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MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.

G.O. No.	85	Press
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Dated	11-1-	18 67.

Not to be folded or roughly handled

*Proceedings of the Madras Government, Revenue Department,
11th January 1861.*

No. 166. Read the following letter from the Inspector General of Hospitals, Madras, to T. PYCROFT, Esq., Chief Secretary to Government, Public Works Department, dated Madras, 19th December 1860, No. 51:—

SIR,

With the assent of His Excellency the Governor, I beg to transmit to you the accompanying letter appertaining to matters in the Forest Department, the original which will be forwarded to the Principal Inspector General, Medical Department.

From the Inspector General of Hospitals, to the Secretary to the Principal Inspector General, Medical Department, dated Madras, 19th December 1860, No. 50.

SIR,

1. In my letter No. 42, dated Singapore, 1st September last, I reported to the Principal Inspector General that an unforeseen detention in the Straits Settlements determined me to proceed to Java, with the double object of procuring a passage to Labuan, and personally to examine into the mode of culture and propagation of the Cinchona tree, which I understood had been successfully introduced into that Island from South America.

2. On the 20th October following, I reported, that I had failed to get a passage to Labuan, but that I had free access to the Government Cinchona plantations and nurseries, and that it was my intention to embody the knowledge I had acquired regarding the culture and propagation of this valuable tree, in a translation from the Dutch of a pamphlet entitled "Kina Kultur in the Island of Java" presented to me by the authors, Doctors Youngboon and De Vrij, two gentlemen in the service of the local Government, in special charge of the plantations.

3. I am now engaged in drawing up a report in reply to the queries of the Royal Commission on the sanitary state of the Indian Army. On the completion of this work it will be my duty to inspect the Military Establishments in the Province of Pegu. But before proceeding thither, although I have not yet received the treatise referred to above, I will without further delay, convey to the Principal Inspector General for the information of Government, the result of my observation and inquiries, as these may be of some service in advancing the active endeavours now being made to naturalize on our mountain ranges, probably the most important genus in the whole Botanical Materia Medica.

4. The Medico-botanical history of Cinchona, introduced into Europe in 1640, is still imperfectly understood, and all relating to it continues a subject of intricate and important inquiry. Of the twenty six species admitted, twelve furnish a part of the barks of commerce. They are all either tall shrubs, or lofty evergreen trees adorned with beautiful shining leaves, two inches long by two broad, rising from 30 to 40 feet in height, the older and thicker stems have now become scarce, those now found seldom exceed 6 inches in diameter, but when protected by dense forest they rapidly run up to 40 and 60 feet in height.

5. The tree is supposed to be indigenous in a meridional distance through Columbia, Peru and Bolivia, extending from the 11° North to the 20° South of the Line, growing on rich surface mould, covering a substratum of Mica slate and gneiss, at an altitude of from 4,000 to 8,000 feet above the sea, where the temperature is equable and varies between 59° and 66° of Fah.

6. The cascarilleras or peelers, usually destroy the tree by stripping off its bark as it stands, whereas were they to cut it close to the ground, young shoots would spring up, which would in their turn become fit for peeling in from 6 to 20 years. This reckless destruction coupled with the enormous demand for Quinine in Europe, has occasioned so great a scarcity, that the authorities in upper Peru contemplate placing an interdict on the exportation of bark for a series of years. It is asserted that 800 to 900 trees are cut down in order to furnish 11,000 pounds of Bark, and that 25 to 50 ounces, or $1\frac{1}{2}$ to 3 per cent., are the two extremes of Quinine from 100 pounds. The sum expended by the Indian Government in the purchase of this valuable Medicine is stated to exceed 5 lacs of Rupees annually. Madras consumes on an

Has actually been

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average 2,090 lbs. of Bark and 451 of Quinine. Great Britain imports annually about 400,000 lbs. of Bark and retains towards 120,000 for Home consumption.

7. In the year 1852 Mr. Haskall was commissioned to proceed to Bolivia by the Dutch Government to procure specimens of the Cinchona tree. He was unable to penetrate into the forests, but both plants and seeds were conveyed to him by the cascari-
Cinchona Calisaya. leras or Bark collectors. The only knowledge, therefore, which this
" *Lenmæfolia.* gentleman acquired regarding the growth of the plant, &c., was from
" *Lanceolata.* these individuals. He arrived in Java in December 1854, with 21 boxes
" *Succirubra.* containing the five species of the tree noted in the margin, and also a
" *Lancifolia.* supply of seed belonging to each species.

8. He selected for his plantation the slope of the Geday mountain about 100 miles from Batavia, varying in elevation from 3,500 to 4,500 feet above the sea, which he effectually cleared of forest, only one seed out of one thousand germinated, and most of the young trees on being planted out speedily died, and of all the trees imported only two survived. Ignorant of the habitudes of the plant, three mistakes were committed.

(1.) The elevation was insufficient.

(2.) The ground should not have been cleared, for the Fungi generated by the decaying roots of the forest trees proved pestilential to the growth of the Cinchona tree, as is shown in the specimen of the root herewith sent of one that struggled on for 6 years.

(3.) The superficial vegetable mould being too light, the tender roots were unable to penetrate the volcanic turf beneath, so spread out horizontally which checked their growth. This, however, turned out a most fortunate mistake, for the trees although stunted in growth and made to resemble the artificially formed dwarf forest trees found in Chinese gardens, being thus forced into early maturity flowered and seeded freely.

9. The Government of Netherlands India felt that hitherto they were experimenting in the dark. To guard, therefore, as much as possible against further failure, they nominated on liberal salaries Dr. Youngboon, a gentleman of distinguished scientific attainments and an eminent naturalist, as sole custodian over the Cinchona plantations and associated with him Dr. De Vrij, an accomplished Professor in Chemical and Agricultural Science in the University of Leyden, to analyze every plant that died, with reference to the quantity of the valuable alkaloids contained in each, the soil producing them, &c., so as to trace all that was hurtful to their growth and to arrive at some sound conclusion respecting the proper elevations for their propagation.

<i>Cinchona Calisaya</i>	15,819	10. Complete success may now be said to have rewarded the labors of these gentlemen; many of the old plants were carefully removed to new localities more inland, numerous cuttings were secured from others and much care was devoted to the germination of the seedlings from the seed referred to in paragraph 3. In the margin is given the number of healthy young trees planted in six different Forests, there are besides well stocked nurseries and a good supply of seed in hand.
" <i>Lenmæfolia</i>	9,20,068	
" <i>Lanceolata</i>	45	
" <i>Succirubra</i>	35	
" <i>Lancifolia</i>	14	
Total.....	9,35,981	

11. For the nurseries, a sheltered part of the forest is selected and cleared sufficiently for the erection of ranges of narrow ridge roofed nurseries, open on both sides. Here beds are formed and scaffolding for pots or cut bamboos for the seed raised fully 18 inches from the ground. The mould is a rich Coffee colored or black, freed from all decaying or dead roots, leaves, &c., and without manure or other artificial substance. The seed which does not exceed a Carroway seed in size, is placed on the surface of the mould, watered twice daily from the squeeze of sponge, and not exposed to the sun until it has germinated, when the sun is admitted from 6 to 8 A. M. If too much water be given, cryptogams destroy the seed, and the plant is so tender that a slight touch will destroy it as it sprouts. Under favorable circumstances the seed germinates in five to six weeks. But they should never be thrown away, until by the aid of a glass the seed is found to have decayed, for they have been known to germinate after a year's exposure on the soil.

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12. Less water is now required for the young plant which should remain in pots from six to twelve months according to their vigor or otherwise. They should never be planted out until they have attained a length of at least six inches and look strong and healthy. Cuttings are treated in the same way. But they are more difficult to deal with than seeds and never make such good trees. The tree thrives best in the densest forest, and the southern decline of hills is that most suitable for its growth. The best forests are those which have the largest trees and especially where the *Quercus Fungiformis* is found, a tree of the Beech species having powerful buttresses and attaining great height.

13. Nurseries succeed best at, or under 4,000 feet. The *Cinchona Calisaya* grows only between 5,000 and 5,800 feet. The other species will flourish at a greater elevation. Those planted under 5,000 feet yield little Quinine, but the best elevations have yet to be ascertained. The tree is at first very slow in growth, but when it has taken root and gains strength, it springs up rapidly. Holes three feet every way should be dug, and the mould freed from stones and foreign substances, replaced and raised like an inverted saucer, so as to let the water run freely off from around the stem of the plant. The holes should be in concentric circles through the forest, i.e. from a given line, circles are formed and sufficient only of the forest is cleared in order to be able to replace the plants if necessary, remove the weeds, &c. Each tree is distant 15 to 20 feet according as the ground is available; at first they were protected by a bamboo fence. But now the Cinchona plantations having extended over so many hundred acres, simple bows are placed around and tied at the top to protect the plant from injury from wild animals, &c. An insect, a kind of *Darmestes*, about the size of the head of a pin, sometimes works into the medulla, where it deposits its egg and kills the young plant.

14. Chemical researches have shown a considerably larger amount of Quinine in the plants grown in the Island of Java than in any yet imported from South America. As shown in paragraph 6, 3 per cent. appears the largest average in the latter, whereas 5 per cent. was discovered in the former, the alkaloid being present in the leaves and roots as well as in the Bark of the stem, which is an encouraging assurance of success. Overseers, usually steady old soldiers, are placed in charge of the plantations; the 1st class receive Rupees 125, the 2nd Rupees 100, and the 3rd Rupees 75 per month. From 2 to 3,00,000 plants are the fixed number in each plantation.

15. My hurried departure from Singapore, did not enable me to procure the necessary letters of introduction to Officials in Java, a point of etiquette absolutely necessary when information is sought, nor did my short stay in the Island, give me sufficient time to make the full observations I desired. I did my best to procure correct information, but I may be in error in some of the particulars above recorded. Had I gone there commissioned by Government, with proper documents, I might have secured from the authorities, both seeds and young plants for experiment on our mountain ranges, which would be much more likely to succeed than any direct importations from South America.

16. I am confirmed in this latter assurance, by the receipt this day, of a communication from the British Consul in Batavia through whose influence, when there, I endeavoured to procure a supply of which the following is an extract.

"Although you did not take the right way to procure Quinine plants, you had hardly left the Island when all began to regret their apparent churlishness. If you get the Governor of Madras to address the Governor General of Netherlands India personally, requesting a supply for an experiment on your mountains, and offering in return any of the products of India that he may desire, the supply will be granted."

17. Having been over the chief mountain ranges within the Presidency of Madras, I was to some extent in a position to contrast their physical aspect with the features of the elevated Forest lands which have proved successful for the growth of the Cinchona tree in Java. The climate and soil too on our hills, I conceive to be equal for this purpose to any thing observed in that Island. I believe also I am correct in stating that the *Cinchona Excelsior* is indigenous in some of our Forests, circumstances which may be considered to augur favorably for the success of the earnest endeavours now in progress to naturalize the tree in India.

Has actually been

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18. I am impressed with the conviction, that the same success which has rewarded the unremitting exertions of the Dutch in Java, ought also to attend similar efforts on the part of our Government. I trust I may be excused for suggesting that immediate advantage be taken of the liberal offer conveyed to me through the British representative in Batavia. It has been through the exertions of His Excellency, first as Minister for the Colonies at the Hague, and second as Governor General of Netherlands India that the experiment, which forms the subject of this letter, was entered on and brought to a successful issue, and I have no reason to doubt the sincerity expressed in a desire to reciprocate the respective advantages possessed by the two countries.

19. The 77th and following paragraphs of Mr. Markham's letter to the Under Secretary of State for India, dated Peru, June 9th 1860; refers to expected supplies of seed and plants from South America. His Excellency the Governor will observe from this report, that no ordinary amount of care is necessary in all stages of its growth, to habituate the plant within our tropics, and he will doubtless direct such measures to be carried out, prior to their arrival, as to the selection of site, preparation of mould, formation of nurseries, &c. &c., as will aid in the success of the experiment.

No. 167.

ORDER THEREON, 11th January 1861, No. 85.

1. The Governor in Council has perused the above papers with much interest, and proposes availing himself of Dr. Macpherson's information.

2. Considering the great expense of the experiment which is now being conducted by Mr. Markham, its unpromising appearance, and the fact that Dr. Macpherson is, so far as Government know, the only Officer who has actually seen the Cinchona plant in successful cultivation, the Governor in Council thinks it desirable that Dr. Macpherson should proceed to Ootacamund, inspect the sites selected there for the experiment and report how far they resemble those which have proved successful in Java, and that he should also communicate to Mr. McIvor what he witnessed of the culture of the plant in that island. This arrangement will cause no extra expense and will only involve the postponement for a short period of Dr. Macpherson's tour in the ordinary course of duty.

3. His report on the other hand will afford Government the satisfaction of knowing whether suitable localities have been selected on the Hills.

4. Dr. Macpherson's absence need not exceed a month or six weeks, and the Governor in Council requests the Director General of the Medical Department to arrange for his proceeding at an early date to the Hills, where a fresh supply of the Cinchona plants and seeds are expected.

5. Dr. Macpherson will understand that he is not to interfere with the proceedings of Messrs. Markham or McIvor. The Government merely require his opinion on the course being followed, and they will act as may seem expedient on receipt of his report.

(Signed) J. D. SIM,
Acting Secretary to Government.

Proceedings of the Madras Government.

Under date the 11th January 1861

Submits a report on the mode of culture and the propagation of the Cinchona tree. Read the following letter from the Inspector General of Hospitals (Here enter 19 Decr 60)

The Govt has decided to take the same with much interest and availing himself of Dr. Macpherson's information.

Considering the great expense of the experiment which is now being conducted by Mr. Markham - its unpromising appearance at the present time, and the fact that Dr. Macpherson is - so far as Govt know - the only Officer who has actually seen

The Cinchona plant
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His report on
the other hand
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suitable localities
have been selected
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In his proceeding
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Dr. McPherson
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will ask as may
be seen in the
receipt of his
report.

S. D. L.

Mr. S.
Copy to the Inspector General of
1. ~~to do~~ Hospitals
2. ~~to do~~ Med. Dept.
7. Military Department
4. Public Dept.

Copy in a letter to B
d/12th March/61. 75.35

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Peruse 1861 Dept
22. of Govt for January.

1865.

Q. of the Madras Govt
21.1st January 1861.

From the Madras Govt 21 March/61
G^o 562 - in Pro. 1st March/61. 175.

Dr. W. Emerson to
proceed to Salem and
on inspecting the sites select
there for the improvement of
the Christiana Cultivation,
report how far they resemble
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