

INTRODUCTION.

We have already announced that our "HAND-BOOK OF INFORMATION FOR CEYLON" published this year is the last bulky volume of the kind that will be issued from our press.

In future, we trust to present annually a compact DIRECTORY volume with every-day information which is needful to the planter, merchant, civil servant, &c. This will necessitate the exclusion of papers bearing on planting subjects such as have occupied a prominent place in successive Hand-books during the last twenty years. The difficulty has always been to find space for the information which we would fain publish for the benefit of our readers. Almost every issue of the *Daily and Weekly Observer* contains information which the planter would be glad to preserve in a convenient form for reference, and we have been frequently pressed to supply this want by an issue separate from the Directory. There is also a great deal of information bearing on the cultivation of new and old products to be found in Home and Colonial periodicals which we should like to make generally known, but for which it is impossible to find space in the pages of an ordinary newspaper.

It is to provide a fitting medium for all such literature that we have determined to publish "THE TROPICAL AGRICULTURIST." This will be issued monthly, and, as may be observed, in a form suitable for easy reference, and for binding in either half-yearly or yearly volumes as may be desired.

Prefix to each issue a table of "Contents" is given which is of little more than nominal value,

but at the end of every half-year a thoroughly useful and complete Index will be appended, so as to make the information under each topic, or respecting each product, readily available.

The publication will be made as soon after the first of each month as possible. Our present preliminary issue, which we distribute gratis to the number of 2,000 copies, cannot be taken as a fair specimen of what will follow either in respect of contents or punctuality; indeed the second issue is, at this date, almost ready for publication. It will be our endeavour to find a place in these pages for everything bearing on the practical work of a tropical planter, our space being no more restricted than our will to serve our constituents. It will be observed that our contents on the present occasion include papers and much useful practical information on the following among other subjects:—

The Cultivation of Cinchona, Tea, Cacao, Liberian Coffee, India-rubber, Tobacco, Vanilla, Fig, Aloe, &c.; on the Preparation of Tea; Adulteration of Tea and Coffee; Manuring of Plantations; the use of Lime; the Coffee Leaf Disease; on Apiculture and Ceylon Bees; Tea and other Products at the Melbourne Exhibition; Planting in Natal, Jamaica, &c.

In our second and third numbers we shall endeavour to find space for the portions of the past letters of the Commissioner at Melbourne for Ceylon, which Tea planters and merchants would wish to keep by them. We shall be glad to receive suggestions from any of our readers for the benefit of our new venture. We have endeavoured to make the subscription as low as possible to *Observer* subscribers, an average issue of from 70 to 80 pages being guaranteed monthly.

"OBSERVER" OFFICE, 24th June 1881.

"THE TROPICAL AGRICULTURIST."

FORM OF ORDER.

TO THE PUBLISHERS,

"Ceylon Observer" Office, COLOMBO, CEYLON.

1881.

DEAR SIRS,—Please enter my name as a subscriber for "THE TROPICAL AGRICULTURIST" (monthly) at eight rupees per annum (being a subscriber to the *Daily or Weekly Observer*), or at twelve rupees per annum (not being a subscriber to the *Daily or Weekly Observer*).

Yours truly,

NEW AND OLD TROPICAL PRODUCTS.

From a recent Price Current of Messrs. Lewis & Peat of London, we transcribe a list of products from India, Africa and China, with the quality and quotations specified, in order to indicate the wide field offered in the requirements of the home market for the operations of the Tropical Planter. A considerable number of the articles named is not the subject of proper, systematic cultivation at all, and yet their quality and value could not fail to be improved by receiving the attention of the trained Agriculturist. The following table may therefore afford useful hints to planters on the look-out for new and profitable products to cultivate in their forest-land or open fields:—

IMPORTED FROM BOMBAY AND ZANZIBAR.	QUALITY.	QUOTATIONS. 1881.
ALOE, Socotrine and Hepatic	Good and fine dry... Common and middling part off...	£6 to £12 £3 10s to £5 10
BEES' WAX, white yellow	Good to fine	£5 10s to £7 10 £4 5s to £5 5s
CARDAMOMS— Alleppey Mangalore Malabar	Fair to fine clipped Bold, bright, fair to fine Good to fine plump, clipped	5s 3d to 6s 3d 7s to 8s 6s 9d to 8s 4s 6d to 6s 6d
CHILLIES, Zanzibar	Good to fine bright	100s to 105s
CLOVES, Zanzibar and Pemba	Ordinary and mid. Good & fine bright Ord. and mid dull	90s to 95s 1s 0d to 1s 1d 11d to 1s
MEBOR STEMS	Fair, usual dry fresh	2d to 2½d 3½d to 3½d
COCULUS INDICUS	Fair...	7s 6d to 8s 6d
COLOMBO ROOT	Good to fine Ord. & mid. wormy	30s to 35s 35s to 38s
EBONY WOOD	Fair to fine	£4 to £9
GALLS, Bussorah & Turkey	Fair to fine dark green white	55s to 70s 35s to 50s 10s to 45s
GUM AMMONIACUM	Small to fine clean black dark to good	90s to 45s 20s to 30s
ANIMI, washed	Picked fine pale in sorts, just yellow & mixed Bean & Pea size do. medium & dark bold scrapped	£17 to £21 £14 to £17 £8 to £13 £11 to £15 £7 to £10 10s

IMPORTED FROM BOMBAY AND ZANZIBAR.
(Continued.)

QUALITY. QUOTATIONS.

GUM ARABIC, picked...	Pale bold clean	50s to 62s 6d
	Yellowish & mixed	40s to 48s
	sorts ... Fair to fine	40s to 50s
ASSAFETIDA ...	Clean fair to fine...	50s to 80s
	Slightly stony & foul	15s to 35s
KINO ...	Fair to fine bright	£4 10s to £6
MYRRH, picked...	Fair to fine pale	£6 to £9
Aden sorts ...	Middling to good...	£4 to £6
OLIBANUM, drop	Fair to fine white	57s to 68s
	Mid. to good reddish	50s to 55s
	pickings... Mid. to good pale...	27s to 32s
	siftings ... Slightly foul to fine	20s to 24s
INDIA RUBBER ...	Mozambique, fair to fine sausage	2s 2d to 2s 4d
MYRABOLANES .	Good to fine pale	
	picked	10s to 12s
	Ord. to fair pt. burnt	6s to 9s
NUX VOMICA ...	Thin to fine plump	8s to 13s
ORCHELLA WEEB ...	Picked clean flatleaf	30s to 45s
	wiry Mozambique	55s to 70s
SAFFLOWER, Persian...	Ordinary to good	5s to 30s
SAPAN WOOD ...	Lean to good bold	£7 to £10
SANDAL WOOD Logs	Fair to fine flavour	£40 to £65
Chips...	...	£20 to £30
TURMERIC ...	Split bulbs	7s 6d to 9s
IMPORTED FROM CALCUTTA, CAPE GOOD HOPE.		
CASTOR OIL, 1sts ...	Nearly water white	3½d to 3½d
2nds ...	Fair and good pale	3½d to 3½d
3rds ...	Brown & brownish	3½d to 3½d
CUTCH ...	Good dark clean...	20s to 34s
GINGEE, Bengal, rough	Fair to good	19s to 20s
Scraped...	...	22s to 25s
INDIARUBBER	Calcutta	Good to fine
	Com. foul & mixed.	6d to 1s 6d
Rangoon	Fair to good clean...	1s 6d to 2s
Madagascar	Good to fine pinky and white	2s 3d to 2s 4½d
	Fair to good black	1s 1½d to 2s 1d
INDIGO, E.I. ..	Ord. to good ship- ping Bengal	5s 6d to 7s
	Ord. to good Oude	3s 6d to
LAC DYE, superior, DT		
T, AB, &c. ...	Superior ...	6d to 10d
Native and inferior, rejections ..	Common ...	4d to 2d

(Continued on page 71.)

(From April 1 to April 9.)

THE MADRAS GOVERNMENT AND THE CINCHONA BARK MARKET.

The Managing Director of the Scottish Trust and Loan Company of Ceylon deserves the thanks of our cinchona planters for coming forward in so timely and practical a manner to endeavour to stop what has become a serious and undoubtedly an improper interference on the part of the British Government with private enterprise:—

CINCHONA BARK FROM INDIA.

Scottish Trust Loan Company of Ceylon, Limited,
123 Bishopsgate St. Within,
London, March 2, 1881.

SIR,—As a matter of great interest to the planters of India and Ceylon, I beg to draw your attention to the following remarks:

The circumstances under which the Government of India commenced the cultivation of the cinchona plant are well known to all, and their success in obtaining a febrifuge for their army as well as for the population of India, is in the highest degree commendable.

They are now, however, far beyond this point, and whilst the planters of Ceylon, struggling against adverse seasons and a dire pest, which has seized their plantations, added to the competition of overwhelming slave-grown crops from Brazil, and adulterated concoctions here, are looking to the future of their cinchona plantations to aid them in their troubles, they find the Government of India, unfettered by want of capital, and the wide difference that lies between private parties and a mighty Government, sending such ever-increasing quantities of cinchona bark into the London market as fill them with anxiety for the future.

The steamer "Eldorado" just arrived has 196,000 lb. of Government bark on board as one shipment or 20,000 lb. in excess of the aggregate shipments from Ceylon for the current season.

If the Government of India is to compete in the English market with private enterprise, an unpleasant outlook for the Englishmen whose welfare depends upon their labour in the torrid zone—let both sides be equal—the Government of India paying a high price for their lands and labour, eight to ten per cent for their money, no assistance from Government Chemists and collectors and the multitudes of advantages which they can indirectly obtain from being the paramount power, and we shall then not feel ourselves over-matched.—Yours truly,

THOMAS DICKSON,
Managing Director.

Mr. Dickson intends to send a copy of the letter to the London papers, and he is anxious to follow up this protest by a memorial and deputation to the Secretary of State for India and the Colonies, provided the Ceylon planting and mercantile community take the necessary action. There can be no doubt that the case against the Madras Government—by far the worst offenders—is a very strong one, and we may expect in any movement of this time to find allies in unexpected quarters. It is not generally known that the Madras authorities, in shipping their bark to London, have entirely departed from the understanding which prevailed at the time the cinchona enterprise was commenced in the Nilgiris. The full intention of the Home Government was to produce bark in order to manufacture on the spot a febrifuge which would be available for the mass of the population. So soon as Mr. McIvor proved the

cultivation to be a success, an analytical and manufacturing chemist, Mr. Broughton, was sent to Madras, just as Mr. Wood was detached on a similar mission to Sikkim. Mr. Wood was encouraged in every possible way by the Bengal authorities, and the consequence was that he established a successful local manufacture, which continues under his successors, to absorb all but an insignificant proportion of the bark cut; while, in consequence of the bad treatment received by Mr. Broughton and his consequent disappearance, the Nilgiri bark has been regularly shipped to the London market to compete with the produce of private enterprise. At Sikkim they now manufacture 200 lb. of febrifuge weekly, absorbing nearly 300,000 lb. of bark per annum, while the Nilgiri crop of bark may be said to be all exported. Mr. Clements Markham has most consistently and urgently protested against the mistaken policy of the Madras Government, and Ceylon memorialists would find in him a strong supporter of their petition. From Mr. Markham's "Chinchona" book lately published we quote sufficiently to shew how strong a case he makes out against the practice which Mr. Dickson attacks:—

"No correct judgment could be formed of the financial result of the Nilgiris enterprise until the factory [Mr. Broughton's] was in full work, and turning out 800 pounds annually, or more. The ingredients, except acid and caustic soda, were obtained in the country, and their cost was small in comparison to the work done. But the outlay, as regards labor and many other items, is the same whether the out-turn is large or small, so that no reliable calculation could be made as to the real cost, until the factory was working up to its full power. Moreover, experience would have suggested improvements in the arrangements for pressing the bark, for preventing loss of alkaloids, and other details. Unfortunately this hopeful experiment, so fraught with benefit to the people of the Madras Presidency, was cut short prematurely, and before a fair trial had been made.

"A Committee was appointed by the Madras Government to report upon the financial result of the manufacture before any correct conclusion could be formed. In their report, dated November 28th, 1874, they submitted a calculation by which it was made to appear that the 'amorphous quinine' was produced at a loss. In the years 1872 and 1873, the quantity produced was 445 pounds. By arbitrarily charging the factory with £2,500 for the bark, and £583 for the cost of working, and interest on plant and buildings, they made out that the 445 lb. cost £3,083, and they placed its value at £1,500. By these figures they made out a loss of £1,583. Their calculations are misleading. It was quite premature to attempt any calculations at so early a stage. The legitimate profit from the sale of bark to pay off the capital charge would, in a few years, have secured a net result obviating all pretext for charging anything for the value of the bark against the factory, while the actual charges would have been lowered by improved arrangements, the results of experience. The capital charge, with interest, has now actually been paid off, and the only legitimate charge against a factory, is, therefore, the cost of cultivating the bark. The cost to the Government of producing one pound of bark, as proved by experience in Sikkim, ought not to be more than 5d; and the factory would as soon as it was in full work, have turned out one pound of the febrifuge at a cost of six shillings, as in Sikkim. So that the febrifuge could have been sold, at a profit, for less than 1 rupee per ounce. But the whole system of manufacture would eventually have

become more economical in proportion to the increased production; and Mr. Broughton had certainly made a most promising beginning of a useful work.

"The Committee's Report had a most disastrous effect. Mr. Broughton resigned his appointment, and left India in December 1874. His place has not been filled up. All attempts at producing a cheap febrifuge for the use of the people were at once put a stop to. The great objects of the enterprise were abandoned. The Nilgiri plantations have, especially since Mr. McIvor's death, been sadly mismanaged. The only object has been to obtain harvests of bark to sell at a profit in the London market, without regard to the renewal of gaps, and to keeping the plantations up to a proper standard. There has been undue destruction of valuable trees. I have reason to fear that there has been miserable waste and havoc, to secure large present results, without regard for the future.

"Yet the trees remain, though in diminished numbers, and flourish. The work can be taken up where it was unwisely dropped, at any time, when a future Government is better advised. The good work cannot be altogether undone. A scientific superintendent of the plantations, combining chemical knowledge, like Mr. Moens in Java, is urgently needed. There have been checks and disheartening delays. But the plantations are still safe. Sooner or later the broken continuity will be restored, work in the right direction will be resumed, and the great object of the enterprise will be finally secured here, as elsewhere.

"Meanwhile the whole interest of the experimental manufacture centres in the Sikkim plantations, where more enlightened views have prevailed during recent years, and where the true object of cinchona cultivation is understood and appreciated.

"After this, it only remains that those concerned—and particularly Ceylon planters—should begin an agitation in order to see a stop put to the present shipments of bark from the Government cinchona plantations on the Nilgiris at an early date.

The above was written on the receipt of Mr. Dickson's letter. Strange to say before it appears in print we receive information which almost supersedes the necessity for the complaint and protest. The *Madras Mail* of the 30th March, contains the following important intimation:—

"CINCHONA.—As a great deal of Cinchona is now being raised by private enterprise, the attention of Government has recently been directed as to what would be the best means of dealing with their own plantations, so that they may not compete with private enterprise. It has been decided to send the bark to England, not to be sold in the market, but for the manufacture of alkaloids for use in India. The work has been undertaken by a London chemist, who has had the good fortune of coming across, in the process of extraction of alkaloids, two other alkaloids which are cheaper, and just as efficient febrifuges as the quinine now used."

We cannot understand why, if all the bark is to be utilized (as it ought to be) for the medical department of the Indian Government, it should be thought necessary to get the febrifuge manufactured at home. Probably the Madras authorities are determined not to follow the example set in Bengal, and will plead that better manufacture with complete extraction of all the alkaloids will more than compensate for the cost of freight of bark. That is their look-out, however. We have no doubt eventually that local manufacture will be established on the Nilgiris as at Sikkim. Meantime all that our correspondent and the Ceylon

planters require is the assurance that no more bark from the Indian Government plantations will be sold in the open market.

COFFEE MARKET REPORTS.

The market reports received from London seem, in some respects, to read conflictingly. But between the estimates of Messrs. Rouse & Co. and Messrs. Rucker & Bencraft in respect of the coming Brazil crop, there is not much discrepancy. The difference in their estimates is not more than 100,000 bags. Although the next Rio crop is expected to be less by 900,000 cwt., yet it must be noted that in Santos coffee, the kind which is chiefly sent to Europe and competes with plantation, there is an anticipated increase of 600,000 cwt. The statistical return of Messrs. Rouse and Co. for the three chief coffee-producing countries is as follows:

BRAZIL.

Exported 1st July to 28th February.			
	1880-81.		1879-80.
	Tons.		Tons.
Rio to Europe	71,500	...	41,000
„ the States, &c.	98,500	...	90,500
Total	170,000	...	131,500
Santos to Europe	38,200	...	33,200
„ the States	10,000	...	8,300
Total from Santos ...	48,200	...	41,500

The Rio crop now coming forward is estimated at about 4 million bags (= 237,000 tons), and Santos 1½ million bags (= 74,000 tons). The Rio crop of 1881-2 is expected to be about 3½ million bags (= 193,000 tons), and Santos 1½ million bags (= 104,000 tons).

CEYLON.

Exported 1st October to 6th March.			
	1880-81.		1879-80.
	Tons.		Tons.
Plantation	11,200	...	16,100
Native	1,000	...	1,000
Total	12,200	...	17,100

The present crop will, it is stated, be only about 20,000 tons, or 13,000 tons less than the small crop of last season. Of Plantation East India the advices continue equally unfavourable.

JAVA.

THE GOVERNMENT CROP.

1880.	1879.	1878.
618,000 bags* ...	1,260,000 bags ...	826,300 bags
or	or	or
36,700 tons	74,800 tons ...	49,000 tons

* Latest official estimate.

Messrs. Rucker & Bencraft report under the same date, 10th March:—

"COFFEE.—Our surplus European stock on the 1st instant was 17,500 tons against 25,300 tons on the 1st of February. The stock itself has rather increased during the month, but in nothing like the same proportion that it did in February last year, hence the great improvement visible when the past and present year's stocks are compared together. Our readers will remember that last year the European stock ran from 84,700 tons on the 1st of March to 116,660 on the 1st of May, and that then for some months it remained about steady. It is hoped and believed that the improvement made in the relative position will be increased, and the more sanguine

ones affirm that before very long our surplus stock will disappear altogether. To put Coffee in Europe on a better foundation, it is necessary that not only should the surplus disappear, but that a very decided deficiency should be apparent, as it must ever be remembered, when comparing this year's statistical position with that of a year ago, that the stocks in May, June, July, and August last year were unhealthily large. As regards the current Ceylon crop many of our friends advise us that the total will be even less than is expected. There can be little doubt but that the smallest crop known for many years is now being shipped. It is therefore with great satisfaction that we note that the crop for next season promises to be a good one. The last Dutch sale was, say $\frac{1}{2}$ to 1 cent below valuations. Good ordinary fetched say $35\frac{1}{2}$ to $36\frac{1}{2}$ cents, or say $1\frac{1}{2}$ to 2 cents under the prices paid at the last sale. Such a low price has not been known for ten years. Stocks in Rio and Santos are fairly heavy, and the daily receipts in the former port are for the time of year unusually large. The estimates for the 1881-82 crops are about 3,200,000 bags from Rio, 1,500,000 bags from Santos, 200,000 bags from Nord, giving a total of 4,900,000 bags. The market on the spot is very quiet, and the auctions daily are in favour of buyers. Privately business recently has been of quite a retail character.

As of still greater interest to our planters, we give prominence to the monthly coffee report of Messrs. Robert von Glehn & Sons. This firm makes the probable deficiency in the coming, as compared with the last, Brazil crop equal to 1,200,000 cwt., and shews altogether a total deficiency of coffee crops in 1881-82 of 2,270,000 cwt. :-

"LONDON, March 7th, 1881.

Since the date of our last circular, prices of coffee have declined as follows :-

Middling Plantation in London from	
92/6 to 90/	say 3 per cent.
Good ordinary Jamaica in London	
from 56/ to 53/	6 per cent.
Rio Coffee in New York	13 cents to 12 cts. 8 "
Good ordinary Santos Coffee in Havre	
70 cents to 65 cts. 7	"
Haiti Coffee in Havre	67 " " 62 " 8 "
Santos Coffee in Hamburg	60 " " 57 " 5 "
Java Coffee in Holland	38 " " 36 " 5 "

The causes of this decline are not far to seek. Hopes had been confidently entertained that during the present half year the receipts of coffee at Rio and Santos would fall off, and that under the influence of small stocks in New York and reviving trade, the bulk of these reduced receipt would be taken for the United States Markets. These expectations have not been realized and during the last five week receipts of coffee have amounted at Rio to 14,950 bags per day, against 5,223 bags per day in February last year and against 13,650 bags per day during the last 6 months of 1880; at Santos to 4,450 bags per day against 800 bags per day in February and against 3,327 bags per day during the last 6 months of 1880; and moreover so far from the United States taking more, they have taken less than their usual share of the supplies of Brazil coffee, in consequence no doubt of the stringency of the New York money market, and the shipments to Europe have therefore increased in proportion, causing a temporary glut of this kind of coffee in the European markets. There have not been wanting, besides, the usual exaggerated reports of the future supplies which always accompany times of depression. Take as an example the letter signed "Common Sense" in the *Shipping and Commercial List of New York*, in which the writer predicts that "we shall enter upon the crop of 1882 with a surplus of over 3 million bags of Brazil coffee," and

states it as his opinion that the price of fair Rio in New York should fall to $10\frac{1}{2}$ cents before 1st July. We will not class with exaggerations such as this the opinion expressed by some of the Rio firms, that receipts will continue up to 30th June at an average of 15,000 bags per day, and we advance with some hesitation an opinion contrary to such authorities, but we do not believe the Rio receipts will continue on so large a scale, and we know that our opinion is shared by the most competent authority on this side of the Atlantic.

As regards the future of the Coffee market, we think there are unmistakeable signs that we are approaching the turning point. In the first place, present low prices are evidently everywhere stimulating consumption; witness the increase in the deliveries for the month of February.

From London 902 tons Plantation Coffee, against 504 tons in February, 1880.

From Holland 87,000 bags coffee against 64,000 bags in February 1880.

From Havre 85,799 bags coffee against 56,535 bags in February, 1880.

From Trieste 11,130 quintals against 9,150 in February 1880.

Secondly the large crops of 1880-81 are rapidly coming to an end, and our stocks in Europe show it is true an excess over last year of 20,000 tons, but the crops of 1881-82 do not promise to be anything like so abundant as those just coming to a close.

The following statement shews the difference between some of the principal crops of coffee just coming to a close, and the new crops :-

Crop 1880-81.	Estimated crop 1881-82.	Deficiency.
Rio ...4,570,000 bags	3,200,000 bags	--
Santos 1,356,000 "	1,700,000 "	--
Brazil...5,926,000 bags	4,900,000 bags	60,000 tons
Java ...1,259,960 piculs	618,000 piculs	38,000 "
Ceylon 31,000 tons	25,000 tons	6,000 "
Manila 90,000 piculs	70,000 piculs	1,250 "
EAST INDIA--		
Plantation 10,000 tons	4,000 tons	6,000 "
Native 7,000 "	5,000 "	2,000 "

Total 113,500 tons

Allowing for exaggerations and increase of production of coffee in some of the other countries of growth, from which returns are not so easily obtained, we contend that we have enough before us to show conclusively that the production of coffee has not outstripped the consumption of the world.

NEW GALWAY.—Some days ago I saw a note of yours in re "Tea from Uva," in which you said you thought the tea referred to would be the first shipment from Uva. The first shipment from Uva, I believe, was from this (New Galway) district. In the beginning of 1880 or late in 1879 New Cornwall sent some. Early in 1880 Warwick sent some to England. I also sent a packet to Ireland, and this year Warwick has sent some more. We have had a fine blossom out for the last few days, and some nice showers to set it. Cinchona same as last. Tea, a few trees dying out. No other new products. Can you suggest any that would pay at this elevation? Elk fearfully destructive to cinchona and grass. Elephants, a few seen now and again. There are some cheetahs in the neighbourhood. Occasionally we hear of a bullock or cow being killed. I caught a cheetah a short time ago, 7 feet 6 inches from tip of nose to tip of tail. Bug is gone on the hills and will nae come back again (I hope). Leaf disease, none to speak of. Grub, catch 'em if you can. Railway, a long time coming. General prospects, fair.

CEYLON AT THE MELBOURNE EXHIBITION.

COFFEE AND TEA AWARDS.

PROSPECTS OF CEYLON TEA IN THE MELBOURNE MARKETS.

Melbourne: March 14th, 1881.

DEAR MR. BRUCE,—When I telegraphed and then wrote to you the result of the jury awards respecting Ceylon coffee, as communicated to me, I could not doubt that ere the departure of the mail for which I am writing the full details would have been published, so that we might see how we compared with India, Fiji, &c. As yet, however, there is nothing made public regarding coffee or cinnamon. You in Colombo, therefore, will have known the awards for Ceylon coffee some three weeks before those awards are made public in Melbourne. I have heard the delay in publication attributed to the loss by a jurymen of some papers, but I am assured that no alteration is likely to be made in the awards as communicated to you. It is possible that in to-morrow's paper the coffee and cinnamon awards may appear, or at any rate in the *Argus* of the 16th, so as to enable me to see what the comparative position of Ceylon is as regards coffee.*

The proof of the tea awards having been brought to me for correction I was able to telegraph to you "Tea 36 awards, 11 being Firsts." I now forward a copy of the *Argus* of March 10th, in which the thirty-six awards are underscored. Enclosed you will find separate list of Ceylon awards and synopsis:

MELBOURNE INTERNATIONAL EXHIBITION, 1880-81.

TEA AWARDS.

Jury.—Messrs. D. Gibson, J. Everard, W. J. Cowderoy, A. Harvey, W. Pitt Brown, and E. S. Harley.

ORANGE AND FLOWERY PEKOES.

First Order of Merit, Ceylon.—Keir, Dundas & Co. Loolecondra Estate, Upper Hewaheta:

Do	do	do
Do	do	do
Do	do	do

The Ceylon Company (Limited), Koledenia Estate,

Third Order of Merit, Ceylon.—Keir, Dundas & Co., Loolecondra Estate, Upper Hewaheta; G. H. D. Elphinstone, Windsor Forest Estate; Mackwood & Co., Galbodde Estate; Keir, Dundas & Co., Loolecondra Estate, Upper Hewaheta.

PEKOES.

First Order of Merit, Ceylon.—Haldane and Anton, Calsay Estate, Dimbula; A. J. Stork, Blackstone Estate.

Third Order of Merit, Ceylon.—A. J. Stork, Blackstone Estate; P. R. Shand, Dunedin Estate; Mackwood & Co., Galbodde Estate.

PEKOE SOUCHONG.

First Order of Merit, Ceylon.—Keir, Dundas & Co., Loolecondra Estate.

Second Order of Merit, Ceylon.—P. R. Shand, Dunedin Estate.

Third Order of Merit, Ceylon.—Mackwood & Co., Galbodde Estate; G. & W. Leechman, Agrawatte Estate; Ceylon Company, Hope Estate; Ceylon Company, Sogama Estate; G. H. D. Elphinstone, Windsor Forest Estate.

SOUCHONG.

Second Order of Merit, Ceylon.—Keir, Dundas & Co., Loolecondra Estate, Upper Hewaheta.

Third Order of Merit, Ceylon.—Mackwood & Co., Galbodde Estate; G. & W. Leechman, Agrawatte Estate; G. H. D. Elphinstone, Windsor Forest Estate; Ceylon Company, Koledenia Estate.

BROKEN PEKOES.

First Order of Merit, Ceylon.—Keir, Dundas & Co., Loolecondra Estate; Ceylon Company, Sogama Estate.

Third Order of Merit, Ceylon.—Mackwoods & Co., Galbodde Estate; C. S. Armstrong, Rookwood Estate, Deltota; Mackwood & Co., Galbodde Estate.

CONGOU.

Third Order of Merit, Ceylon.—J. A. Smith, Lomay Estate; Keir, Dundas & Co., Loolecondra Estate.

MIXED TEAS.

Third Order of Merit, Ceylon.—T. C. Owen, Oonoona-gala Estate.

BLENDING AND PACKING.

Second Order of Merit, Melbourne.—Ceylon and Foochow Company.

COLLECTIVE EXHIBITS.

First Order of Merit, Ceylon.—Keir, Dundas & Co., Loolecondra Estate, Upper Hewaheta.

Second Order of Merit, Ceylon.—Mackwood & Co., Galbodde Estate.

India takes 35 First Orders of Merit, Ceylon 11, Japan 1, Melbourne 1 (blending and packing).

India takes 77 Second Order of Merit, Ceylon 3, Japan 2, Melbourne 1 (blending and packing).

India takes 104 Third Order of Merit, Ceylon 22, Japan 14.

India exhibits 339 samples, 216 awards; Ceylon 78 samples, 36 awards; Straits Settlements 1 sample; Japan 35 samples, 16 awards; Melbourne and China 54 samples, 2 awards.

COFFEE.

Jury.—E. S. Harley, W. P. Brown, M. Benies, J. Huthens, R. W. Wilson.

FIRST ORDER OF MERIT.—Ellembellary Estate, Madras; Cootamundra Estate, Madras; Hillgrove Estate, Madras; Nedembally Estate, Madras; Seaforth Estate, Madras; Glenvan's Estate, Madras; Inglewood Estate, Madras; Stanes and Co. Estate, Madras; Balmadies Estate, Madras; J. T. Baker, Yakkabendakelle Estate, Ceylon; Lee, Hedges, & Co., Ceylon; Colombo Commercial Company, Ceylon; Whittall & Co., Ceylon; Mackwood & Co., Ceylon; Loolecondra Estate, Ceylon; Courthope, Bosanquet & Co., Ceylon.

SECOND ORDER OF MERIT.—Waverley Estate, Madras; Hallacarey Estate, Madras; Chowdikadu Estate, Madras; Eliza Estate, Madras.

THIRD ORDER OF MERIT.—Sussex Estate, Madras; Goatfel Estate, Madras; Thottullgalla Estate, Ceylon; Delmege, Reid, & Co., Ceylon; Langdale Estate, Ceylon; Kintyre Estate, Ceylon; Tillicoultry Estate, Ceylon; Armitage Bros., Ceylon.

PURE PLANTATION GROUND COFFEE.

FIRST ORDER OF MERIT.—R. Harper, Melbourne; Parson Bros, Melbourne; J. F. M'Kenzie and Co.; Gregg and Co., New Zealand.

ESSENCE OF COFFEE.

FIRST ORDER OF MERIT.—Dunn and Hewett, London; A. Elder, Edinburgh; E. Delacre, Brussels.

ROASTED COFFEE.

FIRST ORDER OF MERIT.—Parsons Bros., Melbourne (Ceylon Plantation, Peaberry, Jamaica, and Java.)

SECOND ORDER OF MERIT.—J. F. M'Kenzie and Co., Melbourne (Ceylon plantation); R. Harper, Melbourne (plantation and peaberry).

CORAL AND SHELLS.

HON. MENTION.—Ceylon Government, coral and shells.

* 15th March. The coffee awards are in to-day's *Argus*.

MINERALS, ROCKS, AND FOSSILS.

Jury.—O. R. Rule (chairman), George Foord, H. Y. L. Brown, Jas. G. A. Stitt, and R. H. Bland; Norman Taylor, expert.

Second Order of Merit.—W. A. Fernando, Ceylon, plumbago.

Third Order of Merit.—Delmege, Reid and Co., Ceylon, plumbago; Armitage Brothers, Ceylon, plumbago; A. C. Dixon, B. Sc., F.C.S., Ceylon, collection of rocks, minerals, gems, &c.

Fourth Order of Merit.—A. M. & J. Ferguson, Ceylon, plumbago, enclosing quartz, showing what care must be taken to separate foreign matter.

CHEMICAL AND PHARMACEUTICAL PREPARATIONS.

Jury.—C. R. Blackett (chairman), M. Galloy, H. Brind, P. R. Challen, Sydney Gibbons, W. Johnson, J. Kruse, J. Robertson, S. H. Roberts, J. G. A. Stitt, R. G. Wilson, Dr. Renzio, and Baron von Mueller; expert, Geo. Manley Hopwood.

MEDICINAL OILS.

Third Order of Merit.—D. A. T. Dessanaika, Ceylon, medicinal oils.

MEDICINAL BARKS, &c.

First Order of Merit.—Botanic Gardens, Calcutta, collection of cinchona barks; Government of Madras, Madras, cinchona bark, jalap, &c.

Second Order of Merit.—E. H. Cameron, Ceylon, cinchona barks; Lee, Hedges and Co., Ceylon, cinchona bark; Mackwood and Co., Ceylon, cinchona bark; T. C. Owen, cinchona barks.

Third Order of Merit.—Botanic Gardens, Brisbane, collection of medicinal and other barks.

VEGETABLE SUBSTANCES USED IN TANNING AND DYEING.

Honourable Mention.—Dissanaika, Ceylon, tanning barks.

SYNOPSIS OF CEYLON TEA AWARDS.

T. C. Owen...	1	3rd	award
G. H. D. Elphinstone...	3	3rd	"
C. S. Armstrong...	1	3rd	"
Keir, Dundas & Co.	6	1st	" } And 1st award
do	2	2nd	" } for collective ex-
do	3	3rd	" } hibits.
Haldane and Anton	1	1st	"
Ceylon Co., Koladenia	1	1st	"
do	1	3rd	"
do Hope	1	3rd	"
do Sogama	1	1st	"
do	1	3rd	"
Mackwood & Co.	6	3rd	"
A. J. Stork	1	1st	" } And 2nd award
do	1	3rd	" } for collective ex-
P. R. Shand...	1	2nd	" } hibits.
do	1	3rd	"
G. & W. Leechman	23	3rd	"
J. A. Smith...	1	3rd	"

SUMMARY.

10	1st awards.
2	2nd "
22	3rd "
1	1st " for general collection.
1	2nd " do

In all 36 awards.

From the latter it will be observed that, out of the 36 awards, the teas exhibited by Messrs. Keir, Dundas & Co. obtained 11 (including the collective award) or very nearly one-third of the whole. Of the 6 First Class awards gained by this firm, 4 were for special teas classed as "orange and flowery pekoes." They also, of all the exhibitors from Ceylon, obtained the only First Class award for what I suppose I am

right in regarding as our staple tea:—pekoe-souchong. For souchong they obtained a Second Class award, and, for broken pekoe a First. Besides their four First Class awards for the special or fancy teas, orange and flowery pekoe, Messrs. Keir, Dundas & Co. obtained two Third class awards for the same class of teas. A Third Class award for congou makes up 10 direct awards, to which must be added an additional or collective award for general excellence. With 11 awards in all, of which 7 are First Class, Messrs. Keir, Dundas & Co. take first rank not only amongst Ceylon exhibitors but also in comparison with India and all comers. This must be gratifying to those immediately interested, especially to him who may be regarded as almost the pioneer of tea growing and tea manufacture in Ceylon,—Mr. James Taylor.

Next in order to Messrs. Keir, Dundas & Co., tested by number of awards, come Messrs. Mackwood & Co., who received 6 Third Class awards and a collective award for general excellence, or 7 in all. One of the awards for orange and flowery pekoe, one for pekoe-souchong, one for souchong, and two for broken pekoe. To these 6 Third Class awards is added a Second Class award for general excellence. If any person is inclined to undervalue Third Class awards, I may say that one of the jurymen told me that the standard of marks set up was so high that admittance to the Third Class involved a very severe ordeal. Following Messrs. Keir, Dundas & Co. and Messrs. Mackwood & Co. in number of awards comes the Ceylon Company (Limited) with five awards. Of these two are First Class: one for orange and flowery pekoe and one for broken pekoe. Two Third Class are for pekoe-souchong, and one Third Class for souchong.

Fourth on the list as regards number of awards comes Mr. G. H. D. Elphinstone with three Third Class awards. One was for orange and flowery pekoe, one for pekoe-souchong, and one for souchong. I hope this result will not be disappointing to Mr. Elphinstone and to the practised Indian planter who superintends the manufacture of his teas. With reference to the whole of the awards the composition of the jury must be kept in view and the tendency in Melbourne to judge teas largely by outward appearance. One jurymen said to me, not with reference to Mr. Elphinstone's teas, but as accounting for the number and class of awards for Ceylon teas generally, that some of the teas were "out of condition." As the teas were in good order when tested by Messrs. Moody and Sibthorp, any change for the worse, if it has occurred, must be attributed to delay and exposure, the result of Mr. Everard's pig-headed obstinacy in so long resisting the presence of Mr. Brown. Had I known at the first all I know now, I should have protested against the appointment of Mr. Everard as juror and especially against the samples being taken to his office and lying there during the long delay which his obstructive action involved. Mr. Sibthorp, in the official letter in which he requested the executive to add Mr. Brown to the jury on tea (of which Mr. Everard was really chairman, Mr. Gibson being chairman of the general jury which took in tea, coffee, &c.) stated distinctly that Mr. Everard could be objected to as agent for Japan tea, and that the objection would only be waived if Mr. Brown's presence was allowed. Mr. Brown was then allowed to act. I have nothing to say against Messrs. Cowderoy, Harvey, and Hurley, except that they are naturally swayed by the traditions of the Melbourne tea market. This person wasted the time of the jury at one sitting for an hour by personal abuse of me, and he has favoured me with a characteristic letter, because of my efforts to get justice done to Ceylon. I have not replied to Mr. Everard, and I only mention him and his animus now, to say that, considering all the circumstances of the case, we have only reason for surprise that the jury

awards for Ceylon tea are so favourable as they stand. Of course the previous verdicts of tea-tasters and analysts will not be forgotten.

Next to Mr. Elphinstone comes Mr. A. J. Stork with two awards, one of which is First Class for pekoe and one Third Class for the same kind of tea. They evidently know how to prepare fine tea on Blackstone estate.

Messrs. Leechman & Co. are the recipients of two Third class awards, one for pekoe-souchong, and one for souchong, regarding which my remarks already made as to the standard insisted on should be noted.

Windsor Forest, Gallebodde, Agrawala, and Blackstone, are all situated in the old and rainy districts of Dolosbage and Ambagamuwa.

Mr. P. R. Shand received two awards, one of which was Second Class for pekoe-souchong, and one Third for pekoe.

The other Ceylon exhibitors on the list obtained each one award, that against the name of Calsay estate in Dimbula (Messrs. Haldane and Anton) being First Class for pekoe.

Mr. C. S. Armstrong obtained a Third order of merit for broken pekoe. This gentleman must have learned the secret of having made the kind of tea which pleases the eye of the typical Melbourne broker, for I heard but one chorus of admiration of the appearance and especially the *packing* of a consignment of Rookwood tea sold on the 8th of this month by Greig & Murray. The verdict was that the packing was greatly superior to Indian. Whether the prices will satisfy Mr. Armstrong's expectations, I do not know, but they are considered good with reference to the present state of the market. I believe the bulk was purchased by Mr. Walker a dealer who has laid himself out to sell Indian and Ceylon tea. He most strongly believes in the superior quality of the latter. He has asked permission to distribute specimens in the Ceylon Court, permission which of course, I shall be only too happy to grant. I enclose the leaf of the catalogue in which the Rookwood teas are described and the prices at which they sold are noted.

SALE OF CEYLON TMA.

Under instructions from the Importers. Ex R.M. Steamer, from Ceylon, Season 1880-81.—Rookwood:

44 quarter-chests Ceylon pekoe souchong 20 lb., blackish well made wiry leaf, very brisk strong rich malty flavor 1/1½.

40 quarter-chests Ceylon pekoe souchong 20 lb., even twisted blackish even leaf, strong ripe rich malty pekoe flavor 1/1½.

20 half-chests Ceylon broken pekoe 44 lb., handsome small very even leaf pekoe tips, rich and full ripe brisk pekoe flavor 1/3½.

7 quarter-chests Ceylon broken pekoe 25 lb., small even handsome wiry leaf pekoe tips, rich full strong and pungent pekoe flavor 1/5.

6 half-chests Ceylon broken tea 21 lb., fairly twisted brownish black leaf, strong brisk full flavory 1/2.

44 quarter-chests Ceylon pekoe 21 lb., wiry small handsome pekoe leaf, choice full ripe strong malty pekoe 1/6.

12 half-chests Ceylon fannings 44 lb., small even reddish brown open broken leaf, pungent strong brisk flavory 9/3.

On the 1st of this month occurred a sale of Ceylon tea by no means so encouraging:—

61 half-chests of pekoe-souchong sold at 1s 1d per lb.
19 " souchong 11d "
1 " congou 7d "

Mr. Moody shewed me a specimen of the tea which realized only 7d and he predicted a low price. The leaves resembled beans with loose tissue. I said: 'It is very hard: that tea is made from good Assam hybrid, the flush of which is large. The liquor is probably good.' The reply was: "No matter: tea of

this appearance will not suit this market." I have little doubt the tea will be sold at a large profit by the cutters and mixers.

Mr. J. A. Smith of Lonmay estate, it will be seen, obtained a Third award for congou.

Mr. T. C. Owen obtained a similar award for what the jurors have classed as "mixed teas." Whether Mr. Owen's tea was really a mixture of different teas, or merely a "one kind" tea, I do not know, but one day it was remarked to me:—"The more teas are mixed the better. If several teas, each of which may have an objectionable flavour, are blended, the result is a tea which takes greatly with consumers." It has, therefore, been recommended that persons or firms in Ceylon should lay themselves out to purchase and mix high and low grown teas and teas of different flavours and qualities. One of the brokers controverted this view and said the mixing could be much better done here. But the motive for this opinion is obvious and I agree with Mr. Moody. I have no doubt some of our merchants will soon try the experiment of buying and blending teas. Brokers and dealers in London and Melbourne may offer objections, but the taste of the consumers must rule in the end. As tea grows in Ceylon from sea-level to 7,000 feet, there must be large scope for a judicious mixing of the delicate mountain teas with the ranker produce of lower levels.

The general result is that for 78 exhibits of tea Ceylon has received 36 awards, or not far short of 50 per cent. Of the awards 11 were First Class, including 1 collective award; 3 were Second Class, including 1 collective award; while 22 were Third Class. Of course the fact will be noticed that the majority of the awards are Third Class, but that still means, according to a member of the jury, a high order of merit in the tea. Considering that tea manufacture has been carried on in India for well nigh half a century, while our enterprise, as a serious matter, does not date back more than a fifth of that period, and considering also that on this occasion India from the Brahmputra to Cape Comorin, sent the best specimens of her produce, I think we ought to be if not contented yet encouraged by our "good second" position.

India sent no fewer than 339 samples of her best teas to the Exhibition and the awards were 216, in the proportions of First Order of Merit 35

Second	"	77
Third	"	104

For First Class awards in proportion to total samples, Ceylon is considerably ahead for India:—one-seventh against less than one-tenth. In Second Class awards India scores victor. In the proportion of Third Class awards to total exhibits, the two countries are about equal. Ceylon, therefore, considering her comparative youth, has come in a *very* good second to India.

The total exhibits of tea you will see, was 507, China not being directly represented at this Exhibition. Japan is and very efficiently by my good friend Mr. Tokio. Japan tea ("Oolong") seems to be as much appreciated in Melbourne as in the United States, judging by the awards, which are in the proportion of 16 to 35 exhibits. But of the awards only one was First Class and one Second, while 13 were Third Class.

The China teas were, I believe, shewn by Mr. Gladstone of the Oriental Tea Company, which Company obtained First and Second Class awards for "blending and packing." The unmixed China teas ("pure and simple") seem to have been shut out because not exhibited by any one directly connected with China. Mr. Gladstone is to protest, and I do not see why his protest should not be successful. If so, according to his information, five of the China teas will be classed for first awards. * You will see that Melbourne blended

*15th March: See remarks in to-day's *Argus*.

teas and China teas numbered together 54 samples. The Straits sent one sample which does not seem to have obtained an award. Java did not shew. At the next World's Show all the world's teas and especially those of the mother country of tea, China, ought to be exhibited. The Straits, Fiji, and the tropical regions of Australia, are sure to compete, but what with soil, climate and labour supply (this above and beyond all), it will go hard if India and Ceylon do not hold to the high rank they have attained.

A considerable proportion of the Ceylon teas which have received awards are high-grown, in Upper Hewaheta, Dimbula, Pussellawa, &c. In looking over the Indian list of awards the proportion of high-grown teas, in Darjeeling, the Nilgiris, Kangra Valley, Kumaon, &c., is still more striking. Of the eight teas from India which obtained First Class awards for orange and flowery pekoe, four were Darjeeling teas and one a Nilgiri tea. Of the collective First Class orders of merit, only one was given for low-grown Assam and Sylhet teas, while high-grown tea obtained three: two Darjeeling and one Ceylon.

While, therefore, plenty of good tea can be produced at low elevations, the result of these Melbourne Exhibition awards ought to afford encouragement to those who possess tea estates at such high elevations as those around Darjeeling and Ootacamund in India, and Nuwara Eliya in Ceylon. The Calsay pekoe which gained a first order of merit was grown at an elevation of about 7,000 feet. Mr. Elphinstone, with tea culture extending from sea level to nearly 7,000 feet on Oliphant, ought to be able to send perfect mixed and blended teas into the markets of the world. And so with others in Ceylon, for whose tea enterprise there is I believe, a great future.

But tea from the same estate and prepared under the same superintendence is far more capricious than coffee. Climatic changes have much to do with this, as tea is specially sensitive to atmospheric influences. But, following the case of Java with its rich volcanic soil, the question arises whether the sudden fall in value of tea from the Terai and Dooras estates in India may not be owing to the same cause: a deficiency of iron in the soil? Iron is not a fertilizing substance, but the ferruginous clays of Dimbula &c., which are fatal to cinchonas, seem to suit tea well: better than soils which are apparently richer, finer and deeper. I suspect Col. Money's preference for rich-soiled low insalubrious places for tea cultivation is liable to large qualification. I hope the Ceylon press will publish the whole of the Indian awards, so that tea growers may be able to test the correctness or otherwise of the inferences I have drawn, as well as to learn lessons which do not present themselves to me at present. Through the courtesy of Mr. Moody, of Messrs. James Henty & Co., I am able to forward several copies of the pamphlet in which he has embodied in a clear and convenient form the whole of the tea awards. [Distributed as far as possible to Tea exhibitors.]

The "Ceylon and Foochow Company, Melbourne," which figures for second order of merit under "Blending and Packing," is, I understand, Messrs. Mackenzie & Co. under another title. That title clearly indicates that our fine Ceylon teas are used to improve those obtained from China, and the compliment ought to be appreciated by Ceylon tea growers. In truth, the result of the Exhibition awards but faintly indicates the growing favour with which Ceylon tea is now regarded. Of course there are dissentient voices,—some interested and prejudiced and others of honest people whose tastes require to be educated in a right direction. Most sincerely do I trust that this Melbourne International Exhibition and my own efforts in connection with it may result in securing a ready and profitable market for Ceylon teas amongst the specially tea-drinking colonists of these great and advancing lands of the South. Com-

merce is progressive, but some of its branches are stringently conservative. Of this we have had strong proof in the recent refusal of brokers and dealers to bid for the Syndicate Indian teas at Sydney and Adelaide. But this kind of passive resistance to change for the better will ultimately give way before the efforts of men like Mr. Moody of the firm of Messrs. James Henty & Co., of Melbourne. I have before me as I write a catalogue of a sale which Messrs. Greig & Murray are to hold on the 18th, "under instructions from Messrs. James Henty & Co., Agents for the Calcutta Tea Syndicate in connection with the Government of India, and R. A. Sibthorp, Esq., Commissioner." This catalogue includes 3,026 half-chests of the teas of Season 1880-81, "from the celebrated districts of Assam, Cachar, Darjeeling, Chittagong and Kangra Valley." The collection is so large and so well assorted with reference to this market, that I feel confident the teas will go off with good competition. There are lots to suit small as well as large dealers. For instance 5 quarter chests Assam pekoe of 20 lb. each; 5 similar packages of pekoe souchong; 20 half chests of Cachar orange pekoe of 50 lb. each; 39 chests of Cachar broken pekoe of 96 lb. each; 15 half chests Cachar pekoe of 45 lb. each; but the great bulk of the teas are in those 38 lb. packages which Mr. Moody so strongly recommended as the most suitable for this market. The lots of such half-chests run from 20 to 60. This sale of exclusively Indian teas will rival in quantity the great sale of Foochow teas which took place a few days ago. Much of that tea was of very low quality, while the Indian teas, presented in quantity never before paralleled in Australia, are all pure and good. At twice the cost of the low quality Foochows they will be comparatively cheap, looking at the quantity and nature of the extract they yield. That good teas can be obtained from China, I have repeatedly admitted; but there can be no doubt that the bulk of the Foochow teas (especially this season) are inferior and rubbishy. In buying Indian and Ceylon teas, the Australians will have guarantees involved in the fact that the producers and manufacturers are their own countrymen, honest and reliable. Even if slowly at first, therefore, yet none the less surely will the rapidly increasing population of Australia take the bulk of their teas as they now do their coffees from India and Ceylon. In this and in other directions, the bonds of union will be drawn closer between the great colonies of the south and Britain's widespread eastern possessions.

15th March.—Coffee having been mentioned above, I may now say that the coffee awards have, at length, appeared in this morning's *Argus*. Considering the efforts made by the planters of Southern India to send numerous and carefully prepared specimens of their very best produce to this Exhibition, I am not surprised to see "Madras" leading, with 9 First Orders of Merit against 7 awarded to Ceylon. Madras estates get, in addition, 4 Second Class awards, against none of that class for Ceylon. Madras figures for two Third Class awards, and Ceylon for 6. I take it for granted the Ceylon press will republish the whole of the coffee awards from the *Argus*, including those given to Melbourne dealers for Ceylon plantation coffee, which, when counted, tend to more nearly equalize the positions of Ceylon and India. On what principle the coffees exhibited by Messrs. Delmege, Reid & Co. and Messrs. Armitage & Co. were ranked Third Class, I cannot say. I only know that in a letter addressed to me by Messrs. Delmege, Reid & Co. they stated that the produce of Langdale, Kintyre and Tillicoultry estates, which they got ordered out from London for the purpose of this Exhibition, sold in Mincing Lane at 112s per cwt. Taking the awards as I find them, it appears that Southern Indian coffees obtained of

First Class awards	9
Second „ „	4
Third „ „	2

Total ... 15

This was out of a much larger number of total exhibits than Ceylon sent. For her more limited number of exhibits, Ceylon obtained

First Class awards	7
Third „ „	6

Total ... 13

Over and above this number of awards, Ceylon can claim the principal credit for the coffees which obtained awards as follows:—

“PURE PLANTATION GROUND COFFEE.

FIRST ORDER OF MERIT.—R. Harper, Melbourne; Parsons Brothers, Melbourne; J. F. Mackenzie & Co., Melbourne; and Gregg & Co., New Zealand.”

Largely, if not exclusively, the coffee for which the above awards was given was plantation Ceylon,

Then we get:—

“ROASTED COFFEE.

FIRST ORDER OF MERIT.—Parsons Brothers, Melbourne (Ceylon plantation, peaberry, Jamaica and Java).

SECOND ORDER OF MERIT.—J. F. Mackenzie & Co., Melbourne (Ceylon plantation) R. Harper, Melbourne; (Plantation and peaberry.)”

Ceylon ought to get credit for the vast majority of the above awards given to the leading Melbourne importers of and dealers in coffee; and it is more than probable that from Ceylon coffee was obtained the

“ESSENCE OF COFFEE,”

for which awards were given, thus:—

“FIRST ORDER OF MERIT.—Dunn & Hewett, London; A. Elder, Edinburgh; and E. Delacre, Brussels.”

As Fiji is not mentioned in the list of awards in the *Argus*, I cannot help thinking the list is incomplete, I certainly understood that at least one First Class award was given for Fiji coffee. Before the 22nd, the day on which the Marquis of Normanby is formally to deliver the awards, complete lists will, no doubt, be available. Meantime, I copy the Ceylon awards as they appear in to-day's *Argus*:—

FIRST ORDER OF MERIT.—John F. Baker, Polwatte mills (coffee of Yakkabendekelle estate); Lee, Hedges & Co.; Colombo Commercial Company; Whittall & Co., Mackwood & Co.; Loolcondara; and Courthope, Bosanquet & Co.

There are thus seven First Class awards, instead of six as I was led to telegraph. Loolcondara estate does not seem to have been included in the list furnished to me originally. It is well to have a correction to make on the favourable side. To continue copying the Ceylon awards:—

THIRD ORDER OF MERIT.—Thotulagala estate; Delmege, Reid & Co.; Langdale estate; Kintyre estate; Tillicoultry estate; and Armitage Brothers.

As Mr. Harley, who, in effect, judged the coffee, was also judge of the cinnamon, I expected the awards for each to be published simultaneously. But as nothing is said of our old staple bark, I turn to our new. I told Mr. Blackett* that I was disappointed to get only Second Class awards for our Ceylon cinchona bark, but he assured me that the quantity as well as the quality of the Indian barks left no other result possible. The awards for Medical Barks appeared in the *Argus* of the 8th, with the result that India obtained two FIRST ORDERS OF MERIT, thus:—

Botanic Gardens, Calcutta, collection of cinchona barks.

Govt. of Madras, Madras, cinchona bark, jalap, &c.

* Chairman of the Pharmaceutical Jury.

SECOND ORDER OF MERIT:—

E. H. Cameron, Ceylon. cinchona bark.

Lee, Hedges & Co., do.

Mackwood & Co., do.

T. C. Owen, do.

You will thus see that all the cinchona barks exhibited in the Ceylon Court obtained Second Class awards, being ranked second only to the fine and extensive exhibits from British Sikhim and the Nilgiris.

In the same paper you will see the awards for minerals, rocks and fossils. I regret that a First Class award was not given to Mr. Fernando, and I have written to this effect, attracting special attention to the enormous block of pure plumbago exhibited by him. As matters stand the awards to Ceylon exhibits in this class are:

SECOND ORDER OF MERIT:—

W. A. Fernando, Ceylon plumbago.

THIRD ORDER OF MERIT:—

Delmege, Reid & Co., plumbago.

Armitage Brothers, do.

A. C. Dixon, B. Sc., F. C. S., collection of rocks, minerals, gems, &c.

FOURTH ORDER OF MERIT:—

A. M. & J. Ferguson, plumbago enclosing quartz, shewing what care must be taken to separate foreign matter.

I am sorry to see exhibits in the Third Class which I hoped to see higher up, but I suppose our Ceylon plumbago was compared not with any exhibits of the same mineral but with the large, complete and valuable collections of more precious minerals in the Exhibition. I need scarcely say that I did not expect any award for the piece of plumbago enclosing quartz. Mrs. Guille used the language, when shewing the specimen, which the jury adopted. I feel that Mr. Dixon's collection of Ceylon rocks and minerals deserved recognition in a higher class, but we cannot get all as we could wish. For medicinal oils you will see that Dassenaikie Mudaliyar obtained Third Order of Merit, and also “honourable mention” for tanning barks. The Government of Ceylon also received “honourable mention” for an exhibit of hal resin.

In the *Argus* of the 10th, in addition to the tea awards, you will find a Fourth Order of Merit awarded to the Ceylon Government for printing; while “special collections of books” are “commended,” thus:—

Government Agent, Kandy, Ceylon, styles and books.

A. M. & J. Ferguson, „ printed books.

Rev. C. Alwis, „ printed book.

For walking-sticks there seems to have been no First Class award. Wijeynarayane, of Ceylon, therefore comes first with a Second Order of Merit.

In the Melbourne *Argus* of the 12th are the Fine Arts awards, with reference to which I may say that I could not obtain recognition of the plumbago elephants sent by Messrs. Fernando, Delmege, Reid & Co., and Armitage Brothers, as sculptures. As a yellow primrose was nothing more than a yellow primrose in the eyes of Peter Bell, so the model of an elephant in our Ceylon carboniferous mineral was merely “black lead” to the Melbourne jurors. And the Melbourne exhibits from Ceylon did not include any pictures except the Kandian specimens of scenes from Hindu mythology. Our photographs atoned for all. In that branch of the Fine Arts, however, represented by “general furniture” you will see under SECOND ORDER OF MERIT:—

D. F. de Silva, Ceylon, carved ebony stand and brackets.

A mistake has been made here, which I have brought to the notice of Mr. Newberry with the repeated expression of my hope that the elaborately carved ebony couches may receive the recognition they deserve. The carved ebony chairs exhibited by

Dou Andris of Galle have secured a Third Order of Merit, while Mr. Sumps' rattan lounging chair and tea-poy are awarded the Fourth Order of Merit.

In the *Argus* of the 14th you will see that Mr. Kyle's exhibit of Breakwater concrete receives honourable mention. I drew special attention to his plan of and report on the breakwater, which, as I wrote long ago, I submitted to Sir Wm. Jervois, &c.

Under "Building Stones," honourable mention is made of "Graves, Cotton & Co., Ceylon." This is a mistake which I must get adjusted. I suppose that really honourable mention has been awarded to the breccia or cabook, or both, sent from Ceylon.

In the *Argus* of to-day (15th) you will find in addition to the coffee awards "honourable mention" made of the Ceylon Government for an exhibit of "coral and shells." The Fiji Court opposite us has, in addition to lovely shells, a most exquisite collection of corals. But the only exhibit in the nature of coral which stands in the Ceylon Court is the so-called "black coral" sent by an Italian who believes that the true red coral exists in deep water off Ceylon! I must see whether a mistake has not again been made.

I see that "honourable mention" has been made of the collection of African elephants' tusks made by Mr. Chirnside and Mr. Adams. The latter I met at their really grand exhibit case a few days ago and had a long talk with him about the African elephants and their wealth of ivory. He told me that the mounting of the truly magnificent tusks cost many hundreds of pounds, and I can well believe it. The beautifully white ivory is rich with gold carving, and two tusks form the frame of a unique mirror. There is one tusk which a powerful man would soon tire of carrying. Our poor yellow tusks compare unfavourably with this superb trophy of ivory, but I think "honourable mention" ought to be awarded to Mr. Templer's elephants' skulls. I have written to that effect.

I have spent the best part of two days going over, copying and commenting on the numerous and on the whole gratifying awards received by exhibits in the Ceylon Court and published during the fortnight, since last mail left. To-morrow morning, it is probable, the cinnamon awards will be published, so as to enable me to indicate their nature, and then little more can be expected. As matters stand, our comparatively limited collection in the Ceylon Court has received, I believe, not less than 120 awards, and a very fair proportion of these are First Class. I have considered it only honest to put up *all* the awards, low as well as high, and Sir Herbert Sandford said he wished others acted on the same principle. With the array of award cards, of a good size and printed in colours, the effect of the Court is quite striking, and before we commence to dismantle I may, perhaps, decide on having one more photograph taken. I feel pretty certain that no Court of its size in the Exhibition has secured so many awards, and few Courts of any size. Mr. Dawson has been always ready to give information to visitors and jurors, and Mrs. Guille since she joined the Court as caretaker has done excellent service, not only in arranging and keeping everything nice but also in giving information to visitors and jurors, her knowledge of French and German being particularly acceptable to the numerous foreigners at the Exhibition. I have felt that very frequently I could be of more use to Ceylon out of the Court than in it, and it is only just that I should acknowledge my obligations to the Assistant Commissioner and to Mrs. Guille.

Through some mistake on the part of Mr. Caire I have not yet received the additional sets of photographs you asked for, but I hope to send all by next steamer.

Trusting that the intelligence respecting awards, &c., will be acceptable to the Committee, as well as to the Government and people of Ceylon, believe me, yours truly,

A. M. FERGUSON

AWARDS FOR COFFEE, TEA, AND CINNAMON.

Melbourne, 16th March 1881.

DEAR MR. BRUCE,—In this morning's *Age* appears the report of the sub-jury on tea which I enclose. As regards sample 528 the probability is that it was lost by the breakage of the bottle in transit from Mr. Newberry's office to Mr. Everard's. The fact that special attention was drawn to this sample—Mr. Taylor's underfermented tea—shews that it was dispatched from the Ceylon Court and its disappearance probably deprives Mr. Taylor, Messrs. Keir, Dundas & Co., and Ceylon, of an additional First Class award. I have consulted Mr. Moody about sending in a further sample of what remains of this tea, but he thinks it better, in view of all circumstances, not to move further in the matter. You will see what the jury say about teas getting out of condition, and no doubt the tea exhibits have suffered materially by delay, first in the appointment of a jury and then in the conduct of the major part of the sub-jury under the influence of one of their members. You will see that the number of samples of teas submitted to the jury was really 823, the largest number, I suppose, ever shewn at any Exhibition. Notwithstanding delay, exposure and their consequences, I think the position attained by Ceylon is most encouraging. Of the fine quality of our teas there can be no doubt. The great point is *care in preparation*.

With reference to the shifting of the coffees exhibited by Messrs. Delmege, Reid & Co. and Messrs. Armitage Brothers from the second to the third class since the original memorandum was furnished to me, enquiry will be made. I have reason to believe, however, that class was decided by size of bean. The coffees in question were good in colour and bloom, but smaller in the bean than others.

As I anticipated, this morning's *Argus* contains the awards for cinnamon, and, as I expected, Ceylon here stands beyond competition. As regards Ceylon exhibitors, this is the order in which they appear:—

CINNAMON.

FIRST ORDER OF MERIT.—S. Rajapakse, Mudaliyar; J. F. Driberg, Ekelle Estate.

SECOND ORDER OF MERIT.—H. D. Silva; Lee, Hedges & Co.

I suspect it was the smallness of the exhibit sent by Messrs. Lee, Hedges & Co., which shut it out of the First Class. Mudaliyar S. Rajapakse's cinnamon was in full bales of all sorts, from Third to Very Superior.

I am sorry that Mudaliyar Jayetilleke's vanilla did not obtain recognition (Mr. Vollar's was spoiled). But the Mauritius samples were large as well as fine. Succulent vegetable matters are so apt to get "out of condition." Mr. Bawa's preparation of coffee and milk was sour when opened.

You will see that the Government Agent of Kandy gets a second order of merit for seeds, and that Messrs. G. & W. Leechman receive honourable mention for their enterprise in sending a living coconut palm.

This, I suppose, about exhausts the list for Ceylon, unless my representations about the collections of Dr. Trimeu; the Government Agent, Jaffna (palmyra palm products); and Messrs. G. & W. Leechman (coconut palm products), are attended to. By next mail I may probably be able to send you a copy of the corrected and complete list (a long one) of awards to Ceylon.—Yours very truly.

A. M. FERGUSON.

The following is the report of the Sub-Jury No. 2 on Tea, consisting of Messrs. Everard (chairman), Cowderoy, Harvey, Brown and Harley:—

"The sub-jury appointed by sectional jury 31 to report on tea have concluded their labors, and have now to say that sample bottles of all teas on Exhibition, numbered from 1 to 823, were sent to the tea saleroom of Messrs. Everard and Co. the country and exhibitors of the teas not being disclosed until the whole of the samples had been tasted, and the awards made. We had some difficulty in deciding how we should give the awards, but we ultimately concluded to judge of each description of tea independently, giving an award to the best of the various kinds of tea, and if we found afterwards any special exhibitors well up in all classes of tea, to give such collective exhibit a first award, &c. In going through the various exhibits we found several samples of China teas, but as we afterwards found they were exhibited by the Oriental Tea Company and the Ceylon and Foo Chow Company, but not being the manufacturers or producers, we were unable to give them any awards but it is only right to say that if such exhibits had been eligible we should have given first awards for Souchong, Congou, Pouchong, Oolong, yellow Pekoe. Tea consumed by natives and scented orange Pekoe, very fine. It is much to be regretted that official exhibits from China and Java were not made, as we could then have demonstrated the relative positions of all the tea-growing countries. We much regret that many of the samples had gone off in qualities and lost much of the aroma which would have remained in fresh drawn samples, and this probably causes some of them to be placed in a lower position in the awards than would otherwise have been the case. Where possible we have made allowance for this but many of the samples were out of condition from improper curing and other causes. One sample, No. 528, exhibited by Keir Dundas (Ceylon court), and to which special attention was drawn, never reached us.—For the jury, J. EVERARD, chairman. Melbourne, 4th March, 1881."

CINCHONA.—We are informed that probably the experience gained on Summerhill estate, Nuwara Eliya district, will afford a satisfactory answer to the question, "Will cinchona grow successfully on the same land for the second time?" On this estate some 16,000 trees were cut down and rooted out last year and the land planted over again, the result being a growth so far which is very satisfactory.

COFFEE LEAF DISEASE.—We call attention to the opinions quoted by our London correspondent at first hand from Mr. Cooke, one of the great English authorities on Fungi. Mr. Cooke is much interested in Mr. Marshall Ward's work, more particularly as he is himself engaged in investigating a disease which has attacked the coffee in Venezuela and Porto Rico. We shall take care that Mr. Cooke is furnished with copies of Mr. Ward's further reports as they are published. Our Scottish correspondent has also some interesting remarks on the subject which will shortly appear.

DATE COFFEE.—In a paper received this morning from London, there is an account of a lecture by Dr. Richardson, in which he speaks in highly favorable terms of what is known as 'date coffee':—"The lecturer also briefly alluded to the date coffee, which has recently been thrown upon the market, and observed that it was undoubtedly a highly nutritive article of diet, and largely flesh-forming."—*Cor.* [The Company advertise the opinions of several analysts and medical men, but one question is what kind of samples were laid before these gentlemen, and another why be allowed to apply the term coffee to a mixture chiefly formed of dates?]

THE COMMERCE OF JAMAICA.

A Supplement to the *Jamaica Gazette* of Jan. 20 has been sent to us by Mr. Morris, containing the annual report of the Collector General, with accompanying statements of customs revenue, imports and exports, &c. for this West Indian Colony. With regard to import duties we learn that the amount collected in 1879-80 was £25,000 in excess of the previous year, the collection being the largest made since 1875-6: this result was partly due to the drought experienced at the end of 1879 and beginning of 1880, causing a large demand for foodstuffs. The severe storm of August 1880 occurred too late in the financial year to materially affect the collections for that year, but the current year will show a large increase in the importation of flour, meal, rice, saltfish, &c. The amount of export duties was in excess of the previous year by only £43, a decrease having taken place in rum, coffee, and dyewoods, as against an increase in sugar. The aggregate value of the exports was over 1½ million pounds, being an increase of £155,000 over the previous year and £170,000 over the average of the three previous years. Of the total amount £1,512,978 19s 3d the island is credited with £1,427,000 19s 11d, or an increase of 13 per cent, and foreign produce and manufacture with £85,834 19s 4d, or a decrease of 9 36 per cent. The principal articles in which increases have taken place are as follows:—

Articles.	Quantities.	Values.
		£. s. d.
Beeswax	476 cwt.	462 2 9
Cocoa	1,151 "	4,286 13 6
Ginger	1,073 "	4,036 1 3
Honey	1,070 "	1,070 11 9
Pimento	38,699 "	66,174 14 9
Sugar	2,966 hhds.	82,420 3 7
Cigars	6,030 lbs.	3,489 10 0
Hides	230,272 "	2,356 6 10
Bananas	111,689 bunches.	5,660 17 6
Cocoanuts	2,384,607 no.	7,553 8 5
Oranges	5,184,732 "	5,090 10 3
Coffee	Decrease in quantity.	5,583 9 11
Rum	" "	11,767 0 0

Among the articles which shew a decrease is lime juice 37,641 gallons of the value of £1,825 1s 7d. It will be noticed that coffee and rum show a decrease in quantity though an increase in value, the latter due to better prices. The decrease in coffee was equal to 574 cwt. A new item of export was cinchona, the total quantity shipped in 1879-80 being 23,981 lb of the value of £7,302 14s. It seems that the trade in cattle and horses with Cuba, which promised at one time to become an important item in the export trade of the colony, has been checked to some extent by a rise of 12 per cent and upwards in the market value of stock, and also by the enforcement of strict quarantine rules. The distribution of the export trade was as follows:—67·3 per cent to the United Kingdom, 20·1 p. c. to the United States, 5·2 p. c. to Canada, and 7·4 p. c. to other countries, the first and last showing a decrease, and the other two an increase, the latter being due to direct or additional steam communication. The fruit trade with America increases annually, and promises to form in a few years a large proportion of the export value of the colony. 74·5 per cent of the value of the total exports is made up by the four great staples, viz. sugar 32·9, rum 13·8, coffee 16·8, and dyewoods 11 per cent. Pimento amounts to 9·6, and fruits including cocoanuts 4·8 per cent, while all the other items together amount to 11·1 per cent of the total production. The export of annatto has risen from 22,435 lb. in 1876 valued at £560 17s 6d to 91,890 in 1880 valued at £1,531 10s. The export of beeswax has not varied much, 1876 showing 1,017 cwt. 3 q. 5 lb. of the value

of £6,042 11s 11d, and 1880 1,540 cwt. 0 q. 9 lb. valued at £6,468 6s 9d. The quantity of cocoa exported in 1876 was 469 cwt. 1 q. 27 lb. of the value of £1,286 11s 6d, while last year the amounts were 3,304 cwt. 2 q. 9 lb. and £10,918 6s 7d. We hope the export of this article from Ceylon (121 cwt. last year) will increase equally rapidly. Coconuts also show a considerable increase, the figure for 1876 being 1,840,315 valued at £5,520 18s 10d and for 1880 6,315,475 valued at £20,525 5s 8d. The export of coffee last year was 90,972 cwt. valued at £254,722 against 96,715 cwt. in 1879 valued at £249,138, there thus being as we have said an increase in value though a decrease in amount. The export of cinchona we have already mentioned: it remains to be seen whether this article will have such a rapid increase in Jamaica as has been the case with us. The fruit exported comprised bananas, limes, mangoes, oranges, pineapples, plantains and shaddocks. Of the bananas the number of bunches exported in 1879 was 132,832 and in 1880 440,642, the values being £13,283 4s and £38,556 3s 6d respectively. The export of limes is very variable, last year showing 1,210 barrels valued at £484, being a decrease as compared with 1878 but an increase of 100 per cent over 1877 and 1879. Mangoes also show fluctuations, though there has been a steady increase the last three years: the export for 1880 was 37,360 valued at £28 0s. 6d. The export of oranges also varied somewhat, though last year showed a large increase or any of the previous four years, the amount being 14,609,489 valued at £11,687 16s 10d. (In this connection we may mention a case reported in the *Trinidad Chronicle* at the end of last year where the captain of a small American vessel engaged in carrying fruit from the West Indies to the United States made an offer for 100,000 to 120,000 oranges to be delivered in ten days. The *Chronicle* commenting on this showed that the price to be paid for the quantity would only amount to a few hundred dollars, but hoped that as in the case of Jamaica a large trade would spring up.) Pimento shows a rapid increase during the 5 years, viz. from 391,952 cwt. in 1876 of the value of £39,973 12s 10d to 91,209 cwt. in 1880 valued at £145,570 12s. 3d. The value of walkingsticks exported was £652 8s, being an increase over any of the previous four years, though the number of bundles was considerably less. Tamarinds show a marked decrease in value, the 4,550 lb. exported in 1880 being valued at only £56 17s 6d, whereas 3,479 lb. in 1876 were valued £173 19s. The value of the cigars exported has increased greatly during the five years, the 2,633 lb. of 1876 valued at £282 15s having grown to 9,826 lb. in 1880 valued at £4,913. Of manufactured tobacco there was a very large decrease in quantity and value in 1880 as compared with 1879, from 135,051 lb. valued at £8,440 13s 9d to 35,271 lb. valued at £1,322 13s 3d. The woods exported comprise brazilletto, candlewood, ebony, fusticwood, lignumvitae, logwood, and mahogany. The export of brazilletto has risen from 3 tons valued at £4 10s in 1876 to 197 tons valued at £304 in 1880. Of candlewood there was no export in 1877, 1878, or 1880, but there was a decrease in 1879 as compared with 1876 from 75 5-20th tons valued at £124 10s to 19½ tons valued at £19 10s. Ebony shows an increase over 1879, but a considerable decrease as compared with the previous three years: in 1876 the amount was 498 1-20th tons valued at £1,494 3s, whereas last year only 230 tons valued at £644 were exported. The amount of fustic wood exported in 1880, viz. 1,699 tons valued at £5,097, was only half that of sent out in 1879, the value having diminished in the same ratio. Lignumvitae which in 1876-9 showed pretty nearly the same figure, 71-85 tons, last year took a sudden bound to 953 tons valued at £632 10s. The figures for logwood in 1880, 46,325

tons and £159,821 5s, are almost identical with those for 1877, the amounts being greater in the other three years of the series. The value of the mahogany exported in 1880 was £277 5s, against £30 only in 1879: in fact there appears to be a regular increase and decrease each alternate year. The last article mentioned in the export table is yams, and these show a steady decrease in quantity from 1,014 cwt. 29. 26 lb. in 1876 to 269 cwt. in 1880, the value having decreased from £331 11s 11d to £80 14s. As the value of this article seems to have increased, however, this year may show an improvement in the figures.

The last statement appended to the Collector's report contains a précis of reports of the collectors of taxes on the condition of the trade and agriculture in the several parishes of the island during 1879-80. In the parish of St. Thomas, we learn the cultivation of chocolate for export has been commenced, and also an acre of Liberian coffee as an experiment. In St. Catherine also a commencement has been made in chocolate, oranges and Liberian coffee for export. Of the parish of St. Ann we read:—

"The result of Agriculture has been this year considerably checked by severe drought. It is remarkable that with seasons so detrimental to other cultivation the coffee crop now being gathered promises to be one of the largest known for years past. The Pens are in good cultivation and steadily maintain their value and breed of stock. An exportation of 133 head of cattle to Cuba has taken place during the year. The supply of fruit was plentiful until the Cyclone of the 18th August which destroyed many valuable trees and several Chapels, School Houses Wharf Stores and other buildings—this, together with the drought, has caused unusual scarcity in ground Provisions. The fruit trade with America is thriving.

"The regular trading of Steamers to the several Ports of the Parish has been of great advantage, although the Merchants complain of dull times and stagnation of trade. The lake near "Moneague" shows no signs of abating, although it does not continue rising it monopolizes a considerable quantity of grazing land." In the parish of Clarendon there was an increase in the export of coffee owing to heavy crops, but the prospects for the coming year were very discouraging.

CEYLON BEES:

COLONIES OF "APIS DORSATA," THE MOST WONDERFUL BEE IN THE WORLD, TAKEN BY MR. BENTON IN THE KURUNEGALA JUNGLE.

We are glad to say that Mr. Benton has at length been successful in capturing the "Apis dorsata" (Sinhalese "*Bambarā*"), which he describes as "the most wonderful bee in the world." Mudaliyar Jayetilleke secured a party of Sinhalese bee-hunters who guided Mr. Benton to the Bambaragala, a mountain rock some 30 miles from Kurunegala in the jungle, and there, after a very interesting and exciting experience, which Mr. Benton will probably relate for the benefit of our readers, two colonies of the "*dorsata*" were secured. So much importance does Mr. Benton attach to his work here, now that he has seen this bee, a splendid honey-maker, that he is to postpone his departure to Cyprus for another fortnight, returning to Kurunegala to morrow morning. He has left specimens of the new bee in spirits which can be seen at our office. The Sinhalese were much astonished to see the way in which Mr. Benton handled bees which, wrongly used or blown upon, are so savage that they will pursue the offenders for miles, and Mr. Jayetilleke declares that he has got more practical information about bees from Mr. Benton in a week than he had from all other sources in many years.

Correspondence.

To the Editor of the Ceylon Observer.

"EMPTY IRON TIN, PRESSED DOWN CRAMMED FULL WITH COCKCHAFFERS."

DEAR SIR,—“Just a line” to request your correspondent “Cockchafer” from Dolosbage to kindly inform us what his *empty iron tin crammed full of cockchafters* was composed of? When I was at Dimbula two years ago we never knew a man (even an Irishman) who paid at the rate of sixpence for such an article. In this manner we cannot conceive how your correspondent (vide *Observer* 31st) was able to secure 600 beetles for the amount. As for the “boiling water ready at 4 o'clock in an asphalt boiler,” we are ready to believe anything after the *empty iron tin* &c. —Yours faithfully,

NO COCKCHAFFER.

WILD THYME AND COFFEE LEAF DISEASE.

Penryn, Cornwall, 4th March 1881.

DEAR SIR,—Enclosed are two slips about wild thyme. May not some use be made of it in connexion with coffee leaf disease, growing it amongst the coffee, or otherwise?—Yours faithfully,

F. CUMMINS.

THYMOL, THE NEW ANTISEPTIC AND DISINFECTANT.

Thymol, a newly discovered Crystal prepared from wild thyme, is pronounced by Chemists and Physicians to be far superior to, and stronger than Carbolic Acid, coal tar, or any other of the antiseptics and disinfectants hitherto known. It has been shown by Lewin & Bucholtz, to be about eight times as powerful as carbolic acid.

It has the very great advantage of being quite harmless, and possesses the delicious and fragrant odour of wild thyme.

Cornwall is certainly at its best in May. In autumn the light granite-sand soil is apt to be parched; and there is but little heather in the mining parts, so industriously is the surface soil “skimmed” for fuel. The furze mostly blooms twice a year; but its autumn blossoms are few indeed compared with the abundant glory with which it clothes all wild places in spring-time. Then, again, the hedges in autumn are dry and brown; while in spring a Cornish hedge—a stone wall generally with a good core of earth—is not only a botanical study, but is something for a painter to pore over. In some of those hedges you may count a score of different kinds of wild flowers. Sometimes for miles they are covered not only on the sides but along the tops with primroses, set so thickly that the leaves are scarcely seen. Sometimes they are ablaze with foxgloves and red campion. The flowers are not of rare kinds. You look in vain for any orchis except the commonest, or for the large vetch and purple flag which now and then light up the gloom of a deep Devonshire lane. But what with patches of lichen, and three or four varieties of hawkweeds and ferns small and big, and flesh-coloured stonecrop, and *wild thyme* so abundant as to colour the whole face of the stone for many yards, a Cornish hedge in the spring is something not to be seen elsewhere. And all this, combined with a sense of freshness unattainable at any other season, you lose if you put off your Cornish trip till the usual time. You don't even have the compensation of better weather; for mostly—though last year was an exception—May in Cornwall is often drier than July. After the long wet of winter there comes a month or more of steady sunshine, when you may be sure of smiling seas and warm seaside nooks day after day. And if you miss the great catches of pilchards, you come in for mackerel whiffing, work in which you may take a personal share instead of only looking on.—*Chambers' Journal*.

"CINCHONA" AND "CHINCHONA."

28th March 1881.

DEAR SIR,—In his book on the Peruvian bark tree the author has exercised his right and spelt the Spanish-Latin name as he thinks it should be spelt, and surely no other English writer can be supposed to know better, for none have given so much time and study to the subject of *cinchona* in all its bearings. Nevertheless he must be aware, as those are who have been like himself among Spanish Americans, that the word is by them written and printed “*cinchona*,” and this not out of mere whim, but on the recommendation of the Madrid Academy, than which there is no higher authority in all Spanish-speaking countries.

With regard to the pronunciation, I wish to point out that here in Ceylon you are at fault. As is almost invariably the case in adopting a word from another language, the English have again used a little license and given the word a sound to suit themselves, as when on the introduction into England of the Portuguese and Spanish wines Oporto and Xeres they made so free with the names as to call them respectively, Port and Sherry. The correct pronunciation in this case is “*cinchona*,”—ch being the same as in chick, chip, chum. This is a more important matter than the spelling, because if pronounced “*cincona*” for instance the word would be as completely disguised to the ear of a Spaniard as the word chaff would be to that of an Englishman if pronounced kaff (to a North Briton perhaps there would be no difficulty), and would certainly not be recognized by a

CASCARILLERO BOLIVIERO.

COFFEE AND GRUB.

Lindula, 31st March 1881.

DEAR SIR,—I must thank “A. L. C.” for answering my queries respecting grub, but surely he has made a mistake in mentioning 6c. as a fair sum to be given per 100 beetles! Until I learnt the experience of others I had settled to give 12c. per bottle containing on an average 2,000 of the small speckled beetle or the small brown cockchafer, or 12c. per 100 of the large patana cockchafer (*Leucopholis pinguis*), or the stag-beetle. Perhaps it is to the latter “A. L. C.” refers? I am glad to say that I am not yet much troubled with beetles or grub, but as they increase (as I fear they will) the pay will decrease in proportion.

And with regard to the enemies of this insect pest: the problem seems to be to discover what birds or animals (besides Sinhalese) take a delight in *chevring* beetle so, as every little helps, I give my unqualified support to the green lizard (erroneously dubbed ‘bloodsucker’), which at present swarms in thousands, and which is called in Tamil *ōnān*, *pacchōnthi*, *karattōnān*, or more commonly *karattān*. It is perfectly true that in the low-country a little speckled lizard plays havoc with the young shoots of cacao and Liberian coffee, and richly deserves, therefore, to be hunted to the death; but he is herbivorous, while, as far as my careful observation has gone, our green friend is purely carnivorous. I have often watched the latter creep up a petania or verbena plant and quietly gobble down a small beetle that had alighted to eat the flowers, but only last week had I the pleasure of seeing one with a beetle an inch and a half long in its mouth. And here I may draw Mr. Haldane's attention to the fact that the victim was one of the squeaking beetles, which I think he has not described. A friend (not a planter), hearing the other day that a blue-gum was black with beetles feeding on the resinous exudations, asked if there was any connection between the increase of grub and the introduction of eucalypti. I suppose I was correct in denying the soft impeachment?

KAROLY FÜRDÖ.

[There are no Eucalypti in the part of Maskeliya affected with grub, we believe?—Ed.]

CINCHONA AND COFFEE CULTURE WEEDS.

Holmwood, Agra Patana, March 31, 1881.

DEAR SIR,—I have been much interested by Mr. McCall's letter on not weeding cinchona, as that has been my principle for about three years: except where the self-sown seedlings are so thick as to deserve care, I only pull out or cut down the largest weeds. Where the seedlings are thick they answer the purpose of weeds in covering the ground. Whether this is the cause or not, I lose very few trees by canker, and damping out, or whatever it may be called, and many experienced planters who have seen my clearings say they have seldom seen healthier or better cinchona.*

I would go even further than Mr. McCall, and not only allow weeds to grow but also sow such grasses as are adapted for mowing or covering. If a clearing is kept fairly clean for two or three years this grass would be ready when the trees were fit to strip. It would certainly prevent the very free growth of self-sown plants, but considering the millions now obtainable this would not involve the loss it might have a year or two ago.

I notice Mr. McCall writes: "Weeds are doubtless one of the greatest enemies on coffee estates," but I have been and always shall be of the opinion that if on the estates that have suffered so much from the grub those grubs had had some weed roots to eat there would have been fewer coffee rootlets devoured.

Yours faithfully, REGINALD W. WICKHAM.

SELF-FERTILIZED COFFEE FLOWERS AND THE RESULT?

Maskeliya, 31st March 1881.

DEAR SIR,—In event of the failure of the fine blossoms we are having this year, can it not be ascribed to the fact that our coffee is "self-fertilized" year after year, as well as to the weakening effects of leaf disease &c. &c.? The following is an extract from a lecture delivered in Manchester in 1873.

"A number of experiments, conducted with a patience and a philosophical power of observation which cannot be too highly praised, led Darwin to the conclusion that when a flower is 'self-fertilised'—i. e., when the ovules are fertilised by pollen from a stamen belonging to the same flower—the number of seeds produced is smaller, or their vigour is less, than if it is 'cross-fertilised'—i. e., impregnated by the pollen conveyed from a stamen belonging to some other flower of the same species; and that if this process of self-fertilisation is continued through several generations, the plant at length becomes altogether sterile. This fact, when fully established experimentally, Darwin crystallised into the aphorism now so often quoted, that 'Nature abhors perpetual self-fertilisation.'"

From this, one may infer, that if at any rate the flowers intended to produce seed for nurseries, had been "cross-fertilised," we should have had stronger and healthier plants in our clearings, and therefore less likely to be affected with the different diseases that coffee suffers so much from now.—Faithfully yours, SWADDY.

[In other words, we ought years ago to have tried experiments with new seed from Coorg (chick coffee), Liberia, Mocha and why not from the heart of Abyssinia, the home of the coffee plant?—ED. C. O.]

GOLD IN CEYLON.

Kurunegala, 1st April 1881.

DEAR SIR,—Just at this time when you receive information from different quarters concerning the existence of gold in Ceylon, may I be allowed to give you the following descriptive names of villages in

Seven Korales, which signify that at one time or other they were connected with gold in some shape or other, such as Randeniya—two villages by that name—meaning gold meadowland village.

Ranwalagedara—Gold mine, or pit, house.

Ranawana—Gold forest.

Rangama—Gold village.

Rannutugala—Rock of gold pearl.

Rangalepola—Place of gold rock.

Ridigama—Silver village.

It is a well known fact that in ancient times a certain king did actually make copper, silver, and gold coins, at the city called Dambadeni Nuwara, and some of the specimens of these coins are to be found in Seven Korales. It is by taking the name of this city that the present Government Agent of the Province recently named a Hatpattu called Dambadeniya Hatpattu. I write this in order to attract your attention to the existence of these descriptive and significant names given to villages from time immemorial, so that in case, as you suggest, experiments are to be tried in search of gold, one or two of these villages may be selected as the scenes of such experiments, for by their situation and nearness to the town of Kurunegala and Polgahawela railway station they can be conveniently and easily reached.—I remain, yours truly, A KANDYAN.

COCKCHAFER CULTIVATION :

BEETLE POWDER vs. DATE COFFEE.

6th April 1881.

DEAR SIR,—As many eminent English doctors agree that ground dates make excellent coffee, and as it seems clear that the British public will consume anything not absolutely dirt, that is sufficiently adulterated to suit their palates, there seems to be no reason why we should not turn the cockchafer plague into a lucrative business. The beetles are known to contain a large amount of phosphates, and as we cannot always get crops from the branches of the coffee why not take them in another form from the roots? I think "Melolonthine" would be a good name for the beetle powder. We ought, perhaps, to mix a little real coffee with it at first until the public taste is educated to the required standard.

I have not time myself to take out the patents, but shall be glad to give hints on feeding, collecting, pulping, &c., to any man of genius whose relatives have nothing to do, on condition I receive a certain number of "Finder's" shares.

To ensure the supply of a pure article, it would be best to do the entire manufacture out in Ceylon or the dishonest middlemen in London would tump with it.—Yours faithfully, NO FRAUD.

[Mr. Benton found the Sinhalese of the North-western province, only less fond of eating the young broods of bees in the combs, than of the honey itself!—ED.]

CINCHONA.

April 7th, 1881.

DEAR SIR,—Your correspondent "Cascarillero Bulviero," writing in your impression of April 5th, lays justly stress on the general mispronunciation of one part of the above title word in the island; but he should remember that the language in Bolivia, as indeed he confesses, is not up to the perfect Castilian standard of the Madrid Academy.

It is only in the Spanish-speaking parts of South America and in the North of Spain that the *c* before *i* is pronounced like *ss*. in Castile, according to my information, the *c* before *i* has the sound of *th* in the English word *pith*; therefore the word cinchona enough to be pronounced "thinchona."—Yours truly,

VANTOSKY RENTON.

* Of what age now?—ED. C. O.

TEA PREPARATION.

Bunyan Estate, Maskeliya.

DEAR SIR,—The enclosed circular you may like to read over. It refers to "Kinmond's improved patent tea drying and green leaf withering machine"—and was sent to me on the subject of manufacturing tea, without the aid of charcoal. A machine like this has been in use for the last ten years (I believe) in Assam.—Yours faithfully,

TOM GRAY.

From the *Indian Tea Gazette* we quote as follows on this subject:—Years ago, when I first mooted the idea that Tea could be fired without charcoal, it was scouted. It was said "The fumes of charcoal had some chemical and necessary effect." "The Chinese would not have used it from time immemorial had a substitute, and a cheaper one, been practicable." Such were the objections. It is now no longer a question. A great part, perhaps the greater part, of the Indian produce, is to-day worked with other fuel, and it is only a question of time when all of it will be so. It is generally admitted that tea prepared in Dryers, is more valuable than that fired over charcoal; and begging the question that the fumes of charcoal are not necessary (the old idea is very nearly exploded), it is reasonable that it should be so; for, if there is one thing certain in tea manufacture, it is that speed is necessary. Charcoal drying took on an average 45 minutes.—Tea is fired in the best dryers in 8 minutes. In respect of speed, Kinmond's dryer (which is the one I advocate) is certainly unequalled. When, as in large factories, 30 to 40 maunds of tea have to be made daily, it is evident that, *ceteris paribus*, the machine which will do most in a given time and given space must be the best. The great feature in Kinmond's Dryer is the fact that a separate blast of hot air is forced through the tea on each tray. In all other dryers I have heard of, the same hot air passes through each tray successively, and moisture is consequently more or less carried upwards through each. It is principally in this respect, and in the large quantity of work it executes, that I consider the excellence of Kinmond's dryer to consist. It remains only to give shortly the results of a long series of experiments with Kinmond's dryer. The valuations were made by more than one Calcutta broker:—

Class.	Charcoal dried.	Machine dried.
Pekoe.....	R0 11 0	R0 14 0
Broken Pekoe	R0 10 0	R1 1 6
Pekoe	£0 1 6	£0 1 10
Broken Pekoe	£0 1 5	£0 2 7

These were made from the same leaf, at the same time, with every care. In one of my gardens, after Kinmond's dryer was obtained, the teas averaged upwards of 2 annas per lb. more all round. The dryer can also be used for withering leaf, which it does effectually, but in my opinion no tea dryer is fit for that work, inasmuch as to do a large quantity takes far too much time. Artificial withering is only necessary when the weather is wet and cold, and the machine, to do it, should do a large quantity at a time. No tea dryer can do this. A machine fitted for that work has yet to be invented, unless Baker's wet leaf dryer, of which I have heard good accounts, but have not seen, would answer.

THE GRAPE VINE OF COLOMBO.—Those who are of opinion that the grape vine does not thrive in Colombo would do well to pay a visit to the residence of Mr. P. T. Sleyrna Lebbe at the junction of *New Moor* and *Messenger's Streets*. The very sight of the bower will lead one to believe that Colombo is the natural home of the grape vine; but this belief turns to wonder and amazement when he looks at the hundreds of bunches of luxurious fruits to be seen all over.—*Jaffna Patriot*.

MANILLA HEMP.

At the monthly general meeting of the Agri-Horticultural Society of India held on Thursday, the 17th February, the following circular from Surgeon-General Edward Balfour on the subject of the Manilla Hemp plant was submitted:—

Mr. Liotard, of the Agricultural Department of the Government of India, has this year (1880) reported on the materials in India, suitable for the manufacture of paper. Several of the fibre-yielding plants are mentioned by him and, amongst others, various species of the genus *Musa*, of the plantain or banana tribe, many of which have been grown in the East Indies from the most remote times. At pages 54 to 58 he describes the introduction, in February 1858, of the Manilla hemp plant, direct from the Philippines, into the Madras districts, by Colonel (now Sir

George) Balfour. Nevertheless, the import trade return of the United Kingdom show a large and continually-increasing delivery of hemp

from the Philippine Island, now averaging yearly about 20,000 tons, valued about half a million sterling. I have ascertained from the London Produce Brokers, through Dr. Birdwood of the India office, that this important article is the true Manilla hemp from the *Musa textilis*, that the bulk of it is delivered in London, where it is made up into cordage and ropes for ships, especially for yachts' running rigging, being very light, strong, and clean, and also for clothes lines. But there is no doubt that the Manilla hemp plant, *Musa textilis*, grows as well in British India as other species of the plantain or banana genus, and that British India could, in a couple of years, supply the London market with all that it could take of Manilla hemp fibre. The prospects of benefiting British India by creating an export trade from it of the extent and value above indicated might well incite to considerable efforts to attain success. In 1861 to 1863 the Madras Revenue Board made continuous efforts* to secure

* 1861, 24th April, No. 2,128	the naturalization of the
" 31st May, " 2,785	plants which Colonel
" 1st June, " 2,847	Balfour had introduced,
" 21st " " 3,226	but their efforts seem to
" 25th " " 3,301	have been effectual only
" 5th August, " 4,212	in the Wynaad, from
" 5th " " 4,219	which, by 1877, the Con-
1862, 13th Feb. " 894	servator of Forests re-
" 16th " " 983	plied that the Philippine
" 24th Sept., " 6,096	variety had been intro-

duced on several of the coffee estates, where it grows remarkably well, and no doubt is felt there as to the value of its fibre. Revenue and of the Agri-Horticultural Societies might The attention of the Boards and Commissioners of be re-directed to this plant.

The Secretary stated that *Musa textilis* was grown for several years in the old garden of the Society, but it did not progress satisfactorily, and the cultivation was eventually abandoned.

CINCHONA CULTURE.—We are glad to learn that Mr. Karlake, who recently returned to Ceylon, is taking out a patent for what he hopes will be a very simple and cheap method for renewing the bark of cinchona trees.

SALES OF CINCHONA BARK.—Cinchona bark is selling locally, at wonderfully good prices, the Oliphant bark, chips of officialis trees (1.43 of quinine) realized R1 per lb. on Saturday, the probable London valuation being, 2s 3d or so per lb. Gallamudena bark (*succirubra* quill) fetched R1.12½.

COFFEE LEAF DISEASE.

I told you in my last letter that I hoped to receive through the kindness of a friend Dr. Cooke's opinion upon Mr. Marshall Ward's last report on his investigation into *Hemileia vastatrix*, and I have this week been favoured with a letter written by that gentleman upon the subject which I am permitted to extract from. Dr. Cooke's high reputation as a botanist will give weight to the opinion he expresses, and its favourable character will no doubt be satisfactory to Mr. Ward, who, I hope, will give us the opportunity of reply on the points as to which Dr. Cooke is anxious to obtain further information. The following is the substance of Dr. Cooke's letter to my friend:—"I have read Mr. Ward's second report, as I read also his first one, with considerable pleasure and interest. I consider that the work he has done is, thus far, satisfactory, and I follow it with the more interest, because it seems in a fair way of proving, what I at the first strongly believed, but had to suspend on account of conflicting evidence, viz.—that the *Hemileia* was related to the *Uredinea*, a belief in which I have never completely lost faith—even when the evidence seemed the strongest in favour of its belonging to the *Mucosini*. I do not know Mr. Marshall Ward personally, but I should be glad to learn from him, how he interprets certain of the phenomena recorded by Abbay and Morris, especially as to spores being contained *within* the large papillate spores of the *Hemileia*. I find another species of *Hemileia* at the Cape of Good Hope, with the smooth spores as well as the rough ones, which I have figured in *Grevillea* and called *cysts*. I should like to know if any of the brown spots, with black pin points on them—bear any resemblance to a *Septoria*—and what is the nature of the black pin spots. I should always be glad to hear from him as he proceeds, as well as see his reports—as I have also been investigating, as well as I can at such a distance from the coffee disease of Venezuela and Porto Rico—which is, apparently, a different thing altogether." I trust that this opinion of Dr. Cooke, and the queries he has started, may assist in the correctness of conclusions at which Mr. Ward may arrive.—*Our London Cor.*

COFFEE PLANTING &c., IN NATAL.

The following extracts from letters from a former Ceylon planter to a friend in the Island have been placed at our disposal. In one letter the writer says:—

"My chief object in going to the low-country was to see the coffee and sugar estates, and to see how they cultivated them. Sugar is, as of course you know, the chief export from Durban, and this flourishes, but the present season has been so dry that it is feared that the crop will not be a paying one. The estates, as a rule, are not large, varying from 150 to 300 acres in extent (some are as large as 600) with a large reserve of bush. Mills are not erected on all estates, but only on a few, so that the planters only have to look after their canes, which they send when ripe to the mill nearest them to be crushed, the crusher taking a portion of the sugar in payment for crushing. I went over one of the largest mills and was very much interested in what I saw, but it is fearfully hard work on Europeans to have to stand for hours in the heat of the day in the boiling-house. Nearly all the labour on the estates I visited is cooly, who have an awfully easy time of it and are perfect rajahs in their way. The men commence work at sun-rise and knock off in the middle of the day for food (which appears to me absurd) and return to work until sunset. The women very seldom work, and seem to be quite agreeable to

remain idle, as the absurd Government regulations for coolies compel superintendents to supply the wives of the men with rations whether they work or not. The rations which Government requires to be given to coolies consist of 10 lb. rice a week and in addition to this the estate has to supply them with ghee, 1 lb. per month, and also fish when obtainable. If you stop any of these rations they go to court and the poor cooly gets all his own way. I saw very little coffee, but what I did see seemed to me to be doing very well, but this was partially abandoned although it had a very fair crop upon it. The bean is much smaller and very irregular. The curing is done very badly and the light and everything mixed up together. I went to the mills at Amgeni, where most of the coffee is cured, but even there I was surprised at the slovenly way in which everything was done. I saw some coffee on a barbacue before it was milled, and donkeys were promenading about on it, so you may judge for yourself how things are done. For all this and in spite of the grub which I hear kills the trees, I firmly believe from what I have seen that with care and occasional manuring that coffee might be made to pay here. Dry seasons are against it certainly, and that is all, I fancy. I am leaving this for the coast again as soon as I can get a transport wagon to take my things down, as I am convinced that this is not the place for me; I mean up *luere*. Cattle, horses and sheep are dying in this district from cold and poverty, and as instances of this, one farmer lost 100 calves from lung sickness and another about 500 sheep from cold; this is not very encouraging."

A second letter is written from Durban, Natal, on 22nd November 1880. The writer says:—

"This mail I forward a paper to you, in which it shews that although coffee has to a certain extent been abandoned here, yet there is a chance of its being revived again. People here know next to nothing about it and do not seem to take any trouble, and yet expect the tree to do well without going in for cultivation. Their great idea seems to be to get large crops without any outlay, and if they do not get this in about four or five years time, they abandon the estates. Another drawback they say they have is the borer. As yet I have not seen any trees so affected, but surely there must be some remedy for this; and they also complain of high winds, but up to the present time I have not felt any wind nearly equal in force to that I experienced on — when the young clearing was blown on its broadside, trees, stakes, and every thing else. They know nothing of the numerous pests and drawbacks which you have to contend with in Ceylon or they would not cry out as they do. Natal, I fancy, is a very good place for coffee, as crop ripens during the dry season, and the way I propose to go in for it here is to plant up in small acreages at a time, and that in connection with other things which give a good and quick return, such as maize, potatoes, and vegetables generally. They tell me that the only way to render the cultivation of coffee profitable in Natal is to renew stem, branch, and occasionally the tree, after it has borne its fourth crop. This to Ceylon planters would seem an extraordinary proceeding and I cannot understand it at all. However, as your humble servant hopes to be one of the commission spoken of in the paper I shall endeavour to find out during the tour which I suppose will be taken through the country, something more definite on this subject. The other day I visited a farm near Pietermaritzburg, for the purpose of looking at some coffee, and although the trees are looking like abandoned coffee, yet they looked wonderfully healthy as far as the foliage was concerned; and this after they had borne a very good crop, but a large proportion of this was light. This I have often seen

myself on neglected coffee in Ceylon. I was reading a report yesterday on coffee in Natal by a sugar planter who had gone in for it on a small scale, and in three years time from putting the plants in he got $\frac{1}{2}$ cwt. an acre and the following year 9 cwt., then a short crop and abandonment following, although manure was easily obtainable, transport cheap, and labor moderately so. Then coffee is called a failure; it is a disgrace when one sees fine trees abandoned for want of a little attention and experience. I pruned one of the abandoned trees at the farm near Pietermaritzburg which I spoke of, and although it was only roughly done, yet when finished it looked nearly as well as some of the young trees in the best part of — clearing. I am in communication now with the M. L. C. for this county, and although my Ceylon experience was short, still I hope I shall be able to turn it to good account out here. I have only been down a few days and expect to be running about from place to place for some time to come. By the time this reaches you your crop will be all in, which I trust has been a favorable one and that you have plenty of good wood for a bumper next year 1881. How is your cacao getting on?"

A third letter, dated 19th January 1881, from Verulam, County Victoria, Natal, speaks of the war, and the consequent rise of provisions. The writer then proceeds:—

"What will be the outcome of all this it is impossible to say, but added to all this there has been a regular plague of caterpillars along the coast, which has destroyed hundred of acres of sugar-cane and mealies. Cheerful state of things for a young colony!"

"As far as regards coffee, I took the tour I mentioned in my last letter and will now give you an account of what I saw and heard. I started from this on the 20th December and the following day I came to the first under cultivation. It was only a small place of about 25 acres, and the proprietor was a man of a peculiar temper and was not altogether anxious to give me any information. However, I learnt from him that he was merely experimenting with coffee; although he had several failures, he intended to try and find out some remedy. Amongst some of the fields (which I may tell you were all in blocks of from three to five acres with wind belts of bamboo and mulberry) I saw trees from five to six years old bearing an average crop of from 8 to 10 cwt. an acre, but these trees were not pruned or topped. He informed me that these trees at three years old gave a crop of 4 cwt. an acre, and every year up to the present had given a good return, and that he could not grumble and that is something to hear from a man out here, where nine out of ten men are in a perpetual state of discontent. Before leaving this field he said he expected to see it all die out next year, as it always did, from what cause he could not say, but in my own humble opinion it was simple overbearing and inattention and lack of manure that killed the trees. However, I was silent on the subject. The next field this interesting individual took me to was one he was experimenting on. It was about 7 years old, and the trees he informed me were fast dying out, so he thought that by sawing off every primary and applying a little manure in the shape of some bog soil and shells from the beach it might have the desired effect; and really I was surprised to see the effects on the bare poles, which had shot out new primaries, &c., in all directions and looked very much like coming into bearing again, but it is impossible to say whether the experiment will repay him for his trouble. The aspect of the plantation was N. W., about five miles from the sea, and the soil a loose loam. If the proprietor had been a decent sort of a man he would no doubt have given me further particulars and encouragement. How-

ever, he finished up by saying he would not advise anyone to go in for coffee, so we parted. The next estate I visited was —, the superintendent of which was —, formerly the possessor of an estate in —, and who knew — and all — districts well. Possibly you may have heard his name, but it is 39 years since he first went to Ceylon and has left it now some 20 years. Poor fellow, he is getting on in years and is somewhat reduced in circumstances. He is not fond of Natal and holds a very poor opinion of coffee planting in general here, and there he is right, I fancy. He has no coffee under cultivation, but goes in for mealies and arrow-root. The next estate I visited was, belonging to the Natal Land and Cultivation Company, which holds much the same position here as the Ceylon Company, Ltd., used to do with you. I was very much pleased with what I saw here, but the system of cultivation carried on was somewhat different to Ceylon. They have 700 acres altogether in cultivation: coffee, tobacco, and mealies. Coffee is planted here in fields of from 5 to 10 acre blocks, with wind belts of bananas (bamboos are not approved of). Mealies and tobacco are planted between the rows of coffee. The plants and trees which I saw looked very healthy and those fields in bearing were looking A 1. The superintendent expects to get an average crop of 8 to 10 cwt. all over. Here they only allow the trees to grow to 8 years, after which they root them up and put in fresh plants. On my enquiry what the cost of cultivation was per acre, the superintendent said he could not tell me, as money was no object and as it was the Company's show estate, when money was wanted it came. This does not give a private individual much idea of what his outlay will be before he gets a return. After leaving —, I went to — estate near —. This place belongs to the same Company and the same system of cultivation is carried on, and in all cases the superintendent have gained what experience they have in this colony, and don't seem to care to listen to what others have to say on the subject. However, I am quite satisfied that coffee can be grown in Natal and be remunerative for a certain period, but as to cost of cultivation I cannot say anything."

The following is the paper referred to in the second letter:—

THE FAILURE OF COFFEE PLANTING IN NATAL.—Mr. Crowder, M. L. C., having brought before the House his notice requesting a commission to inquire into the above, and as I have informed the hon. members, that I am quite willing to give evidence thereon, I think the general public will not be displeased if one of the oldest planters lays before them briefly, through the medium of your valuable columns, his experiences in coffee planting, leaving your readers to judge for themselves whether the experiment is worth repeating.

In the year 1860, on the Red Hill estate, I produced half-a-ton of marketable coffee: in '61 two, in '62 four, and in '63 thirteen tons. Mr. Middleton, on the Snaresbrook estate, was in advance of me as regards quantity, until 1863 when my crop exceeded his. By this time, Mr. M. and myself were favored with many visitors and intending planters anxious for information on the culture of coffee, and preparation of the berry for market.

Our principal guide was "Old Laborie's coffee Planter of St. Domingo." By following his instructions the foregoing large crops were obtained from a very small acreage, and coffee planting in Natal proved the most lucrative branch of coast enterprise. To be as brief as possible, a few years after the success of the enterprise was thought to be almost beyond doubt. A disease appeared amongst the trees, causing the branches to die off at the joints; this disease seemed to encourage the borer, and so destructive did this

grub become that out of about 180,000 trees on my own and Mr. Gooch's estates scarcely one tree escaped.

The way the scourge works is by insinuating itself under the crown of the root and boring up the stem of the tree, emerging from the stem after slowly killing the tree, near the topmost branches in the form of a beetle. While in the grub or dangerous form, the creature is about an inch long, of a pale yellow or whitish color, armed with a pair of strong hard forceps or pincers, which he seems to bore with in the most scientific manner.

Unfortunately I stuck to the plantation much too long, having learnt at school that perseverance was a marvellous virtue. My friends advised pruning: I pruned. Not pruning. I didn't prune. Manuring: I manured. No manure: I abstained from manuring. Bone dust: I boned. Lime: I limed. Guano: I emptied on a certain plot of land the contents of a bag warranted as imported from Jehaboe. Delving: I delved and dug. Weeding: I weeded. Let the weeds grow: and I speedily obtained a luxuriant growth. Catch crops: I let go my hold. I shunned tobacco and mealies. I drained. Irrigate; I could not.

What to attribute the failure to I know not, but conclude by adding four words:—"The acts of God."

GOLD AND PEARLS IN CEYLON.

Our Kandy correspondent sends us the following interesting extract from a local publication dated March 1854:—

In connection with the discovery of Gold in Ceylon, and the alleged existence of a Pearl Bank off Mount Lavinia, the following information may perhaps be of interest.

Gold is found only in the native or metallic state, but is generally more or less alloyed with silver, in proportions varying from a fraction to 72 per cent. When pure, its specific gravity is 19.25.

If is found sometimes in brilliant crystallized grains, but more generally in small irregular lumps or grains in veins of quartz or calcapar. It is also obtained from beds of micaceous specular iron, in the form of spangles; in decomposing blende, and amongst iron pyrites. It is, however, far more abundant in the sand of rivers, and in the alluvial deposits of loose gravel, sand, and mud, which in many regions are spread over all other strata.

In the East, Borneo, Sumatra, and many other islands of the Indian Archipelago, as well as Cochinchina and Siam, are known to possess productive gold mines. Of the productiveness of the Ceylon Gold washings little can as yet be stated; but it has long been known to the natives that Gold was procurable; and by the kindness of L. de Soysa, Esq., Modliar in the Translator's department of the Colonial Secretary's Office, the subjoined extracts from two ancient Sinhalese works on the geography and products of the Island are made public.

From these works, entitled Kadayimpotta, it appears that formerly the whole Island was divided into three great Provinces, called Maya Ratta,* Pihitty Ratta,† and Ruhunu Ratta‡. These were sub-divided, Maya

* Maya Ratta, bounded on the north by the Dedro Oya; on the east by the Mahawelliganga and the mountains; on the south by the Kaluganga; and on the west by the sea.

† Pihitty Ratta, bounded on the west, north, and east by the sea; on the south by the Mahawelliganga and Dedro Oya rivers; it was also sometimes called Raja Ratta, as the ancient Capitals were situated in it.

‡ Ruhunu Ratta, bounded on the west and north by the Mahawelliganga, and Kaluganga (or Kaltura) rivers; and on the east and south by the sea. The mountainous portion of it was called Malayaa Ratta.

Ratta into 28, Pihitty Ratta into 14, and Ruhunu Ratta into 14 Rattas, or smaller Provinces.

In describing the various Rattas in the Province of Maya Ratta, one writer mentions, among others—*Sihuruwana*, of which he says, "This country is so called from the number of streamlets, lakes, and rivers which abound in it. There are lands in it sufficient for the maintenance of the four constituent parts of an army. There are also in it rice villages, Gem vilages," &c. &c. The Buddhist Temple Lankatilleka Vihare is situated in this District.

From the same author the following notices are extracted:

Kururatta (Allooteoor Corle?). A Pearl bank is spoken of about 6 miles from the Coast.

Pehetigalle (Pittigal Corle?). In this division there is a mine of precious stones called *Sindeya*, also a Sea-port called Mahadampe.

Belligalle (Belligal Corle?) Gold, precious stones and pearls are found here.

Dewameratta (situated between two oyas, or rivers, in the Kornegalle District). Silver is here found in a cave.

Merisaru and *Mahavelliganga*. Several mines of precious stones.

The second author, writing in a more summary manner, declares that there were known to exist in Ceylon, at the time he wrote "64 silver and 16 gold mines, one thousand (i.e. a very great number) of Pearl banks, and 100 mines of precious stones."

HOW TO START A TEA GARDEN AND MAKE IT PAY.

ROUGH ESTIMATE.

Cost of opening out, in the Debrooghur District, Upper Assam, a new tea garden of 200 acres—clearing and planting 50 acres annually, and probable profit therefrom in the eighth year:—

FIRST YEAR.

Cost of 500 acre grant under 30 years' lease rules, value of timber, &c. (first instalment)	Rs. 1,000
Clearing 25 acres by Teklas for buildings, and sowing at stake, at R16 per acre	400
Preliminary buildings. Temporary bungalow, out-houses, godowns and cooly lines...	600
Tea seed, for germinating beds, and for planting out at stake, 25 maunds, at R70 per maund	1,750
Importation of 55 coolies, at R100 per head landed on the garden...	5,500
Engagement of 10 local labourers under a two years' agreement, at say R25 per head...	250
Wages of 62 labourers at an average of say R4 each per mensem	2,976
Establishment...	
Manager, at R200 per mensem.	
Mobri " 10 "	
Native Doctor, " 25 "	
Chowkidar " 6 "	3,072
Syce " 5 "	
Waterman " 5 "	
Dakwallah " 5 "	
Loss on say 300 maunds rice, at R2 per maund	600
Garden stores, implements, &c., say	1,000
Cart bullocks and pony	500
Government fees, law expenses, &c., say	300
Station or steamer agent's salary at R15 per mensem	180
Calcutta agent's charges, say	500
Discount, feed of live stock, stationery, postage, and other contingencies, say	1,372
Total	R20,000

RESULTS AT END FIRST YEAR.

Receipts ... Nil.

Debit balance ... R20,000.

It is a good plan to give all buildings to Assamese to execute, as they build far better and stronger houses than imported coolies can, on first arrival in the country.

The following are the details of the buildings estimated for:—

Temporary Bungalow for Managers	...	R	50	0	0
Cook-house	...	"	7	0	0
House for servants	...	"	10	0	0
Stables	...	"	8	0	0
Small out-house	...	"	5	0	0
20 coolie huts	...	"	140	0	0
House for Mohri and Assamese.	...	"	14	0	0
House for Native Doctor...	...	"	7	0	0
Hospital	...	"	10	0	0
Rice godown (strong and substantial)	...	"	25	0	0
Stores godown	...	"	10	0	0
Charcoal godown	...	"	10	0	0
		R	296	0	0

This leaves a balance of R304 for thatch, and other contingencies.

Tea seed.—About 22,000 seeds go to the maund, and if the seed is at all good, about 18,000 will be found to germinate in the beds. We will assume that the garden is to be planted 4 × 4'. The number of stakes in an acre thus staked in an acre thus staked out, will be 2,722. As three seeds as a rule are planted at each stake, 8,166 seeds will be required per acre. But to make sure of such a number, at least 9,000 should be laid in the germinating beds. We would thus require for the 50 acres no less than 450,000 seeds, and calculating that only 18,000 will turn out good in the maund, 25 maunds of seed will be required. We have allowed R70 as the price of seed per maund. For this amount very good hybrid jāt can be obtained from trustworthy sources. Excellent tea seed can sometimes be obtained from natives at a very much lower figure, but as they cannot be relied on or trusted in any way, it is better to obtain tea seed from some well known garden direct. We have made no mention of nurseries, as there would in all probability be a sufficient supply of seed over in the germinating beds, which, growing up into seedlings, would suffice for the few vacancies which might occur. If the 50 acres is carefully sown and well looked after, there will be no vacancies to speak of. If the Manager, however, wishes to transplant out seedlings the next season, in lieu of sowing seed at stake, nurseries would of course have to be made. This would add to the cost, and the price of the extra amount of tea seed purchased would have to be added to the estimate.

Labour Force.—It will be seen that we have estimated for 55 imported coolies and 10 local labourers, making thus a total of 65 labourers on an estate of only 50 acres. This will perhaps be found fault with, but we maintain that this amount of labour is by no means in excess of actual requirements. Moreover, that instead of the estate suffering a loss thereby it will eventually prove a positive gain. We all know the heavy losses sustained by gardens owing to insufficiency of labour. The 62 working souls employed on actual garden work, it must be remembered, includes men, women and children. There would most probably be about 37 men, 18 women, and 7 children (boys and girls). Taking into calculation the number likely to be daily on the sick-list amongst freshly-imported coolies, and the number of deaths likely to occur during the year, 65 souls are by no means an unreasonable number to start operations with. For such a number a good native doctor should certainly be engaged.—*Indian Tea Gazette.*

THE PROGRESS OF INDIA.

What, for instance, can be more significant than the extraordinary development of foreign trade which India has witnessed during the last fifty years, involving as it does a rise from 18½ millions sterling in 1834 to more than 122 millions in 1880? This advance—due, of course, mainly to the introduction of railways—is more rapid even than that extraordinary commercial development which has been experienced in recent years in the United Kingdom. The average foreign trade of the United Kingdom for the period 1816—20 was 84 millions sterling; this had increased in the period 1871—78 to an average of 646 millions. Thus, while British trade increased between seven and eight-fold in the sixty-four years between 1816 and 1880, the Indian trade has increased nearly as much in the forty years from 1840 to 1880; and the figures of the present year, as is well-known, already indicate that its commercial progress will be even more marked than that of its predecessors. Great, however, as this progress has been, it is really insignificant when contrasted with the possibilities which the country affords. The 250 or 300 millions of people who at present inhabit India, are hardly yet touched by the great tide of industrial enterprise which is setting in towards its shores. The 7,000 miles of railway, which at present traverse the country, have, indeed, infused a new life into the commerce of these parts where their influence extends; but vast areas are still untouched, and the great majority of the people still live the primitive life of isolated agriculturists, tilling with pain their native glebe, aspiring to nothing beyond the satisfaction of their humble daily wants, and unconscious of the innumerable opportunities of wealth which lie unused around them. The average agricultural outturn, for instance, 11 bushels per acre, is as nearly as possible identical with that to which Mr. Lawes, the great agricultural experimentalist of England, has succeeded in reducing a portion of his land by incessantly cropping it with wheat, without any manure, for a period of thirty years. It is, in fact, about the lowest, which a soil, exhausted by continuous, reckless and unscientific cropping, can be made to yield. Supposing a more generous and rational method of culture to be introduced and the average yield raised—as it unquestionably might be—to the English average of 27 bushels, we should have an addition to the world's supply of agricultural produce of three millions of bushels, available either for fresh population in India, or for the wants of foreign countries.—*Pioneer.*

GOLD IN INDIA AND AUSTRALIA.

The Government of India in analysing Mr. Brough Smyth's famous report remarked: "If we omit the altogether exceptional sample from Wright's Level which gave 24½ oz. per ton, and the picked specimens from the same workings which gave 25½ oz. per ton, we get 88 samples, yielding an average of 1 oz. 8 dwts. 22 grs. of gold per ton." That was the result of Mr. Brough Smyth's explorations in the Wynaad over a period of eighteen months. Let us compare these figures with actual mining results in Australia. The actual yield from quartz-mines in Queensland was about equal to Mr. Brough Smyth's average specimens in the Wynaad. The average yield in New South Wales for the same year was 1 oz. 5 dwts. 7 grains per ton. There is no lack of rich "specimens" in Australia as in the Wynaad, but experience has taught the Australian miners not to attach too much importance to specimens. The average yield of a mine over a period of time, is a far more certain indication of the value of land in the neighbourhood for mining purposes. With the

above figures before us, we may well ask ourselves what there is to justify the high prices that have been paid for mining lands in Southern India? This is a matter, however, that chiefly concerns speculators in England; if they are satisfied it is not for Indian landholders to complain.

The reports before us contain some useful hints for the managers of the companies that are commencing operations in our midst. The importance of having improved machinery is strongly insisted on. Though the gold-saving appliances in Queensland are acknowledged to be "the most modern and approved obtainable in Australia," yet, we are told, it has been demonstrated by practical assay that as yet, "only about 50 per cent. of the gold contained in quartz is obtainable by our appliances. In some few reefs, where the mundic is largely impregnated with sulphides, especially zinc and lead, and nothing like 50 per cent. of the gold can be obtained, even when the reverberating furnace is used." Indeed the importance of the proper treatment of tailings, and matter which has passed through the quartz-crushing mills, is becoming universally recognised. The Queensland report avers that one-seventh of the yield of gold in one district had come from the "pyrites works," the owners of which are supposed to have made large profits. It is worthy of remark that the total value of quartz-crushing machinery in Queensland, is put down at £270,000 only, a small sum in comparison with the capital that has already been raised for mining in India. But with this machinery, the yield of quartz-gold in the colony in 1879 was about 190,000 ozs., worth at £3-10s. per oz., about £650,000. The yield from alluvial mines (chiefly worked by Chinese) in the same year, was 98,815 ozs. The total yield of gold for the year was 288,556 ozs., valued at £1,009,946, the number of miners being 3,191 Europeans, and 5,621 Chinese; and the average earnings of each individual miner was £114. For the year 1878, the earnings were as low as £74.

From the same official documents, we gather the interesting fact, that the total Australian gold supply from 1851 to 1878 was £240,000,000. And yet gold-mining flags in Australia, though any quantity of auriferous land may be had for £1 an acre. "The want of means to carry on prospecting operations for the discovery of the new gold-fields, and the gradual exhaustion of those easily worked deposits of our known gold-fields, have been the main causes of the decrease in the number of our gold-miners, and until new fields be opened, or the necessary capital and skill for working the deeper or more difficult deposits of our older gold-fields be forthcoming an increase of our gold-yield can scarcely be expected." Such is the opinion of Mr. Harrie Wood, the experienced Under Secretary for Mines at Sydney. It is some consolation to reflect that gold-mining in India will not languish for want of capital.—*Madras Mail* 28th, March.

CINCHONA BARK.

The local agent of the New Zealand Loan and Mercantile Agency Company has forwarded us the following interesting extracts on Cinchona, received from its London Manager, and which will doubtless prove of interest to our readers.

"The cultivation of cinchona bark in various parts of the world has of late attracted considerable attention here, and in view of the possibility of its being exported from Fiji, we have endeavoured to procure some information on the subject for your guidance. You will find it embodied in the enclosed copy of letter addressed to us by Messrs. White, Binnie and Co., produce brokers, of this city, and the results of an auction held here on 30th ult., and set forth in the accompanying copy of the *Public Ledger* of

yesterday. We believe that the best variety of the "Quill" bark grown in Jamaica (under the direct auspices of the Government) is most successfully treated at an altitude of about 5,000 feet above the level of the sea, and that the first essential towards its healthy development is a dry well drained soil of good rich quality."

Extract from White, Binnie and Co.'s Circular:—

"There are no statistics to show the increase in the production of Bark in the East Indies (commonly called Cinchona Bark), the statistics in London comprising about South America and East Indies. The increase has however, during the last five years, been very great, and has been largely stimulated by the unexpectedly high prices realised in the London market, where three years since as much as 15s 6d was obtained for good Government grown quills. The market here has fluctuated considerably from time to time, but the consumption of sulphate of quinine is now so large that notwithstanding the large supplies of Bark, price of sulphate, which used to vary between 5s 6d and 7s per oz., has, during the last three years, averaged double that money, and is even to-day 11s per oz.

"Of the South American Bark lately imported, a large proportion is of very inferior quality, with a low percentage of quinine, whilst the East India is generally of superior quality and is greatly in favor with makers of sulphate.

"The unit is percentage of crystallised quinine sulphate which the bark contains, e. g., 1 lb. (7000 grains) contains 98½ grains or 1.41 per cent., at 1s 6d per unit=2s 1d per lb.

"A large admixture of alkaloid (Cinchonine) will depreciate the value and vary the price."

London, December 2, 1880.

[*Fiji Times*.

GOLD IN CEYLON.

The following is Sir Samuel Baker's reference to the first discovery of gold in Ceylon:—

It has hitherto been the opinion of most writers on Ceylon that the precious metals do not exist in the island; and Dr. Davy in his work makes an unqualified assertion to that effect. But from the discoveries recently made, I am of opinion that it exists in *very large* quantities in the mountainous districts of the island. It is amusing to see the positive assertions of a clever man upset by a few uneducated sailors. A few men of the latter class, who had been at the gold-diggings both in California and Australia, happened to engage in a ship bound for Colombo. Upon arrival, they obtained leave from the captain for a stroll on shore, and they took the road towards Kandy, and when about half-way, it struck them, from the appearance of the rocks in the uneven bed of a river, called the Maha-Oya, 'that gold must exist in its sands.' They had no geological reason for this opinion; but the river happened to be very like those in California, in which they had been accustomed to find gold. They accordingly set to work with a tin pan to wash the sand, and to the astonishment of everyone in Ceylon, and to the utter confusion of Dr. Davy's opinions, they actually *discovered gold*! The quantity was small; but the men were very sanguine of success, and were making their preparations for working on a more extensive scale, when they were all prostrated by jungle fever; a guardian-spirit of the gold at Ambepussé, which will ever effectually protect it from Europeans.

They all returned to Colombo, and, when convalescent, they proceeded to Nuwara Eliya, naturally concluding that the gold which existed in dust in the rivers below must be washed down from the richer stores of the mountains.

Their first discovery of gold at Nuwara Eliya was

on the 14th of June, 1854, on the second day of their search in that locality. This was found in the 'Vale of Rubies.' I had advised them to make their first search in that spot for this reason; that, as the precious stones had there settled in the largest numbers, from their superior gravity, it was natural to conclude that, if gold should exist, it would, from its gravity, be somewhere below the precious stones, or in their vicinity.

From the facility with which it has been discovered, it is impossible to form an opinion as to the quantity or the extent to which it will eventually be developed. It is equally impossible to predict the future discoveries which may be made of other minerals. It is well known that quicksilver was found at Cotta, six miles from Colombo, in the year 1797. It was in small quantities, and was neglected by the Government, and no extended search was prosecuted. The present search for gold may bring to light mineral resources of Ceylon which have hitherto lain hidden.

The minerals proved to exist up to the present time are gold, quicksilver, plumbago, and iron. The two latter are of the finest quality, and in immense abundance. The rocks of Ceylon are primitive, consisting of granite, gneiss, and quartz. Of these the two latter predominate. Dolomite also exists in large quantities up to an elevation of 5,000 feet, but not beyond this height.

CULTIVATION OF TOBACCO IN INDIA.

A report of the tobacco operations at Ghazipur and Pusa during the year 1879-80, by the Official Director of the Department of Agriculture and Commerce, N. W. P. and Oudh, had just been published, which shows that the enterprise of Messrs. Begg, Dunlop and Co. bids fair to command success. The firm have farms and machinery both at Ghazipur and at Pusa; but the most important part of their operations is carried on at the latter station, in the district of Darbhanga. Of the 1877-78 crop 29,993 lb. were exported, 25,247 lb. to England and 4,746 lb. to Australia. This was an experiment, and one which, so far as Australia is concerned, is not likely to be repeated, it being found that there was no market there for the cured leaf, as sufficient tobacco of the class is grown in the Colonies, and sells at the low price of 4d per lb. In England, however, the Indian tobacco met with a more promising reception. The market was very dull, and the average price of the tobacco sold was not higher than 3½d. per lb.; but some of the best leaf fetched as high as 5½d. per lb. The result is regarded as decidedly hopeful in this way, that American tobacco of average quality was being sold at the same time at similar rates; and the Indian tobacco was the result of the first year's curing, and was not so good as it might have been. The firm is now able to turn out a far better class of tobacco; so the question of the Indian competing successfully with the American article may be regarded as practically solved. The extension of the trade with England is not being pushed at present, however; the promoters of the industry contenting themselves with first developing a local trade in the manufactured article—smoking mixtures, cavendish, cigars, &c. The whole of last year's outturn, amounting to 163,000 lb. of cured tobacco, has been kept for manufacture at the company's works at Pusa. Cavendish, golden leaf, bright smoking mixture, dark smoking mixture, honey-dew, cigars, and cigarettes are all made under the superintendence of the skilled European curers and manufacturers employed by the company. The tobaccos are sold at prices varying from R. 1-8 per lb. for golden leaf to 7 annas per lb. for black cavendish. The increasing demand for the Pusa tobacco is shown by a statement of monthly sales commencing April, 1879, and ending

November, 1880. In the first month named the total quantity sold was only 223 lb., and in the last 7,620 lb. were disposed of. The description for which there is the greatest demand is black cavendish, large quantities of which are used by soldiers. The cigar trade, which was developed only in the year 1880-81, is increasing daily; and in the four months from August to November last upwards of 200,000 cigars and cigarettes were sold, valued at R3,000. As soon as the Indian market is satisfied, the present operations sufficiently consolidated, the establishment properly trained, and cultivation extended, the firm hope to be able to produce enough tobacco of good quality both to meet the Indian demand and to make regular and large shipments of leaf to England.—*Bombay Gazette.*

COFFEE LEAF DISEASE.

(From our Correspondent.)

Aberdeen, 10th March 1881.

A paper on coffee leaf disease by Mr W. Bidie was read at the last meeting of the Linnæan Society. Plants grown from Ceylon seed suffer most, while those trees of Coorg origin and growth are least affected. A system of "renovation pitting" has been successfully tried: pits being dug at short intervals, wherein after judicious pruning all the affected leaves are buried, and this precaution seems to check the spread of the disease, particularly among the Coorg coffee trees." In reference to the suspicion of Ceylon seed being affected, I may tell you, a friend of mine, who is an authority as a cryptogamist, has been devoting a good deal of time lately to microscopic examination of cereals, in view of embodying all evidence obtainable respecting the probability of fungi being carried and propagated from the embryo of the plant. He has found the embryos of cereals to be infested with the mycelium of fungi (of some kind or other), and extending his examinations to other seeds he found a like condition in the embryo of dates, and in that of Ceylon coffee. This fact, as far as I am aware, has escaped the observation of Ceylon scientists.

I had a call the other day from the Professor of Botany at the Aberdeen University, and had some talk with him about Mr. Schrottky's experiments. He has no faith of good resulting from that gentleman's work in Ceylon, as foreign matter introduced into the circulation of the tree of strength sufficient to kill fungi will certainly damage the tree. There is no single instance of fungi being cured by a like mode of treatment.

CHINCHONA CULTIVATION.*

Like all the books written by Mr. Clements Markham, this volume is a piece of excellent workmanship in every particular, full and accurate in detail and arrangement, lively and perspicuous in statement and narrative. For all general purposes it exhausts the subject and enables any person of ordinary intelligence to understand the steps which gradually led up to the beneficent results which have already flowed from the successful introduction on a large scale into India, and the cultivation there, of trees producing the Peruvian, or Jesuit's, bark, famous as the best and speediest cure for tropical and other fevers. It was in March, 1852, that the Indian Government first proposed officially to introduce, if possible, into India the most valuable species of the large family of trees

* "Peruvian Bark: A Popular Account of the Introduction of chinchona cultivation into British India, 1860-80." By Clements R. Markham, C.B., F.R.S., with Maps and Illustrations and Index. (London: John Murray. 1880.)

growing wild on the slopes of the Andes, in Peru, Ecuador, and Colombia; and the late Dr. Royle, the reporter on Indian products, did all in his power to further the design; but no real progress was made. Early in 1859 the subject was brought before Mr. Markham by Mr. Henry Deedes, of the Indian Office. For other scientific purposes Mr. Markham had already visited the chinchona regions of South America, and had become familiar with the people, and master of their languages. In March, 1859, Mr. Markham proposed a plan of operations and laid it, with an offer of his services, before the present Lord Derby, then the first Secretary of State for India under the system of government which the year before had superseded the old Court of Directors. On the 8th of April (1859) Mr. Markham's proposals were accepted, and he was duly commissioned to carry them into effect. Mr. Markham left England in December, 1859, for South America, taking with him Mrs. Markham, who, it was arranged, should remain at a point near the coast to conduct correspondence, &c., while her husband and his party explored the forests east of the Andes. The "fellow labourers" of Mr. Markham, as he calls them, were:—In the capacity of coadjutors, Dr. Spruce and Mr. Pritchett;—and as assistants, practical gardeners, Mr. Weir and Mr. Cross. Dr. Spruce was a Yorkshireman, born not far from the pleasant village of Stillingfleet, which has the honour to claim Mr. Markham himself as a native. Richard Spruce is from Welburn, near Castle Howard, and very early in youth distinguished himself by his knowledge of the botany of the romantic neighbourhood of that village. He had, like his leader, already visited South America. In collecting the grey bark trees of Huanuco the services were secured of Mr. Pritchett, who had been for some time agent of the Ecuador Land Company. John Weir was a practical gardener obtained from Mr. Veitch; and Robert Cross was an able and painstaking Scotchman from Kew. Mr. Ledger was also associated with the expedition. Of all these fellow-workers Mr. Markham speaks in terms of the highest praise; and we are ashamed to say that as regards each of them he has to utter bitter complaints of the shabby and unjust treatment they received at the hands of the Indian and the Home Governments. The details given by Mr. Markham leave no doubt that the recompense awarded to these men for all their perils, their attainments, and their success was emphatically paltry, and very far below the justice of their claims. Will the time ever come in this country when scientific labours, even the most distinguished, will not be estimated by the officials of the Government on a scale suitable only to a mechanic or a footman? There are titles, pay, and pensions in profusion for military and diplomatic services more frequently pernicious than useful; but the scientific discoverer or explorer is more likely to meet with contempt than recompense by the "department" he serves.

In the course of 1861, after encountering great hardships and no small peril in the South American forests, considerable supplies of the desired specimens were landed in England and India. For the interesting narrative of these hardships and perils the volume must be consulted. The region selected for the first chinchona plantations in India was that of the Nilgiris hills—the highest mountain range south of the Himalayas—situated in latitude 11 deg. 10 m. and 11 deg. 32 m. N., and longitude 76 to 78 deg. E., and affording conditions of climate suitable for the new cultivation. Outside India the cultivation has become successful and is assuming large dimensions in Java, Jamaica, and Mexico. During the eight years 1867-75 the Government of India imported a total of 46,000 lb. of Peruvian bark, at a cost of £160,000, or, say, an average of 70s. per lb. Besides the Government imports there was a private annual import

into India of 5,000 lb. of bark, making the total annual imports about 10,000 lb. weight, at an annual cost of about £40,000, or, say, 80s. per lb. The success of the Indian cultivation has already to a large extent put an end to this great outlay. The private cultivators of bark in Ceylon and India are already looking forward to the creation of a large market in China; in which country, by reason of cheapness and the superior quality of the article, it is expected gradually to supersede opium as a medicine in those vast areas of delta and swamp where rice is principally grown and from which fever is never absent. It is among the possibilities of a future not distant, that India may make some atonement to China for the evils of the opium trade, by substituting for the exports of that pernicious drug exports still more extensive of the bark and alkaloids of the Peruvian tree, which has the property of curing and preventing the most constant and fatal maladies of tropical countries.

Mr. Markham says with equal eloquence and truth that among the greatest of the benefits which this country can confer upon India is, by the aid of science and enterprise, to enlarge the field of useful products of which the diversified climates of the Peninsula are suitable. "By this means we shall leave behind us the most durable memorials of the benefits conferred by our rule. The canals and other works of the Moguls were in ruins before the English occupied the country; but the melons which the Emperor Akbar, the founder of the Mogul dynasty, introduced into India still flourish round Delhi and Agra." And Mr. Markham adds—but we trust with too small an appreciation of the stability of the Ganges Canal and the Vehar Reservoir—that, centuries after these mighty works have become, the one a river and the other a dry valley, the people of India will have cause to bless the healing effects of the fever-dispelling chinchona trees still covering the southern mountains with their luxuriant forests. We will complete the forecast by adding that in this distant time the hundred native castes and tribes of India will remember with reverence and gratitude the names of the two valiant Yorkshiremen, Markham and Spruce, and their fellow-labourers, as the men who accomplished their great work in the short space of twenty years 1859-1879. Mr. Markham gives reasons for spelling the word "chinchona" and not "cinchona," or "cinhona," as it was spelt by Linnaeus, and the altered spelling has raised a botanical dispute. The title "chinchona" is given to the bark tree as a memorial of the cure of fever by its means in 1638 of the Countess Chinchon, wife of the Governor of Peru.—*Pall Mall Budget*.

LEAF DISEASE IN COFFEE.—A correspondent, writing on Leaf Disease in Coffee, says:—"Something might be found out of the manner the Arabs treat the coffee plant. Mocha is the king of coffees—either by climate or treatment—perhaps it is that arid climates grow the best. There remains no doubt of the plant being perfection. Doctors and botanists may advise a good deal to counteract influences, yet Arabia is the starting point, because it gives the best. Dent's Concession in Borneo in its most arid parts should give next to Mocha. English coffee growers must beware that the Spaniards in Manila do not take to and surpass them in coffee growing. Anyone finding out the mode to dispense with fungus, I think must do so from Arabia. If anyone cannot be found here who has been in Mocha, by bringing one plant with fungus upon it, and taking it to Mocha in a week, perhaps he might find out the Arabs' secret, and from that add to his fortune in a treatise on the plant, and thus surpass those who cannot dispense with fungus. Of all the people who have gone to plant coffee, has one of them asked at Aden anything about it?"—*L. & C. Express*.

ARTIFICIAL POULTRY RAISING.

A prominent dealer in poultry, Mr. H. W. Knapp, of Washington Market, New York, gives a discouraging opinion of the probable success of chicken-raising by artificial means. He said recently when questioned on the subject:—

I went to France to study the matter, for if it can be made to succeed it will make an immense fortune, as it has already done in Paris. I was delighted at what I saw there, and the matter at first might seem to be so fascinating that I do not wonder that new men here are always ready to take hold of it. Even clergymen and actors are bitten with the desire to transform so many pounds of corn into so many pounds of spring chicken. The now successful manager, Mackaye, spent about a thousand dollars in constructing hatching machines and artificial mothers in Connecticut, but he found that the stage paid better, and his expensive devices may now be bought for the value of old tin. Enthusiasts will tell you that by the new discovery chickens may be made out of corn with absolute certainty. In Paris this has been done; but the conditions are entirely different here. There the land is valuable, and they cannot devote large fields to a few hundred chickens; the French climate is so uniform that the markets of Paris cannot be supplied from the South with produce which ripens or matures before that of the neighbourhood of Paris; the price of chickens is so high and labour so cheap that more care can be given with profit to one spring chicken than one of our poultry raisers could give to a dozen. Here we have plenty of land; the climate south of us is so far advanced in warmth, that even with steam we cannot raise poultry ahead of the South, and the margin of profit is so small that one failure with a large batch of chickens sweeps away the profits from several successful experiments. When persons wanted me to go into the project I declined, and was called an 'old fogey.' One man spent a fortune on the enterprise in New Jersey, and at first was hailed as a public benefactor. What was the result of all his outlay and work? He managed to hatch quantities of our chickens every February; but although he could fatten them by placing them in boxes and forcing a fattening mixture down their throats, he could not make them grow; they had no exercise; they remained puny little things, and another defect soon appeared—though fat, they were tough and stringy. The breeder sent lots of them to me, and they looked fat and tender; but my customers complained that they could not be young, for they were tough and tasteless, and that I must have sold them aged dwarfs under the name of spring chickens. It was found absolutely necessary to let them run out of doors as soon as the weather allowed it; and by the time that they were ready for market, the southern chickens were here and could be sold for less than these. The upshot of the business is that this breeder has sold out, and another man has now taken hold of a small part of his old establishment to try other methods of making it a success. As to raising turkeys in that manner, it will fail more disastrously than the chicken business. Size and weight are wanted in turkeys; and that reminds me, continued Mr. Knapp, that the newspapers ought to impress the country people with the necessity of improving their poultry stock; breeding in and in is ruining poultry; every year the stock we receive is deteriorating, and this is the cause. I could give you some striking examples from my experience of forty years in the business. Some years ago we poulterers thought that ducks were going to disappear from bills of fare altogether; they were tasteless, worthless birds, which people avoided. On Long Island a farmer made experiments in breeding with an old Muscovy drake, tough as an alligator, and the common

duck. The result was superb, and has changed the whole duck industry. If the farmers of Northern New Jersey, the sandy country best suited to turkeys, would bring from the west a few hundred wild turkeys, we should have an immediate improvement. I see no such turkey now as we had twenty years ago. The breast is narrow and the body runs to length; it is all neck and legs, and can be bought by the yard. Rhode Island sends us the best turkeys, but they are not what they used to be. If, instead of attempting to beat Nature at her own game, the rich men who have money to spend would devote it to better breeding, there would be an improvement. I do not yet despair of seeing immense farms wholly devoted to raising better poultry than we yet have.—*Home and Colonial Mail.*

NEW AND OLD PRODUCTS:

CEYLON LOW-COUNTRY REPORT.

LIBERIAN COFFEE; CACAO.

Western Province, 5th April 1881.

My last, in which I took a tone of dread for the life of the Liberian coffee plants in the field, was written on the day on which rain fell, and it was just in time, for a few days more would have settled a large percentage of them; as it is, a few have been scorched. 21 days is the measure plants of this size can stand, even when carefully protected from the fierce sun. Since the rain came the plants have been making rapid progress, but a fresh *clecking* of crickets have appeared. They have cut a few plants here and there, over the field, but they have settled most seriously to work on steep stony hillsides, of which there are several in the clearing, on which they have cut fully one-half within the last few days. The most of the plants so cut would grow again if not further interfered with, but they are always cut anew, when they develop a bud.

Nearly all the seed from Theobroma is up, and that from L. & Co. has three-fourths up in five weeks; that from C. S. & Co., that was sown a few days later, is just showing one here and there. I was much alarmed about the crickets in the sheds, when I found one morning twenty cut seedlings, within a few feet, but for a week past they have of their own accord entirely desisted from this work.

When the plants began to suffer from the drought I set all hands to improve the shade. The rain came just as the work was finished, and I set all hands to undo what they had been doing, and this is the third time the same thing has happened since Christmas. After a fortnight of dry weather the sun scorches the leaves, wherever exposed; after one heavy shower, the shade must be removed at once, else the leaves rot, and are riddled by minute insects, so that he who hopes to get up Liberian coffee in this climate needs to be ever on the alert. If, however, he once gets it up to 18 inches, his cares are over: in twelve months more he will have a tree six feet high with twelve pairs of branches, regularly graduated from two feet to two inches, and having several hundreds of fruits at various stages of development. As the best bunches of fruit are up to, and even over, 30, and 140 has been counted on 8 joints of a two feet branch, I begin to think the assertion that a single mature tree has given 30 lb. not such an awful cram after all. The author who gave currency to this statement, nearly 40 years ago, did not condescend to say whether the 30 lb. was in cherry, parchment, or marketable coffee—he left a wide enough margin for choice, so that with 600 trees per acre, and the crop reduced to 3 lb. of cured coffee, we have still 16 cwt. per acre. If some of the trees under my care make good their present promise four years hence, this

is by no means a wild estimate; with good soil to start with, and skilful treatment in the mean time.

CACAO.

I have heard of such wonderful estimates of the profits of cacao cultivation, framed by those who are just beginning in the low-lands of the Western Province, that I think a slight sketch of my own three years' experience may be of service to them. I may introduce myself as a planter of over forty years standing, with a wide and varied experience; but when I began cacao I knew no more of the habits of the plant than I had casually picked up from newspapers, and other publications, to which I had given no particular study: I had, therefore, almost a clean sheet to take my notes on.

It is just three years since I sowed my first seed, in bambu cylinders, filled with the best soil I could command. Most of them grew, and they were planted out, on land that had been trenched, rooted, and prepared for Liberian coffee nurseries, with the larger trees left as shade. Here they grew till the best plants were four feet high, and were getting their branches, which a belt that separated them from the clearing was cut down, and within a few days not a leaf remained on any of them. Some of them still live, and struggle to send out shoots from the stem, but the wind always defeats their efforts. The next batch of plants were put out, alternately with Liberian coffee, on land with a very easy incline to the west, the soil being a loose gravel, with much organic matter. This lot got on tolerably till the south-west monsoon opened, when they went the way of their elders. Those that remain alive are making a strong effort, but will no doubt be finished off by the wind, when it comes round to the S.W. Of course I have given up all attempts to establish a cacao field on that land.

On this place, I introduced 500 well-grown plants, in bambus, in July 1879, and before the end of that year not one in ten was left alive. They encountered three months of dry weather; they were cut by lizards and crickets; insects riddled the leaves; white ants cut the taproots, just below the surface; the wind stripped them; and now at the end of 21 months I have not 25 of the 500 odd remaining. In November 1879 I sowed the whole field at stake, and surrounded each plant with a basketwork cylinder from 15 to 18 inches high. On the portion of the clearing that faces the S.W. the whole of them died out within four months, and three-fourths of those on the eastern side followed. At the end of May, last year, I put down seed at all the failures, but dry weather set in immediately afterwards, and they never even germinated. Finally I put down nearly 10,000 seeds in baskets in September and October, one-fourth of which were cut by lizards and crickets, almost as soon as they came up, and above 1,000 were cut the very first night after planting in the field. At the end of November last year the whole clearing was fully planted. Now, in April, one half of the spaces are vacancies. The number of plants for the place is about 8,000. I have, first and last, used 25,000 seeds, and I have still upwards of 4,000 vacancies. My conclusion is, that, of all the plants I ever have had to deal with, the cacao is the most delicate, and has in this climate the most enemies. I by no means say that the evils to be encountered in getting up a field of cacao, in this climate, are insurmountable, for I have one field of ten acres, in which I have not at the end of five months absolutely lost ten per cent of my plants. I do not know whether cacao will, when more advanced, be able to resist the prevailing wind, on situations exposed to it, but, so far as my experience goes, it inclines me to the negative side of the question. In every situation that I have had to deal with, the young plant needs temporary shelter, but, so far as I have been enabled to observe, it is not

benefited by overhead shade, except when very young. I certainly have seen benefit from placing a jungle branch with the leaves on, over the basket shield in hot weather. This plant does not take kindly to a soil where sand or gravel are the prevailing ingredients; an alluvial flat, or a deep clayey loam, seems to suit it best.

White ants, I had always believed, touched no living plant, and it was only after obtaining the clearest evidence I admitted that the young cacao plant was an exception to the rule. It is over true a tale that they have destroyed tens of thousands in the low-country, and will destroy hundreds of thousands more before all the projected plantations are complete. I do not know whether the gentleman who recommended steeped aloe leaves was in earnest. The aloe is by no means a common plant in Ceylon, and is a very slow grower, and nothing can be clearer than the utter impracticability of the plan where there is not an aloe plant within ten miles, or a drop of water to be found on the surface of 100 acres. As to the other enemies of this plant, the lizards and crickets breed most freely in a loose dry soil, and do not much affect clays, gravels, heavy loams, &c. There is no doubt that allowing the weeds to take and keep possession of the soil would moderate the ravages of both crickets and lizards on the cultivated plants, by affording them a wider field of choice, but it is an unsettled question, whether the gain in one direction might not be balanced by a loss in another; so far as coffee is concerned, there is no question about the action of weeds. For myself, as the father of monthly hand-weeding on coffee estates, I will not be the man to make the experiment of burying young cacao plants in dirt, in the hope of benefiting them thereby. Seed must now come rapidly down in price, with so many trees coming into bearing at so many points of the country, and there will be little difficulty in maintaining nurseries at a moderate cost, to supply vacancies as they occur.

As to the minor insect enemies, I have observed about half-a-dozen species of caterpillar feed on the leaves, and several species of minute beetles; then a small species of black ants bring the spawn of the white bug and establish it on the tender shoots of a thriving plant, but it generally succeeds in dismissing its unwelcome guest in a few days. Besides all those reptiles and insect foes, there is a large percentage of failure, for which I am still unable to account; a plant of eight or ten inches suddenly ceases to grow, and sometimes remains for months, not dead, but sickly, and then suddenly dies off. On examination, there is no sign of insect action, either on root or stem. If this is an effect of dry weather, then why are other less advanced plants not affected in the same way? I have had an ample opportunity this season of studying the effects of drought on the young coffee plants: all that were planted in the same kind of soil, and had grown equally, showed the same day the same signal of distress on the same day, but cacao shows no such uniformity of constitution; a plant that has been cut when very small will fight to establish a fresh stem, through the whole dry season, and probably with success; while its next neighbour, that has met with no check, has been growing freely till it is above a foot high, suddenly drops its leaves; sometimes renewing its growth when rain falls, but more frequently going off altogether, even after the advent of rain. I would be glad to learn whether this is common in the experience of other cacao planters, or if it is a special dispensation, affecting the soil and climate which I have to deal with only. The largest plant I have found the white ants dispose of was three feet high, but I have had cases of sudden death, of plants quite as advanced, for which there was no apparent cause. One plant that some time ago I remarked as a specially thriving one I found this morning with

all its leaves withered. Finding it was quite dead, I tried to pull it up for further investigation, but it retained too firm a hold of the ground for my strength. In February every plant drooped on the 21st dry day except the very smallest; in March it was the 25th day on which they began to complain. If therefore what I have stated of the cacao be the effect of drought it would appear that every cacao plant has its own constitution, and that while one gives up in a week another of the same age and treated precisely the same holds out three or four weeks and rapidly responds to the first shower. Mr. Fraser tells us that in Trinidad it is only the larger seeds in the middle of the pod that are used for reproduction. There may be something in that, but we who have been paying a cent each for our seeds naturally grudge doubling the cost by rejecting any.

NORTHERN QUEENSLAND.

(From the "Mackay Standard.")
COFFEE.

We could not perhaps do better than reproduce a few extracts from an article which appeared in a former issue of the *Standard* on this subject — "Millificent, the property of Mr. Costello, is situated at about twelve miles distance from town. At the back of a compact homestead the cultivation begins, and here are found 25 acres of coffee, two or three years old in vigorous growth. It is growing on a spur running north from the mountain. Half the coffee is on the east side, the other on the west side of this spur. The land is the usual basaltic scrub, and we noticed that if possible the coffee looked more flourishing where the stones were most plentiful. William Sabonadiere in his well-known work "The Coffee Planter of Ceylon" sums up the characteristics of the soil most suitable for coffee culture as follows:—"A dark chocolate colored soil mixed with small stones under ledges of rock and bestrewn with boulders of granite." On Mr. Costello's selection these characteristics are found to perfection. The three-year-old trees have a fair crop of young coffee on them, and the two-year-old trees have already a very promising maiden crop. The trees are planted 6 x 8 feet apart, and the older ones are already topped to four feet in height. Although the entire crop is in a most flourishing condition those situated on the west side of the range are in a more vigorous condition than those on the east, being more sheltered from the force of the E. S. gales that the district is occasionally liable to. From the summit of the hill among the coffee one of those magnificent views for which the north side is so justly celebrated spreads out before us. To the east, like a panorama, the waters of the South Pacific glistening in the sunshine, and dotted with innumerable islands of verdant green, to the west and south the dense masses of the coast range and scrub land slopes of Blackfellow Mountain tower high above us. We visited Mr. Costello's coffee nursery where we found many hundreds of healthy young coffee plants ready for planting out when the proper season arrives. Highly gratified with our visit we started on our return after congratulating Mr. Costello upon the pluck displayed by him in his endeavor to introduce a new industry into the district. While on this subject we desire to draw the attention of farmers to the advisability of following Mr. Costello's example. The growth of coffee at Mackay is no longer experimental. The machinery required is inexpensive. The families of many of our farmers could do most of the crop gathering and the demand for coffee in the colonies will absorb all that can be produced for many years to come, while the duty of 4s. per lb. on imported coffee will offer that amount of protection to our producers until the Queensland

market is supplied with Queensland grown coffee. That Mr. Costello may be considered the pioneer of coffee growing in Mackay does not admit of a doubt, and we trust he may reap the reward which he so justly deserves for his enterprise."

COCOA NUTS.

Whether it would be profitable to grow these on account of the copra we are doubtful, but there is a steady demand for the nuts in the South which will for some years render their growth a paying speculation. In this connection we may with propriety take the following extract from the columns of the *Australasian*. It forms, part of a special report upon this district which appears in that journal. "Barnes' garden is the sight of Mackay, and a very interesting example of the power of industry and perseverance, it is. Many years ago Mr. Barnes took up a selection on a tract of land that was little better than a salt swamp. Twenty acres of this have gradually been formed into the finest fruit, vegetable, and flower garden in Australia. Mr. Barnes supplies the whole of Mackay. He has reared 1,200 cocoa-nut trees, besides great numbers of apple, peach, and other English fruit trees, and bananas and date palms. He is famous for the enormous size of his pine-apples. Vegetables of every description are produced. A profusion of splendid flowers completes the beauty of a very remarkable spectacle. Bearing with us substantial proofs of the excellence of Barnes' garden, we rejoined the steamer which proceeded on her way through the most charming of Queensland waters."

DATE COFFEE.

(Smith to Jones,*)

I hope 'twill ne'er be my fate, Jones,
To drink that stuff composed of date stones.
I never heard that juice of dates
Consoles, cheers or invigorates.
You might as well scrape mud from gutter,
And dub it "best prime English butter,"
As call *this* coffee: oh, 't is awful
That such a swindle should be lawful.
Some say 't is made of rotten figs, sir,
If that's the case then "dash my wig," sir,
Your system 't will completely flummock
When you convey it to your stomach.
Others declare 't is made of raisin,
Which statement seems to me 'sazin';
For if you'll list to me a minute,
I'll shew there is no *raison* in it.
If made of rotten dates or figs, sir,
'T is only fit for feeding pigs, sir,
Then throw it to your swine and boars, or
Cocks and hens, but don't buy more, "sorr."
We planters of this spicy island,
Whose business 't is to till and buy land,
We cultivate the coffee berries
Somewhat resembling English cherries.
True coffee can't be imitated,
'T were well to call ours "anti-dated,"
To shew that difference there be, sir,
'Twixt tweedle-dum and tweedle-dee, sir.

SMITH.

COLOMBO GRAPES.—Mr. P. T. Slema Lebbe has been good enough to send us a bunch of grapes the produce of his cultivation which was referred to in a paragraph in the *Jaffna Patriot*, copied into our issue of last evening. He informs us that the bower yielded over 120 lb. Having tasted the grapes we can testify that in the present hot weather they are very refreshing. The bunch sent us is 6 inches long and weighs 7 oz.

* The latter (Jones) has purchased a packet of "Date Coffee:" hence Smith's remarks.

*(From April 10 to April 16.)***COFFEE MIXTURES AND ADULTERATIONS.**

A planting correspondent in the low-country writes:—

"There appear to me two things that the Planters' Association ought to do about the Date Coffee:—

"1st.—Obtain a legal opinion, as to whether an injunction could not be got to prevent the Company from using the word 'coffee,' in describing their preparation of date stones. If they produce a beverage, that is cheap, palatable, wholesome, and nourishing, it is quite able to stand on its own bottom, and make a name for itself, but, whatever it may be, it is not coffee, and has no right to usurp a name which belongs to an article costing much more in production, and the value of which rests on qualities, which no cheaper produce can lay claim to. The English Parliament has legalized the sale of a mixture of chicory, because the grocers of Great Britain are a more important factor in elections than coffee planters, but the same privilege is certainly not extended to date stones, and the grocer interest is not likely to avail the Company, as it will naturally prefer the preparation it can mix at its own discretion.

"2nd.—A memorial to Mr. Gladstone, shewing that this new commodity avowedly comes into competition with a whole group of duty-bearing products, and praying that date stones may be placed on the same footing at the custom house as the tea, coffee, cacao, and chicory, it proposes to displace.* For once in a way, the coffee and chicory planters are in the same boat: a common foe should lead them to the same platform to fight for a common interest. The tea and cacao planters are less directly interested, but if this Company succeed in creating a taste for their trash, it will more or less affect the whole group, especially when the genuine commodities are loaded with a customs duty, and the spurious imitation enters free. The Company seem to be moving heaven and earth to push their wares on the markets; while the planters sit idly by, to watch but never act. We can have no hope of checking to any appreciable extent the fraudulent practices of British trading, which a high authority has declared to be the legitimate outcome of free trade, but when those practices touch our own interests at a vital point, nothing should be left undone that may possibly tend to our protection."

Our correspondent, and many more of our readers, will be glad to learn that the Chairman of the Planters' Association has taken up the question of memorializing the home Government on the subject of coffee adulteration and the sale of coffee mixtures, and that a result long pressed for in these columns will now be attained. We take it for granted that the draft memorial submitted by Mr. Wall to a Subcommittee of the Planters' Association, after any needful amendment, will be unanimously supported throughout the country. We trust the Chamber of Commerce will either make it their own or take independent action to endeavour to secure the same end, namely, the restriction which the most ordinary fair play calls for in the case of the retail sale of coffee mixtures in the United Kingdom. We want both the local bodies to send home a petition annually until the present grievance is redressed. Coffee alone among colonial produce is placed at the serious disadvantage of having all kinds of legalized, but

* It was expressly stated that duty is paid on the date stones.—Ed.

abominable, mixtures sold under its name in the United Kingdom. We do not see why the prohibition of all such mixtures should not be asked for. True, chicory and the trash of "dates" which is to be used for coffee pay the same customs duty (14s per cwt.) as the fragrant berry, but that is no safeguard against the most rascally deception which is openly and almost avowedly practised on the mass of the consumers. The working and even the lower middle classes are unable to protect themselves in buying the cheap and attractive coffee mixtures, so neatly and conveniently assorted. Then by degrees their taste becomes vitiated, until real coffee would positively be a strange and unpleasant drink to them. Chicory or some other powder they must have, and it becomes possible to palm off upon them 90 per cent of some wretched stuff to 10 of ground coffee. How is it to be wondered that the consumption of coffee in the United Kingdom should have gone back steadily, while tea has so marvellously increased, under these circumstances? Our Handbook shews that the consumption of coffee in the United Kingdom was 16,730 tons in 1847 against only 14,540 tons in 1880; while the consumption of tea in the same period has quintupled, the increase alone being equal to 72,500 tons. Forty years ago, in fact, coffee was drunk in the mother-country to the amount of fully 1½rd lb. per head of population, while now the ratio is '09 lb. Tea, on the other hand, from 1½rd lb. has gone up to nearly 6 lb. per head of population! Can any stronger evidence be required by Mr. Gladstone and his colleagues of the injurious effect of the iniquitous "Order of Council" which sanctions the sale of coffee mixtures? If it be the wish of the British Chancellor of the Exchequer and his Lords of the Treasury to suppress the consumption of coffee altogether in the United Kingdom, let them say so; but surely the present system of depraving the public taste ought to be stopped in the interest of everybody concerned.

Whether, however, the Home Government will consent to stop the sale of chicory and date mixtures of coffee or not, there is one reform which, if put as an alternative in the Ceylon Memorial, it seems to us, cannot possibly be refused at this time of day. We refer to the declaration on the label required on such mixtures of the proportions of each substance which they purport to contain. If this is done, it will open the eyes of the consumers to the small quantity of coffee they are really receiving in their mixtures, and, moreover, it will enable a check to be put on coffee, as on other, adulterations; for, should the proportion of coffee be found less on analysis than is declared, the retailer can, of course, be punished. Most heartily do we commend this movement to the support of planters and merchants. We have always thought it a reproach that the agitation commenced by Mr. Leake was not continued by his successors in the Association. Surely public men in Ceylon do not require to be told that here, as in the old country, if a grievance of long standing is to be redressed, the efficacious mode of action is that which has been made memorable in Anti-Slavery, Reform, Free Trade, and so many more legislative victories, namely Agitate, AGITATE, AGITATE!

THE INDIA-RUBBER ENTERPRISE.

Very great confidence is expressed in the future of the Ceylon Rubber enterprise. Not only does the growth of plants exceed all expectation, but the resulting produce is almost certain to be valuable if one may judge by what is said of rubber taken from other trees either indigenous or introduced years ago into Ceylon. We learn that a sample of rubber taken from a "Ficus" in the Matale district and sent to a London broker has been reported on most favourably as very suitable for commercial purposes, and worth 2s 3d per lb. All reports seem to agree that the demand is practically inexhaustible, provided rubber could be supplied a little more cheaply than at present, so many are the new as well as existing uses to which this product can be applied in British art, manufacturing and scientific departments.

On the other hand, the profitable nature of the cultivation of rubber trees to the Ceylon planters has been challenged for the following reason. It has been said that Ceara rubber trees to do them justice ought to be planted about 20 feet apart. That would give no more than a hundred trees to the acre; but it is felt that at least 175 trees can safely be planted. The yield of rubber per tree has been calculated at four ounces of marketable produce per tree per annum. This would amount to say 44 lb. of rubber per acre, which, at present prices, might be considered the equivalent of £5 gross. No great fortune to be made out of this amount certainly, even though, as is pointed out, the cost of cultivation and collection must be very small, a mere trifle. No new product, it may be said, leaves so small a margin as this one, if the yield of four ounces per tree is a fair estimate. It is on this point, however, that we require further information.

CEYLON TEA IN AUSTRALIA.

Our morning contemporary and a correspondent of his are rather sanguine in estimating the profit on the sale of Ceylon tea reported from Melbourne by last mail. Fault is found with us for speaking of it as "a poor sale." Of course we were contrasting the minimum 7d per lb. with the minimum of previous sales. Nevertheless, the average for nearly 4,400 lb. being 1s 2½d per lb., we are free to confess the sale was not so poor as we supposed. But it is a mistake to consider that all is profit between the rate at which the tea is delivered in Melbourne and the sale price. What about Melbourne charges? We have heard complaints that the charges on tea by agents "down South" are a caution and enough to run away with most of the profit on sales realizing no more than the one under notice. The rate of commission alone in Australian ports seems to be 7½ per cent against 2½ in London.

We most fully believe in the future of the Tea enterprise in Ceylon. We have said already, and we repeat the statement with the utmost confidence, that we can beat both Northern and Southern India in cheapness of production, while the average quality after further experience in preparation ought to be fully as good. Mr. Hay, of Dolosbage, an old Darjeeling planter, looks on a steady return of 400 lb. per acre per annum of tea as almost certain, and he is confident of placing the produce "f. o. b." in Colombo harbour at a rate nearer to 40 than to 50 cents per lb. There can be no doubt, therefore, that if care is taken to prepare tea suited to the Australian market, Ceylon should secure a full share of the business, and realize an average price for its tea nearer 1s 6d than 1s 2d per lb. The former rate after the deduction of all charges would leave a very handsome profit.

SIR SAMUEL BAKER ON BEES IN CEYLON.

If he has not already seen the book—and we think not—Mr. Benton will be interested in what the great hunter and keen observer, Sir Samuel Baker, has to say, in his "Eight Years in Ceylon," on bees—

These people (in the eastern jungles,) lived upon sago cakes, pumpkins, wild fruits, and berries, river fish, and wild honey. The latter is very plentiful throughout Ceylon, and the natives are very expert in finding out the nests, by watching the bees in their flight, and following them up. A bee-hunter must be a most keen-sighted fellow, although there is not so much difficulty in the pursuit as may at first appear. No one can mistake the flight of a bee *en route* home, if he has once observed him. He is no longer wandering from flower to flower, in an uncertain course, but he rushes through the air in a straight line for the nest. If the bee-hunter sees one bee thus speeding homewards, he watches the vacant spot in the air, until assured of the direction by the successive appearance of these insects, one following the other nearly every second in their hurried race to the comb. Keeping his eye upon the passing bees, he follows them, until he reaches the tree in which the nest is found.

There are five varieties of bees in Ceylon; these are all honey-makers, except the carpenter bee. This species is entirely unlike a bee in all its habits. It is a bright tinsel-green colour, and the size of a large walnut, but shaped like the humble bees of England. The mouth is armed with a very powerful pair of mandibles, and the tail with a sting even larger and more venomous than that of the hornet. These carpenter bees are exceedingly destructive, as they bore holes in beams and posts, in which they lay their eggs, the larvæ of which, when hatched, feed upon the timber.

The honey bees are of four very distinct varieties, each of which forms its nest on a different principle. The largest and most extensive honey-maker is the 'Bambra.' This is nearly as large as a hornet, and it forms its nest upon the bough of a tree, from which the comb hangs like a Cheshire cheese, being about the same thickness, but five or six inches greater in diameter. The honey of this bee is not so much esteemed as that from the smaller varieties, as the flavour partakes too strongly of the particular flower which the bee has frequented; thus in different seasons the honey varies in flavour, and is sometimes so highly aperient that it must be used with much caution. The wax of the comb is the purest and whitest of any kind produced in Ceylon. So partial are these bees to particular blossoms, that they migrate from place to place at different periods, in quest of flowers which are then in bloom.

This is a very wonderful and inexplicable arrangement of Nature, when it is considered that some flowers, which particularly attract these migrations, only blossom once in 'seven years.' This is the case at Nuwara Eliya, where the nilloho induces such a general rush of this particular bee to the district, that the jungles are swarming with them in every direction, although during the six preceding years hardly a bee of the kind is to be met with.

There are many varieties of the nilloho. These vary from a tender dwarf plant to the tall and heavy stem of the common nilloho, which is nearly as thick as a man's arm, and about twenty feet high.

The next honey maker is very similar in size and appearance to our hive-bee in England. This variety forms its nest in hollow trees, and in holes in rocks. Another bee, similar in appearance, but not more than half the size, suspends a most delicate comb to the twigs of a tree. This nest is no larger than an orange, but the honey of the two latter varieties is of the finest quality, and quite equal in flavour to the famed 'Miel vert' of the Isle de Bourbon, although it has not the delicate green tint which is so much esteemed in the latter.

The last of the Ceylon bees is the most tiny, although an equally industrious workman. He is a little smaller than our common house fly, and he builds his diminutive nest in the hollow of a tree, where the entrance to his mansion is a hole no larger than would be made by a lady's stiletto.

It would be a natural supposition, that so delicate an insect would produce a honey of corresponding purity, but instead of the expected treasure, we find a thick, black, and rather pungent, but highly aromatic, molasses. The natives having naturally coarse tastes and strong stomachs, admire this honey beyond any other. Many persons are surprised at the trifling exports of wax from Ceylon. In 1853, these amounted to no more than one ton.

Cingalese are curious people and do not trouble themselves about exports; they waste or consume all the bees' wax. While we are contented with the honey, and carefully reject the comb, the native (in some districts) crams his mouth with a large section, and giving it one or two bites, he bolts the luscious morsel and begins another. In this manner immense quantities of this valuable article are annually wasted. Some few of the natives in the poorest villages save a small quantity, to exchange with the travelling Moormen for cotton cloths, &c., and in this manner the trifling amount exported is collected.

During the honey year at Nuwara Eliya, I gave a native permission to hunt bees in my forests, on condition that he should bring me the wax. Of course he stole the greater portion but nevertheless, in a few weeks, he brought me seventy-two pounds' weight of well-cleaned and perfectly white wax, which he had made up into balls, about the size of an eighteen pound shot. Thus in so short a time one man had collected about the thirtieth part of the annual export from Ceylon; or allowing that he stole at least one half, this would amount to the fifteenth.

MR. BENTON ON BEE-CULTURE.

Of the importance of Bee culture, Mr. Benton has given us a new idea by the fact he learned in Java that wax is imported into Netherlands India, chiefly from Holland, to the annual value of two millions of rupees. The wax is chiefly used in dying the sarongs and other cloths of the people.

We call attention to the following interesting paper by Mr. Benton entitled

A PEEP INTO A BEEHIVE.

Light a piece of rotten wood or a roll of cotton rags and blow a few whiffs of smoke among the bees, then rap several times on the outside of the hive with a light stick and wait a few minutes for the bees to fill themselves with honey. A very little smoke will alarm the bees and with the drumming cause them to fill their sacs with honey. *When gorged with honey or liquid sweets, bees will not sting unless forced to do so.* Some poor chap may have failed in getting sweetened up, so, on opening the hive, the cluster may be sprinkled with sweetened water. This they consider a great treat and by the time they have disposed of it are as harmless as so many flies. The buzzing which they make shows that they are as good natured as a company of fat aldermen just after dispatching a roast turkey at some friend's house. The combs may be taken out and handled just as you please, and the bees brushed and scooped about with little danger.

Three classes will be found to constitute a prosperous colony of bees during the summer season: A fertile queen, a few hundred drones and about twenty for thirty thousand workers.

The queen is the only fully developed female in the hive. The supervision of the hive and the laying of eggs is her office. She lays during the summer season from two to three thousand eggs each day.

A fertile queen is about three-fourths of an inch long, has short wings, a slim, finely tapered body, and in the common bees, is a deeper black in color than the workers. The Italian queen has no yellow bands crossing the body, but is of a golden yellow color. The cells in which queens are produced are conical in shape and resemble a peanut in appearance. They usually project downward from the edges of the combs. About sixteen days elapse from the time the egg is laid until it comes forth a perfect queen. Five days after hatching, if pleasant, the queen flies out to meet a drone and pair. After pairing she returns to the hive and rarely leaves it during her life unless she is accompanied by a "first swarm." She lives four or five years but is not usually very valuable after her third year. If the queen be taken from a colony during the working season, the bees are thrown into great confusion, but they soon construct queen cells, place an egg or a larva in each, supply it with royal jelly, (the food for the queen larvæ) and thus cause it to be developed into a queen. Upon this one natural principle depend all of the various methods of increasing colonies by dividing them into parts and allowing each part to form a separate colony.

The drone bee is stouter and larger than either the queen or worker and similar to the queen in color. They appear in April or May and usually disappear during August. They have no sac within their bodies for carrying honey, no pollen-baskets on their legs and are provided with a sting, consequently they are unable to assist in the labors of the hive.

The drones are the male bees and appear in the hives about the time young queens are being reared in order to impregnate them. When they have fulfilled this office they are then destroyed by the workers. But one drone is needed to impregnate each queen, but as bees (and nearly all winged insects) pair while on the wing and colonies in a state of nature are isolated, many males are produced that impregnation may be accomplished before the queen, in roaming about, meets with any accident.

Drones are produced in twenty-five days from unimpregnated eggs placed in large sized cells.

The Worker Bees, well known to every one, are undeveloped females having a sac within the body for carrying honey to the hive and baskets on the hinder pair of legs for carrying pollen—the yellow dust of flowers—which they feed to the young. Wax from which comb is built, is secreted by them under the scales of their bodies. It is secreted from honey the same as animals secrete fat from the food they eat. Eighteen or twenty pounds of honey are required to produce one pound of wax, hence, if honey be taken out and the combs returned to the bees a great saving is made. Propolis or "bee glue" is a substance gathered by the bees from the trunks of trees, and is used in stopping all crevices in the hive and in varnishing the inside surface. About twenty-one days is the time required to produce workers from the eggs. The worker cells are small and when capped do not extend beyond the surface of the comb as do the capped drone cells. During the first two weeks of their existence they work inside of the hive taking care of the brood, etc. The workers live about two or three months during the honey season and from six to nine months at other times. As they drop off during summer their places are supplied by others, so that a whole colony, with the exception of the queen, is changed several times in a season. This is shown by substituting for a black queen a fertile Italian queen. The young bees produced will have the yellow bands and in a short time the whole colony will be entirely changed.

A whole volume might be written about these wonderful little workers.

Ovid, Michigan.
--American Paper,

F. B.

JAMAICA CINCHONA BARK.

Mr. Morris sends us sheets of the *Jamaica Gazette* containing the account sales of 180 bags of bark from Jamaica sold in London on 30th November 1880, together with a memorandum by himself on the results of the sale. These are summarized as follows:—

Species.	Gross Weight.	Deduction for Sample, Moist. &c.	Net Weight.	Average Price for all multiples.	Total amount realized.
	lb.	lb.	lb.	£ s. d.	£ s. d.
Crown bark, <i>C. Officinalis</i>	7,791	930½	6,860½	0 5 6	1,889 17 7
Red bark, <i>C. Succirubra</i>	6,314	801½	5,512½	0 3 1½	886 13 2
Yellow bark, <i>C. Calisaya?</i>	292	46	246	0 3 3	40 1 5

Total...14,397 1,778½ 12,618½ 0 4 5 2,796 12 2

In explanation of the difference in price of this consignment as compared with the former one, the brokers write:—

"The reduction in price upon some of the marks as compared with previous consignments arises from the market having fallen 1s. to 1s. 2d. per pound; and also quinine is now offering at 10s. 6d. to 11s. per ounce, whereas in August last, (when the last consignment was sold,) the price of quinine was from 12s. 8d. to 13s. per ounce."

This bark was all from trees blown down or damaged by the hurricane of August last, and prepared so expeditiously that the whole was ready for shipment within six weeks from that occurrence. Sun heat alone was used for drying, Mr. Morris remarking on the superiority of this to drying in sheds. The qualities and prices of the shipment are shown in detail in the following table:—

Marks and Kinds.	Weight.	Rate per lb.	Amount.	Weight.	Total Amount.
	lb.	s. d.	£ s. d.	lb.	£ s. d.
Crown Bark, <i>C. Officinalis</i> .					
No. 2 Root bark	662	7 8	238 8 8		
" 1 " "	52½	7 0	18 5 9		
" 1 Trunk "	790	7 2	283 7 1		
" 2 " "	388	5 6	106 14 0		
" " "	3,902½	5 5	1,056 19 10		
" " "	399½	5 4	100 9 4		
Twig " "	542½	2 4	63 6 5		
Garblings " "	163½	2 0	16 6 6	6,860½	17 7
Red Bark, <i>C. Succirubra</i> .					
No. 1 Root bark	188½	3 8	34 11 2		
" 2 " "	360	3 2	57 0 0		
" " "	873	3 1	134 11 9		
" 1 Trunk "	320	4 0	64 0 0		
" 1 " "	1,620½	3 11	317 6 0		
" " "	617½	3 2	97 15 5		
" " "	350½	3 0	52 12 3		
Twig " "	684½	1 1	37 1 7		
Garblings " "	268½	2 11	42 0 9		
" " "	209½	2 10	29 14 3	5,512½	13 1
Yellow bark, <i>C. Calisaya?</i>					
No. 1 Root bark	22½	4 2	4 12 9		
" 2 " "	58½	3 4	9 15 10		
" 1 Trunk "	58½	4 5	12 19 6		
" " "	35½	4 2	7 6 10		
" " Twig "	71	1 6	5 6 6	246	40 1 5
					12,618½ 2,796 12 2

The average price for officinalis was 5/6 per lb. and of red bark 3/1½, against 6/7 and 3/1½ for the previous consignment, but, if the fall in the market be taken into account, it will be seen that the relative prices have been maintained. The average price of the whole consignment was 4/5, being a fall of only

3d on the previous one. Mr. Morris quotes from *Colonies and India* a statement showing that the Jamaica red and crown barks went higher than the Ceylon and Indian, but whereas all the former bark was sold a good proportion of the Ceylon was withdrawn. At the end of his memorandum Mr. Morris states that the bark sent as *C. Calisaya*, but which Mr. Morris always considered as a hybrid has now been proved to be so, and will in future be sent on its own merits as the produce of the "hybrid variety." It realizes a better price than the red bark, and if it will grow at lower elevations than the crown its cultivation will be extended.

COFFEE MIXTURES AND ADULTERATION

We cannot believe that the Committee of the Chamber of Commerce will persist in refusing to join the Planters' Association in memorializing the home Government on this subject. The question is one which excites a great amount of interest throughout the country and estate proprietors will certainly feel that their Colombo Agents care little about their affairs if they decline to meddle in this matter. A correspondent writes:—

"I cannot but feel that we owe it as a duty, alike to the Government and to the coffee planters, to show how the prevalent practice of adulteration and admixture has affected the consumption! We had no such facts to show when previous representations were made. We could then plead the *unfairness* of the practice, and express a belief that the event of an increase of consumption *might* be due to this cause. But now, the further development of the evil, and of its formal though qualified legalization, prove clearly to have caused a declension of serious amount when increase ought surely to have taken place. If, then, it be granted that it is *proper* to point out the injurious effects produced by the practice, how could we consistently avoid asking for its prohibition? It seems to me that after pointing out the unfairness of a practice and its injurious consequences, we should simply stultify ourselves if we were *not* to ask for this manifest righting of a wrong! I believe that since the exposure of so much sophistication of tea from China the public mind has been much stirred, and the evil of adulterations generally has become much more fully recognized at home. Apart from the bugbear of *date coffee*, I think this time is opportune for such a representation as that contemplated by the draft memorial. I think we might well hope to get the order in Council amended in so far as necessitating a statement of the *proportions* of such mixtures as bears the title of "coffee mixtures."

CEYLON TEA.

2 Great Tower Street, London, 12th March 1881.

DEAR SIR,—We had a sample submitted to us recently of Ceylon tea the produce of the Sembawattie Estate, Yakkdessa, and we are glad to notice a marked improvement in leaf and liquor.

The leaf is desirable, being blackish, fairly twisted and mixed with gold tip; the liquor, although lacking the fullness of some of the fine Darjeeling marks, is brisk and pungent. With care in the manufacture we believe this could be obtained, and the result would be a really valuable tea.—Yours faithfully,

GEO. WHITE & Co.

THE WAY TO CATCH COCKCHAFERS at night, according to Mr. H. Wright, is to hang a common estate lantern in a good-sized tin, at the bottom of which is a sufficient quantity of kerosine oil to kill the beetles, which, attracted by the light reflected from the tin, will precipitate themselves into the trap.

Correspondence.

To the Editor of the Ceylon Observer.

LIBERIAN COFFEE PLANTS.

7th April 1881.

DEAR SIR,—A very interesting article appeared in one of your issues regarding the use of seed from trees the flowers of which have been *self-fertilized*. It is pretty evident that leaf disease does not arise from any peculiar weakness of the coffee tree, but in independent of the injury and loss from the effects of leaf disease, the coffee tree has been allowed to degenerate, and this is probably one cause for young estates, in even choice virgin soils, yielding so poorly as compared with young clearings of olden times. It was a very common practice as soon as one estate was opened to plant out the next estate or clearing with plants grown from seed gathered from the maiden crop! It will be as well for those growing Liberian coffee to see that their plants are from trees a few years old—or still better grown from imported seed. In the face of all known rules and principles of planting and for the sake perhaps of a few rupees saved, a very bad practice is at the outset carried on and evil results must follow.

The rapidity with which plants from seed picked ripe and put into nurseries a few days after, is no proof that they are first chop. If the seeds are allowed to get partially dry and then put out, they will come up not "like beans," a thing most undesirable, but gently and with a firm appearance. Imported seed, when carefully packed, give a sufficiently fair result, and as plants from seed picked from trees grown on a *foreign* soil should be *treasured*.

AN OLD COVE

GOLD-PROSPECTING IN CEYLON:—TESTS, AND LOCAL EXPERIENCE.

Nuwara Eliya, April 11th, 1881.

DEAR SIR,—If your correspondent "Sore Fingers" will digest the "black sand" in dilute *nitro-muriatic acid*, decant it carefully and add a few drops of a solution of *proto-sulphate of iron*, he will readily ascertain the existence of gold by its being precipitated in a metallic form.

The dilute *nitro-muriatic acid* may be composed of 1 part *muriatic acid*, 2 parts *nitric acid*, 2 parts *water*.

The vessel containing the subject of the experiment should be placed in warm water.

The simplest way, however, is to wash the sand in a small pan with sloping sides and a flat bottom, passing it off gradually with the water, when, if the operation is conducted skilfully, whatever gold there may be will remain in the angle of the pan.

With regard to the "black sand" in question, it is very abundant in this neighbourhood, being found in streams and on and below the surface in every direction. I have hitherto found no gold with it, but this is not a thing to be surprised at, for gold is four or five times heavier than the sand and would naturally seek a much lower depth. If found together it would be owing entirely to some local circumstance, such as a light soil resting on a bed of clay or rock, or in watercourses where some rock or boulder has arrested the course of the stream forming a pool where heavy substances would sink and collect. This sand is—as far as I have been able to determine in the absence of some necessary tests and re-agents which I am awaiting—an oxide of manganese, probably the mineral *Psilomelane*, and may prove to be valuable.

I tested a piece of the supposed gold-bearing quartz from the Hog's Back tunnel the other day, but found no trace of the precious metal. The pyrites seemed only too pure. I may, however, have had a poor specimen to deal with, and I intend trying others which I have by me.—Yours faithfully,

W. FREDK. MAYES,

COFFEE LEAF DISEASE: THE RESULTS OF "VAPORIZATION" IN THE DUMBARA VALLEY.

(Communicated.)

The enclosed report will probably interest some of your readers as it introduces an entirely new feature into the results of my experiments.

Leaf disease was at its height in the beginning of January on the field that is here spoken of as well as on the surrounding coffee.

The treatment resulted at the time in a decided check of the spread of the disease, but in my opinion it had gone already too far and the treatment could have scarcely, constitutionally, benefited the trees much. For two months little or no leaf disease was observed but during the last eight days, it has again made its appearance in considerable vigour in that part of Pallekelly Estate; but the treated field is singularly free from it, of which I have satisfied myself personally. I can account for this difference in no other way than by concluding that the treatment did not only check the disease at the time being, but that it was also instrumental in preventing ultimately on the area operated upon, the growth of the various forms of this fungus which has resulted now in a fresh attack on the untreated coffee surrounding.

It will of course be necessary to corroborate the above by results elsewhere before we can fully accept this conclusion. Uredo-spores are now freely produced in the surrounding untreated coffee, and it will be interesting to note whether and in what space of time they will spread and germinate on the treated field.

EUGENE C. SCHROTTKY.

Mr. Vollar, writing to Mr. Schrottkey, reports:—"Pallekelly, 9th April: I have much pleasure in stating that on close examination of the field that was treated by your process of 'vaporization,' some three months ago, I find that it compares very favorably with the adjoining untreated coffee. On the latter leaf disease is again showing up, while on the treated area it was difficult to find a leaf diseased."

THE TEA TRADE OF AMERICA.

The following remarks as to the tea trade of America, taken from a San Francisco commercial paper, may be interesting: The tea business of late years, and more particularly in 1880, has been sadly cut up and scattered, as almost every jobbing grocery now imports more or less for their own trade sales. During 1880 the steamers of the Pacific Mail Steamship Company brought us from China and Japan six cargoes, and the O. and O. Steamship Company eight cargoes, and the two combined brought us upwards of 120,000 packages, in addition to a much larger quantity in transit for Eastern cities. The O. and O. Steamship Company also chartered two sailing ships to bring tea for reshipment East by the Central Pacific Railroad. During the summer and fall the retailers formed a co-operative society for the purpose of importing for their own use an uniform brand and standard of teas for their retail city trade; how it will work is yet to be proven.

Although the bulk of the tea consumed in the United States is imported through the port of New York, the facilities offered by the steamers crossing the Pacific to San Francisco have diverted a portion of the traffic in that direction and a considerable part of the direct importations by interior importers have been received by that route. These direct importations naturally diminish the distribution from New York, while they supply a very important part of the consumption of the country, and this fact should not be lost sight of in estimating the trade of the year.—*Home and Colonial Mail*.

THE MANUFACTURE OF INDIAN TEA.

The following memorandum of instructions relative to the operations for season 1881, which, we understand, has been issued by a gentleman of experience for use on some large gardens in India may be useful to some of our readers:—

1. The hoe to be continually used throughout the manufacturing season in scarifying the surface of the land.

2. The spring shoots to be allowed to grow out about nine inches before commencing to pluck the leaves.

3. Plucking to be limited to the leading shoot or bud *and only two leaves* (this must be strictly adhered to), and the leaves or flush should not be allowed more than eight days to mature.

4. Withering to be done rather slowly, and avoid exposing the leaves to artificial heat.

5. Rolling to be done in the machine without much pressure, as the leaves will be all young and succulent.

6. Under ordinary conditions it will be unnecessary to allow the leaves to ferment, and they may be spread thinly upon the drying trays at once direct from the rolling machine.

7. The charcoal fires must be strong and brisk, so as to arrest the action of fermentation in the leaf.

8. The colour of the leaves after they have been infused for testing should be similar to that of a new bronze penny piece; this may generally be regulated by increasing or decreasing the fermentation of the leaves after the rolling operation. It is, however, impossible to get the proper bright colour on the infused leaf, unless the plants themselves are in a vigorous condition, and unless the leaves are plucked in a succulent state, say on the eighth day.

9. If the labour force is insufficient to cultivate the whole area under plant, and to remove each flush after it has been allowed eight days to mature, then special "nirricks" in hoeing and plucking must be made, and liberal extra payment for the performance of extra work must be made. And if this arrangement should prove to be insufficient, then the worst parts of the plantation had better be abandoned for the time being, so as to enable the labour force to work the remainder in a proper manner.

It is utterly hopeless to expect to realise a profit by making nothing but "common teas," which, no doubt, are produced by want of cultivation, and by taking 12 to 14 days to remove each flush—*Home & Colonial Mail*.

THE GOLD AND SILVER OF THE WORLD.

A lecture was delivered on Monday night at the London Institute by Mr. G. Phillips Bevan, F.G.S., F.S.S., the subject being the "Gold and Silver Mines of the World." It was replete with interesting facts and figures. Speaking of the early discoveries in the colony of Victoria, he cited Mr. Brough Smyth for the facts that three diggers at Forest Creek obtained in 19 days 360oz. of gold; a party of five cleared 2½lb. in a single day; another of four got 11oz. from sunrise till 3 p.m.; while another of three obtained £1,000 in 14 days. The same authority mentioned that at Ballarat, the head-quarters of the deep mining district in that colony, a party of six got 1,344oz. of gold for ten weeks' work, while in four months another gang earned £24,000. The winnings of 42 Ballarat companies up to the date of Mr. Smyth's writing were no less than £4,305,463, one of them—the Band of Hope—having washed 14,975oz. in 44 working days. Of colossal nuggets the lecturer mentioned the Welcome Stranger, weighing 2,280oz., 2½in. long and 10in. thick, a lump of solid gold found by the merest chance, yet worth £9,534; the Welcome Nugget, which weighed 2,217oz., and was sold for £10,000; the Blanche Barkley, 1,743oz.

in weight, and sold for £6,905; the Heron, weighing 1,008oz., which fetched £4,080. The Victoria goldfields now covered an area of 1,241 square miles, which in 1879 yielded 715,000oz., valued at £3,000,000. Queensland was traversed by a chain of gold rocks from north to south, and at least 4,000 square miles were being worked with all the experience gained from the failures of the sister colony. The yield for 1879 was over a million sterling. South Australia was more a copper than a gold country, but the goldfields of Port Darwin were being industriously worked by the Chinese. After mentioning South Australia and New Zealand, the present rage for speculation in Indian gold mines was touched on, with a due caution to perplexed investors. The Russian mines in the Ural range were interesting, both as having been probably referred to by Herodotus and as having enabled Murchison to forecast the success of gold mining at the Antipodes. Passing over to the American continent, the lecturer spoke of the gold fields of North Carolina and Virginia, the Californian discoveries and the rich silver mines of Nevada and New Mexico. He gave an elaborate description of the Great Comstock lode, the two mines of which had yielded in 20 years 363,671,605 dols. He spoke further of the immense wealth of the Arizona and Colorado silver mines, as well as of the Bolivian mine long known by the name Potosi, and of those worked in Peru, Chili, and Mexico. The European mines were the last to pass in review. It had been computed, Mr. Bevan said, that the grand total amount of gold produced during the historic ages was £3,517,093,500 and that of silver £2,826,250,000, making for both the precious metals together no less than £6,343,343,500.—*Home and Colonial Mail*.

MR. ANDERSON'S NEW BOOK.

Of coffee in New Caledonia Mr. Anderson thus writes:—"Sugar cane, rice, and coffee plantations are to be met with in various parts of the island. While in Fiji the notion is that the high land, 1,000 and 2,000 feet above sea level, offers the most suitable elevation for coffee planting, it is worth while to bear in mind that in New Caledonia, only a couple of degrees of latitude distant, the bushes are to be noticed on the flat land, and to all appearance thriving." Of coconuts in that island, he states that they are very abundant, but that from lack of a market for copperah, or intelligence, they are left to rot, and are chiefly used as food for pigs. He states the island to be rich in metals, especially nickel. Of the products of Fiji he writes that they are mainly bêche de mer, pearl and turtle shell. There is also sandal wood, but good quality of this is now scarce. Of your staple growth in Fiji, Mr. Anderson remarks:—"Coffee has been grown on sundry islands and seems from all accounts to have thriven at an altitude of 200 feet in a certain locality. It is supposed that on the high ground, 1,000 feet or 2,000 feet above the sea level, it ought to succeed well. After the doleful history of cotton, it would be a pleasure to hear of Fiji becoming a good coffee producing country. To start on a new speculation in a new colony like Fiji needs the pushing determination of men who can meet disappointment or success with a certain amount of equanimity. Before the coffee bushes produce, they are exposed to the vicissitudes of two or three years weather, and they are liable to be considerably damaged by heavy blasts of wind. In New Caledonia there are several coffee plantations on the low-lying land which to all appearances look thriving, but looking well and paying well are not necessarily inseparable conditions. The following is what our author writes relative to coconut planting:—"Many ex-planters and others are planting nuts with the hope of raising coconut palm estates. The trees take four or five years to produce properly. So

that patience is required. After they are in bearing order, there is no reason, should the demand for coconut oil be so great as at present, why the speculation should do otherwise than pay. The nuts ought to be planted at least fourteen feet apart. Roughly speaking 100 trees per acre can be relied upon. Reckoning upon 60 nuts for each tree, per annum, this gives 6,000 nuts per acre: that is about 1 ton of copperah. Many people might say this is below the mark: on the average it is not much so. The price given for copperah by the principal merchants in Levuka varies from £9 to £12 per ton." The estimate of the time for the trees bearing profitably—4 to 5 years—seems to me a mistaken sanguine one. I believe the pioneers of coconut planting in the Jaffna peninsula entertained the same delusive hope, and estimated their profits accordingly; but they were painfully deceived, for it was rare to find a tree attain a paying development under about twenty years, and it was no wonder, therefore, that the original planters of coconut estates in Jaffna lost their all before they derived paying returns from them. Mr. Anderson closes his remarks on the productions of Fiji as follows, and I would recommend his opinion to the authorities of Ceylon as an example:—"Were the future Government of the island to consider that the planters are the mainstay of prosperity—for if not they, who?—and if throwing aside all private hobbies and unbiassed opinions, they were to regard the interest of the planters as the interest of the country, time would not be long in deciding whether or not the isles of Fiji are to be considered as pearls of goodly value." These few extracts will convince your readers how much of interest to them they will find in Mr. Anderson's book which has special relation to their own experience; but, apart from that, the writer's remarks on the ethnology of the South Sea islands would alone fully repay its perusal.—*Our London Cor.*

REMEDY FOR RECENT COLD IN THE HEAD.—Rodolfo Rodolfi recommends, from personal experience, the chewing of two to three dried leaves of *Eucalyptus globulus*, as a sovereign remedy for cold in the head and coryza, provided they are recent and not chronic. The effect is said to make itself felt decidedly in about half an hour.—*Pharm. Zeit.*

SOMETHING FOR MR. BENTON.—To-day (Saturday) a swarm of bees took up their abode in an old gin case at No. 4, Park Street. The gin case had been converted into a pigeon house; the pigeons, however, politely retired, and left the bees in undisputed possession. They are of the ordinary size, somewhat smaller, and darker than the ordinary hive bee at home. Whether they will remain and occupy the dove-cot has yet to be seen. At present they are all in and seem contented.—*Cor.*

DATE COFFEE.—There appears to be no end to the inventive genius of some people, and many of them seem to have made a 'dead set' upon coffee. We have had the celebrated pelatos coffee, which was simply baked acorns; more recently date stones have made their appearance in the London market under the title of *date coffee*. Yet another instance comes before us in the shape of "a preparation of fruit," under which name a foreign gentleman has obtained a patent for a preparation "closely resembling Mocha coffee." The fruit of the *Ceratonia Siliqua*, commonly known as carob beans or locust-pods, and vulgarly as Russian figs, is roasted and ground into powder, and is then mixed with a certain proportion of the roasted and ground seeds of *Vicia Sativa*, i. e., tares. An infusion of this mixture may be used as a beverage, and if it is taken with a large quantity of imagination, it will closely resemble Mocha coffee.—*Planters' Gazette.*

(From April 18 to April 23.)

MANURES FOR COFFEE PLANTATIONS.

An important correction has to be made in our remarks on Mr. A. Ross's experiments with specially prepared artificial manures. Instead of R70 per ton being the cost, it should be, as most of our readers will have guessed, R70 per acre; but this is calculating on an application of not less than 1 lb. per tree, or fully half-a-ton per acre. This special manure, therefore, including cost of carriage and of application, is equal to R140 per ton; but, if it adds from 3 to 4 cwt. per acre to the crop ensuring a steady return of 5 and 6 cwt. per acre, Mr. Ross is right in saying that it will pay him well. It is a significant fact that more than one planter and visitor to the young districts have lately remarked to us that wherever coffee has been manured *there* the blossom has set satisfactorily. On one well-known Dikoya property, we believe, the experienced superintendent shews the difference between manured and unmanured coffee in this respect, on the same field. Nevertheless the proprietors who, at this time of day—after two most trying seasons—can face an expenditure of R70 per acre for manure are few and far between. In many cases within our knowledge, the total expenditure on estates which have been kept clean, has been reduced to R50 per acre. In other cases where similar rigid economy might be expected, the outlay has risen to R80, simply because, as the managers say, money so supplied so irregularly, that the labour force became comparatively disorganized, and it became impossible to get work done so exactly and steadily as would otherwise have been the case. This should be a warning to over-zealous agents and bankers: if the funds are to be supplied at all, far better to do so every three or four months, than delay for six, and even eight months, and so add twenty to thirty rupees to the cost of upkeep per acre. As regards manuring, it is evident that everything depends on the fitness of the particular application for the soil operated on. Until careful analyses and experimental stations in every district are established, a great deal of money must be wasted by planters, for it is not everyone who can arrange for analyses and the preparation of special manures on their own account, like the proprietors of Ventura and Aluwihari.

THE HOT SEASON IN COLOMBO.

The correspondent who addressed us the other day, and his colleague who challenged the accuracy of our article, will be interested in the following return which has been courteously furnished to us from the office of the Surveyor-General:—

Maximum temperature of the air registered from January 1870 to April 23rd 1881.

In 1870	91.0	30th March.
1871	90.0	21st April and 9th May.
1872	90.0	13th and 14th May.
1873	91.0	1st May.
1874	91.5	19th April.
1875	95.0	3rd February.
1876	90.6	22nd April.
1877	94.6	16th February.
1878	93.7	13th April.
1879	90.5	26th January.
1880	90.8	26th and 26th April.
1881	91.2	7th February, 14 and 16th March, and on the 12th, 14th and 16th April.
12	[1099.9	

Average—91.66

So that the average maximum temperature at Colombo in the shade is under 92 degrees. This will not seem very much to residents in India, or even Australia; but let them remember that the temperature with us never falls below summer heat, that in fact, the average of maximum and minimum is up to 81°—the highest so far recorded for any station on the world's surface (outside Ceylon); and yet Colombo is an exceptionally healthy city for European residents.

TEA PLANTING IN CEYLON.

We have received a letter from a gentleman on his way to manage a tea estate in Assam, in which he says:—

"I was much struck (in my rapid journeying through Ceylon by rail and short residence on a tea estate) with the capabilities of the island to produce tea, and with the lack of experienced tea planters."

He goes on to say that since seeing Ceylon his views have considerably modified, and he is desirous of procuring a berth at R700 or R800 a month, as a preliminary to investing on his own account. We have advised him to stick to India if he can get such a salary as this: not half that sum being at present procurable in Ceylon, although the prospect before tea planters investing on their own account is, we believe, exceptionally good. It is most satisfactory to learn on all sides how favourably impressed our Indian visitors are with the prospects of Ceylon as a tea-growing country. We travelled down by the Gampola coach this week with a young Assam tea planter, and he fully realized all our advantages in ready means of transport, full supply of labour, healthful climate, as well as suitableness of soil and climate in so many districts. The severe fever and epidemic cholera which carry off so many Assam labourers—each costing the planter a heavy bounty—have no parallels here. A beautifully regular and vigorous field of young tea (from 15 to 20 months old) on Helbodde estate, Pussellawa, attracted the attention of the travellers by coach and justly received commendation; a good deal of the land planted was patana.—The following extracts from the Tea Circular of Messrs. Layton & Co., dated London, 10th March, are deserving the attention of Ceylon as well as Indian tea planters:—

"INDIAN TEA.

"The chief feature is the large increase in the deliveries, it being remarkable that those of China Tea in the same period have fallen off very materially; buyers do not, however, appear to have been influenced in consequence, for while the public sales have continued moderate, and comparatively small, prices of common grades—perhaps in sympathy with China—show a slight decline; the only qualities for which the demand continues unabated are good and fine, these bringing fully former rates.

"Managers of gardens in India will do well to remember in the manufacture and preparation of Tea for the coming season, that although the article has hitherto deservedly—as compared with China leaf—taken root in the trade of this country, it is nevertheless patent that unless the inferior character and "washy" liquors are replaced, by hard pungent flavour, the result and average prices or next season must be again disastrous."

AGRICULTURE IN CYPRUS.—The *Homeward Mail* reports that an agricultural show will be held at Nicosia on Wednesday, Thursday, and Friday, April 27, 28, and 29. Prizes will be given for horses, mules, donkeys, camels, cattle, sheep and goats, pigs, turkeys, geese, ducks, and pigeons. The committee will also award prizes for wheat, barley, caroubs, potatoes, best samples of each vegetables (best basket of these in season), silk (best skeins), cotton (best sample), cheese (best sample), butter (best sample). An exhibition of agricultural machinery is invited, and merit will be awarded according as the funds will allow.

CEYLON AND INDIAN TEA AT THE MELBOURNE EXHIBITION.

By last mail I wrote you about the great sale of Indian tea—the greatest by far ever held in the Australian Colonies, including as it did 200,000 lb. weight—which was to be held at the instance of Messrs. James Henry & Co., on their own account and that of the Calcutta Syndicate. The sale has been held, and although the prices realized were somewhat lower than those obtained at the earlier sales the results are deemed very satisfactory and very favourable for the future of Indian (let us add Ceylon) tea in the Australian markets. Every "line" was sold, although some of the lots included large numbers of heavy packages, and as there were at least fifty purchasers of the teas they are sure to be well distributed. There is one dealer, Mr. Walker of Swanston Street, who sells only Indian and Ceylon teas, and who states that he has a large demand for the latter. Measures are being taken to establish another dealer in Indian teas exclusively in Collins Street, and in due time by such means as these prejudice will be overcome and a taste formed for pure first-class teas which must be gratified. Of course existing tastes have to be consulted, and many of the Darjeeling teas and those from Cachar, Kangra Valley, &c., are, equally with the Ceylon teas, fit for going into consumption on their own merits. Others must be mixed and blended. One of the great difficulties is about price. It is so difficult to get people to understand that a tea which yields 42 to 52 per cent of extract (Mr. Dunn has got the latter result from a Ceylon tea), soluble salts in proportion, is worth much more than a tea which cannot be made to give more than 30 per cent of extract, if so much. Preparatory to the sale, Mr. Moody diffused information as to the merits of Indian teas, including the following testimony from a source which even the most conservative of Melbourne dealers must admit to be valuable because beyond doubt spontaneous and disinterested:—

"THE TEA OF THE FUTURE.

"Under this head the *Anglo-American Grocer* gives the following interesting comments, which bear out, from a trade point of view, nearly all we have said on this subject:—

"Of all the articles of produce which claim the attention of our readers, we believe there are none that have shown the same remarkable expansion in their production, during the last score of years, as Indian tea.

"It will seem but as yesterday, to many of our country friends, when the London tea traveller first showed them a sample of Assam Pekoe. What excitement it produced! How speedily the kettle was boiled, and the new silver-tipped product submitted to the test. And how well it stood that test! Nothing approaching to it in strength had been seen before; little wonder, therefore that fancy prices were asked and easily obtained for it. With the enormous increase in the production—the present season being expected to turn out 45,000,000 lb.—prices have obtained a very reasonable level, and it is now the standing complaint of all Indian tea growers that their teas bring actually less than their relative value when compared with China tea of similar quality.

"It was in 1842 that the attention of the Indian Government was first drawn to the subject of tea cultivation in Assam; and seeing the immense benefit that would naturally result from the encouragement of the industry, they imported experienced cultivators and manipulators of leaf from China, who superintended the early efforts of the Indian tea growers.

"The tea plant grows naturally on the slopes of the Himalayas, and thrives best on a rich soil of decayed vegetation, with a humid atmosphere, and considerable heat. . . . The first ten or fifteen years of Indian

tea-growing produced scarcely a sufficient quantity to bring it commercially into use. But after 1860 it began to be used by appreciative consumers for the purpose of adding strength and flavour to China tea. The prices of the finer sorts ranged them from 4s to 4s 6d per pound, and there seemed to be such a future before tea of such excellence, that tea-growing became the speculation of the time. The next few years showed wretched results. The tea was badly made, and nearly half the crop had become sour when it reached this country. Prices fell to a very low point. Planters saw that they must improve the quality if they were to keep their position; and a steady improvement may be dated from 1870. Several grocers introduced Indian teas into their blends with excellent results; in many instances as much as one-half being Indian tea. We do not propose to offer any advice on the use of Indian teas; our object is rather to mark the steady development of the trade, and let our readers draw their own conclusions. A reference to the dock returns for the present year shows an increase in the consumption of this tea of nearly six million pounds over last year, which fact alone is sufficient to establish the correctness of the heading of this article. We are informed that in many towns in the north of England and throughout Ireland, Indian tea is retailed alone, without any mixture of China tea whatever. This, no doubt, would be a bold experiment in some places, but if care be taken in the selection of the right sort, no doubt it would succeed.

We venture to think that the best results may be obtained from Cachar and Darjeeling teas mixed together. The Assam growths are almost too strong to drink alone; but every grocer finds, by experience, what suits his customers best, and acts wisely in giving them just what they like, and always alike. *A good plan, we should think, would be to mix three or four sorts of Indian tea together, say one heavy, strong, thick tea, another a brisk, pungent tea, a third of a juicy, full, soft, character, and the fourth, perhaps, a fine, flavoury, Darjeeling or Kangra Valley tea to give a distinctive tone to the blend.* These, of course, are mere suggestions on our part. We do not presume to lay down fixed ideas for carrying out what must in all cases depend on individual tastes; our object is to point out the wonderful popularity of Indian teas, and to suggest to all our readers the advisability of studying their character closely. We feel sure it is bound to be as our heading puts it—"The tea of the future," and the wisest course, therefore, will be for every tea-dealer to join the winning side, and realize in his own trade the truth in the old saying that "Nothing succeeds like success."

The writer in the *American Grocer* has gone wrong only in the statement that it was in 1842 that the attention of the Indian Government was first directed to tea cultivation. It is now certain that long before the era of the "discovery" of the indigenous tea in the jungles of Assam, by the brothers Bruce in 1826, the existence of an Indian tea was known to Indian civilians and others. The utilization of the plant was long hindered by Dr. Wallich's persistent opinion that the true tea was merely a camellia. But its true nature was placed beyond doubt and the attention of Government and individuals devoted to the enterprise much prior to 1842. The details I need not enter on. I may say, however, that he would be reckoned wild who in 1842 had ventured to predict that in less than forty years India would be successfully competing with China in the supply of tea to a great and advancing population in Australia, Ceylon also giving promise of taking her place in the same field.

(From April 25 to April 30.)

GOLD AND GEMS IN CEYLON.

We have received from Mr. Auwardt specimens of quartz from his property, Mount Pleasant, near Galle. In these there is no appearance of gold, but a good deal of black mica. In some samples previously furnished, Mr. A. C. Dixon discovered traces of gold. The professional reports of this gentleman have also been laid before us, and we may extract a few passages to shew his opinion of the prospects of gold reef being found in the Southern Province near Galle. On the 15th December last, Mr Dixon wrote:—

"I have examined the specimens of gold, gems and bag of sand which I received from you on the 9th instant with the following result:—

a. The small nugget was pure gold and weighed over 6 grains.

b. The stones in the paper parcel were fragments of gems such as corundum, sapphire, garnets, tourmaline, zircon, &c.

c. The bag of sand contained fragments of the same mineral as b, abounding especially in garnets, I did not find any gold in the sample sent in bag."

On the 27th December after a personal visit, Mr. Dixon was able to say:—

"I saw the man who found the gold and examined the place from which he took it. I requested him to dig more and wash it in my presence, after which I examined the residue. I found no trace of gold in it, but numerous fragments of gems and quartz. I then followed up the ravine to its source with the expectation of finding a quartz reef from which the gold might have come. I found two small reefs crossing the ravine and took specimens from them. These I have examined and find only a slight trace of gold not in quantity to warrant its working. There is evidence of the occurrence of gems in the vicinity. I saw several which had been taken from the opposite side of the hill, and judging from these they appear to be of as good a quality as the gems at Ratnapura but not so large in size. They were chiefly ruby, sapphire, tourmaline and cat's-eye. I have no doubt larger ones will be found. I spoke to your kangani respecting the quartz reefs and have no doubt that if they were broken into, it would set the matter at rest as to whether gold is to be found there in quantity worth working. From what I saw it did not appear to be so."

Again:—

"I have examined the specimens of quartz sent on the 17th March and find in it slight traces of gold at the rate of a few grains per ton. There is other metallic matter in the quartz, viz: iron as a sulphide. I have no doubt from what I saw when there that better samples will be sent you."

So far therefore search at Galle has been unsuccessful, although Mr. Dixon holds out encouragement of persevere in blasting for a reef. We trust Mr. Auwardt's further efforts may be crowned with success.

We learn that the result of Mr. Harvey's hurried visit to the Dolosbage, Matale and Ambagamuwa districts has been to leave matters very much as they were, save that certain out-crops of quartz were pronounced non-auriferous and that of other places an opinion was expressed favorable to investigation. Mr. Harvey is a very high authority in the gold-mining world and is naturally, therefore, correspondingly cautious in the expression of his opinion. He was the first, it seems, to inspect and report favourably on the auriferous land belonging to the late firm of Messrs. William Nicol & Co. of Bombay, and his report led to the establishment of the Glenrock and other Gold-mining Companies. His inspection of our hill region

was far too hurried to lead to definite practical results. It may, in one sense, be said to be premature, for Mr. Harvey would be the man to call in after some progress was made in the investigation, to give a decisive opinion on the value of quartz, and the nature of a reef. Planters will act quite rightly to make available representative specimens of the quartz which they have reason to suppose to be auriferous; but, as Mr. Harvey pointed out, the proper course in the case of Ceylon where gold has been found in the river beds and nowhere else (to speak of) as yet, would be to pan and wash in the river and follow up so long as gold was found, until at last it disappeared from the washings, and then to look right and left and all round for the matrix reef from which the gold had gradually been denuded. Now this is work appertaining to the Government of the country. It is impossible that private individuals can undertake this duty, and we think, therefore, there is good reason for calling on the Lieut-Governor to devote some portion of the surplus revenue from the Pearl Fishery to an investigation which may be fraught with important consequences to the revenue and prosperity of the Colony. It will be remembered that in 1854 an attempt to follow up the Mahaoya and Hingula in the manner described above, was frustrated by the advent of the south-west monsoon. Unfortunately this same rainy season is again close at hand. Mr. Harvey was greatly struck with the advantages presented to the miner in Ceylon in railway and road communication, water power, good climate, &c. He also expressed an interest in the gem-digging operations in the country and hazarded the opinion that much deeper mining both for gems and gold in suitable localities (as recommended by Sir Samuel Baker in the case of Nuwara Eliya), ought to lead to successful results. The bed of an ancient river, or the old bed of an existing river which has shifted its course, would probably be a favourite spot in which to operate for gold.

It must be remembered that Ceylon is one of the oldest geological formations. Geologists speculate on this island having been connected with Madagascar and the Malay Peninsula by land long since submerged. They still regard a belt commencing on the east coast of Africa and across Madagascar, Ceylon, Malay Peninsula and Borneo as the most likely division in which to find the remains of the earliest human beings or of the most advanced apes, on the earth's surface. Denudation of the rocks and reefs has therefore been going on in Ceylon far longer than in most countries, and the fact that very valuable gems and evidences of gold have been found so near the surface affords good reason for anticipating greater success from deeper mining.

Since writing the above we have seen Mr. A. C. Dixon on his return from the Rakwana district. The Rangwelletenne limestone with its supposed 90 per cent of lime is a delusion. The limestone Mr. Dixon saw is poor. Gem pits exist on Everton estate to the depth of forty yards, and Mr. Dixon saw finer stones—sapphires chiefly—than any he had previously seen in the island. Two or three were valued by the Chetty owner at over £200 a piece; but Mr. Dixon fully agrees that the proper localities have probably not yet been explored for the best gems, and he is likely to recommend a trial shaft in an old river bed.

CEYLON COCOA.

Our London political and commercial correspondents call attention to the fact of parcels of cocoa from Ceylon selling for 100s per cwt., an exceptionally high price, considering the state of the market at present. Mr. Tytler is to be congratulated on this result, since this cocoa came from his Dumbura properties. It is evident that Ceylon will beat the West Indies in the

quality of its cocoa, provided care is exercised in the preparation. Since writing the above we have been favoured with the following letter from Messrs. Sabonadière & Co., who are agents for Ambecotta plantation, proprietors Messrs. Tytler and Heirs of T. C. Morton, while Pallekelly belong to Mr. Tytler alone (Messrs. J. M. Robertson & Co., Agents) realized the same price for its cocoa:—

To the Editor of the Ceylon Observer.

DEAR SIR,—We have much pleasure in handing you copy of sale prices and Broker's report on *Amba* cocoa per S. S. "Duke of Buckingham," shipped on this occasion by us in January last—details of *Palli* cocoa per S. S. "Almora," (shipped by Messrs. J. M. Robertson & Co.) belonging to same proprietors are also given. In forwarding us the report and result of sale, our London friends remark that, "The rates obtained surprised the market—the highest valuations before the sale being 80s. to 85s."

Yours faithfully,
p. p. SABONADIÈRE & Co.,
FREDK. NOONE.

Valuations and Prices of Cocoa.

PER S. S. "DUKE OF BUCKINGHAM."

Amba, A	15 Bags valued @ 80/ to 85/ sold @	100/6 in bond
Do. B	5 " " 70 — " "	80/
Do. T	1 " " Chips and Triage " "	25/

21 Bags Cocoa.

PER "ALMORA."

Palli, I	32 Bags valued @ 80/ 85/ 12 Bgs. sld. @	100/
Do. 2	15 " " 60 70 75 sold @	100/
T	3 Triage " "	60/
T	1 and chips " "	25/

51 Bags Cocoa.

Report on the above.—The sale of your cocoa per steamers "Almora," and "Duke of Buckingham" must be considered most satisfactory. The price of 100/ 100/6 for the bulk is quite a fancy one, and we must again remind you that if this cocoa comes in quantity, it is highly improbable that such sales can be maintained. There is little fault to be found with the cocoa itself; we think it rather better than last year's shipments: there being fewer unripe or pale berries.

The rose color of the bean itself is considered very good, whilst the light, fragile husk is much liked.

The price is the best proof how much the cocoa is liked.

True copy. p. p. S. & Co.,
F. N.

GEMS AND LIMESTONE IN THE RAKWANA DISTRICT.

We learn from Mr. Shand, senior, that the Rangwelletenne limestone so well reported on by Mr. Hughes was found in the shape of boulders in the river, and that Mr. Dixon could not find any of similar quality for the good reason that all the best boulders had been collected and used up for estate purposes. There exists, however, a small bed of limestone not far away which runs through native property, and which, had the Superintendent of Rangwelletenne (Mr. G. D. Brabazon) not been absent from the district, he could readily have pointed out to Mr. Dixon. Altogether it is a pity that the geologist's visit to the district was not made known to proprietors generally beforehand. His attention

could have been directed to what is supposed to be the richest gemming land in the district, near the Everton ridge, and also on Batakande from which, last year, it is said, £9,000 of precious stones were sold, all taken from an area not exceeding 2½ acres! The old Everton pits which were sunk to a depth of 120 feet had to be abandoned by C. M. Hassana Marikar, because he had no means of pumping out an accumulation of water. It is very evident that there is room with modern appliances and adequate capital for a Limited Company to develop a very profitable Gem-digging industry in the Sabaragamuwa district.

CEARA RUBBER — NO SEED TO BE GOT FROM SOUTH AMERICA.

A Colombo merchant writes:—"The following in reply to enquiries for Ceara rubber seed may be of interest:—"The last mail from South America brought news to the effect that drought had killed the plants for 150 miles, and that they have now to push many miles up the river to secure seed. None is expected in London for some time."

CINCHONA BARK SALES.

The sales of Indian bark reported by last mail, being the large quantities shipped by the S.S. "El-dorado" and "Kaiser-i-Kind," are regarded as most satisfactory, and a happy omen of what the future has in store for Ceylon and Indian planters. For the first time, the brokers report that the quantity of bark offered from the East was large enough to test the market, and the result was that nearly all the 2,400 packages were sold readily for prices reaching up to 10s 3d per lb. for "renewed crown"; while, out of 3,250 packages of South American offered simultaneously, only 600 found purchasers. The sale of the parcel by the "Kaiser-i-Hind" more especially calls for remark: it was as follows:—

	Bales,	Prices,
NCC natural crown	20	5s 0d
Branch crown	13	1s 11d
Mossed crown	6	7s 0d
Renewed crown	22	10s 3d
Natural succirubra	41	4s 0d
Branch succirubra	13	2s 6d
Mossed succirubra	8	5s 0d
Renewed succirubra	46	7s 0d to 7s 2d.

Upon this Messrs. Rucker & Bencraft remark:—

We particularly attract the attention of our friends to the sale of this latter parcel. Here we have not single packages, but important piles of natural crown at 5s, renewed crown at 10s 3d, natural succirubra at 4s and renewed succirubra at 7s to 7s 2d.

Prices, in face of the heavy supplies, were lower. It has undoubtedly been to the advantage so far of East Indian importers to sell practically to the highest bidder without reserve. But when such a heavy amount is put forward as at this sale, it becomes questionable whether the market is always capable of absorbing the whole quantity at full market rates, and it will be for the future to prove whether it is possible to continue the policy of immediate sale to highest bidder, when our East Indian friends are contributing no longer a few hundred packages per month, but instead as many thousands. We do not know anything about the analyses of this large shipment of bark, but it is generally questioned whether better prices would not have been obtained if it had been distributed over several sales, or at least had more firmness been shown in holding it.

We trust, however, that as regards the Government Gardens' bark, this is the very last consignment which will be sold to private manufacturers. We have the assurance from Madras that henceforth the bark is to be entirely used for manufacture on account of the Government as in the case of the Sikhim bark, with this difference: that Ootacamund bark is to be sent home to be manufactured in place of being used up on the spot. Our London Correspondent, in correcting the *Economist's* deliverance on the question raised by Mr. Thomas Dickson, is wrong himself in supposing that the Ceylon Government is as great a sinner as the Indian in this matter. The Hakgala Gardens are of too insignificant proportions to be considered in any sense a rival to the planters, and all the bark harvested there, so far, has been exceedingly trifling. The answers to the questions in the following letter which appears in *Colonies and India* in reply to Mr. Dickson will be readily found in our Handbook:—

THE INDIAN GOVERNMENT EXPORTS OF CINCHONA BARK.

TO THE EDITOR OF "THE COLONIES AND INDIA."

SIR,—With regard to Mr. Dickson's letter I should wish to ask a few questions:

First. The Indian Government having created their plantations and supplied their wants, what objection can be made to their selling the surplus instead of allowing it to be wasted? [It is not the surplus, but *all* the Nilgiris bark that is sold.—ED. C. O.]

Second. Until the cost of introducing cinchona cultivation into India is recouped by the Government, have they not a right to reimburse themselves by the sales complained of? [The outlay has already been recouped.—ED. C. O.]

Third. In case of any emergency, such as an outbreak of fever in any district or the wants of an army in the field, should not the Government continue to extend their plantations, and meanwhile sell their surplus harvest as they are now doing?—I am &c.,

London, March 24.

INDICUS.

Mr. Dickson is determined not to let the matter sleep, and it is well to make assurance doubly sure in the case of India, while most certainly the tendency of the Jamaica authorities (under the very energetic auspices of our friend, Mr. D. Morris) to develop a regular Government Cinchona Trading Company should be nipped in the bud. Experimental Gardens by all means; but, when it comes to planting hundreds of acres and to publishing special *Gazettes* with the detailed results of the sales of the Jamaica Government bark in Mincing Lane, it is time the home authorities were questioned on the subject. Mr. Dickson writes to us as follows:—

The Scottish Trust and Loan Company of Ceylon, Limited,

123 Bishopsgate Street, Within, London,

March 25th, 1881.

DEAR MR. FERGUSON,—I have sent you a copy of the *Colonies and India* in which my letter regarding cinchona appears, and also the *Jamaica Government Gazette*, to show you how eager the Colonial Governments, led on by specialists, are to become planters and traders and to copy the Indian Government.

If in cinchona, why not in sugar, tea, or any other produce? Every one interested in Ceylon and India who will give the matter a little consideration, will see the injustice, and one of the highest authorities, Mr. Clements R. Markham, writing to a friend says:—

"I saw the letter about Government cinchona sales,

and quite concur. Government very properly sold barks to repay expenses, and that being done, it has no right to trade; moreover that was not the object in introducing cinchona cultivation into India and Ceylon."

It is simply renewing the old East India Company's trading powers which were taken from them 50 years ago, and on a parallel with our old Government Cinnamon Garden affairs.

Unquestionably we can confine them to the limits I have mentioned, and restrict their trading powers, and I shall use my best endeavours to organize a deputation to some member of Parliament who will espouse our cause, and you and our friends in Ceylon must back us up. No time is to be lost unless we wish to be swamped.—Yours truly,

THOMAS DICKSON, Managing Director.

P.S.—I have stirred up many of the Ceylon houses here, who all agree something should be tried. I have brought the matter before Messrs. Matheson & Co. in hopes of securing the influence of Mr. Hugh Matheson, M. P., and also Sir Jas. Elphinstone.

I asked Sir David Wedderburn, but am sorry I did not succeed. I have just seen Mr. Magniac, M. P., of Messrs. Matheson & Co., who has kindly promised to interest himself in the matter, and is clearly of opinion the India Government have no pretext so long as we can show the plantations are self-supporting.

The statistics he requires are as follows:—

(1) What may be the annual production of the Government Gardens? [360,000 lb. at Sikhim, all manufactured; 250,000 lb. Nilgiris, all shipped and sold.—Ed. C. O.]

(2) What may be the estimated requirements? [Of bark by Government to make a febrifuge for the population, it is impossible to say.—Ed. C. O.]

(3) Are they extending their plantations?—[Very little.—Ed. C. O.]

(4) Are their gardens still in debt?—

[No: a source of profit.—Ed. C. O.]

Can you procure these, and we will then have it brought before Parliament, if not sooner? [Refer to our Ceylon Handbook and Markham's new book for the latest and most authentic information.—Ed. C. O.]

Copy of Letter from Mr. Markham.

"The object of introducing cinchona cultivation into India was to bring the febrifuge within reach of the masses of the people. It was right to sell the bark until all the capital outlay, with interest, had been recovered. This has been done, and the whole of the Government bark ought now to be worked up in India for the use of the people. I consider it a breach of trust, and an act of doubtful legality for the Government to continue to sell bark for profit in London Market.

"The Government cinchona plantations were not established for any such purpose. Their objects are to discover the best methods of cultivation and of harvesting to establish the best species to supply plants and seeds, and distribute them widely so as to extend the area of cultivation, and to manufacture very largely, the cheapest form of the febrifuge for the use of the people of India.

"Successive Secretaries of State, Sir Charles Wood, Lord Ripon, and the Duke of Argyll have adopted my views on this subject and impressed them on the Government of India and Madras.

"Certainly any one is entitled to quote my opinion: it is published, and is public property."

Mr. Dickson would do well to ask our late Governor, Sir Wm. Gregory, to interest himself on this question, and, perhaps, to call Lord Kimberley's attention to it. As we have already stated, Mr. Clements Mark-

ham is entirely with the planters in their claim. Sir Wm. Gregory's policy in Ceylon was based on the principles Mr. Markham laid down, namely,—Government gardens to supply seed and cuttings and to try experiments, while the cultivation for commercial purposes was left solely in the hands of planters. We feel sure that the House of Commons, if appealed to, would at once decide against the policy of the Madras and Jamaica Governments in growing bark to sell in the Mincing Lane market.

CEYLON COFFEE IN THE HOME MARKET.—An ex-Ceylon colonist writes:—"Your readers will be happy to hear that Ceylon coffee is the only one keeping up its price—some fine bold fetching 114s the other day, while some Jamaica *ditto* my broker shewed me only fetched 53s, which was worth 75s two months ago. In Brazil also there has been a heavy drop."

STRENGTH OF INSECTS.—At a meeting of the Maryland Academy of Sciences recently, Dr. Theobald showed a species of a beetle and gave the following figures:—Weight of beetle, 2 grains; weight moved by it, 5½ ounces—2,640 grains, or 1,320 times the weight of beetle. A man weighing 150 pounds, endowed with the strength of his insect, should therefore be able to move 198,000 pounds, or nearly 100 tons.—*Madras Mail.*

LACQUERED TIN TEA BOXES.—Mr. C. P. Jones, of Baillie Street, Colombo, has sent for our examination a couple of Harvey Brothers & Tyler's patent portable lacquered tin boxes which have been used to a great extent by shippers of Indian tea. The boxes are imported to Ceylon in pieces, and are then hooked and soldered together. They are made in convenient sizes. The largest of those sent to us will contain 20 lb of tea, and costs Rs 1'65. The smaller tin will contain 12 lb. Suitable representations of tea estates, and the processes of curing and packing tea, are portrayed upon them, giving them a very attractive appearance. We feel sure these will be well received if sent (filled with Ceylon tea) to Australia, as they will be handy for carriage away from the centres of trade. The difference in cost of these over ordinary packages is equal to 3d. per lb of tea; but the produce sold in these handy boxes sells for a better price and in fact the price of the box is more than repaid. Further particulars will be found in our advertising columns.

SCINDIA'S Paper Mill has at last been completed under the supervision of Mr. Cowasjee Wookerjee, who selected and brought out from Europe the machinery with all the latest improvements. The mill turned out really excellent paper several hundred yards in length, on the occasion of its first trial, which took place on the 9th instant. Yesterday (Thursday) Scindia, who had not previously been near the mill, held a special durbar in order to inspect the sample rolls of paper, which is here manufactured from karbi and rags and is pronounced to be of a superior texture. His Highness was much pleased to ascertain that the first European industry established in his territory had so far proved a complete success. The mill is to be visited by Scindia in State probably next week. Great praise is due to Mr. Wookerjee for the untiring zeal and energy he has shown in connection with this scheme, from which considerable results may be expected. The mill, indeed, promises to be a great success, especially as skilled European engineers and workmen have been employed to carry on the work.—*Indian Agriculturist.*—[When is a wealthy native like Mr. C. H. De Soyza, or Mr. Sampson Rajapakse, to establish a cotton or paper mill in Ceylon?—Natives carry on both successfully in India.—Ed. C. O.]

Correspondence.

To the Editor of the Ceylon Observer.

NEW PRODUCTS IN UVA: CACAO AND LIBERIAN COFFEE ON PATANA-LAND.

Deyenewette, Passara, April 22.

DEAR SIR,—As you have done much to promote the success of new products, and always urged the necessity of railway extension to Uva, you will doubtless be pleased to receive by this post specimens of Liberian coffee and cacao grown on patana soil in Badulla district: the former raised from Polgahawella plants, and the latter from Pallakelly seed, and both three years old.

On some of the Liberian trees are hundreds of berries, and some of the cacao trees gave over forty pods. From some 200 pods gathered all about the size of the sample, an average of twenty-eight seeds was the result, all of which are growing in bambu pots except 300 seeds used by me in the manufacture of chocolate paste. After grinding the seed on a curry-stone and mixing cinnamon, cream, and sugar, it was very good, and only required vanilla to complete both flavour and colour to make the real thing.

It is about time you received another report on the progress of new products in Uva.

Trusting you will receive the twenty-five berries of Liberian and cacao pod in separate packets by this post, I remain, dear sir, yours faithfully,

HENRY COTTAM.

[The cacao pod is a good average specimen weighing 10½ oz., while the Liberian coffee cherries are splendidly healthy and full-sized. It is Mr. Cottam, hard-working persevering planter as he is who ought to have got a free grant of land, and not a capitalist so well able to buy for himself as Mr. M. H. Thomas. Indeed, we shall have a good deal more to say on the subject of this Uva grant, if Mr. Thomas does not voluntarily forego his claim to all but the first 100 acres. The House of Commons should hear of this matter otherwise. Meantime we wish every success to Mr. Cottam as a pioneer with new products.—ED. C. O.]

CACAO CULTIVATION.

Gang Warily Estate, Western Dolosbage,
23rd April 1881.

DEAR SIR,—Some time ago (9th inst.) "New Products" asked a few questions relative to cacao, and as no one has come forward—better late than never—I'll endeavour to answer them.

(1.) Where does it thrive best, in or out of shade? That will a good deal depend upon elevation. Over 2,000 feet I don't think shade necessary; but under that, I certainly think a light shade desirable; and, the lower the elevation, the more shade will probably be required. I find the jak tree answers capitally, and, for a light permanent shade might be planted about a chain (66 feet) apart, which would give ten trees to the acre.

Cacao under shade may take a longer time to arrive at maturity, and bear less fruit; but I believe that under shade the trees will be more lasting and the pods larger and the seeds of a better quality, at the same time yielding enough to pay well. I believe in cacao a good deal as a mixed cultivation; and I find it thrives well, both as plant and tree, under the combined influence of the shade of coffee (ten years old) and jak trees of about the same age. It does no harm to the coffee.

(2.) How many pods per tree are required to the cwt. per acre?

(3.) How many pods per tree, or cwts per acre will pay?

11

Fifty pods per tree is, I think, a low average and should give 1½ lb. of merchantable cacao. Taking 435 trees to the acre that is nearly 6 cwts. per acre; and this, at prices already obtained for Ceylon cacao, would pay handsomely. Planting and estate cultivation would be less; and merchants, charges &c. would be much the same as coffee. The 3rd and 4th years there would be a small crop, and the 5th and 6th years should more than pay working expenses. The 7th year the estate will be in full bearing. Twenty-five pods per tree should pay its way, one may calculate on crop lasting six months, a consideration, as less coolies would be required, and there would not be the same rush as with coffee.

(4.) What distance apart is considered most suitable? In decent soil, I say, 10 by 10 feet if cacao is grown by itself. This gives 435 trees to the acre.

Your low-country, Western Province, correspondent seems to be in the "dumps" about the cacao, and, I don't wonder very much, if he has planted in an exposed situation and in poorish soil, as I gather from his letter. Cacao requires for its wellbeing (1) good, freeish soil; (2) shelter from steady or gusty winds; (3) suitable elevation, with forcing climate, and good rainfall; (4) shade. To those (like above) who can't grow cacao as an even field I say plant the sheltered good nooks and corners (along with other products) with cacao. One or two hundred trees thus to the acre will always help to keep the pot boiling—the expenses against which will be only curing on the estate, and merchant's charges.

Your Western Province correspondent and others who are much troubled with whiteants should try cacao stumps, prepared the same as coffee stumps, but with more care. If the taproot is too long cut off a small bit with a sharp knife, but, do not do so if it can be avoided. It is a good plan to dip the tap root in any solution which is deemed likely to keep away whiteants, and encourage the growth of fresh rootlets. I have tried stumps myself successfully. They take upwards of a month to bud. They should be over six months old, but the proper time can be judged by the ripeness of the bark and thickness of the stem of the plant: the size of an ordinary pencil and thicker.

For plants to put out I recommend that the nursery should be made on poorish land, by which means the roots do not grow beyond control. Shade during weather which requires it with a temporary roof, or thatch, and remove the shade before planting in order to harden the plants, as is the case with cinchona. I find these tough little 'gentry' take to the ground and resist whiteants better than their more handsome and delicate brethren. Remove the plants as carefully as possible with a digging fork, and plant in continuous showery weather—not in a puddle of rain. Alternate sunshine and shower is the desideratum—shade with ferns, or branches which retain their leaves for a long time.

'Lastly, and in conclusion' (the part of the sermon, or lecture, we used to enjoy most) take care of the husks after you remove the seeds, as I note my pigs eat them readily, so they are likely to prove a not-to-be-despised addition to the pig food.

Mr. Tytler was to give us some hints about the curing of this interesting new product. I hope he will do so.—Yours truly,
JOHN DRUMMOND.

CINNAMON CULTIVATION IN THE HILL AND LOW DISTRICTS.

Veyangoda, 24th April.

DEAR SIR,—During the last few years planters, owing to the shortness of coffee crops, have given their attention to what is called new products. Amongst other things attention has been turned to cinnamon cultivation. A very great error has

been made in cultivating this product. Plants have been put out singly on one estate in the hill country on which I was resident. The visiting agent, on one of his inspecting visits, suggested a field on which the coffee had gone out, to be planted with cinnamon. I was asked to make enquiries in the low-country as to cost of plants. Clumps of plants were then selling at R30 per thousand; that was considered too high, and my P. D., who was resident on the adjoining estate, during one of his frequent visits to Ambagamuwa, purchased plants at R10 the thousand and planted them out singly, one in each hole. When next I met him, I pointed out to him the great mistake he had made. The plants would, I said, be fit for cutting in about three years. Each stock would then put out a couple or so of suckers which in their turn will be fit for cutting in a couple of years. The clumps or bushes will thus be gradually pruned, and it would take ten or twelve years before the cinnamon will pay more than the cost of monthly weeding. My P. D. looked surprised and asked me why I hadn't told him so before. For the simple reason, I answered, that he had not consulted me. I have written so much, as I see from time to time advertisements of cinnamon plants for sale, and as a warning to planters not to put out plants singly. It will never pay, especially as the quality of the cinnamon grown on the hills is inferior and is known as Corle cinnamon. The best use to which such cinnamon can be put is to have it scraped into chips and sold for the extraction of oil. Cinnamon seeds are generally sown in the low country, in beds in which drills are made with the hand, and into which from 10 or 12 to a handful of seed is dropped. The more the seed the larger the clump, the sooner it will pay and the chances of the plants growing, as the outer ones protect the inner ones. It has been said in an old number of your Directory, in an article written evidently by that very able planter who now writes from the "Western Province," that it is next to impossible to make supplies good on our old estates. If the writer of the article in question were to visit the estate under Mr. Driberg's charge at Ekelle, he would no doubt be agreeably surprised to see acres and acres of supplies flourishing, by Mr. Driberg sowing his seed in handfuls in drills. Finally it will be impossible for planters up-country to put out plants in clumps, unless from nurseries on the estate, as the cost of carriage of so much soil with the clump will be ruinous.—Truly yours,

B.

INDIA-RUBBER SEED.—The Zanzibar correspondent of the *Times of India* writing on the 5th instant reports:—

On a recent visit to the mainland, Dr. Kirk, who is well-known as an enthusiastic botanist, has obtained specimens and seeds of the true India-rubber plant of the district, which will enable the botanical authorities in England to describe and fix the species. The seeds have been sent to the Indian Government at Calcutta, where the East African plant will be cultivated along with the plants already obtained from Brazil and Central America. As the East African India-rubber grows wild over upwards of 1,000 miles of longitude and extends far inland, no doubt many parts of India will be found suitable for its growth. The India-rubber plant has already been introduced at Madras by Dr. Kirk, who has also supplied the seeds from which plants are now being distributed to our tropical colonies from the Royal Gardens, Kew.

We have received several interesting communications on the subject of Rubber cultivation in Ceylon which will appear in an early issue.

CEYLON AT THE MELBOURNE EXHIBITION.

I have alluded to the vote of thanks accorded by the Pharmaceutical Society for specimens of Dr. Trimmen's drugs. A copy of the local organ of this Society has been sent to me, in which you will find the following:—

Donations.—A special vote of thanks was carried to A. M. Ferguson, Esq., the executive commissioner for Ceylon at the International Exhibition; for a valuable collection of drugs, seeds &c., from the Ceylon Court for the society's museum. And also to Mrs. Guille, for the care she took in packing the specimens. Again, the President, in his address, stated:—

"The president of the Board of Pharmacy and himself, as president of the society, had issued a joint circular to the executive commissioners of all the courts at the Melbourne International Exhibition, asking for specimens of chemicals, drugs, &c., for the museum. Already they had received the most courteous responses, and from Mr. A. M. Ferguson, the commissioner for Ceylon, and editor of the *Colombo Observer*, they had received a numerous and valuable collection of dried specimens, arranged by Dr. Trimmen, the eminent botanist, which it was intended to carefully preserve, as well as all other specimens with which they might be favoured."

Of course only portions of the specimens were given: the rest will go to Mr. Guillefoyle for his museum, or to other institutions.

Besides Mr. Blackett, Mr. Bosisto, M.P., is a leading member of the Pharmaceutical Society, and in the number of the periodical sent to me I find notices of the interesting exhibits of products of the eucalypti and other native plants which Mr. Bosisto shews in the Exhibition. While some of the eucalypti are of dwarf habit and useless for timber, the blossoms give food to bees so useful in this country. Hives are abundant everywhere, and so is honey. I rather wish than hope for the success of apiculture in Ceylon. We have enough of neither summer nor winter, I fear.* An extreme contrast to the dwarf eucalypti are the great trees, the *tallest* by far in the world, of Fernalshaw and Gippeland, *E. amygdalina*. The leaves of *Amygdalina odorata* yield large quantities of essential oil which Mr. Bosisto was the first to introduce both in Australia and Europe, in the hospitals of which it is recognized.

"As an antiseptic of great power. A few drops sprinkled on a cloth and suspended in a sick room renders the air refreshing; and for disinfecting and deodorising, a tablespoonful of the Oil added to two or three pounds' weight of sawdust, well mixed and distributed will speedily produce a purifying effect. It is also employed as a valuable Rubefacient in all Rheumatic Affections, as a Basic Odour in aromatising Soaps, and as a Solvent of Resins difficult of solution." Then there is "Syrupus Rostrati":

"Prepared from the Inspissated Juice of the Red Gum Tree. A delicate mucilaginous astringent, employed in all affections of the mucous membrane, particularly in Diarrhoea and Chronic Dysentery."

But the great source of Bosisto's preparations is *E. globulus*, "the blue gum," which is so great a success in South India and Ceylon, as well as in other parts of the world. To Mr. Bosisto it yields an essential oil, the effects of which are thus described:—

"Tonic, Stimulant, and Antiseptic. A small dose promotes appetite; a large one destroys it. In stronger doses of 10 to 20 minims it first accelerates the pulse, produces pleasant general excitement (shown by ir-

* Mr. Benton assures us that the alternate rainy and dry seasons here operate much as winter and summer do in temperate regions.—ED. C. O.

resistible desire for moving about) and a feeling of buoyancy and strength. Intoxicating in very large doses, but, unlike alcohol or opium, the effects are not followed by torpor, but produce a general calmness and soothing sleep. A strong cup of Coffee will at once remove any unpleasantness arising from an over-dose."

Then, from the same tree is obtained "Eucalyptol," thus described:—

"For Inhalation in Bronchial Affection. Quantity employed—From half to one teaspoonful with half a pint of hot water in the Inhaler."

Next comes the "Tincture," tonic, antiperiodic and antiseptic, "Eucalyptene":—

"The Tonic or bitter principle in an amorphous condition; employed in Low fevers in doses of one to three grains."

The "Liquor" is described as

"The Fever and Ague Remedy. Dose—For Ague and Dengue Fever 30 to 60 minims in half a wineglassful of mucilage and water, or glycerine and water, with the occasional addition of two minims of Eucalyptol every two or three hours during the paroxysms of Ague."

This would seem to be a fair substitute for quinine, which, however, it is not likely to supersede. Here, happily, fever of a malarious origin is rare. Next we have an antiseptic, emollient preparation, and then

"Cigarettes of Eucalyptus Globulus. Recommended for Bronchial and Asthmatic Affections, and also for the Disinfecting and Antiseptic Properties. Note.—The Cigarettes are numbered 1 and 2. No. 1 are without Tobacco: No. 2 contain a small quantity, and are recommended for general smokers."

There are two further preparations, thus described:—

"Oil.—*Atherosperma moschata* eass. The physiological effects of this Oil, in small doses, are Diaphoretic, diuretic and Sedative, and it appears to exert a specific lowering influence upon the heart's action. As a medicine it has been introduced into the Colonial Hospitals, and employed successfully in cases of Heart Disease. Administered in one or two drop doses at intervals of six or eight hours.

"Liquor *Atherosperma mosch.* Employed in Asthma and all affections of the respiratory organs."

"Dwellers in Ceylon will, therefore, see that the Australian gum trees are valuable for other properties than as quick-growing yielders of good timber.

From the Government of New South Wales I have received copy of an enlarged edition of Baron von Mueller's "Select Extra-Tropical Plants Readily Eligible for Industrial Culture or Naturalization; with Indications of their Native Countries and Some of their Uses." I anticipate reading this volume with the same interest and profit with which I have perused the published "Decades" of the Baron's great work on the Eucalypti. The book just received I can now only glance at, with reference to a few products in which we are specially interested and which can no doubt be grown in the tropical and even the subtropical portions of this wide-spread island-continent, if only cheap labour becomes available. Friends in Ceylon when they take into account the fact that the mean temperature of Melbourne is the same as that of Nuwara Eliya, 75°, will not be surprised to learn that at Berwick, close by, cinchona calisaya had not only grown but flowered "already five years ago." We need not fear the competition of this colony, however, and Queensland and Southern and Western Australia which have the proper climate lack the labour. The Baron states of *C. succirubra* that "It has been found hardy in Lower Gippsland and the Westernport district." The Baron adds:—"The best temperature for cinchonas is from 53° to 66° F.; but they mostly will endure in open places a minimum of 32° F.; in the brush shades of the Botanic Gardens

of Melbourne, where years ago cinchonas were already raised by the thousand, they have even resisted uninjured a temperature of a few degrees less, wherever the wind had no access, while under such very slight cover the cinchonas withstood also a heat of a few degrees over 100° F."

With cinnamon the Baron seems to have tried no experiment, although he notes that Dr. Hooker found plants at 6,000 feet on the Khasya Hills, while Dr. Thwaites found the true *C. Zeilanum*, BREYN, "even up to 3,000 feet in Ceylon." Coffee, the Baron states, "has been admitted into this list, not without great hesitation, merely not to be passed. The cultivation within extra-tropical boundaries can only with any prospect of success be tried in the warmest and simultaneously moistest regions, frost being detrimental to the coffee plant." With reference to this I may add that coffee plants from Queensland shewn in the Exhibition looked very much "shuck," while specimens of tea plants were generally far more healthy. Queensland shewed even mangoes on several occasions and with "bananas" and pineapples she keeps Melbourne regularly supplied.* In Dunn & Hewett's case in the Exhibition cacao is shewn in every possible shape, and the attempt to represent a tree with blossom and fruit is fairly successful. But what is called a coffee tree is a miserable caricature of what, when healthy and free from fungus and grub, and covered with snow-white blossoms or ruby-red fruits, is a very beautiful object. May we yet see it in its pristine glory in Ceylon. The Baron notices the Liberian species of coffee, but, strange to say, takes no notice of the fairly successful experiment to naturalize this plant in Queensland. That will yet be a great and rich colony, with its vast resources of soil and climate. I met Mr. Lukin Gresswell here a few days ago, and was much interested to hear his account of the great transcontinental railway he is engaged in furthering. The idea now is that the Queensland section should reach the ocean at Port Parker, about 90 miles short of Port Darwin. But all these colonies are doing wonders in railway construction, lines of which will speedily connect the coldest regions of Australia with others where tropic heat ever reigns.

Mr. Lukin Gresswell holds that even in tropical Australia white men can labour and live, but this I doubt. The solution of the problem would seem to be Lieut. Governors with paternally despotic "crown-colony" rule in the tropical latitudes, the lands being cultivated by Indian immigrants. This, and Sir Wm. Jervois's idea of Tasmania as the centre of the great Australian confederation, may yet be realized. But to return to the botanic Baron's book. Of the ubiquitous tea plant, which is said to grow in Japan so far north as 39° (or 32° farther from the equator than Ceylon), where a temperature of 16° F. sometimes exists, it is remarked:—"This evergreen and ornamental bush has proved quite hardy in the low-lands at Melbourne where in exposed positions it endures without any attention our night frosts as well as the free access of scorching summer winds." Again:—"The plant comes into plentiful bearing of its product as early as the Vine and earlier than the Olive. Its culture is surrounded with no difficulties, and it is singularly exempt from disease, if planted in proper localities." The Indian planters believe that they have chosen proper localities, and yet their bushes suffer not only from what the Baron himself calls "the very troublesome tea-bug of Asia, *Helopeltis theivora*," but from red spider and mosquito blight, while in Ceylon small moths do much mischief. The Baron, at the conclusion of his notice of "Camellia Thea," states:—"Seeds of the tea bush are now in many parts of Australia locally to be gathered from plants distributed by the writer, and for years to come the cultivation

of the tea bush, merely to secure local supplies of fresh seeds, ready to germinate, will in all likelihood prove highly lucrative." This may be true, and the plant may be widely cultivated in gardens and hedges, but we need have no fear of the Australians for generations to come growing the tea they drink. Conditions of soil and climate exist here as well as in America, but cheap and plentiful labour is a *sine quâ non*. Cacao the Baron does not include in his book any more than cardamoms. On the whole, we, in Ceylon, are more likely to be successful in cultivating the eucalypts and acacias of Australia, about which this book gives much valuable information, than our Australian friends are to compete with us in the growth of purely tropical products.

CEYLON COCOA IN MINCING LANE.

Messrs. Rucker & Bencraft report as follows in their Price Current on the parcels of Ceylon cocoa referred to by us yesterday, and which it seems they sold:—

Cocoa.—The statistical position is weak; stocks are increasing, and arrivals are heavy. At sale 7,200 bags went flatly, and prices were easier.

Our little parcel of Ceylon marks, Amba and Palli, fetched the fancy prices of 100s to 100s 6d. This cocoa is much liked, it has the true rose colour, and the husks are light and fragile. Stocks are:

1881. 1880. 1879. 1878. 1877.

59,471 26,941 17,737 25,614 26,539 packages.

Rather different are the remarks of Messrs. Wilson Smithett & Co., who are said to be leading authorities on cocoa:—

Cocoa.—The auctions this week were again heavy, and importers shewing a disposition to sell a further decline of 1s to 2s was established. A parcel of 72 bags Ceylon realized an extreme price, and one that may prove very misleading to growers, as the quantity required for the special use (these went for coloring chocolate) is very small, and large importations could only rank with other growths, and sell at relative prices, say 70s to 75s per cwt.

But we notice that the same firm acknowledge to an increasing consumption of cocoa in France amounting for the first two months of 1881 to 1,910,028 kilos, against 1,562,523 in 1880 and 1,392,011 in the same period of 1879.

THE (CEYLON) TEA AND CINCHONA PLANTATION COMPANY (LIMITED).

We take the following from the *Home and Colonial Mail*:—

We have received a prospectus of the above project, the capital of which is £100,000 in £1 shares. The purpose for which the Company is formed is stated to be the "purchasing of estates and developing therein the cultivation of tea and cinchona." "It is also proposed to cultivate other valuable articles such as cardamoms, india rubber, cocoa, nutmeg, and vanilla, the soil and climate of the Southern Province of Ceylon being especially suitable for the growth of such products." "To inaugurate the business of the Company, the directors have arranged to purchase and take over certain properties, of about 2,335 acres in extent, in the Southern Province of Ceylon, locally known as Anningkanda and Panilkanda, at an average cost of about £6 5s. per acre." The estates are, the prospectus states, already partly planted with tea, cinchona, and cardamoms, the extension of which will be proceeded with vigorously.

The following contracts have been entered into: 1st. One dated the 25th of March, 1881, between Alexander Brooke, as vendor of the Anningkanda estate, with all the buildings, plants, trees, tools, machinery, and crops growing thereon, and David Baird Lindsay as

as purchaser of the same on behalf of the company, and—2nd. One dated the 24th of March, 1881, between Edward Morton Rossiter, Richard Wade Jenkins, and William Charles McEntee, as vendors of the Panilkanda estate, with all the buildings, plants, trees, tools, and machinery, and crops growing thereon, and David Baird Lindsay as purchaser of the same on behalf of the Company.

The purchase money to be paid under these two contracts amounts to the sum of £15,000, of which £9,000 is to be paid in cash and £6,000 in fully paid up shares of the Company.

The directors express their belief that handsome profits will be realised by this venture for the reasons that they do not depend upon any one article of produce alone, and that labour is cheap and abundant in the district in which the Company propose to commence operations.

CYPRIAN BEES.

At the 10th annual convention of the North American Bee-keepers' Society the Rev. O. Clute read, for the author (Mr. F. Benton) a paper on "The Next Progressive Step," from which we take the following as of special interest to the gentlemen in Ceylon who purchased colonies of Cyprian bees from Mr. Benton as well as to others:—

I propose to try to accomplish a portion of the committee's work by presenting for your consideration a statement of the views entertained, after some years of experience with Cyprian bees, by prominent bee-culturists of Europe, so far as the latter have expressed themselves in the apiarian journals of the continent. The authorities I shall quote are such as are known to have had experience in cultivating this race of bees, and whose reputation is too well assured for any to doubt their having used care and having made great efforts to arrive at the truth. In 1868 the first colony of Cyprian bees were received just at the beginning of winter and did not survive until the next season. Another colony was obtained in 1872, and two more in 1874, since when other importations have been made. Apiaries of hundreds of colonies of Cyprians are now in existence in Austria; in Germany there are also large Cyprian apiaries, and the race is attracting much attention in adjoining lands as well as on this side of the water. The opinions expressed by foreign journals are, in the main, very strongly in their favour, and I am fully persuaded that our next progressive step is to introduce their cultivation extensively into this country.

A brief description of the Cyprians may not be amiss to many. The bodies of the bees are strong, slim, and wasp-like, the abdomen being quite pointed. They are to be classed, decidedly, among the yellow races; their whole bodies have generally a more golden or orange color than those of the Italians.

The Cyprian queens are perceptibly smaller than other queen-bees, their bodies being slender, in fact delicate appearing, very tapering, but long. The drones of the Cyprian race are strong, and have long, apparently stretched-out bodies.

In regard to the qualities of the Cyprians, Herr Cori says:—"This race exceeds all those thus far described. The bees commence brood-rearing earlier, have an active disposition, fly when the weather is cool, are extraordinarily prolific, and are diligent in honey-gathering. As regards their disposition to sting it may be said that it is not greater nor less than that of the Italians or of other races." The testimony of this man is well worth considering, for, holding a high position under the Bohemian government, he has for many years devoted a great deal of his time to the elevation of his favorite pursuit—bee-culture, in his native land, and has become re

cognized in his locality as an authority in such matters. In 1875 he wrote as follows:—

"The Cyprians appear to be no particular friends to drones. At the second revision of my colonies in the spring during the latter part of May. I found in sixty-two colonies no ripe drone brood, and in only a few was any drone brood to be found, while from hives containing bees of other races drones had been flying for eight days. How long it was before my original imported Cyprian queen placed eggs in a drone comb, hung in the middle of the brood-nest! Rather than comply with my earnest wish she allowed empty combs, usually so odious to the bees, to be placed between the sheets of brood, and yet this colony was very strong, the weather quite favourable, and I fed it more diligently than any of the others. Such a similar occurrence in all of my Cyprian stocks indicate that it is a peculiarity of this race to commence drone-rearing much later than others do. On the other hand, the killing of the drones takes place from two to three weeks later than with our other bees, but the making away with the drones then goes on rapidly. Indeed, we met with individual drones in February in colonies in good order and even those possessing good young queens. I believe, therefore, that I am not mistaken in assuming that a further peculiarity of this race is the wintering of individual drones. I found in none of my Cyprian stocks too great a multitude of drones; on the contrary, in comparison with other races, there were rather less, than more. In the collecting of honey the Cyprians are very diligent; they appear to be discreet in the occupation of the ready combs with brood and honey, and only after that to devote themselves with full zeal to the building of new combs. They begin the sealing of honey earlier than do other races of bees."

The best proof that can be adduced to show that the Cyprians have sustained the good reputation early given them by the Count, is found in the fact that from time to time, since the above was written, he has imported more from Cyprus.

One of the well-known and often-quoted bee-raisers of Northern Germany is Herr C. J. H. Gravenhorst, of Brunswick, not a breeder of queens for sale, but an extensive honey producer, whose sensible articles in the old numbers of the *American Bee Journal*, form quite a fund of information. He says himself, in an article which I translated for the *American Bee Journal*, September 1877: "After trying various races and concluding that the Italian was the best, I felt not the least inclination to procure and cultivate still another race." However, on the recommendation of some of his apiarian friends, he procured, in 1874, two Cyprian queens, and after three years' experience with the breed reported as follows:—

"The colony with the imported queen was especially diligent, gave a large return, and with the remainder of the stocks, was in good condition for winter. The wintering and development during the next spring left nothing more to be wished for.

"After having carefully observed the Cyprian bee—pure as well as hybrid—I have come to the following conclusions regarding the same:

"1. The diligence of the Cyprian is at least equal to the Italians; indeed, as regards economy within the hive, the former have the preference, because they are less inclined to build drone-comb. The same peculiarity is noticeable also with the hybrids.

"2. In their purity they are certainly more beautiful than the handsome Italians. Those who visited my apiary were always much surprised as strong stocks filled with these beautiful bees were opened, and masses of the insects rolled out so peaceably.

"3. When rightly handled, they are neither more nor less inclined to sting than the Italians."

In another place the same writer remarks:—

"It is a well-known fact that the most of the Italian colonies do not winter as well as black bees, and very often suffer by spring dwindling. This is not the case with the Cyprian bee. I have reared in three years many a Cyprian queen (not to sell with a few bees, but for my own use, and to sell in full Cyprian colonies in the spring), and every such colony wintered well, coming out strong in the spring.

"The Cyprian bee will not swarm as much as the Italian, and does not build as much drone-comb as the latter.

"I will not say the Cyprians work better than Italians, but it is certain my Cyprian colonies yielded me every year the greatest honey harvest. As to stings, it may be stated, they used them neither more nor less than the Italians."

Herr Dathe, the author of the very practical *Lehrbuch*, says: "The Cyprians are more inclined to gather honey than to swarm; however, they are not as gentle as the Italians and are often so cross that they cannot be controlled by means of tobacco-smoke, resembling in this respect the Egyptians."

There seems to be two parties as regards the temperament of the Cyprians. Some say they are quite gentle bees, others that they are very ugly*—being almost unmanageable. This of itself would lead us to think that through some mishap the latter had been handling hybrid bees, which are well known as great hands to sting, and indeed, we find a large number of bee-keepers testifying that it is only when hybridizing has taken place that bees of Cyprian blood are cross.

Herr Guenther, of Gispersleben, Thuringia, is another noted and extensive breeder of Italian bees, who says the Cyprians are very diligent and prolific, but says they are exceedingly cross.

Herr Anton Lorenz writes:—"The Cyprian bee is diligent—where there is a chance to rob; this proves its diligence, which we do not wish to disparage in the least, but its crossness exceeds all bounds. As some praise its good disposition, while others bring forward its inclination to sting, are we not to conclude that the race is not pure or not of the same sort, whether this be, as Herr Hilbert thinks, because some have Smyrniar blood in them, or because there are two kinds of bees on the Island of Cyprus, one of which is decidedly ugly."

I fully believe our next progressive step is to introduce and commence the dissemination of the beautiful, valuable bees of Cyprus. I have presented you with the views of the prominent apiculturists who have tested these bees on a large scale and for a number of years—some as many as seven years, and you see they are very generally agreed on all points but one, and that the majority report favourably regarding that point, while from our own experience with Italians we can easily understand how such a diversity of opinion might exist when in reality there existed no serious objection to the race of bees.

Perhaps we cannot, as that enthusiastic German, Herr von Natzmer, suggested to his countrymen, "annex Cyprus," yet I think when American bee-culturists fully realize how great is the benefit likely to result from the introduction of this race of bees, they will not be slow in turning to account all practical means at hand to aid in the work.

Lansing, Mich.

FRANK BENTON.

NOTES ON LIBERIAN COFFEE: ITS HISTORY AND CULTIVATION (IN JAMAICA).

This is the title of a pamphlet by Mr. D. Morris, published by the Jamaica Government. Its purpose is to give the Jamaica planters the leading information on the subject. Mr. Morris acknowledges his indebtedness to the book published by us in 1878, and, in fact, the whole pamphlet is largely composed

of information from that work and from our columns. We quote the following regarding Liberian coffee in Jamaica :—

In 1879, Mr. Jenman reported as follows respecting the Liberian coffee at the Castleton Gardens :—"There is a great demand for this coffee, which the garden is quite unable to meet at present. All attempts which have to my knowledge on the part of private parties to import either plants or seed have proved failures. Another small parcel of seed received some months ago from Kew Gardens, produced between four and five dozen plants. I shall still further extend the plots now in cultivation, that the Gardens may in time be in the position to supply plants in thousands yearly. I am glad to be able to report that the first few trees received have, this year, borne a small crop of fruit, which has recently been gathered and sown. Several applications for the seed have been made, all of which I have felt it my duty not to comply with. Ample means exist here for raising it successfully, such as private persons do not possess; and, without question, it is to the interest of the colony that precautions should be taken to ensure a minimum of loss with the seed produced for the first few years. From the quantity given the first season it would be impossible to form even an approximate estimate of the ultimate yield of the tree; nor, as its character under cultivation is as yet unknown to us by actual experience, could its merits compare with the common species be judged thereby. However, taking the circumstances connected with these particular trees into consideration, the yield appeared quite satisfactory. No record was obtained of the quantity produced by any or all the trees, as the berries were picked one by one as they ripened, to avoid the risk of loss by rats. Taking equal numbers of average fruit of the two species grown side by side on the same ground, the relative weight of the Liberian was as eight to three of the Arabian." The further progress of the Liberian coffee plants, at Castleton, is given in the following interesting remarks by Mr. Syme in his report for 1879-80 :—

"**LIBERIAN COFFEE.**—Thirty plants of this species growing on the rather steep slope of the ravine above the aquatic tank are now from 4 to 10 feet in height, and bore this year a large crop of cherries. Over 7,000 plants have been raised from them. The parent plants were in flower when the hurricane swept over them thus blasting all hopes of a crop of cherries in 1880-81. Of the 31 plants put out in the old canefield by Mr. Jenman in April, 1879, five were uprooted by the storm. The others are now—say at twenty months old—from 3 to 5 feet in height with stout stems and fine bushy heads and in the best of health. Two or three produced a few flowers last August. This plantation has been extended during the year by an additional 86 plants, and the ground carefully cultivated—all have done well. No nurseries were planted with them, and they have had no protection from the sun or wind other than what was afforded by the adjacent hills and the bamboos growing by the river side. By thus planting in the open we may expect to have fruit from them at a comparatively early age. But for those who would plant this species extensively for profit it is advisable that the plants have both shelter and partial shade. Nevertheless, I am of opinion that on suitable soil with an annual rainfall of not less than ninety inches this species may be successfully cultivated without any special shelter from cutting winds of shade from the sun; and that it will be equally well or perhaps better, the soil being suitable, if provided with shelter and partial shade in localities with an annual rainfall of not less than seventy inches. Thus there are large tracts of coast land in the Island that are well suited for the successful cultivation of this tree-coffee."

Hitherto, the number of plants placed under favourable conditions in Jamaica, have been too few to allow of an estimate being formed of the approximate

yield per acre. The plants now at the Castleton Gardens were kept for two seasons in the uncongenial temperature of the Cinchona Plantation (5,000 feet,) but after removal to Castleton (600 feet,) they have made satisfactory and rapid progress. Recently they were described as "beautiful and much admired objects in their dress of stately dark green foliage, laden with the pure white bloom among which appeared the ruddy fruit from the previous year." During the year 1879-80 some seven thousand seedlings were raised from the produce of these trees, and the cultivation is being rapidly extended, both at Castleton and at the old Botanic garden at Bath. Another peculiarity of Liberian Coffee is dwelt upon which if found generally applicable to it, will greatly increase its value. The tree is mentioned as possessing the habit of sending its "strong tap-root far into the ground" and this characteristic is believed "will enable the Liberian Coffee to live and bear fruit in seasons of protracted drought, which prevent the setting of blossom on the ordinary coffee at low elevations."

We may naturally look forward to the quality of Liberian Coffee being greatly improved under cultivation both in the East and the West Indies; but taking the opinion expressed above and assuming that Liberian Coffee will sell generally at 90s. per cwt., this does not, necessarily, involve a lower return for the capital and attention devoted to it. From its adaptability to cultivation in the plains, from its more robust and prolific character, and from the generally more economic treatment to which it is amenable, it is quite possible that its cultivation will prove even more remunerative than the high-priced varieties of Arabian Coffee.

THE EVIL WROUGHT BY THE PHYLLOXERA IN FRANCE AND THE REMEDY.

(*Pall Mall Gazette.*)

While nations during the last few years have been occupied in flying at each other's throats and doing their utmost to decimate their neighbours, a silent enemy has been making terrible havoc in France and other countries, causing to the former State nearly as great a money loss as that entailed by a tolerably long war. The name of this enemy, all the more deadly because it is so small as to be nearly invisible, is the phylloxera, and the mischief that has been inflicted by it on French interests may be estimated by the fact that in 1880 alone 92,000 acres of vineyards were utterly destroyed, and that the yield of wine and brandy, which was 83,836,000 hectolitres in 1875, was last year only 29,677,000. If we take one of the most productive wine departments in France—namely, that of Gard—we find that in 1865 there were 261,027 acres of vineyards, but that of these the phylloxera has absolutely destroyed 244,485, so that Gard now only possesses of her staple crop but 16,542 acres. The yield of wine has fallen away from 2,445,000 hectolitres to 139,640 in 1879, although a slight improvement was manifested last year. This means simple ruin to a large portion of the department, and a most serious loss to the whole State; while the numerous drinkers of claret, champagne, and brandy in this country are feeling their share of the loss not only in the scarcity of the articles, and the consequent rise in price, but also in the deterioration of the liquors, which is very marked in the case of the spirits. Nor is France the only victim, for wherever vineyards exist, as in Germany, Italy, Spain, Austria, Hungary, and even in Australia, we hear of this destructive little pest, defying all attempts at extermination, and driving the vineyard proprietors to the verge of insanity.

The magnitude of the evil may be measured by the magnitude of the reward offered by the French Go-

vernment—300,000 francs—to any person who shall discover a radical remedy. Chemists and savants have been active enough in devising nostrums, but the reward has not yet been claimed, although, collectively, several of the experiments have afforded partial relief in certain districts. The mischief of the phylloxera is that it seems to be wholly unaffected by changes of temperature: no summer, however hot, no winter, however cold, appearing to have any effect upon it. Indeed, one experimenter has gone so far as to enclose specimens in glass tubes and plunge them for a lengthened period into freezing mixtures, and yet the phylloxera has emerged triumphant and unharmed. Another of its peculiarities is, that it is preserved from the attacks of birds and insect-feeders by being able to burrow deeply into the roots of the vines, so that practically it has very few natural enemies to contend with. The treatment to which it has the most decided objection is that of immersion in water, and the flooding of vineyards has in consequence been in some districts the most efficacious remedy yet discovered. It is an easy one, when the character of the ground and the proximity of a river allow of its being applied; but so many vineyards are situated on the steep slopes of hills, to which the water could not be brought except by a costly system of pumping and canals, that it would be practically useless in the great majority of cases. Of artificial remedies, the most efficacious appears to be the sulphur carbons, which kill the phylloxera more speedily than anything else. But, whether from the trouble or the expense, vineyard proprietors have been rather backward in using it, although every facility has been offered by the Paris and Lyons Railway Company to supply it at 45 f. per 100 kilogrammes, together with an injector, specially made for the purpose, at 40 f. M. Dejardin, secretary to the Gard Phylloxera Commission, states that according to his experience the sulphur carbons do not answer alike in all soils, but only in those which, being very light, allow the vapour to thoroughly permeate every grain. The most radical treatment is, doubtless, the entire destruction of the vine and its replacement by American stocks. This seems rather paradoxical as it is from America that the phylloxera has been imported; but notwithstanding this fact, the American vines are not injured by it. This is due probably to their comparatively new and robust growth, while the French vines, owing to their being a good deal worn out, or perhaps to some peculiar internal weakness, have fallen an easy prey. The latter supposition is the more likely, seeing that the phylloxera has been very destructive at Geelong in Australia, where the vines have not attained any great age. M. Girard, formerly president of the Entomological Society of France, does not share M. Dejardin's enthusiasm over the introduction of American vines, on the ground that enough is not yet known about their "idiosyncrasies," and that in all probability an entire change in culture will be necessitated, with a possible change in the quality of the wine. As a considerable acreage in Gard has been replanted with American stocks, whatever may be the ultimate result, a comparatively short period will enable the vine-growers to see how far the scourge will be kept at arm's length.

PERUVIAN BARK.

A popular account of the introduction of cinchona cultivation into British India. By Clements R. Markham, C.B., F.R.S. London: John Murray.

In this volume Commander [sic] Markham has supplemented the narrative previously published of the travels undertaken by him in connection with the enterprise of introducing the cultivation of Peruvian bark trees into British India and Ceylon, and has presented in a concise form a complete

history of the undertaking, from its commencement in 1860 down to the present year. Although specially interesting to medical men and botanists, the author, writing in a popular style has rendered the work attractive to the general reader, and has placed before the public an amount of information in regard to the cultivation of the cinchona trees of South America, and of the manufacture of the inestimable alkaloid drug extracted from them, which will be recognised as being of a most valuable kind. The use of quinine and the relative alkaloids extracted from the cinchona tree has now become so indispensable, and has proved of such incalculable value in warm countries where fever abounds, that on this account alone a history of the enterprise by which its benefits have been secured ought to prove of great interest. We are informed that there are now 547 acres under cinchona cultivation in the Government plantations on the Nilgiri Hills, besides 4,000 acres of private plantations on the Nilgiris in Wynad, Coorg, and other hill districts of Southern India. In British Sikkim the Government cinchona plantations now cover an area of 224 acres. The annual bark crop from Government plantations of Southern India alone is 490,000 lb. In Ceylon 5,578 acres were under cinchona cultivation in 1877. In 1879-80 the quantity of bark sold in the London market from British India and Ceylon was 1,172,000 lb. The East India source of bark supply is now the most important, but one as regards quantity, and by far the most important as regards quality. On the Nilgiris the whole expenditure has been repaid with interest by the sale of bark in the London market, and the Government is now deriving large profits of many thousands a year from the bark harvests. In Sikkim the true object of the undertaking has been better understood, and the plantations are utilised for the supply of a cheap and efficacious febrifuge to the people of India. In 1879 there were 7,007 lb. of this cheap febrifuge manufactured. Having given these general facts, the author proceeds to relate the history of the discovery of the virtues of Peruvian bark, of its first introduction into Europe, and of the opposition to its use. He then gives some account of the first botanical investigations connected with the cinchona genus, of the early trade and destruction of trees, and of the region of the Andes, where the trees flourish. His next object is to convey to his readers a correct general idea of the characteristics of a true cinchona, of the number of valuable species, and of the nature of the bark and of the febrifuge alkaloids which are extracted from it. Having also described each region of the Andes separately—where the valuable species are found, with some account of their discovery, and related the circumstances connected with the introduction of cinchona trees into Java by the Dutch. Commander Markham concludes with a lengthy description of the arrangements which he set on foot for the accomplishment of a similar object in India. In the course of his narrative the author directs special attention to the inadequate remuneration which his fellow-labourers, Dr. Spence, Mr. Fritchett, Mr. Cross, Mr. Weir, and Mr. Ledger received for their difficult and perilous tasks. He writes:—"They have laboured zealously and most successfully, and their task was one which called for special qualifications. Some have lost health, all have risked life and limb in the service of their country. They have nobly earned the gratitude of the Government and people of India. Cinchona cultivation is now not only self-supporting but remunerative. Recompense would not be paid from revenue provided by the tax-payers of India, but from the profits of work actually done by the very men who are now deprived of their due reward. It is unnecessary that I should give further expression to the indignation I feel at the injustice with which those have been treated who have done an

inestimable service to mankind. If the people of England, and still more the people of India, are contented that this should be the requital for such service, there is nothing more to be said." The volume, it may be stated, is plentifully illustrated with maps and diagrams.—*Scotsman*.

CINCHONA.

(From our London Correspondent.)

The auction this week went off very irregularly, and the prices realized were moderate. There was great interest felt in this sale, because of the large quantity of Indian Government bark arrived by the "Eldorado" and "Kaiser-i-Hind." I give you the result of the sale of this importation, which was principally grown in the Government gardens at Ootacamund:—

"RED."

NATURAL.				BRANCH.			
1880.		1881.		1880.		1881.	
Bales.	Price.	Bales.	Price.	Bales.	Price.	Bales.	Price.
2	s. d.	2	s. d.	5	s. d.	31	s. d.
35	2 9	23	2 10	4	1 3	13	2 6
75	2 10	4	2 1	4	1 4		
39	2 11	18	2 4	4	1 5		
42	3	56	2 5	21	1 8		
37	3 2	5	2 6	22	2 7		
54	3 8	70	2 9	35	3		
14	3 10	60	2 10	5	3 1		
65	4	46	3 1				
5	4 1	41	4				
	5			110 bales		44 bales	
370 bales		325					

SCRAPED.

none none 43 2 9

RENEWED.

1880.		1881.		1880.		1881.	
Bales.	Price.	Bales.	Price.	Bales.	Price.	Bales.	Price.
9	5 4	15	4 2	16	4 5	15	2 11
1	5 6	35	4 4	35	4 6	2	3
3	5 8	30	4 5	48	4 7	18	3 1
3	5 9	33	4 7			85	3 7
102	6 3	15	4 9			5	3 8
15	6 4	18	4 11			140	3 10
75	6 5	160	5			8	5
5	6 6	5	5 1				
43	6 10	60	5 2	99 bales		273 bales	
1	6 11	1	5 3				
		6	5 6				
		3	5 7				
		6	6				
		5	6 1	5	2 5	4	1 6
		10	7	33	2 7	10	2 5
		26	7 2	5	2 9	9	2 8
						4	2 11
						2	3
257 bales		428 bales		43 bales		29 bales	

"CROWN."

NATURAL.				MOSSED.			
1880.		1881.		1880.		1881.	
Bales.	Price.	Bales.	Price.	Bales.	Price.	Bales.	Price.
2	4 0	20	5 0	1	6 2	5	5 11
1	4 3	23	5 8	1	6 7	25	6
1	4 4			1	6 8	6	7*
2	4 8			8	6 9		*not sold
5	4 9			6	6 10		
14	5			0	6 11		
11	5 5			20	7		
9	5 11			7	6 1		
20	6			5	7 3		
13	6 1			4	7 4		
23	6 4			14	7 10		
5	7 1			5	8		
106 bales		48 bales		78 bales		36 bales	

RENEWED.				BRANCH.			
1880.		1881.		1880.		1881.	
Bales.	Price.	Bales.	Price.	Bales.	Price.	Bales.	Price.
7	8 4	5	7 7	1	2 4	8	1 10
5	8 6	9	7 9	12	2 7	5	1 11
10	8 7	50	8 11			3	2
3	8 10	25	9			9	3 4
4	9	5	9 1				
30	10 1	22	10 3	13 bales		28 bales	
13	10 2						
72 bales		116 bales					

TEA IN CEYLON.

A certain tea estate in Ceylon enjoys a reputation among Ceylon folks at home for splendid tea. I am in a position to tell that estate to exercise yet a little more watchfulness while tea is being put up for shipment. This estate has sent to England tea put up in bulk and in 2 lb. tins. The former—of which I have seen several cases—is uniform in appearance, excellent in quality and free from dust. The same cannot be said of the 2 lb. tins, for, about a third of the number contained in one box are very much different from the remaining two-thirds. The third is a fine leaf, broken into $\frac{1}{4}$ th to $\frac{1}{2}$ th inch, very superior in quality, and although the appearance of the leaf is pleasing to the eyes of those skilled in teas it is too small to command its value from the general consumer. The two-thirds fall short of that estate's handsome clean leaf bulk cases, by being poorer in extract, flavour, and very dusty. The fault lies in packing tins of very different qualities into the same box. The retailer selling a sample tin cannot guarantee the others to be the same.—*Aberdeen Cor., April 1st.*

THE "TEA CYCLOPÆDIA."

This, according to the somewhat lengthy title, is "a volume of selections from leading and original articles, correspondence, and papers, regarding matters of permanent interest and value concerning tea and tea science, tea blights, soils, and manures, tea cultivation, buildings and manufacture, miscellaneous tea topics, tea statistics, &c., &c., &c., collected from the last eight volumes of the *Indian Tea Gazette*, and from several other valuable sources, and classified according to subjects, by the editor of the *Indian Tea Gazette*. Illustrated with colored plates on 'blights,' from drawings by S. E. Peal." The synopsis at the beginning states that

This Volume has, for greater convenience to readers, been divided into Parts, with separating half-titles. The first section treats of Tea Science, and the botany and chemical properties of Tea, as well as of the early history of the industry. The second section is devoted to a reproduction of the most valuable papers on, and correspondence and opinions regarding, "Tea Blights and Tea Pests," which have appeared in the pages of the *Tea Gazette* during the last four years, as well as in those of contemporaneous journals. The Third part is devoted to an exhaustive consideration of every point bearing upon Tea Cultivation and Manufacture for the past four years, arranged as nearly as possible under distinctive sub-heads. Part IV contains special reference to the principal Tea Districts of India, with incidental notes on the less important districts, while statistical tables of Indian Tea Cultivation, as far as published to date, are appended. Part V shows the countries, other than China and India, in which Tea Cultivation is now being carried on, or has at any time been attempted. Part VI refers to the discussions which have taken place regarding the opening up of new markets for Indian Tea, and of operations as far

as they have gone at present, or have been projected. Part VII is devoted to miscellaneous subjects of interest connected with Tea and the Tea Industry. Part VIII, the concluding part, contains Tea Reviews, for the past year, and valuable Tea Statistics for the past ten years.

The more important parts are printed in large type, and each column on each page has the subject set forth in capitals, so that the reader has little difficulty in turning up what he wants. A full index at the end completes the usefulness of this volume, which should be in every tea planter's bungalow, in Ceylon as well as in India.

THE JAFFNA TOBACCO TRADE.

Is the trade of Jaffna, whether we consider the extent of a land under tobacco cultivation or the amount of capital employed in it. As a matter of fact tobacco is more largely cultivated in the Northern Province than any other product. Extensive tracts of land are devoted to tobacco cultivation in all parts of the Province. To many in Pachellapallai, Wadamaradchy. Poonaryn and Illeppakadavai it furnishes the only means of livelihood. It is much to be regretted that there is no record of the area under cultivation nor of the quantity gathered in at each season. The Customs reports furnish us only with the quantity that is exported to India, the tobacco, which is converted into cigar or which is sent to the towns in the Island, being not noticed. There is however not the least doubt that the quantity of tobacco which meets the demands of the Island is very large.

In tobacco there is a greater variety than in any other article: but one feature common to the tobacco of the Province and which has been more than once noticed is that it possesses a flavour and strength seldom met with in tobacco cultivated in other parts of the Island. We cannot at present mention the names of all the species known here. The chief of them are *Illeppakadavai*, *Netheavaddai* and *Pokkan*, and these are considered very rich and form a large proportion in the tobacco that is used in the manufacture of cigars. *Pokkan* is also used for chewing purposes—but from its high price its use in this manner is limited only to the well-to-do classes.

Another circumstance connected with the tobacco trade and not generally known is that the tobacco exported to India is far inferior to that which is utilized for cigars. The tobacco for export is tied into sheaves containing 500 and upwards, rolled into bundles or chippams and sent off. The tobacco exported during 1880 is as follows:

January	...	cwt. 4,064
February	...	4,820
March	...	4,569
April	...	585
October	...	6,478
November	...	8,426
December	...	4,232

The total is cwt 33,174. We have no figures for the quantity drawn to meet the demands in the Island. It is a well known fact that a large supply is generally sent to Colombo, Galle, Kegalla, Gampola, and other places.

An impression exists in certain quarters that the tobacco trade has declined and that it is not so remunerative as it was a few years back. In our inquiries we have not met with a single circumstance to confirm it: and all that we have been able to ascertain shews it to be a wrong and unfounded presumption. There are more men engaged in the trade and the cultivation of the leaf is more extended now than in any period within our recollection.

In this connection it would be unfair not to mention the name of the gentleman who rendered material service towards the extension and

development of this trade. We refer to Mr. Charles Morrison now Agent, O. B. C. Kandy. His energy and ability apart, during the time he presided over the affairs of the local Branch of the O. B. C. he gave active encouragement to the trade, extended the business of the institution entrusted to him and relieved the traders from the necessity of borrowing money from the unrelenting Chetty who was the only capitalist then known in the land.

It is the opinion of experienced traders that the out-turn for this year will be very small compared with that of last year, the rain in January and February having prevented transplantation. The plants are still young and the crop will not be ready for market for a short time to come. A great disadvantage the tobacco traders suffer from is the stoppage of steam communication. This is a source of loss and inconvenience. The mode now adopted is to send it in sailing vessels to Negapatam and thence to Galle or Colombo by means of steamers.—*Com. Ceylon Patriot*.

COFFEE LEAF DISEASE.

LONDON, April 8, 1881.

I read with much interest Mr. Ward's last public reference to coffee leaf disease, and, I told you, I sent the lecture he read on the subject before the Planters' Association through the medium of a friend to Dr. Cooke. That friend has obligingly forwarded to me Dr. Cooke's remarks upon it, which I am kindly permitted to communicate to you. He writes:—"I have read over the account of Mr. Ward's lecture, but, as there is nothing new in it, nothing additional to his report, it hardly calls for special comment. All I can say is, that I think he is on the right track—that is—practical experiment, and I fancy that I go along with him in what he has said. Of course we must not force his analysis too hard. Most cordially do I endorse his last sentiment, viz.,—destroy every vestige of dead leaf from the surface of the ground, by burning them, and restoring in the *ash* the mineral constituents to the soil, but if all the leaves are carefully taken away, and so much potash &c., abstracted from the soil and not replaced, gradually the soil will grow so poor in the essential mineral constituents of the leaves that vigorous growth will become impossible. If the leaves are studiously picked up and carted away, without compensation to the soil for what is abstracted, the remedy will scarcely be better than the disease." I regret to say that Dr. Cooke's lecture on this subject read before the Linnean Society has not yet been published and I understand that even the author himself has not received a copy of it, so I am not in a position as yet to send you one. The delay by the Linnean Society in issuing copies of important papers like this is one that is strongly and adversely commented upon by all its members. I have not yet heard Dr. Cooke's opinion upon the note published by you relative to the appearance of a fungoid disease upon the coffee estates in New Granada. I am unwilling to tax Dr. Cooke's kindness too far, but I have asked my friend, if he should meet the former, to verbally ask his opinion as to the presumed similarity between it and the *hemileia vastatrix*. I have forwarded copies of your notice of this subject to several friends whose opinion on such a matter may have weight. The professor of botany to the Royal Veterinary college tells me that although there is doubtless an affinity between the two diseases, they appear to him to possess distinctly marked features of divergence. He also told me that he had not seen any future reference to the outbreak since the notice appeared in *Nature* that you quoted. He has also written me

with respect to Mr. Marshall Ward's lecture:—"I myself regarded the final remarks of Mr. Ward as *entirely to the point*. Practical men always look for miracles in remedies, which even scientists cannot produce." Mr. Leake writes me in reply to my query addressed to him on the New Granada subject:—"I know nothing of the new disease, never heard of it before. A green yellow Hemileia with a phosphoric smell must come straight from the old gentleman himself, I should think." Mr. John Brown, of the Uva Coffee Company, writes me: "I can give you no information about leaf disease in New Granada, but am anxious to know how it is progressing. I met a gentleman the other day who had been in conversation with a Brazilian planter, and got from him the assurance that there was no leaf disease in that large opposition shop. If I should hear anything you will be informed." Another gentleman connected largely with coffee, and who has travelled much, tells me in a letter in reply to one I addressed to him: "The disease is doubtless the *Hemileia vastatrix*, and consequently, as they don't manure in those parts, it must, as I have all along maintained, be owing to bad seasons." This is all the information I have as yet been able to collect on this interesting topic. If I should receive Dr. Cooke's opinion respecting it, I shall of course communicate it to you.—*Our London Cor.*

THE INDIAN GOVERNMENT EXPORTS OF CINCHONA BARK.

TO THE EDITOR OF "THE COLONIES AND INDIA."

SIR,—In reply to "Indicus" letter of the 21th ult., I would state—

First.—The Indian Government created their plantations for the benefit of the masses of the people, and to bring a cheap febrifuge within their reach and the whole of the bark ought now to be worked up in India for the benefit of the people, and, not shipped for sale here for the purpose of showing flourishing accounts. To talk of a surplus of bark with millions of fevered wretches in India too poor to buy it is bitter irony, as the native press will doubtless show. The shipments are wrong morally and are wrong legally, for by everlasting laws the inhabitants of a country have the first claim upon the produce of the soil, and in the present case the produce is raised from their own taxes.

Secondly.—I have it from the highest authority that all the capital outlay with interest has been recovered.

Thirdly.—If the Government wish to be prepared for the emergency mentioned, selling their bark in London is in direct opposition. Better let the trees grow and improve until they are wanted or store their febrifuge until required, if they will not distribute it to the poor ryots; but they need not now fear any emergency, as there cannot be much under fifty thousand acres, containing many millions of Cinchona trees, planted by private enterprise in India and Ceylon.

I am, yours &c.,

THOMAS DICKSON.

123 Bishopsgate Street Within, London. April 2.

THE INDIAN GOVERNMENT EXPORTS OF CINCHONA BARK.

TO THE EDITOR OF "THE COLONIES AND INDIA."

SIR,—The question whether or not the Government of India should extend their cinchona plantations and offer the surplus bark in the best market, to the supposed detriment of planters in Ceylon, &c., might perhaps be put in another light than that presented by Mr. Dickson. In the case he puts forward, the planters are said to suffer from competition. But even if the Indian Government withheld from the European market the surplus bark they produce, is

it to be supposed that private planters would not suffer from competition elsewhere? Would the Java planters who now produce the finest and most valuable bark in the world cease to extend their plantations? Would the Bolivians who are now *cultivating* the best cinchona trees, and who last year sent into the London market bark which sold at 14s. 6d. per lb., cease to compete against Ceylon? Ceylon can never hope, owing to the nature of its climate, &c., to compete with other districts in the most valuable kind of bark—viz. *Cinchona Ledgeriana*.

The plea of unfair competition is, therefore, childish. Planters must expect competition and be prepared to meet it by cultivating only the most valuable varieties the climate and soil will permit of.

Secondly.—Any profit accruing to Government from the sale of cinchona by increasing the revenue should decrease the taxation. It therefore becomes a matter of whether a comparatively small number of planters shall make large profits, or whether thousands shall experience a decrease of taxation (other things being equal.)

Thirdly.—Quinine is still sufficiently expensive in this country to prevent the poorest from purchasing it for themselves in case of fever and disease. Competition will tend to remove this evil, and bring quinine more within the reach of the poor both in India and in this country.

Your correspondent "T.D." will find his sixth question answered in Mr. Markham's book on *Peruvian Bark* (1880), p. 440, where it is said:—

"It is true, therefore of the cinchona enterprise that, as a mere commercial speculation, it has paid off the whole outlay, including introduction of the plants, cultivation, and interest, and has become a complete financial success."

And again, "In 1880 the whole capital account had been paid of with interest, and the plantations began to yield a clear annual profit"

Those who complain of competition will do well to seek another market, and bear in mind the suggestion made by a writer in the *Pall Mall Gazette* of September 18, 1880 (quoted by Mr. Markham in his work), that "China will probably be hereafter among the largest and most constant customers for cheap febrifuge alkaloids from British India. From vast tracts of country in China where rice is cultivated fever is never absent. Opium is now employed as the medicine easiest to be had and cheapest. If cinchona alkaloids could come into competition with opium and obtain the preference by their lower price, the immense superiority of cinchona over opium as a febrifuge would produce a revolution in the Chinese consumption of the two drugs. By this process a solution would be found for the dangers and uncertainties of the large opium revenue of India and for the perplexing moral questions connected with it." To the above it might be added, although somewhat apart from the question at issue, that it probably only needs a different mode of preparation for the market to increase the percentage of morphia and decrease that of narcotine in Indian opium, and to thus bring it into competition with the Turkish and Persian opioms, with which the European and American drug market is almost entirely supplied, Indian opium being an almost unknown article on the Continent or in America.

London, April 5.

I am, &c.,
CHEMICUS.

[Of course the chemists and home manufacturers will prefer the Nilgiri's bark to be sent to the Mincing Lane Market to being utilized on the spot.—Ed. C. O.]

INDIA, CROP AND WEATHER REPORT.

For the Week ending 12th April: General Remarks.—The reports disclose no material change since last week. The general health is fair, though small-pox still continues in parts of Northern and Central India

and British Burma, and is also more or less prevalent in places in Bengal and Assam. In the Cachar district of the last-named province cattle disease has again increased. There was more or less rain in parts of British Burma, in Assam, and in many districts of Western and Southern India. Elsewhere the dry weather prevailed for the most part, though there were a few showers here and there. In Bengal and the Central Provinces the harvest has been good, and in other parts of the country, with few exceptions, an average, or in some cases a full, yield has been obtained, or is expected.

Madras.—No rain in Kistna, Chingleput, Tanjore, and Coimbatore; general prospects good.—*Pioneer*.

CULTIVATION OF THE AMERICAN ALOE (AGAVE AMERICANA).

In our last issue we referred to the subject of the cultivation of the Rhea Plant on tea lands as a subsidiary to the tea plant. We mentioned how the fibres obtained from the plant *Boehmeria nivea* possessed qualities unlike those of any other material employed in textile work; the only difficulty that stood in the way of the extensive cultivation of the plant being, that no efficient process nor machine had been discovered suitable for separating, cleaning, and dressing its fibres. This difficulty, however, does not stand in the way of the American Aloe, so information anent the plant and the value of its fibre as an article of commerce will no doubt prove of interest to the readers of this journal.

The species *Agave Americana*, belongs to the genus *Agave*, of the natural order *Amaryllidaceae*—the *Amaryllis* family. This plant is really not an *Aloe* at all (the African genus *Aloe* belonging to the *Lily* family), though very similar in habit to some species of that genus. Although it grows freely all over Northern India, and is now introduced generally throughout the country, it is a Mexican plant. The centre scape rises to the height of 18 or 20 feet, flowers in the rains, while the seed germinates in the capsules before they drop off. It grows in almost any soil, and requires very little care. It is supposed not to arrive at full maturity under one hundred years; but this opinion is an error, as the age at which it arrives at maturity varies, according to circumstances, from 10 to 50 or even 70 years. When it has acquired its full growth, it produces its gigantic flower stem and then perishes. The plant is useful in many ways. By making incisions in its stem a fermented liquor and favourite beverage called by the Mexicans "Pulque" is obtained, from which again an agreeable ardent spirit called "Vino Mercal" is distilled. "Pulque" is said to be a most wholesome drink, and remarkably agreeable when one has overcome the first shock of its rancid odour; it is said, moreover, to be an excellent application for gout and rheumatism. The dried flowering stems are an almost impenetrable thatch; an extract of the leaves is made into balls which will lather water like soap; the fresh leaves themselves, cut into slices, are occasionally given to cattle; the centre of the flowering stem, split longitudinally, is by no means a bad substitute for a razor-strop, owing to minute particles of silica forming one of its constituents; but the most useful part of the plant is the leaf, the fibres of which form a coarse kind of thread, which are called in England "Pita Flax." The natives make very good common cordage or rope with these fibres. Some samples of the fibre were sent to the Agricultural and Horticultural Society for "an opinion as to whether it could obtain any value as an article of commerce in the Indian or Home markets." Messrs. Cogswell and Robinson report on the samples as follows.—"With reference to the samples herewith alluded to in the foregoing memorandum, I beg to observe that

the washed and heckled fibre prepared from the "Agave Americana" or common aloe, is about the best I have seen, being beautifully clean and well freed from the bark or outer skin of the plant, of good colour, there being but a very slight tinge of greenish, which it is impossible to thoroughly eradicate without extra steeping, or the addition of chemicals, to the injury of the fibre; it is of very great length and strength, and a really good commercial commodity, its value to-day (November, 1880) being about eight rupees a bazar maund. The sample unchecked I would value at about one rupee a maund less. The sample of combings, generally known as tow, could be used in this country for paper-making only, its value as such being about three rupees a maund; but in England, where spinning machinery can be applied to it, a good yarn might be produced. As a product of shipment thereto it is of greater value than being consumed locally for paper making; for the latter, I am of opinion, it is too good and costly, as jute tow, and such like fibres, are so cheap and plentiful in this market. —*Indian Tea Gazette*.

A PROFITABLE PLANTATION COMPANY

is the Darjeeling Tea and Cinchona Association, Limited, for which we have the report of the Managing Agents (Messrs. Schoeae, Kilburn & Co. of Calcutta) to be presented at the fifth Ordinary half-yearly general meeting of the Company, convened for the 20th April 1881. We quote as follows:—

We have the pleasure to lay before you our annual report on the Company's affairs, and audited accounts to the 31st December 1880, shewing a profit on the past year's working of R187,892-13-4.

The estimated crop of bark, has, as we led you to expect in our report for the first half-year, been greatly exceeded, the total shipments of dry bark having reached 353,608 lb.; and although the results obtained cannot but be considered satisfactory, there is to us an element of disappointment in the excessive loss in weight in the drying process, during the past season nearly 4½ lb. of green bark having been required to produce 1 lb. dry. It must, however, not be lost sight of that this loss in 1879 was below the rate usually expected. The gross average price realized in London for 290,192 lb. was 1s 10½d per lb. and 63,416 lb. still remain unsold.

The outturn of tea amounted to 1,251 lb. which fetched an average price of Re. 1 and ½ anna per lb.; and the expenditure, under all heads, including the new cultivation and substantial buildings, R114,413-15-4 against an estimate of R97,000. The excess is accounted for by the large outturn of bark.

The result stands as follows:—

Proceeds of bark actually received	194,178 lb.	R1,82,273	13	11
Bark sold but account sales not yet to hand	96,014 ,,	71,221	6	0
Estimated value of bark still unsold	63,416 ,,	47,559	0	0
Excess realized over valuation of previous season's stock	..	12,584	4	5
Tea and other receipts	..	1,252	8	9
Balance from 1879	..	1,699	4	7
Total	..	R3,16,590	5	8
Deducting the outlay of	..	1,14,413	15	4

The amount at credit of the past year remains as.. R2,02,176 6 4

Out of this sum you have already received R1,20,000 in ad-interim dividends to the extent of 60 per cent; and we now suggest that a final dividend of 40 per

cent on the paid up capital should be declared, making in all 100 per cent for the year.

The surplus balance of R2,176-6-4, we would propose be carried forward.

For further information we beg to refer you to the Manager's report annexed; and, we may mention, that with the continued large consumption of bark, we think you may look forward to further satisfactory results.

The estimates for the current season are—

Expenditure	R106,000
Outturn of bark	300,000 lb.
do tea	8,000 „

From the Manager's Report we have:—

Cinchona Plantation.—From the 30th June, 301,611 lb. of bark have been packed and despatched, which, with 51,051 lb. cut during the first-half of the year, gives a total of 352,662 lb., and shews an increase of 2,662 lb. over the revised estimate. At Nauring the new clearances of calisaya and hybrid plants are looking exceedingly well, and will, I have no doubt, turn out a success. In nurseries, there are 134,000 plants, of which 50,000 are calisaya: these will be ready to be planted out at the beginning of the next rains, and as they are at present looking very healthy, I think there is every chance of their doing well. In addition to these, 2½ seers of succirubra seed have been placed in frames: this should, under ordinary circumstances, yield a very large number of plants, which in time will be put out 4' x 4' on the land immediately under the Guelle tea estate.

Tea Plantation.—The quantity of tea made during the past season did not turn out so much as could have been desired. After the second flush, the bushes were badly blighted by green-fly, which very seriously affected the outturn: only 1,415 lb. of tea were manufactured, which however fetched good prices. About 60 to 70 acres of extensions will be made this year, to the West and South-west of last year's clearances, which will thus give a continuous block of 120 acres of new tea joining on to the 200 acres of tea that was planted three and four years ago. The seed is good hybrid, taken from well-known gardens in the Terai.

Labor.—From the end of October, coolies began to come in, in large numbers from the hills. The two factories of Poomong and Nauring, mustered between 800 and 1,100 coolies daily, during December and January, which is about 250 more than we were able to obtain at this time last year. Many of these are however only cold-weather coolies, who begin leaving about the end of February or beginning of March; I hope to be able to retain between 500 and 600 coolies during the rains: this will still leave me rather short-handed, as the new clearances will require a very large amount of labor to keep them in anything like proper cultivation, in addition to which, barking has to be carried on during the whole of the rains. I shall do my utmost to keep as many coolies as possible.

SALT AS A FERTILIZER.—My experience in the use of salt leads me to the following conclusions:—It keeps the land cool and moist. It neutralises drought. It exterminates all soil vermin. It prevents potato rot. It glazes and stiffens straw, preventing clinking and rust. It keeps the ground in such condition that the berry of all kinds of grain fills plumply, however long-continued the hot and dry weather may be.—*Country Paper.* [In a circular, issued in 1871, and also one in September, 1879, we clearly shewed by most conclusive experiments that salt prevented the potato disease. Why is it not used more extensively? The Land laws, which empires in the press, and wordy declaimers in chambers of agriculture denounce—do not clash with it. The true reason is—the cultivators are too lazy—indifferent. S. Downes & Co.]

SAWDUST.—The *Building and Engineering Times* point out that in America a very important use has been found for sawdust. By compression it is found to become sufficiently dense and compact to serve all the purposes for which the strongest wood is now required. It would seem impossible to obtain, even with the highest pressure, such cohesion as this; but it is stated that the blocks of pressed sawdust are capable of standing a pressure of twenty-three tons to the square inch. This opens up quite a new market for sawdust, which has hitherto been a comparatively waste product. A more startling substitute still for planking has been manufactured from straw. It is asserted that the inventor can manufacture timber in any desired length from 12 feet and upward, and to 32 inches in width, at a cost competing with the better grades of pine.—*Overland Mail*, April 1.

WHITE ANT PEST.—Various remedies have been suggested and tried from time to time to check the ravages caused by white ants on tea estates, but none have proved effectual. Constant hoeing, kerosine oil, lime, charcoal have all been tried without avail; mustard cake is recommended in the *Journal of the Agricultural and Horticultural Society of India* as a remedy. We are told that,—"Many years ago these insects caused much deredation on plots of sugarcane of foreign kinds in the Society's garden. Various supposed remedies were ineffectually tried, but only one had any real effect, and that was mustard cake. This was applied in the first instance simply as a manure for the cane; but it had quite unexpectedly the effect of introducing the red ant largely into the plantation, and these completely destroyed their white brethren, so much so indeed that we were not troubled again by the latter."—*Indian Tea Gazette*.

COCA.—At a meeting of the Royal Botanic Society, Regent's Park, held last Saturday, Mr. G. J. Symons, F.R.S., in the chair, the candidates were balloted for and duly elected Fellows of the Society, and the names of nine others read for ballot at the next meeting. Upon the table was exhibited a fine flowering specimen of *Erythoxylon coca*, the "Coca" of South America, grown in the society's greenhouse. Professor Bentley said that, although in this country little was known of it, in South America its consumption was calculated at 40,000,000 lb. per annum, and the natives considered it as much a necessity of life as tobacco in other countries. Marvellous tales were told of the power of the coca leaf in allaying hunger and stimulating and supporting the body in extraordinary exertions, more especially in that of climbing heights and travelling over mountainous districts.—*Home and Colonial Mail*.

DATE COFFEE.—A valued and reliable authority, who is always a long way in advance of the rest of the world, informs me that, as a set off to the Date Coffee Company, a firm of preserved fruit manufacturers intend to astonish us with something more delightful. Naturally, at the great marmalade works of this firm in Spain there are cartloads innumerable of orange pips, which have hitherto been a source of loss and vexation. It has, however, been suggested to these astute traders, by an equally astute Yankee, that they would make excellent "coffee!" The process is extremely simple. The pips are first thoroughly washed in running water, they are then dried for several days beneath the rays of a Spanish sun, and then very carefully roasted. The great difficulty is in the washing, which must on no account be over done; but if it be properly accomplished, my friend says, the result is a beverage of the most delightful aromatic flavour, rivalling even the best Assam tea. Out of compliment to the inventor, who very appropriately is a vehement advocate of temperance, it will be called after him "Blank's Nectar."—*Home and Colonial Mail*.

(From May 2 to May 7.)

CEARA RUBBER CULTIVATION IN CEYLON.

We give prominence to several interesting and thoroughly practical communications addressed to us on this subject in answer to our remark on the uncertainty of the yield of produce from the fast-growing Ceara rubber in Ceylon. In the first place we have a sceptical planter asking; 'Will the planting of rubber pay?' and he gives an estimate which, if correct, looks very much like a decision in the negative.—

CEARA RUBBER, WILL IT PAY?

To the Editor "*Ceylon Observer*,"

Western Province, 22nd April 1881.

DEAR SIR,—I should very much like to ask a question through the medium of your valuable columns, and if you will permit me the space I will put it, and a few calculations besides. The question is, that with which I head this letter, viz., Ceará Rubber, Will it pay?

I am quite open to believe that it will, if anybody will be able or good enough to prove statistically that it has, will, and does. I of course mean, as a product *by itself*. I have taken some little trouble to go into figures in the matter, and the conclusion I arrive at is far from satisfactory to my mind, and unless some other calculation can be shewn with a better result, I greatly fear Ceará rubber is not to be the Eldorado that some may fondly anticipate.

We frequently see writers in the "*Planting*" column, speak of what a wonderful growth has been attained by Ceará, but what we want to see is an equally wonderful production of caoutchouc, but for this particular subject nobody will give us so much as a hint, even Dr. Trimen in his "*Notes on Some Trees Yielding India-rubber*" only goes so far as to say that "in Ceylon it may be confidently *expected* that they [Ceara, &c.] will become a valuable source of revenue," but there is not one word to shew how this confident expectation will be realized. No doubt, if we had thousands of acres of Ceara growing wild, and had only to pay an occasional visit with a gang of coolies, armed with Mr. Wm. Smith's cinchona scraper, then Ceará would "become a valuable source of revenue," but otherwise I don't quite see it. I estimate as follows for one acre based on the following facts—

109 trees planted 20 feet × 20 feet = one acre.
Each tree we may *expect* to give $\frac{1}{4}$ a lb.
Vide Dr. Trimen's figures each lb is worth R1.25 in England.

Cost for the first three years will be as follows:—

Estimate for one acre of Ceará Rubber.	
Purchase of one acre at upset price plus stamps, &c.	12.00
Felling and burning one acre of chena	12.00
Lining and holing	3.75
Weeding 1 acre for 12 months at 3s per month	18.00
Management	10.00
Purchase of seed and filling the same, 2 cents per seed	2.18
Contingencies 20 % on the above	5.78

Total for the 1st year ... 63.71

2nd year's expenditure :

Weeding at 2s per acre per month	12.00
Management	10.00
Contingencies 10 % on above	2.20
	24.20

3rd year's expenditure

The same as 2nd year		Current	
Dr.	Account		Cr.
To 1st year's expenditure	63.71	By 1st crop $\frac{1}{4}$ lb per tree = 54 $\frac{1}{2}$ lb at R1.25 per lb =	68.13
To 2nd year's expenditure	24.20	Balance to Dr. of 4th year	43.98
To 3rd year's expenditure	24.20		
	112.11		112.11

To balance due 43.98

The above estimate gives nothing for cost of curing, roading, assessment, transport home, duty (if any) and interest on outlay, so not considering this the estimate must be considered as a very low one. As to the yield per tree I don't think we can well expect much more, till the tree is very much older, and allowing for the contingencies above, I think the estimate I have given as to quantity reasonable.

With regard to curing, Dr. Trimen speaks in his "*Notes*" of the purity of the prepared rubber being a matter of first importance," and goes on to say, that the milk should be passed thorough sieves, so that we may "confidently expect" that the preparation for the market will cost us something considerable. Then last, but not least, we have a vastly superior market to contend against.

If anybody "who knows" will be so good as to make his views public as to the paying question he will be granting a boon to them and also to yours faithfully,

SCEPTIC.

Very much to the point also is the series of propositions laid before us by Mr. Borron who has given considerable attention to this new product:—

To the Editor, "*Ceylon Observer*."

DEAR SIR,—In its avidity for new products, it is evident that the public would like to do a big thing in Ceará India rubber, but that its aspirations are checked by a scarcity of seed. It would be well, however, if our knowledge of the article was a little more complete, and your late leading article was well timed in preparing would-be cultivators for a possible trifling yield per tree and very low returns per acre. There are several other points, however, deserving of careful consideration:

1. We have been told that the demand for rubber is general and almost unlimited. If so, it is remarkable that while the total supply is comparatively not by any means large, yet the price seems to keep pretty steady at very moderate limits, so that it is strange the supposed large demand does not either increase supplies or raise prices. Perhaps some explanation may be found in the indestructibility of the substance enabling old used-up material to be again worked into new.

2. It is most desirable that our Botanical Garden Department should as soon as possible, by actual experiment, ascertain not merely the best planting distance for the trees, but also the probable average yield that may be reasonably expected, and the best mode of extraction. I note you adopt the distance suggested by Dr. Trimen, but I think general experience inclines to much closer planting. You mention 4 oz. per tree as the possible yield, but give no reason for saying so. The mode of extraction mentioned by Mr. Cross, the collector, as adopted by the natives, viz., that "the outer surface of the bark of the trunk is pared or sliced off to a height of 4 or 5 feet," would, if it does not lead to the death of the tree, probably preclude the securing of a crop oftener than every second year.

3. The facility of propagation and successful growth in poor hard soils has evidently been much

exaggerated, and it would be well if the public were disabused on this point.

At an elevation of some 1,200 feet, with a high temperature and an annual rainfall of some 70 inches, I planted a seedling in good soil slightly manured. The plant grew most rapidly and well, attaining a height of some 25 feet in about 9 months. I planted another seedling in superior but unmanured soil, and in 4 months it was over 6 feet in height and blossoming. In poorer soil I planted 3 which in about 8 months had branched freely and were over 10 feet high. In poor hard soil I planted 2 which, though healthy looking are now, at about 9 months old, only some 5 feet in height, while in very poor hard gravelly soil a plant of the same age was only a little over 3 feet in height and was sickly looking besides. Mr. Cross says:—"Dry hard gravelly wastes, if found to support any kind of bush, are also suitable sites." Again:—"On bare (!) or thinly covered portions of rock the cuttings might be laid down flat and a little heap of stones or any kind of debris about the size of a mole hill piled over each." I was foolish enough to sacrifice a tree to try this. Need I say, that after over a month's hot weather with some occasional good rains there are no signs whatever of a shoot, and the cutting seems to be perfectly dried up and lifeless. The ill success of this experiment did not encourage me to try the further recommendation of Mr. Cross, viz., that "holes might be made in stony land with an iron jumper, and a stout cutting put into each, and filled with pebbles." Such wild advice is almost enough to throw discredit upon Mr. Cross's other statements. As Mr. Cross, however, was only portions of two days in the Ceara rubber-growing district, the advice he tenders must be at second-hand, only, as by his own accounts the natives generally seemed very ignorant, one would have expected more caution from a scientific man.

4. In the future cultivation of this tree, one great difficulty and loss will arise from the ravages of wild pigs, which will grub up even fair-sized trees to devour the tubers on the roots. Of the few trees I have growing on an estate not specially subject to their attacks I have already lost two in different portions of the estate by their means, and one of the plants was over 10 feet high; while the other trees have only been secured by building walls round them. On a large scale I have had to fence in a cardamom clearing of about 140 acres to protect it from wild pigs, but India rubber hardly promises such returns as would justify so great an expenditure. Trusting that other rubber experimentalists will favor the public with their experiences.—I remain yours truly,

A. G. K. BORRON.

In answer to Mr. Borron's first remark, we may say that the consumption of rubber in the United Kingdom and Europe and North America has certainly increased very largely of recent years, but a still further reduction in price was the condition mentioned to us as preliminary to an almost unlimited demand. In 1874 the quantity imported into the United Kingdom was 129,163 cwt. worth £1,326,605, and in 1875 the import was equal to 149,724 cwt. valued at only £1,313,209. Moderate as the rate now is in the planter's opinion, the raw material is still too high it seems to admit of rubber being used so universally as it would be if large quantities could be got at a price nearer 1s than 2s per lb. This fact of lower prices being looked for, of course, strengthens the case of our correspondents in reference to the doubt cast on the question 'Will the cultivation pay?' On the second of Mr. Borron's points

we most fully agree in the special need of the Director of the Botanical Gardens following up his useful paper of practical instructions with further notes, the result of experience which, at present, he alone has within his reach. Four ounces per annum were mentioned to us by a merchant, on the authority of Mr. Forbes Laurie, we believe, as a probable yield in Ceylon; but this point has yet to be practically settled, and that there are very diverse opinions abroad among men who have given attention to the subject, may be judged from the following from one who has consulted home as well as local authorities:—

"I think 4 ounces of caoutchouc per tree is far too little to reckon on, but Dr. Trimen will settle this point very shortly. In the meantime I may mention that the '*Chavannesia esculenta*' (a creeper in Burmah) gives 3½ lb. of rubber the 7th year, and can be tapped annually afterwards with the same result. The creeper is, I believe, a quick-growing one, but cannot surely equal the Ceara the growth of which 'passeth all understanding.' The trees at Peradeniya are planted close together and in very poor soil. If therefore the yield is less than some expect, the facts must be taken into consideration. Given a good soil, proper elevation, and so on, I believe the Ceara tree will yield from 1 lb. to 1½ lb. caoutchouc per annum after the 3rd year, but this is of course mere conjecture; the result has yet to be proved."

We trust Dr. Trimen will lose no time in determining, so far as he can, the yield from the Ceara rubber trees. According to Cross, the trees need be only five inches in diameter to be ready to tap, and, surely, those in Peradeniya must now be much larger. If the yield is only equal to four ounces per annum, most people will consider that Ceara rubber is not worthy of attention from the Ceylon planter, more especially in view of the large additional area covered with indigenous trees reported from the East coast of Africa. When Dr. Trimen does fix a day to tap, he ought to invite representative planters to be present.

THE AMERICAN APICULTURIST AND HIS HUNT AFTER CEYLON BEES.

Mr. F. Benton, our enterprising American visitor, carried away with him from the jungles of the Kurunegala district such a dose of malarial poison, as, we fear, must serve to remind him for a long time to come of the dangers attendant on tropical bee-hunting. Ignorant or sceptical of the risk of jungle fever, Mr. Benton walked long distances in out-of-the-way forests and villages; he climbed trees after the "Bambara" bee nests, and exposed himself to heavy rain in his eagerness to secure colonies and specimens of bees, of combs, &c., during the few days at his disposal. It was no wonder, therefore, that he was at length prostrated with a severe attack of malarial fever. We wished Mr. Benton to visit Nuwara Eliya to recruit, and, if possible, to see somewhat of the bees in that elevated region referred to by Sir Samuel Baker. To give an idea of the enthusiasm of this Western visitor in the pursuit of his object, we may quote as follows:—

Kurunegala, April 16.

"I did not think it advisable to join you on your way to Nuwara Eliya. My thanks are, however,

equally due to you. I intended sending a little review of Sir Samuel Baker's account of bees, there being, it seems to me, several important errors in it, but this morning one of our bee-hunters came in with the report that he had found *bambura* upon *bambura*, and I am off for his village, about seven miles away.

"Thus far I have obtained no additional colonies, although I have made very great exertions. I have seen many, but they were with one exception, in very inaccessible places on high rocks or trees. The single exception was a colony located within five feet of the ground and which I went after, but found that some one had smoked and burned away the bees and cut the comb for the sake of the honey, but a few hours before my arrival. The *bambura* I have in the frame-hives are doing well! working, &c!!"

Later on Mr. Benton was a little more successful and he returned to Colombo on Saturday, the 23rd instant, with some colonies of the "*Bambura*" (*Apis dorsata*) as well as of the small *Apis Indica*, and with a full collection of specimens of the combs, nests, bees of all kinds, &c.; but also, as we have said, with an alarming attack of jungle fever. All through Saturday night our American friend had what he called "a bad time," the most terrible experience in his life, and something to remind him of the dangers of a tropical jungle. Dr. White prescribed, and thanks to a vigorous constitution and the marvellous effect of repeated heroic doses of quinine, the fever was so far subdued by Monday morning as to enable Mr. Benton to fulfil his intention of starting back for Cyprus by the French mail-steamer. We hope to hear of his safe arrival there and complete recovery, and also of the safe arrival of his interesting charge, which will then probably be the first introduction of the *Apis dorsata* and *Apis Indica* to Europe. In any case Mr. Benton's expedition to Ceylon and Java will be fruitful in information of surpassing interest to apiculturists. Nor is it likely to be less fruitful of useful results to the East. The Cyprian bees introduced by him are flourishing well, we learn, with Mr. W. H. Wright (at The Aviary) and Mudaliyar Jayetilleke (Kurunegala). Both these gentlemen have acquired a great amount of practical information on bees generally, and as Mr. Benton said there is no valid reason why Ceylon should not develop an industry of considerable importance (especially to the natives) in Apiculture. As already mentioned Mr. Benton considers the rainy and dry seasons afford a parallel distinction to winter and summer seasons in temperate lands.

Mr. Benton is a capital example of the self-made, self-reliant, energetic American. It was very amusing to hear his quaintly original remarks on the dullness and unhandiness of the people about him in the jungle villages. When prostrated with fever he said he did not believe there was in all the N. W. Province anybody equal to tying a parcel properly;—he challenged a few to try but the rope came off almost as soon as the parcel was handled. "Now," he added, "I could tie that parcel so that it would travel a thousand miles without giving trouble!" A Western man and his health failing in the profession chosen for him by his father, Mr. Benton set to work, as an adult, to study and qualify himself as a school master, passing in succession as teacher in a Village, District and County School to the State Agricultural College (Michigan) where his position, curiously enough, is that of Professor of German, he having acquired a native's proficiency in that language, although his parents are of English descent. Apiculture he has taken up as a leisure study and employment. One brother he lost in the Civil War, while another is the well-known American artist, Mr. Dwight Benton, who resides in Rome.

Mr. Benton was very sorry to have to leave without completing certain work he had sketched out for himself in regard to our bees, and he intended writing a paper for the local Asiatic Society (which he had to take away unfinished), as also making some further contributions to our columns. One of these contributions—a preliminary sketch—which reached us from Kurunegala may be given as it stands, as follows:—

FROM FAR-OFF INDIA:

THE BEES OF CEYLON—*APIS DORSATA*, THE GREAT EAST INDIAN BEE.

From this, the bottom side of the world, I send greeting to all the bee-friends in dear old America. I shall present you here some very "big bee-yarns," yet all that I have not seen myself has been drawn from very trustworthy sources. [Two paragraphs headed respectively, "Off to the Jungles," and "*Apis Indica* (Mee Meso)," are omitted, their substance having been given in a previous article in the *Observer*.—ED.]

"DANDUAL MESO."

I did not see the bee which the natives call by this name, and which is smaller than that just mentioned, but a piece of its brood-comb which I secured is one-half an inch thick and shows hexagonal wax-cells, eighty-one to the square inch of worker-comb, while the drone-comb has twenty-five. The workers, then, must be about the length of those of *Apis Indica* but much more slender, being, in fact, quite wasp-like in shape, although the drones are no doubt quite as large, if not slightly larger, than those of *Apis Indica*. This bee is said to build a single comb which it attaches to the branch of some tree or to a horizontal timber of a building. I think, under favourable circumstances, it will, like other species of the same genus, build additional combs parallel to the first. Very likely it is *Apis florea*, said to be a native of Ceylon, India, China, and Borneo. It must have about the size attributed to that species; moreover, I found indications of but four sorts of real honey-gatherers in Ceylon, three of which I can identify as other species, and the native language recognizes four bees only. I would like to secure some of these bees, though I do not believe they are worth spending much time for. There is "bigger game in the bush."

THE TOM THUMBS AMONG BEES!

I have with me a small box containing a colony of very curious little bees with their equally curious queen and combs. These bees, called by the natives, *kana mee messo*, though belonging to the numerous family *Apidae*, are only distant cousins of our honey-bees, not being in the genus *Apis*, but that known as *Trigona*. The worker of this bee is but three-sixteenths of an inch long, has a large head and a small, blunt abdomen, the wings being longer than the latter. They are black, with one light colored ring on the abdomen, which is also light-colored underneath, stingless, very active, and gather pollen and honey. It is really amusing to see them come in laden with pollen, the pellets being larger in proportion to the leg of the bee, or even to its body. The strength of the individual workers is very great. The queen is dark yellow, and has an immense abdomen, her wings not being strong enough to lift her body into the air, when the ovaries are filled with eggs. The worker-cells of this bee are about half the size, and of the shape of short, plump, grains of wheat, and are placed in irregular bunches with passages between; the pollen-cells and the honey-cells are fully as large as good-sized peas, and each forms a group of its own. I found these bees in a small hollow tree in the jungle near Kalutara. They had built down from the hole of the tree a tube about a foot long, a half inch to three-fourths in some places in diameter, and composed of particles

of wood glued together with some resinous gum. Through this tube the bees entered, and it evidently served as a protection against some of their enemies. A nest of ants was located farther down in the same tree, but I noticed that these insects, so ravenous in tropical countries, avoided this tube. Another colony, which I found lodged in one of the hollow iron pillars in front of the village-inn in Kalutara, had built no such tube, the entrance hole being just large enough to admit one bee at a time.

But are these 'big bee-stories'?" some one asks. Well, "from one extreme to the other," for now I will tell you what I know about the

Giant Bees!

It was, unfortunately, only just before I was to embark (with the Cyprian and Holy Land bees I had brought with me), to continue my journey to Java, that I gained any satisfactory information about these bees I had sought them in the forests and made inquiries among the natives everywhere I had gone, but had not found a single specimen. Then I visited the Colombo Museum, and though none were to be seen there, one of the gentlemen connected with it, Mr. R. Van Cuylenburg, very kindly introduced me to Mr. W. H. Wright, a retired planter and a lover of flowers, birds and insects, who had often seen *bambura*, the largest bee of Ceylon, which I fully believe is *Apis dorsata*, found also in India, Malacca, and many of the Dutch East Indian possessions. He told me they were not often found near the coast, but generally built their combs upon rocks or attached them to the branches of forest-trees. He had, however, been called upon to remove from the upper part of a hotel-window in Colombo, the principal seaport of Ceylon, a large nest of these bees. I remember to have read that a swarm once took up quarters in a coal-shed in Point-de-Galle, another seaport town. Thus, they do live in an inclosed space sometimes. "Why," said my informant, who is a highly esteemed citizen of Ceylon, "I have seen combs of *bambura* hanging down fully five feet from the branches of the trees. The natives climb into the trees and cut off the combs and let them down with ropes, smoking away the bees; and I have seen them load thirty men with the honey and wax taken from one *bambura* tree." Again he remarked, "When they swarm the air is black with them, and I have seen a stream of them as long as from here to the Museum." The distance indicated was nearly half a mile!

In Sir James E. Tennent's work entitled "Ceylon" is the following note: "A gentleman connected with the department of the Surveyor-General writes to me that he measured a honey-comb which he found fastened to the overhanging branch of a small tree in the forest near Adam's Peak and found it nine links of his chain, or about six feet in length, and a foot in breadth where it was attached to the branch, but tapering towards the other extremity. It was a single comb with a layer of cells on either side, but so weighty that the branch broke by the strain." I called on Mr. Wm. Ferguson, the gentleman here referred to, and found him a person of no slight scientific attainments, being a fellow of the Linnean Society, and the author of several works on the botany of Ceylon. He confirmed the statements made in this note and added also that the swarm was close to the ground. Tennent also says: "I have never heard of an instance of persons being attacked by the bees of Ceylon and hence the native assert, that those most productive of honey are destitute of stings." I did not hear any such statement as is made above, but found that the natives had little dread of the ordinary bees, which do not often sting severely, and that the *bambura* was not feared as the various kinds of wasps. Tennent remarks: "Wasps are greatly

dreaded by the natives." This is as I found it, and there is good reason for the dread, for some of these insects as well as the carpenter-bees, are immense fellows. The natives say that "seven *deboreh* stings will kill a man;" but I got eight, therefore—! * Then there is *cooroomineah*, "three stings from which are sure death." One more quotation, and then I will show you the point of these wasp yarns. Tennent says in a note: "At the Jan. (1839) meeting of the Entomological Society, Mr. Whitehouse exhibited portions of a wasp's nest from Ceylon, between seven and eight feet long and two feet in diameter, and showed that the construction of the cells was perfectly analogous to those of the hive bee." Now, the native words, *bambura* (the large bee) and *deboreh* (one of the large wasps) are used interchangeably by many who do not know the proper application of each; besides, many do not know the difference between these two insects, a fact not to be wondered at, especially as one species of the wasp so resembles the large bee as to deceive many who have often seen the latter. I was often shown nests of wasps when my interpreter, himself a native, had asked for *bambura* (the large bee). Of course although some wasps suspend their nests to the branches of trees and make hexagonal cells, "analogous to those of bees," their combs are built in a horizontal position, made of paper, and have cells only upon one side—the under surface, and it is needless to add that these insects are so fierce as to be untamable. Thus without further remarks the reader can see how natural it was that, through some travellers who did not take pains to ferret out the real facts of the matter, an error should creep into print and then into our bee publications. Such is, I believe, the origin of the story that the combs of *Apis dorsata* were built in a horizontal manner, and that the fierceness of these bees made them unmanageable. The description Mr. Wright gave me of the manner in which the natives secure the honey of these bees shows that no great fear of the insects under discussion can exist; moreover, there is in Mr. A. R. Wallace's valuable scientific works "The Malay Archipelago," a very similar account of the method employed by the bee-hunters in Timor. He says the nest of *Apis dorsata* was "on a horizontal branch seventy or eighty feet from the ground," to which the bee-hunter ascended "with his face, arms and legs completely bare," and after holding smoke under the combs "coolly brushed away the bees that settled on his arms and legs." "Several bees," says Mr. Wallace, "followed me at least half a mile and stung me severely." This is not at all strange, for Mr. Wallace says he remained under the tree until stung once, whereupon he "ran away beating off the pursuing bees with an insect-net and capturing them for specimens." He further states that he "is inclined to think that the best way is to make no attempt at escape, but only slow and deliberate motions;" and he "thinks a bee settling on a passive native makes no effort to sting." The italics are my own, and help to bring out the idea, which every bee-master will perceive at once, that Mr. Wallace surely knew nothing of practical work with living specimens of the genus *Apis*, however well able he might be to crack hard scientific names over dead ones. I not only believe *Apis dorsata* can be domesticated, but I also believe that, intelligently managed, that is in some manner which accords with its peculiar traits, it will be found to be little or no more dangerous than the other species of the

* Mudaliyar Samuel Jayatilleke, when he saw Mr. Benton, bare-handed and bare-headed, manipulating a colony of *bambaras* which had been placed in a frame bee-hive, and not receiving a single sting, said that 'he could scarce believe him an ordinary mortal'—Ep.

same genus which we are accustomed to fear no more than we do our horned and hoofed servants.*

Now let us see if that horizontal yarn will shoot off in a perpendicular manner:

1st.—It is known that the combs are often five or six feet across, but being, as is also known, of ordinary bees-wax they would, especially in the heat of the tropics, break down through their own weight even if there were no brood, pollen or honey in them, and no weight of adhering bees to sustain. It is not reasonable, then, to suppose they are built in a horizontal manner, although the wasps' combs, being made of paper, withstand the heat and remain in their horizontal position.

2nd.—I have the assurance of Mr. Wm. Ferguson, F.L.S., that the comb he measured was built in a perpendicular manner.

3rd.—I have seen two preserved combs of *Apis dorsata*, and know that they could never have been built in a horizontal manner, nor could they remain long unbroken if their place of attachment were brought into such a position as to leave the sheets of comb horizontal.

4th.—Mr. W. H. Wright, who has seen many nests of *bambara* (*Apis dorsata*), says: "They never build their combs horizontally, but always perpendicularly."

For my own part I have always believed that every species of the genus *Apis* built its combs perpendicularly. When, therefore, I heard this story about the combs of the great bee of East India, I concluded that, either the bee did not belong to the genus *Apis* and had been misnamed, or else that a mistake had been made in applying that story to this insect. I am now satisfied that the latter of these suppositions is correct; indeed, there is no doubt in my mind but that all these horizontal inclinations are exclusively attributes of our interesting, though none too distant, friends, the paper-making wasps.*

All the way from Ceylon to Singapore I pondered over the stories about these wonderful bees, and when our steamer entered that beautiful harbour, I at once sought eagerly for bee-trees in the surrounding country. The Malaysians knew the large bees under the name *lebah besar*, but said that I must go to the adjacent mainland—the Malay Peninsula, because when these bees came upon Singapore island, the people drove them away with torches. But our steamer was to sail as soon as the China mail arrived, and it was not safe to venture far, so I did not find them. But upon visiting the Singapore Museum I was delighted to find there two combs of *Apis dorsata*. These were from Quedah, in the Southern part of Siam, just across the line from Malaya, and still in the Malay Peninsula. I had no rule with me, but with a stick I got the length and the breadth and with a strip of paper the thickness of one of the combs, also the length occupied by a certain number of cells, and these were measured when I reached the steamer. The length was three and one-half feet and the depth a little over two feet. The thickness of the brood-comb was one and one-half inches, and as near as my measurement will permit, I make out four and one-half cells to an inch, or twenty to the square inch. I shall make an accurate measurement of combs and cells of *Apis dorsata* as soon as possible and give the figures, for I cannot place great reliance upon the last two dimensions given here. Yet they agree with the estimate I made when viewing the combs; that is, I knew its cells had a greater diameter than the worker-cells of *Apis melifica*, but thought them not as large as drone cells of the species just named, although deeper, since I saw

at once that the brood-comb was much thicker than even the drone-comb of *Apis melifica*.

With the measurements I have taken as a basis (and they cannot be far from correct), let us make a calculation. First assume that the worker *Apis dorsata* bears the same proportion to its cell, as regards length of body, that the worker *Apis melifica* does to its cell, then we can say: the length of *Apis melifica* is to the length of its cell as the length of *Apis dorsata* is to the length of its cell; or, transposing these terms and substituting the known dimensions (given, for convenience, in eighths of an inch), we have the following proportion: 7.8th in.: 4.8th in.: 12.8th in.: x, the unknown term, x, representing the length of the body of the worker *Apis dorsata*. Working out the proportion, we find *Apis dorsata* to be very nearly seven-eighths of an inch long! Comparing in this manner the combs of the *Apis Indica* with the known dimensions of the worker *Apis melifica* and its combs, a result is obtained so nearly in accordance with the careful measurement I made of the worker *Apis Indica*, that I believe this method can be applied in obtaining the size of other members of the genus *Apis*, and that the figures I have given above as the probable length of *Apis dorsata* will prove not far from correct. It is very reasonable to suppose that the tongue of *Apis dorsata* bears a similar proportion to its body, as regards length, that the tongue of *Apis melifica* does to the body of this bee. Upon this supposition and with twenty-six hundredths of an inch as the average length of the tongue of *Apis melifica* if our figure seven-eighths of an inch represents very nearly the true length of *Apis dorsata*, its tongue is forty-five hundredths of an inch long—over one-half longer than that of our common bees!

"What will these Great East Indian Bees do?" I don't know. Wait until I get them and see!

FRANK BENTON.

China Sea, off Banca Island,

February 10th, 1881.

Mr. Benton much regretted his inability to see or write to several friends before leaving, but the state of his health must be his excuse with all these including Mr. Jayetilleke, whose letter we quote from as follows:—

"Kurunegala, 1st May 1881.—I have just returned from the interior having had to attend the paddy rent sales, and was very much concerned and felt sorry to learn that Mr. Benton left this with an attack of fever during my absence, and more so not having had a single line from him, or any other person, as to how he is, and whether he has left Ceylon with his *bambara* bees. I thought you would be the best authority to write to and ascertain the fact. I am sorry Mr. Benton came too early in the season to secure the *bambara* bees, as this is only the commencement of the swarming season, and in a fortnight or so, there will be hundreds of *bambara* hives settled. He has gone to great risks in securing only one box of these, and I trust that he will succeed with them. The *Apis melifica*, or the Holy Land bees, are doing very well, and they are doubtless more industrious and fast workers and are more tractable than our common Ceylon bees. I have made one discovery which, if it results to my satisfaction, I shall communicate to you, which is that the Ceylon bees do not seem to approach vanilla flowers when in bloom, whilst the Cyprians are found continually amongst them, and I have an idea that, if they take to them, they might turn out to be good fertilizers, and save much trouble and labour in fertilizing them as is done at present. I am watching them carefully and have ceased operating on the flowers to discover if these bees will prove successful in carrying on this troublesome operation."

* Mr. Benton proved this to be the case at Kurunegala.—ED.

COFFEE MANURING AND COFFEE PROSPECTS.

Mr. John Hughes is not inclined to let Mr. Tolputt have the last word in the prolonged controversy over the question of the best manure for coffee, whether it be one in which potash or nitrogenous elements chiefly prevail. The following communication arrives at an opportune time when the minds of many planters are specially set on the consideration of the best available manure to apply to their trees —

79 Mark Lane, London, E. C., March 18.

John Ferguson, Esq., *Ceylon Observer*.

DEAR SIR,—I notice you have published some long letters from Mr. Tolputt.

If Mr. Tolputt will refer to my report (page 18), he will see that I by no means undervalue the importance of potash, but I maintain that 4 % potash equal to 8 % sulphate of potash will be found practically sufficient in a complete coffee manure, and that on soils already rich in potash a smaller quantity will do. I feel sure that planters will find it more permanently economical to make nitrogen in the form of organic matter, the dominant element of their manures. Thus, cake, fish manure (free from sand), and dried blood, aided by small quantities of steamed bone meal, or superphosphate, will be found to be the most economical manure for a shrub like coffee. It is no business of mine to convince Mr. Tolputt, and if that gentleman thinks proper to make potash the principal element in coffee manures and to waste money in expensive fertilizers of an exceedingly soluble nature, he can of course do so, but I shall continue to recommend planters to apply those manures which, from personal experience, I believe to be most profitable, and most suitable to the special requirements of their soils, climate and situation. I am glad to notice that the Ceylon Government has removed the duty from ground coral when used as a manure, for I believe it will be a most convenient method of applying lime to the estates.

If ground coprolites have been found to give good results in Aberdeen, it is not surprising that ground bones and ground coral (carbonate of lime), if applied in a stimulating climate like that of Ceylon, will certainly prove economical as a permanent fertilizer. In connection with this question of carbonate of lime as a manure applied either separately or in union with cattle dung, you may remember that at page 36 of my report I gave an analysis of some sea sand taken from Bude in Cornwall, and which I stated was used in large quantities every year, being mixed with cattle dung in the form of a compost. I send you a cutting taken from this week's *Farmer*, in which public attention is again directed to this use of carbonate of lime in the form of calcareous sand:—

Bude sea sand is becoming a popular article for land fertilization; its lasting effects are greater than those of other manures. By the analysis made by Dr. Voelcker, this material contains no less than 78·24 of carbonate of lime for every 100·00.

I am very pleased to hear you are likely to have a good blossom, and hope it may mature into a good crop.—Yours very truly,
JOHN HUGHES.

But what is the use of manuring at all? We be the cry of planters after perusing the following very gloomy statements from an up-country report. This contributor begins by asking "What about the 'bumper' crop?" a remark at once unfair and unworthy of the writer, for he knows, or ought to know, that we opened the year by expressly discarding the word "bumper" from our columns, and neither by our-

selves nor by a single correspondent has it since been applied to our prospects. These prospects were said to be better than any anticipated at the same period for either of the past two seasons, but we suppose our critic would almost deny this proposition now? He writes:—

"The splendid season we have had forced out very large blossoms everywhere up to about 4,000 feet, and even on considerably higher elevations in Dimbula. Bogawantalawa blossoms were poor. But the general cry is that they have not set. Is it the 'seasons' and 'weather' again? Too dry after the February blossom, too wet after the March one? Or must it be admitted that 'W. McK.' was right in seeing its wood in quite another light, from the roseate hue which so dazzled the eyes of 'Z'? Seventeen out of over a score blossoming seasons I have seen, were blamed for the difference between crops and hopes. Surely it is time now we admitted the Ceylon climate to be unsuited for coffee.

"You have surely been misled about that wonderful 'Venture' manure. You are advertising either the manure, Venture, or Mr. Ross; or some one seeks by your aid to shew mortgagees that we have only to follow in his footsteps to get paying crops for an indefinite time. I hear, however, that Aluwihare has actually fallen off in crops as much as any estate in Matale, certainly more than any estate which has received similar care and outlay. This too, in the last four years, while manures have been made from analysis, although perhaps not much of the Aberdeen manure went to Aluwihare. Venture gave much better crops per acre in 1876-77 and 1878, than it did or will do in 1879-80 and 1881. During 1879-80, seasons were perhaps against it, but this manure had not been used previous to that time, or, at all events, did not affect the crops of 1876-77, nor perhaps of 1878. You say Mr. Ross finds that by manuring with this stuff (chiefly bones and poonac) he raises his crops from 2 or 3 cwt. to 5 or 6. But he did not get 5 cwt. in 1879 or 1880, and it is doubtful whether throwing in this crop the three years will average 5 cwt. Now, surely 'Venture,' naturally the finest estate in Dikoya, would have given at least four cwt. without manure during these three years. It is in its prime, being all under ten years of age, and most of it between four and eight years. The adjoining old estate of Lawrance, has averaged over three, during those years, without manure, or with only such stuff as pulp, &c. Norwood and Venture lie on either side of Lawrance. The first two estates were manured yearly up to last year, yet it was proved two years ago, that Lawrance, without manure, averaged much the same as Norwood, and within a cwt. or 1½ of Venture for the previous four years. Norwood and Venture had the advantage of youth. The difference in crops in favour of Venture did not more than cover the difference in expenditure.

"If coffee cannot set a crop in a good season, unless manured at a heavy loss during bad seasons, it is worse than worthless. All analysis of the tables of manures which you published lately from the Customs accounts shews that during the five years 1865 to '69, we used, on an average, £30,000 of manure yearly; from 1870 to 1874 £50,000 worth, and from 1875 to 1879 £140,000! Cattle manures too were made to a much larger extent during the last five years (1875-1879) than ever before. Yet, with this enormous increase of expenditure, and 80,000 acres of young coffee which has come into bearing since 1870, our exports go down to about three-fifths in the ten years, 1870 to 1880. Leaf disease has beaten us. We have spent more than we could afford from the crop returns in cultivation, without apparently arresting for a moment the backward tendency of exports. This too with a railway, with the export tax taken off, without the heavy loss

on rice which was a regular item in accounts 15 years ago, and with an increase of 40 per cent in prices for six years.

"When, oh! when, is the tide to turn? Can 'Z.' tell us?"

"A great deal of manure was applied in 1879, and together with that put out in 1880 all of which should be still unexhausted in the soil (since 1880 gave neither crop nor wood as of yore), the trees must be sitting in it. The quantity sent by rail in 1879, 225,000 cwt., is greater than that of any year previous to 1875, and in 1880 as much as 128,960 cwt. were sent up."

It is proving too much when the unwisdom of applying manure is attempted to be shewn. At this time of day it is surely unwise to condemn scientific cultivation; but no doubt the cause of comparative failure in a majority of cases in Ceylon, is found in the application of the manure not being guided by science. Our coffee planters have as much need as their neighbours who grow sugar in the West Indian Islands to lay to heart the lesson contained in the following article from the *Barbados Agricultural Gazette* :—

"It is somewhere recorded of an ancient planter that on being asked, by a younger member of the profession, what were the chief essentials in good farming, he replied, that there were three things which constituted good agriculture: the first was manure, the second was manure, and the third was manure. In fact, it is quite evident that this old gentleman, judging probably by the light of his past experience, had fully settled in his own mind, that the great and essential feature of successful farming was comprehended in that highly pregnant word *manure*. And who is there amongst us of a younger generation, that has given this all-important matter the most ordinary consideration, but must of necessity have come to the same conclusion—a conclusion irresistibly borne in upon the mind as the reaping of each crop discloses *results*, which, it must be confessed by candid persons, fall very far short (at least in most cases) of the *expectations* which had been formed, but which alas! were doomed to failure and disappointment. To the observant this repetition of failure, year after year, can scarcely be cause for wonder, when has been seen, perhaps with impatience, the composure (we had almost said obstinacy) with which men shut their eyes to what ought to be patent to the most indifferent and careless; and as long as this condition of affairs is allowed to exist, so surely will our planters make short crops, and become more and more heavily in debt to the merchants. English and Continental farmers have years ago discovered that they were unable to manufacture a sufficient quantity of so-called farm-yard manure to enable them to farm successfully, and had the good sense to largely supplement their own efforts in this direction by liberal applications of *natural manures*, like Peruvian guano and nitrate of soda, and *artificial manures*, as sulphate of ammonia, super phosphate of lime, and many others which we need not specify. But whilst our brother agriculturists have so promptly recognised the one thing necessary to ensure satisfactory results, we in this island are only now, as it were, opening our eyes to the advantages to be derived by a more liberal treatment of the soil with manures suitable for restoring the elements of fertility to our much abused and, at the same time, long-suffering servant. We say without hesitation that dame Nature, ever bountiful, and almost prodigal in her liberality, has bestowed upon men no greater gift than the soil which he cultivates with such niggard hand. Because man knows by experience its enormously recuperative power, he argues, if he give this

matter any consideration, that little help is needed from him, and *that little* he gives with grudging hand. Ought it to be possible for these things to be written,—and in our own organ too? Truly it is not a gratifying task [which we have undertaken, but the disease is a serious one, and requires a drastic remedy and though, by some, our criticism may be considered harsh, we would assure our readers that we write in no unfriendly spirit, only intent on bringing before them, with as much force and clearness as we can, the most easily attained means of producing the largest and most remunerative sugar crops, thus enabling us to compete, with some hope of success, with that ever-increasing production of sugar which is being carried on all over the world, and which, aided as it is by all the appliances which modern science and skill can devise, threaten us with great disaster, if not *extinction*. It is the opinion of some we know, that the great panacea for all our ills is improved manufacture of sugar, but whilst fully sensible of the advantages and greater profit, which have been proved to accrue from the introduction of improved processes of manufacture, there is no denying the fact that such alteration in our present system of manufacture, involves a greater outlay than most owners of Sugar Estates in this country are able, however willing, to undertake.

We believe it has been admitted by out-siders that our cultivation, (by which we mean the stirring of the soil, whether by means of plough, hoe, or fork; surface drainage, and the strengthening of the thinner portions of our fields by the addition of mould taken from deeper places)—leaves little to be desired, but we challenge any one to say that the beautifully prepared fields, almost garden-like in their appearance, have a proper proportion of the *great farmer*—manure.

Doubtless everything in this world is more or less relative, and to such as are content with a return of 1 hoghead or $1\frac{1}{2}$ hoghead sugar per acre, we have only to say, 'Go on, and prosper in your misdirected efforts.' But to those, on the other hand, who are desirous of securing better returns than they have hitherto done from their fields, we say, 'do not be satisfied with less than 3 hogheads of sugar per acre with its accompanying molasses'—always remembering that although we in this country consider such to be a very heavy return, half as much again is ordinarily produced from an acre of land in countries where the soil has not become impoverished by constant cropping. Now although recent low prices seem insufficient to keep up Estates that are heavily in debt, it by no means follows that sugar cannot be produced to a profit in this island, as the following figures will shew :—It is thought that there are 80,000 acres of arable land, moiety of which (40,000 acres) grows canes for each year's crop, and produces about 40,000 tons (*nett*) of sugar, and 32,000 puncheons of molasses. Then it is generally admitted that the first ton of sugar can be produced at a cost of £14, and taking this ton of sugar, with its molasses, as worth £20 even at recent prices (say 21s. per cwt.) there is left £6 profit, or 42 per cent on the cost of production.

From these figures it follows that each arable acre, yielding a $\frac{1}{2}$ ton of sugar annually, gives only £3 nett, and that at £100 per acre land yields an interest of only 3 per cent. Thus, while sugar in Barbados can be grown at 42 per cent. profit, a great many estates are only paying three per cent. To natives of this island fields of sugar-cane form so natural a feature of the country that probably few of us ever give more than a passing thought, as to whether the canes are high or low, good or bad; but the writer well remembers the comparison which he formed in his own mind, on his return from his first visit to England, between fields of wheat, oats, and barley, on which his eye had been resting for many months, and our cane-fields. Positively

the canes (the crop had but just begun) looked like a forest. By parity of reasoning it must become abundantly evident that high manuring is absolutely necessary to enable us to hold our own. We must not be deceived by illusory hopes of the English Government imposing countervailing duties on bounty-fed sugars. No—our strength lies within ourselves, and do not let us imagine that others will fight our battles whilst we look on with folded arms. Surely, it is in the power of each individual Manager or Conductor of a Sugar Estate, if he strive with might and main, to compound a fair quantity of really good pen-manure. We fear that many, by adding heavy and oft-repeated layers of mould to their manure heaps, flatter themselves that they are “making up” a fine lot of manure; but can there, we would ask, be anything more self-deceptive? Mould is not manure, and it is only by the judicious admixture of various materials, such as vegetable matter (whether in the form of sweepings, bush, or other litter) along with the dung and urine of *well-fed* animals, and a sufficiency (only) of mould to fix the ammonia and other gases which are liable to be given off in the process of decomposition, that a compound which will answer our expectations can be obtained. In the last leading article of this Journal the treatment of Stock was well and ably commented upon, and we heartily agree with the view expressed by the writer. When saying that Stock should be sheltered from the rays of the sun by day, and the chilling effects of the night dew, we only need to substitute the word ‘manure’ for ‘stock,’ and the remarks well apply with equal force. We confidently assert that all yard-pens should be *wholly* covered, and there can no doubt that field pens should, in part at least, if not entirely, be sheltered from atmospheric influences. It is curious to observe the inconsistency of men, who, while making a great point of almost instantaneously covering with a jealous care, guano and other artificial fertilizers, yet seem utterly unconscious of the great loss they sustain by undue action of weather on what they ought to guard with the most vigilant, and anxious care.

Having done all that can reasonably be expected in the making up of the best and largest quantity of farm-yard manure, there remains much yet to be done by having recourse to our chemists, with whose assistance great things can now be accomplished in the way of growing heavier crops than of yore. Time was when the application of artificial manures demanded the serious consideration of the Barbados Planter, for knowing little or nothing of their composition there was more or less of risk involved in the undertaking; but now that there are amongst us two Chemists of repute, why should we not, when any doubt exists as to the suitability of any manure for our soils, make sure of what we are doing by having our soils analysed. We believe there should be, in most cases, *three* applications of Manure;—a priming in November in the cane hole—the application from the farmyard, from October to December, *in the banks*—and the final touch in June, when the rainy season sets in.

Let us have improved machinery (Steam Mills if we can) but let us, even if to the neglect of other points, never fail to supply our fields with liberal applications of manure, and then, and only then, can we rest satisfied that we have achieved the highest aim in agriculture.”

Mr. Ross's example in having his soils and manures analysed is, in our opinion, worthy of more general adoption. But, inasmuch as it is impossible for each individual proprietor to have this done systematically, we consider that the Planters' Associations and each District Committee, worthy of the name, ought

to arrange for the establishment of experimental stations, through which so many conflicting theories and so much of contradictory evidence could be brought to the proof of practical demonstration.

COFFEE LEAF DISEASE.

Mr. Borron sends us a very outspoken, if a not very encouraging, letter on this subject. He finds fault with Mr. Marshall Ward for bringing forward his sulphur and lime experiment without giving all the facts of the case, apparently hinting that it was no more successful than those conducted according to Mr. Morris's directions; and he expresses once for all an opinion decidedly adverse to the repeated proposals of Abbay, Morris and Ward that planters should collect and destroy fallen diseased leaves. We believe that Mr. Borron has the majority of the planters with him in this decision, and that henceforward the thorough collection and destruction of the leaves must be put on one side as an impracticable operation.

SALT AND VERMIN.—A planter writes:—“I see it said *salt* is an unfailing remedy for vermin in the soil. If it be so, surely, in the face of the ruin wrought in many parts of the country by grub, the Government might relax somewhat their strict rules with regard to its sale. In one of the vermicide powders advertised in your paper, *poochies* seem to revel: ‘They enjoy a day tied up in a packet’ of it.”

SULPHATE OF MAGNESIA.—The following correspondence has been handed to us for publication:—3rd December, 1880.—L. Nurse Bowen, Esq. Dear Sir,—We beg to forward you the following extract from a letter of Messrs. Cooper McCarrine and Co., as it refers to the report of the Analysis Committee of the Agricultural Society, to which your name was attached as chairman.—We remain, sir, yours truly, (signed) Louis, Son and Co. “We thank you for a copy of *Planters' Journal*, and read with surprise the rough calculations of value of ‘Ammonia Fertilizer.’ It is certainly new to us to be told that Sulphate of Magnesia is not a Fertilizer! Why, we have had orders for it, and it alone, from planters in the West Indies.”—Broad Street, 7th December, 1880.—Messrs. Louis, Son and Co. Gentlemen,—I have to acknowledge receipt of your note of 3rd instant, forwarding extract of a letter received from the shippers of the “Sulphate of Ammonia Fertilizer” to which reference was made in the report of the Analysis Committee of the Agricultural Society of this Island. On behalf of the Committee, I beg to state in reply, that “rough” as may be the calculations of the value of the Sulphate of Ammonia existing in this Fertilizer, it amounts to £25 per ton—exactly the price at which your firm, and many others, here, sell the guaranteed pure article. This is near enough for the Committee. With respect to the fertilizing properties of Sulphate of Magnesia, I admit profound ignorance on the subject, but would observe that when the Committee undertook this duty on behalf of the Agricultural Society, they adopted as a standard a tabulated form of comparative values of the fertilizing constituents of artificial manures by Anderson, Nisbet, Way, Hooges, the North British Agriculturist, and Dr. Voelker published in Richardson and Watt's Chemical Technology, and among these constituents Sulphate of Magnesia found no place. Nor do we find it in any fertilizers specially prepared for the sugar cane. Clearly then the planters here who have purchased this fertilizer have paid very nearly £6 per ton for an article, the existence of which they were ignorant of, and which they would never have purchased had they been aware of it.—I remain, gentlemen, very respectfully yours, L. NURSE BOWEN.—*Barbados Agricultural Gazette.*

Correspondence.

To the Editor of the Ceylon Observer.

**COFFEE LEAF DISEASE AND MR. WARD'S
SULPHUR AND LIME EXPERIMENT: THE
FINANCIAL IMPOSSIBILITY OF GATHER-
ING AND DESTROYING DISEASED LEAVES.**

DEAR SIR,—In Mr. Ward's lecture delivered before the Planters' Association, special reference is made to a certain sulphur and lime experiment, details being given of several highly satisfactory results. No mention, however, is made of any unsatisfactory consequences, of the possible existence of which even there is neither hint nor warning. And yet there were several adverse circumstances, apparently as resultant as the more favorable. If the birth of a new idea is hard to bear, if the revival of an exploded notion is yet more painful,—the suppression of some of the particulars of an important experiment is more unendurable still. Mr. Ward ought to know the danger of a half truth and to have realized that such a garbled narrative as his was only calculated to mislead the planters, and place himself in a false position. The community can afford patiently to await any theory or explanation that may be forthcoming, but meanwhile I think it is entitled to demand full details of this particular experiment with *all* its supposed results. I complain of no ideal danger. A proprietor has found fault with me for prematurely disposing of his stock of sulphur, and with a superintendant for the ill-success of his S. and L. application, though probably it was neither better nor worse than hundreds of others, while it will be more through good luck than good guidance if many estate owners have not been again seduced into further sulphur and lime expenditure.

Putting the sulphur and lime treatment aside, the most general urgent recommendation of science has been the collection and destruction of our diseased coffee leaves gathered as they fall. Mr. Ward says: "You will never get rid of leaf disease as long as you allow the diseased leaves to remain on the ground as they are now. No specific can be successful so long as you leave the leaves there." I am afraid that on this point also the teaching of science and the experience of practice will be found incompatible. I have neither the means nor inclination to try this further recommendation, and must leave its trials to others who have; but so far, I think, I but express the opinion of many old and experienced planters, when I say that the risk of fire, and impoverishment of soil, the expense, the labor, and the time required for this treatment, if adequately carried out would be such that, if coffee badly affected cannot be made to pay without it, it certainly never will with it, and that it would be better to at once submit to the inevitable, than to be allured on by false hopes into a heavy and profitless expenditure. But further, if I understand Mr. Ward aright, the spores on fallen leaves on rocks or ground, anywhere, but under the living leaf, if left to themselves must die. They shoot their little tubes, which grow and fill and burst, and there's an end of it. But if disturbed, as in the process of collection they must be, myriads will be diffused through the air, only to attach themselves to the living foliage of the surrounding trees, and run their full course once more. I do not say that the thorough and careful collection and destruction of the diseased leaves would not lead to a mitigation of the pest, but I feel no certainty that it would pay, which is the grand end and aim of the practical coffee planter.—I remain, yours truly,

A. G. K. BORRON.

TOBACCO CULTIVATION.

Veyangoda, 4th May.

DEAR SIR,—In an article on the cultivation of tobacco in the Negombo district, in your Directory of 1876-8, it is said that by means of movable cattle pens the ground intended to be planted with tobacco ought to have an inch of cattle manure. I take it that this mode of treating the ground is necessary only in poor sandy soils. I have a piece of land to be planted with tobacco, the soil of which is fairly rich and approaches a sandy loam. I have not sufficient time before me to go over the ground with movable pens. In the absence of cattle manure, will any of your correspondents who cultivate tobacco kindly inform me what is the next best manure to be used, Will lime or ashes do? The cultivators in Dumbura or the pioneers in Trincomalee will be able to enlighten

A GREENHORN

[Try bones and poonac.—ED. C. O.]

NEW PRODUCTS IN THE COFFEE DISTRICTS.

Dikoya, May 4th, 1881.

SIR,—In view of the already many fatal reverses sustained in coffee property since leaf disease and bad seasons combined have made themselves felt, and though granted that much has been done in the right direction, is it not the case that—owing in some measure, possibly, to a loyal prejudice in favor of the 'old horse,' but largely too to restricted expenditure the planting through the coffee of suitable new products has very generally been done in only a *half-handed* and not *thorough* manner?

It is the case, I think, that working proprietors and V. A.'s now very generally recognise the expediency of doing so, and have acted and are acting accordingly, as far as means at their disposal permit. But, as to absent proprietors and mortgagees, as a rule, realizing this as keenly as they ought, it is only necessary to look around at the large areas of *only* coffee still to be seen, to doubt it. If good crops rule again—well and good—but suppose they do! What tremendous outlay need have been, or need be incurred, in planting out other things, or what loss can arise from the doing so? If coffee is to hold its own again generally before other things, as a paying investment, it will have to be known within the next three years; and cannot anyhow, as far as cinchona is concerned, enough be realized from the latter, if dug out, to more than cover its expenses? You and all others experienced will emphatically answer Yes! to this, I feel sure; provided of course the land &c. is suitable: and where in the new districts is it not? In the case of officialis and Calisaya varieties, anyhow, little or no damage will have been done the coffee, even though it be planted, as I consider it ought, tree for tree: and I think it will be conceded that those who took this view, and earliest and to the fullest extent acted on it, have proved themselves the knowing ones. On the other hand, in the case of coffee prospects not improving in the future, in what position stand those severally interested in an unprofitable estate with nothing but coffee on it, and other products not instituted to a sufficient extent?—Can it pay proprietor, mortgagee or agent, to continue working it? And if not, I need hardly ask what that estate has absolutely done for them all! With a fine show of cocoa coming up, or a few hundred thousand cinchonas, there is a fair prospect of its paying all parties to struggle on and wait. And is a suggestion now out of place to mortgagees and agents, and more particularly, perhaps, to the large capitalists at home, whose support I take it, may at present be considered the mainstay of the planting enterprise generally for their own interests' sake, as to helping their clients with their approval and funds, to fully fortify their properties

with whatever new product may be judged most suitable? But a few hundred pounds, and where plants are, less will suffice on each estate. As far as private mortgagees are concerned, if the agents do not care to come forward with the extra advance, those who arrange for this somehow, will, depend on it, prove their wisdom. Where done, and claims treated with consideration and not pressed against proprietors, till good times come again, it will probably avert loss and bring good cheer to all again. In the case of cinchona, the comparatively miserable sprinkling of trees put in, in past years, more by way of experiment than otherwise, have been and are meeting much of the whole expenditure on many estates, and as soon as ever trees now planted can be profitably cut—quantity per acre as making up for size and age—depend on it, they will very generally bear. With this in view, and looking at the immense market in Africa and Asia all but untapped as yet, and where quinine ought to be a household word in many districts, I hardly think there is much fear of Ceylon and India combined prejudicing present prices appreciably for many years to come. As against these suggestions, in many cases proprietors have been forced by their backers, or by personal need to dispose of these plants to meet current extremities. Is this not a suicidal policy truly?

That owing to a partial failure in coffee crops Ceylon is on a troubled sea at present, is, I think, openly admitted now by all, but it is not owing to a want of innate capability, and is it not in the power of those most interested in the Island, by taking proper precautions at once, to render their prospects sure again, and yet reap full returns?—I am, sir, yours faithfully,
BREAKERS AHEAD.

LIME—LIME—TONS TO THE ACRE WANTED.—A planter writes:—"If we could get plenty of good caustic lime cheap, a Schrottky or a Ward would be unnecessary. With a railway, we might apply 3 tons an acre in the new districts."

THE CEARA TREES (writes Dr. Trimen in a note received to-day) are yet full young to tap, but the impatience of the planters may force me to premature action in the matter. But I scarcely think this tentative experiment is likely to settle the question as to yield, as we have yet to find out the best method of procedure, time for operation, and subsequent preparation of the milk. I will consider the desirability of asking any planters to the milking.

COFFEE AND CINCHONA.—According to statistics published in the *Ceylon Observer*, there are now 35,000 acres in the island planted with cinchona, the total number of plants being nearly one hundred million, valued at two millions sterling. About 10,000 acres are planted with tea, giving an annual yield of 500,000 pounds. The relative importance of coffee in Ceylon is not what it was; but yet it is gratifying to hear that the prospects for the forthcoming crop are very good.—*Academy*.

CEYLON TEA IN AUSTRALIA.—A Ceylon Colonist lately arrived in Melbourne, writes:—"I have been busy on the Ceylon Tea question and will give you the result. Several dealers, grocers, and private persons agree in this. Large merchants cannot push Ceylon tea on the market, in opposition to China and Indian tea. But if an agent or person interested in Ceylon tea takes the trouble to go with samples to the large inland towns, and amongst the country people, he can dispose of large quantities of Ceylon tea in small parcels. The retail price of tea is from 2s. to 3s. 6d. a lb., and if an agent was to offer Ceylon tea in 2, 4, 6, 8, or 10 lb. packets at prices slightly below the quoted rates, he could sell freely; and, as soon as the tea was made known, the dealers would have to buy in large quantities."

"THE TEA AND CINCHONA PLANTATIONS CO., LIMITED."

The full prospectus of this Company referred to by our London correspondent in his last letter has reached us. It states that

Morowa, the district in which these Estates are situated, with its heat and ample rainfall is particularly well adapted for the production of Tea. There is at present a good local demand, besides large and increasing markets in the Australian Colonies as well as in Europe. Taking the average value at 1s. per lb., and the yield at 400 lb. per acre, it is estimated that Tea, when in full yield, will give a net minimum profit of £6 10s. per acre per annum. The Cinchona trees (from which Quinine is extracted) of which there are 11,400 from one to two years old, will cost very little for up-keep, being planted amongst the Tea, and when ready for barking may be reasonably expected to yield a profit of about 8s. per tree—say £4,560, being nearly one-third of the entire purchase-money of the whole property. From the Cardamoms now planted (the indigenous variety grows wild in the Forest lands of these properties) a maiden crop will be gathered this year. It is stated on good authority (see Appendix) that from one acre of the Malabar variety as much as £40 has been recently cleared, that a field of one year old plants has been valued at £60 to £70 per acre, and four year old plants, in full bearing, at £200 per acre. Tea, Cinchona, and Cardamoms are perennials. Labour is cheap and abundant in the district in which the Company propose to commence operations. There is a large reserve of land on these Estates very suitable for all the above-named products, the cultivation of which may be extended to the following, viz. :—

Tea	1200 acres, yielding when in full bearing,	
	a yearly profit at £6 10s. per acre	£7,800
Cinchona	250 acres, do £40 do	£10,000
Cardamoms...	250 do do £10 do	£2,500

1,700 acres, giving an estimated yearly revenue of ... £20,300

It is estimated that an outlay of £40,000 on extension and up-keep will amply suffice to obtain this result being, with the purchase-money, a total of £55,000, the profits on which, when the Estates come into full yield, will give a proximate yearly dividend of 37 per cent.; but by raising money on the issue of debentures the dividends may be increased up to 50 per cent. on the aggregate of calls on Shares. There still remain a reserve of about 635 acres available for other purposes, and on the Forest Trees, which must be left to shade the Cardamom plants, there is reason to believe that Vanilla, which is a most profitable article, may be extensively and successfully grown. The permanent buildings on the property comprise Store-houses sufficient for present requirements, an excellent bungalow for the Superintendent, and the usual lines for labourers. The leading features of the scheme of this Company are:—*Firstly*, that it should not depend on any one article of produce alone. *Secondly*, that, from the present cultivation, it should pay the Shareholders a fair rate of interest from date of payments on calls, until such time as the proposed extended cultivation shall yield sufficient to pay the larger dividends anticipated.

Valuation of the Company's Estates.

The following estimate of the value of the "Anningkanda" Estate, was made by Mr. Richard A. Bosanquet, of the firm of Messrs. Courthope, Bosanquet & Co., Colombo, on the 24th December, 1879, viz. :—

"Tea 1½ year old, at £40 per acre: Tea, planted in 1879, at £20 per acre; Forest land, at £5 per acre; Cheua land, at £2 per acre."

Based on this valuation, with the addition of only £10 per acre as increased value of the Tea for the 15 months'

additional growth, the following moderate value at the present time is arrived at, viz. —

47 Acres of 2½ year old Tea, at ... £50 =	£2,350
123 do 1½ do do ... 30 „	3,690
12 do Cardamoms ... 20 „	240
5,400 Cinchona Trees over 1 year old 4s „	1,080
6,000 do do recently planted 1s „	300
333,876 Tea Plants in Nursery, at	
10s. per mile „	166
952 acres of Forest Land, at £5 per acre £5 „	4,760
1,207 do Chena Land, at £2 per acre £2 „	2,414

2,335 acres, of the aggregate value of ... „ £15,000

[The valuations of tea and cinchona seem to us high: above the rates recommended in our Handbook. The appendix to the prospectus consists of extracts, chiefly from the *Observer*, on the subject of tea, cinchona, cardamoms and vanilla in Ceylon.—ED.]

CULTIVATION OF THE FIG IN TURKEY.

The United States' Consul at Smyrna states that the Aidin district is the only one which produces figs for exportation. The fruit will grow anywhere in the neighbourhood of Smyrna, of a good quality for consumption, in a green state; but the Aidin plain is unique in its climate and soil as being favourable for the proper curing of the fig. The thermometer seldom falls below three or four degrees under freezing point, and in the summer seldom rises above 130 degrees Fahrenheit in the sun. In Aidin, the winters are generally wet, the dry weather commencing in May and continuing till the end of October. Any rain at the end of July, or during the month of August and September, when the fruit is under the process of drying, injures the quality by causing it to burst, hardens the skin, gives the fig a dark colour, and spoils its keeping quality. Heavy dews will cause the same evils.

The fig tree will grow in almost any soil; a rich heavy soil is, however, preferable; but to produce figs that will dry well and please the merchant, the soil ought to be of a good depth, and of a rich, light, sandy nature; this, if the weather be favourable, will produce large figs, of a white thin skin, and of the finest quality. Before planting, the ground is well ploughed two or three times, to a good depth, well fertilised, and freed from all weeds and extraneous roots. The fig is propagated from slips, selected with as many fruit buds as possible. To form a tree, two slips are planted, one foot apart, and then joined at the top. The trees, if planted in rich soil, should be placed about 30 feet apart, and for poor soil, about 25 feet distant from each other. The cuttings are planted in the month of March, two in each hole, at about 9 inches or a foot apart at the root end, and during the growth of the trees, the ground is ploughed up two or three times during the winter or spring, and the space between them is used to cultivate cotton, sesame, or Indian corn.—*Indian Agriculturist*.

THE ADULTERATION OF TEA IN AUSTRALIA.

A few months ago we gave the results of a series of analyses of milk sold in Melbourne, made at the laboratory attached to the Industrial and Technological Museum by Mr. Frederic Dunn, under the supervision of Mr. J. Cosmo Newbery. From the same source we have now obtained some particulars of the analysis of many specimens of tea purchased in Melbourne. Great reliance is naturally and deservedly placed by the public on the reports on various articles of food occasionally emanating from this laboratory. Such reports usually refer to analyses spontaneously undertaken, and the particular sources whence the articles experimented upon are obtained are not divulged. Consequently,

they cannot be considered as advertisements either of the merits or defects of any individual product. Moreover, they are not usually paid for by any private person. The laboratory, too, is a branch of the public service, and the gentlemen employed therein are not directly under the control of any Minister of the Crown. Very much work has been done at this laboratory in the direction of exposing food adulterations; and if this work has not resulted in as great a diminution of the sophistication of the articles we habitually eat and drink as could be wished, it is not the fault of the scientists who make the analyses, but of public authorities who neglect to utilise or pay due heed to the information contained in their reports. With regard to the experiments on teas now under consideration there is much of disquieting character in the information supplied by Mr. Dunn, as it shows that a large proportion of the tea that goes into consumption in Melbourne is shamefully debased. But it also shows that the white and yellow rogues who derive a profit from the systematic corruption of this article of food could, under a proper law efficiently administered, be punished or, at all events, checkmated. In England, grocers are frequently fined for selling adulterated tea; but here adulterations of all descriptions are allowed to go unpunished.

However opinions may vary as to the effects of tea on the animal economy, there can be no doubt that injury is done to health by using adulterated tea. At any rate, if any persons do entertain doubts on that point, they had better refer to recent proceedings in the Medical Society of Victoria, when the subject of tea-drinking was before that body. Nor is it necessary to describe the process by which analysts detect the sophistication of tea. The various methods of adulteration of tea may be defined as the addition of "leaves other than those of tea, except those used for scenting; exhausted tea leaves and damaged tea; an undue proportion of stalks or vegetable matter foreign to tea of any kind whatever; foreign mineral matter, especially sand, quartz, soapstone, China clay, magnetic oxide of iron, &c. Lastly, the substances used for artificially colouring or painting the teas, as ferrocyanide of iron, or Prussian blue, indigo, turmeric, &c."

Probably most of the sophistication to which tea consumed here is subjected, is done in China. In that direction the Celestials have acquired a degree of skill far and away beyond that to which Europeans have attained. In Melbourne, very many families buy their teas from Chinese hawkers, whose ways are "quite too winning," the lollies which Chinky Chinky Chopsticks gives to the young ones at the door being a very successful bait to induce the housewife to deal with him. Their teas are highly scented with a good "grip" on the palate; in fact they are such teas as the Canton short-leaf mixtures, which will be referred to further on. The use of such teas is gradually depraving the public taste. Housekeepers request their grocer to supply them with a similar article, and he asks the wholesale merchant to enable him to meet the demand, and thus the evil increases.

The quality of tea is judged, not only by its aroma and by the flavour and colour of the infusion, but by the amount of soluble matter or "extract," as it is called, which it yields. But, generally speaking, tea is classified according to the proportion of extract, mineral ash, soluble salts, and theine obtained. This rule, however, is subject to modification, inasmuch as chemical analysis sometimes reveals that the leaves have been mixed with some foreign matter, evidently added to give extract. Genuine tea contains between 4 and 6 per cent of mineral matter, 3 per cent of which consists of soluble salts, and yields in its ordinary air-dried condition extract ranging from 32 to over 50 per cent.

As a rule, the younger and better the tea, the higher the percentage of extract. The following table gives an analysis of genuine teas:—

Name.	Locality.	Percentage of Mineral Ash.	Percentage of Extract.	Percentage of Soluble Salts.	Percentage of Theine.	No. of Samples Averaged for the Analysis.
Pekoe	... China	5.90	38.40	3.75	•	1
Do	... Ceylon	4.71	45.60	3.16	1.81	26
Do	... Indian	5.19	41.41	3.19	1.77	2
Do Souchong	... China	6.00	36.40	4.14	*	1
Do do	... Ceylon	4.78	45.11	3.06	1.81	13
Do do	... Indian	5.42	39.66	3.19	2.05	7
Souchong	... China	5.80	40.80	4.24	*	1
Do	... Ceylon	4.72	43.68	3.10	1.79	13
Do	... Indian	5.26	38.85	3.04	1.62	3

* Not determined.

With regard to this table, it would not be fair to use it for the purpose of making a comparison between different tea-growing countries inasmuch as the Ceylon teas were Exhibition teas, while the Indian and Chinese were obtained from bulk samples which had been sold in Melbourne.

The next table gives the results of an analysis of Chinese teas obtained from the importers, and taken from bulk samples:—

Name.	Price per lb. in bond.	Percentage of Mineral Ash.	Percentage of Extract.	Percentage of Soluble Salts.
Congou ...	s. d. 1 0	5.26	27.52	2.90
do ...	2 3	5.74	32.24	2.83
do ...	1 0	5.40	33.00	3.56
do ...	0 10	5.72	25.36	2.66
do ...	0 10	5.80	24.20	2.09
do ...	1 5 1/2	5.50	22.84	2.13
do ...	1 5	5.84	21.04	2.64
do ...	1 4	5.40	26.66	2.74
do ...	1 5	5.90	25.04	3.23
do ...	1 3	7.70	29.04	4.77
do ...	1 2	5.40	27.68	2.60
do ...	1 3	5.20	31.92	3.02
do ...	1 9 1/2	5.38	31.12	3.38
do ...	1 6	5.60	29.44	3.09
do ...	1 5	5.40	28.24	2.87
do ...	1 7	5.66	31.60	2.77
do ...	1 7	5.90	29.04	2.89
do ...	1 7	5.60	31.44	2.94
do ...	1 9	5.46	29.44	2.62
do ...	2 3	5.74	32.24	2.83
do ...	2 1	5.72	31.44	3.26
do ...	2 3	5.60	32.24	3.11
Souchong...	3 6	5.40	31.44	3.21
Congou ...	2 9	5.80	33.84	3.25
do ...	3 3	5.60	32.24	3.20
do ...	1 9	5.74	31.04	3.34
Scented orange pekoe	1 9	6.10	34.64	3.27

There are very few teas in this lot that would pass the standard for a low class genuine tea, and this, too, notwithstanding the high price paid for a number of them. The majority of the samples must be classed as made-up teas, and consisted principally of exhausted tea-leaves re-fired, tea dust, and withered leaves. In many of the samples an excess of stalks and foreign leaves were detected. In some, especially those mentioned in the table as being sold at 10d. to 1s. per lb. in bond, chemical analysis distinctly showed that, besides the adulterants already named, the leaves had been mixed with some foreign matter evidently added to give extract and colour. One or two samples had been very strongly faced, or artificially coloured, with plumbago. Starch paste was likewise found. Had it not been for these foreign matters, which are soluble in water, the percentage of extract would have been much lower. As it was it will be seen that in the great majority of cases the percentage of extract was below the minimum for the lowest-classed genuine teas.

With regard to Canton short-leaf, it may be mentioned, in the first place, that Canton is the centre of tea adulteration. An analysis of a sample of this description of tea showed that, in 100 parts, it contained:—

Percentage of stalks	28.71
Percentage of green tea	15.74
Percentage of black tea	55.55

100.00

Many stalks were found foreign to the tea plant, and were ascertained to be cut-grass stems. The percentage mentioned as black tea was, in reality, a green tea which had been faced, probably with plumbago. Foreign and withered leaves were also detected, as were likewise a large number of small nodular particles, which proved, on analysis, to be tea-sweepings or lie, tea, held together by starch paste. An analysis of the whole sample of Canton short-leaf gave the following results:—

Percentage of mineral ash	6.70
Percentage of extract	37.69
Percentage of soluble salts	3.17
Percentage of theine	0.72

This percentage of theine, which is one of the chief constituent parts of tea, is very low. At the same laboratory, about 70 samples of Foo-chow congou yielded 1.67 per cent. of theine, the lowest percentage being 1.50. In 71 samples of Ceylon (exhibition) teas, the average percentage was 1.89, and the lowest 1.82; and in about 60 samples of Indian tea, the average percentage was 1.77, and the lowest 1.44. It may be added, with regard to Canton short leaf, that it has a very large sale, and is used by grocers to give the pronounced flavour which is so appreciated by the public. Jasminum sambac, evidently used for scenting purposes, was likewise detected in the samples.

As a rule, Indian and Ceylon green teas, which have been analysed at the laboratory, have proved to be perfectly free from adulteration, and the opposite may be said, with a few exceptions, of Chinese green teas. Some 60 samples of Chinese black teas, obtained from the most respectable grocers in Melbourne and suburbs, and sold at a retail price of 2s. to 2s. 6d. per lb., were a short time since analysed. The following is a summary of the analysis:—

Name.	Price per lb. s. d.	Percentage of Mineral Ash.	Percentage of Extract.	Percentage of Soluble Salts.	Remarks.
Congou ... 2	6 5 40	35.20	3.50		Highest percentage obtained from 30 samples.
Congou ... 2	6 5 47	26.78	2.56		Lowest do.
Congou ... 2	6 5 63	31.92	3.26		Average of 30 different analyses.
Congou ... 2	0 5 52	34.80	3.13		Highest percentage obtained from 28 samples.
Congou ... 2	0 5 60	19.57	2.49		Lowest do.
Congou ... 2	0 5 55	30.08	3.06		Average of 28 different analyses.

We will conclude with a few general remarks. The sales by public auction of China teas for the six months ending 31st December, 1880, is stated to have been 3,391,000lb. Of this 2,005,000lb. were sold at and under 1s. per lb. in bond. The remaining 1,386,000lb. were sold at 1s. 0 1/2d. to 1s. 10d. per lb. in bond. The duty on tea is 3d. per lb. There can be no doubt that grocers make a great profit out of tea. Some articles they sell at a very low price to get custom, but they make up for that on tea. Pure tea will go much further than the ordinary teas, and consequently less need be used. It is well to bear that in mind because when pure tea is used, too much may be put into the pot, and its very goodness may create a pre-

judice against it. Many persons condemn a large leaf tea as being of little strength. Such an opinion is erroneous. Some of these teas have been proved by Mr. Dunn to be very rich in extract, soluble salts, and theine. Of course these remarks do not apply to an excessively large leaf. *Melbourne Argus.*

TIN TEA BOXES.

The following reference to these new boxes is from the pen of Colonel Money, the well-known authority on tea:—The boxes measure $15\frac{1}{2} \times 10\frac{1}{2} \times 10\frac{1}{2}$. They are handsomely illustrated with Indian Tea Plantation subjects.* Each piece runs into a groove in the adjoining one, so that one minute will put a box together and a touch of solder here and there completes it: they are then perfectly air-tight. The boxes are very slightly. Price is now 2s. 5d. per box. Boxes sent to Calcutta up to this have been charged 2s. 7d. The price is dependent on the fluctuating price of tin, which is somewhat lower now. Of course they are sent out in pieces. Cases holding pieces for 100 boxes weigh 4 cwt. The firm tell me that Messrs. Schöne, Kilburn and Co., and Messrs. Begg, Dunlop and Co., in Calcutta have consignments of the boxes, so any of your readers can see them. In my opinion there are several advantages to be derived from their use. They will help to open up new markets. The ungainly, unwieldy packages we have used hitherto, are certainly detrimental at least where Indian teas are not known. By the use of these tin boxes the sale of our teas would, I am sure, be extended at home, and they would also give great facilities for successfully introducing Indian Tea into Australia (Canada, the United States, the Cape, &c. It seems some Indian Tea has already been sent home in these tins, and I am told it met with a ready sale, quite to 8d. per lb. over what it would have brought in chests. This is, of course, too good to last, but less than one penny a lb. increase would pay for their use. The tares of these boxes is, and must be exact, viz., 3 lb. 15½ oz., so only a few would be opened at the Custom House, and the great loss by the deterioration of tea being exposed (few know how great it is) would be avoided. There is no doubt tea will keep better in transit in these boxes than in our old packages. How are they to be packed? Chests holding four tin boxes were recommended. I think crates of strong light battens would answer perfectly, and 6 or perhaps 8 boxes might then be placed in each. The rule of the Custom House is to discard fractions of a pound both in the gross and the tare. But in the gross the number below is written, in the tare the number above. In the case of our ordinary Indian packages, if we could regulate our tares exactly, so as to make the gross weight only one ounce above the whole number, and the tare one ounce below the whole number, the loss would necessarily be much decreased. This, however, is impossible, for, as a rule, the tares are one or two pounds less when they arrive in England than when they left the garden, owing to the wood drying in transit: and thus it is quite a chance what the real tares come out here. But, with the tin boxes in question the tares, that is their weight, being fixed and equal, and not liable to change, we can so arrange the weights that the loss will be very trifling, thus:—

	lb.	oz.
The box weight	3	15½
We put in tea	20	2
Gross weight	24	1¾
In the Customs the gross is written		24
And the tare is written		4
The Tea paid for will be	20	lb.

*Top, is "the tea garden." Front, "weighing leaf." Back, "packing." Ends, "elephants with howdah," or, if desired, the Plantation mark.

that is a loss of only 2 ounces, or not much above half per cent., instead of 3 per cent., as shown in the old packages. Roughly, the cost of using these tin boxes would be all told, from $1\frac{1}{2}$ to $1\frac{3}{4}$ per lb. and with our lead-lined boxes it averages perhaps one penny. The difference of a half penny, or even three farthings per pound would not be much for the advantages detailed.

LIME AS A MANURE.

The very abundant and highly important substance popularly called lime, but dignified by chemists with the name of *protoxide of calcium*, has long been used by agricultural nations as a manure. It has been in use for nearly 2,000 years, for, according to Pliny, the Gauls successfully raised heavy crops of corn with it; while the Romans found an application of lime very beneficial to their vines and olives. It was, however, about the middle of last century before liming was introduced into this country.

The reason why lime acts so powerfully on vegetation is that combined with decayed animal and vegetable matter, it forms into a compound soluble, which, melting by the action of rain, supplies the plants with the chief elements of vegetable life—oxygen, hydrogen, and carbon; while it at the same time attracts carbonic acid from the atmosphere and forces the plant to absorb those gases more rapidly than usual.

Lime is found to be more efficacious upon—1. Land that has been habitually lightly manured than upon land that has been habitually heavily manured. 2. Land that in its composition contains no alkali than upon land which does contain alkali. 3. Land containing lime in its composition which has been habitually ploughed deeply than upon land in a similar state habitually ploughed lightly. 4. Newly broken up old grass land than upon land which has been previously continually cropped.

Lime ought not to be applied at all to lands which, according to their nature, already contain any of it in their composition; neither ought it to be applied to soil, no matter how rich that soil may be in other manures as long as the remains of any previous application continue to exist therein. It is well known that lime from its nature, always seeks down into the ground; and it is also well known that some soils retain its influence longer than others. According to one authority, twenty years is supposed to be the limit of its beneficial action over a great part of the south of Scotland; while another, a farmer in one of the Border counties, after laying down and liming a field of grass, found its influence extended to nearly thirty years.

Lime greatly accelerates both the dissipation of manure and the chemical decomposition of the soil; and in the very degree in which it increases fertility by this species of action, the land on which it operates must, in order to maintain the fertility, be supplied with proportionally large doses of manure, and perhaps with occasional doses of such mineral constituents as combine chemically and nutritively with the lime. Grass lands which have been allowed to run to seed, and which have become overrun with rushes and coarse vegetation, may be greatly improved by a dose of quicklime; for, according to Dr. Hunter, 'Quicklime is an instrument of death to the coarse herbage of meadows.' The same authority says that it is also known to change the taste of certain kinds of grasses altogether. 'If a handful of lime be brown on a tuft of rank sour grass, which has in former years been invariably refused by cattle, they will afterwards eat it close down.' Fine pasture lands have likewise been found to be naturally benefited by a top-dressing of the mineral in solid form.

Now, when the old days of farming are passing away, in which, according to a seventeenth century writer, 'rains and dews, cold and dry winters, with stores of snow I reckon to be the best kinds of manures, impregnated as they are with celestial nities,' I cannot conclude better than in the words of Liebig:— 'A time will come when plants growing in a field, will be supplied with their appropriate manures prepared in chemical factories, and when plants will receive only such substances as actually serve them as food.' David Swan, in *N. B. Agriculturist*.

CULTIVATION OF VANILLA.

The high price of vanilla should encourage the cultivation of this plant in many of our Colonies, which are well adapted to its growth—*e.g.* Ceylon, Queensland, New South Wales, the West Indies, British Guiana and Honduras, Fiji, and parts of New Zealand. Some portions of South Africa and many districts in India would no doubt also prove capable of yielding an abundant supply of excellent vanilla. Mauritius is at present our only Colony where the culture of this plant is systematically carried on, though small experiments have been made, with encouraging results, in Jamaica.

As it requires special treatment, a few remarks upon its cultivation may be of interest to those who may be tempted to make the experiment.

In Mexico, vanilla is planted either in a forest or in a field. In the former case the underbrush, climbers, and large trees are cut down and removed, and young saplings only preserved to serve as supports to the vanilla plant, preference being given to trees having a milky sap; near each tree two cuttings of the vanilla plant are placed side by side in a shallow trench 1½ inch deep, and sixteen inches long, three knots of the stem being laid in this trench and covered with dead leaves, brush, &c. The rest of the cutting to the extent of three or four feet is placed against the tree and tied to it. The supporting trees should not be nearer than twelve or fifteen feet apart, to give sufficient room for the development of the plant. After a month the cutting will have taken root and must be carefully kept free from weeds and briars of all kinds. In the third year the plant begins to bear fruit which it continues to yield for many years.

When the vanilla is cultivated in a field the Mexicans first plough the ground thoroughly and raise on it a crop of maize. In the protection afforded by this plant a number of young milk-bearing trees of the fig family grow, which in a out twelve or eighteen months are large enough to answer the purpose of supports to the vanilla plants which are then placed as above described. In Mexico and Guiana the plant is allowed to climb up the trees, the fertilisation of the flowers is left to nature, and a large number of flowers consequently remain unfertilised and the yield of vanilla is small. In a few days after fecundation the flower falls off and the fruit continues to grow till the end of the first month: it takes, however, another five months before it is completely ripe. Each pod must be gathered separately, and not the whole cluster at once, the time to gather them being indicated by the pod cracking when pressed with the fingers. If too ripe the pods split in drying, changing in colour from yellow to brown and black. If not ripe enough the fruit will lack fragrance and proper colour. The ripe fruit has no odour at first, the agreeable odour of vanilla being developed by a process of curing. While the fruit is drying, an unctuous dark red liquid, called balsam of vanilla, exudes.

In Mexico the pods are collected and placed in heaps in a shed to protect them from rain and sunshine, and left there for a few days; they are then, if the weather is warm and clear, spread early in the morning on a woollen blanket and exposed to the direct rays of the sun; at about midday the blanket is folded round the beans, and the bundle left in the sun for the remainder of the day. In the evening it is enclosed in tight boxes to "sweat" all the night. The next day the same treatment is adopted, and the beans, after exposure to the sun, acquire a dark coffee colour, the shade being deeper in proportion to the success of the "sweating" operation.

If the weather is cloudy, the vanilla is collected into bundles, a number of which are packed together into a small bale, which is first wrapped with a woollen cloth, then with banana leaves, and finally with a stout matting, which is firmly bound and sprinkled with water. An oven is then heated to 110° F. (60° C.), and the bales containing the larger beans are placed in it. When the temperature has fallen to 113° F. (45° C.) the smaller beans are introduced and the oven closed tightly. Twenty-four hours afterwards the smaller beans are taken out, and twelve hours later the larger ones. The vanilla has then acquired a fine maroon colour.

The drying operation then commences. The beans are spread on matting and exposed to the sun every day for about two months. When the drying is nearly complete it is finished in the shade in a dry place, and the pods are then tied up in small bundles for sale.

In the Island of Reunion a different method is adopted.

In the first place the vanilla plant is never allowed to grow out of human reach, the different trees on which it is supported being connected by pieces of bamboo or other wood, placed horizontally, so as to form a kind of lattice, on which the vanilla can spread freely.* As the vanilla loves a moist soil, and will not bear a burning sun the trees are never cut down. If grown in a field the support chosen is usually the physic nut *Jatropha hurea*, on account of its rapid growth and abundant milky juice.*

When the trees are of sufficient size to shelter the plant, the cuttings are set between the trees in a trench, eight inches deep, and covered with dry leaves, straw and a little soil. This is generally done in the rainy season, as the cutting requires frequent watering while it is taking root. The shoots are trained on the lattices when they have begun to grow freely, and in two years are in full bearing. A length of stem of twelve to twenty-six inches in a state of nature, although it may produce more than forty flowers, rarely yields more than one pod—the flowers being only capable of fertilisation by the aid of insects.

A man named Edmund Albins, a former slave in Reunion, discovered that if the pollen of one flower was made by artificial means to fertilise the stigma of another flower, it was possible to obtain more than 3,500 pods from a single plant, although this would cause the death of the plant before they could ripen. The method adopted, therefore, is to choose on each cluster the finest flowers, and only fertilise those presenting a large and fleshy peduncle. These are known to be successfully fecundated, if the flower, instead of dropping off, remains and dries on the top of the fruit. When this is observed the rest of the flowers are cut off.

When ripe the pods are sorted according to length and scalded. The long ones are dipped into water at 194° F. (90° C.) during ten seconds, the medium ones fifteen seconds, and the shorter ones, one minute, or longer. They are then exposed to the sun between woollen blankets until they acquire the characteristic maroon colour, which occurs in about six or eight days. The pods are then spread on hurdles, and placed in garrets to dry gradually. As in this Colony the roofs are flat, and covered with tin, the garrets are in reality drying closets with a stream of warm air continually circulating through them. When the drying has proceeded so far as to allow the pod to be twisted easily round the finger, the operation called "smoothing" begins; and this requires great care, as every bean must be passed through the fingers from time to time, so as to spread the oil which exudes on the whole length of the bean, as the fermentation proceeds, for the lustre and suppleness of the vanilla depend upon this treatment. The beans are also turned frequently, so as to ensure their drying equally on both sides. In a month the pods are dry, and are then sorted according to their length, and into the three following varieties: 1st. Fine vanilla, from eight to eleven inches long, glossy, dark brown, and unctuous, and soon covered with minute, frost-like crystals, technically known as *givre*. 2nd. Woody vanilla, from six to eight inches long, lighter in colour, not glossy, presenting grey spots

* How far the irritating property of vanilla, which is sometimes manifested in vanilla ices, &c., may be due to the growth of vanilla on an acid euphorbiaceous plant may be worthy of enquiry. The use of fig-trees, as in Mexico, would seem at all vents to be safer and more judicious.

on their surface and having very little *givre*. These generally come from pods not quite ripe. 3rd. Vanillon, consisting of two varieties, both of which are short. The best are obtained from ripe fruit and are covered with white crystalline efflorescence; the inferior are obtained from abortive or unripe fruits, and owe any odour they possess to having been in contact with those of better quality.

A slightly different method of drying is adopted in other vanilla-growing countries. In Guiana the pods are placed in ashes and left there till they begin to shrivel. They are then wiped, rubbed with olive oil, tied at their lower end, and hung up to dry in the open air. In Peru the vanilla is dipped into boiling water tied at the end, and hung in the open air; after twenty days the pods are rubbed over with castor oil, and a few days later are pressed into bunches.—*Colonies and Ind. a.*

JAMAICA PUBLIC GARDENS AND PLANTATIONS.

CINCHONA—LIBERIAN COFFEE—COCOA—TOBACCO—VANILLA—RUBBER—JACAP—COCONUTS.

We have received the annual report on these gardens for the year ending 30th September 1880. With regard to the distribution of plants, Mr. Morris says:—

In the distribution of Economic Plants from the Public Gardens, in addition to several thousand Cinchona seedlings and plants distributed from the Cinchona plantations, new Sugar Canes, Fruit trees, Banana and Pine-apples from the Hope, and Coconut plants from the Palisadoes plantation, some 26,937 plants, including Trinidad Cacao, Nutmeg, Clove, Cinnamon, Liberian Coffee and Vanilla, have been distributed from the Botanic Gardens at Castleton. The total distribution during the past year is estimated at an aggregate of nearly one-hundred-thousand plants of economic value.

There have also been exchanges of plants and seeds with private persons and public gardens, the latter including ours at Peradeniya. It is stated that

In exchanges maintained with Botanical Institutions and Gardens abroad, 753 packages and 8 boxes of seed, 9 warden cases, and 1 box of plants have been received; the latter containing 356 plants of economic value. In return, this Department has forwarded 10 Warden cases of Plants, 6 boxes and 3 casks of Seed, and an aggregate of 874 packets of Seed weighing 376 pounds. Six Warden cases, containing nearly 500 Plants, were forwarded to the new Botanic Gardens, Demerara. Several cases of Mahogany and Guango Seed were despatched to India and Java; and numerous packages of Cinchona Seed were forwarded to applicants in India and Ceylon.

A scientific catalogue of all the plants in the public gardens is in course of preparation, and meanwhile Mr. Morris gives in an appendix to his report a list of the most interesting trees, shrubs, fruit trees, economic and medicinal plants, with their English and botanical names. Mr. Morris says:—

The public are kept well informed, by periodical notices in the local papers, what plants are available for distribution, at any particular season, and I am glad to find that, by these means, a considerable impulse has been given to the distribution of valuable economic plants, which cannot fail to be permanently beneficial. The year was in many respects unfavorable for planting operations, the unusual rains of October 1879 being followed by a comparative drought. At the cinchona plantations the rainfall was 50 inches less than in the previous year—128.15 against 177.46. Before the country had had time to recover from the conditions brought about by these circumstances came the hurricane of August, which did great damage to coffee properties, to bananas and fruit-trees, and to agricultural produce generally. Notwithstanding this, however, Mr. Morris says,

After the lapse of only a few months there are indications of a return to the normal conditions of agricultural pursuits; the Coffee crop, now being gathered, is expected, in many districts, to be a good average; the fruit trade is rapidly recovering and with the great activity generally displayed by the peasantry in opening up and replanting their banana and provision grounds, it may, naturally, be hoped that with a few sea-sonable showers in the earlier months of the year there will be a renewal of favourable conditions among all agricultural interests.

He then relates how the cinchonas damaged by the hurricane were utilized, and adds:—

The successful harvesting and utilization of Cinchona Bark appears, therefore, to be in a great measure independent of times and seasons, and this experience may well commend itself to all Coffee planters in the Island; suggesting the advisability, if not the absolute need, of combining Cinchona with Coffee cultivation, wherever they can be successfully pursued; thus utilizing the stability and certainty of the one, as compensating for any unfavourable conditions that may arise in the other.

Each garden is then reported on separately, first coming the Castleton gardens, of which we read:—

It is satisfactory to learn that although the loss to the gardens in valuable Economic trees &c. destroyed by the late hurricane was very great, particularly, in Clove, Cinnamon, Nutmeg, Trinidad Cacao, &c., very few species have been entirely lost, and the damage will, it is hoped, be remedied in a few favourable seasons. The *debris* resulting from the storm, was cleared away by means of the ordinary labour of the Garden and without additional grants and Mr. Syme reports 'that although the grounds present a somewhat open and ventilated appearance they probably look as well as they have ever done before.' During the past year, the principle of charging certain fixed, but reasonable, prices for the valuable Economic plants distributed from these gardens, has been attended with such success, as to fully justify its adoption. Not only has a larger number of plants been actually distributed, but they have been taken up by persons thoroughly in earnest about their cultivation, and likely to give them every care and attention. The total number of plants distributed during the year from this Garden amounts to 26,937, as against, 24,141, distributed in the year 1878-79; the different kinds were represented as follows:—

Trinidad Cacao	7,180	Liberian Coffee	958
Nutmeg	800	Sweet Orange	9,074
Clove	436	Vanilla	239
Cinnamon	145	Palms, Orchids, &c.	8,110

Rainfall—104 inches.

Next comes a long report on the cinchona plantations, of which Mr. Nock says:

"During the year 1879-80 about 50,000 Cinchona plants have been set out in their permanent places. Of these about 43,000 were *C. officinalis*; 6,000 of *C. Calisaya?* and 1,000 *C. succirubra*.

A summary is given of the various sub-divisions of the cinchona plantations, as follows:—

1. *Lower Latimer*.—4,800 feet to 5,500 feet; about 30 acres, originally planted in 1868, with Red bark (*C. succirubra*) at distances of from 10 to 12ft. apart. The majority of these trees were uprooted for the bark crops of 1878-79 and 1879-80. A few trees only are left, and these are preserved for seed. It is proposed to replant this area, with good kinds at distances of 4ft. by 4ft.

2. *Upper Latimer*.—5,330 feet to 5,900 feet; an irregular patch of about 25 acres, very widely planted with the Crown bark (*C. officinalis*), the Red bark (*C. succirubra*), and a few of the hybrid variety. These trees are from 4 to 10 years old and number, in all, about 10,000 healthy trees.

3. *Monkey Hill*.—5,900 feet to 6,300 feet. This is

the highest of the Plantations occupying almost the crest of the main ridge of the Blue mountains: about 15 acres: planted entirely with Crown bark (*C. officinalis*), about 11 years ago. This plantation has yielded the greater proportion of the Crown bark, shipped during the last 2 years.

4. *New Haven* 5,500 feet to 5,700 feet. A small patch of about 6 acres planted with Crown bark, (*C. officinalis*), of nearly the same age and character as last. About 2,000 trees have already been taken and the remainder are doing well.

On both the New Haven and the Moukey Hill Plantations, the original planting has been completely masked by the abundant growth of self sown seedlings some of which are now large enough to be cropped. These plantations are, in this respect, are the most successful of any, and they will probably yield a succession of valuable crops for several years. Root bark from these trees has realized 10s. 1d. per pound, and trunk bark 7s. 11d. per pound.

5. *White's Puce*:—4,900 feet to 5,400 feet; containing about 8 acres. All the trees, consisting of Red bark and the hybrid variety, between 10 and 11 years old, were "coppiced" on this piece last year and the stumps left to throw up fresh roots. After making a start, many of them died off, and it was ultimately decided to uproot all, but about 200, which are now growing well. After being cleared, this piece is in course of being replanted by the hybrid variety at distances of 4 feet by 4 feet.

6. *Belle Vue*—4,800 feet to 5,500 feet; containing about 30 acres, very sparsely planted about 4 to 5 years ago with *C. succirubra*. Owing, however, to "dying off" and the severe effects of the late hurricane, the number of trees on this Plantation is now reduced to about 2,000. Under these circumstances, it is proposed to re-line, and re-plant the whole area, at 4 feet by 3 feet, and establish the large leaved Crown bark, *C. officinalis*, var. *condaminea*.

7. *Upper Buzza*:—4,800 feet to 5,400 feet; containing about 40 acres; of which 4 acres are planted in Jalap. This plantation was opened and planted during the years 1879 and 1880 with the Crown bark (*C. officinalis*) at the top; the Red bark (*C. succirubra*) at the bottom, and some plants of the hybrid variety between. All these are placed at distances of 6 feet by 6 feet, (giving 1,210 trees to the acre) and appear to be well established.

8. *Lower Buzza*:—4,500 feet to 5,000 feet; about 30 acres in extent; planted with Red bark. (*C. succirubra*) from 6 to 9 years old; containing about 5,000 healthy trees.

Three nurseries were established during the year containing about a million plants, but these were so damaged by the hurricane that only about a third were saved, which have been chiefly used in planting up the plantations. The principal kinds of cincho a hitherto cultivated in Jamaica were the crown and red barks and the hybrid variety. With regard to the plant of hard Carthagena, brought by Mr. Cross to England and entrusted to Mr. Morris by Dr. Hooker in 1879, we read:

I am glad to be able to report that the plant, so kindly presented to the Government of Jamaica at the request of Sir Joseph Hooker, has been the means of thoroughly establishing this species in the Island. Early in 1880, a number of good plants were successfully raised by Mr. Nock, from cuttings, and five are already planted out in their permanent places; some at 5,000 feet, and others at 5,500 feet, and all are apparently doing well. To those probably several others will be added during the course of the present year. Of other kinds we read:—

Yellow Bark As it was found that the true Yellow barks were not in the Island, efforts were made to procure seeds of the best kinds from India and Java. Through the kindness of Dr. King, a packet of the

seeds *C. Calisaya vera* was obtained from the Sikkim Plantations, which has produced about eight thousand strong healthy seedlings. As *Calisaya* is the source of the Yellow bark of commerce and the most valuable of all the medicinal barks, this addition to our collections will duly be appreciated.

Ledgeriana Bark:—Towards the close of the year the Plantations were enriched by the arrival of three plants of the celebrated *C. calisaya* var. *Ledgeriana*, a variety which has, hitherto, been almost entirely in the hand of the Dutch Government at Java. These plants were raised at Kew by cuttings from a plant presented by Mr. John Eliot Howard, F.R.S., the eminent Quinologist, and Sir Joseph Hooker very generously placed them at the service of the Government of Jamaica. The plants have already been planted out near the Director's residence, and are in a most satisfactory condition. They measure, (December 1880) respectively, 12 1/2 and 18 inches in height. Mr. Howard remarks that "*Ledgeriana* is the prince of all Cinchonas." Quite recently bark of *Ledgeriana* has been sold in the London market at the high price of 14s. 8d. per pound, and bark from *Ledgeriana* trees grown in Java, has been sold in Amsterdam at 17s. per pound. These remarkable prices show the great importance which should be attached to the due selection and propagation of the best kinds of Cinchona; and though the successful cultivation of the Red and Crown barks, in view of the very satisfactory prices lately obtained, will continue to be remunerative in Jamaica for many years to come, it is obviously prudent to introduce the more valuable kinds, whenever, they can be obtained, for the purpose of giving the enterprise a thoroughly permanent and remunerative character.

Large leaved Crown bark:—Through the kindness of a planter in Ceylon a quantity of seed has also been received as *C. officinalis*, var. *Condaminea*, harvested at the Government Plantations, Dodabetta, Southern India. This is regarded as a robust large-leaved variety of the true Crown bark, and it is intended to plant about ten acres with it at the Belle-Vue Plantation, in order to test its merits in Jamaica.

Regarding the bark harvested during the year, of which the account sales are given in an appendix, Mr. Morris says:—

On reference to appendix A, attached to this report, it will be noticed that four consignments were made within the year, containing in the aggregate 27,299 pounds. The gross return on this quantity was £5,380; leaving after deducting shipping-charges, insurance, brokerage and expenses in England, a nett return of £5,145-19s. The bark, above mentioned, was produced by 8,246 trees, of all kinds, from 8 to 10, and 12 years old; giving an average return of 3 1/2 pounds of dry bark, per tree, and an average nett value of 12s. 5 1/2d. per tree. Of the 8,246 trees, 210 were of the hybrid variety, which according to returns contained in appendix A, yielded an average of 4 1/2 pounds of dry bark per tree, or a value for each tree of £1 4s. 2d. Of the remainder, 3,915 trees, were the Crown bark, *C. officinalis* yielding an average of 1 1/2 pounds of dry bark per tree, and a value of 9s. 3 1/2d. Again, 4,091 were Red bark trees *C. succirubra* yielding an average of 4 1/2 pounds of dry bark per tree, with an average value of 16s. 1d. per tree. Taking the above average values, it would appear that, tree by tree, the hybrid variety was the most valuable of all; but taking into consideration the small number of trees barked, 210, and the fact that they were exceptionally fine specimens, the comparison of these with the 3,945 trees of the Crown bark of all sizes, is not quite a fair test—also with the Red bark, the average value of these trees at 16s. 1d. compare most favourable with the Crown bark trees at 9s. 3 1/2d. Here, again, it must be remembered that the Red bark trees cannot be planted, so closely, as the Crown Bark and they take several years longer

—probably twice as long—in arriving at maturity ; and on our highest ridges where the Crown Bark is, completely, naturalized, it attains maturity in 5 to 7 years, whereas, the Red bark, suitable only for lower elevations would require from 10 to 12 years. This comparison is made on the supposition that the Red and Crown Barks are equally in demand. But as the Red bark is not a good quinine-yielding bark, it is not bought by the quinine manufacturers but the druggists. Hence, if there should be a fall in the prices of Cinchona Bark, from its more abundant supply, and the purposes for which it is used, the Red bark would suffer first ; whereas good Crown Bark from its more abundant per centage of quinine, and larger demand, would always meet with ready sales. Taking the actual returns of the Crown Bark as mentioned above, and assuming that they were planted at elevations, 5,500 to 6,300 feet, and at distances of 6 feet by 6 feet, or at the rate of 1,210 per acre, an acre of this species would give a gross return of £563. From the working expenses of the Government Cinchona Plantations it may be safely assumed that an acre of Cinchona trees could be established, including purchase of land and all expenses up to the third year, for £30, or up to the sixth or seventh year, when the bark would probably be ripe, about £40 per acre. The cost of barking, curing, shipping and brokerage has hitherto averaged about 8d. per pound. This would make a total cost of about £100 to grow and put in the market 1,815 pounds—the produce of an acre of dry bark realizing £563. As the yield of an exceptional tree, Mr. Nock records the following : One of the largest trees on the plantations was uprooted and barked on the 7th of April last. It yielded 40 pounds of trunk bark, 5 pounds of twig bark, and 9 pounds of root bark, equal in all to 54 pounds of green bark. This when thoroughly dried was reduced to a total of 16 pounds. At the average price obtained for this kind—the hybrid variety—viz :—6s 1½d. per pound, the produce of this one tree was worth £4 18s 4d. It may be added that this tree was growing in a sheltered situation in good soil, and was nearly twelve years old. It measured 40 feet in height and a circumference at the base of about 30 inches. The spontaneous growth of cinchonas, especially of *officinalis*, by self-sown seedlings on the Blue Mountains had been already noticed. Mr. Morris adds another fact of the same tendency :—

It appears that in 1867-68, before the sites of the present Government Plantations had been fixed, Mr. Robert Thomson, the late Superintendent, planted out with the consent of the owners, several seedlings in nurseries on Hibernia, Whitfield Hall, Farm Hill, and other estates for experimental purposes. When the Latimer plantation was finally opened in 1868, most of these seedlings were removed—a few only, of the smaller and weaker plants being left behind. The patch planted at Whitfield Hall, occupied a small area at an elevation of 4,800 feet, surrounded by forests about two miles from Whitfield Hall Great House. After the removal of the plants, in course of time, the road to the nursery became overgrown ; and the locality and its associations had apparently passed out of notice. While in the neighbourhood last year, meeting with a man who had assisted in removing the plants from Whitfield Hall to Latimer in 1868, and hearing that a few Cinchonas were still left, I was led to visit the spot in order to examine the trees and their condition after the lapse of so many years. It was evident that, since 1868, nothing, whatever, had been done to the spot. The road was quite overgrown and the surrounding forest was thick and almost impenetrable. The condition of the Cinchona trees occupying an area of about 120 square yards, was, however, very remarkable. By carefully counting them, I found that there were 379 trees on this small area ; some of which were only 9 inches apart. Most of the trees consisted of the Crown bark

(*C. officinalis*) ; they were about 20 feet high, with tall clean stems ; the largest measuring 15 inches in circumference at the base, and the smallest 8 inches. Being the remains of a nursery, it was, naturally, expected that some of the trees would be very close and others considerably isolated. They appear, however, to have grown up and completely shaded the ground ; for underneath, the soil was clear of weeds, and covered with a thick covering of fallen leaves. The condition of the trees and the locality in which they were found showed clearly that Cinchona trees thrive best when they are planted closely, together, and when the ground is well shaded and kept cool and moist. Moreover, these trees indicated that when a Cinchona Plantation has been thoroughly established and the trees completely cover the ground, (say in the 3rd year from planting), no further attention is necessary till they have arrived at maturity and are fit for barking. As indicating the value of Cinchona planting in the Blue Mountains,—taking these 379 trees, which occupied an area of less than 120 square yards.—it was estimated that if they yielded on the average one pound of dry bark per tree, (younger trees, at the Government Plantations yielded 1½ pounds per tree), each tree would be worth at least 5s. ; this would give £94 15s 0d. as the value of 379 trees on an area of 120 square yards—one-fortieth of an acre. Under ordinary conditions it would not, however, be advisable to plant the trees so closely as this, but the value of an acre of land planted with trees even at one-half, the above rate would amount to more than £1,800. Large as this sum may seem, it appears that with the precious Ledgeriana Bark, grown by the Dutch in Java, (a few plants of which have just been introduced to Jamaica), the yield per acre, as quoted by Mr. John Eliot Howard, F.R.S., (*Pharmaceutical Journal*, No. 534 p 244) is estimated from actual sales, at £2,000, per acre. The natural inference from these remarks will be,—If Cinchona is so productive a cultivation and these large sums are obtainable with so much ease and facility, will not such large areas be ultimately planted with Cinchona as to lower the prices and render the culture unremunerative ? Commercially, of course, cheapness means small profits, and, as with all other products, so with Cinchona, the supply should not exceed the demand. But to examine these points in detail. The demand for quinine is so extensive, and the terrible death roll amongst all nations of the world from fevers, for which quinine is the sole remedy, is so vast that, there is no prospect, whatever, at present, of the price of quinine being seriously reduced. On the other hand, the prices of good quinine-yielding barks have been steadily rising. Again, when we consider the comparatively small areas in which all the conditions necessary to the production of the best qualities of Cinchona Bark obtain, we shall find that very few tropical countries can enter successfully, upon the cultivation ; and of these, possibly only two or three will possess in so eminent a degree all the favourable conditions enjoyed by Jamaica. What is, absolutely, necessary is to select suitable sites where the plants will enjoy the requisite climate, shelter, and soil ; to cultivate only the more valuable and quick-growing species, and to establish plantations on systematic and scientific principles, whereby, the utmost value is obtained for the outlay and the conditions of growth carefully studied.

Mr. Morris evidently realizes the duty of the Government with regard to the cinchona plantations, as may be seen from the following remarks :—

The demands of the market for the best bark are so extensive that for many years to come the quantity likely to be sent from Jamaica will be very small compared with the extensive shipments from South America, and the East Indies : but if chief attention is devoted to the kinds which

are rich in quinine and of quick growth, Cinchona cultivation in Jamaica, as already proved by the quality of the produce cannot fail to be a remunerative industry. The objects of the Government in maintaining the Cinchona plantations for so many years, were, I apprehend, not of a pecuniary character—merely for the return they were likely to yield—but, in order, to prove that Cinchona bark of good quality could be successfully grown in the Island. In addition to this, the plantations had an important work in the successful introduction and cultivation of new or richer kinds; and, in such necessary pioneering and experimental work which private enterprise could not, or would, not undertake. The first of the above objects having been attained, the plantations may not unnaturally now devote special attention to the propagation and distribution of Cinchona plants for the purpose of establishing the cultivation on a large scale in private hands. Much remains to be done in this respect, and while the plantations are thus engaged, such valuable species as are the result of discoveries or improved methods of cultivation may be introduced, from time to time, and such careful and systematic experiments prosecuted, and made generally known, as will place the Island in a position to compete successfully with other countries.

The lands now proved to be so valuable for cinchona culture, have hitherto, been considered of little use. Being too high for coffee they have been almost given away and deemed fit, only, for negro provision grounds. They are tracts of extensive forests clothing the higher slopes of the Blue Mountains. On the Southern slopes it is estimated that, above the line suitable for coffee, there are some 120,000 acres of land on the greater portion of which cinchona may be very remuneratively grown. On the Northern slopes very little coffee has hitherto, been grown,—although that produced is of superior quality; and an extensive zone, quite unopened, about 12 miles long, and four to six miles wide rising from 2,500 feet, to 4,000 feet is still available for this profitable culture. Above 4,000 feet, and up to 6,000 feet, this extensive tract would be most suitable for cinchona cultivation.* I am glad to find that, in one or two instances in which application has been made, the Government has encouraged the experimental cultivation of Cinchona by favourable concessions of portions of these lands and, I have no doubt that, if the circumstances attending cinchona cultivation in this island were more generally known, English capital and energy would soon develop on these hitherto uncleared lands, and in one of the most salubrious climates in the world, a most successful and flourishing enterprise.

With regard to cinchona febrifuge Mr. Morris says:—

It appears that by a simple and inexpensive process, a preparation known as cinchona febrifuge, possessing the properties of true quinine, can be obtained from cinchona bark at so low a cost as 2s 6d per ounce. At the request of His Excellency, the Governor, I prepared, in September last, a Memorandum on the subject, and I hope to obtain such detailed information from India as will place the matter in a practical form. Should the demand for cinchona febrifuge, in the West Indies, justify its manufacture being undertaken here, there would be a considerable saving effected at the plantations by the utilization of "prunings and thinnings" which often, at present, do not cover the expenses of curing and shipping; while, at the same time, an effective and valuable febrifuge would be placed within reach of the poorest. It is satisfactory to learn that the febrifuge is now, being tried, in Jamaica, under the

direction of Deputy Surgeon-General C.B. Mosse, C. B., Superintending Medical Officer, with the view of carefully testing its merits.

Regarding the cultivation of jalap we read:—

As mentioned in the last Annual Report, the Jalap plants, hitherto, under cultivation here, have been planted among the cinchona trees, but as the tubers were found to exhaust the soil and the vines to injure the young plants, it was decided to remove the Jalap tubers as completely as possible and establish a separate plantation where the comparative results of the cultivation might be more carefully watched. The Jalap plantation, between 4 and 5 acres in extent, occupies the South-Eastern portion of the Upper-Buza plantation; the ground is laid out in a succession of terraces, about 4 feet wide with drains on the inner side; the tubers are planted about 8 or 10 inches apart, and covered with soil to a depth of about 4 inches. Last year, owing to the soil being fresh and newly cleared, the growing shoots soon after making their appearance were eaten off by "grub," but after the May rains, they started again, and their subsequent growth has been most satisfactory.

It may be added, that, the Jalap has become quite naturalized on many parts of the plantations and when once established, in a congenial soil, it is almost impossible to eradicate it. Indeed, in many places, it threatens to become a troublesome weed and like the strawberry, (*Fragaria vesca*), to cover the ground (where it cannot find anything to climb upon), with a thick matted carpet of green leaves. The chief difficulties which have been, hitherto, experienced in the utilization of the Jalap crop have been the proper drying and curing of the tubers. In the moist, cool, climate of the cinchona plantations, it was found impossible to dry them thoroughly, by exposure to the sun, and, it was proposed to import a fruit-drying machine from America for experimental purposes. The success which has attended the curing of the cinchona bark at the Parade Garden, Kingston, has however, suggested the possibility of a similar treatment for the Jalap tubers, and it is intended to send the coming crop to the plains to be cured.

The Palisadoes plantation is chiefly an experimental coconut plantation. We read:—

Nearly three thousand more plants have been put out, bringing up the total number of trees of all sizes to twenty-three thousand. The trees, in bearing, have been carefully counted by numbers marked upon them (as they come into bearing), in red paint. During the year, the bearing trees have increased from one thousand five hundred, to three thousand three hundred. The yield of the plantation for twelve months has been forty-nine thousand nuts, of which four thousand have been utilized in the nurseries. The remainder are being sold locally, at rates varying from 65s to 70s per thousand. Supplies of young growing plants have been distributed, free of charge, for planting on the Pedro and neighbouring Cays, at Port Royal, and other places along the coast, where they might be useful as land marks, or, as affording shade and ornament. A case containing coco-nut leaves, carefully dried, has also been forwarded to Kew, for the purpose of enabling Dr. Hugo Muller to carry on his researches on the occurrence of quercite in members of the palm family. We may expect to have Jamaica as a rival in the manufacture of coconut products, if Mr. Morris's suggestions are carried out:—

Now that the trees are coming into bearing, it has naturally been suggested whether some means might not be adopted for utilizing its resources for the manufacture of coconut oil and coir. As a first step in this direction, it is proposed to prepare a quantity of copra, (the kernel thoroughly dried in the sun), and send it to the English or American market in order to test its value. For this no machinery is required, and as it is a wellknown and lucrative article of ex-

* For the information of those contemplating taking up Cinchona cultivation in Jamaica it should be understood that these lands are, for the most part, quite unopened by roads and from 30 to 40 miles from Kingston.

port in other countries, there is no reason to doubt that it will prove, equally so, in Jamaica. In view, however, of the numerous advantages to be derived from the local manufacture of coconut oil and poonac, (the residual cake) and of the many purposes to which coconut fibre, properly prepared, may be applied, the desirability of establishing coconut mills, with suitable machinery, is a question which must yearly suggest itself in view of the increasing returns from the coconut plantations in this island. It is true, that the English and American markets are capable of utilizing, at fairly remunerative prices, all the nuts that may be sent them, but the advantages to the island in the sale of nuts are not at all comparable to those which would arise if the local manufacture of coconut oil and coconut fibre were undertaken, and carried on in an efficient manner.

At Hope plantation, we read,

The *Sappan*, an East Indian dyewood, of great value, appears to grow with great vigour, and plants have been largely propagated.

Of the Bath garden Mr. Morris writes:—

This interesting remains, of what was the only Botanic Garden, of the Colony, for more than eighty years, is still maintained for the sake of its valuable trees and palms. I regret to record that, during the late hurricane the fine *Pinus* in the centre of the garden was blown down and that two valuable nutmeg trees were lost. During the past year. I have endeavoured to increase the usefulness of this garden by establishing nurseries of Liberian coffee, cacao, nutmeg, cinnamon, &c., &c., in order to render it available for the distribution of these plants in the Eastern portions of the Island. As already mentioned in a report, published after my first visit to the Bath Garden, this district appears to be eminently adapted for the successful cultivation of most tropical plants requiring a rich soil, and a warm, humid climate. The plants of Liberian coffee, already growing in this and the Plantain Garden River district, are among the most promising in the Island, and if cacao and nutmeg were added, these would constitute sources of industry particularly suitable to the wants of the people, and likely to be most productive and successful.

Mr. Morris's remarks on Liberian coffee are substantially the same as those quoted by us from his separate pamphlet on the subject. Of cacao we read:—

In the propagation and distribution of this valuable product attention has been almost entirely confined to the best kinds of Trinidad Cacao. From trees of these varieties imported in 1873-74, a large supply of pods have been gathered and about 12,000 seedlings established in bambu pots. Several cases of pods have also been obtained direct from Trinidad, which had been carefully selected and packed under Mr. Prestoe, the Government Botanist's personal supervision. As the ultimate success of cacao cultivation, in Jamaica, will depend on the nature and value of the produce, the first consideration of every planter will naturally be the selection of the best varieties as seed trees. From these, when established, he will be able to extend the cultivation, selecting again those varieties which appear to be most suitable to the particular circumstances of the soil and climate. This must naturally be a slow process, but I would at the outset of what possesses all the elements of a sound and successful enterprise, recommend that, only the best varieties of Trinidad cacao be planted at first, and that the cultivation be kept carefully free from such deteriorated and worthless varieties, as will only lead ultimately to disappointment and loss. Efforts are being made through Dr. Ernst, to introduce some of the best varieties of Caracas cacao. About fifty plants of Trinidad Cacao have been lately planted at the Hope, in the neighbourhood of the land irrigated by the water courses, and they have hitherto done well.

Owing to the effects of the hurricane no pods are expected to be produced on the trees at Castleton for some time, but the stock of plants already established, will, it is believed, be sufficient for present requirements. The collection at Castleton has been increased by planting out 54 plants during the past year, in the old canefield, where they are doing well. On the general distribution of Trinidad cacao from the Castleton Gardens, Mr. Syme makes the following report:—

"Plants of this variety are in great demand, but, strange to say, it is by the well-to-do of the community. It is to be regretted that the peasantry, settled on some of the best cacao-growing lands of the colony, do not cultivate more of this plant. One reason for this is that they are disheartened by the raids made on the pods and their contents by the rats. It would well repay them for the trouble and expense of systematically poisoning and otherwise preventing the rats from getting to the pods; or by simply training the young trees to a single stem for a height of from 4 to 5 feet, and then fixing a piece of sheet tin around each stem." Although Cacao cultivation was an important industry in Jamaica about a hundred and fifty years ago it had so declined that twenty years ago the only trees in the Island were a few inferior kinds scattered here and there in settlers' gardens. Owing, however, to the encouragement given to the industry by Government, by introducing the best varieties of Trinidad Cacao and disseminating information on the cultivation and curing of this important product, a decided improvement has, lately, taken place, both in the quantity and quality of the exports.

Tobacco and vanilla are also favourably reported on. Of indiarubber it is said:—

A Warden case, containing a number of *Landolphia* or African rubber plants was lately received from Kew, and they are a valuable addition to the India rubber plants already in the Island. Mr. Syme reports that they are doing well, and are readily propagated by cuttings from twigs. Of the India rubbers, already introduced the most promising is the Ceara rubber tree, (*Manihot Glaziovii*), a native of Ceara, a coast town and district of Brazil in lat. 4° 5', possessing "a very dry arid climate for a considerable part of the year." This plant is, evidently, of a very hardy character and adapts itself readily to the exigencies of culture. Plants at Castleton, (600 feet), and at the Farade Garden, Kingston, (50 feet), are doing well. At the former gardens young trees when about 9 to 12 feet high were beginning to flower, but the hurricane deprived us of the hope of procuring seed this year. Some four or five hundred seeds, received from Ceylon, will, however, afford good opportunities for further extending the cultivation. Judging by reports received from S. America it is possible that extensive tracts of dry, and stony almost worthless lands, in the plains, may be turned to good account by means of this cultivation.

Of the Pará rubber there are only two plants in Jamaica, and of the *Castilleja elastica* none. Mangoes are doing well, the areca grows and fruits freely, and the kital quickly attains to maturity and an immense size. Another staple of ours is reported on thus

A plant of the best variety of Ceylon Cinnamon was brought out from Kew early in the year. It has been planted out at Castleton and under Mr. Syme's care is growing freely. From what has come under my observation, it appears that there are two kinds of Cinnamon in the Island. One is undoubtedly a form or variety of the Ceylon Cinnamon, *C. Zeylanicum*, but, whether, owing to the nature of the soil and climate or to deterioration from other causes, it does not appear to possess the delicate aroma, taste and colour, of the true Ceylon Cinnamon. The Cinnamon tree, even, in Ceylon, varies in a peculiar manner ac-

cording to the character of the soil and rainfall. The natives of Ceylon reckon the variety known as, *Rase Corundu*, as the only genuine kind; six others, almost indistinguishable botanically, are considered spurious. As a plant of the true kind is now, in the Island, it will soon be possible to test the influences of the soil and climate of Jamaica upon it.

The demand for nutmeg plants is great, but this is not the case with cloves. The report closes with remarks on fibre-yielding plants, fodder plants, and vines.

(CULTIVATION OF THE RHEEA PLANT ON TEA LANDS.

The species *Urtica* (*Boehmeria*) *nivea*, belongs to the genus *Urtica* [Stinging Nettles], which form the type of the Natural Order Urticaceæ—the Nettle and Fig Family. The species *Boehmeria nivea* is the Rhea of Bengal, and is also known by the name of the "China Grass" and "Grass-cloth" Plant, as the investigations of Dr. Falconer have proved it identical with the plant that yields the celebrated grass-cloth of China. It is "an erect shrub, with alternate, cordate leaves hoary beneath, and small, dioecious, greenish yellow flowers, in axillary, peduncled, globose heads."* It bears no sting. The plant is remarkable for the tenacity of the liber of its bark, which yields a remarkably fine fibre, and from which the so-called "grass cloth," a most delicate fabric, is prepared.

Textile manufacturers are endeavouring to bring it into use as a substitute for, or at least an addition to, cotton, wool, flax, hemp, and jute. In 1803 some specimens of the *Urtica tenacissima* from the Malayan Islands and Peninsula were placed in the Botanical Gardens. This led to the cultivation of the plant in other parts of India. In 1814 a quantity of the fibre was sent to England, and favourable reports were received of its probable usefulness. But a difficulty has stood in the way of the development of regular industry in the fibre of the Rhea plant. There is no process, nor machine, that will properly and efficiently separate the bark and fibre from the stem, and the fibre from the bark. This is a problem yet to be solved. In 1870 the Government of India offered two prizes to the inventors of the best machine or process for its manufacture: the offer was renewed in 1877, but up to date no satisfactory results have been achieved. The Government therefore do not deem it advisable to renew the offer of rewards until—

"Private enterprise has shown that the cultivation of the plant can be undertaken with profit in these or other parts of the country, and that real need has arisen for an improved method of preparing the fibre in order to stimulate its production."

We are told however that:—

"Rhea is naturally an equatorial plant, and it requires a moist air, a rich soil, and plenty of water, while extremes of temperature are unfavourable to it. Such conditions may be found in parts of Burmah, in Upper Assam, and in some districts of Eastern and Northern Bengal: and if Rhea can be grown in such places, with only so much care as is required in an ordinary well-farmed field for a rather superior crop, it is possible that it may succeed commercially."

Although the Government have withdrawn their offer of rewards, they have not withdrawn their aid *in toto*. For in their report we read:—

"But in order to aid persons who are anxious to try the cultivation of the plant in localities which are *prima facie* suitable, the Government will be willing to place roots at their disposal. A plot of about 2 or 3 acres will, therefore, continue to be

kept under Rhea in the Botanical Gardens at Howrah for the supply of roots to intending growers."

Now that Tea is giving such poor returns, any thing that may pay to grow, in addition to the tea plant, will no doubt be welcomed by all Tea Proprietors and Tea Planters. Why not try the Rhea Plant? Although no efficient process nor machine has yet been discovered suitable for separating, cleaning, and dressing the fibres, if the industry is taken up on a large scale, machinists will no doubt soon invent machines that will answer the purpose. If Planters will turn their attention to its growth, and to the process of manufacture of the fibre into a suitable form for the spinning and weaving factories, we feel sure that the requisite discovery would soon be made, and the problem solved. It would then go well hand in hand with the cultivation of the tea plant, and the two industries combined would no doubt yield as handsome returns as any other in the world.

The strong fibres obtained from the plant by simple maceration, are used by the natives for many useful purposes, but the working of them up for textile goods is the difficulty which has to be overcome. The natives simply scrape the fibres to fit them for making twine, thread, fishing nets, &c. One of the necessary conditions essential to success, is that the fibre should be rendered saleable in India at a price not exceeding £15 per ton. The subject has attracted very great attention of late in England and France, and even in America to some extent. Renewed attempts are being made to introduce the fibre into European factories. The Chambers of Commerce of Liverpool, Leeds, Bradford, and Belfast, have taken up the matter, and the spinners of Yorkshire are experimenting on various mixtures of the fibre with wool and cotton, and trying the suitability of the mixtures for making fancy trimmings, ladies' dresses, and upholsterers' textiles; the fibre possessing qualities unlike those of any other material employed in textile work.—*Indian Tea Gazette*.

CINCHONA BARK.—Large supplies of cinchona bark continue to be sent to England by the P. and O. canal steamers. About four hundred bales of bark were put on board the steamer "Ancona" last Thursday.—*Madras Standard*, 15th April.

COFFEE LEAF DISEASE.—Mr. Schrottky is quietly but steadily going on with his treatment. He has operated on 250 acres in the Dumbura valley, and will begin on a similar extent in the Dimbula district in a few days. Mr. Schrottky has also been making experiments of great importance in reference to cinchona cultivation, but we are not at liberty for the present to refer more particularly to these.

NILGIRIS, March, 1881.—A great deal of the tea produced in the Nilgiris is sold in the Presidency I am told, and, most likely, much more would find a local market if planters would be content with a moderate price. I judge they ask exorbitant figures, from the quotations of retail merchants in the advertisements. This may not be so; but anyway the shops should be able to sell Pekoe Souehong at 0-12 instead of R1-8! Tea is generally cured here by means of a furnace and non plate, with drawers on top. There seems to be a degree of laxity in tea-making, sorting, and packing in this district, which requires thorough reform; but this is a subject for a letter in itself. But Tea planters must not pose as the only unfortunates. The local paper has the following:—"The coffee crop of 1880-81 has been a most unfortunate one. Estates estimated to yield 60 to 70 tons gave only 4 and 5, while others have absolutely no crop at all. It is a mystery what became of the fine show of blossom early in the year."—*Indian Tea Gazette*.

(Continued from page 2.)

IMPORTED FROM CALCUTTA CAPE GOOD HOPE. (Continued.)			IMPORTED FROM CHINA JAPAN AND THE EASTERN ISLANDS.		
	QUALITY.	QUOTATIONS.		QUALITY.	QUOTATIONS.
MUSK, Pod	Gen. good. Nepaul	38s to 50s	CAMPHOR, China	Good, pure, & dry.	
Grain	" " Assam	40s to 65s	Japan	white	85s to 87s 6d
NUX VOMICA	Ordinary to good	6s 6d to 10s	CASSIA LIGNEA, unsrtd	" " pinky	
SAFFLOWER	Good to fine pinky	£5 to £5 5s	BUDS	Fair to good bright	35s to 35s 6d
	Middling to fair	£4 to £4 15s	CLOVES Penang	" " " "	48s to 50s
	Inferior & pickings	£2 10s to £3 15s	Amboyna	Fair to fine bright	
SHELLAC, genuine			CUBEBS	Middling to good do's	2s to 2s 1d
Orange	Fine pale lemony	£7 5s to £7 15s	Ord. stalky to fine	clean	£5 10s to £6
European	Button-Blood		DRAGONS' BLOOD	Good to fine	£11 to £15 10s
2nd	Good to fine	£6 to £6 10s	lumps	Ord. to fine bright	£4 10s to £11 10s
3rd	Dark to fair	£5 5s to £5 15s	GALANGAL ROOT	Lean to fair bright	
TAMARINDS	Middling to fine, not stony	10s 6d to 14s	GALLS, China	Fair to fine bold pale	61s to 64s
	Stony and inferior	3s to 5s	GUM BENJAMIN—		
[IMPORTED FROM CAPE OF GOOD HOPE.]			Sumatra, 2nd qual	Marbled, fair to fine	£12 to £16
ARGOL, White	Fair to good	87s 6d to 95s	"	vid. to good but	
Pinky		65s to 90s	Palumbang & 3rd ql	false pkd	£6 10s to £10
ARROWROOT (Natal)	Middling to fine	5d to 8d	Siam, 1st & 2nd	almond	£3 5s to £6 10s
BUCHU L. AVES, spiral	Fine long narrow	9d to 1s		Fair black to fine	
round	Yellow to good green	6d to 7d	do. COPAL, Manila, Hard	clean tear	£11 to £25
OSTRICH FEATHERS,	1st, blood & primes		Soft	Fair to good scrap.	40s to 65s
White		£24 to £35	Blocky to cln. yellow	20s to 30s	
1st & 2nd	Fair to fine picked	£14 to £24	Batavia, good to fine	£5 to £5 2s 6d	
3rd & Femina	" good	£5 to £18	do. DAMAR	Singapore fair	
Boos or Tail	" "	£7 to £12	do. GAMBOGE	specky do. 7s to 90.	
Black	Long fair to good	£9 to £14	Ord. blocky & coarse	£13 to £15	
Drab	Short med. "	65s to 80s	GUTTAPERCHA genuine	Fine clean Banj &	
	Common to fine	20s to 150s	Macassar	2s 2d to 3s 8d	
COLOMBO ROOT, sifted	Mid. wormy to fine	32s to 36s	Sumatra	Barky to fair	9d to 2s
CROTON SEEDS, sifted	Fair to fine fresh	55s to 70s	Reboiled	Common to fine cln.	6d to 1s 6d
EBONY WOOD	Middling to fine	£16 to £30	White Borneo	Good to fine clean	11d to 1s 3d
GINGER, Cochin, Cut.	Good to fine bold	60s to 150s		Inferior and barky	4d to 10d
	Small and medium	38s to 60s	INDIA RUBBER-Borneo	Damp & porous to	
	Fair to good bold	3s to 45s	Java, Singapore & Penang	fine dry	1s 8d to 1s 10d
	Small	25s to 32s	MUSK	Slightly foul to good	2s 3d to 2s 8d
NIX VOMICA	Fine bold fresh	12s to 14s	Tonquin, 1st qual., Pod	clean	
	Small ord. and fair	7s 6d to 10s		Genuine mid. to fine	
MYRABOLANES, pale	Good to fine picked	10s to 11s 6d		shape	50s to 60s
	Common to mid.	9s 9d to 8s		Horny & false packed	10s to 30s
	Fair Coast	7s to 7s 6d		Fair to find pods	32s to 42s
	Burnt and defective	6s to 6s 6d	NUTMEGS, large	61s to 80s garbled	2s 10d to 3s 7d
OIL, CINNAMON	Good to fine heavy	2s 6d to 4s	Medium	85s to 90s	2s 8d to 2s 9d
CITRONELLE	Bright & good flavor	24d to 3d	Small	100s to 125s	1s 10d to 2s 7d
LEMON GRASS		24d	MACE	Pale reddish to pale	1s 6d to 1s 10d
OBCELLIA WEED	Mid. to fine, not woody	35s to 54s		Ordinary to red	1s 4d to 1s 5d
PEPPER—				Chips	1s to 1s 2d
Malabar, Black sifted	Fair to blod heavy	54d to 54d	OIL OF ANNISEED	Good sweet crystal-	
Alleppee and Cochin	" " good	54d to 54d	do. CASSIA	ised	8s 9d to 9s
Tellicherry, White	" " " "	1s to 1s 6d	RHUBARB, Sun dried	" " bright	4s to 4s 3d
RED WOOD	Fair and fine bold	£5 17s 6d		Good to fine sound	2s to 4s 3d
SAPAN WOOD	Mid. coated to good	£9 to £12	High dried	Dark ord. and mid.	10d to 1s 8d
SANDAL WOODS, logs	Fair to good flavour	£30 to £60		Good to fine	1s 2d to 1s 6d
10. chip		£16 to £23		Dark, rough & mid.	10 to 1s 2d
SENNA, Tinneveli	Good to fine bold green	9d to 1s 2d	SAGO, Pearl, large	Fair to fine	10s to 17s
	Fair middling bold	34 to 5d	medium	" " "	15s 6d to 16s 6d
	Com. dark & small	1d to 24d	small	" " "	14s to 16s
TURMERIC, Madras	Finger fair to fine	14s to 18s	Flour	Good pinky to white	15s to 16s
Do.	Mixed middling	12s to 14s	SOY	Good	1s 10d
Do.	Bulbs whole	9s to 11s	STAR ANNISEEDS	Ord. to fine bold	80s to 90s
Cochin	Do. split	8s to 9s	STICKLAC, Siam	Fair woody to fine	
VANILLOES, Mauritius				free	82s to 85s
& Bourbon, 1st	Fine crystallised 6 to 9 inch	30s to 37s	TAPIOCA, Penang Flake	Fair to fine	24d to 3d
2nds	Foxy & reddish	20s to 28s	Singapore	" " "	11d to 24d
3rds	Lean & dry to mid. under 6 inch	15s to 21s	Flour	" " "	14d to 13d
4th	Low, foxy, inferior and pickings	8s to 12s	Pearl	Bullets	17s to 18s
				Medium	16s to 17s
				Small	10s 6d to 17s
			CUTCH, Pegue	Good to fine	25s to 35s
			GAMBIER, Cubes	Ord. to fine free	20s to 26s
				Pressed	20s to 23s
			Block	Good	17s 6d to 17s 9d

TOBACCO CULTIVATION IN INDIA AND CEYLON.

There is hardly any part of this vast country, from Peshawur to Cape Comorin (or Dondra Head), in which tobacco of some sort or another cannot be grown, and is grown for native consumption. Naturally, as with any other plant, some soils and climates suit it better than others, and at present Madras and Burma claim the reputation of producing the best leaf. There appears to us, however, no reason why, with proper care and attention in the cultivation and curing, as good tobacco should not be produced in Bengal, or elsewhere, as in the two parts of the country which have already acquired a name for it. Nay, as a fact, it is already produced, and consumers of Madras and Burma cheroots may be surprised to hear that a good deal of the tobacco of which those favorite brands are made is first exported from Bengal, and then returned here in the shape of genuine Madras or Burma cheroots. Some of it also, perhaps, re-appears in the disguise of the genuine Havannah, for there is a large quantity of tobacco exported annually from this country to Germany, and a good many of the cigars sold here as Havannahs are manufactured in the neighbourhood of Berlin. The consumption of tobacco throughout the world increases annually in a larger ratio than the population, and it has long been a matter of surprise to us that greater efforts have not been made to increase the cultivation and improve the manufacture of tobacco in this country. An experiment on a moderate scale has certainly been tried by Messrs. Begg, Dunlop & Co. at Ghazipur and Pusa, during the last few years, and the results, the report of which for the year 1879-80 is now before us, are, we consider, quite sufficient to justify not only those gentlemen in extending their manufacture, but to induce others to follow their example.

The chief operations of this firm are at Pusa, in the Durbhanga district of Behar, carried on under the supervision of European and American managers and curers, and employing about four hundred natives. In 1877-78 the quality of cured leaf exported was 29,993 lb., which sold at an average of about 3½d. per pound, an excellent average for the first year's curing, as it was the same average rate as that at which American tobacco was then selling in England. The French Government were also so favourably impressed with the samples they examined that they at once gave an order for forty maunds, and enquired to what extent the supply might be relied on. This seemed to promise a good opening, but the present proprietors do not appear inclined to extend their operations. In the next year they only increased the area of cultivation by 75 acres, and the season turned out very wet and therefore unfavourable to the proper curing of the leaf. Other causes also operated to prevent an extension of the export of the produce, though we should have thought that these would have conduced to a more extended cultivation. We are told that the demand for the tobacco in the Indian market developed so rapidly that it was soon found that, with the present establishment and the present extent of cultivation, the firm would have for a time to give up any idea of competing in the European field; for the enterprise has not yet become sufficiently strong to carry on the struggle in both places. The insufficient quantity of the outturn during the last two years, the initial expenditure incurred in importing machinery and training up hands in the manufacturing processes, the greater certainty of success, the immediate and higher profit expected in this branch of the industry for the capital (Rs 1,00,000) which the firm have sunk—all decided them in favour of confining themselves to manufacturing to meet the demand for local consumption. How long a time will elapse before the firm again finds itself in a position to export, it is difficult to say; year by year the extent of operations is increasing, but large supplies of to-

bacco cannot be available for export until the Indian market is thoroughly satisfied.

Here then is a fine opportunity for others to compete, for the Indian demand is not adequately satisfied, and the foreign markets may be said to be untouched. For the benefit of any one who may feel inclined to engage in the enterprise we add a few lines as to the system of cultivation adopted, which is as follows:—For tobacco some rotation of crops is practised and cultivators seldom sow it on the same land for three years together. The crop generally preferred to precede it is the root crop, *Batatas edulis* (shakar-kand), extensively used as food by the poorer classes for some months in the year, which is sown in the rains and dug up in the cold weather. After this, or some other rabi crop has been taken off the field, the land is well dug with a hoe, and then ploughed twice every month. The manure used is chiefly cow-dung, which is thrown on the land, or cattle are penned on the ground. Land being thus well-ploughed and well manured, is fit for planting with tobacco on the cessation of the rains in the month of September. The seed is first sown on a seed-bed from which the young seedlings are transplanted to the field. After this, it requires very little care, except a little weeding and picking off the superfluous shoots, leaving ten or twelve leaves on the plant. No irrigation is necessary; a little water is only allowed for two days at the time of transplantation. The crop is ready for cutting in February or March. The yield of an acre is from twelve to twenty maunds, which is generally sold at Rs 5 to Rs 8 per maund. It must be remembered that the coarse thick leaf produced by natives on their field, by the excessive use of nitrogenous constituents, does not answer the purposes of the factory. Finer leaf, with considerably less acid taste, is only fit for curing purposes. The outturn per acre of leaf for the factory is therefore estimated at 800 lb. instead of 1,600 lb. (20 maunds), as in the native-cultivated land. Indeed, the outturn at Pusa during the last two years did not exceed 600 lb. per acre, owing to the finer texture of leaf grown, and to the land not being so heavily manured with animal matter as the native lands. But all the leaf produced in a tobacco field does not give prime tobacco. An acre generally produces about 10,000 plants, of which one-fourth gives first class tobacco; one-fourth, second class; and the remaining half, third-class tobacco. All these classes will give a total weight of about 600 lb. of marketable article.

As to the cost we learn that the price paid for an acre of tobacco (600 lb.) is about Rs 40, or 15 lb. per rupee, or a little above one anna per lb. The cost of curing is very small, probably not exceeding more than a rupee for 100 lb. The cost of growing and curing tobacco has thus been reduced from what was estimated by Mr. Buck, in his report of the 18th October 1876, viz., 5d. per lb. delivered in England, and it is now considered possible to deliver cured tobacco in England at 3d. per lb. with even a small profit.

We think that we have now said quite enough, backed up as we are by official reports, to show that tobacco manufacture in India ought to prove a most profitable investment, if properly managed.—Asian.

The largest sale for artificial fertilizers is in the South Atlantic States, the lands in which have become impoverished by cotton and tobacco culture.

It is estimated that the manurial products annually emptied into the river Thames by the sewage of London, if applied to a barren soil, would impart to it a productive power capable of feeding 150,000 people.

A ton of cotton seed meal contains 38 pounds of potash, 56 pounds of phosphoric acid, and 78 pounds nitrogen. A ton of average barnyard manure contains 12 pounds of nitrogen, 6 pounds of phosphoric acid and 13 pounds of potash.