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Revenue DEPARTMENT.

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Not to be folded or roughly handled

Proceedings of the Madras Government, Revenue Department, 22nd October 1862.

No. 281. Read the following letter from W. GREY, Esq., Secretary to the Government of India, Home Department, to T. PYCROFT, Esq., Chief Secretary to the Government of Fort Saint George, dated Fort William, the 9th December 1861, No. 2,405 :—

SIR,

1. In continuation of former correspondence, I am directed to forward to you a copy of a report submitted to the Government of India by Dr. Anderson on his return from Java, together with a copy of the reply made to him.

2. Dr. Anderson will leave for Madras to-morrow morning and will arrive therefore simultaneously with this letter. His first care will be to superintend the removal of the plants which he has in charge to the Neilgherry Hills, for which it is hoped that all necessary preparations will have been made under the orders of His Excellency the Governor in Council.

3. It will be observed from my letter to Dr. Anderson that he is instructed to communicate fully to His Excellency in Council the result of his observations in Java, and the Governor General in Council is sure that this communication will be received with much interest, for the letters received by the Government of India from the Authorities in Java mention not only that Dr. Anderson has had "the opportunity of inspecting all the Plantations and Nurseries of the "Quinine, and of procuring every useful and available information regarding the culture of "Quinine, the forests in which the tree is planted, the height above the level of the Sea, &c., "&c.," but they state also that Dr. Anderson has diligently availed himself of the opportunities offered to him, and that he has acquainted himself fully "with all the peculiarites of our method "of cultivating and transplanting the Quinine trees in the forests," and speak of him as possessing all the necessary qualifications for superintending successfully the culture of the Cinchonæ in India.

4. Having regard to the high importance of establishing the cultivation of this invaluable tree in India on an extended scale, to which end it is above all things essential that situations should be selected in which the trees may be expected to flourish after they leave the Nurseries, the Governor General in Council feels confident that the Government of Madras will think it very desirable that the knowledge acquired by Dr. Anderson should be taken full advantage of in choosing sites for the Chinchona plants which he is now taking to Madras, as well as on other points connected with their management.

5. I am desired to suggest that Dr. Anderson should be afforded, under the instructions of His Excellency in Council, every facility for examining the existing Nurseries in the Neilgherry Hills, with the view of comparing their position and general character with the conditions which have been found to be necessary in the Nurseries in Java, so that some opinion may be formed as to the prospect held out by the present plan of operations of securing the establishment of the cultivation on that extensive scale to which, after many drawbacks and difficulties it has at length attained under the management of the Dutch.

6. With reference to the 5th paragraph of my letter to Dr. Anderson, I am desired to express the wish of the Governor General in Council, that a good supply of the Chinchona Succirubra should be given for transmission to Batavia,—not more in return for the valuable accession actually received to our own stock in the number of plants of the Chinchona Calisaya brought round by Dr. Anderson, than in acknowledgment of the very courteous and liberal spirit evinced by the Dutch authorities in the matter generally, and especially in the cordial reception given to Dr. Anderson, and the unreserved manner in which the fullest means of obtaining information were made available to him.

From THOMAS ANDERSON, M.D., Officiating Superintendent of the Botanic Gardens, Calcutta, to W. GREY, Esq., Secretary to the Government of India,—No. 326, dated the 4th December 1861.

1. I have the honor to report my return to Calcutta on the 28th November from Singapore with seven Wardian cases containing 412 young and very healthy plants, and 400,000 seeds of species

of Chinchona, obtained from the Chinchona plantations in the Island of Java. I have secured a passage to Madras by the Mail Steamer of the 10th, the plants ought therefore to reach their destination at Ootacamund about the middle of this month. In a demi-official letter from Java, dated 26th October, I briefly reported my progress up to that date. The plants I have now brought were made over on the 7th November at the Nursery of Tijaneroian on the Malabar Mountains 180 miles from Batavia.

2. Dr. Junghuhu most liberally placed at my disposal 100 plants of *Chinchona Calisaya*, about 300 of C. Rahudiana and 6 of C. Lancifolia. Of the first of these species I considered only 56 plants strong enough to undergo the risks of the long voyage to Madras, and accordingly I had the number of C. Pahudiana increased to 350. A larger number of C. Lancifolia was also offered to me, but only 6 seemed at all likely to survive the journey. Of those 6 one has died ; the only casualty among the 412 plants. C. Lancifolia is in the young state a succulent, rank plant, forming little or no wood,and accordingly exceedingly liable to damp off when transported to a warm climate. From Tijaneroian the Wardian cases were brought by coolies to Batavia, under the charge of the principal Native gardener of the Calcutta Botanic Gardens. He rode alongside of them all the way, travelling only by night and resting with the plants by day under the dense shade of a fig tree (Ficus Nitida) found in all Javanese villages. I went in advance with Dr. Debrij to examine the original Chinchona plantations of the Dutch,where all the original plants from South America are, and where also all the accidents and failures occurred, which at first threatened the entire extinction of the experiment. At Buitenzorg I halted for the arrival of the Chinchona plants ; and after having seen them again, I proceeded to Batavia to make arrangements for their voyage to Singapore. My great aim was to detain the plants as short a time as possible in the hot climate of Batavia. The cases reached Batavia late on the night of the 13th November and were shipped on board the Batavian and Singapore Steamer on the evening of the 14th. I sailed from Batavia on the morning of the 15th. After a pleasant passage of three days through a perfectly smooth sea, we arrived at Singapore on the evening of the 18th. My intention was to have remained at Singapore until the arrival of the Peninsular and Oriental Company's Steamer from Hong-Kong, and to have proceeded by it to Galle, there to land the cases and wait the arrival of the Mail Steamer from Suez, and by it take a passage to Madras. However, on my arrival at Singapore I found the Calcutta and Hong-Kong Steamer *Lightning* about to sail for Calcutta, and I at once saw the advantage of proceeding by that route in preference to going by Galle. By going to Calcutta the plants would have 10 or 12 days in a cool climate, almost identical, in temperature, at least, with that of the Chinchona plantations of Java; they would have every convenience for resting in shade, and abundance of careful attendance, and would also escape the risks which would be incurred by landing and re-shipping heavy cases in the harbour of Galle in the hurry of coaling and landing cargo. Lastly, no time would be lost, as by this route I shall reach Madras quite as soon as if I had gone by Ceylon. After leaving Penang a fungus appeared on nearly all the plants, and this rendered necessary the unpacking and re-packing of all the plants in the cases, a work which has occupied the Head European Gardener, and several Natives, for three days. All traces of the fungus have been most carefully removed and the moss with which the pots were packed has been dried. Advantage was also taken of this shifting of the plants to dispense with two unwielding Wardian cases lent to me in Java. The plants contained in these were placed in three light cases of the pattern used in this garden. I stated in my demi-official letter that the information freely imparted to me by the scientific gentlemen in charge of the Chinchona cultivation was one of the most important parts of my mission. Much of this information referred to questions of proper evation above the sea, mean temperatures of atmosphere, and soil, exposure to sunlight, clearing of the forest, nature of the soil, and position of the plantations on the mountains ; as well as to points of purely chemical interest. There can be no doubt that, on the whole, there will be greater difficulties to contend with in introducing Chinchona into India than have been experienced by the Dutch in Java. Dense forests possessing a moist climate do not occur extensively in Southern India at elevations from 3,000 to 6,500 feet high, which may be taken roughly as the two extremes at which the cultivation of species of Chinchona will be most successful. The site selected at Ootacamund is, as Mr. Markham allows, at least 1,500 feet above the highest elevation at which C. Calisaya is found in Bolivia and 2,000 feet higher than the upper limit at which, after numerous experiments, it has been found possible to grow that species in Java, four degrees nearer the Equator than Ootacamund. Mr. Markham seems to forget that the lines of mean temperature are even near the Equator not parallel with degrees of latitude, and how much more do they vary when the points compared are Mountain chains whose every phase of climate is influenced by local causes. If the Chinchona Calisaya is planted in a scantily wooded "Shola" whose elevation is 7,830 and the highest 7,950 feet above the sea, the young plants will most certainly be lost. Besides elevation and Metereolgical considerations, it is also necessary in selecting a site for Chinchona Nursery to take into account the proximity and extent of forest that will be available for the permanent site of the trees. It will cause a large increase of expense at the first planting, and great additional labor in attending to the trees afterwards, if the product of a Nursery must be distributed over circumscribed patches of forest far removed from each other. A small ravine containing a forest about a mile broad and whose upper limit is only 4,000 feet above the sea will accommodate a very small number of trees requiring dense shade, and whose height when full grown will probably exceed 80 feet. Such a patch of forest at Mercara is described by Mr. Markham as well suited for a Chinchona plantation. Judging from the papers published by the Madras Government, the same remark applies to all the sites chosen in Southern India. Forests of the limit of a 1,000 acres and the Neddivattam site of 400 acres would be stocked by the hundredth part of a year's produce of a Java Chinchona Nursery. In Java, where the Dutch have entered on the cultivation on a most extended scale, the Nurseries which are only nine in number are in the centre of vast forests where many square miles of forest are available for receiving the young trees from each Nursery. In many places on the Volcanic range of the Malabar in Java I have ridden for three or four hours through a plantation of Chinchona extending for 4 or 500 yards on each side of the path. Such liberal views of what is necessary for the success of so important an undertaking as the naturalization of the Quinine-yielding Chinchonas contrast strongly with the imperfectly formed plan on which this cultivation has been commenced in India.

3. In reading the official papers published by the Madras Government I have also noticed that no provision seem to be made for selecting different sites for the various and numerous species already introduced into the Nursery at Ootacamund. It may be generally said that each species of Chinchona requires a peculiar treatment for it to attain its highest development, and this is shown by each species of Chinchona being found in South America within limits suitable to itself alone. This fact has been fully admitted by the Dutch, and they have attempted to imitate in the Nurseries and plantations the natural conditions in which each species is found. This difference among the species has also attracted the notice of Mr. Thwaites the Director of the Royal Botanic Gardens of Ceylon, and who is charged with the superintendence of the introduction of Chinchona into that Island. He tells me that that valuable species, *C. Succirubra* is quite a tropical plant and succeeds well at Peradenia, the tropical Botanic Garden of Ceylon. Of course such a species cannot be expected to flourish in sites ranging from 7,000 to 7,800 feet in elevation. I have many other facts to record and many more remarks to make, suggested by what I observed in Java, but it is quite impossible for me to allude to them now with all the pressing duties of my Office, which must be attended to before I leave for Madras. I shall, however, have the honor to submit this report in an extended form, embracing the whole subject of the introduction of Chinchona soon after my return from Madras.

4. In conclusion I consider it my duty to recommend that a definite plan should be drawn up in the most liberal spirit having for its aim the means of procuring the largest possible amount of Quinine in the shortest possible time Its details ought to include provision for the immediate establishment of Nurseries on all the Mountain ranges suitable for the cultivation of any of the species, and where large tracts of forest are available, such as the Khasia Hills, the Eastern Himalayas, the Mountains extending from Chittagong down to the Malayan Peninsula. On all of these ranges at least *C. Succirubra* will thrive, and it is one of the richest in Quinine of all the species of Chinchona. A Nursery and plantation might at once be organized at the Northern slopes of the Khasia, where the rain-fall is only 150 to 200 inches in the year, and where forests

are tolerably abundant. Should this be sanctioned, I would propose to leave in the Botanic Garden of Calcutta a sufficient number of the plants I brought from Java to commence a plantation, and seeds to form a Nursery. I would suggest that not more than 10 plants of *C. Calisayas* and about 60 of *C. Paludiana* be left here ; to these I can add 32 seedlings of various species which were raised here in April and which in two months will be strong enough to stand the journey to the Khasia Hills. With a little care these plants I propose to leave here can be kept in perfect health until the middle of March.

From W. GREY, Esq., Secretary to the Government of India, Home Department, to T. ANDERSON, Esq., M D., dated Fort William, the 9th December 1861, No. 2,212.

SIR,

1. I am directed to acknowledge the receipt of your letter dated the 4th instant, reporting your return to Calcutta from Java with a collection of Chinchona plants, and your attention to proceed with them to Madras by the Steamer leaving on the 10th.

2. The Governor General in Council remarks that you propose to submit a fuller and more complete report upon what you have observed in Java, and of the recommendations which you would found upon the information acquired there, after your return from Madras.

3. A copy of your present report will be forwarded to the Government of Madras by the Steamer, and I am to request that you will communicate to that Government all the further information not included in this report which you have obtained in Java, with a full exposition of the views which your visit to the Chinchona Plantations has led you to form on the subject of the cultivation of this valuable plant in India. Your communication will of course embrace the important fact which has been brought to your notice, and which may perhaps not be known to the Madras Government, that the roots of the young plant of three and four years old have been ascertained to yield a larger per centage of Quinine than is procurable from the bark of the old tree.

4. The Governor General in Council approves of your suggestion that a few of the plants from Java should be retained here with a view to their removal to the Khasia Hills after your return to Calcutta.

5. The Madras Government will be requested to place at your disposal a number of plants of the Chinchona Succirubra, and the Governor General in Council desires that you will take such measures as may seem best, in communication with the Madras Authorities, for securing the safe transport of these plants to Batavia.

6 The Madras Government has been requested to give you every facility for examining the Nurseries in the Neilgherries and satisfying yourself as to the prospect which they give of ultimate success.

No. 282. ORDER THEREON, 22nd October 1862, No. 2,262.

Ordered to be recorded, with reference to Government Order, No. 2,259, of this day's date.

(Signed) P. P. HUTCHINS,
Acting Deputy Secretary to Government.

R 29 July/62 № 407
408.

R 19 Novr/62 — 197
198.

Copy mm Letter to England
dated 23d Octr № 75 of 1862

№ 281 & 282.

Permo 1862 Sept
Rec. of Govt for Octobr/62
№ 2960

From the Secy to the
Govt of India

Dated 9th Octr 1862
Recd 14th Octr 1862

(Encl 2) № 2405

№ 2262. 22d Oct/62

Transmitting in continuation of former corrde
a copy of a report sent to
Superintendg Dr Anderson
on his return from Java
together with a copy of the
Reply sent to him in con-
-nection with Cinchona
plants & Dr Anderson's
intended departure for
Madras. —

William Order

№ 2262.

22 Oct

Ordered to be
recorded with reference to the
letter of this days date —

JP

Fort St George
22d Octr 1862