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MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.

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283-284

Dated 22-10-1862

Not to be folded or roughly handled

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

No. 283. Read the following letter from Mr. W. G. McIVOR, Superintendent Government Chinchona Plantations, to T. PYCROFT, Esq., Chief Secretary to Government, Madras, dated Ootacamund, 20th January 1862, No. 97 :—

SIR,

1. With reference to your communication of the 14th ultimo, No. 1,649, I have the honor to acquaint you for the information of Government, that during Dr. Anderson's stay on these hills, I furnished that gentleman with every information regarding our operations; and at his request he was carefully instructed in our process of propagation and cultivation of the Chinchonas, which the filling of our new propagating house afforded him the means of observing in all its details. Dr. Anderson expressed himself highly gratified by our system of propagation from layers, being a method not usually adopted; and one which greatly facilitates our means of increasing these valuable plants. Dr. Anderson has also been furnished with the plans of our propagating house in order that he may erect two similar buildings on the Himalayas so as to enable him perfectly to follow the method of propagation practised here.

2. So far as our operations have yet extended our success is indisputable and quite unequalled, but a difference of opinion exists between Dr. Anderson and myself as regards one of the next steps I am about to take, namely, that of planting out 75 acres of Chinchona plants without the shade of forest trees; this, Dr. Anderson thinks will prove disastrous, although there can be no objection to this opinion being placed on record; in order, however, that the Government may be satisfied that I have not come to any hasty conclusion as to the various modes of culture it is desirable to pursue in our experiments, I beg to be permitted to detail the facts which have influenced me in forming an opinion.

3. As already brought to the notice of Government we propose planting during this year, in all 150 acres. Of this 75 acres will be planted under various degrees of shade of forest trees and 75 acres planted without any shade of forest trees.

4. With reference to the first method the advantages which it offers are these :—The cultivation can be conducted with little skill, as under dense shade all will be left to nature and in reality no cultivation required, the plants would also look well to the casual observer, although drawn and watery. Its disadvantages are these, the period when we can expect Quinine, or bark, will not arrive until our Chinchona plants overtop the forest trees and expand their heads in the open sunshine, and this will take from 40 to 60 years; and it is doubtful if some of the most valuable species of Chinchona would ever overtop the forest, but die out as described at paragraph 11, the plantations would also have to be felled to obtain the produce.

5. It will be observed that under this system of cultivation, and with the necessity of destroying the plantations to get the produce, the growth of Peruvian bark would never become an article of private enterprise, and it is doubtful if Government plantations would ever be found on a scale sufficiently large to affect the value of Quinine in the market.

6. With reference to the second system its advantages are :—If successful it will furnish bark in eight years from the date of planting, and in twelve years the bark will become an article of commerce. The plantations will not have to be cut down or destroyed in order to obtain the produce; but uniform and constant yearly supplies of bark will be procured without any damage whatever to the trees. Thus the production of Peruvian bark will be placed within the reach of the ordinary speculator, and even within the reach of the man of limited means, and as it would be profitable, it will no doubt soon become an extensive article of produce. Its disadvantages are these, to get the trees over the first year or two of their growth will require a great amount of skill and attention. The ground being cleared of the forest will be exposed to the full effects of evaporation and radiation and this in a limited degree, although beneficial in promoting the fertility of the soil. In excess no doubt will be injurious, but this injurious action can be more simply and efficiently combated by other means than the shade of living trees.

7. The arguments against this method advanced by Drs. McPherson and Anderson, who visited the cultivation in Java, have received my full and serious consideration, and from all I can gather the whole seems to have originated in a misconception of facts. It is believed by Dr. Junghulu, the Principal Director of Chinchona cultivation in Java, that the Chinchona trees in their natural localities on the Andes "grow in damp forests over-shadowed by trees." But the greatest authority* contradicts this conclusion and their practice, and states that the only species they have cultivated to any extent, viz., the C. Luciemafolia or as it is now called Pahudiana "grows in a very sandy micaceous soil, on dry sunny hills without much shelter from the sun." But were it so, that the Chinchona trees grew in damp forests, over-shadowed by trees, still it would be difficult to come to a conclusion more erroneous than that in cultivation such was desirable or necessary. Because in the localities where plants are indigenous there is always one or more conditions the most favorable to the perfect developement of the plant, but there are also other conditions which are injurious, and one of these is invariable over-shadowing and over-crowding.

* Howard's 7th No. of Nueva Quinologia de Pavon.

8. Our minds not being fixed as to the best culture to be applied to a newly introduced plant, the absurdity of the above conclusion does not appear in so full relief as if the same principles and facts were advanced to guide us in the treatment of plants long in cultivation. Suppose any one were to dictate to the agricultural world that they must grow their Tea, Coffee, Cotton, Wheat, Barley, &c., &c., &c., among thorns, briars, and weeds, because they must of necessity grow under such circumstances in a state of nature, it would be received as the production of a wandering mind although the facts would be correct, and only the conclusion erroneous. All terrestrial plants which have been brought into economic cultivation from the beginning of the world up to the present time, have been found to be benefited by full exposure to the light of heaven; and no facts have yet been advanced to show that the Chinchonas are likely to form an exception to this general rule.

9. In coming to a conclusion as to the course desirable to be followed in our experimental cultivation, I have been much guided by the opinions of Mr. Markham. This gentleman commissioned by the Secretary of State for India, visited South America in 1860, penetrated into the Chinchona region, and being an excellent observer, noted with great minuteness, the various influences as affecting the growth of these valuable plants. Mr. Markham visited India at the end of the same year and by numerous notes and a long personal intercourse, conveyed to me every particular of his observations, and this intercourse afforded us the great advantage of being able fairly to discuss the best means of applying a system of culture suited to meet the different conditions of our climate.

10. The correctness of Mr. Markham's observations has stood the test of practical experience, without failing as yet in one instance, and it would be unreasonable to conclude they will fail when applied to the future stages of our operations, especially as his means of observation have been of the most perfect nature. I do not for a moment doubt the high scientific attainments of Dr. Anderson, but this gentleman has only seen in Java the plants in a very doubtful state of cultivation, and therefore is more liable to form an erroneous opinion. Moreover, the Java system of rearing seeds had at the instance of Dr. McPherson a fair trial here, and when compared with the results we otherwise obtained it proved a failure.

11. The opinions of Mr. Markham are also borne out by every authority who possessed the same advantages as himself, namely that of studying the habits of the Chinchonas in their natural localities. Mr. Howard believes that the Chinchonas "delight" in exposure to "free "air, cold, water and sunshine." Poeppig states that with the bark collectors "all stems were "rejected even when they stood in very promising groups (Manchas) if the soil was damp and the "vallies warm, and without a current of air." Dr. Karsten states "for the bark of the Chinchona "growing in the ravine described high above the actual limits of the forest gave 3½ per cent, sul- "phate of Quinine, whilst that from the lower lying forest scarcely yielded one per cent." Weddeln suggests that in cultivation the Chinchonas be planted in cleared ground along with

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faster growing plants, and this would no doubt be a good system were it not that the faster growing plants would take up a great proportion of the nourishment from the soil, which would be more profitably stored up in the Chinchonas. Mr. Cross, a very intelligent young gardener, engaged by Mr. Markham to assist him in his mission, states in the notes he furnished to me: "I observed that many of the red bark trees when growing under dense shade lost a portion of "their branches, and sometimes all of them during the wet season; or if not they assumed a weak "climber-like habit, which, if exposed suddenly at any time to influences of a damp or dry nature, "would be likely to cut them off altogether."

12. Much has already been, and no doubt will be, demonstrated in actual cultivation to show various modifications in applying the principles above given, with the greatest advantage to the conditions of our climate and soil; but, until this experience is had, it appears safest for us to endeavor to administer to the plants in the highest degree, those conditions which have been ascertained to be most favorable to their perfect developement on the Andes, and to remove or mitigate such as are injurious.

13. Our present success is only comparatively satisfactory, and this we can only expect to be the case in our future operations; as had I possessed at the beginning the same experience I have even now, nearly double the results would have been obtained; also with reference to our system of cultivation and propagation although comparatively perfect, yet no doubt it will ultimately give way to one very much superior when we become better acquainted with the nature of the plants; but these improvements will be effected only by a modified application of the same principles, as we cannot expect to violate with impunity any of the laws which govern vegetable life.

14. I shall now briefly notice the present condition of our experiment, as the coldest and the greatest part of our dry season has now passed away and it gives me much pleasure to be able to state that all our Chinchona plants in the open air have borne this unusually severe winter without injury. In September last I planted at Neddivattam six plants of different species in a cleared spot on the highest and most exposed point of the site, and all of these have not only borne the cold and drought without injury, but it has never checked their growth, and at present the plants are in the finest possible state of health, their leaves of the deepest green some of which measure 9 × 12 inches.

15. At Ootacamund I planted fifteen plants between May and August, and twelve of these were of the red bark, being the most tender species, I wished to test the amount of cold and exposure it would bear. Here the cold of December checked the growth of these plants, but has not in the least injured them, the leaves still keep their deep green color and measure from 7 to 9 inches. This plant is evidently more hardy than we at first supposed, as a plant of "Fuchsia Serratifolia" (growing within two feet of the red bark) had the points of its tender shoots killed by frosts, while even the young leaves of the red bark were not touched.

16. The plants in our propagating houses continue to grow with their usual vigor. The largest of those growing as specimens measure 4 feet in height and the circumference of the stem above the ground measures 3¼ inches, at 18 inches above the ground 2½, and at 3 feet 2¼ inches. The strongest growing plant that we have, is one that has been layered and consequently short, but the circumference of the stem at the ground measures over 4 inches. The total number of our plants at present is about 9,000 of eight different species. Of these upwards of 3,000 have attained a size fit for propagation, the others are necessarily small but making satisfactory progress. Dr. Anderson was furnished with 204 plants of our most valuable species for introduction in Bengal, and 16 have been forwarded to Mr. Maltby for the Rajah of Travancore. On taking the plants out of the Wardian cases, which Dr. Anderson brought from Java, they were all more or less affected by rot and fungi at the roots. Three of the Calisayas have died since being transplanted, two more are doubtful, but the others seem to be recovering.

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

No. 284. ORDER THEREON, 22nd October 1862, No. 2263.

1. The Government consider this report very satisfactory.

2. Mr. McIvor will forward brief monthly reports of the progress of his various operations, noting especially the condition of the plants at Neddivattam.

(Signed) T. PYCROFT,

Chief Secretary.

Pub. Rec. 14 December 1861 to 1649.

Copy in a Letter to England dated 23d Oct. 1862

From Supt. Gen. Chinchona Plants Calcutta 10 Dec. 62 Rec. 3474 in Rec.

No 283 & 284.

Revenue 1862 Dept.
Progs of Govt for Oct.
No. 223

From
The Supt. Genl
Chinchona Plantations

Dated 20th
Rec'd 25th } January 1862.

Intimates that Dr. Anderson was furnished with every information regarding the cultivation of the chinchona and that he expressed gratification at the system adopted and points out the difference of opinion existing between the Dr. and himself on the planting out 75 acres of Chinchona Plants without the shade of Forest trees.

No 2263 22d Oct.

With an order

3 Feb 1863

Very

This is very satisfactory. I am much especially pleased to hear that the Plants recommended would have succeeded so well if they had been left 3 years more they will practically confirm Dr Anderson's

It is wise to try different experiments

Will

Referred to Editors Table
Will

No 2268.
Forwarded for information
Will
22 Oct 1863

1 Copy to the Supt. Gen. Chinchona Plantations Calcutta. Oct. 24th