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MADRAS RECORD OFFICE

GOVERNMENT OF MADRAS

Revenue

DEPARTMENT

G.O. No.	1335	Press
B.P. No.		Mis. ☒
Dated	9.6.1876	196

Not to be folded or roughly handled

PROCEEDINGS OF THE BOARD OF REVENUE, dated 3rd May 1876.

Read the following Proceedings of the Madras Government, 10th January 1876,
No. 27, Revenue Department:—

Read the following Extract from the Proceedings of the Government of India in
the Department of Revenue, Agriculture, and Commerce (Fibres and Silk),
dated Calcutta, 23rd November 1875, No. 5/156-165:—

Read the following papers on the subject of the development of an industry in
the silk of the tasar and other wild silk-spinning worms of India:—

Letters to the Government of Bengal and the Chief Commissioner of the Central Pro-
vinces, Nos. 244 and 246, dated the 26th and the 28th September 1872.

Letters from the Chief Commissioner of the Central Provinces, Nos. 1,234-63 and
1,733-83, dated the 12th April 1873 and the 28th May 1873.

Despatch to the Secretary of State, No. 6, dated the 23rd June 1873.

„ from the „ „ 14, „ the 11th March 1875.

„ „ „ „ 32, „ the 17th June „

Read also the following correspondence relative to the experiments conducted by
Captain Coussmaker in the matter:—

Letter from the Government of Bombay, No. 4,128-113C., dated the 24th Oct. 1872.

„ „ „ „ 4,197-153, „ the 26th Dec. „

„ „ „ „ 2,754, „ the 23rd Sep. 1874.

„ „ „ „ 1,520, „ the 19th May 1875.

„ to the „ „ 55, dated the 4th June 1875.

RESOLUTION.

For some years past the attention of Government and of private individuals has
been given to the possible development of a profitable industry in the silk of the
undomesticated silk-spinning worms of India, the most important of these being the
tasar (*Antheraea Paphia* and other varieties).

2. The worm abounds in most forest tracts in India. Mr. Geoghegan (page
110 of his Account of Silk in India) says that it is found “in the Sub-Himalayan
tracts almost throughout the extent of the range, through the hills from Assam to
Chittagong, in the Sundarbans, everywhere in the great belt of hill and forest
inhabited by the Santal, the Kol, the Khond, and the Gond, in the Western Ghats,
and in portions of the Madras Presidency.” Captain Coussmaker says he has found
it in the jungles between Tanna and Ankola (Bombay Presidency), a distance of 330
miles, and he has reared the worm successfully in the three districts of Satara,
Kolhapur, and Dharwar. The worm also abounds in the tract between the Burrakur
and the Soane (Bengal Presidency), a tract of country measuring 200 miles in length
by 80 miles in width, and it is largely distributed in the districts of Gurdaspur and
Sialkot and in the Jummoo territory.

3. Hitherto the worm has ordinarily been confined to the jungles, but Captain
Coussmaker's and other experiments seem to prove that it is quite capable of domesti-
cation. Its habitat, however, is undoubtedly the jungle tracts, and, owing to this
and to the collection of the cocoons having hitherto been left entirely to certain
classes of aboriginal tribes inhabiting the forests, there are no accurate data on which

to found an estimate of the supply available. It seems clear, however, that even now the supply is more than equal to even a greatly increased demand, and that this supply is capable of indefinite extension.

4. At present there is practically no demand in the European market for this silk, except in the shape of fabrics prepared in this country, and for these the demand is limited. Whether it is possible to create a sufficiently large demand to remunerate outlay on the part of Government is a question which cannot yet be positively answered, but the probabilities are in favor of the creation of such a demand if certain difficulties hereafter to be described can be overcome.

5. In 1872 Captain Coussmaker, an Assistant Superintendent in the Bombay Revenue Survey, who had for some years given his attention to this matter, had some tasar silk reeled off and woven into fabrics, under his superintendence, in the Dharwar jail. Samples of these fabrics were sent by the Government of Bombay to the Government of India, and were sent by them for report to Calcutta where the samples, especially a twilled kind, were much approved. In connection with the report on these samples, it was stated to the Government of India that certain difficulties connected with the reeling and dyeing of the silk, which had hitherto operated to prevent the creation of a regular and extensive trade in tasar silk, had recently been overcome in Italy. Copies of the papers were sent to the Governments of Bombay and Bengal and the Central Provinces for information. The Chief Commissioner of the Central Provinces having asked to be furnished with particulars of the processes of the reeling and dyeing said to have been discovered, Her Majesty's Secretary of State for India was requested, in despatch No. 6, dated the 23rd June 1873, to cause inquiries to be made in England and the large centres of silk manufacture on the Continent, and to communicate the results. While this inquiry was being originated by the Government of India, Captain Coussmaker went on leave to England, proposing with the concurrence of the Government of Bombay to devote some time to inquiries into the subject.

6. A reply to the despatch to Her Majesty's Secretary of State has now been received, and the result of Captain Coussmaker's inquiries has also been embodied in a letter to the Government of Bombay, of which a copy has been communicated to the Government of India. The outcome of the researches made is as follows:—

From the papers received from the Secretary of State it appears—

(i)—That a person at Lyons, unnamed, holding the position of chief chemist to the firm of Guinon and Picard, manufacturers of chemical products at Lyons, has discovered how to reel and dye tasar silk. The reeling process, he states, is thoroughly inexpensive. He has submitted samples of the results of his process to Mr. Haden, British Vice-Consul at Lyons, and this gentleman pronounces them to be "really remarkable," adding that "he has reason to believe that if experiments carried on under inspection resulted in similar success, the Government of India would possess the information it desires." The dyeing process the inventor declares to be absolutely successful, "except as to one point which he thinks could be satisfactorily dealt with." The inventor has patented his processes in France, and would require similar protection in Italy, Great Britain, and India, before doing anything for the Government of India. He declines to come to India, and he expects a fixed sum (not stated) for communicating and practically demonstrating all he knows about the matter.

(ii)—The Vice-Consul at Lyons has also been in communication with a person named Chalon, a worker in velvet at Beaurepaire in the Department of the Isère who professes that he can reel off a thread a thousand mètres (nearly 1,100 yards) in length from the unpierced cocoon. This person also requires a fixed sum before imparting the secret of his process. The Vice-Consul adds that this is probably the process to which the Government of India referred in its letter to the Secretary of State.

(iii)—The Consul at Genoa has been in communication with, amongst others, Mr. Mylins, a silk manufacturer at Buffalora, who has tried experiments in a small way, but without much success. He says, however, that no serious trials have yet been made with tasar, and expresses his willingness if the Government of India will send him a parcel of cocoons to make a series of experiments with them. The Consul says that Mr. Mylins's standing and reputation are unexceptionable, and his works on a large scale.

(iv)—The Consul has also heard of an invention patented jointly by Mr. Gaddum of Latour and Mr. Bosshardt of Turin for carding the silk produced from difficult cocoons. It appears that tasar cocoons have been successfully treated by this process.

(v)—Mr. Thomas Wardle, a silk dyer of great experience, states that he has discovered a way of dyeing tasar silk in brilliant colors and of giving it the lustre of Chinese silk. Mr. Wardle is ready to continue his experiments and also to teach his process to natives of India. It is not stated whether this gentleman is ready to come to India and on what terms, but the Secretary of State has asked to be furnished with samples of dye-stuffs, and of tasar and other wild silks, so that Mr. Wardle may be in a position to continue his experiments. Local Governments have been asked to supply these samples.

7. Captain Coussmaker's inquiries in regard to reeling in England have been unsuccessful. Messrs. Mason and Company, silk-spinners, have bought this and other wild silks as "waste," and have carded it, and Messrs. Lister and Company, of Bradford, are ready to take a large supply of pierced cocoons for the same purpose, converting them into spun silk, but no English manufacturers seem to have attempted or to be disposed to attempt the reeling of the unpierced cocoon. But Captain Coussmaker succeeded, by the good offices of Chevalier G. Jervis, Conservator of the Royal Industrial Museum at Turin, in inducing an Italian spinner to try experiments, with the result that the silk can, it is stated, be reeled at a cost of something over £2 per cwt. of cocoons. If this is actually the case, the rate is extremely low, but there is probably some mistake in the figures. The firm, which is not named, say that the reeling can be done much cheaper eventually after perfection of the process and adaptation of the machinery to this particular kind of silk. The specimens thus reeled were valued in London at from 1s. to 2s. per lb. more than the samples reeled at Dharwar by Captain Coussmaker, and these were in Calcutta thought very good, and in London were considered equal to anything of the kind sent from India and China.

8. In addition to the results thus obtained, reference has been made direct to the Government of India by Mr. Jules Deveria of Rampore Baulea, who states that he has discovered a process of reeling tasar in an ordinary filature. The sample of the skein of the silk which he reeled under this process was not entirely successful, and a report obtained on it by the Bengal Chamber of Commerce was unfavorable.

9. With the preliminary information thus obtained, the Government of India is in a position to consider what should be the next steps to be taken in view to the development of a new industry, which may perhaps take, to some extent, the place of the trade in the manufacture of silk from domesticated worms. This latter industry, of which Bengal is the principal seat, is in a languishing condition, and seems, indeed, doomed to gradual but inevitable decay. Even, however, if the Bengal silk-trade were to revive and again assume the flourishing position it once held, it is quite clear that in an almost purely agricultural country like India the introduction of new manufacturing industries is desirable, and that it is of great importance to find external and internal markets for produce of which India possesses a monopoly, but which is not now utilized.

10. In stimulating the production of tasar silk the State may aim at supplying either the local or the European markets with manufactured silk, or at creating an export trade in the raw material with Europe. But before any great step in this direction can be taken, it is necessary to make further cautious and preliminary detailed inquiries; for, besides the two difficulties already mentioned, both of which will probably soon be overcome, there are still others of a somewhat more formidable character perhaps, which tend to leave in doubt the question whether the silk of the tasar worm may be profitably employed on a large scale.

11. The two great obstacles to which attention has hitherto been directed are—

1st.—Defective reeling in connection with the difficulty of properly dissolving the natural gum exuded in spinning by the worm.

2nd.—Difficulties in dyeing.

As regards the first, owing to the defective way in which the silk is reeled, the thread is not continuous, and retains more or less of the peculiar cement (compared to plaster of Paris by Captain Coussmaker) which the worm exudes, the presence of this cement detracting from the appearance of the fibre, rendering it unfit for fine fabrics, and preventing it from taking fine colors. It has, however, it is understood, been proved by actual experiments made within the last year, that by the use of a simple alkaline solvent and by keeping the basins of water in which the cocoons are plunged when being reeled off at a temperature of about 200° Fahr. or a little higher, all difficulties of reeling, so far as the mere unwinding of the silk is concerned, disappear.

In respect to the second, there seems to be little doubt that no real effort to dye the silk has been thoroughly made, and that if attention were turned to the subject by competent persons the difficulties in question could easily be overcome.

12. The other and more serious difficulties which will require to be overcome appear to be, 1st, the manner in which the cocoons are naturally distributed. It is true that the supply is inexhaustible, but owing to its distribution over a vast area, a thousand square miles will, in the natural condition of things, seldom probably yield as many cocoons as a single hamlet in Italy produces of the domesticated worm, and although the cocoons can be obtained for nothing, yet as the search for them has to be made over enormous areas, if large quantities, such as a filature would require, are to be obtained (and it is only during one brief period of the year when the trees the *Antheraea* chiefly haunt are shedding their foliage that any successful search can be made) it appears doubtful whether, under these conditions, the wild cocoons would not cost more than cocoons obtained from domesticated worms.

13. It is true that the tasar worm can be entirely domesticated, but if regularly domesticated like the *Bombyx mori*, the produce obtained would perhaps be more costly than that of the *B. mori*, inasmuch as many more worms would be required to produce an equal value of silk, and if the manufacture of silk from the *Bombyx* worm is not remunerative, as seems sufficiently proved by the state of the industry in Bengal, *a fortiori* the tasar worm will not yield any profit.

14. Again, the tasar may be half domesticated, a certain number of moths being kept for laying purposes yearly, the eggs hatched and the young worms turned out to feed themselves, thus avoiding the heavy expense (especially during the later stages) of constantly supplying fresh leaves to the worms; but here also it appears doubtful how far it will be possible to concentrate the worms or protect them from birds or other enemies if they are at all abnormally numerous on any group of trees. Under these circumstances, it appears probably that it is only in a nearly wild condition that the tasar can prove remunerative.

15. The second difficulty (which is even greater than the first) depends upon an inherent defect in the filaments spun by the worm. It must be remembered that the thread of the tasar silkworm is spun from a double spinnaret, and that these filaments are not parallel, lying close side by side, but are spirals touching each other only at the exterior points of their curves, but united by the natural gum in and with which they are exuded, and it is on this spirality that the elasticity of the silk depends. Now, in reeling the silk it is necessary that the spirals should be ground well into each other so as to form an even round thread, but it is doubtful whether the filaments can be brought to bear the amount of *croissance* necessary to produce the round thread, and without this it will be impossible to provide an article of export which will be acceptable in a European market.

16. Granting that this difficulty may be surmounted, it appears certain that it can only be done under skilled European supervision, aided by the best mechanical appliances in properly appointed filatures. It will be hopeless to expect that such reeling as is required to fit tasar for manufacture into superior fabrics for the European market can be done by natives working in their own homes. If success is to be expected in the manufacture of tasar silk, the operations of villagers must be confined to the production or collection of the cocoons. The reeling processes, if manufacture is to be attempted at all in India, must be carried out in properly organized filatures, possessing means and appliances, machinery and systematic supervision, such as are wholly unattainable by villagers in their own homes. Thus, for the proper reeling of tasar, where the basins must be kept at a heat of from 200° to 205° Fahr., nothing but steam can keep them uninterruptedly at precisely that temperature which is essential not only to enable the silk to unwind, but to keep the gum still retained by the filaments at just such a temperature when they reach the *croissance* as to be soft and yielding, but not so soft as to be worked out.

17. The conditions of successful manufacture being such, there does not appear to be any prospect of reviving the reeling of silk as a village industry, whether the silk is produced for local consumption or export. Under no circumstances would there appear to be any reasonable prospect of any proximate material enlargement

of the local demand. If, therefore, anything is to be done for the country in silk, whether for the domesticated or the tasar worm, it must, it seems to the Government of India, be in the way of increased exports either in the shape of cocoons or as raw silk so reeled as to be acceptable to the European purchaser.

18. In regard to tasar, many of the most important data necessary towards forming a satisfactory conclusion in the matter are altogether wanting, and the Government of India are of opinion that the subject should be systematically investigated, so as to set at rest all doubts which now exist.

19. Towards the attainment of this end, the first thing in regard to which it is requisite to obtain definite information is the exact cost at which the raw material can be collected or produced in commercial quantities, both in its wild and semi-domesticated state. The next points on which further information is requisite are the cost of reeling off the silk, the amount of silk there is in proportion to cocoon, the degree in which the filaments will bear *croissure*, and the consequent ultimate value of the silk in the market.

20. With this object in view the Government of Bombay and the Chief Commissioner of the Central Provinces will be asked to collect cocoons in order that careful experiments may be made with them in some of the leading filatures in this country, and also under the direction of Her Majesty's Secretary of State in some of the leading filatures in France and Italy. Careful and full reports on all the points noted above will be asked for, and all reasonable expenses incurred in these experiments will be reimbursed. The Secretary of State will be asked to have experiments efficiently carried out to test the dyeing capacities of this silk, the material furnished from the experiments to be made in the filatures in France and Italy being used for the purpose. His Lordship will also be asked to cause experiments in carding to be undertaken with pierced cocoons.

No. 5/156.

ORDER.—Ordered that a copy of this Resolution be forwarded to the Government of Madras with a request that the Government of India may be favored with any proposals or suggestions which His Excellency the Governor in Council may have to make in the matter.

Ordered, also, that a copy of this Resolution be forwarded to the Financial Department for information.

(True Extract.)

(Signed) A. O. HUME,
Secretary to the Government of India.

ORDER THEREON, 10th January 1876, No. 27.

Miscellaneous.

COMMUNICATED to the Board of
Revenue for any remarks they may have
to offer.

(True Extract.)

(Signed) W. HUDLESTON,
Chief Secretary.

To the Board of Revenue.

1335-4
COMMUNICATED to all Collectors who are requested to inquire and report whether tasar or other undomesticated silk-spinning worms are found in any quantities in any parts of their districts, and if so, whether they are utilized locally. Information should also be given regarding the quality, cost of production, &c.; and samples of cocoons should be sent up.

2. Dr. Bidie will be requested to favor the Board with any information on the subject which he may be able to supply.

3. It is observed that a Memorandum regarding the tasar silk-worm was drawn up by Dr. Shortt and embodied in Proceedings of Government, Revenue Department, dated 14th March 1873.

(True Copies and Extract.)

Acting Sub-Secretary.

To all Collectors,

„ G. Bidie, Esq., M.B.

Copy to Secretary to Government, Revenue Department.

Exd. W. J. Lewis.

- (1) Number of pages _____
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GOVERNMENT OF MADRAS

DEPARTMENT

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*6.0.14. 11.13.15.18.58
10.1.19.56-57*

*1. To the Board of Revenue
Office*

*24.12.1904
10.3.1905*
 Board of Revenue,
 MADRAS.

PROCEEDINGS, 3RD MAY 1876, No. 1,157.

24.12.1904
 Encl.

Received 9 June 1905

MAY. 1876.
 No. 1,157.

24.12.1904
24.12.1904
 Taser and other wild Silk-spinning Worms.—
 Communicating to all Collectors for report,
 Government Order on Resolution of Govern-
 ment of India on the development of an industry
 in the silk of —, and requesting Dr. Bidie to
 favor Board with any information on the
 subject which he may be able to supply.

9.1.1905