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MADRAS RECORD OFFICE.

Government of Madras.

Revenue **DEPARTMENT.**

G.O. No. 1312 (207 – 211) Press / Mis.

Dated 23 – 10 – 1967

Not to be folded or roughly handled

Read the following papers :—

No. 207. From Assistant Surgeon G. BIDIE, M. B., Honorary Secretary, Agri-Horticultural Society, to the Secretary to Government, Revenue Department, Fort Saint George ; dated Madras, 16th October 1867.

I have the honor to report, for the information of Government, that, in the month of September, I visited Coorg, with a view to collect some facts regarding the ravages of the insect called the Borer, which has lately caused such destruction on coffee plantations there, and in the neighbouring districts of Wynaad and Munzerabad. It is now upwards of four years since I last visited Coorg, and the first thing that struck me on the present occasion was the altered appearance of the country. In every direction the sides of the hills and ravines have been stripped of their umbrageous forests, and, instead of the magnificent expanse of living green that used to meet the eye on all sides, we have numerous sterile looking tracts, which give a peculiar air of desolation to the prospect. Did the evil, however effected by clearing, not extend further than this, it would be of no great consequence ; but, as has already been brought to the notice of Government, the extensive destruction of forests in Coorg has had a serious effect on the streams, that, rising amongst its hills, descend to fertilize the plains. There is no reason to suppose that, although every tree in Coorg were cut down, the rain-fall would be sensibly diminished, as its amount depends chiefly on the geographical position and physicial conformation of the country, but the existing clearing has, undoubtedly, had the effect of causing a large portion of the monsoon water to run off almost immediately, instead of lodging in the forests, as it used to do, and, by evaporation, rendering the air moist during the dry season. I have no doubt that this change in the drainage of the country caused the droughts of late years to affect Coorg much more seriously than they would otherwise have done, and feel sure it will continue to render the culture of coffee there always more or less precarious. Coffee is a plant which delights in a moderately warm and moist atmosphere, and suffers much when subjected to a dry heat. Considering, therefore, that in Coorg it is deluged with rain during six months of the year, and exposed to scorching sunshine, with the earth baked as hard as a brick, during the remaining period, it is astonishing that it thrives there so well as it does. I have made the foregoing remarks with a view to show that the vigour of the coffee plant may have been impaired by the accidental changes that have recently taken place in the climate through the great destruction of forests.

2. Much of the land now under coffee in Coorg is very ill-suited for the purpose, it being so steep that no care or ingenuity can prevent the surface soil from being washed away. Two or three monsoons are, in general, sufficient to sweep off every trace of *humus*, and the plants then get down on the cold, hungry subsoil, which consists chiefly of clay, decaying gneiss and kaolin, and is notoriously deficient in lime, phosphates, and other elements, without which coffee cannot live and produce remunerative crops. Owing to this and the exhausting effects of fruiting, plants on estates which have been five or more years in existence have, as a rule, a very sickly look, and, under the present system of culture, must have speedily disappointed the hopes of their proprietors, although the Borer had never made its appearance. On most estates, too, the system of pruning is improper, and has been the chief cause in inducing a disease called *rot*. This dis-

temper makes its appearance during the rains, when the plants are saturated with moisture, and attacks the leaves, many of which turn black and fall off. Whenever the leaves drop, the berries near their insertion also fall down, and, in this way, as much as 1 or 1½ bushels per acre of crop may be lost. The immediate cause of the disease seems to be the overcrowding of the branches, which prevents the necessary exposure of the leaves, &c., to light and air, and so retards perspiration, assimilation, and the due ripening of wood in the stem and primaries. In some plants affected with rot, I have found the centres of the stems in a state of decay, brought on, no doubt, by the complete stagnation of the circulation. The quantity of weeds allowed to grow on some estates is also most prejudicial to the coffee, and the practice of piling them round the base of the stem when uprooted, highly objectionable. Every English gardener knows how much the gooseberry bushes in a neglected garden suffer from caterpillar, and there is every reason to suppose that a foul coffee estate is equally inviting to the Borer. These several causes, then, have greatly lowered the vital powers of the coffee plant in Coorg, and helped to render it a ready and easy prey to the Borer.

3. Other depressing agencies arose in the droughts of past years, which not only acted most detrimentally on the coffee, but also appear to have produced a peculiar state of the atmosphere, highly favorable for the development of its insect enemies. Throughout the whole of Western Mysore and Coorg, the abundance of wood-destroying insects has, during the past year, been such as to attract general notice, and plants of all kinds, from the Jack to the Bamboo, seem to have suffered from their ravages. The common opinion is that their appearance in such numbers is an effect of the drought, and this would seem to be the correct one, as there was no other general appreciable cause in operation, and because the explanation is consistent with established facts regarding the influence of atmospheric conditions on insect life. Throughout the whole of 1866, then, the coffee in Coorg was generally in a sickly condition, partly from the effects of causes already referred to, and partly from those of the droughts. At the beginning of the present year, too, the amount of blossom put forth by the coffee was such as had never before been seen by the oldest planter, and, although looked upon by many as a propitious sign, it was doubtless but a symptom of the feeble condition of the plant; as it is a well known fact that plants in a sickly condition often produce an unusual number of flowers. No doubt, this effort on the part of the coffee still further reduced its powers, as no phenomenon of plant life is more exhaustive in its effects. Altogether, therefore, the coffee plant in Coorg has for some time been in such a weakly state as would render it peculiarly liable to disease, and during the past twelve months, the White Borer has found in it a highly congenial field, in which to live and multiply. I shall say nothing of the Red Borer, as, confining itself chiefly to tender branches, it is not nearly so destructive in its operations as the other one, and, besides, it has never appeared in great numbers. For the last few years, occasional specimens of the White Borer have been observed by planters, but it is only of late that they have appeared in such numbers as to cause alarm. At the present moment, I do not believe there is an estate in Coorg free from the pest, while one at least has been rendered worthless, and many more will be in nearly the the same condition before the advent of the rains in 1868. In fact, this branch of

industry is threatened with complete extinction, and it is very humiliating to think that the cause is a tiny insect, of which a man could crush a thousand between his palms. To enter into the natural history of the insect, were the facts at my disposal sufficient to enable me to do so satisfactorily, which they are not, would, in my opinion, be of little avail, as remedial measures, to be successful, must be directed against the causes that have favored the production and increase of the insect, rather than against the creature itself. Indeed, at first, the operations of the enemy are so insidious, that it is generally impossible to say whether a tree has been attacked or not, and it is only when the work of destruction has gone beyond all remedy that symptoms of what has happened become manifest. The signs of Borers being in a tree are drooping of the younger leaves, and, ultimately, a yellow colour in the whole of the foliage. In advanced stages, the leaves drop off, and, after a few abortive attempts to put forth fresh buds, the plant withers and dies. After the leaves have become yellow, a very slight force will break the stem across, when the tunnels of the enemy, accurately filled with the debris of the wood in a fine state of division, will be observed. These are generally about the diameter of a small quill, and are always confined to the wood, never entering the bark until the larva has done its work, passed through the pupa stage, and is about to escape in the form of a beetle. It is the larva of the insect that is called the Borer, and which proves so destructive in its habits. The eggs from which it is developed would appear to be deposited immediately under the bark of the plant near the ground, by means of a telescopic looking strong ovipositor, with which the abdomen of the female beetle is furnished. It has not been ascertained whether, in performing this operation, she takes advantage of one of the numerous cracks in the outer bark, but it is probable that such is the case; as, by so doing, she would, without difficulty, reach the tender inner layers which the ovipositor would easily penetrate, and thus place the germs of her future progeny in contact with the mucilaginous *cambium* which would supply them with nutriment, until they acquired sufficient strength to commence tunnelling operations in the wood. The tunnel made by the young Borer is but small (about the diameter of a netting needle), and entirely confined to the sapwood. It does not continue long of that size, however, but gradually gets larger as the insect increases in bulk and strength, and then the hard central wood of the stem is attacked. As the Borer works into the stem, it seals up the passage behind it with the debris of the wood, so firmly agglutinated by some mucilaginous fluid that it can be removed like a cast of Plaster of Paris on laying open the tunnel. This occlusion seems to be necessary for the existence of the larvæ, for, on laying some of them bare, with the view of watching operations, exposure to light and dry air speedily proved fatal. A considerable number of Borers are generally found in one stem, but, although their passages are very intricate and eccentric in their course, the tunnel of one very rarely communicates with that of another. Roots are just as frequently destroyed by them as stems, the larvæ travelling downwards; and when the wood of the stem has become nearly exhausted, they frequently strike off into branches. The full grown Borer or larva is generally from ¾ to 1 inch in length, and about the diameter of a quill at the head. The body is whitish, soft, ringed, destitute of feet, thickest in front, and tapers gradually toward the blunt posterior extremity. The head is harder than the body, and furnished with very

powerful mandibles. When the larva has completed its term of existence, during the whole of which its entire energy is expended on feeding, it approaches the surface of the stem, and, passing into a state of inactivity, becomes a pupa. How long it remains in this state is doubtful, and all that we know with certainty is that the *imago* is produced in a cavern prepared for it by the larva in the sap wood, or immediately under the bark, and that, having got through the process of exuviation, it cuts its way out in the shape of a perfect beetle. Instead of living in a dark hermetically closed tunnel, it now exits in light and air, soaring on wings, or jumping with its powerful legs. It is at this time about ½ inch in length, or sometimes a little more. The head is small, depressed, and furnished with robust mandibles, tapering antennæ and large brilliant reniform eyes. The elytra are black, and each is marked with three oblique greenish bands, meeting in pairs at their inner extremities when the wing cases are folded, and by a diagonal one at the upper end. The hind legs are long and powerful, and the basal joints of their *tarsi* are furnished beneath with brush-like appendages. The insect belongs to the tetramerous family of Coleoptera or beetles, and will doubtless be soon in the hands of English Entomologists, able to identify it and give a full account of its natural history. We have as yet no reliable information regarding the periods of the year at which the insect is to be found in its various stages of development. In the trees examined by me in September, I found only larvæ. Probably the beetle or perfect insect emerges in the dry season or earlier months of the year, as it would hardly be possible for it to live during the heavy rains of the monsoon. The Borer does not attack dead stems.

4. It will be observed that, through the whole of this letter, I have endeavoured to show that the coffee plant in Coorg has been subjected to various debilitating influences, which have predisposed it to disease, and I now wish to say that I look on the Borer as akin to an epidemic. Change in the climate, impoverished soil, and bad cultivation reduced the vital powers of the plant to a minimum, and the severe droughts of past years there furnished the special influence that caused the pest to increase to such an extent. There is no other rational method of accounting for a scourge that has appeared simultaneously in so many districts so far removed from each other, and under such varying circumstances. At the same time, there is no doubt that, when once the disease has appeared on an estate, it will not confine itself to sickly plants, but, when these have been used up, extend its ravages to the most vigorous and healthy. That a general debility in the coffee plant has been a powerful predisposing cause is, I think, sufficiently evident from the following considerations :—

(*a.*) Plants purposely or accidentally manured (such as those around coolie lines), and thus in vigorous health, rarely suffer much from Borer, while others in the immediate neighbourhood, in which this condition is absent, suffer severely.

(*b.*) Plants on newly opened estates, in which the soil has not been exhausted, escape entirely, or suffer but slightly.

(*c.*) Plants on dry, barren, and exposed ridges suffer soonest and most severely. Shade does not appear to protect plants from Borer in Coorg, and, although it did, the climate of a great portion of the district is such as to render its use impracticable, the shutting out of light and air by it during the rains, when the plants and atmosphere are saturated with moisture, and the heavy drip rendering the coffee

sickly and unproductive. In Bamboo lands, and places where the monsoon is less heavy, however, it may prove useful. I may mention one curious and suggestive fact regarding shade that was brought to my notice by a planter. When shade was talked of some time ago, he tried an experiment on a small portion of the estate with the charcoal tree (Sponia Wightü) to afford shade, and the result was that the charcoal tree was riddled with Borer, while the coffee escaped entirely. This result would seem to support a proposition, enunciated by the late Inspector General Macpherson, who had given great attention to coffee culture, viz., "that the Borer had attacked the coffee because the trees in "which it used to live in the jungle had been cut down." It is quite possible there may be some truth in this, but, at all events, the rearing of belts of the charcoal tree on estates, so as to afford shelter from dry and scorching winds, and give the Borer a less expensive food than the coffee tree, seems deserving of a trial. Farmers and gardeners at home are quite familiar with expedients of this kind for getting rid of the larvæ of insects destructive of fruit trees or crops. I examined the Borer found in the charcoal tree, and it seemed identical with the coffee one. As I have hinted already, it seems perfectly futile to attempt to stop the increase of, or to extirpate, the Borer by doctoring individual trees, and the truth of this will become apparent when we consider for a moment that every acre on an estate contains an average from 1800 to 2000 plants, and that the larvæ live in the interior of the stem. On the other hand, there connot be a doubt that the complete destruction by fire of every coffee shrub infested with Borer is a most essential preventive measure, as every Borer permitted to live may produce a beetle, and every female beetle may deposit at least 200 eggs. For *stamping-out* measures of this nature, some combination amongst planters is highly desirable, as a *bored* estate, in which such means are neglected, will prove a source of danger to others in its neighbourhood. I think, however, that the efforts of the planter should chiefly be directed towards the introduction of a superior mode of cultivation, so as to get the plants into better condition. A badly cultivated plant, no matter what its nature, is always a ready subject to disease, and one properly treated will yield as much crop as three neglected. In almost every instance, the aim of the Coorg planter seems to have been to get as much land, and put down as many coffee plants as possible, his mind running more on the possible returns, than the care, trouble and expense that their proper culture would demand. He seems to have entirely forgotten that the richest soils become rapidly exhausted under cultivation, and that if he does not sow, in the shape of labor and manure, he cannot expect to reap. The coffee, too, is an exotic, a garden plant in India, and, therefore, all the more liable to disease, and requiring careful culture to render it productive. I have already stated that young plants in unexhausted soil, and old ones in manured ground, are, even on infected estates, much less subject to Borer than others in less favorable circumstances—no facts, it appears to me, could be more indicative of the value of, and the necessity for, *high cultivation* ; by this, I mean more careful weeding, systematic manuring, and skilful pruning. It may be said that the expense of such changes will preclude their introduction. To this, I would reply that one acre carefully cultivated would yield as much as three badly managed. It is also

See specimen forwarded.

consistent with past experience in matters agricultural and horticultural to say that, if a plant will not pay under high cultivation, it will not pay at all, and the sooner, therefore, its culture is abandoned, the better for all parties concerned. There is no doubt, however, that in favorable localities, and under skilful and liberal treatment, coffee in Coorg will prove remunerative, and the Borer shortly disappear. The manures best adapted for coffee are natural manures, such as farm-yard dung and night soil, guano, lime, bones, and artificial manures, containing alkalies and phosphates. Probably a mixture of natural manure, lime, and artificial manure would prove the most useful. A gentleman, for some time resident in a coffee district in Jamaica, informs me that, after five or six years of coffee culture, the land there becomes so exhausted, that the planter uproots the coffee and puts down guinea grass. The coffee planter in Coorg would do well to imitate this system to the extent of substituting guinea grass for coffee in barren portions of his estate, which would enable him to keep a stock of cattle to supply manure, and render him to some extent independent of hired bullocks for the carriage of his coffee to the coast. A large quantity of manure could also on most estates be procured by erecting simple latrines on the dry-earth system for the coolies, and I have tried to impress on various planters that it would pay them well to keep a small establishment of toties, to prepare and store the earth in the dry season, and manage the places. I have been told that coolies refuse to go to latrines, but only the vile places on the old system have been tried hitherto.

5. I hope the importance of the subject may prove an apology for the length of this letter, as an important branch of industry and source of revenue is threatened with extinction, and financial loss or ruin hangs over many hundreds who have embarked their means in coffee estates. I have tried to express my views on the subject as practically and honestly as possible, even although it may be at the risk of offending those whom I am anxious to benefit; and I trust that a residence of some years on the frontier of Coorg, during which I could hardly fail to learn something of coffee culture, may at least secure for my remarks a careful consideration.

6. In the Proceedings of the Madras Government, Public Department, No. 107, and Order thereon, No. 1262, dated 11th October 1867, just to hand, I am requested to offer any suggestions that may occur to me with reference to the inquiry about to be instituted by Government regarding the Borer. Of late years, diseases in cultivated plants have become so common in Europe and various British Colonies, as to cause serious anxiety and loss. In the last number of the *Gardener's Chronicle*, there is a leading article pointing out the necessity for appointing State Vegetable Pathologists for the investigation of plant disease, and the writer supports his views by an able paper on the subject from the pen of Dr. Fuchs, and an extract from the *Australian Weekly Age*. It is useless, however, for me to open up this question, as the Government have already recognized the propriety of such an investigation. It, therefore, only remains for me to offer a few remarks regarding the nature and scope of the inquiry to be instituted regarding the Borer. The investigation should embrace a visit to

coffee districts not affected, as well as those infested, with the Borer, and in each instance careful observations and inquiry should be made as to elevation of site, exposure, nature of soil, quantity and disposition of neighbouring jungle (noting amount of clearing), amount of rain-fall and months during which it falls, temperature and humidity of atmosphere during the several months of the year, prevailing winds, and peculiarities of indigenous flora*. Opinions and facts regarding the effects of forest destruction on district drainage, climate, and vegetation generally, should also be carefully collected, as this is a subject of great scientific interest and vast importance in various ways. Localities in which coffee culture has been attempted and failed partially or completely should also be noted, and the causes of the failures ascertained. The state of the coffee plants in the various districts visited should also be noticed, with any peculiarity in the mode of culture. If in a healthy condition, the circumstances to which this is attributable should be ascertained, and, if feeble, or suffering from disease, the proximate causes should be carefully investigated. Disease may arise from vegetable or animal parasites; excess or deficiency of light, air, heat, or moisture; improper culture; or exhaustion of, or noxious elements in, the soil. The nature of the diseases, and their effects, to which the coffee plant is subject will, of course, form the chief points of pathological inquiry; but much light may be thrown on these by noticing the diseases to which other plaints cultivated and uncultivated in the coffee districts are liable. It will also be necessary to enter into the nature and mode of application of remedies for the various abnormal conditions. The varieties of the coffee plant under culture and their respective merits, and any signs of degeneracy, should also be noticed. This will lead on to the consideration of the prevalent system of coffee culture in Southern India, and its consistence or otherwise with the established rules of horticulture, based on vegetable physiology. In entering on the special subject of the Borer, the parts of estates on which plants were first attacked and suffered most, and parts in which they escaped partially or entirely, should be sought for, and any peculiarities as to situation, slope, drainage, exposure, shade, soil, culture, &c., be noticed. At the same time, the natural history of the insect in its various stages, and the nature and extent of its ravages in individual trees and on estates will form subject of inquiry. It would also be well for the Officer deputed to carry out this work to indicate if any parts of the districts coming under his observation would be suitable for the cultivation of other plants, such as tea, chinchona, nutmeg (a wild nutmeg grows in Coorg), cloves, cocoa, vanilla, West Indian arrow-root, &c., and whether any of these plants might be substituted with advantage in worn-out coffee estates. If the proposed investigation be carried out to the extent that I have thus indicated, and by scientific agency, a vast amount of practical and scientific information will be accumulated, and the Government be in a position, not only to promulgate rules for the prevention and removal of disease in cultivated plants in the Hill Districts, but also to inform the public as to the most profitable system of their culture, and how those planters, presently threatened with ruin, may improve their prospects.

* The beautiful "coffee plant," a species of *Strobilanthes*, is believed in Coorg to indicate soil suitable for coffee culture.

No. 208. From C. B. SAUNDERS, Esq., C. B., Officiating Commissioner of Coorg, to the Chief Secretary to Government, Fort Saint George; dated Bangalore, 14th October 1867, No. 489-2.

In continuation of my letter, No. 3626-23, of the 3rd instant, I have the honor to transmit, for the information of the Right Honorable the Governor in Council, copy of the correspondence marginally noted, bearing on the matter therein referred to.

From the Superintendent of Coorg, No. 1750, dated 4th October 1867, with enclosures.
From the same, No. 1780, dated 5th October 1867, with enclosure.
From Officiating Conservator of Forests, Mysore and Coorg, No. 663-94, dated 10th October 1867.

2. Without in any way recommending the employment of the Reverend Mr. Richter, or any other particular individual, on the duty of investigating the causes of the ravages committed by the Borer, I deem it to be undoubtedly desirable that all the available information on the subject of the destruction caused to coffee plantations and sandalwood trees, whether by the Borer or otherwise, as well as the views of the local authorities on the subject, should be laid before the Government of Madras, to enable them to come to a satisfactory decision as to the course which the proposed inquiry should take, and the parties by whom it should be conducted.

From the Superintendent of Coorg, to the Secretary to the Commissioner of Coorg, Bangalore; dated Mercara, 4th October 1867, No. 1750.

In reply to your No. 434-35 of the 23rd ultimo, forwarding the correspondence marginally noted, on the subject of Colonel C. P. Taylor's application to be appointed "Special Borer Commissioner" for Southern India, I have the honor to submit copy of a letter from the Assistant Conservator of Forests, relative to the sandal trees said to have been attacked by a species of the Borer.

From Secretary to the Government of India, Foreign Department, No. 1434, dated 23rd August, to the Commissioner, with enclosure.
From the Commissioner to the Chief Secretary to the Government of Fort Saint George, No. 3449-22, dated 19th September.

2. It will be observed that the destruction of these trees is now alleged to have been chiefly caused by the droughts of the past few years. It would appear that these trees have been dying out during the past three years from the excessive heat experienced during that period, as I personally inspected localities along the road, from Fraserpett to Nunjarajpatten, and could not find any trees attacked by the Borer: I had four trees cut down and examined, but could find no traces of the Borer, or of the cause of their destruction. I believe that those trees containing the Borer were attacked by the fly after they had withered, and that the past hot seasons have caused the coffee plants to become predisposed, and more suitable for the ravages of the Borer.

3. With regard to the immediate objects of such an inquiry, I would beg to submit copy of a letter from the Reverend Mr. Richter, himself an observant naturalist, and to state that he has devoted much time to inquiries regarding the Borer, and that I had made arrangements to procure the statistics regarding the area of estates attacked, number and age of plants destroyed, &c.

4. I would also beg to report that Dr. Bidie, who is said to be a good Botanist and Entomologist, and who is the Honorary Secretary of the Agri-Horticultural Society of Madras, has just completed an un-ostentatious inspection of the estates which have suffered from the ravages of this pest.

5. If Colonel C. P. Taylor's allusion to Dr. Hooker of Kew is a presumption of his knowledge of Botany and Entomology, his inquiries would doubtless prove most beneficial; otherwise, I would venture to deprecate this Province being charged with the expense of inquiries which have already been made, and the result of which Mr. Richter is in such a good position to afford. The period of his annual tours of inspection has now commenced, and he can combine both duties.

From the Officiating Assistant Conservator of Forests, Mysore and Coorg, to the Superintendent of Coorg; dated Mercara, 28th September 1867, No. 248.

I have the honor to inform you that, on the 27th and 28th instant, I visited the Oolgooly village; the Moodegherrynad Parputtigar accompanied me. I noticed that the trees that have died are most of young saplings. The trees are in some instances perforated by the Borer; but in most cases, when cut down, are found to be perfectly sound. Many trees must have died out during last year and the year previous to it; many are dying out now. I can only attribute this to the unusual droughts that have prevailed during the last few years. I do not believe that there is any remedy for it. I have directed the Parputtigar to dig up the roots of two trees that have died—one root to be that of a tree perforated by the Borer, the other that of a sound tree. These I will examine on Monday next. The larger trees seem to have escaped.

2. I may mention that several of the different kinds of jungle trees in this locality have also died.

From the Reverend G. RICHTER, Principal, Government School, Mercara, to the Superintendent of Coorg; dated Mercara, 2nd October 1867, No. 135.

After careful perusal of the official correspondence, herewith returned, on the proposed Special Commission on the Coffee Borer, and in reply to your questions—what inquiries I had made regarding the Borer, and when I should be able to furnish a report on the subject for submission to Government—I have the honor to state that, having suffered to a considerable extent from the ravages of the Borer, and being, therefore, deeply interested in the subject, I have given it close attention, and, I believe, I have been the first who gave a scientific and nearly complete description of the Borer and its habits. My communications have been published in the Proceedings of the Agri-Horticultural Society of Madras, and will be supplemented as soon as my experiments and further inquiries on the Borer will be matured. Moreover, I am in correspondence with Dr. Mess, Professor of Entomology, and Coleoptera in particular, at the University of Munich, Bavaria, who has correspondents all over the world to supply his collection at the University with beetles; and from him I expect what information he may be able to give about the Borer, specimens of which, in all its stages, will be forwarded to him by the next mail.

2. During my late tour of school inspection, and in a previous excursion with the Honorable John Young, from Madras, I have seen almost every coffee estate in Coorg, and, coming in contact with many planters, Europeans and Natives, I have great facilities to acquaint myself with the state of affairs in the Coorg coffee districts, and I shall be happy to embody my experience after one month, should I be permitted to visit the different coffee estates in Coorg during the interval, in an official report to Government, accompanied by accurate drawings of the Borer and its work of destruction. As a plan for such a report, I would suggest the following topics:—

1. Description of the Borer, from the egg to the beetle, with illustrations.
2. Signs of recognition of a tree infested by the insect.
3. Habits of the Borer, not confined to coffee nor to particular locality.
4. Suggested remedies.
5. Statistics regarding the extent of its ravages in Coorg.
6. Similar insect epidemics in other countries, especially in the pine-forests in Germany.

4. Should you deem it advisable to defer such a report until the receipt of Professor Mess' communication, the interval will afford only greater leisure to treat the subject more fully.

From the Superintendent of Coorg, to the Secretary to the Commissioner of Coorg; dated Mercara, 5th October 1867, No. 1780.

In continuation of my letter, No. 1750, of the 4th instant, I have the honor to forward, for the Officiating Commissioner's information, an extract from a demi-official communication received from the Officiating Conservator of Forests.

Extract from a demi-official communication received from the Officiating Conservator of Forests, dated Periapatam, 2nd October 1867.

* * * *

At Sontacopaul, I cut down eleven trees, and dug up their roots. Four showed signs of some insect (most probably the Borer) having touched them ; but I believe not *one* was killed by its ravages. Seven were dead, or dying, but the wood was perfectly sound and good—roots and all. Hundreds of trees are dead or dying, chiefly young ones. I was glad to see that at Fraserpett and Ramasawmy Kanawe they are looking very healthy. The disease seems to be localized between the 8th and 12th miles on the Fraserpett Ghaut. I was out five hours, and went over a lot of ground, cutting down trees at distances some way apart. I believe the drought predisposed some trees to disease, and killed others outright ; the Borer coming in afterwards. What with the clearings at Bhoikerre, Robert's place, and Macpherson's, the rain is apparently driven out of its course for a time, and leaves this tract of country comparatively dry ; still, I found dead trees in good soil, and where they were well shaded. I believe that it will be as hard to find a reason for their dying, as to say, off-hand, why the potato blight comes in some years and not in others. Trees down here are healthy enough.

(True Extract).

(Signed) R. A. COLE,
Superintendent.

From the Officiating Conservator of Forests, Mysore and Coorg, to the Secretary to the Commissioner of Coorg ; dated Bangalore, 10th October 1867, No. 663-94.

I have the honor to report, for the information of the Officiating Commissioner of Coorg, that, during my late visit to that Province, I was told that the sandalwood trees in and about the village of Sontacopaul, in the Mercara Taluq, had been dying in large numbers, and that it was supposed that this unusual mortality was occasioned by the ravages of the Borer, the same insect which, by report, has lately been doing so much damage to the coffee plantations in Coorg and other coffee growing districts.

2. The Superintendent of Coorg showed me a Borer, said to have been taken out of a dead sandalwood tree. The insect was to all appearance the same as the Coffee Borer, except that it was somewhat larger.

3. I visited the villages of Sontacopaul, Nelloor, Beichanhulli, and Wulligili, the places where the sandalwood trees had died in large numbers. The Parputtigar of the Naad informed me that 1462 dead trees had been counted, and I have no reason to doubt the accuracy of the statement. At Nelloor, in one acre (70 yards by 70 yards) alone, I counted twenty-four dead trees, of all sizes, and at Beichanhulli, two miles to the north-east of Nelloor, in a piece of ground measuring 50 feet by 40, I found four large and six small trees quite dead, and five dying. At Nelloor, the trees were in shade, and growing in light forest soil. At Beichanhulli, twelve of the dead and dying trees were growing in red soil, on the top and sides of an old Cudday, and three of them in the stiff muddy soil of a village lane. At Wulligili and Sontacopaul I found dead trees in open Bani lands. It would not, therefore, appear that trees growing in one particular kind of soil were more predisposed to the disease, whatever it may be ; as dead and dying trees were found in all sorts of soil.

4. I cut down and split up eleven trees, and had their roots dug up. I forward copy of the notes made on the spot, from which it is evident that, whatever the cause of death may be, it was not the Borer that killed them.

Sontacopaul.

No. 1. Tree five inches in diameter, quite dead. Marks of some insect (like Borer) which had bored through a portion of the trunk, entering at about eighteen inches *above* the root, and gone out again about a foot higher, just touching the heartwood. Wood otherwise sound. Roots full of mud and white-ants.

No. 2. Small tree, four inches in diameter, little or no heartwood, just dead. At junction of roots and stem, some insect had bored through the breadth of the tree. Wood sound. Roots sound, with the exception of one large one, which was rotten and full of white-ants.

No. 3. Tree, six inches in diameter, quite dead ; roots dry ; wood sound in large root. Found some heartwood faintly scented. No apparent reason for tree dying.

N. B.—These three trees were all in open Bani lands.

Nelloor.

Nos. 4 and 5. Saplings quite dead, easily pushed down by hand. Wood sound, and roots too, with the exception of one root of No. 4, which was hollow for a few inches.

No. 6. Saplings. Signs of some insect having entered just above the root, and tunnelled to about two feet up the stem ; but no signs of the insect, or of its having gone out at the top of the boring. Roots sound.

Nos. 7 and 8. Trees ten inches in diameter, twenty-five feet high, quite dead. No sign of Borer. Wood apparently sound ; little heartwood, slightly fragrant. Roots sound.

Beichanhulli.

No. 9. Tree seven inches diameter, dying leaves on two or three of lower branches only. Wood dry ; heartwood about one inch in diameter, fragrant. Roots sound. Clay soil.

No. 10. Small tree, four inches in diameter. Same remarks as above, but no perceptible fragrant heartwood.

Wulligili.

No. 11. Saplings two inches diameter. Wood sound, quite dead. Roots sound, one hollowed out by whiteants. Soil dry Bani. Many dead saplings all round.

5. It will thus be seen that, in five out of the eleven trees examined, roots and wood were sound, and untouched by any insect. In three, the wood was sound, the roots more or less injured ; and in three, both wood and roots were injured. The roots of Nos. 1 and 2 were full of white-ants. I found no insects in any of the trees I cut down. I do not think the Borer the cause of the death of these trees. It is a difficult matter to find a really good and perfectly sound piece of sandalwood in any of our Koties. All the trees seem to be more or less hollow. I do not, therefore, think that the small holes in the trees I examined were the causes of their dying, nor can I ascribe it simply to the drought of the last two or three years, for the mortality seems to be confined to a very small area.

Near Bhoikerre, at the 5th mile stone from Mercara, there are a few dead trees ; thence to the 8th stone, the trees appear to be healthy enough. Nelloor, which is about 2 miles to the south of the Fraserpett Mercara road, is between the 8th and 9th mile stones ; here, as already reported, the mortality is very great. Beichanhulli is between the 10th and 11th mile stones, and about one mile to the north of the road. Wulligili lies between Sontacopaul and Beichanhulli. Everywhere else there is no unusual mortality to be observed.

6. The affected portion of country is just to the west of very large clearings which have been made for coffee cultivation.

The Bhoikerre estate, Mr. Robert's estate, Koshalappa's estate, a piece of cleared land belonging to the late Mr. Moultree, the Halleri estates and a piece of coffee land to the east of them, and Dr. Macpherson's estate at Sontacopaul, are all in the vicinity of the affected district, besides some smaller holdings belonging to Natives.

7. I could gather nothing definite from the Natives as to their opinion of the cause of the trees dying off so largely ; they only said that they "died as the bamboos die, and they could not tell why—perhaps it was the long drought." In the absence of any other apparent reason, I can only suggest that the unusually light monsoons of the last three years, aided, perhaps, by so large a portion of forest land having been cleared all about, may account for the fact of these trees dying in such unusual numbers.

8. I have called for information as to whether an unusual number of dead sandalwood trees has been observed in the adjacent Taluqs of Periapatam, Arkulgode, Munzerabad, and Maharajdroog, in the Mysore Province, but have not yet received any answer.

PUBLIC DEPARTMENT.

No. 1312.

FROM

A. J. ARBUTHNOT, ESQ.,

Chief Secretary to the Government of Fort Saint George,

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,

FOREIGN DEPARTMENT.

SIR,

With reference to your letter to the address of the Officiating Commissioner of Mysore, authorizing that Officer to apply to the Madras Government for the services of Lieutenant Colonel C. P. Taylor, Paymaster at Madras, to inquire into and report on the devastation caused by the Borer insect in the coffee planations of Coorg, a copy of which letter was furnished to the Madras Government with Mr. Under Secretary Wyllie's docket of the 23rd August last, No. 1435, I am directed to submit, for the consideration of His Excellency the Viceroy and Governor General in Council, the enclosed copies of the correspondence which has passed on the subject, from which it will be seen that the Governor in Council, not being satisfied that Lieutenant Colonel Taylor possesses the knowledge of Entomology and Botany which would give weight to his opinion in regard to the best mode of checking the ravages of the insect, deemed it proper, before complying with Mr. Saunders' application, to ascertain whether the Conservator of Forests could suggest any Officer possessing the requisite qualifications; that Dr. Cleghorn named a Mr. Nietner, a Coffee Planter in Ceylon, and Captain Lang, R. E., Assistant Secretary, Department Public Works, in Oudh; that inquiry was made from the Director of the Government Gardens near Kandy, whether Mr. Nietner would be willing to undertake the inquiry, and that the answer having been in the negative, the Madras Government have, with Mr. Saunders' assent, and in anticipation of the approval of the Government of India, placed Assistant Surgeon Bidie, M. B., Professor of Botany in the Madras Medical College, at the disposal of the Commissioner of Mysore and Coorg, for the purpose of conducting the proposed inquiry.

Proceedings,	24th	September	1867,	Nos.	199—202.
,,	1st	October	,,	,,	8 & 9.
,,	14th	,,	,,	No.	107& 108.
,,	15th	,,	,,	Nos.	151—154.
,,	22nd	,,	,,	,,	207—210.

2. His Lordship in Council trusts that, under the circumstances, the selection of Assistant Surgeon Bidie, in preference to the Officer named in your letter to Mr. Saunders, will meet with the approval of the Supreme Government. The inquiry is one of considerable importance to the planting interest in Southern India, and it is very desirable that it should include the coffee plantations in Wynaad, as well as those in Mysore and Coorg. It is one in which the Local Government have therefore a direct interest, and for which they have deemed it their duty to obtain the services of the most qualified person available. Dr. Bidie, though not a professed Entomologist, is an accomplished Botanist, well acquainted with Anatomy, and a practised observer, and it will be seen from his letter of the 16th instant, reporting the result of his observations during a recent visit to Coorg, that he has already devoted considerable attention to the subject of the proposed inquiry.

3. I am to suggest, in conclusion, that the actual travelling expenses of Assistant Surgeon Bidie, and such additional charges as may be entailed on this Government in the payment of deputation allowance to the Officers appointed to discharge Dr. Bidie's duties as Superintendent of the Lunatic Asylum and Professor of Botany during his absence, be debited to Coorg and Mysore, for the periods during which he may be employed in those Provinces respectively.

I have the honor to be,
Sir,
Your most obedient Servant,

FORT SAINT GEORGE,
22nd *October* 1867.

Chief Secretary.

Extd. J. H. Burns.

Public Department. 17

PROCEEDINGS of the MADRAS GOVERNMENT

Read the following letters.

From Asst Surgeon G. Bidie, M.B. dd 16 Octr 1867.
From the Offg Commissioner of Coorg, dd 17 & 18 Octr 1867. Nos 409 & 3938.

Order thereon 22nd Octr No. 7311—

The Officiating Commissioner of Mysore and Coorg having intimated his assent to the proposal made by this Govt that the services of Assistant Surgeon Bidie, Professor of Botany in the Madras Medical College, should be placed at the disposal of the officiating Commissioner for the purpose of enquiring into and reporting on the devastation caused by the Borer

Borer insect on the Coffee Plantations in Coorg and Mysore, His Excellency the Governor in Council directs that Dr. Bidie will proceed to Bangalore with as little delay as possible and report himself to the Officiating Commissioner. Mr. Saunders will be furnished with a copy of Dr. Bidie's letter of the 16 instant which the Govt. have perused with much interest. In reporting the arrangement for the sanction of the Supreme Govt. the Governor in Council will suggest that the actual travelling expenses of Dr. Bidie, for which he will submit bills to the Offg. Commissioner, and the additional charges

charges entailed on this Govt. in the payment of deputation allowance to the officers who may be appointed to discharge Dr. Bidie's duties during his absence, should be debited to Coorg and Mysore for the periods during which Dr. Bidie may be employed in those Provinces respectively. After the completion of his enquiries in Coorg and Mysore, Dr. Bidie will proceed for the same purpose to Wynaad. All the charges connected with the enquiry in the latter District will of course be debited to the Madras Presidency. It will be open to the Offg. Commissioner to

instruct

instruct Dr Bidie to include in the scope of his Enquiry the injury which it appears has been done to the Sandal Wood trees by the Borer or by some other cause.

Dated 27th Sept 1858

No. 1316

PROCEEDINGS OF GOVERNMENT.

FPA 1768
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Pub Dep 186 7 Department.

the Offg. Comms. of Mysore
Asstt. Surgeon G. Bidie, M.B.
Accountt. General.
Inspector Genl. Medical Deptt.
Director of Public Instruction
Collector of Malabar —

despd 24/10

Public Department.

No. 1312.

To

The Secretary to the Government of India,
Foreign Department.

Sir,

With reference to your letter to the address of the Offg Commissioner of Mysore authorizing that Officer to apply to the Madras Govt. for the services of Lt Colonel C. P. Taylor, Paymaster at Madras to inquire into and report on the devastation caused by the Borer Insect in the Plantations of [illegible] in Coorg, a copy of which letter was furnished to the Madras Govt. with Mr Secretary Wyllie's dated of the 23d August last, No 1435, I am directed to submit for the consideration of His Excellency the Viceroy

I have sent the copy of Dr Bidie's letter.

and Governor General in Council the enclosed copies of the correspondence which has passed on the subject, ~~and~~ from which it will be seen that the Governor in Council not being satisfied that Lt Colonel Taylor possesses (any) such knowledge of Entomology and Botany as would give weight to his opinion in regard to the best mode of checking the ravages of the insect, deemed it proper, before complying with Mr Saunders' application, to ascertain whether the Conservator of Forests could suggest any officer possessing the requisite qualifications, that Dr Cleghorn named a Mr Nietner, a Coffee Planter in Ceylon and Captain

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3. I am to suggest in conclusion that the actual travelling expenses of Assistant Surgeon Bidie and such additional charges as may be sanctioned on this Government in the payment of deputation allowance to the

Officer

Asylum appointed to discharge Dr Bidie's duties as Superintendent of the Lunatic Asylum and Professor of Botany, during his absence, he desires to leave and Mysore for the periods during which he may be employed in those Provinces respectively.

Fort St George
25 Oct 1869

Public Instrument

No 1212.

Copy Foreign Power. India
Foreign Office

Date 22nd October

No 1768-2032

207 & 211.

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