somewhat in the year under review, but later statistics show that there has been no further decline, and the prospects of trade are good." As it would be interesting to have his views in some detail of the paying possibilities of coconut oil, coir yarn, coir fibre, and minor products, he should prepare a lecture on the subject, and deliver it in the Colombo Chamber of Commerce, with open doors, and invite discussion thereon. He will deserve well of the Colony if he succeeds in showing how the best string in its bow can be replaced should the dread necessity arise.—*Madras Mail*, Nov. 19.

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TEA CULTURE IN TEXAS: U.S. DEPARTMENT OF AGRICULTURE SUBMITS PROPOSITION TO MAKE EXPERIMENTS; WANTS THE LAND DONATED.

WILLING TO BEAR CONSIDERABLY MORE THAN HALF THE EXPENSES AND DONATE THE CROP.

Some time ago Beaumont was visited by two representatives of the Unted States Department of Agriculture for the purpose of making a superficial investigation of this section with a view of finding a suitable location for making an experiment with growing tea in Texas. It is believed that the gentlemen were very favourably impressed with the country about Beaumont and a study of the soil and climate requirements leads further to the opinion that Jefferson county will prove suitable for making the tea experiments and further, that it will result successfully. When Congressman Cooper visited Washington recently he unproved the opportunity to call upon the chief of the bureau to plant industries and inquire the progress of this matter. He did not receive a definite reply at the time but was informed that the department would furnish him all information as soon as possible. In this connection Congressman Cooper has received the following very full report on the matter. Contained in the letter is a very explicit proposal which the Government will make and the matter is in some respects up to the people of this section to take hold of and further push the plan:

Washington, D. C., Oct. 4.—Hon. S B Cooper, Beaumont, Texas. Sir, Referring to your personal inquiry, made a short time ago, in regard to plans for work on tea in Texas, I have to say that we have been carefully considering various plans in connection with this work, and have been waiting to be in a position to give you some definite facts before writing you.

I may say that it is the desire of the honorable secretary of agriculture to make a commercial test of the possibilities of growing tea in Texas. It is recognized that there are large tracts of land in many parts of the southern states adapted to this kind of work, but the important question of labor has always been more or less of a drawback to the successful production of the crop in question. The work at Summerville, South Carolina, has demonstrated, we think, the possibility of growing tea commercially, but there is still much to be done before capital can be interested in the project on any extensive scale. Our idea is, that to achieve the best results the department should secure the co-operation of the people of Texas, an effort being made to establish a well equipped tea farm and factory; and, after the work is on its feet, to allow private parties to continue it, providing it is found profitable. The Government is precluded from making any improvments on land that it does not own, or lease for a period of years. The Secretary does not think it advisable for the Government to purchase land for this sort of work; he thinks that land sufficient for the the purpose ought to be donated by interested parties, as this will keep up an interest in the work which could not be maintained in any other way. The plan is to start with about fifty acres with opportunities for increasing this to

one hundred acres if it is thought desirable to do so. A one hundred acre tea plantation, properly managed and in the right locality, should yield in from six to eight years, ten to fifteen thousand pounds of tea annually. Of course the first two or three years there will be little in the way of yield, as it takes about three years for the plants to reach sufficient size for first plucking.

Briefly, the following outline of a plan has been prepared for this work :

1. Land to be furnished to the department free of charge, under a guaranteed tenure of not less than ten years.

2. Such labor as may be necessary in clearing the land and putting it into condition for planting to be furnished to the department free of charge.

3. Teams and ordinary farm implements such as plows, harrows etc., to be furnished to the department free of charge.

4. One-half the cost of all ordinary labor necessary in establishing and maintaining fifty acres of tea plants to be furnished to the department free of charge.

5. All buildings necessary for the work to be furnished to the department free of charge.

6 The department will furnish an expert superintendent who has had experience in growing and manufacturing tea.

7. The department will furnish all necessary machinery used in the manufacture of tea.

8. The department will furnish all seeds and plants.

9. The department will pay one-half the cost of ordinary labor necessary for the growing of plants and the handling of the product.

10. The product from the gardens will become the property of the donors of the land, but will be handled and sold subject to conditions which may be mutually agreed upon.

EXPLANATIONS.

The tea gardens should be located with due respect to soil, climate, rainfall and labor, particularly colored labor. The plans should be so made as to begin with not less than fifty acres with possibilities of extending to 100 acres within a few years, if it is thought best. The buildings required for the first two or three years will be small. After that, when the tea begins to come in in quantity, a suitable factory building will have to be erected. Such a building for a 100 acre plantation probably will not cost more than $1,500. The full equipment of such a building with machinery, etc., for the handling of the yield of 100 acres will probably cost from $4,500 to $5,000. This portion of the expense will be borne by the government.

In a few days we shall have two of the department's agents visit Texas, with a view to looking over the territory and deciding on the best point to locate. We want, of course, to make this work a success, and to do so the best location should be secured. As already indicated, labour plays an important part in the work. Proper soil and sufficient rainfall are also important considerations. Rainfall, however, we consider less important than the other features mention, if it is practicable to secure irrigation. The ideal location would be where there is plenty of cheap labour, where the soil is sufficiently rich to grow good crops of cotton or corn and where the rainfall exceeds fifty or sixty inches annually, or in lieu of this where irrigation water can be obtained in plentiful supply.

Thanking you for the great interest you have shown in this work, I remain, Very respectfully,

B T GALLOWAY, Chief of Bureau.

—*Beamount Journal*, Texas, U.S.A., Oct. 25.

BRITISH AND GERMAN EAST AFRICA:

FUTURE PLANTING DEVELOPMENT.

From the letter of a recent visitor to East Africa, we are permitted to quote as folows :—

"There is a great future for this East coast belt which, almost throughout, is splendid land for coconut cultivation combined with tobacco, castor oil, sem sem ground nuts, etc., whilst flooded intervals and flooded river banks,—*e.g.*, the Nori Tana districts—are ideal countries for the cultivation of rice and the date palm. No development of this sort can ever be done by the local natives, neither could it be effected in the same way in which Ceylon was first opened up by the European planter backed with a modest capital and his invaluable Tamil cooly ; for he naturally looked for a return in his third or fourth year. In my opinion it can only be done by Companies. Imperial Companies subsidised by a strong Government in some shape or form and by the introduction of tens of thousands of the surplus starving population of the agricultural districts of India. The Germans are far ahead of us: 10 or 12 years ahead of us in the development of their East African possessions. They have now plantations—both Government estates and those belonging to Imperial subsidised Companies—with roughly speaking 50,0000 (half in bearing) of coconut trees and thousands of acres of sisal hemp, yielding hundreds of tons of fibre. The cultivation is splendid and *thorough*, and they are now being repaid by enormous returns after patiently waiting *10* and *12* years to get something in lieu of gigantic expenditure."

BLACK *V.* GREEN TEA.

To the Editor of the *Home and Colonial Mail*.

Sir,—I hope you will allow me, as a shareholder in the Lanka Plantation Company and as one with an extensive knowledge of tea planting, to take exception to some of the statements made at the meeting of the company, a full report of which appeared in your last issue. I think it is a pity at the present time, when both India and Ceylon are suffering from an over-production of black or fermented tea, which has had effect of curtailing profits and producing a crisis, that the chairman of a well-known Ceylon company should deem it politic to discourage the efforts that are being made to relieve the pressure by manufacturing wholesome green tea for which there is a large demand. It should be quite immaterial to the planting interests whether the tea leaf is manufactured as black or green tea. They are both equally well-known articles of com-

merce, and it would be absurd for anyone to set up as an arbiter of taste to decide which should or should not be drunk. In America, at all restaurants and hotels it is usual to offer both black and green tea. It is a delusion to suppose that green tea, as manufactured in India and Ceylon, contains anything in the slightest degree resembling poisonous ingredients, and it is somewhat astounding to hear such an idea mooted.

I regret to see that one of the shareholders at the meeting (Mr Ford North) gave countenance to this idea by remarking that "unquestionably green tea is less wholesome than black."

It is unfortunate that meeting of shareholders interested in the production of tea should vote against a cess that has been, and is likely to still further be, an instrument in extending the knowledge of tea and opening up new markets in foreign countries.

I quite endorse all that was said by Mr Pettit on the subject. He was right in expressing his opinion that the whole of the cess should be used to encourage the manufacture of green tea, which, as he said, was not all unwholesome, and no one need drink it unless they liked it.

I trust in a year or two we shall obtain as considerable a share of the demand for green tea as we already have for black tea.—Yours faithfully, SHAREHOLDER.

London, November 18th, 1902.

—*H. and C. Mail*, Nov. 21.

THE CEYLON POULTRY CLUB MAGAZINE

has now (in its second number) fully developed and apart from the interesting and profitable matter taken over from the allied Indian journal, there is a practical Ceylon article on "buying and selling"—eggs, chickens, full-grown birds—well-worth reading. This is followed by local notes and comments and some short "fowl" ads. Mr. M J Cary is acting for Mr. S P Jeffery, as Hony. Secretary and Treasurer. All who have poultry should get and study this little journal.

THE INDIAN TEA CESS.

Indian Tea Association, Calcutta, 8th Dec., 1902.

To all proprietors and agents of tea estates.

The proposed Tea Cess. The subjoined letter upon this question is published for information.

W. PARSONS, Secretary.

No. 1001-O., dated Calcutta, 28th Nov. 1902.

From the Secretary, Indian Tea Association.

To the Secretary to the Government of India, Finance and Commerce Department.

I am directed by the General Committee of the Indian Tea Association to address you, in continuation of previous correspondence, upon the question of the proposed imposition of a compulsory Cess upon Indian tea.

2. This question was raised in March last by the representation to His Excellency the Governor-General in Council of a Memorial praying for the imposition of the Cess. The Memorial was signed by tea proprietors representing 416,140 acres of tea-bearing land. It received the favourable consideration of Government; and a resolution upon it was published by your Department on the 1st August last. In this resolution it was stated that the request of the memorialists would be acceded to if the tea industry were of substantially one mind on the subject. It was added that the necessary legislation would be undertaken, during the forthcoming Calcutta session of the Imperial Legislative Council, provided that no weighty or widely entertained objections were raised in the meantime.

3. I am now to express to His Excellency the Governor-General in Council the respectful acknowledgments of the memorialists for the sympathetic manner in which His Excellency thus consented to meet their request. They are fully sensible of the fact that legislation of the character in question cannot be undertaken without that practical unanimity to which reference is made in the Resolution. But the General Committee, speaking on behalf of the memorialists, are convinced that they are entitled to claim that the Cess has received the consent of practically the whole of the Indian tea industry. The acreage represented by the memorialists is equal to about 80 per cent. of the whole area under tea cultivation in India. But in the principal producing districts, taking them separately, the percentage is higher. In Southern India it reaches 100 per cent.; in the Bengal-Dooars 86 per cent; in the Brahmaputra Valley—the most extensive tea district in India—85 per cent; and in the Surma Valley 84 per cent. And even in those districts where the percentage is lower the movement is, nevertheless, strongly supported. Nor would it be right to assume that those proprietors who have not signed the Memorial are in even covert opposition. Indeed, the General Committee have good reasons for believing that an additional ten per cent. of the whole area may be safely regarded as, if not favourable, at least as neutral. The remainder would seem to be land which is chiefly in the occupation of small proprietors, both European and Native, who have expressed no opinion. The Committee regret that they are unable to furnish Government with statistics of the weight of tea annually produced by the supporters of the Cess. But, seeing that a majority of the best estates in the large districts are represented by the memorialists, it may be rightly inferred that, measured by this standard, the support given to the Cess reaches a higher percentage than when measured by the standard of area.

4. To summarise the position then it may, the Committee think, be said with confidence that practically the whole industry is in favour of the Cess being tried. Some proprietors may still be doubtful as to whether it will be, in the result, as successful as others anticipate; but the general opinion seems to be that the experiment should be made. Indeed, so far as the Committee can learn, no objections are entertained by any considerable, or in fact by any, section of tea producers. It is true that, in the course of the long discussion that the movement has provoked, something has been written on the opposite side. But it has been written anonymously for the most part, presumably by those who, not being themselves tea producers, are in the fortunate position of being able safely to give advice upon matters with which they are but imperfectly acquainted.

5. Believing, therefore, as the General Committee do, that the conditions laid down by Government in the August resolution are substantially fulfilled, they will now take the liberty of briefly ex-

plaining the proposals which have been formulated for constituting an executive body by whom the proceeds of the Cess may be administered. The ideal executive for such a purpose would undoubtedly be a small Committee of four or five experienced and capable business men, possessing the confidence of tea-producers. But the peculiar circumstances and conditions of the industry preclude the possibility of such a body being called into existence. For it is natural and right that all those who pay the Cess should expect to exercise direct control of the expending of its proceeds; and in the following proposals this expectation has been kept steadily in view.

6. It is proposed to form an Administrative Committee, consisting of members representing (*a*) tea-growers; and (*b*) the general commercial community. This is the principle underlying the constitution of the so-called "Thirty" Committee, by whom the Ceylon Cess Funds are administered; and it appears to be so sound that it has commended itself to the Indian industry. In the appointment of the members representing tea-growers it is advisable that both large and small tea companies, and private proprietors also, should, if possible, have a voice. After most careful consideration it has been agreed that this can be best ensured by permitting every tea district in India to appoint a representative, or more than one; and also by allowing the Indian Tea Association of London, and Calcutta, each to make appointments. The question of the representation of the general commercial community has been solved by inviting the Bengal Chamber of Commerce to agree to nominate three of its members. These nominations the Chamber has consented to make; and it is understood that, of the three members, one will be the President of the Chamber for the time being, and another a prominent banker.

7. There still remain the following points: (*a*) the number of members; (*b*) the precise method by which they will be appointed; and (*c*) their duties. Regarding (*a*) it is recognised that to provide for the equitable representation of the different districts is a matter of some difficulty. A proportionate representation, based on acreage or outturn, would be in theory the most desirable. But in practice it would give so great a preponderance to Assam and Bengal as to be unacceptable to the smaller districts. The most feasible plan will be, it seems, to allot two members to the Brahmaputra Valley, and one member to each of the other districts. These latter are Cachar, Sylhet, Darjeeling including the Terai, Jalpaiguri (the Dooars), the United Provinces (Dehra Dun and Kumaon), the Punjab (Kangra), Madras, and Travancore. There will thus be ten representatives of the various tea districts. The Indian Tea Association (Calcutta) might appoint five members; and the Indian Tea Association (London) two members. The Bengal Chamber of Commerce will, as has been stated, appoint three members. The new organisation will, therefore, consist of twenty members.

8. Taking now the second point (*b*) it is proposed that the district members should be appointed by the local Associations in such manner as may seem to them to be desirable. These local Associations are very representative of each district; and are the only existing machinery by which the appointments could be made. The nominees of the Indian Tea Association will be elected at ordinary or special general meetings of the Association. And it is left to the Committee of the Bengal Chamber of Commerce to decide upon the mode of appointing the three representatives of that institution.

9. To discuss the duties of the new Committee is no easy task at this stage. But judging from its composition there can be little doubt that not more than one meeting at which all the members could be present, could be held in the course of the year. Early in December would probably be the most convenient time for this meeting; and at it a programme of work for the ensuing year could be drawn up and decided upon. So far as can be seen at present the work of carrying out the programme would, of necessity, devolve largely on those members who would remain in Calcutta throughout the year. But, of course, every member, whether a Calcutta resident or not, would have to be kept fully informed of all business transacted. Seeing that many details of the work will have to be carried out in London, it will probably be found necessary to appoint a small London Committee to work in conjunction with the governing body in Calcutta.

10. Such is in outline the scheme of administration which has been submitted by the General Committee to every district Association in India. Speaking broadly it has been approved, although, as is but natural, some districts have thought that the number of members allotted to them is insufficient. But the necessity for keeping the total number within workable limits is now, the General Committee think, fully understood; and they are persuaded that the scheme is accepted, as an initial measure, by all concerned. Time and experience will no doubt suggest many alterations and improvements; but it may, at any rate, be fairly claimed that the executive which will be created under the scheme will accurately reflect the views of practically the whole industry as it at present exists.

11. In conclusion I am to express the earnest hope of the Committee that it may be possible, as is anticipated in the Resolution, to pass the Cess into law during the coming session of the Legislative Council. It is in view of this that the present letter has been written; and it is almost needless to add that, should any further information be required, the General Committee will gladly and readily furnish it.

12. A statement of the statistics upon which the percentages quoted in para 3 are based is annexed:

STATEMENT.

	Area under cultivation. (a)	Area in favour of Cess. (b)	Percentage. (c)
Brahmaputra Valley ..	204,985	174,426	85
Surma Valley ...	132,342	111,512	84
Darjeeling ..	50,769	24,388	48
Dooars ..	76,278	65,527	86
Chittagong & Hill Tracts	4,241	1,738	41
Chota-Nagpur ..	3,284	448	14
Kangra Valley ...	9,745	4,501	46
Dehra Dun & Kumaon ..	8,055	2,029	25
Southern India ..	31,309	31,576	100
Total ..	521,008	416,140	79.87

Note.—The area under tea in Chittagong, Chota-Nagpur, the Kangra Valley, Dehra Dun and Kumaon is chiefly divided among a large number

of small proprietors, many of whom sell much of their produce in India, and are, consequently, more or less indifferent to the Cess.

The figures of area are taken from the Director-General of Statistics' Report published on the 28th June 1901, which was the most recent issue when the Memorial was sign.

THE LABOUR QUESTION IN CEYLON: RECRUITING IMPERATIVE.

Short crops, low prices, and a poor labour-supply are a trinity of evils which dog the planter and help at times to take much of the brightness out of his life. Met singly, either of these evils are worrying enough; while a combined attack would be hard to put up with for any length of time. Although evils are said to be social in their disposition, and dearly love companionship, never appearing singly—as we are proverbially told—yet it is not often that the planters' dreaded trinity, are found in each other's company, or that he is called on to entrench himself against their combined advance. Short crops and low prices do not run as a pair at all, their natures are antagonistic, it is only the third item in the trinity, a short labour supply, which can work its evil way in the companionship of either of the others. A short crop and a short labour supply are possible, indeed, the latter, if in much evidence, may be the creator of the former and low prices and a restricted labour market have been, alas! common enough during these late lean years through which the planting industry has passed. Now, however, that the tea prospects are brightening, the danger immediately ahead of the planting industry is emphatically the labour question, and if that could be satisfactorily solved, it would lift a burden which, at present, oppresses the mind of many a man; while it would be conducive to the easy-running of estate work, and productive of the best results. Not that a superabundance of coolies is at all a blessing; for to have too many, we are told, is even worse than to have too few, leading as it does to slackness, short time, and poor check-roll balances, paid for later on when the inevitable reaction sets in, whereas the short out-turn, and the clamorous demands of fields claiming attention, whet the planter's wits, and often results in much cheaper working than was possible when the ranks of the morning parade were crowded. That the present labour force in the island has proved adequate on the whole during the last few months, is the result of the abnormal weather which lately held back flush, and fought on the side of the small battalions; for if the conditions had been otherwise—nature beneficent and the measure pressed down and over flowing there would certainly have been weedy fields, a weary pursuit of a runaway flush and a worried planter who hardly knew what end of him was up. The ease with which the busy season has this year been got through, ought not, however, to deceive nor create a fool's paradise. Coolies at the end of the busy months always get restless; "tundus" are in demand, and the labour of the country gets shuffled for the new deal. Early as it is, we are informed, that already the flight of the "tundu" has begun, and those desiring immediate reinforcements to their labour force, are staggered at the amounts demanded to effect a transfer of the scant and ragged following by those who possess them. If the debts of the cooly generally were at all in proportion to what appears as the face-value of these early movers, things would be in a very bad way indeed; but most estates, which have heavily indebted gangs, are willing to be inconvenienced for a time by their transfer to others, with the hope that later on, the same outlay will replenish their now repleted force to double the present outgoing. But this shifting does nothing for the country as a whole—though individual estates may benefit—nay, it but locks up more of the planter's money in his advance account, which is the most unprofitable item in his finance; demanding a wary watchfulness, a bit and bridle to keep in any kind of order, and liable to sudden upheavals and depressions which end at times in the gall and worm wood of "writing off." The bidding up of advances is, without doubt, brought about by the desire to possess a trained force, and the unwillingness of kanganies to recruit. It goes without saying that the expert field-hand is a desirable possession as compared to the raw arrival who must make sad havoc when turned loose on the tea flush; but the planting districts are unanimous that without new blood the labour-supply will fall far short of the demand, and soon the cooly will rule. To recruit is, therefore, an imperative necessity on all employers of labour, and if the old supply-fields are worked out, new ones must be found to save the situation. If estates are to have a competitive labour era, even of a short duration—when planter will vie with planter in bidding for coolies—the prospective profits from increased prices, will, to some extent, vanish. Ramasamy will play the increased advance game for any length of time. He has an unstable estimate of his own work which ranges from next to nothing up to his full weight in silver, and as he is much influenced by his "durai's" action and opinion he reflects accurately the planter's mind, settling quietly down when the tide runs in favour of restricted advances, or he becomes a restless insatiable nuisance—a daily demander of "tundus—when he sees and hears of lavish out-goings. At the back of the cooly there are those too who press him when they think that more coin will be forthcoming if trouble be taken to make estate-labour unsatisfactory and restless:—chetties, kaddie-keepers and such like. The planter is himself the barometer of the labour market to a great extent, which is read by all men, and especially visible to the keen gaze of the needy kangany. When the planter gets excited and thinks that his force is going to be hopelessly short, he reflects this in his manner, and up goes the advances. If he suffered alone it would be nothing, but his whole neigh-

bourhood is more or less affected, and has to rise with him, to some extent, however, unwilling it may be.

In the old coffee days it was in the early months of the year that coast advances were given out, and it might be well for the planters to make a united effort *now*, and by pressure and persuasion try to re-open old labour channels, or exploit new ones. Ceylon has ever been a favourite place with the Tamil labourer, and ths experience of the past has been that when recruiting has been energetically taken in hand, the Tamil has responded. Kanganies, we are told, are disinclined to recruit —the field is worked out they say— but it may be that the kangany, in many cases dislikes the trouble, finds new coast coolies unsatisfactory at first, and would rather trust to a new labour struggle and higher stakes. What the planters have got to do is to make their backs stiff, insist upon an infusion of fresh blood, and although there may be disappointment to some, the result will, on the whole, we believe, prove satisfactory. Anyhow the bidding of planters against each other for the resident cooly is simply suicidal:—through that way there lies no avenue of hope.

TEA IN THE CAUCASUS.

INDIGENOUS TEA IN SIAM.

(TRANSLATED FROM FRENCH AGRICULTURAL MAGAZINES FOR 'CEYLON OBSERVER.")

We have before us three such magazines: the *Journal d' Agriculture Tropicale*, published by M J Vilbouchevitch; the *Revue des Cultures Coloniales*, by M A Milne-Pontingon, also published in Paris; and the *Bulletin Economique*, issued by the Government of Indo-China at Hanoi. One is impressed by the earnest attention devoted to tropical cultivation and the scientific study now given at head-quarters, Take the last of the three named magazines, the September number for this year opens with an article on Tobacco in Indo-China, its Botanical Name and Characteristics, Native Methods of Culture, Harvesting, Yield, Preparation and Treatment of the Dried Leaf, Markets' Values and its Distribution throughout Indo-China. Then follows a Paper on a Practical Experiment in the Cultivation of Ramie Fibre in Bengal, founded on a letter from M Karpelès about his experiences in the north of Behar. These articles are both full of the information that an intending planter requires.

The *Journal d' Agriculture Tropicale* is very carefully edited and contains numerous brief articles upon Recent Inventions in Machinery as well as Agricultural Processes or Experiments. In the commercial portion, a notice of Tea in the Caucasus is of interest:—"The Report of the British Consul of Batoum of November, 1901, shows that the success of Tea in Caucasus has been much exaggerated. In the district of Batoum receipts of Tea did not exceed 13½ tons, (29,240lb) It is only 10 years since the first tea was planted. The only two important producers are, until now, the Domaines Impériales at Chackva and the firm of Messrs. Popoff, well-known in the tea trade. In the former 164 hectares (390 acres are opened, but only 42 (105 acres) in bearing, having given 9,784 kilos (21,524lb) tea. The plantation of Messrs. Popoff, only three years old, is of about 125 hectares (312 acres about) with 32 (80 acres) in bearing, having yielded 4,000 kilos (8,800 lb.) of tea, 9 francs the kilo (3s 5d per lb.) was the price of the best quality. Seed is being distributed to the peasants, but the figures quoted are nothing to cause alarm to Ceylon or India. In a favourable year four harvests may be made, beginning in the end of May and the others at three weeks' interval." Another chapter on "Kapok or Vegetable Ivory," the various sources of supply; trees used in Java and the value of Kapok as an industry.

"*Tea in Xien Mai* (Siamese Laos), regarded as a European enterprise," is the summary of information derived from the Report of the Vice-Consul of France at Nan. Tea trees grow spontaneously and on large areas in most of the higher valleys of the chain that divides the waters of the Méping and the Mé-Lao and Woung, as well as between these rivers and the Mé-Ing and the Mékong. These forests of tea-trees, known as "Va-Mieng" are cropped principally between the Mé-Ing and the Mé-Lao. But everywhere the natives, generally Khamous from the left bank of the river, crop only a small quantity, for which they pay a slight due by no means legal, to the village chiefs, or even to the first occupant who discovered this forest. The croppers content themselves with taking off the leaf stalks without any cultivation or attempt at multiplication. Four times a year they harvest the leaves, the first being the best; the green leaves piled up in small packets and first of all boiled with steam, are left aside during two months and, after this maceration, sold under name of "Mieng" for chewing, at about R12 the 60 kilos (135 lb.) The natives do not know that this same "Mieng," sold at this low price, is nothing else than tea. Even were they told this, they would not know how to prepare it But it is certain the rational cultivation of these large groups of trees by an experienced colonist and with the help of head coolies imported from China or Ceylon, would give excellent results in a region so highly favoured by nature. This should be quite as remunerative as the cultivation of teak forests now so largely carried on there with European capital. It would have the advantage of requiring smaller capital and of being carried on for long periods, whereas the reserves of teak are being exhausted. Nothing would prevent a forester from carrying on the two cultivations. Besides, the working with teak presents this peculiarity that although a large staff of workmen must be hired by the year, yet they are often inactive, while waiting for a temporary rise that shall enable them to float some logs in the small streams, and there may be a further idle time while waiting for the next storm. Such enforced leisure might be well utilised.

The *Revue des Cultures Coloniales* seems especially valuable for its notices of recent Literature bearing on tropical cultivation whether English, French or German, though it also has long articles on planting subjects.

CARDAMOM CULTIVATION AND CONSUMPTION

The letter from Major Gordon Reeves affords a clear and straightforward explanation of the circumstances under which he has taken a lease of 45 acres of Crown land; and we cannot see any ground for

complaint, unless it be that such leases should be put up for competition, quite as much as land sold on freehold terms? It may be argued, of course, that Government should discourage the alienation, under any terms, of land avowedly intended for the cultivation of cardamoms, just as much as land for tea, under present circumstances; but 45 acres more or less cannot make much difference, and the transaction having been put through, we should say leave it alone, although it will be observed that Major Reeves is quite willing to give up his bargain, on being refunded his actual outlay.

There can be no doubt that Mr. J. A. Hunter's letter about increased crops in Travancore has created a scare among Ceylon cardamom planters. One of them (in a letter intended to reach us a week ago, but which through misdirection, only arrived yesterday) says:—"The question is whether old Cardamom growers in Ceylon, have India or the Ceylon Government to dread most? In India the planters have no doubt as to holding their own in the struggle with their compact estates and cheap gathering. Locally we have the possibility of more leases on nominal terms and free grant holders of land equally well adapted for the growth of this soon-to-be-over-produced *new product*, competing with lands originally bought from the Crown. I think it hardly fair of Government to look upon an industry which has helped Ceylon for the past 25 years as an 'experimental product,' and it, we are told will in a year or two be wiped out of Ceylon by its more formidable rival India. *Poor Ceylon*—is there nothing she can try which will not be over-produced?"

Now cardamoms are in large demand all over India. No spice is a greater favourite with the people of all grades and castes who can afford to purchase it. If it be expedient to exploit Indian markets, bazaars and towns with tea, how much more, we should say, with cardamoms! We recall one of the largest producers of cardamoms in Mysore informing us that he sold every lb. of his crop in Calcutta or Madras and shipped none to Europe. Cannot Mr. J. A. Hunter urge the Travancore planters to do something of this kind? to join forces with the South of India tea exploiting Syndicate, and get their cardamoms introduced into all likely quarters. Of course, there is a certain local market in Travancore itself, just as there is in Ceylon, for a portion of the crop, and we should fain hope as the prosperity of the natives locally extended, so will the market for cardamoms extend. But exploiting is, no doubt, very necessary: cardamoms are not a necessary, a food product, like rice, or coconuts, or even tea; but if they were brought before the people in every town and bazaar, at a moderate price, we should expect a much greater local consumption than is at present reported. Cannot our correspondent, "An Interested Planter," test some of the markets within his reach, for himself? A trustworthy agent might sell small parcels to the bazaar-keepers at a distance from the cardamom-producing districts, and we should like to know how the markets of Batticaloa, Trincomalee, Jaffna, as well as Galle, Matara, Hambantota, etc, are served with cardamoms? If not readily procurable, very probably the boutique-keepers and the people make up their minds to do without the spice, when if made readily available, they would as readily make purchases The strong objection we have to the open sale of opium in our villages,—that people who never used or saw the insidious, as well as dangerous, drug before, are tempted to become customers,—involves the principle which would tell favourably in the case of a wholesome condiment like cardamoms, and a food-product like tea: make them freely and cheaply available in town and village where they may be at present unknown and a permanent demand is sure to spring up.

EXPERIMENTAL CULTIVATION OF TOBACCO IN BURMA.

Two important attempts at experimental cultivation were made in Burma last year with, as far as can be gathered from the Land Records Administration Report, imperfect results in one case and practical failure in the other. In one case 12 pounds each of Havana and Virginia tobacco seed were distributed among the cultivators—the Havana seed, chiefly in Lower Burma and the Virginia seed in Upper Burma. The results, however, were very chequered. The experiments with ground-nut seeds imported from Pondicherry were on the other hand a failure in the great majority of cases.—*M. Mail*, Dec. 12.

SERICULTURE IN BENGAL.

The Government of Bengal, reviewing the report of the agricultural branch of the Department of Land Records and Agriculture for 1991-02 remarks that the efforts of the Bengal Silk Committee to assist production of healthy silkworms were attended, except in the district of Birbhum, with successful results. Enquiry is being made into the causes of the failure of the operations in that district. To enable the Committee to further expand the scope of their operations and to meet additional expenditure in connection with the erection of new model nurseries in the centres of important silk districts, the annual grant of R3,000, hitherto made by Government, was raised to R6,000 for the year 1902-03, with the prospect of its being continued at this increased rate for two years more. The course of sericultural instruction imparted at the Rampur Boalia Industrial School was remodelled on a more popular basis, the main object of the school being the training of cocoon rearers' sons. In their case the course of training was reduced to six months, and no educational qualifications are required. The one-year rearers' class has been retained for educated students to be trained for the posts of sub-overseers and inspectors in the villages. To encourage the training of rearers' sons in the elementary course, the majority of the District Board scholarships are to be assigned to them.

From the report we gather that Malda is a long way ahead of other silk districts in the number of intelligent rearers, who have learnt modern

ideas. The Committee are planning some interesting experiments with ruby and ultra-violet coloured glasses. Ruby colour is beneficial to insect-life, and it is expected that worms grown in a ruby light will grow to a large size. On the other hand, it is said that microbes cannot exist under ultra-violet rays. Experiments were also tried with worms grown from European seed. Moderate success was achieved, but the Committee have decided not to continue these experiments. They are more hopeful of the results to be obtained by using hybrid seed, bred from the male European, and the female Indian moth. The hybrid seed is multivoltive. Some very fine cocoons have been produced from hybrid worms in the Chandpur nursery.—*Planting Opinion*, Nov. 22,

CONCESSIONS FROM MEXICO.

CONCESSION FOR PEARL FISHING.—A despatch dated 5th November has been received at the Foreign Office, from H. M. Consul at Mexico City, forwarding a copy of the Mexican "Diario Official" of 30th ult., containing the text of a concession, in the form of a contract, granted by the Mexican Government to Messrs. Santa Cruz and Oliver for the purpose of exploiting for ten years the mother-of-pearl to be found from the mouth of the Rio Colorado South to the Port of Manzanillo and on the shores of the islands in the Gulf of California known as Tiburon, San Esteban, San Pedro Martir, and San Pedro Nolasco. The concessionaires are also allowed, during the same period, to exploit the sheep and goats, phosphates and sulphates which exist on the islands of the Revillagigedo Archipelago in the Pacific Ocean, and also within a zone extending ten kilometres (six miles) round the coast of the last mentioned islands to exploit the fish, shell fish, and whales, the islands referred to being: Socorro, San Benedicto, Roca Partida and Clarion, as well as the oysters to be found on the last mentioned. The concessionaires are obliged to respect previously established fishing rights, especially those of small fishermen. By Article 4 the concessionaires will pay in rent as follows:—1 dol. for every ton of fish or shell-fish, 10 dols. for every ton of mother-of-pearl, 3 dols. for every ton of whale oil, 2 dols. for every ton of ordinary turtle, and 50 dols. for every ton of the Eretmochelys Imbricata producing tortoise-shell, 10 cents annually for each head of cattle given pasture on national lands within the zone, 50 cents annually for every hectare (2·471 acres) of national lands cultivated, 20 cents per ton of oyster shell, and 50 cents per ton of phosphates and sulphates which they will work, 50 cents for each sheep or goat utilised, besides an annual fixed sum of 400 dols. They must construct within three years a factory or packing house to tin, or otherwise preserve, the produce of their fisheries. They may build the same free of any charge on any national land within the zone of their concession. They will have to begin work within one year from the date of the present contract, and must contribute 12,000 dols. annually towards the expenses of Government inspection. It is interesting to note that among other reasons the contract will become void by paragraph 7 of Article 17 "for having given over the concession or having admitted into partnership any foreign Government or agent of such Government," but by Article 20 the concessionaires and the company which they may form shall always be considered as Mexican even if one or all of its members were foreigners, and will in all cases be subject to the Courts of Law of Mexico. They cannot ever claim under the contract any rights in International Law, neither will they be allowed to make any appeal to any foreign Diplomatic Agent. The same number of the "Diario" contains another concession of a similar nature granted to Mr. R Gilbert for prawn, lobster and sponge fishing off the coast of Yucatan, between Cape Cangrejo and Punta Flor.—*Board of Trade Journal*, Nov. 27.

PLANTING NOTES.

ARTIFICIAL CAMPHOR.—According to an American patent article camphor (identical with natural camphor) may be prepared by treating water-free turpentine with oxalic acid, whereby pinyl formate is produced. This is distilled with lime, and bornoal and camphor result, which may be distilled off.—*Pharm. Central*, 1902, 566.

CACAO FOR GERMANY—SAMOA.—A Decree issued by the Governor of Samoa, prohibits the importation of cocoa seed and cocoa plants into that island from Ceylon and the Dutch East Indies, and only permits such importation from other countries subject to previous permission of the Government. The decree was to have come into force on the 6th September last.

PEPPER AND OTHER PLANT DISEASES.—The Annual Report of the Government Botanist, Madras, has just reached us, and we extract the following:—

A disease in the Wynaad pepper plantations received a certain amount of attention. After a careful examination of the specimens received it was decided that study at a distance was useless. Several pests were found, and it is always a matter of difficulty to determine which of these has attacked plants weakened from some other cause and which has made an onslaught on originally healthy plants.

The following were dealt with:—Rust in wheat from the Palnis; minute insects (Aptera) among Cinchona seedlings, determined to be harmless because of the character of their mouthparts; smutted Sorghum, remedies suggested and a scheme of experiments with recent methods drawn up for the Saidapet farm; turnip fleas (Bagrada picta) in the Ootacamund gardens; plant bugs (Nezara viridula var.) in the gardens and notably in the Cinchona plantations; difference in colour of coffee beans; a destructive outbreak of green scale (Aspidiotus Camelliae) in the Kanan Devan Tea plantations; a coffee-root fungus in Coorg; a disease of the prickly-pear, unfortunately received in bad condition; Striga enphrasioides, etc., as pests in badly cultivated lands; sand-binding plants as protection on the East Coast; salt bushes as fodder plants; the requirements of the Durian tree as regards climate and elevation; fibre machines suitable for "Aloe fibre"; and questions on Hydnocarpus, mosquitoes, Balsamodendron Berryi as a hedge plant, various species of Cassia as "senna," Tephrosia or "wild indigo" for green dressing, and many other references of minor importance.

Correspondence.

To the Editor.

MR. R. V. WEBSTER AND PURE CEYLON TEA:

"THE MAN FOR ST. LOUIS?"

Cullen, N.B., 4th Nov., 1902.

DEAR SIR,—I enclose a booklet that came to hand last night, sent by Mr. Webster and, I think, you will admit there is food for reflection in its contents:—

(1) Mr. Webster has for twelve years sold only pure Ceylon teas.

(2) He has hitherto sold them all in "foreign countries" and till now has sold none in Great Britain.

These I take it, are the essence of the aims of the "Thirty Committee's" efforts and yet what recognition or assistance has he received at their hands*? I recollect advocating his cause on the Planters' Association Committee or "Thirty Committee" some years ago, about the time he was complaining that not only had his teas sent to Chicago Exhibition been improperly exhibited, but that the very copies of his illustrations in his booklet has been pirated by an opposing firm; but my efforts bore little fruit. Years have passed since then, and while the business of almost every Ceylon planter, who started tea-vending, has become bankrupt or sunk into insignificance, Mr. Webster's business has increased all over the world, till it is now of considerable magnitude, and he is this year spending about *£5,000 in advertisements alone*, and hopes to bring his sales up to three to four million pounds.

He mentioned in conversation that he seriously contemplated making a new departure and selling blends with teas of other countries in them, as he could purchase Indians at better values than Ceylons, and as although he had consistently sold pure Ceylon teas hitherto his efforts had hardly been recognised, while he saw others subsidised with Ceylon planters' moneys, selling blends containing Indian and China teas.

Till this booklet came to hand I was unaware that he had carried his ideas into execution and in losing him as a vendor of exclusively pure Ceylon teas we have lost the most enterprising and successful man who handled them. Under the circumstances he is quite right to handle the teas which will give him best returns, but whether the "Thirty Committee" would not do well to try and induce him to again handle purely Ceylon teas is another matter. I believe it would pay them well to do so.—Yours faithfully,

L. DAVIDSON.

P.S.—Mr. Webster told me that a shopkeeper in one of the ports, where the Boer prisoners landed, secured 100 boxes imported, duty free, cheap, from the prisoners "with the compliments of the Planters' Association" on them. L. D.

[*How long ago is it since Mr. Webster drew £500 from the Cess Fund—and was he not favored at the Paris Exhibition?—ED. *T.A.*]

THE COCONUT—AND QUESTIONS FROM AUSTRALIA.

Wahroonga, New South Wales, Nov. 17.

Sir,—Will you kindly inform me if coconut oil suitable for use as a substitute for dairy butter, mutton, beef and hog's fat is produced in Ceylon? If so is the oil made from the fresh nuts or from copra? What other articles are produced from the coconut that are suitable for use in connection with human food?

About how many tons of copra are shipped from Ceylon per annum, and how much coconut oil and how much of other coconut products? I would like to see a copy of your paper with reply to above questions.—Yours,

M. G. KELLOGG, M.D.

[Dr. Kellogg will find a good deal of the information he wants in our "Manual of the Coconut Palm" and the needful statistics in the copy of our "T.A." we send him. No doubt his enquiries are prompted by the fact that owing to the drought in Australia almost extinguishing the export of lard, coconut oil, "butter" and other products of the palm are in special demand.—ED. *T.A.*]

BEANS—AND BEANS.

Boer Camp, Nov. 20.

DEAR SIR,—Can you give me any particulars concerning the *Tongan Bean* advertised in your columns:—whether a heavy cropper or otherwise and if usable as a good cooking bean. I am forwarding you another *bean pod* which is strange to me, and the name of which I would like to have and also any other particulars concerning same. I have no doubt the information may be interesting to others besides—Yours etc.,

VISITOR.

[The Tonga, Tonka or Tonquin bean is the *Dipterix odorata* of botanists and this is what we are told about it:—

"*D. odorata* yields the fragrant seed called Tonquin, Tonka, or Tonga bean, used for scenting snuff. Perfumers also obtain an extract from it, which forms an ingredient in some bouquets, and the pulverised seed is employed in the preparation of sachet powders. The odour resembles that of new-mown hay, and is due to the presence of *coumarine*. The tree producing these seeds grows sixty or eighty feet high, and is a native of Cayenne. The fruit bears some resemblance to that of the almond tree, and the seed or bean is shaped like an almond, but much longer, and is covered with a shining black skin."

The bean pods sent by our correspondent are surely of the ordinary broad-bean species—a little varied by climate and mode of cultivation? To settle the matter, "Visitor" should send a pod and leaves to Mr. Nock of the Hakgala Gardens.—ED. *T.A.*]

THE COCONUT OIL PUZZLE.

Nov. 22.

DEAR SIR,—You drew attention last week to the sudden drop in the value of coconut oil by 25s in the London Market; but you did not note the rise by 20s just before—I believe the day before. I have heard the remark, which I saw in print, confirmed by business-men who ought to know, that no one seems to understand the course of the Oil and Copra Market. Is not the price of copra much below what it ought to be, having regard to the price of oil, even after the drop? We have drifted into the season of small crops, and yet the price of nuts seems to have receded, instead of advancing; and notwithstanding the very heavy crops reported from all districts, the exports scarcely show any advance. Oil is ahead of the last four years, but copra and nuts in the shell are lagging behind.—Yours, PUZZLED.

COCONUT CULTIVATION IN CEYLON.

DEAR SIR,—I do not intend appearing before the public as a teacher but as an earnest learner, and as one who has made a study of practical agriculture since he engaged in planting, twenty-eight years ago.

It is an axiom in Agriculture, to conform as nearly as possible with the natural conditions under which a product grows, when its cultivation is engaged in.

Now what are the natural conditions under which the coconut-palm grows? Its original habitat was the sea-shore on which the nuts were thrown by the action of currents and waves.

The conditions, under which the tree grew and flourished, were on a free, sandy soil highly impregnated with salt and in an atmosphere that was salt-laden.

The extent of land that answers these conditions is limited, and as the cocouut industry is a sure and certain one, and does not partake of the nature of gambling as some other industries do, the cultivation of the palm is carried farther and farther away inland, and it is removed farther and farther away from the natural condition under which it grows.

According to my thinking, the first and foremost aim of the coconut planter should be under these altered conditions to conform as nearly as possible with the natural conditions under which the palm grows. Here he will find scope for the exercise of intelligence and ingenuity. If he has a stiff, clayey or gravelly soil to deal with, he cannot make it sandy; but it is possible for him to make the soil sufficiently free, to allow of the free passage of roots through it. The first operation should be deep draining. The free passage or water and air through a stiff soil, will help to gradually alter its mechanical condition. An estate scored with drains, will have its transport arrangements interfered with. The drains should gradually be filled up with coconut branches and bushes, first along the line of a road The dramage of the soil will not be interfered with, by packing it with branches, till such time as the bushes are thoroughly decayed and forms, a compact mass. This will take many years, by which time, the roots of the palm will through the soil of of water saturated with decaying bushes cannot but add to its fertility.

Another operation, as for more necessary than draining, is to keep the soil round the trees in a thorough state of cultivation. If this can be undertaken when the plants are young, the benefit to the resulting trees will be very great. The large foraging roots will be helped to leave the surface of the ground and to obtain water for the use of the tree from the soil where it is permanently damp. Rain water will percolate through the soil, and there will always be moisture for the roots to draw upon in a season of drought. The feeding rootlets will have unrestricted liberty and manuring operations in later years will not be costly. If the tilling of the soil should take place when an estate is young the circle tilled should be enlarged annually till 8 or 10 feet radius be reached. I am inclined to the opinion that with this surface round a tree kept in thorough cultivation by tilling and manuring, ploughing will not become a necessity.

Where tilling of the ground round trees is undertaken in later years, I would suggest a complete turning over of the soil, so that the rank growth of grass, always to be found on a heavy soil, be turned into the soil. The benefits of green manuring will be attained by this. This will of necessity result in the cutting of the roots of the tree. Some people object to this, and think it will be harmful to the tree to injure the roots. The harm will be temporary, the gain from the operation of tilling will be enduring. I do not feel any squeamishness in injuring the roots of the coconut palm. Observation will show that the bole of the tree is constantly putting out new roots to replace those that are injured, which generally die.

I am of opinion that the roots of the coco-palm have no functions to perform on the surface of the soil, and that they are there by reason of the mechanical condition of the soil not permitting them to be where they should be, deep down below the surface of the ground performing the function of pumps. A coco-palm has no tap-root, and the main roots, I am inclined to think, perform all the functions of the tap-root. Observation induced this belief in me. The lateral or main roots of trees, generally spread out parallel with the surface of the soil and horizontally. The main-roots of the coconut tree have a downward direction, and in a sandy soil, as in its natural *habitat*, they generally go deep down into th ground. They are found on the surface, only when the condition of the soil does not permit them to go where nature intended they should be. I think it is for this reason—want of sufficient moisture—that the branches and fronds of young trees growing on stiff soil, hang down as a rule, while the exception is to find it in a sandy soil, where when it does occur, it is in a different degree. When roots are to be found on the surface of the soil, I think it is evidence that that soil has not been regularly cultivated and is crying out to be.

Observation shews us, that the butt-end of the mid-ribs of the fronds of the coco-palm is shaped like a spout. During a shower of rain, these catch the rain-water, and a stream runs down the stem or near it. I look upon this as a provision of nature to supply the tree with the large quantity of water it requires. The aim of the intelligent cultivator is to store up what nature provides. This is done by thoroughly tilling the ground round the coconut tree and where the ground slopes, levelling the surface. The necessity

for thus conserving the water nature provides, will be realised during a period of scanty rainfall. The fronds of a coco-palm are so arranged as to thoroughly protect the surface of the ground round the tree, where the rootlets abound, from the direct rays of the mid-day sun. The arrangement of the fronds also prevent rain-water reaching the shaded portion of the ground. Hence the wise provision of nature to counteract this, by the spout-like shape of the butt-ends of the fronds. As I said before, the aim of the planter should be to prevent the water provided by nature going to waste, by tilling the surface of the soil round the trees.

B.

A LEECH IN A DOG'S NOSE: WANTED ITS EVICTION.

Nonpareil, Ohiya, Nov. 23.

DEAR SIR,—Can any of your many readers tell me how to get rid of a leech which has got into the nose of one of my dogs?—It has been there four days now and all my efforts to get it out have been unsuccessful.—The Tamil name for this particular kind of leech is "neere-utta," but of the English name I am ignorant. With apologies for troubling you,—Yours faithfully.

A. D. A.

[We first heard of the trouble Ceylon leeches give by creepings into the nose of cattle and dogs when they stoop to drink at a stream, by a still more peculiar experience: the little child (3 or 4 years) of a Haputale planter—the late Mr. Mitchell of Kelburne—in playing beside a small stream got a leech into its nose; but for some time the parents did not know what was the cause of the bleeding, the high fever and crying of the little one. Fortunately, Mr. W. H. Wright, who was then pioneering in East Haputale, came the way and soon discovered the cause and he proved it by taking the child into a dark corner when the leech popped out enough for Mr. Wright to seize and wrench it away. This is as we recall the story told us at Kelburne, alas, so long ago as March 1865; but if we are wrong the veteran planter now on his Mirigama coconut property, will correct us. Let "A. D. A." then throw a cloth over his dog's head and watch if the leech does not obtrude sufficiently to enable it to be pulled away. There are no doubt other remedies which may be mentioned by correspondents, but the efficacy of the above plan has been repeatedly proved.—ED. *T.A.*]

No. II.

Colombo, Dec 3.

SIR,—A successful way to extract a leech from a dog's nose, even on a rainy day, is to introduce a strong solution of common salt into the nostril occupied by the cruel intruder. The dog will sneeze him off,

"USUS."

No. III.

Colombo, 28th Nov.

DEAR SIR,—Might I suggest a good pinch of snuff, sufficient to make the dog sneeze.—Yours faithfully. C. H.

No. IV.

Kotahena, 29th Nov.

SIR—In reply to the inquiry by "A D A" of Nonpareil, Ohiya, in your yesterday's issue for evicting a leech from his dog's nose, I would recommend him to use an injection of vinegar or a solution of salt as prescribed by Dr. E J Waring, M.D.

P. C. O.

No. V.

Nov. 30.

DEAR SIR,—In answer to "A.D.A.'s" query in your issue of 28th November as to how to extract a leech from a dog's nose:—

Keep the dog in the hot sun a short time. Then bring him into a cool room and dip his nose in a vessel of cold water, and with a handkerchief adjusted between the fore-finger and thumb, you will be able to sprag the leech firmly and he's got to come.—Yours, &c.,

PLANTER.

GREEN TEA AND BLACK: THE TURN IN THE TIDE.

Nov. 26.

DEAR SIR,—I really don't think the prospects of Ceylon Tea—I will not go so far as to say British-grown Teas—were ever brighter. I say so with recollection of the time when the average price was double what it now is. Then, there was the apprehension of a rush into the enterprise, since sadly fulfilled; and then we had not learnt the teachings of adversity, so helpful to thoroughness and economy. And the change has been brought about, within a few months, by a process as simple as that which has immortalised Columbus' egg! It was just like the Britisher. He knew there were Green Teas and Black; and he knew the Yankees (like some others!) were wedded to Greens; but they must be conquered not coaxed; the Black must be poured down their throats. But Jonathan is as tough a customer as his cousin John Bull; and we have had to give up the idea of force. And how many markets have not the British lost in manufactures by not consulting the wishes and needs of the buyer, as the Americans and the Germans do!

Take my word for it, in the next year or two our Green Teas will play such a part in the markets of the world, as to lay the ghost of over-production at least for a decade—may be for ever. Thanks to Rutherford's keenness, we have been spared an increase in the Cess; and in 1904 Greens will need no crutch, and it isn't from Mr. Black they will ask a helping hand. *Exit tributum*! And when that happy day dawns, let us think kindly of a Firm which has had more hard things said of it than any in the Tea business. For is it not Finlay, Muir & Co., who gave the fillip to Greens by their improved process which has enlisted an army of inventors—who laid, in fact, Colombo's egg at Ambewatte!—Yours,

P. D.

TONGA BEAN—I.

Nov. 29.

DEAR SIR,—In your issue of 25th inst., I see a letter from "Visitor" enquiring about the "Tongan" bean. The jat, I advertised, is a *vegetable*, a very heavy cropper and when cooked is of a more delicate flavour than the "French" bean.—I am, Sir, yours faithfully, "SEEDS" MADULKELE.

NO. II.

The Central Seed Stores, Kandy, Nov. 28.

SIR,—Your correspondent "Visitor," wishes to know the merits of the Tongan Bean, and I trust the following will be of some use.—Yours truly,

E. SPEARMAN HUGHES.

The wonderful Tongan Bean is a strong evergreen perennial climber, producing immense quantities of large flat beans of excellent quality, which are used like French Beans. It is estimated that, in a moderately warm situation and good soil, two plants of this bean will supply a small family with this delicious and wholesome vegetable for nine months in the year. The plant is also very ornamental, and may be utilised for covering unsightly objects. It requires to be sown rather late. The bean should be picked very young and boiled whole. Although it is a perennial, it is advisable to sow one or two beans every year, for though the old plants come into bearing much earlier than the young ones, still they do not bear such heavy crops nor the best beans. As the seeds are very slow to germinate, they should be soaked one or two hours in warm water before sowing.

CULTIVATION OF BEET, SWISS CHARD, &c.

Himalaya Seed Stores, Mussoorie, N.W.P., Nov. 29.

DEAR SIR,—I am enclosing a copy of a special Circular which I have just published on the "Cultivation of Sugar Beets, &c." and shall be glad if you will give a notice of it in one of the issues of your valuable paper.

I think that the articles treated of in the Circular would be found useful by District officials, &c. as famine crops, for feeding the millions who are, from time to time, thrown on the hands of Government at Relief Works, &c., and would be infinitely more valuable than the Carrot seed, which, a few years ago, was bought at great expense in Europe and ultimately thrown away, as the Natives would not make use of it.—Yours faithfully,

W. W. JOHNSTONE,
General Manager.

NOTES ON THE CULTIVATION OF SUGAR BEET, GIANT SEAKALE BEET AND SWISS CHARD.

Some four years ago experiments were commenced at the Central Jail, Coimbatore, with a view of introducing some new kinds of vegetables to supplement those ordinarily grown in the Madras Presidency. A small consignment of Sugar Beet seed was obtained from Australia through a gentleman at Ootacamund. The seed was received in October and planted at once, and the result was sufficiently satisfactory to encourage further trials. The following year, seed was obtained from the Himalaya Seed Stores, Mussoorie, and the result was highly satisfactory. The roots have since been grown year by year in several Jail gardens of this Presidency, and have proved a valuable addition to the Jail dietary.

SUGAR BEET.

The method of cultivation adopted at Coimbatore is as follows. The plot which is intended to grow the Beet is dug to a depth of about 18 inches and heavily manured with ordinary farm yard manure, about 2 months before the time for sowing the seed. When the June rains commence, the plot is laid out in beds for irrigation, and the seed sown in drills 1 foot apart, the young plants are subseqnently thinned out to 1 foot between each, and during dry weather are irrigated once a week. The Beet is said to absorb a large amount of nitrogen and in some places it may be advisable to use nitrate of soda and superphosphate of lime as a manure, but here it has not been found necessary, owing to the large amount of lime in the soil. The practice on the Continent is to have the roots nine inches apart each way. This keeps them small and uniform in size, a matter of much importance where the roots are grown for sugar. When grown as vegetable for prisoners, uniformity of size is of no importance, whilst the larger they are, the greater the weight of vegetable produced. The roots grown by Mr. Prondlock in the Nilghiris, varied from 4 lb. 12 oz. to 5 lb. whilst those grown on the Continent vary from 1½ to 3 lb.* No particular attention has been paid to the weight of the roots grown here, and they have varied very much in size, owing to the fact that seedlings thinned out from the beds are planted in other beds. These do not as a rule form large or well shaped roots. It is a common thing here to find roots weighing from 10 to 12 lb., and the average weight of a well grown plot would certainly exceed 6 lb. It seems likely that the large size of the roots grown here is dne to regular irrigation, and to free working up of the soil between the roots, added to the fact that the soil here seems particnlarly suited to all plants of the Beetroot family.

The crop takes about 6 months to matnre, but for the purpose for which they are grown here, the roots can of course be utilised before they attain full matnrity. It is difficult to store roots satisfactorily in this conntry but they have been kept for npwards of three months, by being heaped in a store room and after a few days, when the heat has escaped, being covered with dry sand. The kind of Sugar Beet ordinarily grown here is Vilmorin's Improved, but there are several other kinds, equally good, all of which can be obtained from the Himalaya Seed Stores.

MANGEL WURZEL.

Mangel Wurzel has also been grown here successfully nnder the same conditions as the Sugar Beet, some roots having attained a weight of olose upon 20 lb.

If nsed for feeding cattle, Sngar Beet and Mangel Wurzel, should be well boiled and mixed with other food.

GIANT SEAKALE BEET.

This vegetable was first tried in the Jail garden in 1898. It is a large, comparatively new variety of the Spinach Beet, distinguished by an abnormally large white mid rib. This vegetable has been grown here with great success. It is easy of cultivation and gives a heavy crop in a short time. The seeds are sown in sheltered seed beds, and the young plants bedded to 15 inches each way, when large enough to handle. The plant will grow in any good garden soil and if in rich soil attains a very large size. The practice here is to allow the plants to attain snch a size that they completely cover the ground. The leaves are then carefully removed, with the exception of a few of the tender ones in the centre. The soil is then dug up round the plants, which in a short time give a second crop. This plant, like all the Beetroot family, reqnires lime with manure, unless the soil itself contains a large percentage of lime.

* Mr. Ponlter's reports on Sugar Beet grown on the Nilghiris.

SWISS CHARD.

Seeing that a considerable amount of the Giant Seakale Beet seed was being ordered for this Jail, the Manager of the Himalaya Seed Stores snggested that Swiss Chard might be tried here, as being very similar to the Seakale Beet and much less expensive. On his suggestion four varieties of this vegetable have been cnltivated here with great success. The Swiss Chards, like the Seakale Beet, are all varieties of Spinach Beet. The seed is sown in seed beds and the plants put out about 1 foot apart. They require the same soil and treatment as the plants previously described. They are particularly handsome and give a good return in a short time. The outer leaves should be cut when the plants cover the gronnd completely, and a second crop will be obtained in abont 6 weeks time. These plants when nnder irrigation, withstand the heat well, and can be grown here nearly all the year round. Of the varieties tried here, the White Silver Curled, and the Large Ribbed Scarlet are preferred.

It has been argned that these vegetables and the Giant Seakale Beet contain a very large percentage of water. No donbt they do contain a very large percentage when compared with the majority of English vegetables, but they compare favonrably with most country vegetables. The great thing in their favour is that they are easy to cultivate, give good returns and are thoroughly wholesome. The prisoners also appear to like them, as no complaints of these vegetables are ever made.

Central Jail, Coimbatore, E GADSDEN,
20th July 1902. *Superintendent.*

We oan supply any of the seeds referred to above at the following prices:—

Beet, Giant Seakale	per ounce Rl; per lb.	R7-8
Swiss Chards of sorts ..	.. per lb.	R2-0
Sugar Beets of sorts ..	.. per lb.	R2-0

When very large qnantities are required, orders shonld be registered not later than the end of Jannary and supplies will then be sent on receipt of stock from Enrope.

Apply to:—
The General Manager,
The Himalaya Seed Stores,
Mnssoorie, U. P. A. & O.

THE CARDAMOM POSITION, AND PROSPECTS.

Paniyar Estate, Devicolam, Dec. 1.

DEAR SIR,—Considerable anxiety regarding above has been expressed lately, by those interested, and a good deal of speculation indulged in as to over-production. As most reference has been made about Ceylon, it may be of interest to publish the following figures regarding India, and the Cardamom Hills of Travancore, the latter, probably the largest, and most prolific cardamom producing district of the present time. With the abolition of the Government Monopoly, and the advent of the Land Tax system into the Cardamom Hills, a great stimulus has been given to cardamom cultivation, and the acreage has been increased from 10,000 acres under old system to 15,650 acres in 1900 (Government Survey) and probably 1,500 more during 1901-02. There will therefore be abont 17,000 acres under cardaiuom cultivation in these hills at date. The principal feature, however, is not exactly in the increased number of acres, but in the system of planting, and subsequent treatment, carried out on these later extensions, especially since the Enropean Planter stepped in, (about 1899.) I venture to make the following definition, and estimate, of crop from the 17,000 acres, when in bearing, (this is derived from personal observation and is more a guess than an estimate):—10,000 acres original monopoly gardens, never properly planted, or cultivated, and in a very bad condition, at 35 lb. per acre per annum, 350,000 lb.; 4,000 acres land taken up after 1896 on Land Tax system rather better planted, and cultivated, and comparatively fresh soil, at 60 lb. per acre, 240,000 lb.; 3,000 acres including European holdings (about 2,000 acres) mostly planted 1900-1, systematically planted, at 150 lb per acre 450,000. These figures aggregate 1,040,000 lb. and work out about 60 lb. per acre on the average. Last year the output entirely from native gardens was a little over 300,000 lb, this year the crop is not yet all gathered; but, the output from same sonrce will not be less than 600,000 lb. This increase is partly due to a favourable season, but mostly due to extensions. The badly tended gardens are naturally very erratic in cropping, and will give little in an unfavourable season, and I would not put the annual output over 500,000 lb, on an average, but the later systematically planted acreage (3,000) will crop regularly, and we may expect the output from the Cardamom Hills to be not less than a million pounds in 1903-4. Without considering increased production from extensions in Mysore, Annamalais and other districts in South India, where is a market to be found for Ceylon's increase (over 100,000 lb as compared with same date last year) and the extra 300,000 from Cardamom Hills this year, with every liklihood of a similar further increase next year? It looks as if the cardamom market at present taking about a million-and-a half pounds altogether, will be called upon to increase its capacity another half, or three-quarters of a million in the short space of two years, how is it likely to respond? The cardamom industry scattered over South India, and Ceylon, as it is, with a good many native participants, is not likely to unite in any scheme to open up new markets, so it will undoubtedly be the "survival of the fittest." European planters on the Cardamom Hills have compact estates, from 300 to 600 acres, of good fresh land, the home of the cardamom, with a distinct crop season making picking very cheap, and being close to lowcountry where curing can be carried out to best advantage, have little to fear in the coming struggle.—Yours faithfully. J. A. HUNTER,

NEW COFFEE-HYBRIDS IN TRINIDAD.

Botanical Department, Trinidad, Oct. 30.

DEAR SIR,—I thank you for the notice of my annual report in your *Tropical Agriculturist.* You remark in reference to "coffee-hybrids" that "nothing is said as to their being proof against the fungus *Hemileia vastatrix.*" I am glad to inform you that I was quite unable to do so, as *Hemileia* is as yet an unknown quantity, and I don't think we shall try to import it for the purpose. I hope, however, to put your Gardens in possession of seed, that may be tested as to immunity shortly.—I am, yours faithfully,
J. H. HART.

SNAKES ALIVE! A REMARKABLE MEAL FOR A COBRA.

Dangkande, Rattota, Dec. 13.

DEAR SIR,—The following is a sight not often seen:—

This morning as I was walking along my watercourse, a cobra, which was running by

itself on the edge, plumped into the water on seeing me and swam in the direction of the current.

On following up I noticed something hanging out of its mouth, which turned out to be a small portion of the tail of a snake. I thought I was to solve the knotty problem as to whether a snake swallows its young. Gradually, however, instead of one of its progeny, the cobra disgorged quite three-fourths of a rat-snake before I killed it. I hauled the remaining fourth of the rat-snake out of the cobra and on measuring the snakes, found that the cobra was 4ft. 8in. and the ratsnake 5ft. 2in. It would have taken the cobra a good long time to have digested such a meal—a snake 6in. longer than itself!—Yours faithfully,

H. L. BLACKLAW.

CARDAMOMS: CANNOT INDIA AND CEYLON MARKETS BE SPECIALLY EXPLOITED.

Dec. 13.

DEAR SIR,—I am afraid there is a good deal of truth in what Mr. Hunter says; but with the enormous number of natives in India who daily use cardamoms, I think India has a market within itself for all she is likely to produce, if planters and merchants there will take the trouble to meet, and encourage the demand for their produce. While Ceylon planters, with their facilities for conquering other foreign markets, should lose no opportunity of sending exhibits of their produce to every exhibition open to them. It is only be making known to the world the excellence of our products that we can expect to increase the demand for cardamoms which, as yet, are but little known. Yours truly,

AN INTERESTED PLANTER.

COCONUTS AND COPRA.

Dec. 16.

SIR,—Can you tell me what is the relation between a ton weight of Coconuts and a ton of Copra? How many nuts, in fact, are required for the latter; but at the same time, how do they compare in regard to bullock-cart loads.—Yours truly,

INEXPERIENCED.

[“Inexperienced,” as a coconut planter, should provide himself with our “Manual” and “Directory,” in both of which are much useful information in daily request on coconut plantations. It requires from 170 to 200 nuts to make a cwt. of copra—say 3,700 nuts to the ton; and generally speaking, 6 cart loads of coconuts, if converted into copra, would make only one cart-load. We need not point out the advantage of retaining the husks on a plantation for manurial purposes—the veteran, Mr. W. H. Wright makes splendid use of them—but on the other hand, a good deal of labour and special care are needed in preparing copra properly.—ED. *T.A.*]

THE PRESSING NECESSITIES OF THE TEA INDUSTRY.”

Dikoya, Dec. 14.

SIR,—Your correspondent, G. N. T., in your issue of 4th instant, has done public service by formulating these into 3. His No. 3., “*The improved cultivation of estates*,” I think should be left out, because it is a matter for the individual capitalist, not the public Planting body to attend to. I would substitute for this necessity “The successful launching of the Green Tea Industry.”

We should then have the following necessities formulated:—

No. 1. The reduction and ultimate abolition of the Duty at home.

No. 2. The prevention of tea under a certain standard being shipped from Ceylon.

No. 3. The launching of the Green Tea Industry.

Of these 3 necessities No. 1 may be left to the British consumer; for we, planters, can do little more than support his protest whenever we see him agitating.*

No. 3 is being taken care of to the full by the Cessites, and the majority in favor of the Cess—as a temporary measure at any rate—will ensure it being carried.

No. 2 alone, while not lacking in moral support, has no practical scheme yet suggested for enforcing it.

In my opinion it is the most vital necessity of the 3, because it deals with a defect inherent to tea, and to no other product, viz., that it can be over-produced in inferior quality at a few weeks' notice, to flood the markets, shake the financial position of the Tea Share Market, and prejudice the consumption. No industry can expect to be stable that is exposed to such a risk, and, just as locks were invented against thieves, so must a safeguard be adopted against “spoilt” teas. The following is the scheme which I have to propose for the Press, and the planters to knock into shape:—

Let a qualified Expert be appointed to act with the “Thirty Committee” as Expert Adviser and Office Manager of a permanent Planters' Association Tea Industry Office in Colombo, which would be in touch equally with the Planters' Association and the Chamber of Commerce.

Let the duties of this official be to advise planters on manufacture for fixed fees, and to be the “smeller out” of bad—that is to say rotten—tea leaf in course of export whether on arrival for public sale or shipment otherwise.

In the event of the discovery of a parcel of “spoilt” tea, let it be the duty of the Censor to refer the sample to a Board of Tea Brokers' experts, associated with himself, and, if the tea is only verging on the line of condemnation, let that Board, as a preliminary step, issue a warning to the exporter, which warning could be published if necessary.

* Not so: we maintain that producers as feeling the pinch most should lead the way in agitation; for it is undoubted, that the 2d. extra duty to a great extent came off the prices.—ED. *T.A.*

Where the sample is proved to be flagrantly bad, let the Board issue a certificate to the Government for its condemnation, and let the latter on the same principle that it has ont the Cess Tax into effect at the instance of the planter, enforce this. It must be remembered that such "spoilt" tea has still a market for its full value through Messrs. Böhringer. I am of opinion that this scheme will be found perfectly practicable in principle, and would do more to give stability to the Industry and Share Market than any form of Combine that can possibly be invented.

Its success in Ceylon would also, doubtless, lead to the adoption of a similar scheme in London in course of a little time.—Yours faithfully, PROPRIETOR.

DR. SHERIDAN LEA ON "WITHANIA COAGULANS."

Galagedara, Nov. 27.

SIR,—Many of the natives of India refuse to have anything to do with cheese prepared by means of animal rennet, and there is consequently there a large field for the employment of this plant. Some years ago Surgeon-Major Aitchison sent home an account of the peculiar property of the "Withania." The shrub grows freely in Afghanistan and Northern India and the natives there have for a long time employed an aqueous extract of the capsules to curdle their milk. Some dried material sent from thence to Kew was used by Dr. Lea in his investigations. Withania is a genus of the order Sobanaceæ and has a capsula fruit containing a large number of small seeds In the dried material these seeds were enveloped in a coating of a peculiar resinous matter, which was probably the dried juice of the capsules in which they had ripened. The ferment was found to exist to a very slight amount in the stalks of the fruits, and to be extremely abundant in the seeds. From the ground seeds it could be extracted easily by maceration with solution of common salt, and by treatment with glycerine, so extracted, it was found to be destroyed on boiling, but to be able to withstand moderately prolonged exposure to alcohol. Its activity in a fairly strong extract was quite equal to that of most commercial samples of rennet prepared from the stomach. It could, moreover, be kept with as great security as the latter, by the aid of common salt and a little alcohol. Its commercial value is somewhat interfered with by the presence in the seeds, and in their extracts, of a peculiar yellowish-brown colouring matter which cannot be separated without destroying the rennet

These seeds were obtained from Mr. E Spearman Hughes, Florist, Kandy, some months ago and sent to the United States, and I am glad to state the recent glowing accounts of its great success will open a large field in our Colony for its cultivation.—Yours truly,

J. J: McK.

MATALE PARA RUBBER SELLING HIGH.

Kepitigalla, Matale, Dec. 5.

DEAR SIR,—As promised in my letter of October 1st last, which appeared in your daily issue, to let you know the results of the sale of the 13 cases Para Rubber dispatched, I now have the pleasure in stating that the 13 cases sold for the handsome average price of 3s 11d per lb.—an average price second to none in the world, as very best Paras were selling at same sale at 3s 5½d.

Valuation and sales of 13 cases, Kepitigalla, Matale, Ceylon, Para Rubber :—

London, Nov. 14.

To 4 cases 200 B. A1. valued at 3s 11d sold at 4s.

To 8 cases 400 B. A. valued at 3s 11d sold at 4s.

To 1 case 42 B. rough scrap valued at 2s 8d sold at 2s 10d.

I enclose London Agent's sales memo to verify above figures.—I am, Sir, yours faithfully, FRANCIS J. HOLLOWAY.

THE CARDAMOMS' POSITION AND PROSPECTS.

Gammaduwa, Dec. 7.

DEAR SIR,—Mr. Hunter's letter of the 1st inst. appears most opportunely. It was only the other week your readers were informed of an application to Government for 40 acres of land on 12 years' lease for the purpose of experimental cardamom cultivation, and about a year ago of a grant of 200 acre for a similar purpose. Old cardamom growers have reason to feel alarmed. With 8,000 odd acres of this product and an export, for eleven months, of 551,659 lb, with a probable 750,000 lb, next year, they think their cultivation is beyond the experimental stage. They are now warned they will have a big struggle for existence with their formidable rival India, and our Governor should note this while considering applications for grants and leases for cardamom cultivation. Perhaps, the experience of the older growers may help *them* in the fight.—Yours faithfully,

JAMES WESTLAND.

COCONUT CULTIVATION : SALT.—No. 2.

THE CASE FOR FREE SALT FOR AGRICULTURAL PURPOSES.

DEAR SIR,—In my last communication (in which by the way "husks' was made to read "bnshes"), I pointed out how one of the natural conditions under which the cocopalm grew—a free soil—conld be imitated by draining and tilling. In this communication I intend to dwell on the necessity of salt for coconnt cultivation.

The history of the agitation to induce Government to issue salt for agricultural purposes at reduced rates goes back into the past. The agitation was started by the Coffee Planters headed by Mr R B Tytler, if I mistake not. Government met the agitation with the reply that salt could not be so de-naturalised as not to make it possible for it to be purified and made fit for culinary purposes. A practical Government would have dealt with probabilities rather than with possibilities. Was it probable that the ordinary cooly had a snfficient knowledge of practical chemistry to purify the salt that had been denaturalised, and was it by any means probable, that if he had that knowledge, he would utilise it and expend much valuable time to save a cent

or two on salt per diem? A practical Government would have answered these questions with a decided and emphatic negative. Besides, those who applied for the salt were ready to pay for a watcher, to be supplied by the Government, to see that the salt was used for no other purpose than agricultural.

The Government is sufficiently practical and enlightened to carry manures in their railways at reduced rates and to levy no tolls on manures, on the principle that bread cast upon the waters will return to it after many days, in the shape of increased produce. But it is not prepared to apply the same principle to the issues of salt at special rates for agricultural purposes.

As I am very strongly of opinion that salt is an absolute necessity in coconut cultivation, especially in inland districts having a heavy soil, I started an agitation for its issue at special rates, about fifteen years ago. It was met by the stereotyped reply. Of the benefits of its use in coconut cultivation, one reads occasionally in the papers of the experiments being carried out by Dr. Dias at Henaratgoda.

It was argued by Dr. Trimen at the time of my agitation, that as analyses showed that the coco-palm yielded but a small quantity of salt, and as this small quantity was very likely deposited during the monsoons, salt was not so great a necessity for coconut cultivation as I wanted to make out. I think his reasoning was fallacious. The quantity of any inorganic matter in any product, should not determine its necessity or otherwise. Besides, salt has other properties than manurial. It acts chemically and mechanically on a soil. It keeps the soil moist by absorbing the moisture of the atmosphere. It acts as a solvent and renders available the insoluble plant-food in a soil. Lime does not occur largely in vegetation, yet soils are limited to improve their chemical and mechanical condition. Dr. Thimen was evidently misled by Lepine's analytical rtbles. Cochran, a few years ago, showed that they were wrong as regards the quantity of salt in the husks of the coconut. He was also surprised to find that the husks of a coconut grown on an estate at Kurunegala yielded more salt than in one grown on the sea shore at Kollupitiya.

Of all coconut planters, the late Mr. Davidson was, perhaps, the most intelligent and the one best versed in Agricultural Chemistry. His pupil, Mr. Jardine, is a worthy successor of his. He wrote in 1861:—"A tree requires annually 1·34 lb. salt and 9·79 lb. potash (according to Lepine's analyses), yet the larger amount may be less essential its welfare than the smaller quantity, because this possesses properties which the other has not, and for the want of which nothing else will compensate. The weight of salt required, compared with the other in organic matter, does not exhibit fairly its relative value as a manure. Here (Jaffna) day after day may be seen strings of carts, creeping from the beach to the estates, laden with sea weed. For the sake of the salt it contains, we drive a cart-load of matter, which we could obtain much nearer home and at a little of the cost, because our Rulers persistently refuse to allow us, at the price they sell it for exportation, to purchase that salt for our estates, which it, sometimes, *costs hundreds of pounds to destroy*. The following offer was made to Government Parties to get salt at export price, would adulterate it with matter best adapted to render it unfit for culinary purposes, in the Government stores. They would enter into a penalty bond to the full value of the salt, at the market price, that it should be used solely as a manure for coconut trees and they would pay for a Government employee, who should certify to its application as specified. We deserve, perhaps, that our wants should be disregarded, for I do not remember that coconut planters have ever combined to have them fairly represented. With more of unity and combination in our efforts, we should doubtless command success."

Possibly at the time Mr. Davidson wrote the above, coconut estates regularly cultivated existed only in the Northern and Eastern Provinces. Though the cultivation of the palm and the opening of estates have increased by leaps and bounds since then, the deplorable want of unity and combination which he then bewailed, still exists. If so shrewd and intelligent a planter as Mr. Davidson thought salt a necessity in coconut cultivation, and placed so high a value on it, even on the sea-borde, surely I was right when I, ignorant of his opinion, advocated the use of salt for coconut cultivation, especially in inland districts.

To those who are ignorant of the fact, it will cause much surprise to be told that contractors supply the Government with salt at 25-35 cents the cwt. They re-sell it wholesale for local consumption at R2·36 the cwt., and for export for a little above cost price. Why strangers should be treated better than her own children. I have never been able to find out? Nor why the Government should prefer to export salt and even to wickedly destroy so useful a product, rather than to sell it at export rates to agriculturists, when it will result in increased crops, increased circulation of money, and increased revenue to Government, by the increased consumption of dutiable articles, increased traffic on railways, roads and canals, and increased duty on exports. Will not some member of Council again take the matter up? It appeals specially to the Planting and Ceylonese members.

Salt can be denaturalised at any one of our manure works by the addition of incinerator ashes, and some offensive smelling manure such as guano. Ceylonese know that only the lowest caste of natives can be induced to work at conservancy (with apologies to Mr. Hemming). If once it be known that salt used for manurial purposes is mixed with matter from latrines, not only will no one be so depraved as to attempt to use it for culinary purposes, but it will be difficult to get any one but pariah caste coolies to handle it. I feel certain that if Revenue Officers with a knowledge of the people and their prejudices be appealed to, they will unanimously give it as their opinion that the probabilities of salt denaturalised as I suggest, being used for culinary purposes are extremely remote. If salt be available at cheap rates, its use will gradually extend, till it assumes very large proportions. When one's neighbours see the benefits arising from its use, they will gradually follow suit. If nursery plants, before being put out, are steeped in brine, they become immune from the attack of white ants, and turn out healthier and stronger plants. If a small quantity of salt be sprinkled in coconut holes, insects are destroyed. If a sufficiency of salt be used to impregnate the soil, the plants will be able to resist droughts, as the impregnated soil will absorb moisture from the atmosphere. If salt be applied to coconut plants of larger growth and to trees, the soil is kept moist and free. If mulched simultaneously, the capillarity of the soil is increased and evaporation lessened, so that droughts will not seriously affect them. Salt, as stated before, is a solvent. When the soil is moist and the plant-food is rendered soluble, rootlets will be performing their functions of feeding, continuously. B.

PLANTING NOTES.

CACAO ENEMIES.—We learn that owing, probably, to the prolonged wet weather, there has been a recrudescence of disease—canker, fungus, etc.—among the cacao trees on several estates, North and South of Kandy. We trust the trouble will shortly disappear as the dry weather sets in.

CHINESE TEA.

The once important and lucrative tea industry has, says Acting Consul-General J Scott, of Canton, been almost ruined by Chinese apathy and neglect. Growers in the interior pay little or no attention to their plants, and do not trouble to renew the old bushes as they become decayed. The leaf is picked anyhow and at any time, as prices appear favourable, with the result that, carelessly handled and fired, the tea on reaching the London market is frequently found affected or deficient in strength, body, and colour. Thirty years ago Canton exported to Europe some 13,000,000 lb. of black tea and nearly 2,000,000 lb. of green, whereas now it amounts to less than 1,000,000 lb., chiefly Congou. The well-known

SCENTED CAPERS,

for which Canton was famous, and of which some 7,000,000 lb. were exported in 1872, figure for 1901 at an export of 5,790 lb., only. These figures do not, however, give an accurate return of the entire export, as many shipments are arranged in Hong Kong, to which port the tea is conveyed by junk, and does not, therefore, pass through the hands of the Imperial Maritime Customs. The following figures, obtained from an actual dealer, provide a comparison in the trade in scented capers during the past three years:—in 1899, 4,900,000 lb.; in 1900, 3,700,000 lb.; and in 1901, 3,000,000 lb. A further depressing feature is that the monthly returns of deliveries in London also mark a decline which would lead one to suppose that Canton scented capers are rapidly going out of consumption. The season now under review cannot be said to have been a favourable one as regards quality, nor was it remunerative either to foreign buyers or native sellers. Taken all round the various crops during the season were of a fair average quality, but there was a considerable quantity of leaf left on the hands of natives from the previous season. This they had to work off by mixing it with the new season's leaf—a practice that no doubt had a detrimental effect, and which would have been accentuated had not scenting flower been abnormally cheap and abundant, whereby it was possible for the teas to be scented above the average. The recent decision of the Chinese Government to lower the export duty on tea to 5 per cent. *ad valorem* may have some beneficial effect upon the trade, and had this measure been adopted some ten years ago, the tea trade of Canton and China generally would not have fallen to its present low level. This considerable abatement in the export duty will enable low-priced Chinese teas to compete more favourably with those of India and Ceylon.—London *Chamber of Commerce Journal*, Nov.

A GOVERNMENT REPORT ON RUBBER.

In a report on "Agriculture in the Tropical Islands of United States," by Mr O F Cook, botanist in charge of investigations in tropical agriculture, less than two pages, under the heading "Rubber and Gutta-percha," form the single reference to the matter under discussion. The spirit in which Mr Cook writes is decidedly unfavourable to the formation of rubber plantations. He says, for example: "Notwithstanding widespread interest and the investment of millions of dollars, it cannot be said that rubber culture has passed the experimental stage, if indeed that period has been fairly reached." But there is no reference to any experiment made in any country, or to the results, in such detail as will enable the reader to look into the subject further with a view to satisfying himself as to the present status of rubber cultivation, or to investigate the reasons for "the investment of millions of dollars" which is still going on.

Mr Cook says again; "Moreover, it is known that many rubber plantations established with the most lively expectations have been abandoned because the anticipation, of a profitable yield of rubber from cultivated trees proved to be fallacious." This report would have been more complete and more convincing had it been followed by a list of such plantations and of their locations. As a matter of fact, there has not been time, since the systematic planting of rubber on a commercial scale began actively, for very many of the plantations to become productive, and, so far as we can learn, the results attained have been such as to encourage very many others to engage in this branch of planting. There is reason to believe that more rubber trees have been planted in Ceylon, the Malay peninsula, Burma, Mexico, Central America, and the West Indies during the last twelve months than in any previous year, and in the list of plantations on record in the *India Rubber World* office—which includes all that we have been able to gain any of knowledge of during the past ten years—there has been no case of abandonment of trees once planted. Mr Cook admits, however, that "similar disappointments, misapprehensions, and misrepresentations"—referring to the prospectuses of certain companies formed to plant rubber in Mexico and Central Africa—have, of course, marked the early history of many finally successful and important industries."

INTERNATIONAL COFFEE CONGRESS.

According to *Dun's Review* of October 11th, the International Coffee Congress, then being held in New York, for the purpose of considering what measures should be adopted by the leading coffee-producing countries to improve the position of coffee in the world's markets, had held several sessions, and some progress had been made in the direction of giving definite expression to the views of its members on the important questions forming the subject of their deliberations. The Committee on Consumption reported the three following resolutions:—(1) Recommending to all the Governments and producing and consuming countries the compulsory use of pure coffee in the armies and navies. (2) Recommending to the Governments and countries which produce coffee that they establish, as soon as possible, in countries in which coffee is not now consumed, places for the demonstration of pure coffee. (3) That coffee-producing and consuming countries may prohibit the sale of adulterated coffee, and of substitutes bearing the name of coffee; and, in case this prohibition cannot be enforced, that a heavy duty be imposed on such articles. The Committee on the Causes of the Crises submitted a report of which the following is the resolution recommended:—"The International Conference for the Protection of the Coffee Industry recommends to the producing countries the adoption of differential tariffs for the collection of import duties, applicable to manufactured articles and staples of the consuming nations, proportionately to the tax charged upon imported coffee.—London *Chamber of Commerce Journal*, Nov.

PLUMBAGO REPORT.

There has been a distinct decline since our last We have lately visited all the users of Ceylon plumbago on the Continent and find them in no pleasant frame of mind. Nine-tenths of the ship-

ments to the Continent go to crucible manufacturers who complain of the infinitesimal margin of profit now obtainable on crucibles, largely owing to the comparatively high prices prevailing for the better qualities of plumbago. Trade generally in Germany is we all know, in a bad way and this holds good to no small extent in the iron and steel trades. When one sees firms like Krupp of Essen working only half time, matters cannot be in a very prosperous state. One of the oldest and at one time the largest firm of crucible manufacturers in Germany has just thrown up the sponge and closed its works for all time. The manager informed us that they could no longer manufacture crucibles at a profit, and they would not go on working for the fun of the thing. Several others are working on the narrowest of margins. They do not care to shut down temporarily, as it would disorganize their labour, so they carry on hoping for better times. In America things are far from brisk, and we now hear of an American mine capable of producing 5,000 tons good crucible plumbago per annum. It is true that we have once or twice before heard of American plumbago, but that was the extent of it. When we asked for shipments there was ever some excuse; but the matter has been placed before us now in a much more definite way, and there may be something in it. We still have our doubts, but shall be better able to report on the subject in a few weeks' time. On spot, London, the following sales have been made during the week. Common lump, £18 to £12; good chippy dust, £7 10s.; medium chippy dust, £6 15s. For shipment finest O. L. has been sold at £36 to the Continent. Good quality at £32., medium at £25, and finest chips at £20. Several transactions have been made in plumbago from Southern India. The quality is poor, but it analyses well and gives an excellent polish. If this can be produced in any quantity it will interfere with the trade in Ceylon dust and flying dust. Common qualities of the latter are unsaleable but there is still a good demand both for England and the U.S.. for medium chippy dust at about £7.—Messrs Chapman, Anthony & Co.'s Report to Local "Times."

TRAVANCORE FORESTS.

We have received a copy of "The Mine of Wealth" in the State Forests of Travancore: and what young Travancore can do to create industries—being a lecture delivered under the auspices of the Travancore Government Lecture Committee, by T Ponambalam Pillai, Acting Conservator of Forests, Travavcore. The lecture was a long as well as interesting one and wound up as follows:—"I shall now conclude the paper. I have told you how beautiful are the Forests of this State and how their fame has reached other countries. I have also told you how they have made you independent of other countries by sending you eternal rain and by giving a sufficient supply of timber, firewood and other produce. I have in a way tried to demonstrate that few species of trees in the Forests are worth 25 years' revenue of the State, and the remaining species of timber are worth another 25 years' revenue. In fire-wood alone you have a third 25 years' revenue. From the minor products of which I have spoken, you can obtain a fourth 25 years' revenue. Thus your Forests of which you have every reason to be proud, contain wealth to the extent of one hundred years' revenue of the State or more. Speaking of industries I spoke of fire-wood, of paper materials, of extraction of teak and sandal wood oil, of tar, varnish, gums, resins, dyeing and tanning materials, fibres, arrowroot, gutta percha and other products of tubers, leaves, flowers, fruits and seeds of various trees both as edible and medicinal substances, and the preparation of Botanical specimens. Leaving the vegetable kingdom I spoke of the combination of the vegetable and mineral kingdom such as soap and saltpetre and referred to the various metals that can be worked. Lastly I spoke of the vegetable-animal products such as honey and silk. I also indicated how rare and useful trees and shrubs can be planted with advantage and how the water power can be used."

QUARTERLY CINNAMON SALES.

London, Nov. 25.

CINNAMON.—The last quarterly auctions of the year were held yesterday with a total offering of 234 bales "worked" quill, 944 bales "unworked," 101 bags chips and quillings, and 273 bales wild bark, compared with 825 bales in August, and 1,690 bales at this period, last year.

There was a good attendance of the trade, and with satisfactory competition throughout, the bulk was cleared.

The 234 bales "worked," fine and superior, met good competition and all sold. Firsts and seconds at fully 1d per lb, average advance. Thirds at fully last sales rates, and fourths on the whole rather easier. Firsts realised 1s 6d to 1s 9d, Seconds, 1s 4d to 1s 8d; Thirds, 1s 2d to 1s 5d; and Fourths, 7d to 11½d per lb.

Of 944 bales "unworked," 803 bales were cleared, a few small lots of Firsts at 1d advance, Seconds to Fourths, irregular but fairly steady on average. Firsts at 7d to 1s, Seconds, 6d to 10d; Thirds, 5½d to 9½; and Fourths, 5d to 8¼d per lb.

101 bags chips sold at 3⅝d for bright, and 2¾d for common, and up to 9½d per lb for quillings, &c

WILD BARK.—273 bags offered but met no offers. The limit was 1d per lb. 304 packages of this rubbish was sold on 19th inst. "without reserve"—quills at ⅜d to ½d, broken quills at ⅜d, and coarse bark at ¼d per lb.

STOCKS:—

Plantation	2,689 bales,	against	2,291 bales in 1901.
Chips ..	730 bags	,,	3,154 bags ,, ,,
Wild ..	1,829 bales	,,	2,408 bales ,, ,,
Wild Bark & Chips ..	6,426 bales	,,	7,891 ,, ,, ,,

The next auctions are fixed for 23rd February, 1903.

FORBES, FORBES & Co., LTD.

THE PRICE OF COCONUT OIL.—*Apropos* the information published by us from an outstation correspondent regarding the price of coconut oil, a European merchant writes:—"Your informant is quite wrong as to a rise of 10s in coconut oil just now. I had a wire from home yesterday. The prices offering in London are lower than they have been for at least this year."

INDIAN TEA AREA AND TEA CESS.—The long letter addressed by the Secretary of the Indian Tea Association to the Finance Secretary of the Government of India, contains a good deal of interesting reading; but the statistics it affords are disappointingly old, the area in cultivation being given as at the end of June 1901. We suppose that with fields abandoned the total area in tea in India does not much exceed 500,000 acres against 380,000 to 390,000 acres in Ceylon.

NEW FOOD PLANTS IN YUCATAN.

The gardens and fields of Yucatan are filled with succulent vegetables and sweet smelling herbs unknown to the outer world. In the cultivated fields at the proper season are grown Indian corn, beans, and tubers for which we have no name, for the reason that they have been neither seen nor heard of outside Yucatan. The forests and jungles contain fruits that, excellent even in their wild state, could be made delicious by scientific care and cultivation. There are many wild fruits that offer more promising results than did the bitter wild almond, the progenitor of the peach.

The most important of the large cereals is the

MAIZE OF THE MEXICANS,

the Indian corn of the Americans, and the *xim* of the Mayas of Yucatan. Like several other vegetable products, its origin as a cultivated plant is enveloped in obscurity, the wild plant from whichit was evolved not yet having been identified. Many believe that the cultivated plant had its origin somewhere between Yucatan and the tableland of Mexico. The mother plant was probably a grass and the new grain spread to all parts, each one giving it certain characteristics until the varieties grown in the north hardly seem related to those of the southern lands. The United States Consul at Progres says that Yucatan has six varieties of this grain, and the Maya Indian reverently speaks of it as the "grace of God." The long stalked, large grained class known to the natives as *xnuc nal*, is the most prominent, and has by far the greatest acreage devoted to its cultivation in Yucatan. It is planted in May, is fully matured in January, and then is left to harden and season until gathered as needed. This class most nearly resembles the Indian corn of the United States. It has both the white and yellow grains. Under the haphazard methods of the native Indians, the corn produces in the limestone soil of Yucatan from 20 to 30 bushels to the acre. Under favourable conditions this yield is often doubled. The *xmehenal* is a small, quick growing variety, and the plants are rarely 4 feet high. The natives have a saying "that the cock can pick the flowers of the true xmehenal without stepping off the ground." One variety matures within sixty days of its planting, and the second needs fifteen days more. The *xmehenal xtup*, planted in May, can be gathered in July, and while the production per acre does not quite reach the figures of the *xnuc nal*, it has a greater capacity of resisting the extremes of heat and dryness. The plant or rather the running vine, known as the *macal box*, produces a tuberous root of great nutritive value. Entire families have lived upon this root for weeks at a time and were healthy and apparently well nourished. This plant is very productive. About the middle of May the green shoots first appear above the earth, they grow rapidly, and in November are ready to be dug. The tuber is about the size of a large potato, and is of a purplish colour, like a certain class of sweet potato, and it can be cooked in the same way as a sweet potato. The plant is hardy. A long drought may cause the vine to wither, but with the lightest rain it springs up anew. The roots left in the ground as too small for food propagate the plant, and each year the yield increases. It seems to be a kind of native yam: it grows in almost any kind of moderate rich soil, and when cultivated intelligently should be of some value as a food plant. The *xmakin macal*, like the *macal box*, appears in May and is gathered in November, but it yields only one or two tubers to the plant. These however, are of large size, resembling enormous potatoes. The interior is white and seems to be nearly pure starch. The plants grow close together and the yield per acre is said to be phenomenal. *Xmchenchi-can* seems to be a kind of artichoke, weighing when mature about a pound. The plants are running vines, rarely more than a yard long. An acre will yield an immense crop under favourable conditions. The plant sown August, can be gathered in November. *Xnucchi-can* is a larger root, weighing when mature about three pounds. It is a hardy plant and produces well. Both of these roots are eaten, roasted or boiled, and many like them raw.—*Journal of the Society of Arts*, Sept. 26.

TRADE OF SIERRA LEONE.

RUBBER.

The following comparative statement shows the quantity and value of rubber exported from the Colony to the under-mentioned countries during 1,900 and 1901 :—

	Quantity.		Value.	
	1900.	1901.	1900..	1901
	lb.	lb.	£	£
United Kingdom...	244,316	105,360	22,335	7,174
Germany	30,330	26,295	3,406	2,029
Other Countries ..	274,646	131,655	25,741	9,203

The trade in rubber has declined owing to the article getting gradually less, and higher prices being offered in the adjoining Colony of French Guinea, as well as to the wasteful method by which it was gathered. In French Guinea the price is 2*s.* per lb., and only the best rubber is allowed to be exported, *i.e.* rubber containing not more than 1 per cent of dirty matter mixed with it, whereas in Sierra Leone good quality rubber and dirty adulterated rubber are both bought by merchants at prices varying from 1s to 1s 8d. per lb.

PALM KERNELS AND PALM OIL.

In palm kernels there was a slight decrease in 1901, over 1900, although the market value remained the same. The figures were as follows :—

	Palm Kernels.		Palm Oil.	
	Tons.	£	Gallons	£
1900 ..	...21,517	171,774	128,608	7,436
1901 ..	161,749	131,655	116,340	9,816

There is great scope for the extension of the palm oil and kernel trade ; it is the difficulty of transport which has to be overcome. Unlike rubber, which can be more easily handled, and, owing to its greater value, can better bear the disproportionate expense of the carriage by head—which is the only land transport obtainable in the greater part of the Protectorate—the palm kernel or palm oil cannot reach a shipping port from any distance in the interior before the cost of transport exceeds its value. The completion of the railway will revolutionize the trade in this product, and be the means of bringing to the port the thousands of tons of kernels that at present are allowed to rot.—London *Chamber of Commerce Journal*, Nov.

CINNAMON IN LONDON.

The last quarterly cinnamon sale for the year, held in London on 24th Nvo., may be reckoned as one of the most satisfactory sales of recent times. The quantity of quilled bark offered was 1,178 bales, which, though in excess of the offerings in August last, amounting to 825 bales, was only about two-thirds of the quantity catalogued in November, 1901. Both the limited supply and the season—for the Christmas auctions generally go off with spirit—contributed to good prices. The attendance being good and the competition lively, the higher qualities, which are "worked" in London, sold at prices which recall old times—Firsts running up to 1s 9d and Seconds to 1s 8d, while Fourths fetched as high as 11½d. The whole quantity offered was disposed of under the hammer, at an advance generally of a penny on the previous sales' rates. The best marks have their cinnamon unbaled and rebaled in London, according to traditional custom, and at a cost which ordinary kinds object to, and are honoured with the distinction "worked"! The "unworked" cinnamon constitutes the bulk of our exports, from estates which do not turn out "smarts," or finely quilled spice, and the 944 bales of "unworked" seem to have been worked off as satisfactorily as the more attractive sorts. We do not read that any of the "unworked" spice, which amounted to four-fifths of the total, was bought in; and the prices named show that it shared in the advance which the best sorts secured. The rates at which chips were sold were higher than they had reached for a long time; while 9½d, the top price for quillings, has been touched but seldom.

The absence of any demand for "Wild" Cinnamon, so called, does not seem to have extinguished the trade; but nothing can long survive sales at a penny a lb! How that average can possibly cover all the charges which have to be provided for, from harvesting and transport to warehousing and sale, is more than we can guess; but, pending the total extinction of the trade, we can only hope that the article does not in any way go into human consumption. No doubt it rather forms part of the condiments which are said to be used in preparing "Thorley's food for cattle."

The prospects of genuine spice are bright, as the submersion of low lands, on which cinnamon is mostly grown, has arrested harvesting for weeks, if not months; and with the dry and windy months in prospect, there cannot be much crop taken in till after the Sinhalese New Year in April next.

On page 480 will be found the Report from the leading London firm which we usually quote once a-quarter.

THE FORESTS OF UGANDA.

A Government report just issued furnishes information with regard to the Mau Forest, which extends for about 33 miles along the line of the Uganda Railway. The forest contains an abundanee of hardwood timbers—"too hard" is the complaint of those who have tried to work them. The Commissioner who is reporting, nevertheless, regards the forest as a splendid property, which will not, however, be realisable for many years. One of the conditions of a successful industry are big rivers, it appears, in the Mau: Under these circumstances, residents in the chief town find it cheaper to line their houses with Norwegian timber than to use that of the local forest. The report refers to the rapidity with which eucalyptus trees grow in Uganda, specimens of eucalyptus globulus three years old having reached a height of 30 ft.—*Timber Trades Journal*

TEA IN THE UNITED STATES.

Mr Wm. Sanders, the late eminent Superintendent of Public Grounds in Washington, was sent down to Sumterville, S C, where Commissioner LeDuc was then engaged in making an experiment with tea culture which has since had such a gratifying success under Dr Shepard. Mr Sanders gave it as his opinion that if any more Government or private attempts were made to raise tea, they should be made in a locality farther South; and furthermore he expressed the belief that Florida offers the best opportunities and conditions for success.

We do not agree with Mr Sanders in this opinion Tea has been grown in dozens of localities in the South; from the strong rolling clay uplands of Georgia to the moist sandy low lands of Louisiana, Mississippi and Florida; and there can be no question with men of wide observation that the rolling piedmont, clay uplands of Georgia produce much the most rapid and vigorous growth; thriftier finer and better developed plants, than could be found anywhere in the low country further south and nearer the seaboard.

Mr Sanders seems to have forgotten that most of Japan and the principal tea districts of China are farther north than Florida and have a lower mean annual temperature. Tea will grow and do moderately well anywhere in Florida; but if we had to establish a tea growing plantation in this State we should select the undulating clay uplands near Tallahassee and further west and north toward Quincy.

We do not think tea culture can be made generally profitable commercially under the present existing conditions, with the present price of labour and with our very imperfect knowledge of growing and manipulation. It is only fair to state, however, that Commissioner LeDuc's superintendent Jackson, who claimed to be an expert in tea growing and preparation, stated to a newspaper visitor, that he could make an excellent article of tea in Georgia or Florida for 15 cents a pound. We are under the impression that Dr Shepard has publicly stated that under his present system of child labour, he can produce a marketable article for about the same figure. And it is well known to our readers, doubtless, that Dr Shepard's tea has repeatedly sold up to seventy cents a pound, averaging for round lots, forty-five cents, or better.

The tea plant belonging to the Camellia family and requires about the same treatment as outdoor japonicas. It should have a good strong soil, enriched with a compost of dried muck or peat, bone dust, and ashes. The land must be all drained

and clearly cultivated. The seed should be planted as soon as ripe in mellow drills, like peas, and the plants may be transplanted from the seed beds when about a year old.

They do not withstand the hottest suns very well, and it is a good practice to place them in a partly shaded situation for another year before finally setting them out in the plantation. Use plenty of the compost above indicated for the young plants and continue the same regularly in the field, especially after you begin to gather the leaves, as that operation is exhausting to the bushes.—*Florida Agriculturist*, Oct. 22.

THE TEA CESS.

Memo :—The subjoined letter on this question is published for general information. W. Parsons, Secretary.

No. 6652 S.-R.—Calcutta, 13th December, 1902. From—The Government of India, Finance and Commerce Department. To—The Secretary, Indian Tea Association, Calcutta.

SIR,—I am directed to acknowledge the receipt of your letter No. 1001-O, dated the 28th November, 1902, communicating the views of the Indian Tea Association, Calcutta, in connection with the proposed levy of a cess upon Indian tea.

2. In the Resolution in this Department No. 4178 S.R. dated the 1st August, 1902, it was stated that the necessary legislation for the imposition of the cess would be undertaken during the present Calcutta session of the Legislative Council of the Governor-General, provided that no weighty or widely entertained objections were received in the interval. The objections received by Government have been only three in number, and cannot be considered to be either weighty or widely entertained. The Government of India have accordingly decided to proceed with the necessary legislation somewhat on the following lines :

1 From and after the 1st April, 1903, a cess at the rate of ¼ of a pie per lb. (or such lower rate as the Governor-General in Council may, from time to time, on the recommendation of the Committee hereinafter referred to prescribe) shall be levied on all tea, the produce of India, when exported by sea to any foreign port, or when exported by land to any territory to which the provisions of section 5 of the Indian Tariff Act 1894 (VIII of 1894), have been declared to apply.

2 The proceeds of the cess, after deduction of the cost of collection, if any, shall be paid over to a Committee of twenty, which shall include (*a*) 3 members nominated by the Bengal Chamber of Commerce ; (*b*) 7 members nominated by the Indian Tea Association; and (*c*) 10 members nominated by such local bodies or Associations interested in tea as the Government of India may, from time to time, direct.

3 The fund placed at the disposal of the Commitee of twenty shall be applied by them towards pushing the sale and increasing the consumption of Indian tea in India as well as in foreign countries.

4 The accounts of the Committee shall be subject to annual audit by officers to be appointed by Government, and the auditiors shall be empowered to surcharge any item which, in their opinion, has been improperly expended.

5 The cess shall be in force for five years, and may be extended for a further term if the Government, on the recommendation of the Committee, shall so direct.

6 Government shall have power to make rules for the administration of the Act.

3. With reference to the suggestion in para 7 of your letter that the Indian Tea Association Calcutta, might nominate five members to serve on the proposed Committee, and the Indian Tea Association, London, two members, I am to say that it is not clear how an Association which is not domiciled or represented in this country can nominate representatives, or how it can claim direct representation. It is understood that the London and Calcutta Indian Tea Associations are branches of one body, and that the former has no office nor recognised representative in India. In these circumstances, the Government propose to increase the number of members to be nominated by the Indian Tea Association, Calcutta, from five to seven, so as to enable the latter to nominate members on behalf of the London Association if they so desire.

4. I am to add that it is proposed that the Bill shall be introduced by an unofficial member of the Legislative Council of the Governor-General. I have the honour to be, Sir, your most obedient servant.

E N BAKER, Offg. Secy. to the Govt. of India.

AMERICAN CAPITAL AND ENTERPRISE.

THE FORMATION OF A RUBBER COMPANY TO EXPLOIT NORTH BORNEO.

Before leaving British North Borneo, H. E. the Governor entered into an agreement with Mr Alleyne Ireland for the formation of an American Company to work gutta and rubber in this country.

The Lessee will prospect for and select with as little delay as possible such tracts of land as he shall require ; and the Lessee shall enjoy for the space of two years from the date of this agreement the sole right to select and acquire tracts of rubber and gutta forest or land for the purpose of planting and cultivating rubber or gutta within the State of British North Borneo.—*British North Borneo Herald*, Nov. 17.

THE MADRAS PLANTERS' LABOUR BILL.

The Planters' Labour Bill has been the occasion of a long discussion in the Madras Legislative Council. Three native members were in opposition.

The Hon. Mr G Stokes, in introducing the Bill, said :—Here in S. India many of us, even though we are not employers of organised labour, are familiar with the demand for advances on many occasions, but we do not realise perhaps how universal that demand is. Whenever labour on a large scale has to be organised it can only be done successfully under the system of advances. We need not, therefore, be surprised at finding that the labour on plantations is universally organised on this system. It is undoubtedly a bad system, but it is so universal and so deeply seated in the habits of the labourers that it is impossible either to ignore or overthrow it. Even in the great famine of 1876-1878 I remember when it was attempted to organise and move the people from the inland Districts to the Buckingham Canal, it was necessary to make advances and the case largely illustrated the inherent evil of the system ; for not much above half the labourers to whom advances were made ever turned up on the works. Special officers were sent to accompany the gangs, but notwithstanding all watchfulness they melted at every stage of

the journey. It may be taken, I think, as undoubted that the planter must make large advances and that he must and does lose much money in consequence of the fraudulent disappearance of the labourers. * * * When we remember that the labourers employed in the coffee industry were reliably estimated a few years ago at over 300,000 persons of whom two-thirds were imported labourers, *i.e.*, labourers under advances, and that a considerable number of the labourers to whom advances were made never join the estate and that many more desert, it will I think be conceded that the fraudulent disappearance of the cooly or maistry with the advance made him is an evil of great magnitude, demoralising to the labourer and crippling to the planter and one which it is the duty of the State to correct. In para. 122 and Appendix VII. of their Report, the Planters Enquiry Committee gives statistics of planters' losses which it is unnecessary to quote here in detail, but the returns show that the losses from the desertion of labourers vary from two-thirds of a rupee per acre cultivated in Madras and Coorg to R25 an acre in North Mysore. These figures do not include the losses suffered by maistries or planters outside the Associations making the returns, and are, therefore, much below the mark. * * * It is not the punishment of the cooly nor the repayment of the advance that the planter wants. What is essential in the case of that industry is to get the work done for which the advance is made, whether that work be the supply of coolies by the maistry or whether it be the agricultural work of the estate. This position has been expressed by the phrase that what is wanted is specific performance. In the Bill this is to be attained in the two following ways. Following the principle of the Penal Code and Act V of 1866, the breach of contract is itself made punishable, but power is given to the Magistrate to release and make over the maistry or cooly sentenced to imprisonment to his employer with an order to complete his contract. This is a provision taken from the Labour and Emigration Act of 1901. Specific performance is also recognised in the Bill in Sections 31, 32 and 33 under which conviction and imprisonment is not to operate as a release, the labourer being compelled to return to service after his term of imprisonment, the period not only of his absence from service but also of his imprisonment being added to the term for which he has contracted to serve. The whole term which can so be added is, however, limited to nine months.

The Hon. Mr. ACWORTH in seconding the motion said :—Your Excellency,—I rise to second the motion that the Bill be read in Council. I do not propose to say much at the present moment. As this Hon'ble Council is aware, this Bill has been very long under consideration and had been referred backwards and forwards to the Government of India and the Secretary of State several times. I should, were it not for Section 3, consider the Bill on the whole a good one, but Section 3 has been received with little less than consternation in some of the planting districts. From Wynaad the Government has already received a formal protest against the Section, and from the Nilgiris and Mysore protests against this Section have reached me, and I have been urged to do all in my power either, to get this Section expunged, or so modified as to meet the requirements of those who deal largely in local labour. Government in the notes on the clauses says :—"The object of this clause is to prevent the concurrent application of Act XIII. of 1859 and the proposed labour law to contracts for work of any kind between employers and labourers as defined in the Bill. It is, however, intended that the power which planters have of resorting to the provisions of Act XIII. of 1859 in their dealings with persons, artisans or others, who fall entirely outside the scope of the proposed law, should be preserved." Now it is obvious that under the Bill as at present constructed, the planter will have no hold on the local labourer. * * * *

The Hon. Sir GEORGE ARBUTHNOT said that he was unable to follow very accurately the statistics given by the Hon. Member who had just spoken (the Hon. Mr. K PERRAZU), but he gathered that they were to the effect generally, that the planting industry in South India was an eminently prosperous and progressive one. He could only assure him from a position of authority and from his sad experience that it was not by any means the case, and that unless every possible help was given to the planting industry, there was no doubt that there would be soon no coolies, no pruners and no planters, and that the last of the industry would be seen. * * * *

The Hon. Mr. G SIRINIVASA RAO proposed to point out what he considered defects in the various provisions of the Bill, illustrating his remarks by reference to the particular sections. He remarked in particular that the penal provisions were harsher and severer not only as against the cooly but also against the planter and maistry, than they were in Act VI. of 1901. He concluded by observing that he had pointed out the manner in which the provisions of the Bill, if passed into law as it was, would work hardship not only on the coolies but maistries and planters also. If the defects pointed out by him were not taken note of and reminded, as he had no doubt they would be in the Select-Committee, the employers who welcomed the measure now would find it affecting them immensely worse than now.

The Hon'ble Mr. ACWORTH said that he desired to make a correction in Mr. Perrazu's speech where he said that planters made coolies work for seven days in the week ; but, so far from this being the case, Sunday was always a recognised holiday, The difficulty planters had was to make coolies work six days in the week. The coolies always and habitually took one day in the week extra as a holiday. This would not appear in the planters' check roll, because the coolies did not always take the extra holiday on the same day. But to say that planters made coolies work for seven days was absolutely false. He could not help thinking that Mr. Perrazu had spoken without the slightest knowledge of planters, their estates, or the conditions of the labour that planters employed on their estates.

THE PRESIDENT'S ADDRESS.

His Excellency the President said :—The origin of the Planters' Labour Bill has been fully explained, and it has been drafted after protracted consultation with the Planters' Associations, the District Officers concerned, the Judges of the High Court, the Law Officers of Government, the Governments of Mysore and Coorg and the Government of India. The object of the Bill is twofold ;

to ensure good and fair treatment to the labourer, in sickness and in health, and to protect the employer from the serious losses to which he has hitherto been exposed through the dishonesty, extortion or caprice of the labourer. It has been amply demonstrated that the ordinary civil law is inadequate in the peculiar circumstances of the planting industry and that the importance of the planting industry is sufficient to justify special legislation. The Province of Assam, where the planting industry is not more important than that of Southern India, has for many years past had its own special labour laws and there are stronger reasons for similar legislation in Southern India, in that the labour here is more migratory. The total labour force in the Assam plantations is not much greater than those of Southern India, but whereas in Assam, at any rate six years ago when the Committee reported, the annual immigration only amounted to one-tenth of the numbers employed, in Southern India it amounted to no less than fourfifths. The speeches of the Hon'ble Members opposite have destroyed my hope that there would be an unanimous assent to the introduction of the Bill, but I trust that the further deliberations for which there will be ample opportunity, will prove that the provisions which have been drafted after so much consultation fully and fairly carry out the objects of the proposed legislation.

The following Select Committee was then appointed :—The Hon'ble Mr Acworth, the Hon'ble Sir George Arbuthnot, the Hon'ble Mr G Srinivasa Rao, the Hon'ble Mr J N Atkinson, the Hon'ble the Advocate-General and the Hon'ble Mr Stokes. —*M Mail*, Dec. 16.

THE PITCHER PLANT AS A PLANT PROTECTOR.

One of the greatest enemies to orchid plants in the West Indies is *Balatta americana*—the American cockroach. Numerous are the traps devised and the poisons compounded for the destruction of this insect and yet it does not appear to decrease in numbers, and regular plans of trapping and poisoning must be adopted by the cultivator if he is to keep his orchids free from these—almost ubiquitous—enemies. There are, however, natural checks which deserve attention. First among these comes a large spider, commonly though erroneously known in Trinidad as the "Tarantula." This spider with other large species, are very bitter enemies of the cockroach and assist not a little in preserving the balance of nature. When it is mentioned that one of these creatnres is large enough to capture and kill a full grown mouse —an occurrence once witnessed in the Herbarinm and recorded in Bulletin, January, 1895—it is easily understood how the cockroach falls an easy prey to it. Poultry and the larger lizards also feed upon the cockroach. To the barn-yard fowl, it appears to be a specially delicate morsel, as is recognised by the negro proverb "When cockroach gib' dance, him no ax fowl."

We have recently observed the help given to the cultivator in the destruction of these depredators by tthe various species of Nepenthes or Pitcher plants. As ohey assume full development, the pitchers developed in the end of the leaves, become filled with liquid, into which the cockroach is apparently attracted and eventnally drowned. The liquid (contained in the pitchers) is of a similar character to the gastric fluids of the human stomach and renders any auimal matter fit for absorption by the plant, so that the cockroach is ultimately digested as plant food. The Nepenthes have been found to be so useful for this purpose that they have been deemed advisable to largely increase the number of these plants among orchids, as the damage done by the cockroach has been largely decreased by their aid. The various species of Nepenthes thrive well in the climate of Trinidad and are grown in suspended baskets made of cedar wood in a similar manner to orchids.—*Trinidad Bulletin*, October.

PRIZE ORANGES.

We have to acknowledge the receipt of some splendidly large oranges from Mr. Holloway, Wattegama. They measure up to 12 inches in circumference and 15½ ounces in weight, each. Have larger oranges been grown in Ceylon?

BRITISH CENTRAL AFRICA.

THE NEW RAILWAY-TO BE.

In a recent *Illustrated London News* a plan of the Railway route to Lake Nyassa and some pictures are given. The Railway is to begin in May as soon as the rains are over. Things are looking up in Blantyre and I think there is a great future before that region. The African Lakes Co. is a great success, and Lord Overton, one of the leading men in that concern, has taken an interest in Blantyre and East Africa too. —*Cor.*

TEA CULTURE IN SOUTH CAROLINA, UNITED STATES.

We are indebted to Mr. Charles R. Shepard, of Pinehurst, South Carolina, the pioneer of tea cultivation in North America, for a very interesting, good-humoured and even amusing letter which will be found elsewhere. We can assure Mr. Shepard of our utmost good wishes for his success in all departments of his venture, and we hope to look in upon him and his fields of tea some time during 1904 if he will permit us. We were as much astonished as interested when the Secretary to the U.S. Agricul' tural Department showed us his fine tea bush growing in the open air at Washington, in March 1884. No one in Ceylon we feel sure, will grudge Mr. Shepard his attainment of a maximum crop of 17,000 lb. of tea from Pinehurst at the earliest possible date. All such tea grown on American soil might well be sold at a fancy price—so many dollars a lb.—to patriotic millionaires. The yield per acre is very good—for South Carolina; but from small areas of one or two acres by careful cultivation, ordinary yields everywhere can easily be doubled. Nevertheless, there is probably no more interesting tea-growing experiment in the world at the present moment than that of Mr. Shephard at Pinehurst, South Carolina, which is now brought under the auspices of the U.S. Department of Agriculture. Ceylon planters can never wish to see such teafields extinguished, even if their maximum crop rose to 170,000 lb. or to ten times the maximum to which, apparently Mr. Shephard aspires!

AMERICAN CAPITAL IN RUBBER EXPLOITATION.

PARA RUBBER PLANTATION COY.

The Para Rubber Plantation Company has been formed for the purpose of trading in crude rubber on a large scale in Venezuela, on lines somewhat different from those any large company previously organised. The company begins with the ownership of a tract of land about eight miles wide, lying on both sides of the Casiquiare river for its whole length of 175 miles, comprising about 1400 square miles, of territory, or nearly one million acres. The Casiquiare is a stream navigable at all seasons, connecting the Orinoco with the Rio Negero, the latter which empties into the Amazon a few miles below the city of Manaos. The Negro is navigable up to the Casiquiare as also is the Orinoco, with the exception of about thirty miles obstructed by cataracts above San Fernando, in Venezuela. For the present the company's property will be reached by way of Manaos, and that city will be the basis of the company's operations, It has been suggested by that means of a narrow guage railway around the falls shipments could be made on the Orinoco more economically than in the other direction but such railway has not yet been projected. In spite of its name, the new company is in no sense a rubber planting enterprise.

Reports made on this territory, which have led to the organization of the company, are that it contain rubber trees in abundance of more than one species of *Hevea*, and that these trees, for the most part, have not been worked. The Casiquiare river does not overflow at any time, and the region is declared to be more healthful, for this and some other reasons, than much of the country that has been explored for rubber in the Amazon valley. The population is mainly of Indians, who are more docile than in some other regions of Venezuela and in portions of Columbia where rubber workers have been attacked by the natives.

The natives of this region have developed some degree of civilization, cultivating crops for their own use, and in places have engaged in a small way in gathering rubber. There are also some Brazilian settlers who are familiar with working in rubber, and the company pruposes inducing more Brazilians, particularly Cearenses experienced in working rubber to enter its employ. The Casiquiare district is less remote than some of the upper Amazon rubber fields to which the Cearenses go annually, besides which it is adapted for permanent residence, which is not true of districts which are overflowed every year.

It is the idea of the company that, having a rich and unworked rubber district of large extent, with many resident natives who are capable of being trained to work rubber, and with advantages attractive to Brazilian rubber workers, together with a large amount of capital and facilities for maintaining company stores, it will be able during the next crop season to begin operations extensively and to ship considerable rubber at a cost which will insure profits. One advantage that the company expects to have over some that have operated in the upper Amazon districts is that piracy of rubber will be practically impossible. The Para company will be able to so control the approaches to the Casiquiare that neither goods can be entered nor rubber sent out without the knowledge of the company's agents, and there is no other means of communication with the outside world. The Para Rubber Plantation Company was incorporated August 11th 1902, under the laws of Arizona with five million dollars capital.

Venezuela is divided into thirteen states and two territories. The Casiquiare district lies in the extreme southwestern part of the republic and bounded on the west by Columbia and on the south by Brazil. The population of the territory is estimated at about 46,000, of whom 12,000 are civilized Indians.

RUBBER FROM MOLLENDO.

Rubber from this port on the Pacific has begun to reach the New York market direct, being the product of Bolivia, and particularly of certain concessions worked by capital from the United States. There are now two such companies working on a considerable scale—the Chicago-Bollivian Rubber Co., with its headquarters in Boston, and the Andes Rubber Company, with the headquarters in Baltimore. During the past month rubber has been received at New York, shipped by each of the two companies named.—*The India Rubber World* Nov. 1.

PLANTING NOTES.

RAINFALL FOR NOVEMBER.—The rainfall for November as registered at the School of Agriculture totalled 15·66 in. as compared with 20·10, the total for the same period according to the Surveyor-General's return This shows that nearly 4½ inches more rain fell over the Fort, than over Cinnamon Gardens about 2½ miles inland, during November.

COFFEE INDUSTRY IN MYSORE.—A Conference of planters to consider the state of the coffee industry in the Mysore Province was held at Saklaspur and Mudgere, the particular problems considered being finance, labour and certain inconveniences which they experience in the present decadent state of the industry. By the desire of the planters and by command of the Maharajah, Mr Madhava Row, Revenue Commissioner, attended the meeting, and will report on the position of the industry and the best means of its amelioration.—*Pioneer*, Dec. 19.

ANOTHER "CURE" FOR SNAKEBITES.—I reference to the cure of scorpion stings by the use of malt vinegar, a correspondent states that it very strong acetic acid is gathered from the place of the Bengal grain, which is generally and large ly cultivated in the black cotton soils of the Bellarey, Anantapur, Cuddapah, and Kistna Districts. The acid is collected by means of large clean sheets being spread over the plants, and the acidulous dew formed on the plants is shaken into the sheet and absorbed. The sheet is moved over the field till sufficiently wet. It is then squeezed out in a vessel and bottled. This is carefully preserved and highly prized by the ryot as very medicinal, and is successfully administered in ases of colic, cholera, and all stings. It is much tronger then malt vinegar. It is believed that his acid, which is very clean, forms part or is wholly the mantram or holy water usually employed by the so-called mantram people in the yure of snakebite.—*Pioneer*, Oct, 13.

THE CALELONIAN (CEYLON) TEA ESTATES, LIMITED.

REPORT OF THE DIRECTORS

to be snbmitted at the fifth annnal general meeting of shareholders on Thursday, 27th November, at noon.

The Directors beg to submit the balance sheet and profit and loss account for the year ended 30th June, 1902, duly audited.

The working account, after providing for London charges, shows a profit of £4,134 12s 5d, and the Profit and Loss Account, including the balance brought forward from the previous year, and after payment of Interest on debentures, &c., leaves an available balance of £1,998 8s 5d.

From this sum the Directors now recommended the payment of a dividend of 6 per cent on the preference shares for the year to 30th June last, amounting to £1,920, leaving to be carried forward to the next year the balance of £78 8s 5d, =£1,998 8s 5d.

The Directors regret that they are again unable to declare any dividend on the ordinary shares.

The yield of tea from the Compauy's estates for the past and two previous seasons was as follows:—

	1901.2.	1900-01.	1899-900.
	lh.	lh.	lb.
Lawrence and Venture	410,120	399,087	402,535
Selegama ...	165,379	167,378	111,415
Wavina ..	112,695	94,979	40,763
	638,194	661,444	554,713

The gross average prices obtained in London were :—

	1901-2.	1900-01.	1899-900.
Lawrence ..	6·62d	6·84d	7·40d
Venture ..	6·78d	7·13d	7·59d
Selegama ..	5·70d	5·79d	6·52d
Wavina ..	7·78d	5·64d	6·39d

167 cwt. of cocoa were secured from Kahawatte and 18 cwt. from Wavina, and this realised a net average of about 50s per cwt.: 4,200 seed pods were also disposed of. The previous year's crop of cocoa was only 70 cwt.

The above figures show that the total quantity of tea produced was 26,750 lb. more than the previous season's crop, and 13,194 lb. over the estimates. The improvement in the market for Ceylon tea, notified at this time last year, was not maintained, and for a large portion of the crop lower prices had to be accepted; the result of the year's working, owing to the increase in the quantity of tea and cocoa gathered, is however, practically the same as that of the previous season.

The estimates for the current season are given by the managers in Ceylon, as follows :—

	lb.	
Lawrence and Venture	400,000 Tea	
Selegama ..	175,000 do	
Wavina ...	110,000 do	and 20 cwt. Cocoa
Kahawatte ..	—	175 do do
	685,000 do	195 do do

The coconnts on Kahawattc and Wavina are coming on well and promise to be a succcss; the para rubber trees on the latter estate are also progressing favourably.

The amount charged to capital in the accounts now rendered, inclndes the cost of a new bungalow on Wavina estate, and a new set of coolie lines on Selegama.

Further capital expenditure will be necessary to provide a faotory for Wavina estate, as well as additional machinery and appliances on other estates, in order to keep pace with the new and improved methods of manufacture,

In accordance with the Articles of Association, S Alfred Dent retires from the Board, and being eligib offers himself for re-electiou.

The Auditors, Messrs. Singleton, Fabin & Co., also offer themselves for re-election.

THE HORNSEY TEA ESTATES COMPANY, LIMITED.

THE SIXTH ANNUAL REPORT, 1901-1902.

DIRECTORS.—Charles A Reiss (Chairman); Hamilton A Hancock; Walter S Sichel and W S T Saunders (Managing Director in Ceylou).

SECRETARY.—Albin B Tomkins.

The Directors beg to submit to the Shareholders the Report and Audited Accounts for the year closing 30th June last.

The Crop of Tea has weighed ont 168,749 lb. against last year's 176,885 lb, or a decrease of 8,136 lb of made Tea.

The cost of production has been 26·62 cents; against last year 30 84 cents, or in sterling 4¼d per lb, Colombo against 5d per lb Colombo, last year.

The Loudon sales have totalled 31,130 lb of Tea, selling at an average 7·15d per lb gross, and the balance of the crop has been sold in Colombo, and realized au average of 39·74 cents per lb. The average sale price for the whole crop has been equivalent to a London price of 7·20d per lb gross, against last year's 7·47d per lb, or a farthiug per lb less.

Although the crop has been smaller than last year's, the advantages of having a Factory are very marked. The cost of production has been ¾d per lb lower and the profit on the working of the estate shows an increase over last year of £236 17s 3d.

The average selling price is again lower than the previous year. This is not due to a falling off in the quality or make of the Tea, which have beeu qnite as good as usual, but to a low and adverse market, which has kept prices down duriug the period under review. Prospects for the current year are hopeful; the crop showing an increase of 7,800 lb since the first of July.

The Audited Accounts herewith show that after paying fixed charges and Preference Dividend for the twelve months, there is a credit balance of £21 14s 11d, to Profit and Loss, and this amount has been written off Preliminary Expenses Account.

The Directors have decided that in futnre the Preference Dividends shall not be paid before the end of March and the end of September. This change is deemed advisable as the crop is not entirely sold until the later date.

The Directors desire to express their thanks to Mr W S T Saunders, and to Messrs E Benham & Co, the Colombo agents, for the attention given to the Company's business during the year.

In accordance with the Articles of Association, Mr Hamilton A Hancock retires from the Board, and, being eligible, offers himself for re-election.

The Auditors, Messrs Singleton, Fabian & Co, offer themselves for re-election.

CHARLES A REISS and WALTER S SICHEL, Directors.
ALBIN B TOMKINS, Secretary.
51, Lime Street, E C, London, Nov. 14.

DIGALLA CEYLON TEA ESTATE COMPANY, LIMITED.

Report of the Directors to be snbmitted at the Sixth Annnal Ordinary General Meeting of Shareholders to be held at 20th, Eastcheap, E.C., on Tuesday, 16th December. 1902.

The Directors are pleased to say that the working of estate during the past season has given considerably better resnlts than the previous year, and the profits have made it possible to wipe out the loss of last year, and to pay Preference Dividends to 30th June, 1902,

The crop for the year was 250,781 lb, as against 229,217 lb, for the previous year, and the price realised was 5·88d against 5·01d in 1901-02.

The yield per acre was 415 lb, as against 382 lb tho previous year.

The rate of exchange was 1/4 11-32 oompared with 1/4 7-16 the previous year.

Under clause No. 24 of the Articles of Assooiation, Mr H K Rutherford retires on this occasion from the Board, and being eligible offers himself for re-election.

The Auditors, Messrs Harper Brothers, Chartered Accountants, also retire from office, and offer themseleves for re-eleotion.

By order of the Board,
London, 6th Dec., 1902. WM. JOHNSTON, Secy.

CEYLON AND INDIAN PLANTERS' ASSOCIATION, LIMITED.

DIRECTORS.—Charles Arthur Reiss, (Chairman) Thomas North Christie, Charles Frederick Dickinson' and John Humphery.

SECRETARY.—Albin B. Tomkins.

FIFTH ANNUAL REPORT, 1901-1902.

The Directors beg to submit their Report and the Audited Accounts for the year ending 30th June last.

TEA.—The total yield has been 855,816 lb, against last year's 799,739 lb of made Tea, an increase of 56,077 lb.

The average selling price has been generally lower, but cost of production has been also less, and has more than compensated for the drop in the selling price, so that profits on Tea are £722 4s more than the previous year. It is satisfactory to note that St Andrew's and the Maha Eliya Estates have both done better, and made fair profits, considering the bad time through which the industry is still passing.

The accounts show that after paying Debenture Interest, Preference Dividend, and all fixed charges, there is a balance at credit of Profit and Loss Account of £599 10s 5d. The Directors recommended that £500 be written off machinery account and the balance acconnt of £99 10s 5d be carried forward to next year.

PLUMBAGO.—It is with some satisfaction that the Directors can report fair progress; 206 tons of the mineral have been mined and sold during the twelve months. The average salo price has been R248 or £16 11s 4d net per ton. The market for Plumbago has been more favourable, and the net profit is £1,520 18s 6d, against £1,003 6s 8d last year.

ANALYSIS OF YEAR'S WORKING.

	Laxapana.	Maha Eliya.	St. Andrew's	Kandaloya.	Total.
Total Acreage	1,021	305	760	1,006	3,092
Product	Tea	Tea	Tea	Tea Cdms	
Acreage in bearing and partial	806	264	597	T 586 Cdms 4	2,257
Acreage planted not in bearing	21	35	30	T 4 Cdms156	246
Cost per lb in cents and sterling (Manure included)	25.21 Col	27.23 Col	27.60 Col	30.88 Col	27.17 Col
Gross average	4.12*d*	4.46*d*	4.51*d*	5.06*d*	4.41*d*
Sale price per lb	6.43*d*	40.95*c*	6.46*d*	33.31*c*	
Net Average Sale price per lb	5.50*d*	39.93*c*	5.52*d*	32.29*c*	
Profit por Acre in bearing	£ s d 2 9 0	£ s d 3 10 3	£ s d 1 10 4	£ s d 0 2 7	£ s d 1 14 6

Average Yield per Acre made Tea	410lb	459lb	343lb	299lb	380lb
Crop made lb	354837	121107	204827	175045	855816
Original Estimate 1901-1902, lb	342000	134000	225000	185000	886000
Estimated Crop 1902-1903, lb	346650	130000	215000	185000	876650
Estimated Cost per lb Colombo 1902-1903, cents	25.93	30.02	27.25	30.99	

ACCOUNTS.—The Directors have decided that in future the Preference dividends shall not be paid before the end of March, and the end of September. This change is deemed advisable as the crop is not entirely sold until the later date.

ANALYSIS OF COST F.O.B. COLOMBO.

	Laxapana.	Maha Eliya.	St. Andrew's.	Kandaloya.
Superintendent	2·61	3·10	3·03	3·74
Visiting Fees	—	·83	—	·28
House Coolies	·30	·27	·24	·41
Bungalows	·06	·03	·11	·16
Lines	·18	·08	·23	·33
Factories, etc.	·22	·44	·36	·29
Contingencies	·36	·38	·41	·75
Fire Insnrance	·20	·27	·19	·33
Water Course	·04	·16	·01	—
Supplying	—	—	·10	·18
Roads, Drains, etc.	·39	·37	·44	·64
Weeding	2·71	2 35	3·30	4·87
Pruning	·77	·90	·81	1·36
Forking	·33	·16	·20	·13
Cost of Manure	1·29	·50	1·85	—
Application of Manure	·39	·25	·32	·03
Tools	·09	·10	·13	·07
Stock	·09	—	—	—
Plucking and Baskets	9·91	11·17	9·72	10·06
Manufacture, Packages, etc.	3·20	3·86	3·28	5·05
Transport to Colombo	1·25	1·25	1·51	1·83
Shipping Charges	·70	·19	·69	·05
Machinery	·12	·39	·62	·25
Sundry	—	·18	·05	·02
Cost in Cents per lb	25·21	27·23	27·60	30·88

The Directors regret that the funds available are insufficient for the payment of a dividend on the Ordinary Shares. Regarding the future it seems probable that the limits of production in Indian and Ceylon Tea have been nearly reached, and with consumption slowly but ever increasing, it is possible that prices have reached the lowest level, and that some recovery may be established before the next report is issued. Prospects also for Plumbago for the current year are not unfavourable, and the mineral is being steadily mined and sent to market.

The Directors desire to record their thanks to Mr George Greig and staff in Ceylon, and also to Messrs. Skrine & Co., and the Colombo Agents for the attention given to the Company's business during the year.

By the Articles of Association, Mr Charles A Reiss retires from the Board, and, being eligible, offers himself for re-election.

The Auditors, Messrs. Singleton, Fabian & Co., also offer themselves for re-election.

Directors.—Charles A Reiss and Charles F Dickinson. *Secretary.*—Albin B Tomkins, 51, Lime Street.

London, Nov. 21st.

ANNUAL GENERAL MEETING OF THE CEYLON FISHING CLUB.

At the annual general meeting of the Ceylon Fishing Club held at the Hill Club on Dec. 20, 1902, at 3 p.m., Mr. E M de Coucy Short presided, when there were also present Messrs G G Ross Clarke, F Dew, John Fraser, A W A Plâte, C H Bagot, and J Wickwar.

Notice calling the meeting having been read, the Chairman called on Mr. H D Elhart to read the following

ANNUAL REPORT FOR THE YEAR 1902.

The last annual report for this Club was read at the general meeting held on the 21st December, 1901, after which date one general meeting was held on the 4th February, 1902; and in accordance with a resolution to the effect that a managing Committee meeting shall be held on the last Saturday of each month. The meeting Committee met for the transaction of business nearly every month.

FINANCES.—The amount standing to the balance of the Club at the close of the year is R411·30. The outstanding debts of the Club are as follows:—£43 5s 11d. to the Earl of Denbigh's fish hatcheries and £6 13s 3d. to the Otago Acclimatisation Society for Ova supplied.

OVA.—A consignment of 20,000 brown trout ova was received from the Wyresdale Fishery early in the year, in splendid condition yielding about 12,000 fry.—Attempt was made to rear them in rearing troughs, but owing probably to over-crowding heavy mortality set in, the fry were, therefore, put out into the streams as quickly as possible, being distributed as follows:—Mr Ross Clarke's Stewpond at Nanuoya 250, Mr J Fraser's Stewpond at Nannoya 250, Mr F H Turner's Stewpond at Nanuoya 250, Mr R Jackson's Stewpond at Sita Eliya 250, Hawa Eliya Stream 300, Batuhela 300, Hon E Rosling's Stewpond at Nanuoya 200, Horton Plains 3,750, Nuwara Eliya Stream 1,882, Maskeliya Stream 500 and Nuwara Eliya Stewponds 535.—Total, 8,467.

Two consignments each 20,000 Rainbow ova were received from the Earl of Denbigh's fish Hatcheries—both in bad condition—from the first consignment 1,548 fry were distributed as follows:—Mr Ross Clarke's Stewpond at Nanuoya 300, Buluhela Stream 100, Kandapola Stream 100, Mr J Fraser's Stewpond at Nannoya 250, Sita Eliya Stream 200, Maskeliya Stream 500, Mr Turner for Hewaheta Stream 74 and Mr Cotton for experimental purposes 24.—Total, 1,548.

The second Rainbow consignment yielded nothing. Both consignments arrived in dried condition, and and looked hopeless form the first. The trial shipment of 5,000 Rainbow ova received from the Otago Acclimatisation Society, also arrived perfectly dry and useless. It has now been definitely ascertained that Rainbow Trout are breeding in large numbers both in the Horton Plains and Nuwara Eliya streams, and the Committee has arranged for locally-bred Rainbow fry to be put out into the tributaries of the main stream in Nuwara Eliya during the year.

OTTERS.—Twelve otters were killed during the year for which tke sum of R90 was paid as reward.

CLOSE SEASON.—The close season for the year 1902-1903 was fixed as follows:—For the Central and Sabaragamuwa Provinces from 1st October, 1902, to 28th, February, 1903.—Signed. E M de Coucy Short, J Wickwar, Hon. Secy., C.F.C.

Mr. J. WICKWAR thought that the number of fish taken during the year may be added to the report submitted so as to give members an idea of what the year's fishing had been like.

Mr. JOHN FRASER, said he felt eanguine that a good many residents were not aware that the annual subscription was only R10, and as he was anxious to see the number of members of the Ceylon fishing Club largely increased, he thought that the annual subscription of the Club could be quoted with advantage on the year's report.

The CHAIRMAN remarked that the report before the meeting was hurriedly got together. He had just returned from furlough, and had not the time to do better. The report, as submitted, was adopted and it was also resolved that the suggestions of Messrs. Fraser and Wickwar be included prior to passing for print—and circulation.

ELECTION OF GENERAL AND MANAGING COMMITTEES.

On the suggestion of the CHAIRMAN the meeting resolved that the following members of last year's General Committee be re-elected, viz. :—Messrs. C H Bagot, H G Cuff, A H Dunsmure, Thomas Farr, W F Dew, G G Ross-Clarke, W Maitland, G M Fowler, S Payne Gallway, C P Hayes, G B de Mowbray, C A Hartley, R MacLure, C Bayley, F H Turner, H V Masefield, J Fraser, R Jackson, J Wickwar and the Hon. E Rosling. Messrs. J M Purdon and Cecil de Winton having left the island on long furlough, it was unanimously thought prudent to substitute their names by electing two new members in their stead.

On the proposal of Mr. JOHN FRASER, seconded by Mr. G G ROSS-CLARKE, Mr. W F Dew was elected vice Mr. J M Purdon.

On the proposal of Mr. G G ROSS-CLARKE, seconded by Mr. JOHN FRASER, Mr. F H Turner was elected vice Mr. Cecil de Winton.

On the suggestion of Mr. C H BAGOT it was resolved that the following members of the last year's Committee be re-elected, viz. :—Messrs. J Fraser, Thomas Farr, H V Masefield, R Jackson, G H Bagot, C J Bayley, G G Ross-Clarke and the Hon. E Rosling. In this instance, too, the meeting thought it advisable to elect members in place of Messrs. Cecil de Winton and J M Purdon, whereon it was resolved that Messrs. D Lyall and North C Davidson be elected to serve on the Managing Committee in their stead.

ACCOUNTS TABLED.

The statement of the year's accounts was tabled and shewed a receipt during the year of a sum of R3,546 45
To this was added 1,266 55
which was the amount brought forward last year, thus giving a total of R4,813 00
Of this sum 4,401 70
had been expended during the year
which left a balance of 411 30

The CHAIRMAN said that the liabilities of the Club was £49 19s 2d which was owing by the Club for ova imported from the Earl of Denbigh's and the Otago Acclimatisation Society hatcheries. But he did think that the Club was going to pay that debt in full owing to the bad condition in which the ova had been received.

Mr J FRASER said he thought not, but as that was a matter for the Managing Committee to decide, he thought that it may be safely left in their hands—as they could depend on the Managing Committee to their utmost to make the best possible terms as would be possible, for the mutual interests of all parties.

MR. J. FRASER'S MOTION.

"That all members of the Club desirous of stocking ponds or streams with rainbow trout, considered by the Managing Committee as suitable for the purpose, be presented by the Club with 50 country-bred fish was next put by the Chairman to the meeting." Mr Fraser, in support of his motion, said

that he brought forward this resolution to encourage those distant from Nuwara Eliya and the Horton Plains to take an interest in fishing, if sub-sections were formed throughout other districts to further this scheme where there was decent water for trout. He thought it would be a sure way of inducing members to join the Club. It was now beyond doubt that rainbow trout was breeding in and about the Nuwara Eliya streams and that the bigger fish have been proved to be, swarming in the lake. He thought that rather than overcrowd streams and lake, the fish may be thinned out with advantage and distributed. He would however make no proposals as to how the fish were to be caught. He would leave that to the Managing Committee to decide.

Mr C H BAGOT said that he had had a letter from Mr Thomas Farr, dated the 16th December, bearing on this resolution, which was in a way an amendment on Mr Fraser's motion, but the substance of it was the same. He would, with the permission of the Chairman, read an extract from Mr Faar's letter. The Chairman having given his consent Mr Bagot read, an extract from letter as follows :—

"Should you be at the meeting of the C F C on the 20th instant would you mind reading this letter. Just now I am too busy to attend myself.

"With regard to Mr Fraser's motion I think 50 fish to *every* applicant too much; but I would give 100 where conditions were especially favourable to the well being and propagation of rainbow trout. Besides what is to prevent a man joining the Club getting his 50 fish and then ceasing to be a member. I would propose as an amendment :— "That the Ceylon Fishing Club being desirous of stocking all suitable water in the island with Rainbow Trout is prepared to receive applications through the Honorary Secretary for country-bred fish, all applicants to be members of the C F C."

Mr Fraser said that he was content to withdraw his resolution in favor of Mr Farr's amendment, as it met his views on the subject. All he was anxious about was to see the distribution of country-bred fish where they would be cared for. To interest non-fishing Club members, joining in the movement, and advancing the Fishing Club to a larger organisation than it is at present was what he wanted to see done.

The CHAIRMAN—said that as the meeting was in favour of Mr Farr's amendment, and as Mr Fraser had withdrawn his original resolution—the amendment would have to be seconded before it could be adopted.

Mr C H BAGOT—thereon seconded the amendment—which was carried. Mr C H Bagot wanted to know from the Chairman, if there had been any prosecutions and convictions during the year for poaching trout.

The CHAIRMAN said:—He thought not.

Mr C H BAGOT—and yet I know of cases in which trout have been caught and eaten by poachers.

Mr J FRASER:—Why did you not prosecute?

Mr C H BAGOT:—Oh ! I came to know it a week or ten days after the fish had been eaten.

Mr D LYALL—enquired of the Chairman what the penalty fine would be if a cooly or anybody else was caught poaching trout.

The CHAIRMAN:—It will depend : if it be a cooly R5, if an European, perhaps, very much more. It would all depend on circumstances to a cooly R5 would mean his half month's pay ; to an European any sum would not be too much, as he would be able to afford it.

Mr. J FRASER:—I am afraid, Mr. Chairman, your idea of what Europeans are paid up this way is rather an exaggerated one. (Laughter.)

Mr. C H BAGOT—thought R100 should be the maximum fine for anybody caught poaching.

THE CHAIRMAN :—A cooly would not be able to afford that sum, a fine of R5 as I said before would mean to him his half month's pay, to an European a sum of R100 would be nothing.

Mr. G G ROSS CLARKE:—A cooly may have his friends who would get together and subscribe towards the R5 fine.

Mr. F W DEW—thought a fine of R5 inadequate as a poacher, who caught a lot of trout, would sell them for much more than R5. So small a fine would be no terror to him, and he very probably may not desist from continuing to poach trout.

THE CHAIRMAN:—The fine will depend on what is proved against poacher, and he will be dealt with accordingly.

Mr. C H BAGOT.—said he had on behalf of Mr. Farr to move for the adoption of the following motion:—I would propose that a local Committee be formed for the Horton Plains consisting of members from Maskeliya, Dikoya, Dimbula, and West Haputale.

Mr. FARR supported his motion with the remarks "My reason for this is that the members I have in my mind are regular visitors to the Horton Plains, that they fish no where else, that they are too far from Nuwara Eliya to attend meetings. That in view of the different conditions with regard to the Rainbow Trout as compared with this fish in Nuwara Eliya, such as its remarkable productiveness in some places and its tendency to work up stream as well as down—what would be advisable in Nuwara Eliya might not be thought so on the Horton Plains." I would also in view of the supposed tendency of the Rainbow trout to drop down stream when they become catching—reduce the limit of takeable fish to the same as the Brown Trout.

It was resolved that in view of sufficient notice in connection with Mr Farr's proposal *re* Sub-Committee for Horton Plains not having been given that the motion be postponed for consideration at next meeting when, it is hoped, Mr Farr may be present. It was also resolved in accordance with Mr Farr's suggestion *re* amendment of Rule 11 that the required notice be given and that the matter be brought up at the next meeting.

AMENDMENT OF RULE 4.

Resolved that rule four be amended and read as follows :—

4. Fly fishing is allowed in all Club waters, but fishing with artificial spinning bait is restricted to the lakes within the notice board. Fishing with live or dead bait (worms included) or with hooks larger than No. 6 of the Redditch scale in the rivers and streams is prohibited. No restrictions are placed upon the bait to be used in the lakes.

The original rule has been added to by the insertion of the words *within the* notice *boards*.

The meeting adjourned at 4 p.m. after the usual vote of thanks to the Chair, proposed by Mr G G ROSS CLARKE, seconded by Mr D LYALL, had been recorded.

TEA PRODUCERS' COMBINATION.

(To the Editor of the *Home and Colonial Mail.*)

SIR,—Mr Seton is right, and this matter ought not to be brushed aside. Tea producers, though individually estimable, collectively are fools! The language may seem strong, but look at the facts.

The present price of Indian tea is even now lower than it was this time last year, notwithstanding a better statistical position and prospects far better than we have seen for years.

But for our folly we might easily be getting 2d per lb more for our produce. Think of it, £1,250,000 per annum lost!

The reasons are not far to seek, and are these:—

(a) Buyers combine and sellers do not.

(b) Buyers are few, and sellers are many.

(c) A few sellers are even now making fair profits.

(d) Sellers are jealous of each other.

The number of sellers is the main difficulty, but should not be insuperable if the fact that 2d per lb could easily be added to the present price were brought home to proprietors, shareholders and agents.

The same argument applies to the few who are still making profits, for a rise of 2d per lb. would more than double these profits.

Jealousy must always continue, but its existence need not necessarily be obstructive.

Want of concerted action and want of money are the pressing evils of the industry.

Never was there a better time to bring about concerted action, never can the effects of the want of it be better demonstrated.

Now, how can the difficulties be met? I suggest the following:—

1. Establish an Indian Tea Producers' Combination, which to be effective, must be representative of at least 75 per cent of the industry. (Ceylon should be invited to join, but Ceylon's aloofness would not necessarily hurt us, because Ceylon's supplies to U K are not nearly sufficient to satisfy the requirements of buyers, because Ceylon teas arrive all the year round and because Ceylon teas won't keep, and therefore, must be sold as they arrive.)

2. Establish type standards of all grades of each district, and appoint a valuing committee of brokers to value all the teas of the combination against these standards (each merchant's broker would watch and protect his respective interests).

3. A committee of the Producers' Combination would fix the selling price of each standard rapidly raising against the price by 2d per lb., and no teas should be sold under the fixed price after allowing for variation from the standard.

4. All teas in the Combination should be sold through one representative of the brokers, whether privately or publicly.

5. The auctions should be held in a room under our own control. (This alone would probably suffice to bring in a large proportion of those who might wish to be outside the combination.) The present system is enough to sicken one by the disorderly way the auctions are at times conducted.

6. Calcutta sales should be made on exactly the sames bases.

7. All account sales of garden teas, Calcutta and London, should be charged, say, 1-12 of a penny per lb, which charge would be paid to the Combination funds for its benefit. Estimating the Indian crop at 150 million lb, and deducting 25 per cent. for abstentions, a fund of upwards of £40,000 per annum would thus be raised, and be sufficient to make the combination strong enough financially to be respected. In years of overproduction it could be utilised for compensating growers for holding back a portion of their crops, and at other times for the general benefit of the industry.

9. No extensions should be made by members of the Combination beyond, say, 5 per cent. of their existing acreage to make up for deteriorating areas.

Surely something on these lines is practicable? If not, why not? Who will move in the matter? The Tea Associations seem helpless. Will proprietors, agents and shareholders, approving generally, notify their willingness to meet and discuss it?

If sufficient support is forthcoming a meeting shall be called under the auspices of a chairman of repute.

TEA PRODUCER.

[If tea producers willing to meet to discuss the above will signify the same to us we will notify the writer (with or without disclosure of name as may be desired), and if support seems likely to be forthcoming, arrange for the meeting to be called.—ED. *Home and Colonial Mail.*]—*H and C Mail*, Dec. 5.

MOSQUITOES AND MALARIA.

THE GREAT MALARIA PROBLEM AND ITS SOLUTION.

(*From "Old Colonist."*)

Recently I went to hear a lecture delivered by Major Ross of the Tropical School of Medicine, Liverpool, on Mosquitoes and Malaria, thereby gathering a few "wrinkles" which, I think, is worthy of being recorded for the *Observer*. The subject is not altogether new here; for it was in Aberdeen that the final link was supplied which binds together the insect and the disease. Dr. Manson went to the Roman Campagna, got some mosquitoes to bite a malarial patient, and then despatched them to Aberdeen, where his son let them loose upon himself in his own bedroom, was bitten, and in due course developed malarial fever, discovering in his own blood the unmistakable organisms brought from Italy. Thanks to quinine, he got better of the bite—the mosquito it was that died.

Major Ross is a clever scientist, for some years a well-paid doctor in the Indian Government Service. He confesses, that as such, his duties were extremely light, and that he was glad to devote his leisure to the study of so important a problem. By means of a good map, coloured to show the chief malarial districts of the world—amongst which I note certain spots on Ceylon indicated—the lecturer proceeded to show the extent of the ravages by this dire malady, which keeps the richest portions of the world in a state of barbarism. In India, alone, he said, 5,000,000 of the people are returned as dying from the fever every year. Every year 18,000 whites and 82,000 natives were admitted to hospital, suffering from the disease, and many came in over and over again. He could not give figures for Africa. He did not even know the population; but

this be knew, that nearly all the children on the West Coast of Africa were more or less infected by fever. This he could tell by catching them wild, and examining their blood; as a matter of fact they came in hundreds, offering their blood at 1 penny per drop! and in that of nearly all the children the parasites of malaria were found. A year or two ago anything more wretched than the condition of these children could not be conceived, but already a striking improvement has been effected, and the death-rate marvellously lowered, by simply draining and filling up stagnant pools, and applying kerosine to the margins of lagoons. This chiefly in Freetown which, he sees no reason to doubt, can be made as healthy as any other tropical city, Major Ross is very severe; and justly so, I think, on Colonial Governments for their apathy and meanness in this matter of sanitation. Ever ready to subscribe liberally to imperial displays; in a matter which affects the life of many thousands of helpless subjects, they take not the remotest interest. At Lagos and Freetown there are now employed at the above-mentioned work, from 60 to 80 men with two European Superintendents, but not a sixpence has yet been obtained from Government, the whole cost being defrayed by a wealthy and generous Scotsman. Yes, my critical friend; you like to cackle about the "close-fisted Scot"; but we would like to see a little more of such generosity from the predominant partners! Major Ross now proceeded to describe his initial work undertaken in order to prove to himself the truth of Dr. Manson's theories,

THE DISSECTING OF MOSQUITOES

he, found to be a very difficult and tedious task, but he persevered for month after month, amidst many discouragements. The object was to ascertain if the parasites really existed in the blood of these insects. He continued his experiments for 2½ years examining hundreds of mosquitoes under the microscope. At length, at the close of a hard day's work, he discovered malaria germs in a new species of mosquito brought to him by an assistant. This is the *anopheles*, the female of which—as far as known, is the only species of the mosquito conveying malaria. The malaria germs pass into the stomach of the mosquito, where they develop and make their way into the blood and where they disseminate in minute thread-like forms, collecting in the glands, thence projected through the proboscis into the unlucky victims.

The Major nursed up a family of a few dozen Anophele and immediately set to work to experiment—not only on human beings, but the feathered tribe was equally susceptible from a bite of the jât female insect. Sparrows by the score, and even crows died of malaria, after a single bite! Now an insect-bite that would kill, say, a Colombo crow would, I imagine, kill any living creature. But how is it, if crows be really so susceptible of fever, they do not get exterminated? Herein lies a 'wrinkle,' the crows sleep in trees or on the top of houses, and the anopheles only rise a few feet above the water in which they breed. The ancient Incas must have had an inkling of this, when they raised mounds 100 feet high on which to build their dwellings, and the Colombo-wallah who built an upper storey to his bungalow was wise in his generation, though what became of the poor prophet in the chamber below?

Major Ross experimented in other directions, for instance, he had freshly dug virgin soil from malarial localities placed under his bed, and there he slept without any evil ever befalling him.

Now, in days of old—indeed, up till 1894—we were taught by sage professors that the disturbing of the earth in malarial districts set free certain gases which frequently proved fatal. I was told so on arriving in Ceylon; I was told so more pointedly in crossing Panama. Now, it seems that, like the fable of the Upas tree, this superstition is for ever exploded, and for the future we must keep our eye on the mosquito. Hitherto I had been disposed to look upon it as a sort of God-send—sent to warn man that there was decaying vegetation or dangerous stagnant water near. Now the vile thing has been found out!

On one point I could not quite follow the Major. He said that malaria was always at its worst, in *wet* districts and during the *wet* monsoon—instancing Lagos with 200 inches—but the reverse is our experience in Ceylon, and in Peru. In localities where it *never* rains, the same fever is very rife. Another matter on which we require more light is: Why certain districts are worse than others? Why Kurunegala is worse than Ratnapura? Why Dumbara is worse than Gampola?

It would, I fear, be hopeless to expect the Ceylon Government to spend anything on such an investigation; but surely the Colombo Council might do a little towards purifying the unsavoury margin of your lake; while even the impecunious Municipality of Kandy might afford a few gallons of kerosine to apply to the puddles around Bogambra.

CACAO AND ITS ENEMIES.

(*From a planter.*)

Thanks many for the Hamel-Smith circular *re* Cacao-tree scrubbing brushes. I will certainly give them a trial and order a dozen to start with, but it is a pity he has not sent you out a sample. [We have one brush to show in *Observer* Office.—ED. *T.A.*] I believe in keeping bark as clean as possible though it is just possible some insects may be our *friends* in destroying other pests, etc?

Cacao has had a soaking this year, but this glorious sunshine will do a world of good to trees, beast and man. Mosquitoes are holding high revels and growing to the size of winged leeches, luckily they don't carry lanterns like glow-flies.

COCOA BUTTER.

SOME AMERICAN REPORTS FROM THE NETHERLANDS AND FRANCE.

So many of our readers are interested in cocoa butter that we reproduce in part two American Consular Reports on the subject, made at the instance of a New York firm.

U S Consul-General S Listoe, of Rotterdam, says:—

Cocoa butter is a by-product of the manufacture of cocoa powder. It is derived from cocoa beans by the following process of manufacture: The beans are roasted, separated from the husks and ground; the fluid cocoa, obtained by grinding, is placed in steam-heated hydraulic presses, which brings it under a pressure of 60,000 kilograms (about 132,000 pounds) by 75 atmospheres, and about 30 kilograms (66 pounds) of butter is pressed out of 100 kilograms (220 pounds)

of fluid cocoa. The butter flows off in liquid form, and is caught in moulds, where it is given time to cool and harden.

There are no firms engaged exclusively in the manufacture of cocoa butter; the manufacturers producing the largest quantities of cocoa powder are also the largest producers of cocoa butter.

In 1901, of 1,081 tons of Dutch cocoa butter were sold in the auction sales at Amsterdam.

On January 1 last the average market price of cocoa butter was 0·69 florin (27·6 cents) per one-half kilogram (1·1 pounds), and on July 1 last the articles were sold at 0·74¼ florin (29·7 cents) per one-half kilogram.

Cocoa butter is used principally by confectioners, but also to a limited extent by pharmacists and in the manufacture of fine fancy soaps.

Mr F D Hill, U S Consul at Amsterdam, says:—

The bulk of the cocoa butter is disposed of at monthly public sales held at Amsterdam. The sales are made on customary "fall-of-the-hammer" conditions, and without commission to the second highest bidder. The cocoa butter is packed in bales of eight cakes, each cake being separately wrapped in strong paper.

COPRA PRODUCTS AT MARSEILLES,

The U S Consul-General at Marseilles says:—

The manufacture of copra oil is nowhere so extensively carried on as at Marseilles. From 55,000 to 65,000 tons are made annually by the following concerns, principally:

Rocca, Tassy and de Roux, 22 rue Montgrand.
Magnan Freres, 14 Allees de Meilhan.
Charles Diemer et Cie, 1 rue Picpus.
Fritsch et Cie, 7 Place Estrangin Pastre.

The effort to extract an edible grease from an oil produced upon so vast a scale and formerly available only for the manufacture of soap, gave promise of valuable returns if successful; and that this promise was not delusive may be judged from the circumstance that the factory of Rocca, Tassy and de Roux, which produced 25 tons of butter per month in 1900, now turns out 600 tons per month. I imagine that the success of Messrs. Maguan Freres has also been considerable.

The butter of Messrs Rocca, Tassy and de Roux is styled "vegetaline" and "cocoaline," the greater demand being for the former. The first-named melts at 26° C, and the latter at 31° C, being by that fact better suited for warm climates. Messrs Magnan Freres sell their product as "cocose." The best export markets at present seem to be Holland, England, Norway and Sweden, and Denmark. It is offered for sale in tins, and is almost tasteless.

Just how these imitation butters are made is a matter of violent curiosity in Marseilles, where the story goes that

£12,000 HAS BEEN OFFERED FOR THE SECRET.

I have not been able to obtain it upon demand. It appears that expensive machinery is required.

The oil having by nature much the consistency of genuine butter, the main problem has been to bleach it, to remove the principles which cause rancidity; and to increase the point of fusion. The bleaching operation is doubtless accomplished by the free use of fuller's earth, which, being beaten in the oil, absorbs the colouring matter and is then precipitated and removed. What next occurs is difficult to say; certainly, a chemical process is employed. English manufacturers have lately learned something of the bleaching method as in use here, and are employing in it.

Present prices of copra products f o b Marseilles, per 100 kilograms (220 pounds), are now quoted:—

	Francs.
Vegetaline	89·00
Cocose	87·00
Cochin neutre	77·00
Cochin neige	74·00
Ceylon quality	71·50
Ordinary soap	70·00

The above prices for oil in barrels, of Marseilles make, are for September and October delivery. —*Commercial Intelligence.*

PADDY CULTIVATION IN THE STRAITS. USE OF MACHINERY ADVOCATED.

(To the Editor *S. F. Press.*)

DEAR SIR,—I see that upon two or three occasions you have drawn attention to the advisability of cultivating paddy more extensively in the Peninsula and am therefore induced to make a few remarks upon the subject. In a country where the natural conditions are favourable for the cultivation of rice and where the amount produced is only an infinitesimal portion of that which is consumed, it is a matter of surprise that the subject has not been taken up more energetically. I see a suggestion has been made that Malays should be compelled to plant, which no doubt will be an excellent thing for the Malays, but a measure that will not make the country less dependent (or hardly so upon outside sources of supply) as long as they employ the primitive methods that have hitherto been in use. I have cultivated 'dry' or 'upland' paddy now for two years as a 'catchcrops' and have had to make use of their primitive methods, my land being planted up with permanent crops such as rubber and coconuts. By using this system and employing day labourers in opening up land for paddy solely, I feel convinced that there would be no margin for profit. This being the case there is little inducement for capitalists to take the matter up without which nothing very much can be accomplished. I venture to suggest that the solution lies in the employment of machinery from the ploughing of the land and through the various stages until the rice is graded and bagged. It is being done in America and in Queensland to a limited extent, and surely the same methods could be applied here. A study of the American system would undoubtedly be of great benefit to those interested in pushing the culture of rice here. Unless some such measures are taken in hand this country will never be anything like self-supporting in this respect such as you, Sir, have suggested would be advisable. —I remain, Dear Sir, yours faithfully,

FRANCIS PEARS.

Lanadrow Estate, Muar, Dec. 13.

—*Singapore Free Press*, Dec. 17.

"SOLUBLE TEA."

We direct attention to Mr. John Rogers' notes (see page 495) on this subject—one that he has made peculiarly his own by a long course of study and experiment. The result has been talked of for some time, and has met with the approval of experts, as a thoroughly sound, wholesome and pure tea. All Ceylon producers are therefore specially interested in the success of the article, more especially when it is in demand for countries which have as yet taken little of our ordinary product in chest; and for purposes—such as for the use of travellers explorers, navigators—where bulk is a consideration. We certainly think the promoters of "Soluble Tea' deserve countenance and aid (if required) from the "Thirty Committee"; while they should make a special exhibit of their development at the St. Louis Exposition for the benefit of the American people.

ON "SOLUBLE" TEA.

SOME IRRESPONSIBLE NOTES.

The "Soluble" tea is the very latest and most successful development in the art of producing a thoroughly sound and wholesome, and absolutely pure tea. But, although, the "Soluble" tea is still in its infancy, and will not for some weeks yet be introduced to the public, the idea is very old indeed, and probably has been entertained by many clever people, ever since tea began to be the popular beverage it now is, and an article of daily use. Much ingenuity and large sums of money have been wasted on innumerable attempts to produce a pure extract of tea, which would retain the aroma, flavour, and invigorating properties of the cup that cheers. These attempts mostly failed from their being made with the prepared leaf, or ordinary made tea, and from the fact that the aromatic and finer principles of tea are largely due to an essential oil which, immediately heat is applied, becomes more volatile than steam, and is, therefore, most liable to be lost in any of the well-known ordinary processes of producing extracts. Tea is naturally of so delicate a character that it will not stand such treatment as many of the so-called essences undergo. Some ten years ago, it occurred to the writer that it would be an easy thing to extract the juice from the tea leaf in its green state, and evaporate it down to dryness, and so produce a pure soluble tea. But all such attempts completely failed, and the writer not being a chemist, or at all a scientific person, could not make out why these simple attempts did not succeed, and why it would not come out right. He consulted scientific folk and chemists of standing, but was invariably told, that though it would of course be quite possible for them to produce a pure extract of tea, securing all the fine aroma and flavour of the popular cup at its best (I never yet met a scientist who would admit anything as quite impossible to him) yet it could not be so done as to pay the cost of production. It was not until the writer met with the book by

MR. KELWAY BAMBER,

the well-known authority on the Chemistry of Tea, that he began to think that he was on the right tack at last. When Mr Kelway Bamber was induced to take up the idea, and to advise, and help to work out experiments in London and afterwards, when the writer came to Ceylon for the purpose, then progress became apparent. But it was years before the present very successful results were arrived at and not till after many most disheartening disappointments and failures with chemicals or chemical processes had been experienced. A truly lovely cup of tea was soon produced in "Soluble" tea form, but alas! the extract never would "keep" for any time. Chemicals were at last entirely discarded, much to the delight of the non-scientific operator in these experiments, and the present purely mechanical or automatic process was ultimately arrived at. Referring to our note-book, I find the first entirely successful experiment, on the present lines, was made on 31st May, 1900, and there is a marginal note saying that news had just come of Mr Kruger's flight, and of the immediate entry into Pretoria of the British troops—and a hope is expressed that this may prove a lucky day all round, and for us in particular in our work. It was indeed. The process of that day has never been materially altered since, and the samples of "Soluble" tea then made, after being kept over two years, have been pronounced excellent by all sorts and conditions including even such experts as old ladies and professional tea-tasters, and in many different countries of the world. Of course there have been exceptions. The writer heard of one competent tea-taster some time ago, who pronounced against "Soluble" tea, being under the very erroneous impression that it was made from tea dust and factory sweepings, or (as he said) "rubbish." When he was informed that it was and could only be made from the

BEST GREEN TEA LEAVES,

freshly plucked from the bush, he tasted the tea and altered his opinion entirely. Again the other day, the writer had been tasting some samples of "Soluble" tea in a Colombo office, with some well-known tea-tasters, and it was found very good.

The advantages we claim for our invention will many of them be at once apparent, but, perhaps, some of the most important may not be so soon or so easily recognised. The portability and convenience in use of the "Soluble" tea will naturally be recognised by all and will commend it for use by Armies and Navies, and for expeditions of all kinds, and to Colonists, and all people who live in out-of-the way places, or where transport is difficult, to travellers, and to the man in a hurry. It is not anticipated that "Soluble" tea will at all displace ordinary leaf tea in general use—but where leaf tea cannot be conveniently obtained, or easily infused, then "Soluble" tea, which requires no infusion, but only the mere addition of water, of any temperature desired, to a very small quantity of the powder will often be resorted to. The "Soluble" tea would no doubt have been a boon to our soldiers in South Africa as has been said by members of the Ceylon Contingent who have seen and tasted it, as a man could easily have carried in his belt enough to make two or three hundred cups of tea. Here I may mention that one of the Dutch Doctors, who was a prisoner here lately told the writer that he believed the use of this "Soluble" tea in the water by our soldiers in South Africa might have prevented, in some measure at least, the enteric which was so prevalent. This is an important point, which has, however, yet to be proved.

In Australia and other Colonies, where distances are often very long, and where in many cases, it may be a matter of some trouble and expense to transport so bulky an article as a large chest of tea, it is probable that the carriage of a few pounds of "Soluble" tea which will give an equal quantity of infusion, or as many cups of tea, may be preferred, and tea thus become a more common beverage than it is now in such localities.

But beside its advantages in portability and convenience in use, the writer holds that "Soluble" tea is absolutely the purest and most wholesome form of tea that can possibly be used. That all teas are not absolutely pure and wholesome may be perhaps, admitted, but that the British Planter is—or, rather, let us say that British-grown teas are—like Cæsar's wife is, of course, everywhere allowed, and the writer (as one of the Pioneers of the Tea industry in Ceylon) would be the last to cast any shadow of doubt on such an opinion. It goes then, without saying, that Ceylon and Indian teas

are as absolutely pure and unadulterated as it is possible for leaf tea to be. But I think a little consideration will show, that by a process, in which the leaf, or the fibre or woody part is wholly eliminated, and no insoluble matter can possibly remain, the absolute purity of the extract must be still further assured. It is true also that there are teas and teas, and that some, it has been darkly hinted even of British-grown teas, are not —well, not quite so nectar like as others; and there have been more than hints of some mysterious and terribly baneful stuff called tannin being present in an injurious excess in some of the commoner or lower-priced teas. Tannin was an easy word to pronounce, and yet had a learned sort of flavour about it which made it quickly catch on with the public; so poor tannin was blamed for all the bitterness and any bad flavour found in tea, and for any bad effects on digestive organs caused by excess in tea-drinking.

Here the writer would beg his readers to remember, that he does not wish to, nor has he the slightest claim to pose as a Scientist or Chemical expert in the smallest degree, and he admits that the views given in these notes are solely his own unsupported theories and based on his own personal but unlearned observation. He regrets that the undoubted and acknowledged authority of his co-patentee is not available at this juncture, when these notes on our invention have been called for. Years ago, the writer made a special study of the tea leaf at home, in connection with another matter altogether, having the advantage of a considerable quantity of green tea leaves from small plants growing in pots at the time in a nursery near London. It is an old story now, but may be repeated, that a pound of tea was made from leaf plucked from these plants, probably the

FIRST AND ONLY POUND OF TEA

ever made from leaf grown in England, and probably also the most valuable, as something over three guineas an ounce was refused for it, the London tea packet firm to whom it belonged preferring to present it to Her late Majesty, who was graciously pleased to accept it, the firm no doubt thus making a very paying advertisement out of it. The writer at that time came to the conclusion that the extreme bitterness sometimes complained of in tea, is not altogether due to the much abused tannin, but in great measure to what Mr Kelway Bamber calls in his book on the "Chemistry of Tea" bitter or fatty acids, and that these are simply the juices contained in certain parts of the leaf which have not been reached in the several processes of manufacture, such as rolling, fermenting and drying. The juices in such portions of the leaf would naturally become rancid and bitter in the extreme, and would take longer to extract in infusion than the tannin in the properly prepared parts of the leaf. No one complains of excessive bitterness until the tea has infused a long time, and, I think, it is an admitted fact that the great bulk of the tannin, extracted by ordinary infusion in a tea pot, comes out in from five to seven minutes. The complaints about tannin are of comparatively recent date, and the writer believes the presence of green, or raw, or uncured parts of the leaf, containing these bitter rancid acids, might be traced back to the same period, and for this reason. In the early pioneer days, in Ceylon at least, and before the introduction of all the elaborate machinery now in use, so much more time was spent, especially in firing or drying the leaf over chulahs, or in machines without any artificial draught apparatus, and so much more care taken in plucking and in manufacture, that it was practically impossible that any leaves or parts of leaves could escape being perfectly cured. I do not mean to insinuate that the present day Tea-maker does not take as much care and personal interest in his work as his predecessor of twenty or more years ago. It would be untrue and absurd in the extreme to say anything of the kind in reference to either Tea-makers or Superintendents, but in those early days,

THE TEA-MAKER

had only a very small quantity of leaf to deal with, and that small lot, he had more thoroughly under his own control. With the present enormous quantities being made, and, in many cases at least, the larger leaf being plucked, and the remarkable developments in tea machinery, it is a very different story now. It appears to me that the attention of inventors in Tea machinery has been directed almost solely to the cheapening of manufacture, by inventing machines to turn out the greatest possible quantity in the shortest possible time, and that more attention ought to have been paid to retaining the fine flavour and aroma, and generally to keeping up the fine quality of the tea. For example, I do not think that the use of the powerful fans in drying or firing tea has been an unmixed blessing, but that this powerful drawing off of the steam or moisture from the wet rolled leaf, immediately a strong heat has been applied to it, must draw off much of the delicate aroma contained in the very volatile essential oils. Some years ago, on a former visit to Ceylon, the writer ventured to express these views, which he has never yet seen contradicted or proved to be erroneous. In any case I think those of us, who remember the small quantity of teas made twenty years ago, will agree that they were of much finer quality than the enormously greater quantity of teas now being put on the market. (By the way they fetched a trifle of something like a shilling more than the present average.) The young expert in tea of the present day will not admit this, but then it is probable that about the time I refer to, he spent more of his valuable time in absorbing milk without tea, than in tasting teas without milk. I hope, I shall not get into trouble over these remarks if they ever do see the light.

What I wish to claim in regard to "Soluble" tea is, that no such injurious results as may arise, or are said to arise from drinking an imperfectly or too hurriedly manufactured leaf tea can possibly obtain in the use of "Soluble" tea from which all the insoluble part of the leaf or insoluble matter of any kind has been eliminated. As to the much abused tannin, I suppose most people know now that without tannin, tea would not be drinkable. In "Soluble" tea, though there is undoubtedly weight for weight, more tannin than there is in leaf tea, yet it may be taken for granted that owing to the smallness of the quantity required for a cup, each cup of "Soluble" tea must contain

LESS TANNIN

than a cup of ordinary leaf tea, but from what I have said, it may be gathered, that for my

dart, I do not lay much stress on that fact. Complaints are constantly being heard of good leaf teas being spoiled in the making or infusion. The water has not been at the exact boiling point when put on the leaf, or has been allowed to stand half-a-minute too long, or half-a-moment too short a time on the tea leaves. For "Soluble" tea, water of any desired temperature will do, and it may be claimed, that it is impossible to spoil it in the making. At least the writer would have confidently claimed this for it, until the other day, when he happened to meet some business gentlemen in a Colombo office. They had just been tasting some "Soluble" tea, and were remarkably unanimous in abusing it. What was wrong? It was far too strong! It turned out that they had put into one cup enough to make ten cups. When the proper quantity was put in, it was pronounced all right. The writer was rather depressed when relating this experience to an upcountry friend, saying how could one calculate on, or think of guarding against such an instance, say, of idiosyncrasy as that? But his friend assured him that he "need not worry about that," adding, "You really must not gauge the intelligence of the general public by what you may see or hear in a Colombo office." To the ordinary man, it would naturally occur to add more water if the tea is too strong, or to put less stuff in next time. The "Soluble" tea will, no doubt, have many detractors, especially amongst those who regret most that they are not themselves directly interested in its success, or by a few foolish persons in the trade who may fear that their interests may suffer by it in some way. But all new enterprises have to contend against, and profit by such opposition. The writer is old enough to remember the dismal forebodings and adverse opinions very confidently expressed as to the future of extract of meat, when first introduced by Baron Liebeg, and later as to condensed milk. Liebegs was not nice in appearance—it was nasty to handle—one could not tell exactly how much to use at a time, once the bottle was opened, the stuff would not keep good any time, and lastly it did not taste like beef. Yet we all know how such extracts have become essentials now, and I never heard of any farmer, cattle breeder or butcher being ruined by the introduction of "Liebig." Everyone knows that nothing will "keep" in Ceylon, when once exposed to the exceptionally humid atmosphere The "Soluble" tea like all such extracts in powder form, must be hygroscopic, absorbing moisture even more readily than leaf tea, and in such a moist climate as this must be kept in its air-tight bottle or packet, and the powder must not be exposed to the air longer than is necessary in its use. The general public are, however, now well accustomed to such articles, and know to keep the

BOTTLE WELL CORKED

when not in use, and yet I have been told that some people have spread it on paper and laid it out on a table to dry? or have put it on a chair, and sat on it to compress it?—the result in this latter case was disastrous to the seat of the chair —or have emptied some out of the air-tight bottle into the waist-coat pocket, with like unfortunate results to the waist-coat. But my upcountry friend again consoles me. He says only very clever people do that kind of thing, and that there are not many such very clever people in the world. That the common or garden duffer will do just as he is told on the label, put a little into a cup, pour on water and make a drink of it, and that is exactly what the "Soluble" tea is meant for. As has been said, "Soluble" tea will never displace ordinary tea in general use, it is ridiculous to suppose it will; but there is already evidence, that it is likely to open up new markets for itself, and to introduce the use of tea amongst people, and other places where tea has hitherto been an unknown quantity, and if the taste for tea is thus created, is it unreasonable to suppose, that it may lead to a demand for ordinary leaf tea in such localities. I shall not, therefore, be surprised to hear soon that that Friend-in-Need, "The Thirty Committee," has come forward and offered some of their spare cash for advertising purposes to the "Soluble" Tea Syndicate Limited, or that the Government have voted a special little grant to those public benefactors, in the interests of the Tea Industry of Ceylon. J R.

Dec. 18.

P.S.—The writer has just been informed that orders for trial lots have already been received from some most unlikely quarters by the Secretarie and Agents of the "Soluble" Tea Syndicate, Colombo, Ceylon.

TEA PLANTING INTERESTS:

THE NORMAL VALUE OF THE BRITISH TEA INDUSTRY: THE CAUSES OF DEPRECIATION: OVER CAPITALISATION CONTESTED: THE QUESTION OF ORIGINAL COST: A NEED FOR ORGANIZED CO-OPERATION;

BY SUUM CUIQUE.

There appears to be in some quarters a general impression that the British tea industry, as a public investment, is over-capitalised. Doubtless there are companies which are in that position; but to equalise these there are many others which have for years put by large reserves, so as to fully compensate the industry generally for any loss it may have sustained from those whose capital exceeds their normal value. Many of the former seem to have just hit upon the locality where, from some hidden cause, specially fine teas can be produced; and these have naturally appreciated in value; while many of the latter have depreciated from just the opposite cause.

The chief reason for the present position of the industry arises from (1) a slight over-production which, I believe, never exceeded 5 per cent. of the requirements of the market—or, say, about a *fortnight's requirements*, (2) made more apparent by the combined action of the large buyers; (3) but chiefly what a leading Tea Company Chairman described as "a want of cohesion among producers." One point I believe all will agree in, that the industry could not be reproduced upon a capital materially below its present nominal value, and to establish this I will submit the best evidence at my disposal.

In Mr George Seton's interesting table on the "Results of the Working of 45 Indian Tea Companies" for the year 1901, he shows that the entire return on the nine millions odd sterling, invested in these 45 representative companies, averages only 3½ per cent. These figures, low as they are, make no allowance for depreciation in any form whatever, being simply profits as shown,

without any provision for wear and tear. To arrive at some practical purpose let us divide these 45 companies into two; *i.e.*, that proportion which pays oves 5½ per cent or its capital, and that proportion which pays less than 5½ per cent. I have chosen 5½ per cent, as I look upon it as the mean average rate upon which loans can be obtained on fair tea property, either on mortgage, or in the form of debentures. Consequently, before any profit to the ordinary shareholder can be paid interest upon debentures and mortgages, and any intervening preference share dividend, has to be covered. From this table I gather that 15 of these companies paid 5½ per cent. and over and 30 companies paid less than 5½ per cent. Furthermore that these 30 companies, of themselves, only aggregate a total profit on their capital of 2·17 per cent. and this, too, without any allowance being previously deducted for depreciation of buildings, or machinery, or, in fact, in any manner whatever. The proportions in acreage, actually work out as follows :—

15 Companies	55,104 acres	29	per cent.
30 do	132,311 do	71	do
45 do	187,415 do	100	do

It will thus be seen, that a little more than 2 to 1 represents the larger part; but I shall adhere to one-third and two-thirds, as the simplest form of investigation, and quite near enough for general purposes.

SEVENTY-ONE PER CENT OF THE INDUSTRY WORKED AT A LOSS.

I notice the average price obtained for produce per pound in the London market from these 45 companies is 7.61d, which is slightly higher than the average for all teas from India during 1901; while in Ceylon, although teas on the whole obtain a lower price, they also entail a lower average cost of production. Thus all considered, this carefully arranged table may be taken to represent approximately a section in every detail of the British tea industry generally. The only disparity that might arise being in the slight difference of average cost of production between India and Ceylon, which is practically equalised by the slightly lower price obtained for Ceylon teas. Thus all things considered, the analogy is a fair one, and if it errs it is slightly on the side of a more favourable result for the 45 companies. It may, therefore, I think, be concluded that under present conditions, one-third of the British tea industry is paying its owners over, and two-thirds are paying under, the borrowing rate of capital. Now, if this order were reversed, so that two-thirds paid over the borrowing rate, and one-third only 2.17 per cent, I could almost understand the wisdom of leaving it to the so-called laws of self-adjustment. But here we have actually 71 per cent, of the entire industry being worked at a loss, without any apparent reasonable and combined effort being made for its redemption.

ORIGINAL COST, APPRECIATION AND DEPRECIATION.

Putting down the total extent of the Indian and Ceylon tea gardens at 900,000 acres, which is slightly under the computed area, and costing in the aggregate £40 an acre to bring into full bearing including land purchase, buildings, machinery, communications with interest on money until productive, we have a total cost of £36,000,000. In reckoning £40 an acre as the cost of bringing tea-land into bearing in India and Ceylon, I do not imply that that its value ha remained at £40; for some has become mord valuable and some has depreciated; what I meas is that everything fairly considered, from Darjeeling to Ceylon, and where work is rightly completed, that the figures I state will be fairly close. One certain fact is evident, the more land planted with tea just now, the less the value of the whole industry; or expressed in other words, every extra acre opened now means something taken from, rather than added to the general value of the whole, as indeed may be reckoned any unnecessarily excessive production, no matter how small. The cost of the industry may be understood better in the following tables :—

ITS COST AS DESCRIBED ABOVE.

300,000 acres paying over 9 per cent, costing £40 per acre,	£12,000,000
600,000 acres paying 2·17 per cent, costing £40 per acre,	£24,000,000
900,000 acres averaging 3.50 per cent, profit costing £40 per acre,	£36,000,000

COST BETTER ANALYSED AS FOLLOWS :—

300,000 acres paying satisfactorily,	cost	£12,000,000
600,000 exhausted in paying interest at 5½ per cent	cost	£9,000,000
600,000 chiefly ordinary shares absolutely unprofitable	cost	£15,000,000
900,000		£36,000,000

Thus far I have dealt with cost. It will be well now to consider how far this original cost has altered under the fair and legitimate, or, unbiassed process of supply and demand.

AN APPROXIMATE NORMAL VALUE.

300,000 acres at	£60 the acre		£18,000,000
550,000 ,,	£31 ,,		£17 0 0,000
50,000 ,,	£20 ,,		£1 000.000
900,000 ,,	£40 ,,		£36,000,000

Some explanation may be necessary in arriving at these figures: why one third is valued at sixty pounds the acre and nearly two-thirds at no more than thirty-one. My reason is that the smaller proportion pays over 9 per cent on invested capital, and the larger only at present 2.17 per cent; but I cannot believe otherwise than if the same premeditated care were exercised by the sellers, that the buyers exercise in buying, and which sooner or later they will have to adopt whether they like it or not, that this great disparity could not exist. For apart from all other causes, if a body of labourers, retailers or wholesale dealers, part with what they put into the market at less than it costs, or what I may denote as "a living wage," not only is much needless suffering entailed, but in nine cases out of ten it is nobody's fault but their own. On the other hand, £31 an acre may appear relatively high, compared with what pays 9 per cent.; but we must remember it is the bulk of the industry which has during the last three months been suffering from an over-supply, of, at most, possibly 2 to 3 per cent. on the actual yearly requirements of the market—say, *11 days' consumption* A quantity, far beneath the increase that may any year arise from a favourable flushing season, and probably less than a fourth of what would follow a reversion to the grade of plucking adopted practically everywhere up to two years ago. The final 50,000 acres, valued at £20 an acre, is relatively, probably for its worth, the highest valuation of the whole; yet its total value

does not amount to what the industry has lost yearly since 1899. Most of it pays altogether little more than commission on sales, freights, and insurances, and beyond this will I never believe be quite satisfactory. Doubtless some acres of similar land have already been abandoned during recent bad times; and, doubtless, if our present system continues, this too will be eventually eliminated at a cost to us of many times its worth.

What precedes this, surely shows that the industry is not over capitalised. That in the aggregate it has cost its owners fully what it represents in paid-up capital. That the depreciation of its 71 per cent, is met by the improved value of its 29 per cent; also that the larger proportion could not with full modern machinery buildings, etc., be opened at £31 the acre. I also think that it is satisfactorily shown that we are suffering from a small over-supply, which hitherto we have not had the courage to rightly face. The actual depreciation, beyond what I call the normal value of tea property, and from which we are suffering, must for the present represent some £15,000 000 sterling; and judging from what we see done elsewhere is quite capable of more permanent re-establishment.

THE EVER-RECURRING WANT OF ORGANIZED CO-OPERATION.

So far in this paper my chief aim and object has been to show where the unprofitable portion of the industry comes in. It will be seen that it is represented by two-thirds of the total tea area, so practically incorporating all the medium and common teas. I think it may be assumed that the owners of the one-third with its 9 per cent profit are quite satisfied with their position, but how about the owners of the medium and common teas? If the former average 9d, it may surely be assumed that the latter are worth, relatively, 8d. and 7d., instead of something less than 7d. all round. Now, is there no way of coming together over these two-thirds of the industry? Even though the efforts have hitherto failed over the whole, cannot a more successful attempt be made by the guardians of the two-thirds? To show how utterly we are beating the air to no purpose, let me bring forward two extracts from sale reports, in which I need hardly add that the italics are mine:—

"A decided flatness was noticeable in the earlier part of the week, and became gradually more pronounced, finally resulting in a round decline in price *many large buyers keeping almost entirely out of the market.* Happily the auctions of both Indian and Ceylon teas, so far advertised for next week, are comparatively light, and may thus tend to relieve the position, *but unless supplies are brought forward moderately* the depression may continue *in spite of the improved statistical position, etc.*

"The average of all Indian and Ceylon tea sold for the month of October *is a 1d. per lb. under last season's corresponding month, and is not justified by either the position or quality.*"

There is a very little originality in these reports. The same has been the "shibboleth" for the past three years with one exception, "the improved statistical position now"; and yet, notwithstanding this improvement, teas are 1d lower than a year ago. In other words, as statistics improve, so far prices are worse. Doubtless, there may be a special reason for this, but we want consistent prices, consistent with the conditions of the market, not these continual suggestions for improvement, or, at least some really practical method of meeting this ever recurring difficulty.

Sooner or later, but how much sooner or later, in spite of strenuous efforts to keep a low level of prices, the market will make some natural adjustment, though not to the permanent degree we require. So long as the larger buyers can, as these sale reports tell us, withdraw their buyers if prices do not please them; and so long as they act collectively, and we individually, they will have the advantage. So long as they can appoint one man each, to represent several buyers, reducing buying to a system, and when if a few hundred chests more happen to be put up than immediate wants require; I do not see prospectively, nor do those sale reports help me to see; how the tea industry can assume a permanently right position. They are useful in their way, but they lack the method of an unmolested supply and demand market, which ours has long ceased to be. Still the same difficulty is before us. The first buyer and first seller are unequally placed, and any position short of absolute inadequate supply, will be in favour of the first buyer. Such would, if prices reached too high a range, entail an inrush of cheap and common teas; and with them inferior Chinas would reassume a position. Surely stopping short of this is our right course. If steadily and firmly, during the past three years, an effort in London had been maintained by holding steadily three weeks extra supplies in our own hands throughout, the market I believe would have been steadied and our chief losses avoided. With a strong lead from the heads in London all the markets would be strengthened, and restriction of output abroad would have a chance of possibility. Weakness in the centre means weakness throughout the whole organisation. Mr Andrew Carnegie tells us, that a prosperous and strong market is the chief source of success, both at home and abroad, so can we not in the future take a leaf out of his book and strengthen ourselves by unity of action?

SHAREHOLDERS AND EMPLOYEES ALL SUFFER.

It is desirable that something should be done if only in the interests of superannuated tea planters and others, of widows and orphans; and the long string of suffering shareholders who are deprived of their incomes from the defaulting 15 millions before referred to. Neither does the pressure of these starvation, and, I believe needlessly starvation prices, stop at shareholders; they penetrate the whole industry; garden managers, assistants, and labour are all down on their lowest cut-down wages. Even the tea business in London is becoming a by-word by those employed. Remove extreme pressure, and all will be relieved, and with them, I believe, even the large and small dealers will in the long run benefit, for a too low market produces a trying and unnecessary pressure on all affected.

In the perusal of what I have written, some may consider that I have over estimated the cost of bringing tea into bearing. In my experience, I know of very few instances where I may say land has been brought from jungle into bearing, upon the originally estimated sum, especially in later years. These low, sanguine estimates never complete work; which usually means that the fourth and fifth years returns are used in finishing up; promised dividends are deferred, and thus estimated

outlay kept down. I refer of course to the later periods of lower margins, combined with the necessity of more costly equipment. Many, however, have cost more and many less, than the figure I have quoted. A great misconception has often existed as to the extent of outlay upon a truly efficient factory. Personally, I believe, and few will differ from me, that nothing pays like early efficiency in tea; in its management, in its material, and transport facilities.

It is now four years since some regulation of sales was strongly recommended in London, and for a short time tried. Had this been more thoroughly organised and continued, it is a moderate computation to conclude that by now an average advantage of ½d per lb. would have been added to the standard price of our staple. One of my reasons for saying so, is that, less than a year ago, it was reported that the Indian Association intended to resume the regulation of sales, which had the immediate effect of sending all teas up pretty close upon ½d per lb. An aggregate increase of ½d per lb. for one year on all tea produced in India and Ceylon, would mean 2 per cent on capital invested—nearly three-quarters of a million sterling. It would also have raised the general average profit of forty-five companies from 3½ per cent to 5½ per cent, and would have been almost equivalent to a gain of 5 per cent on the defaulting fifteen millions before referred to. Merchants, directors, shareholders, and all concerned, should remember that strength is the winning order of modern business; the sole apology for failure is weakness, either morally or financially; and that still the first holder is initially in the strongest position, if he only chooses to exercise it in his favour, even to one-half the device that the same power is exercised against him.—*Tea* for Nov.

SALT IN AGRICULTURE.

On the threshold of a New Year, we are called on to defend ourselves against a charge of neglect of duty. Our offence, as laid out in the indictment, is that, on a date not mentioned but easy of ascertainment by the industrious, we failed to support a communication on "Salt" with editorial backing. The charge assumes that support was necessary; and if an impartial jury, under the direction of a competent Judge, should find, that the eloquence on Salt, of a seasoned correspondent, to whose instructive lucubrations and arguments, extending over a series of years, we have afforded due prominence, with frequent editorial benedictions, demanded support in his latest deliverance, we are prepared to abide by the penalty prescribed for what, we believe, the lawyers call *laches*. Our submission will not, we give notice, be wholly unqualified. In the first place, we shou'd dissent from the verdict, as one to be taken *cum grano salis*, for reasons to be hereafter stated. In the second place, we should require an assurance that the penalty be not the same as that provided for the use of the knife—lightened though it has been by recent merciful legislation, as to its *maximum*, by one-twenty-fifth! With these reservations, we are prepared to go before a Judge and Jury. Now to our argument The "communication" referred to spoke sufficiently for itself: it needed no support. The correspondence of our opinion of Salt with the Biblical, is well-known. But, just as Salt which has lost its savour is worthless so surely is excess of Salt unpalatable, and even injurious to the digestion. We claim, therefore, to have done a service to our correspondent in not having weighted the special number of the *Observer* to which he refers, with a saline editorial. In the next place, we desire to give our numerous public-spirited and able correspondents, who have with laudable persistency proclaimed the virtues of Salt in our columns, full credit for the part they have taken in impressing on the Government its duty to the agriculturist and the stock-breeder. Why should *we* do or say aught which would detract from their services when victory was in sight, and draw attention on ourselves. Is the complainant not aware—is it not written in the Chronicles of the Taxation Commission?—that the Governor, already one of the highest authorities and most brilliant exponents of Attic Salt, intends making special inquiries himself into the article as produced at Puttalam and Hambantota? With that assurance, and with the knowledge that the Government is appreciating the unwisdom of saying to those who come to it, for Salt, that it has none to sell, we do not for a moment believe that it will continue the unnatural policy of denying its own children the wherewithal for increasing their food. Land, therefore, is in sight. It would not become us to stand between our correspondents and their full share in the victory, even if it be not a sufficient excuse for our silence that it is impossible for an editor to find time and space for expressing his approval of all the views set forth in his columns. In token, however, of our agreement with our correspondent as to the importance of Salt in Agriculture (and in Stock-breeding), and the duty of the Government to issue Salt for these purposes on special terms, we give editorial prominence to his complaint:—

"I was surprised to find the communication on Salt, published in your columns without one line of editorial comment. After the interest you took in the subject recently, and strongly urged on the Government the advisability of issuing salt for agricultural purposes at special rates, the least one expected from you was an editorial.

"I send you an extract on the virtues of salt from an old book I came across quite accidentally. You will see that one of the properties claimed for salt, is its ability to prevent the dissipation of ammonia in manures. A booklet issued locally, claims for kainit the same properties, and suggests its being sprinkled over manure heaps on this account. Perhaps it is the chloride of sodium in kainit that has this useful property:—

FUNCTION OF SALT IN AGRICULTURE.

Mr. A Beauchamp Northcote has communicated to the *Philosophical Magazine* No. 65, a paper of experiments undertaken to ascertain the *rationale* of the action of salt in increasing the fertility of certain lands,

We have not space for details but quote Mr. Northcote's conclusions:—"The results, then, at which we must arrive are, that agricultural salt is a most energetic absorbent of ammonia, both in virtue of its chloride of sodium and of its soluble lime-salt, and that the proportion of the latter especially, most powerfully affects its action, but that at the same time its agency does not seem to be altogether a permanent one; it will collect the ammonia, but it is questionable whether it can retain it for any great length of time, because in the very decompositions which happen in order to render the ammonia more stable, salts are formed which have a direct tendency to liberate ammonia from its more fixed combinations. It may, however, retain it quite long enough for agricultural purposes, if the young plants are there ready to receive it. Its state of gradual liberation may be for them the most advantageous possible; and to this conclusion all experiments on a large scale appear most obviously to tend. It is described as an excellent check to the too forcing power of guano; and from M Barral's experiment we see that it either prevents the too rapid eremacausis of the latter, or stores up the ammonia as it is formed. As a manure for growing crops, all experience and all theoretical considerations therefore show it to be most valuable; but when employed to mix with manure heaps which have to stand for considerable periods of time, theory would pronounce, as practice has in many cases done, that its power of retaining ammonia under those circumstances is at the best doubtful."

CEYLON COOLY TIN TICKET SYSTEM:

THE AMENDED REGULATIONS.

(Copy)

General 5 (Fs)—Circular No. 66824.

From the Hon. the Government Agent, W.P., to the Chairman, Planters' Association, Kandy.

Dated Colombo —— December, 1902.

Subject:—(*Amended tin ticket regulations.*)

Referring to your No. ———

Sir,—I have the honour to enclose for your information a copy of the amended regulations under the Tin Ticket System, and to state that Estate Superintendents, who wish to have copies of the same, can obtain them on application to the Kachcheri of your District—I am, Sir, your obedient Servant, A. M. GALBRAITH, for Government Agent.

[Printed at the request of the Secretary of the P.A.:—]

The attention of Superintendent of estates is invited to the following amended Regulations:—

1. It is *necessary that each immigrant* cooly should have a *tin* ticket. The letter and number on that ticket supply all the information that is required to *enable* the Superintendent at Ragama to forward the cooly to the estate. Either one ticket may be given to each individual cooly on his departure to enable him to return, or a supply *may* be given to kanganies who are going to the coast to bring coolies.

2. In point of fact the system is simply one by which coolies are forwarded as packages of goods, the tin ticket being the address. *By its means a cooly travelling from Tuticorin*, Tataparai, Tondi, Ammapatam or Pamben is delivered at the railway station nearest to his estate without the necessity for his expending a cent *on his way*. All his expenses are borne by Government and recovered subsequently from the estate to which he goes, through the local Kachcheri. Individual numbers as well as estate numbers are entered on the tickets, thus: 270 17 *in circle*.

If the "17" is entered on the check-roll it will give valuable information as to the identity of the person who presents the tickets.

3. All estates must be registered at the local Kachcheri, where a number will be assigned to each estate, and tin tickets will be issued if required. Tin tickets are supplied at R2·50 per hundred, stamped with the district letter and estate number, and consecutive individual numbers.

Even if no tin tickets are required, registration of the estate is necessary to enable the Superintendent to issue certificates for coolies travelling within the Island. These certificates must be on the form issued by the Railway Department.

4. In the case of large estates, so many numbers should be allotted to each Kangany. These numbers being entered on the bill from the Kachcheri, it will be seen at once to which Kangany the coolies belonged. Care should be taken to issue the numbers consecutively. All tin tickets issued should be collected on the arrival of the coolies on the estate, checking the individual numbers and keeping them under lock and key.

5. Immigrant coolies who have recived advances can still pay their expenses on the journey, but they can no longer obtain cheap cooly rates by rail and steamer, except on the production of tin tickets.

6. All coolies holding tin tickets will be despatched by the 6 a.m. train on the morning of the second day after their arrival at Ragama. Thus, coolies who arrive on Monday will be despatched by the morning train on Wednesday, Tuesday's arrivals on Thursday, and so on. If, however, the estate is so far from a telegraph station that the Kangany has not time to meet Wednesday's train after the receipt of a telegram despatched from Ragama on Monday afternoon, the Superintendent of the estate should write to the Superintendent of the Cooly Camps at Ragama, stating the number of days' detention that is necessary; these instructions will be carried out. Thus, if the Superintendent is satisfied that he cannot meet Monday's arrivals before Thursday, or even Friday, the coolies will be despatched on the day named. The telegram will be in one of the following forms:—

"5, 2, 1, Saturday, 42, Ramasamy, second," or
"1 woman, 2 children, Saturday, 42, Ramasamy, second."

The first of these means that five men, two women, and one child are being forwarded on Saturday; "42" is the first individual number on their tickets: "Ramasamy" is the name of their Kangany; and "second" is the number of the division, in the case of large estates, to which they belong. The second form is used when there are only men and women, men and children, or women and children in the gang.

The day mentioned will be that of departure from the camp, and therefore that of arrival at the railway station. Kanganies who go to meet coolies should have one of the estate tickets. Each cooly, will of course, have a similar ticket and the letter and number of the estate will be entered on the railway ticket, so that the Station Master can point out to the Kangany the coolies who belong to him. If the coolies, whose departure from Ragama has been telegraphed, do not arrive by their proper train, the Superin-

tendent should at once communicate with the Station Master, and failing a satisfactory reply, write to the Superintendent at Ragama.

7. It must be distinctly understood that Government does not hold itself responsible for the safe delivery of the coolies on the estate, but merely at the railway station nearest to their estate. Any Superintendent who does not wish intimation of the arrival of coolies to be sent by telegraph should inform the Superintendent, Ragama Camp, accordingly.

8. Coolies will be given bread and tea before they leave the camp. They will also be given ½ lb. of bread a-piece to take with them. If any Superintendent thinks it necessary that his coolies should receive money for their maintenance between the railway station and the estate, an amount not exceeding 50 cents, a cooly, will be paid to each before he is put into the train. The Superintendent must write and state the amount to be given. If such instructions are given, the amount will always be paid to all coolies for that estate, the Superintendent at Ragama cannot undertake to issue it to some coolies and not to others.

9. Payment of the expenses incurred on account of coolies must be made to the local Kachcheri just in the same way as hospital bills. In correspondence with reference to accounts, Superintendents should always refer to the serial number in the account.

Colonial Secretary's Office, Colombo, Dec. 4th, 1902.

INDIAN TOBACCO.

(To the Editor of the *London Times*.)

SIR,—As the writer of the interesting special article in *The Times* of the 22nd instant on Indian Tobacco and its Possibilities makes reference to reports written by me, perhaps you will kindly allow me the privilege of space for a word on the subject.

Much as I sympathise with the laudable desire of the writer for the development of an Indian industry, I venture to doubt whether his suggestion for the manufacture here of cigarettes from Indian Tobacco is well designed for the attainment of the end desired. My hint to the manufacturers of Indian cigars to enlarge their operations by the inclusion of cigarettes was based on two considerations. In the first place, the recent increase in the importation of cigarettes—which totalled a value of about 21 lakhs of rupees last year, say £140,000—is mainly due to the adoption in Calcutta and some urban areas in Eastern and Northern India of a new habit in supression of the practice of smoking the *hukka* or water-pipe. Amongst especially the younger generation the old-fashioned "hubble-bubble" has been found clumsy and time wasting and been discarded, as the churchwarden pipe has been discarded here. That the new habit will spread extensively is inevitable; and my suggestion to the Indian cigar manufacturer was, in effect, that he should turn his attention to the meeting of a rapidly and continuously increasing indigenous demand by the supply of cigarettes of indigenous tobacco, even if it were necessary to roll them in imported paper.

In the second place, I did not and do not believe that a foreign market of any extent can be found for cigarettes of Indian tobacco. The excellence of Indian tobacco has been eloquently described by many, as well as by Sir Richard Temple, whom the writer of the article quoted. Nevertheless, it must be taken as a fact that Indian tobacco possesses a peculiar flavour of its own which is not easy of appreciation except by those who have smoked nothing else for years. The distinctive merit of Indian cigars in India is their cheapness. When a man can smoke freely at a cost of less than a penny a cigar he is not inclined—in India at any rate, where none of us are rolling in wealth—to indulge in Havanas, even Dutch Havanas, at very much larger cost. But he is also not much inclined to confess that he smokes a cheap cigar because he can ot afford the more expensive kinds, and he learns to make himself believe that he likes the indigenous cigar better. I do not wish in any way to decry the real merit of the Indian cigar, well rolled from well-cured tobacco, but, in fact, the best of them are covered with Java leaf; and I have not yet met the man who, being offered at another's expense the choice between an Indian cigar and a good imported cigar, selected the former. There is something in the physical conditions of the soil and climate which precludes us from growing and making such tobacco as that of Cuba, Puertorico or the Philippines. Much money and energy have been expended fruitlessly during the last 30 or 40 years on the introduction of the best exotic seed, and on the improvement of processes of cultivation and manufacture. These latter are susceptible of further improvement; but, as with many other products, it seems vain to hope for essential change in the quality and distinctive aroma of Indian tobacco. The statistics of the export trade in Indian cigars confirm the view that there is but a restricted demand for them, and the demand does not seem to have any tendency to expand. It is true that last year there was a very large increase in the exports but that increase in the main represented cigars sent to the troops in the field in South Africa.

It seems to me that, if the demand for Indian cigars remains small and non-progressive after many years of effort to create a market, there is not much reason to expect a more active demand for Indian cigarettes whether made here or in India. Nor do I think it would be expedient to make the cigarettes here of Indian tobacco for consumption in India, where, as I have said, the consumers would be natives. The cost of the article would be augmented by the charge for freight on the tobacco to England and back to India, by the wages of the more highly-paid labour employed here, and by the import duty which would be charged on the entry of the cigarettes at the Indian Customhouses. All this additional cost would prevent such manufactures from competing successfully with cigarettes made in India, and perhaps even with the cigarettes made in the United States which are now so largely consumed by natives in India. But that there is a fairly wide field for the profitable employment of capital and skill in India in the improvement of native tobacco and in its manufacture into cigarettes admits of no reasonable doubt.

I am afraid I have written at excessive length, but I am anxious that British capitalists, who already look askance at Indian enterprises should not be misled into the entertainment of projects which must be dismissed as soon as inquiry is made into the facts.—I am, Sir, yours obediently, J. E. O'CONOR.

November 24.—London *Times*, Nov. 28.

PLANTING NOTES.

TRINIDAD CACAO PLANTERS—profit by the American market. Thus in the Port of Spain report of 5th December, we read:—

"Although it will be seen from above figures that Cacao is coming in very freely, there has been so active a demand from America that prices have kept up, and we make no change in late quotations of $12·75 to $13·50 as to quality."

ARTIFICIAL CINNAMON OIL.—A Leipzig firm of essential oil dealers have taken up a patent for the preparation of artificial cinnamon oil, depending on the mixing together of such of its constitutents as have so far been detected. These bodies are cinnamic aldehyde, amyl-methyl ketone, nonyl aldehyde, cumic aldehyde, caryophyllene, linalol and its isobutyl ester, cymene, benzaldehyde, phenyl-propyl aldehyde, furfurol, pinene, and eugenol methyl ether,—*Apotheker Zeitung*. 1902, 760.

Correspondence.

To the Editor.

TEA CULTURE IN SOUTH CAROLINA, U.S.—MR. SHEPHARD REPLIES.

"Pinehurst," Summerville, S.C., Nov. 22.

DEAR SIR,—Some kind soul has caused to be sent to me copies of your issues of October 20th and 22nd wherein your "funny-man" has disported himself at my expense and to my very considerable amusement. It was about my turn and I should not complain; for I have throughout the past summer intensely enjoyed the Indo-Ceylon green tea controversy as conducted in those valuable journals, *The Tropical Agriculturist* and the "Indian Gardening and Planting." Incidentally I would state my surprise that the old Indian process of lightening the color of green tea by panning or attrition (described by Dr. A. Tschirch in 1892) should have been overlooked by so many of your able scholars and planters for so long a time, and adulteration at least contemplated!!

The Pinehurst Experimentation has received so much notice from the Press of this and other countries that it has become almost impossible for me to correct the frequently erroneous statements as to its object and results, and has compelled me to ignore personal attacks.

But as I am indebted to the Ceylon Tea Industry and especially its mouth-piece, *The Tropical Agriculturist*, for so much valuable information, I deem it proper to call your attention to some errors into which you have inadvertently fallen, and which in your desire to continue as a faithful historian you may choose to publish. The Pinehurst undertaking has been experimental from the start until now; at first and until within a few years at my own expense, but latterly it has received generous and welcome aid from the U.S. Department of Agriculture after official investigation had shown that its object was not commercial, but an attempt to prove the feasibility of establishing a new and profitable industry in the Southern States, with all of the attendant benefits. It should be superfluous to inform you that the experiments although on a small scale (none of my gardens are larger than a few acres in extent), have been directed so as to cover as many sorts of tea-seed and as different types of soil and exposure as possible. It was expected that success—measured pecuniarily—might attend very few of the experiments, but it was hoped that some of them might result favourably. I will leave to your own judgment whether the following returns for this season may be regarded as promising, especially as the limit of production does not yet appear to have been reached:—

Old Rose Garden, Assam hybrid seed, 392 lb dry tea from 83/100 acre, or at the rate of 472½ lb to the acre, or over 7 oz to the bush.

Lincoln Garden, Darjeeling seed, 554 lb dry tea from 1 90/100 acre, or at the rate of 290 lb to the acre, or over 2 oz to the bush.

South Fraser Garden, Chinese seed, 530½ lb dry tea from 2 acres, or at the rate of 250 lb to the acre, or 1½ oz to the bush.

I will not exhaust your patience with comparisons with Asiatic production.

Yield of Pinehurst tea for 1902 (don't laugh, please) about 8,500 lb. It is neither expected nor desired to exceed double that amount (don't be alarmed, please).

As to that little, cheap rotary sterilizer for the Green-tea manufacture, it does its work so well that the product sells very readily in the American market at a price which my respect for your feelings forbids me to quote.

In concluding this too lengthy note, I would ask you to favour me with any further notice that you may deign to bestow on this modest undertaking, even though it may be some fireworks from your aforesaid "funny-man."—Yours very truly,

CHARLES R. SHEPARD.

SNAKE AGAINST SNAKE: A QUERY.

Dec. 17.

DEAR SIR,—Can you, or any of your readers inform me through the medium of your much esteemed paper whether the bite of one venomous snake is fatal to another of a different species—and also venomous. And does a snake really prey upon another for food, or use the means of deglutition as a mode of vanquishing its adversary—and, subsequently, disgorging its inanimate body.

Re Mr. Blacklaw's disclosure I have seen the kinds "Karavilla" and "Tollavissa" in conflict, and both seemed to be making more than mere efforts at destroying each other by biting. In this instance, the former snake (always when full-grown larger than the latter) was getting the better in the fight. Being then at school and quite disinterested in the matter we, school boys, stopped the battle to the death of both combatants without waiting for results. Natives tell of the deadly conflict between the cobra and polonga, in which the former is always victorious over the latter by the more deadly nature of its venom, but this statement seems to be mere tradition as I have never heard the report from an eye-witness. In my opinion one snake uses the act of swallowing as a means of defence when its poison is of no avail against its opponent. However, Mr. Blacklaw's discovery and evidence are very singular—(the more so as the rat snake is not very venomous) and ought to be closely studied by all interested.—I am, Sir, Yours, &c., VIRUS.

P.S.—I have seen Koravens (gipsies) keep polonga and cobra together.

MOSQUITO BLIGHT ON THE HILLS?

Dec. 18.

DEAR SIR,—I was told, not long ago, that I was wrong as to Mosquito Blight being possible at 6,000 feet—so I daren't express an opinion. No sign of it this year yet; but I'll take careful "stock" should what I think is Mosquito, appear again and then I will be able to follow what Mr. Harold Mann has written on the subject. If Mosquito Blight is prevalent in Assam, Cachar,

parts of Darjeeling, etc., so far North of the Equator,—why should it not give trouble up to 6,000 feet in Ceylon?—Yours truly,

PLANTER.

[We suppose Mr. Green will say that it is not impossible for the pest to travel to our higher districts; but that so far, as a matter of fact, it has not been verified at or above 6,000 feet?—ED. *T.A.*]

CEYLON TEA ON THE CONTINENT OF EUROPE.

Bâle, Switzerland, 19th Dec., 1902.

DEAR SIR,—In your London letter, dated the 10th October, I note your London correspondent is somewhat sceptical about my statement to a friend as to selling hundreds of thousands of one-ounce tins filled with pure Ceylon tea on the Continent. It may interest your correspondent to know that in France and Switzerland alone during the past twelve months I have sold through the Tea Planters, Ltd, of Bale, 225,000 Quaker one ounce decorated tins filled with pure Ceylon tea, beside which considerable numbers of Koh-i-noor, Ugalla, Bee and Maravilla one-ounce tins are distributed every week, samples of which I send you per post. Further my distribution of teas in one-ounce tins, is not confined to France and Switzerland but is extended to all parts of the globe.

If the sale of a few hundred thousand one-ounce tins produce such scepticism in your correspondent, I fear for the results when he hears that my last order for decorated tins (for delivery within twelve months) is,—150,000 half lb., 150,000 one lb., 150,000 two lb. and 150 000 three lb. It might also interest him to know that I have placed an order for over a million two-ounce parchment tea bags printed in nine colours, and that my largest sale up to date is in lead packets. This statement can be confirmed by the General Manager of the Tea Planters, Ltd., Bale, who will be pleased to show the original contracts signed by me for the above tins and bags.—Yours faithfully,

R. VALENTINE WEBSTER,
Chairman, Tea Planters Ltd., Bale.

MARIAWATTE ESTATE.

A. R. P.

Yield of old Tea ... 101 1 0

Year.	Made tea. lb.	Yield per acre lb.	Year.	Made tea. lb.	Yield per acre lb.
1884 ...	109 230	1,078	1894 ...	110,448	1,090
1885 ...	117,842	1,163	1895 ...	118,560	1,170
1886 ...	105,925	1 046	1696 ...	113,360	1,119
1887 ...	115.996	1,145	1897 ...	105 729	1,044
1888 ...	106.410	1,050	1898 ...	108,423	1,073
1889 ...	113,834	1,124	1899 ...	111,987	1.108
1890 ...	140,144	1,384	1900 ...	137,066	1,357
1891 ...	120,366	1,183	1901 ...	110,302	1,092
1892 ...	119.909	1,184	1902 ...	101,991	1,009
1893 ...	115,440	1,140			

A. R. P.

Yield per acre (& Rainfall) for the whole estate 458 1 17

	Yield per acre lb.	Rainfall: inches.		Yield per acre lb.	Rainfall: inches.
1892	... 643	95·74	1898	... 738	79 90
1893	... 817	86·22	1899	... 749	106 81
1894	... 750	72·00	1900	... 996	114 63
1895	... 886	100·28	1901	... 792	84·38
1896	... 896	115·41	1902	... 898	128·31
1897	... 926	111·25			

D. M. SALMOND, Superintendent.
Mariawatta Estate, Gampola, Jan. 1st.

COCONUTS AND COPRA.

Hanwella, Dec. 23.

DEAR SIR,—In reply to the "Inexperienced," on the above subject, and your remarks thereon, in your paper of the 18th inst., I think your estimate of nuts to a ton is too low, unless the nuts should be extra big in size. My experience here is that between 4,000 to 4,500 dried nuts go to a ton. A cart load of copra, is generally five candies; a cart load of unhusked nuts=500 and of nuts in the shell 1,000 to 1,200. Here is a sample of my copra cured in the estate. I generally get top price for my produce.

PLANTER

[The samples of copra sent are very good—both clean and white and well dried.—ED. *T.A.*]

PLANTAINS: DIFFERENT VARIETIES.

Hanwella, Dec 26.

DEAR SIR,—In answer to your question in *T. A*, *re* plantains. I may mention that I have a variety called 'Bimkehal' *alias* 'Neukehal.' Bim=ground, kehal=plantains=the plantains which grow close to the ground. Neu=ships, kehal=plantains=plantains of the ships. It is a dwarf variety, bearing bunches within 3½ to 4 feet off the ground. Last month there were two bunches of plantains of this kind, on my plantation, almost touching the ground, having 13 and 11 combs respectively, bearing 10 to 15 fruits in each comb. The variety is used both for culinary purposes and dessert.—Yours faithfully,

G. E. AMARASEKERA.

THE LAKE FLY NUISANCE.

[The following instructive letter has been addressed to our senior morning contemporary by Dr. Willey, F.R.S.]

Colombo Museum. Jan. 2.

DEAR SIR,—In your issue of December 31st there is a paragraph stating that the Sanitary Officers have commenced a campaign against the Lake Fly by prohibiting fishing in a portion of the Lake. In an interview with one of your representatives last May or June, shortly after my arrival in the Island, I suggested the desirability of ascertaining the natural enemy of the Lake Fly.

After a brief stay at Negombo last August, I began to think that the abundance of flies might be correlated with the paucity of fishes, due to overfishing of the Colombo Lake, and I mentioned this view freely in conversation.

Later still I came across a statement emanating from a well-known German fishery expert to the effect that the larva of *Chironomus* (the genus to which the Lake Fly belongs) is a favourite morsel with the carps. One of the commonest fishes of the Colombo Lake is a carp called *Barbus dorsalis*, and there are others with similar tastes.—Yours faithfully,

ARTHUR WILLEY.

THROUGH RANGALA AND MEDAMAHANUWARA: ALL ABOUT CARDAMOMS.

Jan. 2.

SIR,—A few notes of a trip through the less-frequented district lying to the east of Kandy and bordering on the great 'Never-Never' country of Ceylon, which extends from the foot of the Walapane ranges across Bintenna to the Coast near Batticaloa, may possibly prove of some interest to your readers. Owing to the absence of railway or other facilities it is as yet quite out of the beaten track; although the enterprise of the

RANGALA AND MEDAMAHANUWARA

planters, who, in spite of transport difficulties, carry on their industrial occupation and wage persevering warfare against the elements which here oppose their sterner and more unpropitious phases, is deserving of a larger share of recognition and encouragement than it appears to have yet met with from the 'powers-that-be.' My own recollection of the district goes back to very nearly forty years, and so far as the means of transport are concerned matters seem to be very much *in statu quo*. It would look as if the Ceylon Government, alarmed at the too rapid exploitation of places of interest all over the globe, had determined that here at least a sanctuary should be reserved where the ubiquitous globe-trotter should not penetrate, or if he did, that it should be only by means of the antiquated gharry-wallah and the exacting resthouse-keeper. It struck me, however, that in this corner of our 'undeveloped estate' a good deal might be done to bring its attractions to the notice of the tourist. A look through the visitors' book at the Teldeniya resthouse showed that a few travellers had come this way; and their remarks were indicative of pleasure and satisfaction. The expense of carriage-hire and the discomfort of a slow journey through the hot Dumbara Valley must, however, to a large extent, discount the pleasure received and it is not likely this route will be favoured until cheaper and easier means of access are available. The drive out to Teldeniya along the banks of the Mahaweliganga is picturesque and interesting; and the crossing the ferry at Gonawatte and drive through the Pallikelle and Rajawala

COCOA GROVES,

with peeps of the hill ranges in the distance, and then arrival at the pretty little resthouse with a good appetite for breakfast, and a chat with the worthy dame who attends to one's comfort and provides an excellent breakfast—all go to make things agreeable But this is but a stage on the journey. The ascent towards the hills now begins, and a real tug-of-war it is, both for man and beast.* The scenery, too, alters in character, and as one rises above the river valley, the hills become more rugged and abrupt. The road winds up through narrow gorges, and presently another village,—

URUGALLA

—is reached. It boasts of a Court-house and Police station and a few bazaars; but the general aspect of the place gives one the impression that it ought not to be there. Three miles up the road there is a gap in the range, and that is where one would naturally expect to find a small centre, and there ought to be a resthouse; as it is here that a really grand view is obtained of the country on both sides of the mountain range. Not far from here the Mahaweliganga bursts through the circumvallation of hills, which has hitherto confined its course and debouches into the flatter country through which it meanders to its outlet at Trincomalee. The hills rise so sharply on both sides as to form almost a perfect wall, and here and there their summits are broken into battlements andembrasures having all the appearance of Titanic fortifications. The rock-capped peak of

NUGATENNA

frowns imposingly across the gateway towards his fellow-sentinels, Hanguranketa and Madulsima, challenging the intruder, be he human power or mightier foe, battalion or storm. The road now divides and a branch goes off hugging the base of the scarped cliffs in the direction of the Nitre Cave district, while the other tends towards the park country of Bintenna, a favourite resort of sportsmen, being now made a little more accessible through the gradual extension of the cart-road. Some thriving villages here nestle among the villages and ravines; but the cultivation is limited, owing to the comparative dryness of the climate. At the time of our visit, however, all was green and smiling, giving occasion for surprise at the apparent sparseness of population; but this may be due partly to the want of better means of communication with the outer world. As a grazing district this would give the impression of having a future before it; as at certain seasons there is an abundant rainfall, which, by means of small tanks, might be conserved for the benefit of both human population and stock. Our visit, however, was chiefly to the region of

CARDAMOM CULTIVATION

and we were agreeably surprised and delighted to find such fine groves, gardens or plantations,—I don't know how they are usually denominated—flourishing luxuriantly, and bearing such crops as it was refreshing to one's eyesight to see. Around us were the relics of a bygone *régime* when King Coffee held sway and the ruins of old stores, pulping-houses and bungalows recalled to memory the names of many a friend and fellow-planter gone to join the majority; and a touch of sadness could not but steal over us and we felt like

"One who treads
Some banquet hall deserted,
When lights are low, and guests are fled,
And all but one departed."

Reverie is not out of place in a scene such as we have here; but the age is too busy for any such indulgence, and our motto is rather

"Let the dead past bury its dead
Work, work in the living present;
Heart within and God o'erhead."

So mote it be!

* We made the trip up and down in March, 1861. —ED. *T.A.*

Revenons à nos moutons—CARDAMOMS rather. This cultivation bids fair to regain some measure of former prosperity, and the prospect is cheering. The past year has been very favourable owing to an abundant rainfall, and the owners of cardamom fields are rejoicing; although the ever-present shadow of declining markets and lowered prices, like the spectre at the feast, takes the gilt off the ginger-bread. The cultivation of cardamoms has some attractions and, perhaps, fewer drawbacks than are incidental to the majority of tropical products. They are generally grown under the shade of the larger jungle trees from underneath which the smaller under-growth has been cleared, leaving all vegetable matter to form *humus* on the surface which is constantly renewed by the falling leaves; and this style of cultivation is *par excellence* the desideratum for a country like Ceylon, when the denudation of the soil results in wash and impoverishment from the action of torrential rains on steep hill-sides The upkeep of the fields is comparatively simple cost of weeding and pruning almost nominal, and the buildings required for curing the produce do not need to be of an elaborate or expensive construction, as hardly any machinery is necessary. The fruit is merely dried, bleached and sorted, when it is ready for packing into boxes of the same kind as tea-chests, but without the lead-lining. Like all fruit growers

THE CARDAMOM PLANTER

—is not without his enemies in the shape of squirrels, monkeys, as well as bipeds of a higher degree of intelligence, who are here afforded an opportunity of supplying the missing link between the 'spicy breezes' and that peculiar trait of the human race which the poet has characterised as 'vile.' Verily a Garden of Eden, but alas! the trail of the serpent is here too; although it is satisfactory to find that the missionary has penetrated into these wilds and planted his schools here and there wherever an opening can be got. More power to his elbow! Here, as elsewhere, he is in the fore-front of enterprise, seeking to reclaim a lost race from out of the wilderness of sin and ignorance, and planting the flag of peace and good will. It is an end worthy of attainment and it needs courage, perseverance and—cash!

Had time permitted a visit to some of these villages would have afforded us great pleasure and given material for a fuller description of the work being done, but we had to pass on. The spell of fine weather which had so far favoured us now came to an end and the curtain literally dropped upon the scene. Passing through the Nugatenna Gap we kept along the Eastern face of the range and climbed up through Kobonella in drenching rain and mist and were not sorry to find ourselves once more under shelter of the hospitable bungalow we were making for. The next morning was wet again and, our time being up, we made good our retreat, reluctantly postponing any further description of the country until another time.

PERIPATETIC.

BEE-KEEPING IN CEYLON: SEVERAL EXPERIMENTS.

Colombo, Jan. 5.

DEAR SIR,—With reference to your remarks on page 508, may I point out that there are a number of expeiments in improved bee-keeping, with frame hives, now in progress. The most notably successful of these is that of Mr. Charles Andree, of Kurunegala, who has regularly exhibited working hives at our Colombo Agri-Horticultural Shows, and fully explained the whole process of honey-making by practical demonstration. Similar hives are being kept at the stock garden (in the late School of Agriculture), by Messrs. F Beven, Veyangoda, D. C Jayawardene, Nanuoya, and others.—Yours truly,

BEEKEEPER.

[We are very pleased, indeed, to have the above information: we missed the last Agri-Horticultural Show through being up-country.—ED. *T.A.*]

GREEN TEAS IN CEYLON IN 1902.—The bonus table for December 16th-31st 1902 is somewhat late in appearing, owing, perhaps, to its large size and the intervention of the holidays. The sum of R19,440·30 paid during the fortnight is larger than for any similar period, we believe, since the green tea bonus began and indicates the activity with which manufacture of this safety-valve of the black tea industry is proceeding in Ceylon. A number of new estate names also appear in the list on page 38. It will be interesting to give a table of the twenty-four half-monthly totals of the past year, as follows:—

Date, 1902.		lb.	Rs.
January	15th ...	65,020	4 086.16
	31st ...	87,853	5,271·18
February	15th ...	63,474	3,600·89
	28th ...	75,650	4,160·72
March	15th ...	65,811	3,464·36
	31st ...	104,239	5,211·95
April	15th ...	155,427	7,771·35
	30th ...	128,710	6,435·50
May	15th ...	61,771	3,088 55
	31st ...	237,900	11,895·00
June	17th ..	183,872	9,193 60
	30th ..	184,664	9.233 20
July	15th ..	222,046	11,102·30
	31st ...	189 216	9,460·80
August	16th ..	114,282	5,714·10
	31st ...	153,353	7,667·65
September	15 h ..	139,000	6,950·00
	30th ...	231,785	11,589·25
October	15th ...	189,437	9,471·85
	31st ..	217,714	10,885·70
November	17th ..	200,193	10,009·65
	30th ..	193,097	9,654·85
December	15th ..	260,742	13.037·10
	31st ..	388,806	19,440·30
	Total ..	3,914,062	198,396·01

Though the figures for 1902 are not yet quite complete, we see that there is at least an increase of 2,324,072 lb. over the total for 1901. The special monthly table for 1902 we have prepared elsewhere, together with that for 1901, provide some interesting points of comparison.

BRITISH AND SIAMESE MALAYA.

At a meeting of the Royal Colonial Institute, held on Tuesday, Dec. 9, at the Whitehall Rooms, Hotel Metropole, Mr Hugh Clifford, C M G, read a paper on "British and Siamese Malaya," which was illustrated by lantern slides. Sir William Robinson was in the chair.

Mr Clifford said that the Malay Peninsula was a country with a strong individuality, but it continued inexplicably to attract only a very small measure of attention from Great Britain. After describing some of the chief characteristics of the country, he said that in 1895, the year immediately preceding the federation of the States, the joint revenue of the protectorate amounted to $8,334,677; and the returns for last year showed that the total had reached $17,541,507 (nearly £1,500,000 sterling), which was more than double the joint revenue of the States six years ago. As to the sources of the revenue, he remarked that the main wealth of the peninsula had hitherto been in its vast alluvial tin fields, from which nearly 47,000 tons, valued at £5,240,000 were exported during 1901. Upon that the Government levied a duty. Another source of revenue was the farms, let by public tender, for the collection of import duties on opium and spirits. The taxes to which he had referred might roughly be stated to fall almost wholly upon the foreign—that was, practically, the Chinese—portion of the community. Railways, too, were a source of revenue, and had been and were being constructed by the Government out of surplus revenue, without any recourse being had to loans. This fact would perhaps show the extraordinary wealth of the country and the successful results which had attended its administration under the protection of Great Britain. At the beginning of this year the assets exceeded the liabilities by over $5,000,000, and the actual cost of administration, as represented by the cost of the Government civil establishment, amounted to only 17 63 per cent of the revenue. This demonstrated how economical was the system of government which had been introduced and how successful the temptation to extravagance had been resisted in the case of this British protectorate. An examination of the Blue-book relating to the Federated Malay States showed that the Malay population had increased during the decade ended 1901 by 35 per cent. But while the population increased it was found that their own land now yielded the people all the support they needed, and they were enjoying a complete individual liberty. It must be confessed that in a land such as the Federated States, where every enterprise was chiefly hampered by a lack of sufficient labour, the temptation to adopt the Dutch system was very great. The sight of the entire native population loafing away its days, and giving to its fields a *minimum* of grudging labour, was an outrage to the economist; for there was a vast quantity of potential energy suffered to go to waste. Whatever the feelings of the Asiatic populations might be elsewhere, in the Malay States it was certain that if a *plebiscite* were taken today it would return an overwhelming majority in favour of our rule as against the ancient *régime*. As matters stood at the present time, the most urgent and crying need of the Federated Malay States was a sufficient supply of labour. So far, the stream of Chinese immigration had flowed with hardly an interruption, but as a set off against it the counter-stream of Chinamen returning to their homes must be borne in mind, and it was not in the power of the British Government to control the emigration. It would appear that Malaya was specially created to serve as a receptacle for the overflow of the natives of India—a natural refuge for a population which annually counted the number of those on famine relief by the hundred thousand. The efforts in this direction had proved wofully disappointing, and the Government of India evinced no great desire to utilise the means of relief which the Malay States offered. After referring to Pahang, the most recently acquired and the least prosperous of the States, he briefly alluded to the portion of the peninsula which lay beyond the limits of the British Protectorate, and, in conclusion, said that, if the Siamese administration of the Malay States was to be saved from failure, they must secure the aid of a Civil service such as had been at the disposal of the British Government in Malaya during the past 30 years. (Hear, hear.)

A discussion followed and the proceedings closed.—London *Times*, Dec. 11.

VANILLA.

A consignment of about 300 kilos of vanilla cultivated in German East Africa, arrived in Hamburg a short time ago. The beans are said to be of the fine dark chocolate colour, and are commencing to crystallise. They are of various lengths, and are reported to compare favourably with the best Bourbon quality.—*Chemist and Druggist*, Dec. 13.

THE SHORTAGE IN GUTTA PERCHA.

If anybody doubted it, the recent enormous rises in the price of crude gutta-percha make it perfectly obvious that, taking it all round, the supply is not equal to the demand. Of course, the rise in crude gutta from about 5s 5d per lb to 9s per lb is very largely due to the new cable projects, but, as the tendency is for more cables in every direction, this rise promises to maintain itself for a long time to come, and it is, moreover, very definite proof of the fact that the production of gutta is extremely limited, and does not seem to be capable of extension in the near future. If additional proof for this contention were wanted it could easily be found in the fact that for several years there has been a marked and increasing deterioration in the quality of the gutta shipped. All this leaves no doubt that the present is an excellent time for a substitute like Gentzsch's New Gutta percha to assert and demonstrate its merits.—*India-Rubber Journal*, Dec. 8.

ZANZIBAR.—In 1901, Zanzibar exported £25,130 worth of rubber, against £25 286 in 1900. Of this, Germany received £7,828 more than in the previous year.

FRENCH GUINEA.—The import and export of this colony show a decided decline during 1901. This is chiefly caused by the rubber trade crisis, the chief product which the country exports. The export of raw rubber decreased from 7,580,120 francs in 1901. As the natives had not taken notice of the warning of the Government not to forget the culture of other products over rubber, they were unable, at the general fall in prices, to make their usual purchases, which caused the big fall in imports.—*India Rubber Journal*, Dec. 8.

CEYLON GREEN TEA IN 1901-2.

THE MONTHLY OUTTURNS.

(Specially compiled.)

	1902. lb.	1901. lb.
January	142.873	252,582
Febrnary	139,124	116,592
March	170,050	105.644
April	284.137	70,614
May	299,671	24.438
June	368,536	108.017
Jnly	411,262	163,967
Augnst	267,635	177,079
September	370,785	112,244
October	407,151	205,137
November	393,290	117,275
December	649,548	136,411
Total ..	3,914,062	1,589,990
Increase		2,324,072

TEA IN PERSIA AND BEYOND.

The British Consul at Meshed, in a report of the trade of Khorassan, states that the taste for tea is strongly developed. It is mainly of the Indian prodnct. The value of the tea imported by the Bandar Abbas, Bushire and Seistan routes was £50,267, but a onsiderable proportion of the tea brought by the two former routes is sai‡ to have been China tea for exportation to Trans-Caspia and Tnrkestan.—*L and C Express*, Dec 19.

APICULTURE.—A correspondent asks how it is that "beekeeping" is not more attended to by the natives of Ceylon? We can only reply that the natives are content to profit by gathering wild honey when such is available in a good flowering season; but that (with the solitary exception of the late Mudaliyar Jayatilake of Kurunegala) we have never know any local bee-keepers, and yet Ceylon has two indigenous bees good honey makers one, a large bee, common in the forests of the interior; and the other a bee not larger than a house fly, found chiefly in the maritime districts We had this fact brought before us first by an American visitor, Mr. Frank Benton, Professor of Apiculture in Michigan University. While visiting Cyprus, he got a commission from the Dutch Government to convey a colony of Cyprian bees to Java, which he accomplished successfully. Calling at Galle on his way back, he had some curious adventures (in getting the fly-bee) before coming to Colombo in search of the large forest-bee. We sent him to the Kurunegala Mudaliyar who gave him guides to the jungle where he got plenty of the bees to take home, but also a severe dose of malarial fever. Mr Benton wrote freely in *Observer* and *Tropical Agriculturist* at the time. He successfully conveyed the Ceylon bees to America; but we fear they died out after some time. The latest news of our friend was that he had been transferred to the headquarters of the Agricultural Department at Washington.—Meantime an experiment in "bee-keeping" after the most approved pattern should be begun at Gangaruwa Experimental Station.

COLOMBO PRICE CURRENT.

(Furnished by the Chamber of Commerce.)

EXPORTS

Colombo, Dec. 22nd, 1902.

CARDAMOMS :—
All ronnd parcel, well bleached per lb. R1·20
Do. dnll medium do. R0·90
Special assortment, 0 and 1 only do R1·40
Seeds do. R1·00

CINCHONA BARK:—
Per nnit of Sulphate of Qninine 6c—1½ to 3 per cent.

CINNAMON :—(in bales of 100 lbs. nett.)
Ordinary assortment per lb. 49c. } All fine sorts
Nos. 1 and 2 only per lb. 56c. } are scarce.
Nos. 3 and 4 only per lb. 41½c. }

CINNAMON CHIPS :—(in bgs. of 56 lbs. nett. per candy of 560 lb.) R60·00

COCOA :—
Finest estate red nnpicked per cwt R50·00
Medinm do do do R40·00
Bright native nnpicked and nndried R35·00
Ordinary do do do R25·00

COCONUTS—(hnsked)
Selected per thousand R55·00
Ordinary ,, R44·00
Smalls ,, R37·00

COCONUT CAKE—
Poonac in robins f. o. b. per ton R89·00
Do in bags none.

COCONUT (Desiccated).
Assorted all grades per lb 18c.

COCONUT OIL—
Dealers' Oil per cwt R16·00.
Coconnt Oil in ordinarv packages f. o. b. per ton R355·00.—Business at both rates.

COFFEE.—
Plantation Estate Parchment on the spot per bus. None
Plantation Estate Coffee f. o. b. (ready) per cwt.—R62·00.
Native Coffee, f.o.b per cwt.—None.

CITRONELLA OIL—
Ready do per lb.—54c.

COPRA—
Boat Copra per candy of 560 lb. R51·00
Calpentyn Copra do do R52·50
Cart do do do R46·00
Estate do do do R52·00

CROTON SEED per cwt—R11·00

EBONY—
Sonnd per ton at Govt. depot R70·00 to 145·00—Sale of 1st Dec. 1902
Inferior R35·00 to R100.00. —Sale of 1st Dec. 1902.

FIBRES—
Coconnt Bristle No 1 per cwt None
Do ,, 2 None
Do mattress ,, 1 None
Do ,, 2 None
Coir Yarn, Kogalla ,, 1 to 8 R16·00 Firm.
Do Colombo ,, 1 to 8 R11·00
Kitool all sizes None
Palmyrah None

PEPPER—Black per lb None

PLUMBAGO—
Large lnmps per ton R600 } Fine qualities scarce.
Ordinary lnmps do R600
Chips do R350
Dnst do R250
Do (Flying) do R125

SAPANWOOD— per ton R45.—Nominal.

SATINWOOD (ordinary) ner cnbic ft. R4·60 Sale of 1st Dec. 1902.
Do (Flowered) per cnbic ft. R10·50

TEA—

	High Grown Average	Medium Average.	Low Grown Average.
Broken Pekoe and Broken	cts	cts	cts
Orange Pekoe per lb	52	42	40
Orange Pekoe do	45	37	35
Pekoe do	38	35	31
Pekoe Souchong do	34	29	28
Pekoe Fannings do	33	28	27
Broken mixed—dust, &c	27	27	26

SHARE LIST.

ISSUED BY THE

COLOMBO SHARE BROKERS' ASSOCIATION.

CEYLON PRODUCE COMPANIES.

Company	paid p. sh.	Buyers.	Sellers.	Transactions.
Agra Ouvah Estates Co., Ltd.	500	—	—	950
Ceylon Tea and Coconut Estates	500	..	—	—
Castlereagh Tea Co., Ltd.	100	95	100	95
Ceylon Provincial Estates Co. Ltd.	500	510	—	—
Claremont Estates Co., Ltd.	100	—	—	—
Clunes Tea Co., Ltd.	100	65	..	—
Clyde Estates Co., Ltd.	100	...	50	...
Doomoo Tea Co., of Ceylon Ltd.	100	..	—	...
Drayton Estate Co., Ltd.	100	—	..	—
Ella Tea Co., of Ceylon, Ltd.	100	..	40	—
Estates Co of Uva, Ltd.	275	—	—	..
Gangawatte Tea Co., Ltd.	100	—	—	—
Glasgow Estate Co., Ltd.	500	1100	..	..
Great Western Tea Co., Ltd.	500	—	—	..
Hapugahalande Tea Estate Co.	200	175	150	—
High Forests Estates Co., Ltd	500	525	—	—
Do part paid	400	—	...	...
Horrekelley Estates Co Ltd	100	110	...	110
Kalutara Co., Ltd.,	500	..	200	..
Kandyan Hills Co., Ltd	100	—	..	—
Kanapediwatte Ltd.	100	50	...	—
Kelani Tea Garden Co., Ltd.	100	..	32½	—
Kirklees Estate Co., Ltd.	100	110	—	—
Knavesmire Estates Co., Ltd.	100	..	55	...
Maha Uva Estates Co., Ltd.	500		—	800
Mocha Tea Co., of Ceylon, Ltd.	500	800	..	...
Nahavilla Estate Co., Ltd.	500	250	300	—
Nebeda Tea Co., Ltd.	500	—	...	—
Palmerston Tea Co., Ltd.	500	...	400	—
Penrhos Estates Co, Ltd.	100	75	—	..
Pitakanda Tea Company	500	—	...	—
Pine Hill Estate Co., Ltd.	60	—	—	—
Putupaula Tea Co., Ltd.	100	...	..	—
Ratwatte Cocoa Co., Ltd.	500	.	...	—
Rayigam Tea Co., Ltd.	100	—	50	50
Roeberry Tea Co., Ltd	100	90	—	—
Ruanwella Tea Co., Ltd	100	...	35	—
St. Heliers Tea Co., Ltd,	500	...	—	—
Talgaswela Tea Co., Ltd.	100	20	...	—
Do per cent Prefs.	100	—	—	—
Tonacombe Estate Co., Ltd,	500	...	—	—
Union Estate Co., Ltd.	500	..	...	—
Upper Maskeliya Estates Co., Ltd.	500	550	—	—
Uvakellie Tea Co. of Ceylon, Ltd	100	—	80	80
Vogan Tea Co., Ltd.,	100	..	55	55
Wanarajah Tea Co., Ltd.	500	...	800	800
Yataderiya Tea Co., Ltd.	100	...	375	350

CEYLON COMMERCIAL COMPANIES

Company	paid p. sh.	Buyers.	Sellers.	Transactions.
Adam's Peak Hotel Co., Ltd.	100	...	80	...
Bristol Hotel Co., Ltd.	100	..	100	—
Do 7 per cent Debts	100	107	...	..
Ceylon Gen. Steam Navigation. Co., Ltd	100	—	225	225
Ceylon Ice & Cold Storage Co. Ltd.	00	—	—	110
Ceylon Superæration Ltd.	100	—	—	—
Colombo Apothecaries' Co. Ltd.	100	—	150	147½
Colombo Assembly Rooms Co., Ltd.	20	15	..	15
Do prefs.	20	...	..	..
Colombo Fort Land and Building Co., Ltd.	100	87½	90	—
Colombo Hotels Company	100	295	.	295
Galle Face Hotel Co., Ltd.	100	—	195	192½
Kandy Hotels Co, Ltd.	100	..	..	—
Kaluganga Nav. Co. Ltd.	70	...	—	—
Mount Lavinia Hotel Co., Ltd.	500	—	300	—
New Colombo Ice Co., Ltd.	100	60	70	60
Nuwara Eliya Hotels Co., Ltd.	30	..	27½	—
Do 7 per cent prefs.	100	—	—	—
Public Hall Co., Ltd.	20	7½	10	—

LONDON COMPANIES

Company	paid. p. sh.	Buyers.	Sellers.	Transactions.
Alliance Tea Co., of Ceylon, Ltd.	10	..	6–7	6½
Anglo-Ceylon General Estates Co	100	...	52 57	—
Associated Estates Co., of Ceylon	10	..	1½–2½	..
Do. 6 per cent prefs	10	..	3–/	...
Ceylon Proprietary Co.	1	.	3–6	..
Ceylon Tea Plantation Co., Ltd.	10	..	22½ 2?½	...
Dimbula Valley Co. Ltd	5	..	5–5½	—
Do prefs	5	—	5–6	...
Eastern Produce & Estate Co. Ltd.	5	...	3½–?¾	—
Ederapolla Tea Co., Ltd	10	...	5–8	...
Imperial Tea Estates Co., Ltd.	10	...	8¾ 4½	
Kelani Valley Tea Assen., Ltd.	5	...	3–5	—
Kintyre Estates Co., Ltd.	10	...	4 5	—
Lanka Plantations Co., Ltd	10	..	3–4	—
Nahalma Estates Co., Ltd.	1	...	nom	..
New Dimbula Co., Ltd.	1	...	2¾–3	..
Nuwara Eliya Tea Estate Co., Ld.	10	—	10	
Ouvah Coffee Co., Ltd.	10	..	6½–7½	—
Ragalla Tea Estates Co., Ltd.	10	.	9–11	—
Scottish Ceylon Tea Co., Ltd.	10	.	10–12	—
Spring Valley Tea Co., Ltd.	10	...	2–5	—
Standard Tea Co., Ltd.	6	..	9¾–10¼	..
The Shell Transport and Trading Company, Ltd. *	1	...	2⅞–3⅛	—
Ukuwella Estates Co., Ltd.	25	—	par	...
Yatiyantota Ceylon Tea Co., Ltd.	10	—	3½–4½	..
Do. pref. 6 o/o	10		8–9	...

BY ORDER OF THE COMMITTEE.

Colombo, Jan 9th, 1903.

* Latest London Prices

RAINFALL RETURN FOR COLOMBO.

(Supplied by the Surveyor General

	1898.	1899	1900	1901	1902	Av. of 33yrs.	1903.
	Inch	Inch.	Inch.	Inch	Inch	Inch.	Inch.
January ..	2·32	·98	3·72	11·91	1·95	2·46	3·53*
February ..	1·98	2·78	0·63	3·55	4·87	2 02	
March ..	4·21	0·88	3·71	5·12	6·85	4·52	
April ..	22·81	6·66	15·12	8·71	10·01	11·30	
May ..	5·80	17·73	10·63	6·28	11·89	11 86	
June ..	10·94	9·23	7·83	5·93	9·84	8·32	
July ..	6·15	1·11	6·77	4·52	4 63	4·46	
August ..	0·97	0·62	7·35	0·46	2·78	3·66	
September ..	6·90	1·48	4·00	3·93	8·15	5·04	
October ...	20·60	12·99	9·47	3·91	31·47	14·56	
November ..	17·38	8·58	9 25	19·84	20·10	13·00	
December ..	3·05	4·44	5·20	1·70	6·43	6·56	
Total..	103·11	73·48	83·68	75·86	118·70	88·76	

* From 1st to 6th Jan 3·53 inches, that is up to 9-30 a.m. on the 7th Jan.—ED *C.O.*

CEYLON TEA: MONTHLY SHIPMENTS TO UNITED KINGDOM AND ESTIMATE.

Estimate	for	Dec.	1902—9½ to 10 mill. lb.
Total	Shipments	Do	1902— 9,000,000 lb.
Do	Do	Do	1901—12,235,867 lb.
Do	Do	Do	1900—11,241,918 lb.

[ESTIMATE for Jan. 1903—9½ to 10 million lb.]

SIERRA LEONE.—The raw rubber export of Sierra Leone has fallen considerably in 1901. In 1899, it amounted to 545,385 lb, in 1900 to 274,616 lb, and in 1901 131,655 lb only. By the irrational method of the natives in tapping the trees many of them have perished, which, together with the keen competition of the neighbouring French Colony of Guinea, would, no doubt, account for the decline. The French product is considerably better.

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's Fortnightly Price Current, London, 3rd December, 1902.)

	QUALITY.	QUOTATIONS
ALOES, Socotrine cwt.	Fair to fine dry	70s a 80s
Zanzibar & Hepatic ,,	Common to good	20s a 60s
ARROWROOT (Natal) lb.	Fair to fine	7d a 8d
BEES' WAX, cwt.		
Zanzibar & White ,,	Dingy to Fair	£5 a £6 12s 6d
Bombay Yellow ,,	Fair ,,	£6 a £6 7s 6d
Madagascar ,,	Dark to good palish	£6 5s a £6 17s 6d
CAMPHOR, Formosa ,,	Crude and semi-refined	16[illegible]s a 176s
Japan ,,	Fair average quality	16[illegible]s
CARDAMOMS, Malabar lb	Clipped, bold, bright, fine	[illegible]s 9d a 2s
	Middling, stalky & lean	1s a 1s 7d
Ceylon.—Mysore ,,	Fair to fine plump	1s a 3s 6d
	Seeds	[illegible]s [illegible]d a 1s 7d
,, Tellicherry ,,	Good to fine	1s 6d a 2s
	Brownish	1s 3d a 1s 6d
,, Long ,,	Shelly to good	9d a 2s
,, Mangalore ,,	Med brown to good bold	2s 8d a 2s 11d
CASTOR OIL, Calcutta ,,	1sts and 2nds	2¼d a [illegible]½d
CHILLIES, Zanzibar cwt.	Dull to fine bright	31s a 4[illegible]s
CINCHONA BARK.—lb. Ceylon	Ledgeriana Orig. Stem	[illegible]d a 9d
	Crown, Renewed	5d a 7d
	Org. Stem	2½d a [illegible]½d
	Red Org. Stem	½d a 4½d
	Renewed	3d a 5½d
	Root	[illegible]d a 4d
CINNAMON, Ceylon 1sts per lb.	Ordinary to fine quill	8½d a 1s 6d
2nds	,, ,,	[illegible]d a 1s 6d
3rds	,, ,,	7½d a 1s 4d
4ths	,, ,,	7d a 11d
Chips	,, ,,	2½d a 10d
CLOVES, Penang lb.	Dull to fine bright bold	5½d a 1s
Amboyna	Dull to fine	5d a 6d
Zanzibar and Pemba	Good and fine bright	4⅜d a 4½d
	Common dull to fair	4 a 4 5-16d
Stems	Fair	2d
COFFEE— Ceylon Plantation ,,	Bold to fine bold colory	92s 6d a 118s
	Middling to fine mid	80s a 105s 6d
	Smalls	55s a 6[illegible]s
Native	Good ordinary	40s a 5[illegible]s
Liberian ,,	Small to bold	36s a 40s
COCOA, Ceylon ,,	Bold to fine bold	6[illegible]s a 88s
	Medium and fair	58s a 64s
	Native	[illegible]s a 60s
COLOMBO ROOT ,,	Middling to good	13s a 2[illegible]s
COIR ROPE, Ceylon ton		nominal
Cochin ,,	Ordinary to fair	£13 [illegible]s a £18
FIBRE, Brush	Ord. to fine long straight	£16 a £19
Cochin ,,	Ordinary to good clean	£20 a £24
Stuffing ,,	Common to fine	£7 a £9
COIR YARN, Ceylon ,,	Common to superior	£15 a £30
Cochin ,,	,, very fine	£12 a £32
do. ,,	Roping, fair to good	£10 a £14 10s
CROTON SEEDS, sift. cwt.	Dull to fair	1[illegible]s a 25s
CUTCH ,,	Fair to fine dry	25s a 30s
GINGER, Bengal, rough ,,	Fair	40s
Calicut, Cut A ,,	Good to fine bold	80s a 85s
B & C ,,	Small and medium	4[illegible]s a 60s
Cochin Rough ,,	Common to fine bold	36s a 40s
	Small and D's	32s a 35s 6d
Japan ,,	Unsplit	33s a 34s
GUM AMMONIACUM ,,	Sm. blocky to fine clean	10s a 35s
ANIMI, Zanzibar ,,	Picked fine pale in sorts	£10 7s 6d a £16
	Part yellow and mixed	£7 a £10
	Bean and Pea size ditto	£70 a £8 15s
	Amber and dk. red bold	£5 15s a £8
Madagascar ,,	Med. & bold glassy sorts	90s a £7 17s 6d
	Fair to good palish	£4 a £8
	,, ,, red	£4 5s a £7 10s
ARABIC E. I. & Aden ,,	Ordinary to good pale	25s a 37s 6d
Turkey sorts ,,		27s 6d a [illegible]2s 6d
Ghatti ,,	Pickings to fine pale	10s a 2[illegible]s
Kurrachee ,,	Good and fine pale	2[illegible]s 6d a 30s
	Reddish to pale selected	[illegible]0s a 2[illegible]s
Madras ,,	Dark to fine pale	1[illegible]s a 25s
ASSAFOETIDA ,,	Clean fr. to gd. almonds	4[illegible]s a 75s
	Ord. stony and blocky	9s a 37s 6d
KINO ,,	Fair to fine bright	4½d a 7d
MYRRH, picked ,,	Fair to fine pale	75s a 120s
Aden sorts ,,	Middling to good	50s a 75s
OLIBANUM, drop ,,	Good to fine white	4[illegible]s a 47s 6d
	Middling to fair	28s a 42s
pickings ,,	Low to good pale	18s a 20s
siftings ,,	Slightly foul to fine	18s a 23s
INDIARUBBER, Ceylon	Fine (grwn. fr. Para seed)	2s 3d a 4s
Assam	Good to fine	2s a 2s 4d
	Common to foul & mxd.	7d a 1s 6d
Rangoon	Fair to good clean	2s a 2s 4d
Borneo	Common to fine	6d a 2s 2d

	QUALITY.	QUOTATIONS
INDIARUBBER (Contd.)		
Java, Sing. & Penang lb.	Foul to good clean	8d a 2s 3d
	Good to fine Ball	2s 6d a [illegible]s 9d
	Ordinary to fair Ball	1s 10d a 2s 2d
	Low sandy Ball	9d a 1s 6d
Mozambique ,,	Sausage, fair to good	1s [illegible]d a 2s 10d
	Liver and Livery Ball	1s 9d a 2s 3½d
Nyassaland	Fair to fine ball	[illegible]s 3d a 2s 8d
Madagascar	Fair to fine pinky & white	[illegible]s a 2s [illegible]d
	Fair to good black	1s 1d a 1s 1½d
	Niggers, low to fine	7d a 1s 9d
INDIGO, E.I.	Bengal—	
	Shipping mid to gd violet	3s 6d a 4s
	Consuming mid. to gd.	3s 2d a 3s 7d
	Ordinary to mid.	2s 8d a 3s 1d
	Mid. to good Kurpah	1s 9d a 2s 3d
	Low to ordinary	1s a 1s 7d
	Mid. to good Madras	1s 4d a 1s 10d
MACE, Bombay & Penang per lb.	Pale reddish to fine	[illegible]s a 3s
	Ordinary to fair	1s 4d a 1s 11d
	Pickings	1s 3d a 1s 4d
MYRABOLANS, Madras cwt	Dark to fine pale UG	5s a 6s
	Fair Coast	4s [illegible]d a 4s 6d
Bombay ,,	Jubblepore	[illegible]s 6 a 6s
	Bhimlies	4s a 7s
	Rhajpore &c.	3s 6d a 5s 6d
Bengal ,,	Calcutta	3s 6d a 5s
NUTMEGS— lb.	64's to 57's	2s [illegible]d
Bombay & Penang ,,	110's to 65's	1s [illegible]d a 2s 5½d
	160's to 1[illegible]5's	6[illegible]d a 1s
NUTS, ARECA cwt.	Ordinary to fair fresh	4s a 17s
NUX VOMICA, Bombay per cwt.	Ordinary to middling	5s 6d a 6s
Madras	Fair to good bold fresh	[illegible]s a 10s
	Small ordinary and fair	[illegible]s a 6s 9d
OIL OF ANISEED ,,	Fair merchantable	4s 9d a 4s 10½d
CASSIA ,,	According to analysis	3s 3d a 3s 9d
LEMONGRASS ,,	Good flavour & colour	5d
NUTMEG ,,	Dingy to white	1½d a 2½d
CINNAMON ,,	Ordinary to fair sweet	3½d a 1s 1d
CITRONELLE ,,	Bright & good flavour	9d a 10½d
ORCHELLA WEED—cwt		
Ceylon ,,	Mid. to fine not woody	[illegible]0s a 12s 6d
Zanzibar ,,	Picked clean flat leaf	10s a 14s
	,, wiry Mozambique	10s a 11s
PEPPER (Black) lb.		
Alleppee & Tellicherry	Fair to bold heavy	6d a 6¼d
Singapore	Fair	6d
Acheen & W. C. Penang	Dull to fine	5½d a 5¾d
PLUMBAGO, lump cwt.	Fair to fine bright bold	30s a 35s
	Middling to good small	2[illegible]s a 28s
chips	Dull to fine bright	9s a 15s
dust	Ordinary to fine bright	4s a 7s 6d
SAFFLOWER	Good to fine pinky	65s a 75s
	Inferior to fair	40s a 60s
SANDAL WOOD—		
Bombay, Logs ton.	Fair to fine flavour	£15 a £30
Chips ,,	... ...	£5 a £8
Madras, Logs ,,	Fair to good flavour	£15 a £30
Chips ,,	Inferior to fine	£4 a £8
SAPANWOOD Ceylon ,,	Fair to good	£5 a £5 10s
Manila ,,	Rough & rooty to good	£4 10s a £5 15s
Siam ,,	bold smooth	£7
SEEDLAC cwt.	Ord. dusty to gd. soluble	117s 6d a 120s
SENNA, Tinnevelly lb.	Good to fine bold green	5⅝d a 8d
	Fair greenish	3½d a 5½d
	Common dark and small	1¼d a 3d
SHELLS, M. o'PEARL— Bombay cwt.	Bold and A's; D's and B's; Small	48s a 130s
Mergui ,,	Small to bold	£7 15s a £10
Mussel ,,	Small to bold	17s a 55s
TAMARINDS, Calcutta... per cwt.	Mid. to fine bl'k not stony	8s a 10s
Madras	Stony and inferior	4s 6d a 6s
TORTOISESHELL— Zanzibar & Bombay lb.	Small to bold dark mottle part heavy	18s a 24s
TURMERIC, Bengal cwt.	Fair	14s a 16s
Madras ,,	Finger fair to fine bold bright	1[illegible]s a 14s
Do. ,,	Bulbs	9s
Cochin ,,	Finger	10s a 12s
	Bulbs	9s a 9s 6d
VANILLOES— lb. Mauritius 1sts	Gd. crystallized 3½ a 8½ in	7s 6d a 28s 6d
Bourbon 2nds	Foxy & reddish 3½ a 8 ,,	6s a 13s
Seychelles 3rds	Lean and inferior	4s 3d a 8s
VERMILION lb.	Fine, pure, bright	3s a 3s 1d
WAX, Japan, squares cwt	Good white hard	56s a 59s