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MADRAS RECORD OFFICE.

Government of Madras.

Revenue **DEPARTMENT.**

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Dated 14-5-1868.

Not to be folded or roughly handled

Proceedings of the Madras Government, Revenue Department,
14th May 1868.

No. 357. Read the following Proceedings of the Madras Government in the Public Department:—

Forwarding copy of a monthly Progress Report from the Commissioner for Investigating the ravages of Borer in Coffee Plantations of Mysore and Coorg. } (Here enter 9th May 1868, No. 573.)

No. 358. ORDER THEREON, 14th May 1868, No. 1,357.

Miscellaneous.

Communicated to the Board of Revenue and to the Officiating Conservator of Forests.

(True Extract.)

(Signed) F. BRANDT,
Under Secretary to Government.

To the Board of Revenue,
„ the Officiating Conservator of Forests, } With Proceedings Public Department, No. 573.

Exd. S. T. Augustin.

Proceedings of the Madras Government, Public Department, 9th May 1868.

No. 58. Read the following letter from the Commissioner for Investigating the ravages of Borer in Coffee Plantations of Mysore and Coorg, to the Chief Secretary to Government, Fort Saint George; dated Mysore, 22nd April 1868, No. 37.

I have the honor to send herewith, for the information of the Government, copy of a monthly Report of progress forwarded by me to the Commissioner for Mysore and Coorg.

From the Commissioner for Investigating the ravages of Borer in Coffee Plantations of Mysore and Coorg, to the Secretary to the Commissioner of Mysore and Coorg; dated Mysore, 22nd April 1868, No. 36.

I have the honor to report, for the information of the Commissioner, that I completed my tour of inspection in Munzerabad, &c., in April. Before entering on the work of the month it may be as well to settle the nomenclature of the chief insect enemies of the coffee, as I find that different observers have been giving different names to them. In a former letter I stated that the White Borer was a Clytus, and from a report of the proceedings of a meeting of the Entomological Society, held on the 6th January, I learn that it was recognised as the Clytus Macaensis. A recent letter from the Secretary of the Society, in reply to some inquiries made by me through a friend, states, that it proves to be the Xylotrechus quadripes of Chevrolat. The generic name was given by Chevrolat in a paper called "Descriptions d'especes d'Clytus propres an Maxique,"* to what he terms his 7th Division of the old genus Clytus. In his work Clytides d'asie et d'Occanic' (1863) Xylotrechus is raised to the rank of a genus, and the insect known to us as the White Borer described as the X. quadripes. The letter concludes by saying, "I cannot find any record of any such beetle having ever attacked the coffee tree in India, or in any other part of the world." The friend through whom I received this information states, that he attended a meeting of the Entomological Society on the 3rd February, when the subject was under discussion, "but could not gather any practical hints as to the extirpation of the insect in the coffee plantations worth writing." The Red Borer belongs to the genus Zenzera, and is so like the *Wood-Leopard Moth*, Zenzera Osculi, of England, that I am not at present prepared to set it up as a distinct species.

I have repeatedly failed in my attempts to get the "Ringer" grub to pass into the imago state, the shaking during my travels having always proved fatal to it; but am quite sure that it is identical with the English *Dart Moth*, Agrotis Segetum.

There is a very destructive insect called by planters the *Charcoal Borer*, as it frequently destroys the charcoal trees which are reared to give shade to the coffee. Its presence in a tree is indicated by a lump on the stem of saw-dust like wood powder, matted together by silky fibres. On removing this the hole through which the insect entered and ejects the morsels of wood will be seen, and it is generally large enough to admit the tip of the little finger. If the tree be now cut down and split open tunnels of the same size will be found running upwards and downwards from the external opening, and the grub lying snug in the bottom of a burrow at the base of the stem. The larva is from three to four inches long, thick, fleshy, and of a pale red color. It has six pectoral, eight ventral, and two anal feet, and is a very powerful creature, struggling violently in the hand, and attacking vigorously with its powerful jaws the cork of a bottle in which it may be confined. The chrysalis is smaller and [illegible] than the caterpillar, and rests about three months. Its abdominal segments are [illegible] with transverse rows of minute reflexed spines, and [illegible] before the moth emerges, [illegible] by some wonderful instinct it pushes itself [illegible] by means of these and clears away the debris of the wood from the external opening, so that there may be nothing to prevent the escape of the perfect insect. Having completed this task it [illegible] to its former place, and rests until the moth arrives at maturity when the [illegible] contrivance is made use of again to enable the moth to escape from the tunnel, within which it could never wriggle out of its case or develop its wings. The moth measures about [illegible] across the upper pair of wings, which are much larger than the lower. Both pairs are of [illegible]

* Annals de la Societe Entomol. [illegible] 1850, p. [illegible]

ish brown color, and the upper ones are clouded with brown. The antennæ of the female (I have not seen a male) are very short and filiform. The wings are deflexed in repose, and furnished with a complicated series of strong nerves. The abdomen is elongated, and the female when touched discharges with considerable force immense numbers of minute white round eggs, which shortly turn black when they have the appearance of very fine gunpowder. This moth belongs to the family Hepialida, and is closely allied to the Hepialus humuli, or Ghost moth of England. It is very common in the charcoal tree, and renders the stem so weak by its tunnelling that it is apt to be broken by the wind. In the monsoon too the rain enters by the exterior opening, gets to the heart of the tree and causes it to rot. The larva may be killed by passing a flexible wire into its burrow, and after this the hole should be closed with a soft wooden peg.

2. There is not a tree in our forests but is liable when dead to the attacks of boring insects, and many in the living state, more especially if sickly, show traces of their depredations. As regards the coffee plant any diminution of vigour in it, no matter what the cause, renders it liable to the ravages of the Borer, and the larva does not find a suitable field in a vigorous and absolutely healthy plant. There seems no reason to doubt, therefore, that one cause of the great prevalence of the Borer of late years has been a general want of vigour in the plants. At the same time it must be stated, that a vast majority of the trees that have died full of the Borer's tunnels would but for its ravages have lived, and might have been restored to a more healthy state. The causes that produced this sickly condition were various, and some of them must have been very general, seeing that the Borer has prevailed over such an extent of country. Not only in the actual coffee districts but in places at a considerable distance from them, such as Hassan and Hoonsoor, I have found Borer present in coffee trees, occurrences that point to the reduction of vigour having been caused in part by some climatic influence. From this and other facts I also infer, that the Borer Beetle is a widely distributed insect and indigenous to the country, as the distance of the stations of Hoonsoor and Hassan from estates infested with the Borer, and the open nature of the intervening country preclude the idea of its having been able to wing its way from the latter to the former. I cannot believe either that the ova of this Beetle could have been carried so far by man's or any natural agency. Concluding then that the Borer Beetle belongs to the insect fauna of Southern India, and is widely distributed, it can hardly be expected that it will ever disappear, and although more favorable seasons and change of mode of cultivation may render coffee in general less liable to or proof against its attacks, still it will ever be ready to prey upon and destroy sickly plants. In a former monthly report I noticed that the Borer had been seen in coffee trees in Coorg 12 years ago, and during a recent visit to the gardens on the Baba Boodens, in which coffee was first cultivated in Southern India, I was informed by the planter Ghaus Shakhadry, "that he had known the Borer there for 30 years." On an estate in Nuggur too in 1860, or 8 years ago, no less than 60,000 plants were destroyed by Borer. These facts also go to prove, that the insect is an old and permanent resident in the coffee districts of the Peninsula. When at Ghaus Shakhadry's plantations I saw coffee plants growing in shade, 70 years old and quite healthy, and was told that about 12 years ago there were plots of coffee in the open, the trees in which were 100 years old. These have all since gradually died out, and the owner attributes their death to extreme age, drought, and Borer. He says that for 12 years back the seasons have gradually been getting drier and hotter, until at the present time the climate is such as to render it impossible to grow trees in the open in that part of the country. There is much collateral evidence to support this statement regarding [illegible] deterioration of climate all along these Western Ghauts, and as the subject is one of great [illegible] importance and scientific interest, it seems to call for a searching inquiry.

3. Since my last report I have visited the chief estates in Munzerabad, and a few of the oldest and most interesting in Nuggur. In both these districts all the planters I have seen are of opinion that coffee must in that quarter be cultivated under shade, trees in the open being liable to perish from the violence of the monsoon, drought, Borer, &c. The most of the estates therefore are under shade, and as those so protected have suffered but little from Borer, as compared with the few in the open, I went over them with great interest. The degree of shade is a point of great nicety and importance, too much being prejudicial to the reproductive powers of

Proceedings of the Madras Government, Public Department,
9th May 1868.

the tree, and too little exposing it to the effects of drought and the attacks of the Borer. The Native cultivators were the first to adopt this system, and there seems no doubt that they were led to do so by experience. It is worthy of note too that the first English Coffee Planters in Southern India followed their example, and that some of their estates, varying in age from 40 to 25 years, still yield large and certain returns to the owners. The effects of shade on a coffee plant are various and worth mentioning. Light being the great stimulus of all the functions of vegetable life, the partial exclusion of it causes these to be performed with diminished energy. Coffee in the shade therefore, as compared with that in the open, grows more slowly, is later in coming into bearing, produces less fruit and ripens it more slowly. The trees too have a tendency to become lanky, and the primaries gradually disappear from the lower parts of the stem, the only branches that remain springing from its immediate top and giving the plant an umbrella-like appearance. The young fruit bearing wood in shaded coffee is also very long jointed, the leaves of unusual size and of a very deep green color. Under a continuous expanse of shade the coffee trees are, as a rule, uniformly healthy and free from Borer, and when attacked they do not succumb to the injury so readily as those in the open, there being various conditions favorable to the conservation of the nutritive forces, and the exercise of the *vis medicatrix naturæ*. Again, when the shade is partial, the trees occurring in clumps, the coffee varies in condition according to the amount of shade it enjoys, those in a subdued light being tall and green, while those exposed to the direct rays of the sun are either in a sickly condition or dead. In most instances the exact limits and shape of the shadow of a clump of trees is as accurately depicted by the state of the coffee as if it had been drawn on paper by a painter's pencil. I am speaking of course of the state of matters in Munzerabad and Nuggur, and it seems to me that nature by the facts just mentioned tells us plainly, that shade is absolutely necessary in these districts and others with a like climate, and by far the best preventive for Borer. Planters, who are prejudiced against shade, often remark that the returns from shaded coffee are too small to render its cultivation worth the while of an European, but I think a little inquiry regarding the profits of some of the older properties in Mysore will dispel this illusion. There are two kinds of shade known to planters, viz., that of the primitive jungle, and that from trees allowed to spring up or reared in cleared ground along with the coffee. In some places of low elevation, and located near the eastern margin of the coffee districts, the former is the more suitable, whereas in those further west the latter is preferable. Forest, consisting of trees that shed their leaves during the hot season, is not suited for shade, and when the trees, although ever green, are too tall it seems also unsuitable. The tree most in favor for secondary shade (that is, shade allowed to grow up with the coffee) is the charcoal tree, and fortunately it springs up spontaneously in abundance in nearly every clearing. As it grows rapidly I was afraid that it might not be very lasting, but find that it lives for about 40 years. At the same time it is desirable that trees of a hardier and more permanent description, such as the jack, should be raised, and when these are of sufficient size the charcoal trees may be cut down. On the whole, I entertain a very high opinion of the system of culture under shade, and think it might be introduced with advantage in many parts of Coorg. Acre per acre the returns may be less when there occurs a favorable season, but on the other hand the owner of an estate under shade can always depend on a fair per centage on his capital, and feel sure that no droughts or other abnormal climatic phenomena, within the range of human experience, can convert his garden into a barren waste. It is also worthy of notice that if the returns from a shaded estate are comparatively small, the working expenses are proportionally little, and that the risk of its being ruined by mismanagement is also much less.

No. 59. ORDER THEREON, 9th May 1868, No. 573.

To be recorded.

(True Extract).

Chief Secretary.

To the Revenue Department.

Rec.d 1868 May 9th
Pro.d of Gen.l Superintendency
No. 1608

Proceedings of the
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Works

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Received 13th May 1868
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Forwarding Copy
of a Memorial Magnes
Report from the
Comm.rs for Investigating
the Mines of Rover
in Co.ty of Plimlimon
&c. &c. &c.

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