No. 3,188.

PROCEEDINGS OF THE BOARD OF REVENUE, dated 31st July 1871.

Read the following papers:—

Proceedings of the Madras Government, dated 25th April 1871, No. 735, Revenue Department.

ABSTRACT.—*Silk cultivation.*—Despatch from Home Government on the specimens cocoons transmitted for opinion, with orders thereon.

ENCLOSURE No. 1.—Copies of letters to the Honorary Secretary to the Silk Supply Association and his reply.

ENCLOSURES Nos. 2 and 3.—Two packets of Cocoons.

ENCLOSURE No. 4.—Silk Supply Journal.

From Messrs. DYMES AND CO., to the Acting Secretary to the Board of Revenue, dated Madras, 29th May 1871.

WE have the honour to refer to the Proceedings of the Board of Revenue, No. 1,151, under date 19th February 1870.

2. The Board therein recommended Government to accept the terms on which Messrs. DeVecchj and Pater expressed themselves prepared to act under the orders of Government in the proposed operation of importing new silk-worm eggs into this Presidency. Both these gentlemen are at present absent from Madras, but it will materially assist us in getting cartoons ready on their behalf if the Board can inform us whether Government now contemplated sanctioning the grant recommended by the Board in their Proceedings of last year.

3. It is necessary that we should be informed of the intention of Government in this matter as soon as possible, to enable us to make our arrangements with China and Japan before the season is too far advanced for the transportation of seed from there.

From A. WEDDERBURN, Esq., Collector of Coimbatore, to the Acting Secretary to the Board of Revenue, dated 29th May 1871, No. 146.

IN reply to paragraph 3 of the Proceedings of the Board of Revenue, dated 11th May 1871, No. 1,965, requesting to know whether the introduction of the Dharwar silk-worm eggs into Coimbatore has been successful and satisfactory, I have the honour to annex extract from a letter from the Superintendent of the Coimbatore Jail to whom the eggs were given, from which it appears that the experiment was quite successful.

ENCLOSURE No. 1.

Extract from a letter from H. R. Grimes, Esq., Superintendent of Central Jail, Coimbatore, to A. Wedderburn, Esq., Collector of Coimbatore, dated 25th April 1871, No. 57.

* * * * *

THE eggs I retained were hatched on the 28th December, and as I still had more worms than I could find food for I tried the experiment of feeding part of them on the leaves of the Ailanthus, or as the tree is called here Peroomarum, the experiment was a failure, the worms thus fed all died within a week, those fed on Mulberry leaves lived and formed cocoons about the 3rd February. The number of cocoons obtained was 19,700, of which 250 were kept for stock; silk was reeled from the remainder. The weight of 19,450 cocoons was 27 lbs. 14½ oz. the weight of silk obtained was 3 lbs. 4 oz.

(True Extract.)

(Signed) A. WEDDERBURN,
Collector.

From Captain T. G. CLARKE, Officiating Secretary to the Chief Commissioner of Mysore, to the Acting Secretary to the Board of Revenue, dated Bangalore, 24th June 1871, General No. $\frac{1,509}{385}$, of 1871-72.

I AM directed to acknowledge the receipt of Mr. Sub-Secretary Pennington's letter, No. 1,989, of 13th May last, forwarding copy of the Board's Proceedings, dated 11th idem, and of an Order of Government, No. 572, of 29th March 1871, and requesting to be furnished with any information available as to the results of the importation on several occasions into this province of the Japanese breed of silk-worms.

2. The attempts which have been made by this Administration since 1866, to revive a languishing industry by introducing into the silk-producing talooks foreign species of silk-worms to re-place the indigenous breeds which had nearly died out from disease and exhaustion, have uniformly failed, and their history may be briefly told.

3. So far back as twenty years ago a silk factory was established in the vicinity of Bangalore under the superintendence of a Government officer, and every effort was made by improved methods of filature, to encourage this branch of industry upon which large classes, especially of Mussulmans, are dependent. The experiment had, however, to be abandoned soon afterwards, and it was not until 1866 that the subject was again energetically taken up by Signor DeVecchj, who, with the aid of this Government, distributed among selected men in the Bangalore District a large number of cartoons. Great expectations were entertained, as these eggs were obtained from crossing Italian and Japanese worms imported by Signor DeVecchj himself, with healthy specimens of the country worm, but from causes not explained the result was most unsatisfactory.

4. In 1867 another distribution of cartoons took place, but with no better results. The worms were reported to have died in most cases before they could form the cocoons, having been infected by the prevailing disease, a sort of "Atrophy." In the year 1869 Signor DeVecchj was commissioned to procure a large supply of Japanese eggs, which were distributed immediately on their arrival among the most intelligent of the silk-worm rearers. The same results followed. The eggs did not hatch in a large number of cases, and for the rest the worms generally died.

5. For the fourth time, in January 1870, a large quantity of newly imported Japanese cartoons was distributed in the Bangalore, Toomkoor, and Kolar Districts: the first results were favourable, and the demand for the eggs was very large, but the worms did not seem to thrive in the second generation, and the foreign species may be said to be already extinct.

6. Lastly, in February of this year, a further importation was received from Japan, and 500 cartoons distributed gratuitously as on former occasions. The results have not yet been fully reported, but it is understood that these are as unsatisfactory as in the previous instances.

7. In the absence of any person acquainted with the habits of the silk-worm, and with the diseases to which it is subject, the Chief Commissioner has been unable to ascertain precisely the causes to which these successive failures are to be ascribed. Much may be due to ignorance in the mode of treatment, notwithstanding that copies of a Treatise on the subject have been largely distributed to the ryots. It is improbable, however, that among so many who have anxiously endeavoured to rear the foreign species none would have succeeded if such had been the only cause. The Chief Commissioner is led to the conclusion that the dry climate of Mysore is not favourable to the freshly imported Japanese breeds, and that it would be undesirable to renew the experiments, unless it can be clearly proved that with care and skill those foreign species can be acclimatized in this part of the country.

8. The results of the distribution made in February 1871 will be communicated to you for the information of the Board of Revenue as soon as the particulars are known.

From J. W. BREEKS, Esq., Commissioner of the Neilgherries, to the Acting Secretary to the Board of Revenue, dated Ootacamund, 28th June 1871, No. 74.

WITH reference to Proceedings of the Board, 11th May 1871, No. 1,965, I have the honour to report that I am of opinion that the same favourable terms that have been granted to Coimbatore for the reclamation of waste land taken up for Mulberry cultivation may be granted to those of this district who wish to engage in silk culture.

2. Mr. D. Cockburn has imported a few hundred worms and is rearing them with care and attention. I venture to draw the Board's attention to his letter of the 3rd February 1870, forwarded with my letter of the 7th idem, No. 22.

3. If a small grant of 2 or 300 Rupees were given him I think he would be in a satisfactory position to furnish a full report of the experiment which might lead to the re-introduction of this branch of industry in this district.

From Surgeon J. SHORTT, M. D., Superintendent General of Vaccination, Madras Presidency, to the Acting Secretary to the Board of Revenue, dated 29th June 1871, No. 694.

I HAVE the honour to submit the accompanying brief account with drawings, showing the different stages of the Tasseh silk insect for the inspection of your Board, about which information was elicited a short time ago.

2. There may be nothing new in the account I have given, and the insect has been, I believe, depicted before by others, but as they may prove of interest together I submit them, and beg to request you will have the kindness to return the drawing back to me when no longer required.

ENCLOSURE No. 1.

A brief account of the Tasseh Silk-worm, accompanied with drawings of the insect.

SOME time ago I observed that accounts of the silk-worm were called for by the Board of Revenue, especially of those that are indigenous to the country, and as I was then in camp I could not attend to the subject, but having had drawings of the *Tasseh* silk-worm by me for some time, and believing that the subject is one of great interest, I now beg to submit the following remarks explanatory of the drawing that accompany it.

The *Phalæna papia Linii Anthera Mylitta, Saturina Mylitta* (Drury) is commonly met with in most parts of Southern India. My attention was first attracted to the subject in 1855-56, whilst in the jungles of Orissa with the Topographical Survey. I there observed that it was bred in most of the hill villages, and that a large quantity of Tasseh silk was exported from thence to Calcutta, Madras, and other places. The hill natives, Oriahs and some of the lower tribes, as well as Telingas, first collect cocoons, and in most instances from their size and form they are able to recognize the male from the female cocoons pretty correctly, and carefully preserve them till the moths emerge when the males are let loose, while the females are carried to a tree they select for the purpose in the vicinity of the Asan or *Pentoptera tomentosa* (Terminalia tomentosa) on which she is placed, where she soon begins to creep along the branches with quivering wings, and in a short time, varying from one to eight hours, the males by some instinct get attracted to the spot that contains the female and an immediate union of the sexes takes place. This lasts from three to four hours, and shortly after the female begins to deposit from 100 to 200 eggs on various parts of the twigs of the tree; 33 of these eggs weigh 5 grains. These eggs when freshly deposited are sticky, but as they dry they adhere firmly to the bark of the stem where they were deposited, and often to each other forming a cluster. The moth dies the next day and the male also perishes about the same time.

I should mention here that the natives watch the tree to keep away cows and birds from destroying the moth, as well as to ascertain the time of the arrival of the male by which they pretend to prognosticate the success or failure of the undertaking, attributing the rapidity of arrival as a sign of prosperity, and a lateness of arrival as indicative of non-success; but, as I have ascertained for myself, there is no truth in such assertions.

Others again keep the moths on small branches or twigs of the Asan or Bhere trees about the outside of their huts, or tied on to other trees till the union is effected, and the eggs are deposited; the eggs are of the size of a split pepper corn, nine of them in line occupy the space of one inch in length. They are circular and bi-convex with a light creamy colour. These they keep till the young larva begin to emerge from the eggs, when they are taken and tied on to Asan trees on which the young disperse themselves; a watch is kept during the day to keep away squirrels, birds, crows, etc., and at night a fire is kindled in the vicinity to frighten away bats, while the root stem is surrounded with ashes to prevent ants having access to them, and in the selection of trees care is taken to avoid those that are infested with ants.

The worm is very small, scarcely perceptible when first hatched, but before it attains maturity it is from three to four inches long and from two to three lines in girth. The larva is of a light green colour with a slightly yellowish streak on either side, and the sixth and seventh segments are marked with an oblong yellow spot, and on the back are several round darker coloured spots surmounted with a few dark coarse hairs, while smaller ones are scattered all over the body. The larva is chiefly found on the *Bhere* or *Zizyphus Jujuba*, *Asan* or *Pentaptera tomentosa*, and the *Teak* or *Tectona grandis*. I have found them chiefly on the *Bhere* tree in Madras, although I got one cocoon from a Teak tree and another from a Casuarina at Mr. H. Church's, Perambore. The larva when ready to undergo transformation forms a cord round a twig from a peculiar resinous substance it secretes, and with which it also encircles the selected part of the branch and then prolongs it to the extent of one or two inches. If the branch is thick the cord is short and stout, and about a line in girth, but if it be a twig the cord is thin, from three to four inches long, and fastened to an upper and thicker branch and prolonged to the end of the twig with several intermediate ties of the same material. From the end of the cord, which is solid, begins the expansion of the cocoon which is reticulated with fine fibres of the same stuff as the cord is made of on the outer surface, thus giving firmness and solidity to the cocoon, and as it approaches completion a few of the leaves in the vicinity are drawn to line and conceal the cocoon externally, and thus to a certain extent mask it from observation; but this only occurs on the Bhere tree, for I have seen no such leaves attached to the cocoons found on other trees where the foliage is large and dense, the larva now imprisons itself within the cocoon, and the same secretion that forms the cord is freely applied to all parts to make it water-tight. Having done this the transformation commences and lasts nine months before the moth is perfected, having its head at the upper part next to the cord, from whence it appears to discharge an acid secretion which readily dissolves the plastering from the cocoon, and the fibres of silk giving way the perfected moth emerges from its prison as a rule early in the morning about day-break. That the secretion is an acid can be readily ascertained by examining an empty cocoon immediately after the moth has emerged; as the part being moist it can be readily tested with litmus when it is seen to give an acid re-action. This knowledge I have practically applied by adding diluted sulphuric acid in the water in which the cocoons are boiled to dissolve the gummy substance out and loosen the thread, and it can then be readily wound off on a hand-reel.

The male and female moths differ in size, the male measuring from the tip of one wing to the other between four and five inches, whilst the female measures from six to seven inches in expanse of wing; both are of a uniform yellowish brown, having a couple of lunated transparent talc like spots in each wing, and it is chiefly in the form of these spots that they differ from other moths of the same kind, namely, the *Satarina Atlas* in which they are of a triangular form, and the moths themselves have a greater expanse of wings.

It takes from ten to twelve days for the eggs to hatch, and from six to seven weeks from the extrusion of the young larva to the completion of the cocoon.

When the cocoons have been collected they are taken home and placed in an earthen chatty containing water, to which a quantity of wood ashes is added to facilitate the solution of the gummy substance and weighted with stones to keep them under water. Should the ashes not suffice the boiling is prolonged for hours before the cocoons are softened and the threads loosened, when they are reeled off on a hand-reel, and the fibres from several cocoons are reeled off together to form a single strand of thread, and are subsequently formed into hanks for disposal. By this means a good many natives get their living about the hill villages of the tributary mehals of Cuttack, as also in the Sumbulpore district.

The cocoon is slightly rough, of a greyish white colour, and slightly reticulated externally with an internal smooth varnished surface; is of an oval form, measuring one-and-a-half inches in length and one inch in breadth: the average weight with the chrysalis is 150 grains, that of the chrysalis itself 130 grains, the empty cocoon twenty grains, and the prepared thread twelve grains. But the cocoons vary much in size, and while some are large others are small.

I have now over thirty cocoons in my possesssion, some of which were in my keeping for the last five months, whilst others were but recently collected. The Orissa Paiks and other hill men cut the cocoons up into circular strips to tie around their match-locks to keep the barrel firm in the stock; they also use it as a cord for various other purposes, and it is reckoned to be very strong and durable.

The soundness of cocoons may be ascertained by their weight, as well as by movement of the chrysalis within when they are shaken, and should my duties keep me at the Presidency I intend trying some experiments for their propagation, and will, if desirable, submit a drawing of the larva, with an account of any further experiment that I may conduct. The difficulty in carrying out such an experiment for the propagation of the species consists in securing at the same time both male and female moths, and for this purpose a large number of cocoons is necessary, as otherwise it is possible that the few one possesses may turn out either all males or all females, as has happened to me more than once. For instance, on the 17th June, a female moth emerged, and on the 23rd two other females issued; shortly afterwards they discharged a slightly viscid secretion, and from three to four hours after their escape from the cocoons they began to deposit a large number of eggs (about 200) without a previous union of the sexes, which union is essential for fertile eggs, otherwise the eggs do not perfect. Of the cocoons now in my possession I am indebted to G. H. Cammiade, Esq., for several very good specimens; to R. H. Bell, Esq., for a couple that that gentleman has had for some months in keeping; F. Church, Esq., for a couple of cocoons and a female moth. A large quantity of cocoons may be collected from the Bhere trees about Madras, but the labour of searching for them will cost more than the silk produce will realize. I lately heard of a gentleman in Madras who succeeded in collecting and reeling off about ten pounds of this silk.

ENCLOSURE No. 2.—Drawing showing the different stages of the Tassch Silk-worm.

IN the second of these papers Messrs. Dymes and Co., on the part of Messrs. DeVecchj and Pater, request early orders on certain proposals made by them with reference to the introduction of improved Sericulture into this Presidency in February 1870.

Board's Proceedings, 19th February 1870, No. 1,151.

2. Their proposals were to supply not less than 500 cartoons of good eggs of the best breeds of silk-worm procurable from China, Japan, Italy, etc., under guarantee that a fair proportion shall germinate. They proposed to have the eggs hatched at their Oossoor factory and thence distribute the worms as directed by Government, on the stipulation that Rupees 10,000 should be paid after successful germination and distribution of worms. It has not been ascertained what the value of these cocoons is in the market. They constitute an important article of trade both in Europe and elsewhere.

3. The Board recommended the adoption of the proposal, but Government resolved to postpone the consideration of the matter till after the close of the then current official year (Government Order, 28th April 1870, No. 602)

Proceedings of Board of Revenue, 19th February 1870, No. 1,151.

4. In the meantime the subject has occupied a good deal of attention, and several Collectors and others have contributed useful letters on the subject which will be found on the file.

5. The Collector of Coimbatore, one of the most important silk districts, requested permission to visit Messrs. DeVecchj's factory at Kingherry in Mysore. He also urged the necessity of appointing a special agency to foster the spread of this form of industry amongst the people, on the ground that although it presents all the elements of success the experiment could not be fairly conducted except "under European supervision backed by Government authority." The Board withheld their support to this larger proposal "until the result of the measure already recommended is known."

Proceedings of Board of Revenue, dated 9th April 1870, No. 2,407.

Mr. Sullivan drew attention in the same letter to successful experiments made in the jail at Dharwar in producing good silk.

6. The proposed visit to Messrs. DeVecchj's establishment was authorized by Government, (Government Order, dated 9th June 1870, No. 810,) and Mr. Sullivan was directed to procure silkworm eggs from Dharwar with a view to similar experimental industry in the Coimbatore Jail.

7. The Collector of Tinnevelly, another silk district, also submitted some interesting communications on the same subject, (Board's Proceedings, dated 5th January 1870, No 30), from which the Board drew the conclusion that it was not "necessary to apply any artificial "stimulus to the production of the Mulberry tree" in that district.

8. The Government likewise, thought that it was not necessary to reduce the assessment on Mulberry gardens. But they considered that it would be "well to ascertain whether the insect "at present indigenous to Southern India is capable of yielding silk which will fetch a price in the "European market sufficiently large to remunerate the growers in India," and they remarked on the exceedingly defective process of reeling pursued in this country and on the effect on the market value of the product as illustrated by Messrs. DeVecchj. They resolved further to forward specimens of reeled silk as well as raw cocoons from Tinnevelly to the Secretary of State with a view to their being submitted to competent authority in England for opinion, and he was likewise "requested to obtain competent advice as to the best means of improving it," and to "send "a specimen or model of the best machines for the purpose (of reeling) used in Europe."

Government Order, 26th August 1870, No. 1,334.

9. Mr. Sullivan in November last submitted his interesting report on his visit to Messrs. DeVecchj's establishment at Kingherry in Mysore, bordering on the Collegal Talook, where the silk industry is specially pursued, with some general remarks of a practical character. His proposals are summed up as follows:—

Board's Proceedings, dated 5th January 1871, No. 37.

(1). "Permission to be granted to Mr. Mackenzie, Police Inspector, and Mr. Lennon, the "Talook Overseer, to cultivate a small extent of land with Mulberry in view to introducing "improved varieties of silk-worms into the Collegal Talook. This was sanctioned in Government "Order, dated 29th March 1871, No. 572.

(2). "Favourable terms to be granted to the Collegal ryots for waste lands brought under "Mulberry cultivation in view to an increased production of cocoons in that talook.

(3). "Establishment of a filature in the Coimbatore Jail, and at first a nursery for rearing "the best varieties of the worm in view to the distribution of good seed to the ryots.

(4). "Ryots taking up land for Mulberry cultivation to be allowed to hold them on favourable terms in the Coimbatore and adjacent talooks."

10. The Board thought that grant of land on progressive cowle would prove sufficient inducement to ryots to enter into the new branch of industry. They remarked that the want of cleanliness, as described by Mr. Sullivan, was likely to militate against the healthy nurture of silk-worms, and thought that it might be "advisable for Government to erect light *airy*

Board's Proceedings, dated 5th January 1871, No. 37.

"buildings of a cheap and temporary character as silk-worm houses" for the use of all "engaged "in the industry." The Board reiterated their recommendations that a supply of eggs should be got from Japan, as "there is no question as to the superior value of the Japanese cocoons "when compared with the native cocoons of this country."

11. The Government in their Order, dated 29th March 1871, No. 572, conceded favourable terms for the cultivation of the Mulberry in Collegal and other talooks of the Coimbatore District, and authorised the Board to extend the same concession to other districts. The establishment of Mulberry cultivation and silk-worm rearing in the Coimbatore Jail had, they observed, been authorized, and the Government desired the Board to ascertain through the Chief Commissioner the results of Messrs. DeVecchj's and Pater's further experiment in Mysore, and likewise whether the introduction of Dharwar "seed" into Coimbatore had been successful and satisfactory.

12. From the reply received from the Officiating Secretary to the Chief Commissioner at Mysore it appears that the attempts made by Signor DeVecchj, aided by the administration of Mysore since 1866 to revive the languishing industry of sericulture, by introducing foreign species of silk-worms to re-place the indigenous breeds which had nearly died out from disease and exhaustion in the silk-producing talooks, have entirely failed.

It appears that twenty years ago a silk factory was established near Bangalore under a Government Officer. The experiment had, however, to be abandoned and little better success attended the attempt made in 1866. Further attempts were again made in 1867 and 1870, and again in 1871, all of which have (the latter as far as can be ascertained at present) proved eventually unsatisfactory. The Chief Commissioner states that he has failed to ascertain precisely the causes of failure, but concludes that the climate of Mysore is not favourable to the newly imported Japanese breeds, and is not prepared to renew the experiment, unless it can be clearly proved that with skill and care these breeds can be acclimatized in Mysore.

13. On the other hand the Collector of Coimbatore reports that the experiment in the Coimbatore Jail has proved "quite successful;" 19,450 cocoons produced weighed 27 lbs. 14 oz, and the reeled silk weighed 3 lbs. 4 oz.— *Vide* Superintendent's report.

Dated 29th May 1871, No. 146.

14. In the meantime an answer has been received from His Grace the Secretary of State in reply to the reference made by this Government under date 26th August 1870, No. 1,334, with the reply of the Secretary to the Silk Supply Association, dated 15th February 1871, No. 1,623, on the Tinnevelly cocoons. They are judged superior in some respects to the common Multivoltius cocoon of Bengal, but "are of an inferior description, carrying the appearance of having "been once a superior race to what they are at present, most probably an imported race not "indigenous to India." The defects in the quality of the silk are attributed to "want of strength "and vigor in the worms, either the result of bad improper rearing or of climate. Probably both "causes have tended to degenerate this breed."

15. The Association discourage the transmission of such cocoons to European markets as not likely to prove remunerative; but they observe, "The satisfactory feature in these specimens "is that the filament exhibits a full amount of 'nerve,' or elasticity, showing beyond a doubt "that a much higher class of silk-worm could be successfully reared where these specimens came "from, and that with the proper seed, and due care, a very different result can be obtained with "but little additional labour."

16. Observing that certain named localities in this Presidency are admirably adapted for sericulture, and adverting to the suitability of Southern India to produce better and more encouraging results, the Association send "specimens of Natal cocoons from Japanese seed originally which has now been for some years acclimatized in the Colony; the great contrast," they remark, "is at once perceptible." Specimens of cocoons from Kangrah are likewise sent, which show valuable qualities and "high class breeding," but are seriously impaired by starvation. The Association certify that these cocoons would be "equal, with proper culture and food, to the "highest priced cocoons in the European market."

17. With the information before them they consider "that the white cocoon from Natal, which produces three crops in the year, would be the best adapted to Southern India. The breed," they add, "is now very scarce in Japan and should be obtained from the Colony in preference to "the risk of being deceived by receiving another different breed from the Japanese."

18. The Secretary to the Association concludes—"I would respectfully impress upon His "Excellency the extreme desirability of first improving, or of substituting, an entirely new race "of worm and testing the cocoons before commencing reeling, and it is a question to be decided "only on the spot whether with the labour available the cocoons, thoroughly dried, would not "be a more profitable commodity than the reeled silk. This would be determined by the cost of "sufficiently skilled labour to reel the silk properly."

The reeling machine which the Association recommended is one constructed in Milan.

19. His Grace the Secretary of State notices the opinion expressed by the Association "as "to the superior importance at this present moment of the improvement of the worms to that of "the improvement of the machines for reeling," and intimates his readiness to request the intervention of the Association "in procuring such fresh seed as you may think necessary for improving the important cultivation;" also to transmit one of the machines recommended by the Association.

20. The Government have ordered one of the latter, and requested the Board's opinion on the subject of procuring seed of the approved white cocoons from Natal.

Government Order, dated 25th April 1871, No. 735.

21. With their letter the Association transmit a copy of No. 9, Vol. I., of the Silk Supply Journal, dated 16th January 1871. The Board think it desirable that three copies of this serial should be transmitted to India (including back numbers) regularly, one for the Government Office and two for the Board.

22. The number of the Journal before the Board contains an interesting and very suggestive report on silk culture in California, where, under State encouragement, the industry has in a few years become very important; an interesting account is also given of one of the principal silk-worm nurseries in that State.

23. In the Silk Supply Report, page 175, the Editors notice the report of the Acclimatization Society of New South Wales, from which they make the following extract:—

"I have also to acknowledge receipt of the package of eggs and seeds from Dr. DeVecchj of Mysore, and have the great satisfaction of saying that they arrived in most excellent condition; * * * * and am happy to add that I am assured of the continued well-doing of the silk-worms which have turned out quite healthy, and prove a most valuable acquisition to this Colony."

The Editors remark, "We have great pleasure in seeing the society receiving seeds and grain from Dr. DeVecchj of Mysore, can congratulate them upon being in good hands, and certify to a sample of silk produced on his estate being second to none in India."

24. The Board further draw the attention of Government to a Report on Cocoons from Natal, taken from page 175 of the number of the Silk Supply Journal above quoted. This extract is re-printed as an enclosure to these Proceedings, as the Board think it desirable to place on record as a useful addition to the papers on Sericulture.

25. The Board will not detain these Proceedings in order to lay before Government a complete resumé of the history of silk-culture in Southern India as far as it can be ascertained from the records in their office. To compile such a brief account would take longer than time now permits, but the volumes on this subject are being now collected, and the Board hope to be able to record the result.

There is, however, ground for asserting that the silk-worm is not indigenous to Southern India. The tradition is that it was introduced by the Mahomedan rulers of Mysore not less than a century ago. It is certain that much encouragement was given to it by Hyder Ali and Tippu Sahib, and in the Report by the Juries on the Madras Exhibition of Raw Products, etc., of Southern

Report on Cocoons from Natal, re-printed from the Silk Supply Journal, No. 9, Volume I., page 176, referred to in paragraph 24.

THESE Cocoons give one of the most interesting results that we have seen as yet, as they prove that not only is the Colony of Natal as suitable as northern climates for rearing silk-worms, but the worm appears to recognize in the climate and food something akin to its native country.

2. The seed, which was sent by the Association to Natal in 1869, was the re-production in Egypt of a high class Japanese breed, and it was principally the favourable reports on the acclimatization of this breed which induced His Highness the Khedive to take up silk culture as he has done.

3. We have now the result of rearing the seed of these re-productions in an English Southern Colony, and the cocoons show beyond all doubt such an improvement in the breed as to warrant our classing them as quite equal, if not superior, to the original Sinchien worm in their native country. With these we have specimens of the Japanese Trivoltino, which have been in the Colony some time, having been imported direct from Japan, and it is gratifying to be able to state that these two have improved in quality, compared with the same race exhibited by the Society of Arts in 1869, and have been pronounced, by an eminent Italian Sericulturist as a most valuable breed.

4. Some magnificent seed has been sent lately to the Cape and Natal, and if we may judge from the results now before us this year will bring us from South Africa cocoons equal to the best in the world.

Note by the Superintendent of the Government Farm, referred to in paragraph 32.

I REALLY cannot advise as to the probable results of commencing operations *here*; the matter will at best be but an experiment; we will have to determine the suitability of *our climate*. Undoubtedly one of the greatest sources of failure in this country has been the *poverty* of the food provided, and this is certainly within *our* province. The exhaustion which has been going on in our soils for ages has produced the results that could only be expected, inferior produce. Tobacco, and nearly everything produced on Indian soils, is deficient in the chemical ingredients which add so materially to the value of agricultural produce. I am strongly of the opinion that, until the chemical value of the food provided for the worms in this country reaches the chemical value of the foods provided in other countries, all expectations will end in failure. Why are the experiments so successful in California and Natal? simply because in both these countries the food of the worms is grown upon *virgin soils*, soils which have been uninjured by the reckless system of farming tolerated by the State in this country. It would throw a great deal of light upon the subject if analysis could be obtained of the leaves of the Mulberry tree, as used for silk-worms in the district, where silk culture has been most successfully introduced. If we are to be included in a general system, organized for the *improvement of the productions* of the country, it would probably be the wisest course to concentrate our endeavours as much as possible and to start operations here where there are facilities both as regards ground for the production of Mulberry plantation and for the erection of the necessary buildings only. I would strongly recommend that, as there is a general expectation that something really worthy of Government will be done, expense should not be a hindrance to the matter being brought to a satisfactory issue. It will of course be absolutely necessary to get out from Italy, or some other country where silk culture is well understood, a qualified man who is thoroughly conversant with all the details of silk culture. It would be very unfortunate should a matter of such importance be entrusted to an amateur let him be ever so able to write on the subject of silk culture. A man of the Foreman or Overseer class, who had had charge of a commercial undertaking in some country where silk culture is extensively practiced, might be added to our establishment; until we possess some such man I would regret very much were silk culture attempted *here*, as you are aware everything done *here* is open to the public; only let us commence an industry of which we know nothing, and *fail in the attempt*, and the result will blast the prospects of silk culture for years in this district.

India in 1857, (published in 1858 by Graves and Co., Madras, and in the records of the Government Office,) there is a good deal of correspondence on the subject, which shows that great interest was taken in the subject, not without success, under the auspices of the late Honourable East India Company. Bengal seed was introduced into Madras in 1790, and also Chinese seed, apparently through Bombay.

26. From the letter of the Collector of Chingleput, (recorded in Board's Proceedings of the 30th September 1869, No. 7,280,) it appears it was known in the district that about 80 years ago Mr. Anderson, whose name is prominent in the correspondence recorded in the publication above referred to, reared silk-worms at Kotambakam in the Poonamalle Division, and realized good profits; and that ten years ago a Mussulman cultivated silk for two years at Trivellore, but relinquished it as the worms died from excessive heat consequent on great drought.

Beyond this little or no information has been forthcoming in reply to the Board's inquiries as to knowledge or tradition of silk-culture in former days at the places named in their Proceedings of the 30th September 1869, at which from the above publication it seems that silk culture was carried on from 80 to 100 years ago.

27. The Board have no intention and no wish to under-state the difficulties attendant on any attempt to revive the culture of silk on a large scale.

Introduced originally, as there is little doubt, with the assistance of State aid; brought at one time to a pitch of considerable excellence and carried on, on an extended scale, silk culture in Southern India now scarcely carries on a languishing existence. Failure attended the attempts of the East India Company in the early years of the century; failure has quite lately been only too uniform in the efforts made by the Mysore administration.

By the French Government in India silk culture has been entirely* given up, as it would not cover one quarter of its expenses.

* Letter from His Excellency the Governor of French Settlements, (in Board's Proceedings, 9th February 1870, No. 939.)

28. But in spite of many adverse circumstances, falling prices, the result of competition among purchasers, and the rapacity of middle-men through whom alone the poorer classes (into whose hands this production had fallen) could reach the markets; in spite of ignorance on the part of the growers, want of enterprise, and of means to restore by selection and importation the vitality of the worm and to provide proper and sufficient food, this culture has not altogether died out. This shows that the industry has existed and can exist, notwithstanding neglect and under unfavourable conditions. The Board have little doubt that not a few parts of Southern India are well adapted to the growth of the Mulberry and the culture of the silk-worm, (notably parts of the Coimbatore District, Courtallum in Tinnevelly, parts of Mysore and Madanapally in the Cuddapah District,) and that with the assistance of the State the culture may be revived and successfully carried on—a source of profit both to the people and to the State.

29. But they are convinced that it is only with aid from the State that this can be done; that if any assistance is to be given by the State now is the time; and that no success can be looked for unless considerable expenditure and exertion be incurred and the experiment carried out on a systematic and well-considered plan. If Government trusts simply to availing itself of the assistance of desultory efforts on the part of individuals, whether official or non-official, who may have a taste for this interesting and delicate culture, the result cannot but be a failure however well-intentioned, intelligent, and even successful the experimenters may individually be.

30. Government have already sanctioned the measures which diminish or remove any obstacles which may have heretofore operated to discourage the growth of the Mulberry tree, and have shown their readiness to encourage attempts to revive sericulture. It only remains to go further to systematise future efforts and to provide those engaged in this industry with the means of contending against the difficulties with which it is at present oppressed by importing for distribution the best breeds of worm procurable.

31. Trusting that Government will concur in the above views, and are prepared to incur the necessary outlay, the Board will to the best of their ability state the causes which have led to the degeneracy of the breed of silk-worms, and consequent decay of the trade.

32. They have no doubt whatever that the real efficient cause of this is *starvation* of the worm. This cannot be too strongly put or too often insisted upon. On this subject the Board beg to refer Government to a valuable Memorandum by the Superintendent of the Government Farm, which is appended to these Proceedings. Either as the natural result of ignoring the principles of agricultural economy, the consequence of which is a general exhaustion of the soil, which for ages has had increasing calls made upon it by cultivation, with hardly any attempt to restore to it those chemical properties necessary to fertility, or in consequence of inferiority of the trees selected for the food of the worm, or both, the worms have been starved; moreover, the food supplied has not been sufficient in quantity. And here it may be observed that whatever be the causes, whether it be that the localities in which this people are directly found were peculiarly suited to this culture or whether by special encouragement on the part of their own rulers, or by a more natural aptitude on the part of this race, the industry is now confined almost exclusively to the Musulman part of the population, and to the *lower* and poorer classes of that people, who though in many ways well adapted for carrying on an industry requiring little physical exertion, much patience and delicate handling, are only too deficient both in scientific knowledge and in enterprise, being unable or unwilling to incur present expenditure for future and not immediate profits.

33. The necessary consequence of starvation has been degeneracy of the worm, a delicate exotic, which even in countries most adapted to it requires the finest and best nourishment to maintain it in that excellence which is essential to its being worth keeping alive at all, and there is no doubt that in a tropical climate the worm is especially liable to deteriorate owing to its tendency here to generate much more rapidly than in more temperate climes, and to its being here especially liable to canker and disease.

34. It only remains to state the measures which the Board consider best adapted for removing the prime cause of degeneration and decay in the worms, viz., starvation, and for renovating and improving the breed.

35. The Board would at first limit the cultivation of silk-worms exclusively to those localities in which it is still carried on with fair success, and where it is best understood (see paragraph 28); adding only the Ganjam and Vizagapatam Districts where they have little doubt localities very suitable for the culture can be found.

36. Next, in addition to the measures already sanctioned by Government for encouraging the growth of the Mulberry it should be ascertained by experiment, and by reference to those who have a special knowledge of the subject, what kinds of soil and manures are best suited for the growth of the Mulberry, and what kinds of Mulberry are found to be best adapted to the nature of the silk-worm, with reference to the localities in which the culture is now carried on. To this end they would suggest a scientific chemical analysis of the leaves of the Mulberry, for it is evident, as shown in the Silk Supply Journal, Vol. I, No. 9, page 163, that certain soils and climates develope bad qualities, such as wateriness in the leaf, which becomes deficient in gluten, and too full of acid, a result injurious to the worms. The Board would distribute seed of the kinds ascertained to be best to growers gratis.

37. To introduce on a large scale the best and most expensive kinds of foreign worms without providing beforehand proper nutriment, and depots for receiving and hatching the eggs and distributing the seed, can only end in failures. The next step, therefore, is to start nurseries at well-selected centres where the seed may be received and hatched, and the species kept up and improved by breeding and selection, and distributed at first gratis; it might eventually be sold and made to pay expenses.

38. The Government Farm affords facilities for starting a Mulberry plantation on a considerable scale, and some of the farm buildings might easily be made available for a nursery.

A note by the Superintendent of the Farm on this subject, which is appended, has been before referred to.

39. Constant renewal of the seed and careful selection will be the best restorative, and the Board would not delay arrangements for the importation of a *moderate quantity* of the best breeds procurable from Japan, China, Natal, and perhaps Egyptian, and Kangra varieties. Japan is undoubtedly the source of the best seed, it is the origin of most of the other kinds above specified, and also of the finest Italian species.

40. But the Board, as now advised, would not accept in its entirety Messrs. DeVecchj and Pater's offer. Either half the quantity should be taken at half the cost now asked, or the firm should be requested to import 500 cartoons of the finest breeds in equal instalments for three years' payment of £1,000 being guaranteed proportionately for each year, on condition of a certain fixed quantity of the seed germinating successfully.

The offer of this firm has this advantage that they undertake the hatching and distribution of the seed imported.

For that of other seeds Government would, no doubt, have to make their own arrangements.

41. Natal seed should, however, be obtained at once; direct, if possible: if not, through the Secretary of State for India.

42. For carrying out the proposals of the Board, diligent and intelligent, indeed scientific attention will be required, and considerable expense, as before remarked, must be incurred to prevent total failure. The Board think that a special officer with a small establishment ought to be appointed to superintend and ensure uniformity in the operations in the several districts where the culture is to be taken in hand. It does not seem necessary to enter more into detail on this point at present, until the views of Government are ascertained.

43. The Board advise that at first, at all events, operations should not be extended to reeling silk.

44. The Board sanction the extension to the district under the Commissioner for the Neilgherries of the concessions made in the Order of Government, Revenue Department, dated 29th March 1871, No. 572, in regard to the reclamation of waste land taken up for Mulberry cultivation; but pending the decision of Government as to expenditure under a system of State encouragement they are not prepared to recommend the grant of sums of money to private persons for carrying out experiments with silk-worms.

45. The Board have to thank Dr. Shortt for his very interesting Report on the Tasseh Silk-worm, which they suggest should be laid on the Editors' table.

(True Copies and Extract.)

F. Brandt.

Acting Sub-Secretary.

To the Secretary to Government, Revenue Department,
with one file of correspondence, Extract from Silk Supply Journal, Memorandum of Superintendent of Government Farm, one Drawing, and two packets of Cocoons.
,, the Collector of Coimbatore, with Extract from Silk Supply Journal, a Memorandum of Superintendent of Government Farm, and Government Order, 25th April 1871, No. 735.
,, the Commissioner of the Neilgherries, with do.
,, Messrs. Dymes and Co., with do.
,, A. P. DeVecchj, Esq., with do.
,, A. F. Pater Esq., with do.
,, the Officiating Secretary to the Commissioner of Mysore, with do.
,, the Superintendent General of Vaccination, with do.

Rev 1871. Dep

Board of Revenue,

MADRAS.

PROCEEDINGS, 31ST JULY 1871, No. 3,188.

Dep.t 15 Aug.t 71

Encl. 4

Received. 17 Aug.t

JULY.

No. 3,188.

Sericulture.—Correspondence regarding introduction of improved sericulture into Madras Presidency, submitted to Government with remarks.

S.C. No. 317 — Mr. Dent 73

S.L. No. 318 — Do

89

Ihr dreimaliges Hoch Ihnen?

Ihr treuergebener in Kilpauk

Ganz ergebenst.

F. Brandt.

18.12.71.

79
10

ENCLOSURES.

No. 1.

India Office,
12th January 1871.

Sir,

I am directed by His Grace the Secretary of State for India in Council, with reference to the correspondence which took place with the Silk Supply Association in 1869, to forward to you a copy of a Despatch and its enclosures from His Excellency the Governor in Council at Madras, dated the 7th of November, No. 36 of last year, with its enclosures, on the subject of the cultivation of Silk in the Madras Presidency generally, and especially in the Tinnevelly District.

You will perceive that the Government of Madras is anxious to obtain the opinion of competent persons as to the value of certain packages of Reeled Silk and Raw Cocoons received from Tinnevelly, with the view of ascertaining whether it is probable that Indian grown Silk can be made to fetch a better price in Europe than it now commands in India; and that the Government also seek for an opinion of the silk reeling machine in use in Tinnevelly, of which they send a specimen, and are also desirous of receiving from England a model or specimen of that which is reckoned the best machine for the purpose in Europe. I am, therefore, to request you to move the Association to be good enough to assist His Grace the Secretary of State in this matter, and I am to inform you that, should the Association deem it a real advantage to comply with the proposals of the Government of Madras to send out a machine from this country, the Duke of Argyll will be ready to send one out. I am to forward a sketch of the machine sent over, and to inform you that the cases containing the Reeled Silk and Raw Cocoons and the machine will be ready for inspection at the Museum attached to this Office, or, should it be more convenient to the Association, they could be sent on loan to any place designated by them.

I am, &c.,
(Signed) J. C. Melvill.

P. L. Simmonds, Esq.,
Secretary, Silk Supply Association.

No. 2.

Silk Supply Association,
65, Moorgate Street, E. C.,
15th February 1871.

No. 1623.

Sir,

With reference to your Despatch of the 12th ultimo, and its Enclosures from the Governor of Madras, advising having sent specimens of Cocoons, Reeled Silk, and a Reeling Machine, from Tinnevelly. I have now the honour to submit the following report upon two packages received from the India Museum, upon the 25th January, said to be from Tinnevelly. Both these parcels are of the same, and, although superior in some respects to the common multivoltius cocoon of Bengal, are of an inferior description, carrying the appearance of having been once a superior race to what they are at present, most probably an imported race, not indigenous to India.

The floss and waste silk is very abundant in these cocoons, in a much greater proportion than it should be, caused by a want of strength and vigour in the worms, either the result of bad, improper rearing, or of climate. Probably both causes have tended to degenerate this breed.

The quantity of silk is deficient, not, perhaps, as compared with the ordinary Bengal cocoons, but as compared with cocoons suitable to the European markets, to which markets it would not be desirable to send them, for the reason that, while the obtainable results would be of small value, the cost of transport and concomitant charges would be the same as upon much higher class cocoons, of a much greater value. Consequently, the proportion the charges would bear to the proceeds would be considerably enhanced.

The satisfactory feature in these specimens is that the filament exhibits a full amount of "nerve," or elasticity, showing, beyond a doubt, that a much higher class of silkworm could be successfully reared where these specimens came from, and that, with the proper seed, and due care, a very different result can be obtained, with but little additional labour.

That Southern India possesses large tracts of country suitable to Silk culture there can be no doubt. The slopes of the Neilgherries and Shervaroy hills are admirably adapted to sericiculture, and correspond, in many particulars, with many parts of Japan and South Africa, more especially Natal. I have the honour to enclose, for the guidance of His Excellency the Governor, specimens of Natal cocoons from Japanese seed originally, but now some years in the colony; the great contrast is at once perceptible; where these were reared, coffee is grown, and the mulberry used to protect the young coffee from the wind.

I also beg to enclose specimens of cocoons from Upper India, which show such high class breeding and, if perfect, such a valuable cocoon, that inquiries were instituted as to why so good a breed gave so poor a result. The answer was, that these worms had been fed but twice in the 24 hours, instead of six times. They came from Kongrah, and, I am informed, within a short distance from the *plains*, where the Government experiment signally failed; but these are from the slopes of hills.

I would respectfully draw the attention of His Excellency to this, because, although this report may be considered discouraging as regards the cocoons sent us to report upon, it should not be so as regards the suitability of Southern India to produce better results. How the breed of worms at Kongrah got there we have no means of ascertaining, but we can certify to their being equal, with proper culture and food, to the highest priced cocoons in the European markets.

Should His Excellency be pleased to furnish us with meteorological, geological, and botanical reports (the two last roughly), we shall be enabled to advise with greater exactness, and perhaps point out the description of worm more especially suited to the localities.

Speaking with such information as we have before us, it is probable that the white cocoon from Natal, which produces three crops in the year, would be the best adapted to Southern India. This breed is now very scarce in Japan, and should be obtained from the Colony in preference to the risk of being deceived by receiving another different breed from the Japanese.

Reeled Silk.—As advised from the India Museum there was none found in these packages.

The Reeling Machine is rude, and results produced from it would not compare with more complete machines. The most approved is one the Association has lately introduced into Macclesfield, constructed in Milan, and, should His Excellency desire one, there will be no difficulty in getting one forwarded to Alexandria, and thence to Madras. I may mention that the Japanese Government lately received two, and were so struck with their superiority that they pulled them all to pieces in order

to obtain exact patterns of all the various parts, and are now making these machines themselves. One of these machines would cost about 30*l.* landed at Madras, and might serve there to modify and improve the native reel.

I would respectfully impress upon His Excellency the extreme desirability of first improving, or of substituting, an entirely new race of worm, and testing the cocoons before commencing reeling, and it is a question, to be decided only on the spot, whether with the labour available, the cocoons, thoroughly dried, would not be a more profitable commodity than the reeled silk. This would be determined by the cost of sufficiently skilled labour to reel the silk properly.

In the event of any future specimens, it would be advisable to instruct the rearer to send with the cocoons a few leaves of the mulberry pressed between blotting paper and allowed to dry.

I am, &c.,

(Signed) B. Francis Cobb,
Honorary Secretary.

The Under Secretary of State
for India.

P.S.—I have the honour to forward three copies of the last number of "The Silk Supply Journal," which contains matter bearing upon this subject.

B. F. C.

with the Authors compliments

12

A brief account of the Tasseh Silk-worm, accompanied with drawings of the insect. By Surgeon J. SHORTT, M.D., Supt. Genl. of Vaccination, Madras Presidency.

(Reprinted from the Madras Monthly Journal of Medical Science.)

(Extracted from the Proceedings of the Board of Revenue, No. 3188, *dated* 31*st July* 1871.)

SOME time ago I observed that accounts of the silk-worm were called for by the Board of Revenue, especially of those that are indigenous to the country, and as I was then in camp I could not attend to the subject, but having had drawings of the *Tasseh* silk-worm by me for some time, and believing that the subject is one of great interest, I now beg to submit the following remarks explanatory of the drawings that accompany it.

The *Phalæna papia, Linn*; *Anthera Mylitta, Saturina Mylitta* (Drury) is commonly met with in most parts of Southern India. My attention was first attracted to the subject in 1855-56 whilst in the jungles of Orissa with the Topographical Survey. I there observed that it was bred in most of the hill villages, and that a large quantity of Tasseh silk was exported from thence to Calcutta, Madras, and other places. The hill natives, Ooriahs and some of the lower tribes, as well as Telingas, first collect cocoons, and in most instances from their size and form, they are able to recognize the male from the female cocoons pretty correctly, and carefully preserve them till the moths emerge, when the males are let loose, while the females are carried to a tree they select for the purpose in the vicinity of the Asan or *Pentaptera tomentosa* (Terminalia tomentosa) on which they are placed, where they soon begin to creep along the branches with quivering wings, and in a short time, varying from one to eight hours, the males by some instinct get attracted to the spot that contains the females, and an immediate union of the sexes takes place. This lasts from three to four hours, and shortly after the female begins to deposit from 100 to 200 eggs on various parts of the twigs of the tree; 33 of these eggs weigh 5 grains. These eggs when freshly deposited are sticky, but as they dry they

adhere firmly to the bark of the stem where they were deposited, and often to each other, forming a cluster. The moth dies the next day and the male also perishes about the same time.

I should mention here that the natives watch the tree to keep away crows and the birds from destroying the moth, as well as to ascertain the time of the arrival of the male, by which they pretend to prognosticate the success or failure of the undertaking, attributing the rapidity of arrival as a sign of prosperity, and a lateness of arrival as indicative of non-success; but, as I have ascertained for myself, there is no truth in such assertions.

Others again keep the moths on small branches or twigs of the Asan or Bher trees about the outside of their huts, or tied on to other trees till the union is effected, and the eggs are deposited; the eggs are of the size of a split pepper corn; nine of them in line occupy the space of one inch in length. They are circular and bi-convex with a light creamy colour. These they keep till the young larva begin to emerge from the eggs, when they are taken and tied on to Asan trees, on which the young disperse themselves; a watch is kept during the day to keep away squirrels, birds, crows, etc., and at night a fire is kindled in the vicinity to frighten away bats, while the root stem is surrounded with ashes to prevent ants having access to them; and in the selection of trees, care is taken to avoid those that are infested with ants.

The worm is very small, scarcely perceptible when first hatched, but before it attains maturity it is from three to four inches long and from two to three lines in girth. The larva is of a light green colour with a slightly yellowish streak on either side, and the sixth and seventh segments are marked with an oblong yellow spot, and on the back are several round darker coloured spots surmounted with a few dark coarse hairs, while smaller ones are scattered all over the body. The larva is chiefly found on the *Bher* or *Zizyphus jujuba*, *Asan* or *Pentaptera tomentosa*, and the *Teak* or *Tectona grandis*. I have found them chiefly on the *Bher* tree in Madras, although I got one cocoon from a Teak tree, and another from a Casuarina at Mr. H. Church's, Perambore. The larva when ready to undergo transformation forms a cord round a twig from a peculiar resinous substance it secretes, and with which it also encircles the selected part of the branch, and then prolongs it to the extent of one or two inches. If the branch is thick the cord is short and stout and about a line in girth, but if it be a twig the cord is thin, from three to four inches long, and fastened to an upper and thicker branch, and prolonged to the end of the twig with several intermediate ties of the same material. From the end of the cord, which is solid, begins the expansion of the cocoon, which is reticulated with fine fibres of the same stuff as the cord is made of on the outer surface, thus giving firmness and solidity to the cocoon; and as it approaches completion, a few of the leaves in the vicinity are drawn to line and conceal the cocoon externally, and thus to a certain extent mask it from observation; but this only occurs on the Bher tree, for I have seen no such leaves attached to the cocoons found on other trees where the foliage is large and dense. The larva now imprisons itself within the cocoon, and the same secretion that forms the cord is freely applied to all parts to make it water-tight. Having done this, the transformation commences, and lasts nine months before the moth is perfected, having its head at the upper part next to the cord, from whence it appears to discharge an acid secretion which readily dissolves the plastering from the cocoon, and the fibres of silk giving way the perfected moth emerges from its prison, as a rule early in the morning about day-break. That the secretion is an acid can be readily ascertained by examining an empty cocoon immediately after the moth has emerged; as the part being moist, it can be readily tested with litmus when it is seen to give an acid re-action. This knowledge I have practically applied by adding diluted sulphuric acid to the water in which the cocoons are boiled to dissolve the gummy substance out and loosen the thread, and it can then be readily wound off on a hand reel.

The male and female moths differ in size, the male measuring from the tip of one wing to the other between four and five inches, whilst the female measures from six to seven inches in expanse of wing; both are of a uniform yellowish brown, having a couple of lunated transparent talc like spots in each wing, and it is chiefly in the form of these spots that they differ from other moths of the same kind, namely, the *Saturina Atlas*, in which they are of a triangular form, and the moths themselves have a greater expanse of wings.

It takes from ten to twelve days for the eggs to hatch, and from six to seven weeks from the extrusion of the young larva to the completion of the cocoon.

When the cocoons have been collected they are taken home and placed in an earthen chatty containing water, to which a quantity of wood ashes is added to facilitate the solution of the gummy substance, and weighted with stones to keep them under water. Should the ashes not suffice, the boiling is prolonged for hours before the cocoons are softened and the threads loosened, when they are reeled off on a hand-reel, and the fibres from several cocoons are reeled off together to form a single strand of thread, and are subsequently formed into hanks for disposal. By this means a good many natives get their living about the hill villages of the Tributary Mehals of Cuttack, as also in the Sumbulpore district.

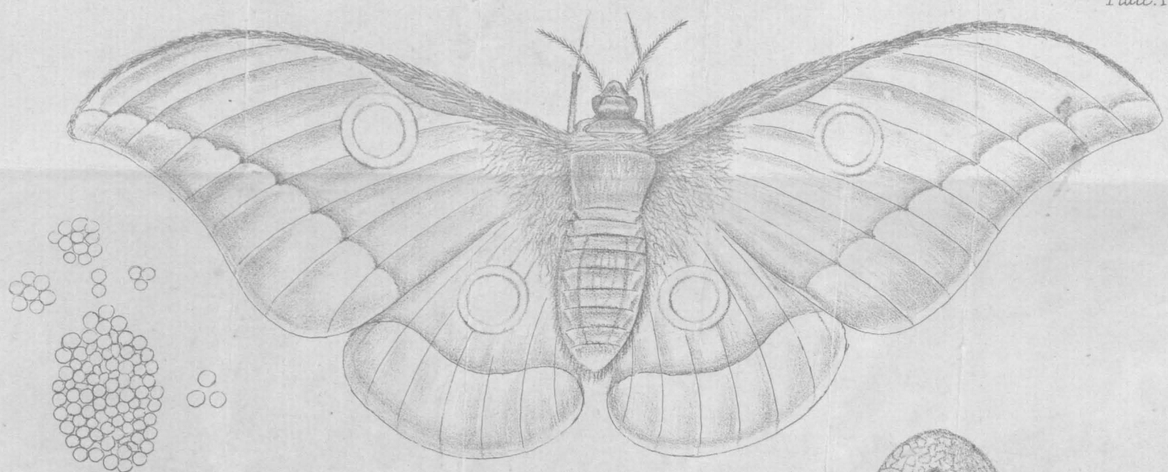
The cocoon is slightly rough, of a greyish white colour, and slightly reticulated externally with an internal smooth varnished surface; is of an oval form, measuring one and a half inches in length and one inch in breadth: the average weight with the chrysalis is 150 grains, that of the chrysalis itself 130 grains, the empty cocoon twenty grains, and the prepared thread twelve grains. But the cocoons vary much in size, and while some are large others are small.

I have now over thirty cocoons in my possession, some of which were in my keeping for the last five months, whilst others were but recently collected. The Orissa Paiks and other hill men cut the cocoons up into circular strips to tie around their match-locks to keep the barrel firm in the stock; they also use it as a cord for various other purposes, and it is reckoned to be very strong and durable.

The soundness of cocoons may be ascertained by their weight, as well as by movement of the chrysalis within when they are shaken, and should my duties keep me at the Presidency I intend trying some experiments for their propagation, and will, if desirable, submit a drawing of the larva, with an account of any further experiment that I may conduct. The difficulty in carrying out such an experiment for the propagation of the species consists in securing at the same time both male and female moths, and for this purpose a large number of cocoons is necessary, as otherwise it is possible that the few one possesses may turn

out either all males or all females, as has happened to me more than once. For instance, on the 17th June, a female moth emerged, and on the 23rd two other females issued; shortly afterwards they discharged a slightly viscid secretion, and from three to four hours after their escape from the cocoons they began to deposit a large number of eggs, (about 200) without a previous union of the sexes, which union is essential for fertile eggs, otherwise the eggs do not perfect. Of the cocoons now in my possession I am indebted to G. H. Cammiade, Esq., for several very good specimens; to R. H. Bell, Esq., for a couple that that gentleman has had for some months in keeping; F. Church, Esq., for a couple of cocoons and a female moth. A large quantity of cocoons may be collected from the Bher trees about Madras, but the labour of searching for them will cost more than the silk produce will realize. I lately heard of a gentleman in Madras who succeeded in collecting and reeling off about ten pounds of this silk.

Ganta Brothers—Adelphi Press.

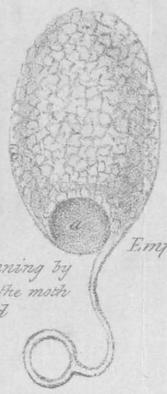


Female

Eggs

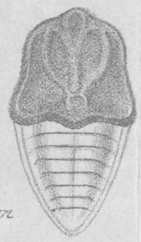


Perfect Cocoon



a. opening by which the moth escaped

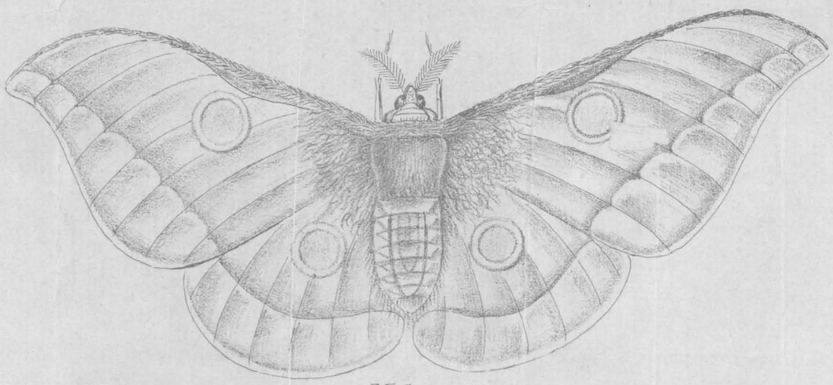
Empty Cocoon



Chrysalis



Cocoon showing the position of Chrysalis in it



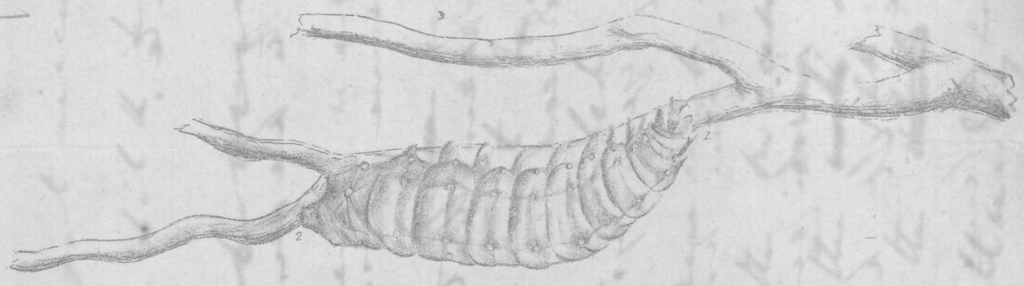
Male

Antheraea mylitta-Drury

Dempsey Lith.

To face page 113, No. XXVI.

Drawing No 2. Showing change of color the day before transformation or the beginning to spin its cocoon



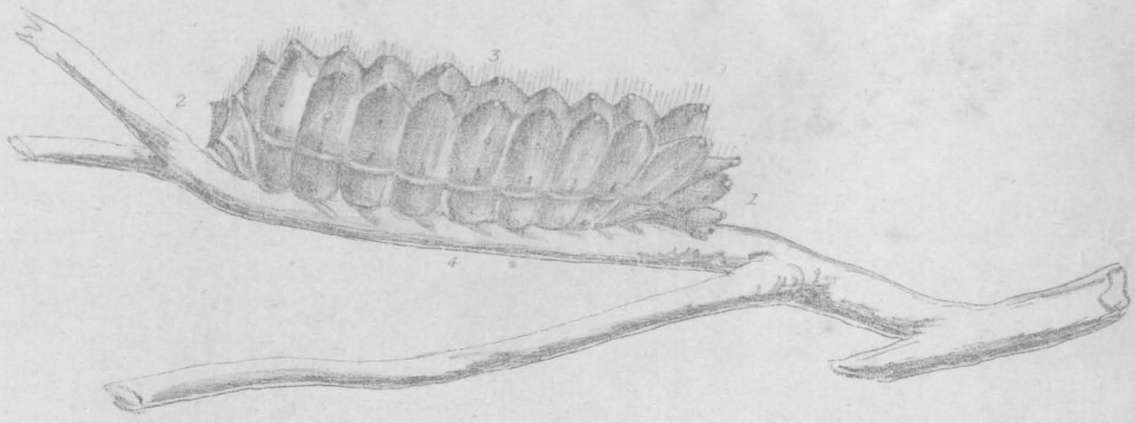
Caterpillar of the Tasseh Silk moth

Larva of Antheraea mylitta-Drury

No 1 Head
2 Back

Dunphy Lith.

Drawing No. 1. Showing natural color of the Tasseh Silk moth Caterpillar



No. 1 Head
" 2 Back
" 3 Upper part
" 4 Lower part

Larva of Antheræa mylitta - Drury.

To face page 113, No. XXVI.

Route!

From the Lakes which the Broad
of Revenue have taken before fit-
it a dream that Agriculture can
in this Road into Lectures during
many years ago - neither the
hills - storms nor the hurricanes
being ~~in~~ dangerous in this Road.
dency. It has, ~~to~~ at the
present time been carried on
in different parts of the country.

but seems never to have attained
any great importance. and
the quality of the silk has been
generally inferior.
~~Experiments have been unsuccessful.~~
Various experiments made at
different times to improve it.
(under Brg the present Experiments
in Bengal have failed.

From the amount of care
bestowed on the successful
management of the worms and
the production of the silk required -
and the risks attending the fa-
-ilure, I doubt whether

light soil can be largely increased
if ever lucrative - profitable as it is.
when successful - It may be checked
but European Firms & Capitalists
may encourage it in its infancy
as the Ryots are encouraged to grow
Cotton, I think, to a large extent -
Cottage Industry -

in this manner as best, it is
well worth the while of Govt.
to give some & encouragement -
-ouragement, as giving profitable
employment to women
& children - especially those
of the Mohammedan com-

preparing the cotton by cleaning
it of the imported varieties &
and to grow this American
plant to establish a factory
in which experiments of every
kind can be thoroughly tried
publicly instead of in secret for dis-
tribution & instruction of
-fered to the people in regard
to the cultivation preparing the
crop for the market. I have
no faith in the declaring efforts

-manity, who are dependent for
their livelihood from many methods
their livelihood.

I am convinced that
the surest, indeed the only
way - of attaining any perma-
-nent, material improvement
is to procure a better primi-
tive practically & universal
in & consonant with the
-lishment of a silk factory
from first to last - in every
detail and competent to
conduct experiments with

of the skilled cultivators -
and to the rising generation
the cultivators - with whom personal
gains will naturally be the
first consideration - while, I am
confident, prove an important
& extensive one. I do not believe
that the State should engage in Horticulture
as a commercial
speculation or any way - or that
it should hold out any pecuniary
inducement to the public to
apply their labor & capital

to Horticulture - the I desire is
that the State should do what
the public cannot do for their benefit -
experiment thoroughly & practically
with all the various species of Fruit.
by the aid of skill - & science
& the it bears
to Science, I am sure;
that this Society can by
its experiments with the various kinds
of the Apple - by Letter "Seed"
by Pear tree can be
be made really profitable,
& manifest gain will accrue
to the country and the public
will be amply compensated in Horticulture

I, in fact, do not consider that the State Grant made for Agriculture from it is used Grant for Agriculture and how spent, will the Board visit an Undertaken Grant for Cotton Cultivation & other products I should be glad to see at a Committee from could be arranged in Bombay for but a few days during the cold season and an annual allowance of Rs 20 to 40 thousand Rs would be sufficient - the Experiment being limited to four or five years. I would be glad to be written to by the 2 Secretaries to the Board put leaving them to determine whether they can spare from their for the Purpose.

at present. We have no
Local Fund Committee in the
district & little cotton. I cannot
write without being absent in
and a few days cultivation. Our
Officers - the Collectors & Deputy
Collectors have not the special
knowledge which includes Experimental
Farming & cotton practically
Their aim
Cultivators and have no interest in
the subject and all their time is
taken up with other

attention. Here are they
are liable to change and the
experience teaches them to shake
hands and then ally themselves
At the beginning of the session
he have made twelve & twenty
they were all in the way of
to die die to investigate on the spot
I have to fit in but to
culture. and cannot become
heard it. If we do anything, the
conclusion which in my judgment
is most likely to prove true

and to be the most economical
is to establish a pot. factory -
a school in fact. where 24 learners
can be busily carried on - and
the people taught how to manage
the worm & its product.

J. D. Sluss

Rev: 1873: Dept
No 661

Minute by the Hon'ble E. D. Smith Esq

Dated
Read 7th March

G.O. No 317 dated 23 March

Relative to the introduction of improved sericulture into the Madras Presidency

C. 15 July 73 R 6. March 73

Revenue Department.

No.

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the 187 .

Read the following Proceedings of the Board of Revenue:

Subng to Govt with remarks correspondence regarding introduction of improved sericulture into Madras Presidency } B. R. 31: July 1871 No 3188

The foregoing Proceedings convey the Board's recommendations in regard to the measures which should be adopted for the improvement of sericulture in this Presidency.

After reviewing the correspondence which has been recently carried on in relation to the subject, the Board proceed to state the conclusions at which they have arrived. They attribute the degeneracy of the breed of silkworms and consequent decay

I concur in the view expressed in this Govt order.

Believing, as I do implicitly, in the

decay of the trade to
starvation of the worms,
and they submit the following
proposals as best adapted
to remedy the defects
which have hitherto
rendered the culture of
silk a failure

1st. Limitation of operations
at the outset to those localities
in which fair success is
still attained.

2d. The institution of
experiments with the view of
ascertaining the description
of soil and manure best
suited to the mulberry and
the kinds of mulberry best
adapted to the nature of the
silkworm, seeds of the approved
kinds being distributed to
growers gratis.

3d. The establishment
of nurseries for breeding the
worm and improving the
species, and being distributed
at first gratis and eventually
sold

soundness and importance
of the general principle
which condemns the
application by Government
of the proceeds of taxation
to the encouragement of
particular branches of
industry, — I am
unable to see any special
or exceptional consideration
in this case which could
justify us in setting that
principle aside.

Sort. but no sufficient
means of judging as to the
prospects of profitable
devoid from an particular

species of industry. The
enterprise will either be
successful, or it will be
unsuccessful. In the first
case, private persons
will evidently come to
engage in it: and the
interference of Govt. will
be useless. In the second
case, the public money
is simply wasted.
In either case, an
artificial direction,
tending to withdraw a permanently
useful portion to the employment
of capital: and this
is, in itself an evil. There

sold to pay expenses
4th The importation from
time to time of the best
seed procurable from
Japan, China & Natal
with a view to the renewal
of the seed, a supply of
Natal seed being obtained
at once

5th The entertainment
of a special officer with
a small establish-
ment to superintend
operations in the several
divisions where the
culture is to be
taken in hand, attempts
at reeling silk being
deprecated.

3. The Board
further suggest with
reference to
the proposal that
those Settlements
should

should be requested
either to supply 250
Cartons
~~Cocoons~~ of eggs and
to arrange for hatching
them and distributing the
worms in payment of
Rs 5000 or to import 500
Cartons
~~Cocoons~~ in equal
instalments for three
years payment of 1000
being guaranteed proportionately for each year, a
fair measure of success
in hatching being stipulated for in either case.

4. From the papers
which the Board have
laid before Govt. it
appears that
Sericulture was
introduced

? Cartons

4?

? 2

Cocoons realising 6/- each
exceptionally in favor of the
present proposal which can
exempt it from the free
action consideration. I would
do anything in reason for the
advantage of Madras only
but that the State should
consider itself charged
with the duty of finding
industrial occupation
perpetually ~~employment~~ for
them, at the expence of the
rest of the community is
~~it~~ what I should recommend.
It appears that the

introduced many years ago, neither the silkworm nor the Mulberry being indigenous in this Presidency. It has up to the present time been carried on in different parts of the country, but seems never to have attained any great importance, and the quality of the silk has always been inferior. Various experiments made at different times to improve it including those quite recently made by the Mysore Administration have failed.

From

This question
This subject is under
the consideration of the Govt. of
India: and I will
take no further action until it
is referred to
us from that Govt.

I agree with H.E. the Governor
as to the inexpediency of our
entering upon an expensive
undertaking for the improve-
ment of Sericulture.--
The experience of the past
does not seem to justify
expenditure.
I would send the papers
relating to the subject
to the Govt of India and
say that we have deferred
taking action until

5. From the amount of care and skill which the management of the worm requires and the great risks attending the enterprise, the Govt doubt whether the ryots will ever enter largely in- to the speculation, profit- -able as it is, when suc- -cessful. It is to be hoped that Euro- -pean capitalists and Firms will embark in it, but so far as the ryots are concerned, it will never probably rise above a cottage industry. Still even in this small way it is worth while to improve and encourage sericulture as giving profitable occupation to women and children, es- -pecially to the Mahomedan Commu- -nity. The Govt have been

a special leaning to it.

the keenest desire of the Govt of India with further experiments in this part of India and are prepared to allot funds for the purpose - WR

6. The Govt are con- -vinced that the purest and indeed the only way of effecting any permanent or material improvement is to pro- -cure a person from Europe, practically experienced in and conversant with the management of a Silk manufactory from first to last in every details, and to establish a Factory under his charge, in which ex- -periments of all kinds could be made, good seed produced for distribution

distribution and instruction
afforded to the people.
The Govt. would then
at least have the means
of acquiring sound in-
formation and be in a
position to extend their
operations as circumstances
might
indicate. [illegible]

6. The Govt. are further of
opinion that in the end
this would also prove to be
the most economical
plan - for as the Board re-
mark no reliance can be
placed on the spasmodic
& desultory efforts of amateur
experimentalists, & the method
of affording aid & encourage-
ment by State contributions
is unsatisfactory & uneconomical

As

7. it appears from
correspondence
held with the Agricult.
Dept. that

Sir Chas. Elliot & Govt. of
Bengal sup.

The Govt. of Madras
have for a considerable
time past
through the Collectors
of a
Sericulture
under an establish-
ment of for 5, years
at least 3 years
Any extension which
may be in contem-
plation in the current year
will be met out
of Funds at their
disposition will be
made, with the

8. As the Govt. of India
has at present under
consideration as to
the question as to
the best practical
method of developing the
silk trade, and improving
sericulture generally in
India, it does not seem to
this Govt. advisable to take any
independent action in the matter
at present, but they resolve to
forward for the information
of the Govt. of India, a copy of
these Proceedings, which give
expression to their views on the
subject.

subject

9. The Board are authorized to inform Messrs Symes & Co. that they are not prepared to accept Messrs. de Vecchi and Peters offer, there being no funds at their disposal available for the experiment.

10. Application will be made to the Madras Govt. for a small supply of good seed, direct if possible, with a view to further experiments at the Coimbatore

Coimbatore Jail and wherever else there seem to be fair prospects of success.

11. The Secy. of State will be requested to arrange for procuring the back numbers of the Silk Supply Journal, and for the regular transmission of three copies of that serial as desired in para 21 of the Board's Proceedings.

Clerk.

Revenue Department

3

To

The Honorable the Colonial Secretary
at Natal

Sir

In a recent report
on certain Cocoons sent
to England from this
Presidency, the Silk
Supply Association remarks
as follows:

"Speaking with such
information as we have before
us, it is probable that
the white cocoon from Natal, as
which produces three crops in
the year, would be best
adapted to Southern India.
This breed is now very scarce
in Japan, and should be
obtained from the Colony in
preference to the risk of being
deceived by receiving another
different breed from the
Japanese"

2.

I.O.S.

Gen Dept

Instructions of
Supreme Govt
Transmitted Herewith

Herewith

Sent from to
Govt of Bombay

The Director General of
Customs be attended to
to fulfil the direc-
tion of the Marquis
and they remain to
be conducted, as heretofore
the Govt: in the interval
may. I.O.S.

Returned on the 25th Oct to the 2nd Jan 26th R. Dept

Returned on the 25th Oct to the 2nd Jan 26th Oct -

2. The Madras Govt being desirous of obtaining some good seed of the kind ~~required~~ indicated with a view to further experiments in this Presidency I am directed to request that, with the permission of your Govt, you will have the goodness to cause a small supply of the same to be procured and forwarded to my address.

I am &c.

(signature)

Sept.

Is the Specimen of Cocoons from Natal, acquired in England to be sent with the letter?

Sept.

Not sent. I should like to know a day or so before

A print & copy of the Precis is circulated with these papers—and 50 copy is also sent for the Hon'ble Sir

Revenue Department

3

Memo for Orders.

one No. 2644, 3027 & 3028 of 1871 & 299 of 1872.

The Board's Proceedings dated 31st July 1871, No. 3188 relate to Sericulture, and a file of the reports of Collectors &c. bearing on the same subject accompanies them.

2. The Board previous at some length the treatment which the subject of Sericulture has received recently from Govt. A precis by Mr Brandt which is put up with the papers reviews the action taken by the State in reference to Sericulture since 1791.

3. The Board evince great anxiety that the question

question of Sericulture should not be allowed to drop and that active measures should be at once initiated with a view to the revivification of this languishing industry. Their proposi: tions are rather vague, but this is easily accounted for by the uncertainty which surrounds the whole subject.

4. They recommend.

(1). That the cultivation of the silk worm should be limited to those districts where it is still carried on with fair success, with the addition of the Ganjam and Vizagapatam districts.

(2). That it should be ascertained by experiment what

I suppose we must analyse the worm too?

what kinds of soil and manures are best adapted for the growth of the Mulberry, and what kinds of Mulberry are best adapted to the silk worm with reference to the localities in which the culture is now carried on. To this end the Board would suggest a scientific chemical analysis of the leaves of the mulberry.

(3). That nurseries should be started at well selected centres where the Silkworm eggs might be received and hatched and the species kept up and improved by breeding and selection.

(4) That a mulberry plantation on a considerable scale should be started at the

the Govt. Farm, Lyallpatt.

(5) That a moderate quantity of the best breeds procurable should be imported from Japan, China, Natal and perhaps Egyptian and Kangra varieties.

(6). That Messrs. Cater and Dr. Veeck's offer should be in part accepted. Either half the quantity should be taken at half the cost as fixed by that firm, or they should be requested to import 500 cartoons of the finest breeds in equal installments for three years: payment of £1000 being guaranteed proportionately for each year on condition of a certain fixed quantity of the seed germinating successfully.

(7) That a special officer with a small establishment should be appointed to superintend and

The Farm has except it its own legitimate work. The functions rule of the Dept. I.S.

They do this - but Rie dft after words - I.S.

This is the first step - at present we really know nothing. I.S.

and secure uniformity in the operations in the several districts where sericulture is taken in hand.

(8). That operations should not be extended to reeling silk.

5. It is clear that unless a skilled supervision of a very high order is available nothing but failure can be looked for in most districts. The Board evidently contemplate this in their ~~sixth~~ seventh recommendation. The question then arises upon what principle this skilled supervision

supervision should be
provided.

6. It would be diffi-
cult to devise any
policy more likely to
command success than
the scheme adopted
by the Mysore Government
of subsidising Signor
De Vecchj, if this scheme
had been carried a
little further. Messrs
Paterand Dr Vecchj
possess or lately
possessed two silk-
-worm-rearing esta-
-blishments - one at
Oossoor in Salem,

the

and

the other at Madoor
in Mysore. An interesting
report on the latter by
Mr Sullivan will be
found in Board's Proceed-
-ings dated 5 January
1871 No 37.

7. The Mysore
Government, who
have constantly since
1866 been endeavouring
to revive silkworm
rearing which used
to be a large source
of prosperity to the
ryot, but which has
latterly received a
severe blow owing to

a

a disease which has carried off the bulk of the worms, availed themselves of Signor De Vecchj's presence in the province in order to introduce a fresh stock of worm from Japan, and distribute it among the Ryots: it having been generally maintained that the disease was due to the degeneration from climate or other causes of the indigenous worm.

With

and

8. With this end in view Signor De Vecchj was commissioned in 1866 to distribute among selected growers in the Bangalore district a large number of worms: but the result was most unsatisfactory. In 1867 another distribution of worms took place but with no better results. The years 1869-70 & 71 have each witnessed a similar attempt and a similar failure.

Vide letter from Secy. to Chief Commr. printed with Board's Proc. of 31st July 1871.

9. The Chief Commissioner of Mysore has not been able to ascertain the causes which led to these repeated failures. He is however led to

"to the conclusion that
"the dry climate of
"Mysore is not favorable
"to the freshly imported
"Japanese breeds: and
"that it would be unde-
"sirable to renew the
"experiments unless
"it can be proved that
"with care and skill
"foreign species of
"silk worm can be ac-
"climatised in Mysore."

To Messrs. Dymes & Co
of which house Mr. Pater
is a member ascribe
the failure to the care-
lessness of the ryots
who "must have used
"baskets tainted with
the

Board's Pro. of 11th Septr 1901 No. 3904

"the diseased country
"worm". They observe
that "natives do not
"like exotic worms: there
"being only one reproduc-
"tion," but that "it is
"impossible to strengthen
"the Mysore worms by
"crossing it with the Ja-
"panese variety." The
Japanese worms they
observe, thrives well
in their factory and
gradually approaches
the character of the
Mysore worms in
respect of becoming
more prolific, but
when they reach that
standard it is time

to

"to breed back, or dis-
"-ease from exhaustion
"will again set in."

11. It is evident therefore that Messrs. Cater & Co. probably the best authorities in Southern India - are of opinion that silk worm rearing can only be placed on a renovated footing by the introduc-tion of a totally fresh stock of worms, and the entire exclusion from breeding purposes of the indigenous stock -

12. It also seems clear

clear that the Mysore experiments failed owing to a neglect of this consideration, and pro-sibly though in a se-condary degree, to the neg-lect by the ryots of that assiduous care and cleanliness necessary to the acclimatisation of a foreign species of worm. Had the Mysore Government, instead of confining themselves to securing the distri-bution of eggs, gone a little further and compelled Signor de Vecchj by

by the terms of an agreement to visit the homes of the silk-worm & receives and see that all the conditions of success in so critical a project were observed it is not likely that there would have been such a lamentable series of failures. It is universally allowed that the silk-worm is not indigenous to India: it must therefore have been introduced and what has been done once can be done again, if

The insurmountable objection to employing private agency is that we cannot ensure permanency or enforce obedience. Private individuals naturally seek their fortunes at hand & are tempted away by other prospects. JOS

I would start as we did with the Farms. One first man with one factory. Expand & alter work as we see our way. but at the outset concentrate our energies on a single one.

JOS

4b

if only the imported stock be fairly treated and kept separate from the native worms.

13 The next question is upon what principle the necessary supervision on the part of Government should be provided. It is submitted that the plan advocated by the Board of starting silk worm rearing in several centres at once and having a special Government officer to superintend them would

would be unnecessarily
expensive. The factory
at Oosoor should it
is submitted be made
the centre of operations,
which should be confined
to the surrounding dis-
=trict until more is
known regarding the
conditions of success
in silk worm rearing.
Here the question re-
=ceives a thorough and
scientific treatment
under the supervision
of a European who pos-
=sesses the confidence
of the Silk
Supply

Supply Association a
is thoroughly acquainted
his task. Everywhere else
industry is confined to na
and the expense attendan
on conducting a separa
series of experiments and
=viding the requisite armo
of superintendence in ea
district would be great.
=less this is provided to a gre
extent, failure will inev
tably result.

14. The Govt should, it
submitted buy the Oosoo
factory with all its stock
ve and engage a Supt. wh
should be a thoroughly qu
=fied man, giving him a
fixed salary and a perc
=tage on all profits realized
Signor De Vecchy would
probably be the best man
if his services could be pro-
=cured, because, besides bein
thoroughly acquainted with
silk worm rearing and
mulberry

This seems some
what interdependent.
Here we have - what
we so much need
& desire - private
enterprise hopefully
at work - Why ha-
ving wish it?
J.O.

+ He has formerly been Bank-
rupt I believe!

mulberry culture, he has had experience in India, but if he is not willing to enter into such an engagement, it would doubtless be easy to secure the services of some other Italian. The duties of the Supt should not be confined to the factory: he should be obliged personally to see that the ryots to whom silk worm eggs are distribu=ted (free of charge) observe proper principles of rearing, and he would to this end have to travel constantly in the district.

15. If the Govt. are not disposed to go to the expense of buying the factory (which however would probably be the most economical course in the long run) it is sub=mitted that the proprietors should be subsidised as pro=posed by the Board, but that a clause should be in=serted in the agreement obliging the proprietors of the factory to carefully watch the germination and subsequent rearing of the silk worm which they distribute to the ryots and to submit a quarterly report thereon to Govt. The annual subsidy might be fixed at Rs 2000 per annum, but its continuance for more than three years should be made contingent on the suc=cessful development of silk worm rearing in the sur=rounding district.

16. In regard to minor and less ambitious projects for aiding sericulture, it is submitted that the plan of subsidising private industry might be pursued with ad=vantage in other quarters and especially on the Neil=gherry Hills. Silk worm rearing has been tried on the Hills several times but failed owing chiefly ac=cording to Mr. Groves to di=sease which attacked the Mulberry leaf and the worm

I believe Lieut. de V. Lushington is not prepared to return to the Father

Why any thing now in the Silk line?

I cannot suppose that Govt would undertake so many things of the kind.

Or do it, if they did.

Vide Board's Proceedings, dated 4th January 1870. No. 10.

Mr Minchin says fall in price - Glen. Keen Govt. has the factory.

Mr Cockburn, however, who resides at Kotagherry reports that he has had silk-worms under his care on two occasions and found them thrive very well indeed. Mr Mc Ivor is anxious to try a small experiment at the Govt. Gardens where the Mul=berry plant thrives well.

17. It is submitted that every aid should be at once afforded to these two gentle=men in the prosecution of silk worm rearing and that the Commissioner of the Neilgherries should be au=thorized to inform Mr Cock=burn that the Govt are prepared to relieve him of all expense incurred by him - Cartoons might be at once imported and supplied to them -

18. The Natal silk-worm (white cocoon-breed) is reported by the Silk Sup=ply Association to be the best adapted for Southern India -

Letter from Commissioner of Neilgherries, dated 7th Febr 1870. No 22.

Letter from Commissioner of Neilgherries, dated 2nd Febr 1870, No 17.
Let him by all means.

I would not mind giving the 300 Rs sought. But the more Cartoons come very Exp pen sive.

Their letter to Secretary of State, dated 15th Febr 1871.

? Should they not apply to the Indian Govt for grant -

Let us see if they will be ably there
JOL

43

Indian - It is an off-shoot obtained from the Japanese breed - The Secretary to the Silk Supply Association observes on the slopes of "the Neilgherries and Shevaroys" are ad: "=mirably adapted "for Sericulture and "correspond in many "particulars with parts "of Japan and South "Africa more especially "Natal". It does not

not appear that the
Mortal breed have yet
been tried in India, and
the first supply of
Eggs should, it is sub-
-mitted, be obtained by
application to the Go-
-vernment of that
Colony.

I have &c.

Signed by Lee.

Mess.rs de Rudi Hales in 1870
offered in exchange of payment of
£5,000. to supply not less than
500 cartons of silk worm Eggs
to be forwarded from China
Japan Italy &c. & to give
his direction for their safety
at Ascot. & guarantee
that a fair proportion of the
Eggs should germinate.

Mess.rs Hales

In reply to Mess.rs Hales
letter of Sept.r 1870. informing &
& enclosing Law applicable
to the failure.

Mess.rs Hales & Co.

Sept.r 1870.

Gentlemen

I am directed by the Lords Commissioners of Her Majesty's Treasury to acknowledge the receipt of your letter of the 1st inst.t and to state that their Lordships do not consider that they are called upon to take any steps in the matter.

I am however directed to call your attention to the Act 33 & 34 Vict.a Cap.y 52 intituled "An Act for the better prevention of Cruelty to Animals" and to state that the Commissioners of Her Majesty's Treasury will be glad if you will take such steps as may be necessary to prevent the commission of any offence against the provisions of the said Act.

I am &c.

Mess.rs Hales & Co.

Bd. of Trade 11. Sept.r 70.
3904.

consider that this is established by the results attained in this colony at Adelaide.

The experiments at the Cape of Good Hope and the Swan River, Western Australia have unsatisfactory. Should this be the case in the Swan River, the Queen's Land will be considered.

The Commissioners have also to suggest the propriety of supplying to the Queen's Colonies of Australia Land Surveyors.

As regards New Zealand

Offer to be recommended that Cuttings be supplied 250 to the Value of £25 the Cuttings probably there obtaining the Mulberry as proposed. Respectfully submitted that the Cuttings be supplied 3 years previously being preferable early Autumn of Spring —

Memo
On introduction of mulberry & Silk culture into Ne
Zealand

[illegible]

for consideration
J. Ds

The question can probably be.

For the Cultivation recommend
— Experiment as to soil &
Climate best suited for
the Mulberry tree.
— 2d as to the kind of soil
best suited for the worm.
— 3rd Distinct of each of the
kinds of tree.
— Establishment of nurseries
for breeding the worms under
a Special Officer & Staff
— 5th Distribution & spread of
approved breed
— Limitation of the Natal
Breed to the nurseries
&c. of State.
— Protection & Encouragement of Silk Growers
Attempts at winding the
Silk to be discouraged —

The first point to be considered
is as to the promise of success
in any particular Colony for
nurturing or producing a Staple
in Silk — of this Experience &
Climate must
Evidently give the best proof
Which has been collected
that at times during

the last century. a fair measure of success has been attained but that it has not been permanent. or apparently owing to want of encouragement & continuous effort.

It is proposed to think that the prospects brighter now

Assuming however that in the hope of developing an industry Govt. grants special advantages for the encouragement of this class of manufacture & there is evidence that the hope will be realized. it is deemed advisable that the Govt should take action in the matter — but what country products?

In the first place it must be observed that the fact has no bearing upon the question of funds available for expenditure with regard to the application which has been made to the Govt. for. Your attention is already directed to the subject as relating to all India.

What is for. "Provincial" funds.

This is purely Imperial. We must get funds from the Supreme Govt. JDS.

Silk Cocoons & Reeled Silk in British European Establishments and a limited Export to Europe for the last three years is shown to be disproportionately small.

What is industry required?

The Returns give the following Statistics of Silk for the Presidency —

Country Articles —	Export to European Countries.		
	1867-68	1868-69	1869-70
Silk. Cocoons.	219	152	877
— Manufactured. Pieces.	5462	5701	9661
	Value, Thousand Rupees.		
Silk. Raw. lbs.	78530	93026	462,767
— Manufactured	49957	46769	46905
	Exports to other Presidencies		
	Quantities		
Silk Manufactured Yard.	—	1063	3515
Pieces	—	605	264
— Raw. lbs.	—	—	4068
	Value, Thousand Rupees		
Silk. Raw. lbs.	—	1940	24,576
Manufactured	—	25815	11,706

Glen Bervie Wedderburn
Colonial Secretary's Office

[redacted]

The value of silk thus
Exported is £35 per pound
according as it is reeled by
the Steam Factories or the
Native methods - or
the improved European system
Assuming a medium average
of £25. The value of 87,
lbs. of raw silk exported
£98,224 or Rs. 9,82,240.
or at 10/. according to
the value placed by the
Native system - it is Rs.
one lakh fifty or Rs. 4,91,120
This is to prove the declared
value, that the whole 87.
lbs must have been Native reeled

An industry 25. is capable
of the development shown
in the above figures in so
short a period must be
very valuable to the country
and would scarcely allow
to call for such a measure
of Government assistance

The recent rise in
price has either sti-
mulated production,
or led to the export
of what used to
be consumed in
the Country - But
the quality is still
the best as ever - We
should, I think, try
to improve this. We
cannot get the right
to do much in reeling
but the quality of
the Cocoons may
greatly improved.

I could procure for the
Museum Specimens illustrative
of the various stages in
the production of the cocoon
& from it

Are there any duties
Stamps?

as is involved in the
Govt proposals.

Experiments of the kind
hitherto by Govt. are unsatisfactory. They can
probably undertake
and take the
risk of private enterprise, and
private enterprise under
favourable conditions.
The Exhibition carried
out by Govt reduced to
investing private enterprise by
removing obstacles from
their way.

The work already
done by Govt is of
sufficient encouragement
to the growth of the industry
to justify this new
plant if this were
likely to be undertaken.
Silkworm breeding might
be introduced as a
Cottage Female

labor. and be introduced
in lieu of the Tread Mill
and arrangements might
be made for having
superior "Tread" for that
purpose.

With hard labor
added Stocks.

But I cannot but
advert to the prop.
of as connected with
the "Sta." houses of
detached cells. These
the last may be serious
detriment, & the objection kept
up principally by feeling
and ideation - Ridiculed
at first sight. Eventually
"tolerated" by it's friends
and all this under "a special
officer" & a "Local Establishment"
Come & Examine "Light
in Light" and then scientific
attention" - as absolutely

I doubt whether patching
with worms is a good
way of employing Jail labor
& the female prisoners are probably
unprepared in number in most
Jails - but on this point the deputation
General may be consulted.

4

indispensable Laundry
Establishment -

The Sup. and Physician
& all such funds
for the purpose - or to
apply for any & such
Sup. - think that
the Sec. & Treas. for
the Sec. & Treas. for
Eng. & the accounts
& Report of half
the Quantity & price -
of Stores & Provisions
& Clothing to the Visitors
& Visitors to the Governor
and that the Sec. &
Treas. & Phys. & Chaplain
Governor & Coroner
or the Delegates (they
also Committee) &

Sills Collins

Forest

by the Experiment. and
that fold. Mr Winstanley
& apply to Rev. Mr.
for what they require
out of the Sect. Supply for
Lodge in their District.

The Rate for Freight
asked & arrange if possible
for sending us a Load
Supply of Coal "Coal"
direct. Intimate
a Vessel ready to get
under Steam, & don't
tell us but this can be
managed. as we then
let the Emigrants from
the Ocean in the Light Boat
from the Ship. the
Ships are laid 2 to Moorings.
and Lighted in about
and then back.

Silk Cultures

Cire

R on the 24th Octr to send to the N.A. thereon on the 25 Octr =
R. 21st June R 2nd Decr.
C 5th Jany 72 R 22nd March 72, RC 23rd R. 1834

RC to Govt Rlys on the Stocks on the 4th June R 6: March 73.

Revenue Department.

No. 317

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the 14th ~~December~~ March 1873

Read the following Proceedings of the Board of Revenue.

Submitting to Govt with remarks Correspondence regarding introduction of improved Sericulture into the Madras Presidency

Pros: of the Board of Revenue

(H.E. 31st July 1871 No 3188.

H.E. 11th Septr 1871 No 3904)

The foregoing Proceedings convey the Board's recommendations in regard to the measures which should be adopted for the improvement of sericulture in this Presidency.

2. After reviewing the correspondence which has been recently carried on in relation to the subject, the Board proceed to state the conclusions at which they have arrived. They attribute the

R.S.G.

Seen
S. D.S.

the degeneracy of the breed of silk-worms and consequent decay of the trade to <u>starvation</u> of the worm, and they submit the following proposals as best adapted to remedy the defects which have hitherto rendered the culture of silk a failure.

1st Limitation of operations at the outset to those localities in which fair success is still attained.

2? The institution of experiments with the view of ascertaining the description of soil and manure best suited to the mulberry and the kinds of mulberry best adapted to the nature of the silk-worm, seeds of the approved kinds being distributed to growers gratis—

3d The establishment of nurseries for breeding the worm and improving the species, seeds being distributed at

C.O. Jam. 172 - R22 March 172, pc 23, R. 13 F

at first gratis, and eventually sold to pay expences. 51 51

4th The importation from time to time of the best breeds procurable from Japan, China and Natal with a view to the renewal of the seed, a supply of Natal seed being obtained <u>at once</u>.

5th The entertainment of a special officer with a small establishment to superintend operations in the several divisions where the culture is to be taken in hand, attempts at reeling silk being deferred.

3. The Board further suggest with reference to Messrs. De Vecchi and Paters offer that those gentlemen should be requested either to supply 250 cartoons of eggs and to

to arrange for hatching them and distributing the worms on payment of Rs 5,000 or to import 500 cartoons in equal instalments for three years payment of £1000 being guaranteed proportionately for each year, a fair measure of success in hatching being stipulated for in either case.

4. From the papers which the Board have laid before Govt it appears that sericulture was introduced many years ago, neither the Silkworm nor the Mulberry being indigenous in this Presidency. It has up to the present time been carried on in different parts of the Country, but seems never to have attained any great importance and the quality of the Silk has always been inferior. Various Experiments made at different times to improve it (including those quite recently made by the Mysore administration)

administration / have failed.

5. From the amount of care and skill which the management of the worm requires and the great risks attending the enterprise, the Govt doubt whether the ryots will ever enter largely into the speculation, profitable as it is when successful. It is to be hoped that European Capitalists and Firms will embark in it, but so far as the ryots are concerned, it will never probably rise above a cottage industry

6. The experience of the past does not seem to justify the expenditure of public money; nor do there appear to be any special or exceptional considerations which would warrant the Govt in setting aside the general principle believed to be sound, which condemns the application of the proceeds of taxation to the encouragement of particular branches of industry. The Govt have no sufficient means of judging as to the prospects of profit to be derived from a particular species of industry. The enterprise will either be successful or the reverse; in the former case private persons are tolerably sure to engage in it and the

the interference of Govt is unnecessary; in the latter public money is wasted. In either case an artificial direction, temporarily or permanently is given to the employment of capital which is in itself an evil. There appears to be no argument to be urged in favor of the proposals submitted which can exempt them from the force of these considerations.

7. As it appears from correspondence held with the Agricultural Dept that the Govt of India has at present under consideration the question as to the best practical method of developing the silk trade and improving Sericulture generally in India, this Govt resolves to

to forward for the information of the Govt India a copy of these Proceedings which gives expression to their views on the subject and to defer taking action until intimation is received that the Govt of India deem further experiments in this part of India advisable and are prepared to allot funds for the purpose.

8. The Board are authorized to inform Messrs Dymes & Co. that this Govt are not prepared to accept Messrs de Vecchi and Paleri's offer, there being no funds at their disposal available for

Experiments

Experiment.

9. The Secretary of State will be requested to arrange for procuring the back numbers of the Silk Supply Journal, and for the regular transmission of three copies of that serial as described in para 21 of the Bds Proceedings.

Ch.

14 Board of Rev Des 15 March 1873

1619 RH

G.O

Sericulture

Note. The draft is in accordance with the Rules of the Madras Local Board & Madras Municipal Act.

The Madras Municipal has recorded a favourable opinion.

Dy

Govt Guard to McEllis 15-2-73.