

7 *Mr. Office*
Per: [Signature]
SELECTIONS

FROM

THE RECORDS

OF THE

MADRAS GOVERNMENT.

PUBLISHED BY AUTHORITY.

No. XXIII.

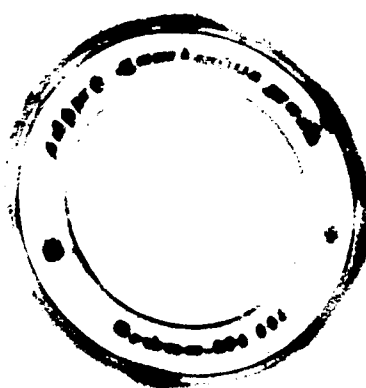
REPORTS

ON

THE FIBRES

OF

SOUTHERN INDIA.



MADRAS:

PRINTED BY H. SMITH, AT THE FORT SAINT GEORGE GAZETTE PRESS.
1856.

A

No. 2687.

FROM G. S. FORBES, Esq.,

Acting Secretary to the Board of Revenue,

TO J. D. BOURDILLON, Esq.,

Secretary to Government Revenue Department.

SIR,

I am directed by the Board of Revenue to submit for the in-

From Ganjam 14th in Consultation 31st May 1855.	formation of the
From Vizagapatam 28th March in Consultation 5th April 1855.	Right Honorable the
From Rajahmundry 5th in Consultation 14th June "	Governor in Council
From Guntoor 11th in Consultation 18th June "	the accompanying
From Nellore 8th March in Consultation 2d July "	reports from the
From Bellary 20th in Consultation 25th June "	Collectors of the
From Cuddapah 5th in Consultation 12th February "	different Districts re-
From Kurnool 23d January in Consultation 1st February "	garding the cultiva-
From Chingleput 10th January in Consultation 8th Feb. "	tion &c. of Fi-
From Salem 5th in Consultation 12th February "	brous substances, as
From North Arcot 18th in Consultation 28th May "	required in Extract
From South Arcot 4th in Consultation 8th January "	Minutes Consulta-
From Tanjore 9th in Consultation 19th February "	tion 19th Septem-
From Trichinopoly 9th in Consultation 14th December 1854.	ber 1854.
From Madura 6th in Consultation 15th February 1855.	
From Tinnevely 24th February in Consultation 19th Mar. "	
From Coimbatore 28th July in Consultation 6th August "	
From Canara 8th January in Consultation 8th February "	
From Malabar 24th February in Consultation 19th March "	
From Madras 30th November in Consultation 21st Dec. 1854.	
From Sea Customs 24th in Consultation 27th September 1855.	
From Sea Customs 3d in Consultation 8th October "	

2. The Board do not think it necessary to review each report. There can be little doubt that Fibrous substances abound in different parts of the Presidency, and may be extensively grown if there is a steady demand at a remunerative price. The Board apprehend that little reliance can be placed on the varying reports of the produce of a given extent of land, the charges or return from a crop of any particular kind of fibre. At present almost all that is grown is consumed in the country or wasted from ignorance of the process of preparation and other causes. In Rajahmundry there seems to be a considerable quantity grown at paying prices. The efforts of an English merchant resident

Dated 5th, in Cons. 14th June 1855.

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The publication of the "Selections from the Records of the Madras Government" may be said to have commenced in 1854, only one number having been published before that year. They have hitherto been numbered by the year—1, 2, 3, &c. of 1854 and 1, 2, 3, &c. of 1855. This has been found to be inconvenient. They will, therefore, henceforward be numbered consecutively, starting from the beginning of the past year—thus, (numbers XXII having been published in 1855,) this, the first number of the present year, is numbered XXIII.

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there, are however stated to have failed. The exports for 5 years have Dated 24th, in Cons. 27th averaged about 7,620 cwts. valued at Rupees September 1855. 43,786, but the Collector of Sea Customs reports that the Aloe Fibre is of so inferior a description that its exportation is not unlikely to injure the trade. In the same period manufactured Fibrous substances (chiefly coir rope) had been exported to the extent of Cwts. 5,63,378 valued at Rupees 12,64,993.

3. Dr. Hunter's experiments prove that Fibre of the finest description can be made in this country, if due care be taken in its preparation, and it is an object of importance to make known to the people the best modes of preparing it. The Board have requested Dr. Hunter to furnish them with samples of Fibres properly prepared, and these will be exhibited on behalf of Government at the agricultural exhibitions in the Provinces. Prizes will also be offered for samples of the best Fibres, and instructions for their preparation circulated at the same time to the people.

4. These measures will it is hoped serve to remove that general ignorance of the value of this product and of the manner of preparing it for the market, which is assigned as one cause of the depressed state of this branch of agriculture. The Board have also sought information from Dr. Hunter regarding machinery suited to the means of the people.

5. The Board are not prepared to recommend that Government should go further than point out to the people the opening now afforded by the state of affairs in Europe, and the profitable nature of the trade they now neglect. The rest must be left to private enterprise, and it is to be feared that until the mercantile community come forward and deal with the Ryots for the purchase of Fibres as they do for Sugar, Indigo, &c. little will result from the endeavours of Government.

6. The imposition of as moderate a demand on the land as the public exigencies will permit, and the improvement of the means of communication, are the only legitimate means by which Government can interpose. Any attempt to stimulate production by bounties—reduced assessment, or direct purchase of the crop, the Board would deprecate. Such a course would interfere materially with the operations of the regular trader—it would be difficult to withdraw from it without injury to the producers, and it might hereafter be found that the product so raised was profitable only from the special advantages shewn to it, and was in reality less profitable than others which it had thus displaced.

7. The mercantile community are sufficiently alive to their own interests not to neglect a profitable mode of investment, and it is only through their agency that a sound and healthy trade can be established or the real value of the article tested.

8. The accompanying Statements from the Collector of Sea Customs show the rates and amount of Export duty levied on Raw and manufactured Fibres. For the 5 years from 1850-51 to 1854-55 both inclusive, the total proceeds have been Rupees 17,264 or 3,453 per annum.

9. The Board recommend that the Reports &c., be printed, and that samples of such Fibrous substances as are new to Dr. Hunter may be procured for experiment by him.

10. The returns from the Sub-Division of the Salem District and Masulipatam will be submitted as soon as received.

I have the honor to be, &c.,

G. S. FORBES,

Acting Secretary.

Revenue Board Office, Fort St. George, }
15th October, 1855. }

No. 86.

FROM WILLIAM KNOX, Esq.,

Acting Collector of Ganjam,

To B. CUNLIFFE, Esq.,

Secretary to the Board of Revenue, Fort St. George.

SIR,

1. With reference to the Board's Proceedings dated the 25th September last and its accompaniments, I have the honor to submit the following brief report on the fibrous productions in Ganjam; their cultivation is on a small scale here, the people having had little or no inducement hitherto to extend it; they could produce far more than they

Memo. of Fibres produced in the Ganjam District.

Memo. of Fibres produced in the Ganjam District.													
Names of Fibres.			Where Grown.	Description and extent of land Cultivated.		Estimated produce per Acre in Maunds.	Estimated cost of Maund of cleaned Fibre.			Selling price of the Fibre at the place where it is grown per Maund.			Remarks.
Telooogo Names.	Oreya Names.	English or Botanical Names.		Dry land.	Wetland.		Rs.	A	P	Rs.	A	P	
				Acres.	Acres.								
1 గోగూనార.	Cavooreya.	Roselle plant, Hibiscus sabdariffa.	Amany Zemindary & Proprietary Talooks of the District.	400	50	8	0	5	0	0	10	0	Grown in Cultivated land.
2 జనమూనార.	Chonce.	Crotalaria juncea. The	Do. do.	1,220	10	10	0	9	0	1	2	0	
3 జొబ్బరినార.	Nodeya Cotha.	Hemp or sunn plant . . .	Do. do.	1,293	.....	10	0	5	0	0	7	6	
4 మోగలినార.	Keya loye.	Cocoanut Fibre. Cocus nucifera.	Amany Talooks. ....	.....	.....	.....	0	2	0	0	3	0	
5 అడ్డనార.	Sheyale loye.	Caldera, Pandanus Odoratis-sinus.	Do. and Zemindary do. ....	.....	.....	.....	0	5	6	0	6	0	Wild creeper.
6 తీగనార.	Cauloova loye.	Bauhinia parvifolia . . .	Do. do.	.....	.....	.....	0	3	6	0	4	0	Do. do.
7 జిల్లూడినార.	Vorakha loye. ....	.....	Purlakemedy and Gumsur . . .	.....	.....	.....	40	0	0	40	0	0	These grow on the river side mostly.
8 పాననార.	Pane loye.	Asclepias Gigantea, Yercum.	.....	.....	.....	.....	0	2	0	0	2	0	Wild creeper.
9 సాగనార.	Moorga loye.	Rabbit weed.	Purlakemedy . . .	.....	.....	.....	15	0	0	15	0	0	Do. do.
10 పూతికెనార.	Caule loye.	Sansevieria Zeylanica, Marool	Do. ....	.....	.....	.....	5	0	0	5	0	0	
11 అక్కెనార.	Ambada loye.	Mulberry tree. Morus . . .	Do. ....	.....	.....	.....	0	8	0	0	8	0	
12 బుడుమునార.	Gooja loye.	Ficus Racemosa.	Amany and Zemindary Talooks	.....	.....	.....	0	4	10	0	4	10	Do. do.
13 బుడ్డలనార.	Ambada loye.	Celtis orientalis . . .	Zemindary Estates . . .	.....	.....	.....	0	5	4	0	5	4	Do. do.
14 యెరుకుతరనార.	Bodo damana loye. .	Ficus Oppositifolia . . .	Do. ....	.....	.....	.....	0	4	0	0	4	0	Do. do.
15 కారుకుండినార.	Damane loye. ....	.....	Do. ....	.....	.....	.....	0	4	0	0	4	0	Do. do.
16 పెద్దతనార.	Bogo Cundoola loye.	.....	Do. ....	.....	.....	.....	0	8	0	0	8	0	Do. do.
17 కుంభినార.	Bodo damana loye. .	.....	Do. ....	.....	.....	.....	0	4	0	0	4	0	Do. do.
18 కొండతామరనార.	Coombe loye. ....	.....	Do. ....	.....	.....	.....	0	4	0	0	4	0	Do. do.
19 అక్కడనార.	Calesa loya.	Careya arborea.	Do. ....	.....	.....	.....	1	4	0	1	4	0	Do. do.
20 గుంజుశేఖనార.	Cooday loye.	Osyris peltata . . .	Do. ....	.....	.....	.....	0	12	0	0	12	0	Do. do.
21 చామశేఖనార.	Gooneche loye. ....	.....	Do. ....	.....	.....	.....	20	0	0	20	0	0	Do. do. It is exposed to dew before taking the Fibre out.
22 మోడుగనార.	Soodarasana loye. .	.....	Do. ....	.....	.....	.....	80	0	0	80	0	0	
23	Polasa loye.	Cannabis Satiya . . .	Do. ....	.....	.....	.....	7	8	0	7	8	0	In the forests and in the hedges.
24	Bovoola loye. ....	.....	Do. ....	.....	.....	.....	2	8	0	2	8	0	
25 శామలినార.	Ocheka loye.	Butea frondosa.	Do. ....	.....	.....	.....	4	0	0	4	0	0	In Jungles.
Shamale Narah.	.....	.....	In Amany Talooks . . .	.....	.....	.....	4	0	0	4	0	0	Do.
			Do. ....	.....	.....	.....	4	0	0	4	0	0	Do.
			In Zemindary Estates . . .	.....	.....	.....	8	0	0	8	0	0	Do.

W. KNOX,
Acting Collector.

W. KNOX,
Acting Collector.Ganjam District, Collector's Cutcherry,
Chutterpore, 14th May 1855.

twined and is used for pellet bows and fishing rods. It is said this was used to make cloth by one of the Goomsoor Rajahs.

Mostly used by the Ooryea fishermen in making their fishing baskets, and as lines for their nets, and for tying fences and making sieves &c., this is very cheap, and when tarred and stretched makes a very good fence, and last for 3 or 4 years.

It is either scraped with a piece of bamboo or soaked and the fibre taken out, a sort of mats called "Durba Chapaloo" are made with it, the finer sort is cleaned and knitted into bags by the labouring class of people.

The tender branches are cut and fibre taken out and used for thatching houses, and making sieves &c.

Are wild trees not much in use excepting for tying fences—they produce fibres their English or botanical names are not known.

It is chiefly used for thatching houses.

Are wild trees used very rarely but they produce fibres perhaps as good as some of the above named.

The Plantain tree is extensively grown in almost every part of the district for its fruit—the sap of it after the tree is cut down is eaten by the natives—they are aware that it produces a fibre, but they are ignorant of the process by which it could be prepared so as to be fit for any valuable purpose, the bazaar people very often use it in lieu of twine when it is dried.

I have the honor to be, &c.,

W. KNOX,

Acting Collector.

Ganjam District, Collector's Cutcherry, }
Chatterpoor 14th May 1855. }

going fermentation in water—as also the Gha (a creeper). The Kooloo is a long slim shrub the bark of which produces the fibre. The fibre is long, resembling in appearance jute or hemp. It is prepared in the same way as hemp. The Rajah of Goomsoor, I believe used to make cloths for himself of the Yercum, the Moorgo and Gha, each village having had to supply him annually with a small portion of fibre in a prepared state, but since his time I believe none of these jungle fibres have been used by the Natives for any purpose whatever. The "Kooloo" is used by them for making rope occasionally, I have not affixed any price to the jungle growing fibres—not having procured them in bulk—but the cost would be that of collecting and preparing only.

I have, &c.,

(Signed) HENRY THURBURN,

Executive Officer.

Russellcondah, 6th December 1854.

(True Copy.)

W. KNOX,

Acting Collector.

No. 43.

FROM P. B. SMOLLETT, Esq.,

Acting Collector,

TO B. CUNLIFFE, Esq.,

Secretary to the Board of Revenue, Fort St. George.

SIR,

With reference to the Board's Circular of the 25th September last, I have the honor to forward a statement of Fibrous plants produced at present in this District.

2. These returns are made from the accounts furnished by the several Heads of Police, but as the greater portion of the District is possessed by private Zemindars little reliance can be placed on them.

3. It may be inferred however that the District generally does not now produce any Fibrous plants yielding an article suited for the European Market, and there does not seem at present any disposition in the merchants settled here to speculate in the growth of such articles.

I have the honor to be, &c.,

P. B. SMOLLETT,

Acting Collector.

Vizagapatam District, Bimlipatam, }
Collector's Office, 28th March 1855. }

Statement of Fibrous plants in the District of Vizagapatam.

Names of Fibre.	Description and extent of land cultivated.				Estimated produce per Cawny.	Selling price of Fibre per Candy.	Remarks.
	Dry.		Wet.				
	Cawnies.	Ruppes.	Cawnies.	Ruppes.			
Janoomoo or Hemp,-	564	3,727	308	3,901	24 Candies.	12½ Rs. & Cdy.	This is used in making ropes and in weaving gunny puttahs for sale.
Gogoo or Hibiscus Cannabinus	211	1,971	63	1,654	3½ do.	11 Rs. do.	The leaf of this plant is used as a vegetable and the Fibre is made into ropes for domestic purposes.
Cotton plants,	181	1,579	199	4,144	.....	.....	After reaping the produce, the plant is thrown away the quality of the Fibre not being known.
Plantain do.-	65	895	.....	.....	.....	.....	After reaping the produce, the plant is thrown away the value of its Fibre not being known.
Cocoanut do. -	13	68	2	10	.....	.....	The Fibre is used in making ropes in some places, but it is in some places thrown away.

Vizagapatam District, Bimlipatam,
Collector's Office, 29th March 1855.

P. B. SMOLLETT,
Acting Collector.

No. 38.

FROM ARTHUR PURVIS, Esq.,

Collector Rajahmundry,

TO BROOKE CUNLIFFE, Esq.,

Secretary Board of Revenue, Fort St. George.

SIR,

I have the honor with reference to the Proceedings of the Board of Revenue under date the 25th September last, to forward a statement showing the extent of cultivation of the different kinds of fibrous plants in this District, and a memorandum in which I trust the further information required by Government will be found. Every publicity was given to the information forwarded with the Extract Minutes of Consultation of the 19th September last, but until there is an increased demand for, and consequent rise in the price of each kind of fibre, we cannot expect that the cultivation will be greatly extended. This does not appear to be the case at present for I was told only a few days ago by an European gentleman well acquainted with the markets that the price of hemp had fallen in England and that shippers had been advised by their correspondents to make up their minds to a loss. He was unable to give any reason for this but of the fact he seemed to have no doubt.

2. Some attempts have been made by certain European residents in this District to produce an improved description of fibre. Mr. James Rundall at Razole in the Nugguram Talook, interested himself a good deal on the subject, and obtained some specimens of fibre from the plantain but the cost was so great, the quantity of clean fibre produced not exceeding 5 per cent, that it would not, unless some much less expensive process of cleaning than that recommended in the papers which have been published on the subject, can be discovered, at all answer in a mercantile point of view. Some further experiments made by the same gentleman with other plants were not attended with much better success. A good specimen however from the Gogoo plant was produced and sent for Dr. Hunter's inspection. Mr. Irvine when in charge of the jail at Rajahmundry produced some apparently very fine fibre from the aloe, specimens of which have I believe been sent to England that the commercial value might be ascertained.

I have the honor to be, &c.,

A. PURVIS,

Collector.

Rajahmundry District, Collector's Office, }
Coconada 5th June 1855.

Statement shewing the extent of Cultivation of Fibrous plants in the District of Rajahmundry in Fusly 1263.

No.	Name of Fibre.	Description and extent of land cultivated.												Estimated produce per cawny.	Selling price of Fibre per maund.
		Dry.		Wet.		Gardens.		Total.							
		Cawnies.	Assessment.	Cawnies.	Assessment.	Cawnies.	Assessment.	Cawnies.	Assessment.						
1	Janoomoo —Hemp,—	1,106½	7,210 9 10 302	3,748	...	...	...	1,408½	9 10 32	...	1½	...	15 9		
2	Gogoo—a Fibrous plant,.....	45½	57 ...	104 12	...	...	...	98½	12	...	...	...	8		
3	Cocoanut (coir),.....	386½	2,137 5 6	...	...	706½	1 10	1,092½	7 4 21	...	...	...	6 6		
4	Cotton,.....	5,892½	26,102 12 1 52½	207 4	...	5	...	5,949½	26,316	...	1 6 5	1½	8 9		
5	Plantains...	...	...	...	...	150	...	150	...	...	...	...	...		
	Total...	7,430½	35,507 11 5 407½	4,060	...	861½	6,790 1 10	8,699½	46,357 13 3	...	...	...	...		

Rajahmundry District, Collector's Office,
Coconada 5th June 1855.

A. PURVIS,
Collector.

Statement containing the information required in Para 13 of the Extract from the Minutes of Consultation dated 19th September 1854 in regard to the modes of cultivation and preparation of Fibres &c., in the Zillah of Rajahmundry.

Particulars of the different descriptions of Fibrous plants.	Modes of cultivation.	Preparation of the Fibres.	Expenses attendant upon the cultivation and preparation.	Quantity grown.	Whether sufficient for local requirements only or whether any part is exported.	Whether there is a desire among the Ryots to extend the cultivation under existing circumstances.	If not whether any encouragement is required.	What are the capabilities of each district generally and of particular localities for growing the articles.	What are the ob-stacles such as dis-tance from the sea-board &c. to the free port of Fibres.
1. Janoomoo or sunn—Hemp.)	The crop is planted in No-vember and cut down by the end of March; whether grown in dry or wet lands it is cultivated like a dry crop and never watered.	The bundles are buried in mud and left for about a week, when they are taken out, fibre is and beaten in for a pooty* of the water and ties are removed after all impurities are removed the fibre is collected. The plants allowed to rot in salt water are said to yield stronger fibre than those prepared in fresh water.	The expenses of cultivation are estimated at Rs. 8-8 and of preparation at Rs. 100 pices each bundle of the equal to 5 cawny of fibre making last year a total of 3,300 shewn below. viss or 412½ mds. valued at Rs. 412 As. 8 at 1851-52 700 62 Rs. 412 As. 8 at 1852-53 3471 9 1853-54 1149 99 1854-55 4269 63 * 5 Cawnies.	About 2,200 bundles are produced in one pooty of land to Madras and other places the quantity exported is three times as much as the quantity consumed in the district.	Partly used in the district and partly exported to Madras and other places the quantity exported is three times as much as the quantity consumed in the district.	Should the demand for the article increase there is no reason to doubt that the Ryots would be inclined to extend the cultivation.	No particular encouragement is required.	The clayey soils and those situated beyond the reach of inundation are those best suited for this purpose. A species of cul-cheep means of transport to lands are to be the shipping found in most ports of Coconada and Coconada District. There is a want of roads from village to village & to the banks of the canals which makes the transport of bulky goods from places distant from the main canals expensive. A remedy for this evil will it is hoped shortly be applied.	A large portion of the district is intersected with navigable canals which are those best suited for this purpose. A species of cul-cheep means of transport to lands are to be the shipping found in most ports of Coconada and Coconada District. There is a want of roads from village to village & to the banks of the canals which makes the transport of bulky goods from places distant from the main canals expensive. A remedy for this evil will it is hoped shortly be applied.

Particulars of the different descriptions of plants.	Modes of cultivation.	Preparation of the Fibres.	Expenses attendant upon the cultivation and preparation.	Quantity grown.	Whether sufficient for local requirements or whether any part is exported.	Whether there is a desire among the cultivators to extend the cultivation under existing circumstances.	If not whether any and what encouragement is required.	What are the capabilities of each district generally and of particular localities for growing the articles.	What are the obstacles such as distance from the sea-board &c. to the transport of Fibres.
2. Gogoo a fibrous plant the leaves are used by the natives as a vegetable.	This plant is planted in July only and comes to maturity in Sept.	As above, the difference being that the bundles left to rot in fresh water are considered to yield the strongest fibre.	Do. Do.	One Pooty of land is calculated to yield 2200 bundles each very small, no productive giving about 2½ portion of the power of the vis of fibre or fibre is exported land on which 5500 viss or 687½ maunds for the whole valued at 687½ Rs. at 1 Rupee a maund.	The extent of the plant being cultivated with the plant being minimised the bundles each very small, no productive giving about 2½ portion of the power of the vis of fibre or fibre is exported land on which 5500 viss or 687½ maunds for the whole valued at 687½ Rs. at 1 Rupee a maund.	As this cultivation under existing circumstances. Ryots to extend the cultivation under existing circumstances. Ryots are not very partial to this species of cultivation.	.....	This plant is suited to all soils excepting those im-pregnated with salt.	What are the obstacles such as distance from the sea-board &c. to the transport of Fibres.
3. Coconut	Young plants of a year's growth are planted out in the 6th year after they are watered for 6 years after which they do not require much water and about the 9th year after planting the trees are generally bear fruit.	After the Coconuts are gathered the outer covering is wetted with water and beaten with wooden mallets when the fibre is loosened. The ropes which are required for various purposes.	The expenses of cultivation are stated to be Rs. 668 for a Pooty of land viz. Price of 600 young plants, 140 Labor required for them, 48 Wages of laborers employed in first watering and then taking care	When the trees begin to bear fruit the value of the produce of a tree exclusive of the fibre is estimated at about Rs. 12 annas per annum making the total value of the produce in a Pooty of land Rs. 300. The quantity of fibre the produce of a Pooty of land is estimated at 150 mds. yielding Rs. 93-12 at 10 annas a md.	This fibre is generally used in the district and for any quantity. Co-owners of a coconut plantation yet the crop being one which lasts for several years the annual income derived without much additional outlay after the trees begin to bear, is such as to induce	Altho it is in some time before it is received by the owner of a coconut plantation yet the crop being one which lasts for several years the annual income derived without much additional outlay after the trees begin to bear, is such as to induce	Vide remark in column 7.	The clayey, sandy soil near the coast and is best suited to this species of cultivation. The trees will thrive in all but the Tan-dimulla, Lingumpury, Gootala, and Cottapully Talooks.	What are the obstacles such as distance from the sea-board &c. to the transport of Fibres.

4. Yerken Milladu in are not cultivated but grow spontaneously.	These plants are scraped from the small sickles or knives but the fibre so extracted is so small that it is not used for any other purpose but for nets to catch birds by the people of Yarokala caste.	The fibre is scraped from the dried plants with small sickles or knives but the fibre so extracted is so small that it is not used for any other purpose but for nets to catch birds by the people of Yarokala caste.	of the crop until the trees bear fruit. 480 668 The expenses attending the preparation of the fibre from the produce of one Pooty are calculated at Rs. 243-12-4. Nil. Expenses attending the preparation of the fibre from the produce of one Pooty are calculated at Rs. 243-12-4. Nil.	.....	Not exported to any other districts.	.....	.....	These plants grow every where.	What are the obstacles such as distance from the sea-board &c. to the transport of Fibres.
5. Mogilly shrub.	This is another spontaneous plant used for hedges.	The leaves are cut into slits, exposed to the sun for about 3 days of fibre are estimated and then being wetted with water, become soft, the fibre is made into thin ropes and used for cots by natives.	Nil, but expenses attending the preparation of the fibre are estimated at 1 Rupee a maund, which is valued at ½ Rupee.	.....	Not exported to any other districts.	.....	.....	The sandy tracts near the sea are best suited to these plants.	What are the obstacles such as distance from the sea-board &c. to the transport of Fibres.

Rajamundry District, Collector's Office, }
Coconada 5th June 1855.A. PURVIS,
Collector.

FROM H. WOOD, Esq.,

Acting Collector of Guntoor,

TO B. CUNLIFFE, Esq.,

Secretary to the Board of Revenue, Fort St. George.

SIR,

I have the honor to forward the return called for in the Extract from the proceedings of the Board of Revenue dated 25th September last, and to state that due publicity has been given in the District to the sentiments of Government expressed in the Minutes of Consultation of the 19th of the same month.

* *Hibiscus cannabinus.*

† *Crotalaria Juncea.*

2. Gogoo* and Janoomoo† are the two fibrous plants chiefly grown in the District; they are usually planted in furrows on the borders of fields set apart for the purpose. The former is sometimes sown broad cast promiscuously with cholum and other dry crops. These plants, when full grown, are pulled up by the roots and dried; afterwards soaked for some 10 days or so in Tanks or Rivers, and the bark, which constitutes the fibre, is then removed, again washed and dried, and kept in this state until required for use. The expense attending this process is calculated at 2 annas per maund. The Gogoo is generally used for cordage, it is also made into twine and worked on looms into Gunnys. The Janapa is also made use of for these purposes. Both kinds of plants are usually grown in the cotton soil, and the produce, averaging annually 1,600 Candies, is considered only sufficient for local demands.

3. The stalks of the palmyra leaf cut and bruised, in a raw state, are also used for cordage by the inhabitants of the villages along the coast.

4. In Innacondah, and some few villages in the Palnaud District, the bark of the apa tree, and the branches of the saga tree, are gathered from the jungles and after undergoing the same process of preparation are used for cordage by the ryots in those localities.

5. The rind of the cocoanut, also the stalk of the plantain tree, as well as jilladu are made but little use of in this District.

6. If a foreign market could be secured, and should the Government be desirous of increasing the cultivation, it is probable that this might be effected by granting waste lands free of assessment for a certain number of years or on favorable terms.

7. With regard also to Para 13, the District being chiefly cotton soil, it has its advantages and disadvantages on that account, the roads being passable only during the dry weather. The distance from the coast is not great and there are facilities of export at Nizampatam, Epoorpalem and other points along the coast.

I have the honor to be, &c.,

Guntoor District, Collector's Office,
Baupetlah, 11th June 1855.

H. WOOD,
Acting Collector.

Return of the different descriptions of fibrous plants grown in the District of Guntoor.

Number.	Name of Fibre.	Description & extent of land cultivated.				Estimated produce per Acre.	Selling price of Fibre per Candy.	
		Dry.		Wet.				
		Acre.	Rupces.	Acre.	Rupces.			
1	Gogoo hemp	..	..	..	..	1	10	Nos. 1 and 2.—These plants are chiefly grown in furrows on the borders of fields, the former is also sown promiscuously with cholum and other dry crops, the exact quantity of land cannot be ascertained. 3.—There are several topes and scattered trees in the sandy tracts along the coast.
2	Janapa or Sunn	..	..	..	..	$\frac{1}{2}$	15	
3	Palmyra hemp	..	..	..	..	..	..	
4	Yapa Do.	..	..	..	..	..	..	4 and 5.—These trees are situated in jungles. 6.—There are a few coconut plantations, and scattered trees in the sandy tracts of the District.
5	Saga Do.	..	..	..	..	..	..	
6	Coir	..	..	..	..	..	..	7.—These trees are planted in gardens and on the hedge banks of Betel Topes.
7	Plantains	..	..	..	..	..	..	8.—These trees are to be found both in cultivated and uncultivated lands.
8	Jilladoo Narah or Yerkum	..	..	..	..	..	..	

H. WOOD,
Acting Collector.

No. 41.

FROM J. RATLIFF, Esq.,

Acting Collector of Nellore,

TO B. CUNLIFFE, Esq.,

Secretary to the Board of Revenue, Fort St. George.

SIR,

In acknowledging receipt on the 4th of October of Extract from the Minutes of Consultation of the 19th September last forwarded with the Board's Proceedings of the 25th idem I have the honor to forward herewith two Statements affording, I trust, the information required on the several points adverted to by Government in Para 13 of the Extract above referred to.

I beg at the same time to observe that no pains have been spared in making the sentiments of Government generally known throughout the District, as well as in communicating to the people at large, the best modes for the preparation of the Fibres.

I have the honor to be, &c.,

J. RATLIFF,

Acting Collector.

Nellore District, Collector's Office, }
Doovoor 8th March 1855.

2 Janoo- moo.	This is cultivated both as a separate crop and as one of the above named, with others, whether dry, wet, for about 20 days. The moosoom or Zareeb. It does not require constant irrigation, indeed the rains of an ordinary season, are of themselves sufficient, irrigation occasional-ly being called for in cases of protracted drought. The crop is generally reaped at the end of about 3 months.	These are made up into bundles not allowed to rot in water, for about 20 to 30 days. The de-satisfactory ba- is raised to sis upon which some little ex- he can definitely tent in the large handfuls state the charges Surugum Ta- and well beat- attending the look only, and on the wa- cultivation of the thence sent to which plant but which inland mar- he believes may kets.	The Acting Collector has been able to remark is applicable to this from the various reports received, the exception	that the bare fact of such an announcement being promulgated, would of itself create a ready market for the article among private Merchants. In the absence however of this incentive, (unless the object be esteemed sufficiently important to permit simultaneous adoption,) the Acting Collector would suggest that whilst dry assessment should alone be levied upon lands exclusively sown with any kind of fibrous plant, such as Gogoonar, Janoomoonar (the two specified in this statement,) Yerkum or Jiladoor, remission of assessment partial or total, should be promised in all cases of ascertained partial or total failure: an indulgence particularly necessary in the case of Janoomoo (or Hemp) in the cultivation of which such failure is frequent.		
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Plantains are not with few exceptions cultivated as distinct crops, but planted chiefly around Betel gardens as a protection against the wind, and in such cases are not assessed. The practice of extracting fibre either from them or from Coconut trees has never hitherto prevailed in the district. A coarse species of fibre however used chiefly to make ropes for drawing water with, and various other rude purposes, is obtained from the stalks of the Palmyra Tree.

Nellore District, Collector's Office, }
Doovoor 8th March 1855.

J. RATLIFF,
Acting Collector.

No. 50.

FROM C. PELL, Esq.,

Collector of Bellary,

TO B. CUNLIFFE, Esq.,

*Secretary to the Board of Revenue,**Fort St. George.*

SIR,

With reference to the 13th para. of the Extract from the Minutes of Consultation, dated 19th September 1854, instructing the several Collectors, to make generally known to the Ryots the advantages derivable from cultivating fibrous plants, and furnish the Government with the following information in a Statement according to the form supplied.

1. The mode of cultivation of fibrous plants.
1. The profit derivable therefrom.
1. The expenses attendant upon them.
1. The quantity grown, whether sufficient for local requirements only or whether any part is exported.
- 1. Whether there is a willing desire among the Ryots to extend the cultivation, if not whether any and what encouragement is required.
1. In what lands fibrous plants are grown.
1. Whether the distance to the sea is great for the transport of fibres.

I have the honor in reply to give as much information in the matter as is obtainable.

The fibrous plants grown in this District are:

First—The Poondy Nar—the seeds of this plant are sown mixed up with cholum and other grain, and is also sown with cotton, the plant grows from $\frac{1}{2}$ to 3 yards in height, the leaves are used extensively as vegetable in curry by the ryots, the plant stands green on the ground for five months, when the leaves begin to drop it is then cut down and put to soak in water for 8 or 10 days, the fibre is after that separated,

* The estimate of the gross produce of this Poondy Nar is 20,000 maunds at 48 Cutcha seers per maund.

The quantity used by ryots themselves is 10,000 maunds.

The remaining 10,000 maunds are sold at the rate of 8 annas per maund.

bound in sheaves, and heaped, the ryots use this fibre for ropes required for cultivation, and sell the surplus, at the rate shewn in the margin,* this fibre is used for no other purpose than making ropes, as the extent of its cultivation is not known to any certainty, I subjoin an abstract of the probable extent.

	Gross Cultivation.		Average.			Probable extent cultivated with Poondy Nar.					
	Acres.	Rs.	Rs.	A	P.	Acres.			Rs.	A	P.
Dry,	13,54,075	10,96,410	0	13	0	50,000	0	0	40,625	0	0
Bagayet,	25,286	1,80,007	7	2	0	1,000	0	0	7,125	0	0
	13,79,361	12,76,417	0	14	8	51,000	0	0	47,750	0	0

The cultivation of this plant may be extended by giving advances for the cultivation of it to the ryots, and creating a certain demand which will ensure a sale.

Second—The Janapa Nar plant is grown by itself separately, but only in a few places in this District; it remains green four months, its height is from 1 to 2 yards, and about the thickness of a finger, the plants when cut, are bound in bundles and put into water to soak for 15 days, the fibre is then separated, bound in sheaves, and stacked, this fibre is used for making small ropes, it is also twisted very fine, and gunnies are manufactured with the twine, and blinds, bags, &c., are made of the gunnies, the fibre is sold at prices varying from a rupee to a rupee and a half per maund, when the gunny becomes old and torn, it is sold to paper manufacturers for making coarse country paper. The extent of the cultivation of this plant may be about 4,000 acres, about 3 maunds of fibre is produced on each acre of land, so that the gross produce is estimated to be 12,000 maunds. The quantity of the fibre produced in this District is insufficient to meet its demand, and the fibre and gunnies, &c., are brought from the neighbouring districts of Mysore, Cuddapah, &c.

3. Cocoanut coir.—The Cocoanut tree is grown in Dhropire and Bagayet lands, the coir is used for making ropes for the use of cultivation, and also for making pack saddles, beds, &c. the extent of Dhropire cultivation in Fusly 1268, was 3,420 acres of land assessed at Rupees 57,500 and the extent of cocoanut plantation alone at the rate of 100 trees per acre would be about 34,200 trees only, the fibre is very little used in Bellary.

4. Ahsin Nar.—The trees and plants from which this fibre is extracted are called Narepah which grow commonly in Mussub soils

and among rocks and such localities, the bark of these is removed, and the fibre extracted and bound in sheaves, of which ropes &c. are made and sold, this is done chiefly by the Boya, Lumbana, and Coreba caste people.

5. The Eatha Nar.—This fibre is extracted from the switches of the date tree, which are beaten into fibres, it is used for making bucket ropes for drawing water from wells, and does not appear to be used for any other purpose, the extent of land occupied by these trees is not known.

6. The Kathalee or aloe plant is generally grown along the sides of roads, the fibre is extracted by a process of smashing, and ropes are made of the same, the extent of ground on which the aloe grows also is not known, and the fibre is only a little used.

7. The Aratee or plantain tree, is grown in gardens in many places, the outer stalks of the stem leaves are used for binding betel creepers to trees, but for no other purpose.

There do not appear to be any fibrous plants in this district besides those above enumerated.

If it is wished to extend greatly the cultivation of any of the above fibrous plants, it would be necessary to give encouragement to the farmers by making advances and taking the produce at a fixed rate, either by Government or private speculators. And it would also be desirable to have a qualified person to superintend the manufacture of hemp as it is but little if at all known properly in this District.

I have the honor to be, &c.,

C. PELLY,
Collector.

Bellary, Collector's Office, }
20th June 1855.

No. 8.

FROM M. MURRAY, Esq.,

Collector of Cuddapah,

TO B. CUNLIFFE, Esq.,

*Acting Secretary to the Board of Revenue,
Fort St. George.*

SIR,

Para 1. I have the honor to acknowledge the receipt of the Extract from the Proceedings of the Board of Revenue under date the 25th September 1854, transmitting copy of the Extract from the Minutes of Consultation dated the 19th idem, calling attention to the orders of Government contained in para 13 of the above extract, and requiring to submit return, in the prescribed form, shewing particulars of the different descriptions of fibrous plants grown in the district, accompanied by information on the several

- * 1. Gogoo.
- 2. Janapum or Sunn.
- 3. Coir.
- 4. Yanoogacalabunda or hill aloe.
- 5. Yapee.
- 6. Eatha or date.
- 7. Palmyra.

points adverted to by Government in the para above quoted, and in reply I beg to afford the following information in respect to the several descriptions of fibrous substances, as noted in the margin* produced in this district.

2. The "Gogoo" plantation is carried on extensively in the talooks of Koilcoontlah, Zummudmudgoo, Doovoor, Cannalapoor, Chennoor and Poolevendlah, and in others to less extent. The seed of this plant is not sown separately but mixed with Jonna, Corra, Sujja, Areca &c. dry grain as also cotton. The extent of land occupied in cultivating this plant cannot consequently be ascertained, this produce is generally grown in dry land dependent on the natural showers, also in garden lands irrigated by wells and reaches maturity in 4 months from the date of sowing. After pulling, the stalks are steeped in water, for a period of 8 or 10 days in order to separate the fibre from the woody part; it is then taken out, the fibrous portion stripped off and dried, manufactured into rope and string, which is used for country cots, fastening up cattle and agricultural purposes. The quantity grown is merely sufficient for the local requisition and will not permit of being exported, the price per maund may be stated at Rupees 1-8.

Janapum or Sunn.

3. The "Janapa or Sunn" plant is grown separately in wet and garden lands dependent on tanks, channels &c. extensively in the Chitwail talook, and to a small extent in Sidhout and Budwail. It requires irrigation once in 6 or 7 days and comes to maturity in 4 months, the preparation and manufacture of this fibre is similar to that of Gogoo as above stated. From this fibre gunney puttah is manufactured in Chitwail to a considerable extent, but to a smaller in the neighbouring talooks, which along with the rope and rough fibre is exported to Madras, Bellary, Nellore, and other places in addition to the quantity consumed in the district.

4. The extent of land on which this article is produced may be estimated at 400 acres, but the quantity produced on an acre cannot at present be accurately ascertained. It has been reported that the fibre is sold at Rupees 1-4 per maund, and the twine at 2 Rupees in the places where they are manufactured.

Coir.

5. The "Coir" is made in Chitwail, Goorrumcondah, Muddenpully and in the proximity of Cudre, in the Poolevendlah talook. The cocoanut trees are planted separately in some localities, whilst in others they are grown in wet and garden lands, also around the fields, consequently the number of acres occupied by cocoanut trees cannot be correctly estimated, but the number of trees in the district may be calculated at about 1,50,000 yielding twice a year, the husk after being severed from the nut is soaked in water and from the fibre thereof string, cord, ropes &c. are made, they are not only used by the ryots in their agricultural purposes, but reported to be exported to Madras, Bangalore, North Arcot, Nellore, &c. The value of this fibre per maund is annas 8 and of the twisted rope, cord &c. 1 Rupee.

Yanoogacalabunda or hill aloe.

6. "Yanoogacalabunda or hill aloe" is grown on the sides of the high road and in the hedges of gardens and fields; the leaves thereof are cut and soaked in water for 10 or 15 days or until the pulpy part is rotted, and then beaten against a stone till all the fibre is separated—after which ropes, cord for buckets and strings for fastening cattle are made in considerable quantities in Goorrumcondah, Muddenpully and Royachoty—and in other talooks to some extent—the manufacture of this fibre is entirely for home consumption not for exportation and must always be limited in quantity. The price fixed upon this description of rope is trifling and it is even bartered for grain.

Yapee.

7. In respect to "Yapee rope" it is to be remarked that the bark of the green branches of Yapee trees (growing in the range of Nullamala hills, the timber of which is made use of for building purposes) is separated from the branches, and from the inner coating of the bark fibres are procured by beating against stones; from these strings and ropes for the fastening of cattle stringing of cots and for various other purposes are twisted; this substance forms a very coarse species of rope not durable, but the export thereof to other places is not general. No fixed price can be stated; it is sold at a very low rate as well as exchanged for grain, and I do not consider it capable of being made an article of commerce.

Eatha or date.

8. In some places where "date" trees are grown the fibres of the branches are extracted and cord ropes &c., for raising water and for tying up cattle are made, it is as aforementioned not sold at a fixed rate.

Palmyra.

9. The number of "Palmyra" trees in this district is limited; in places where they are grown, fibre is prepared from the stem of the leaf and string or twine prepared for fastening the roof of the thatched buildings. This rope is neither exported to other districts or to be had in the public bazars, the quantity prepared being consumed by the manufacturers.

10. Of the several descriptions of fibres above referred to, the Janapa or Sunn plant is in greatest demand and most remunerative to the growers; for the extension of the culture of this plant large quantities of land situated under wells, channels, tanks and other reservoirs in the district is available, and should Agents from the Mercantile houses at Madras make advances or come to some arrangements with the growers that they will take from them the whole quantity grown at liberal prices, I have no doubt that the culture of this produce might be very largely increased and at the same time it might be of great advantage were the Government or some of the Agencies at Madras to send up an Agent to superintend the mode of manufacture and cleaning this fibre, it might be made to bear a higher price and admit of exportation to the European markets than the rough material which is at present manufactured into gunny, &c.

11. Flax is also grown to a small extent in the western talooks Zummulmudgoo, Koilcoontlah, Doovoor, Camalapoor, Chennai and Poolevendlah for the purpose of extracting oil from the seed, but the preparation of the fibre for the purposes of making cloth is perfectly

unknown. As soon as the seed has been taken, the stalks are thrown into the dunghill for increasing the stock of manure by rotting it.

12. I have this season procured 10 lbs. of hemp seed from England; a portion of which I have sown in my own garden at Cuddapah, given a portion to the Civil Judge and sent the remainder to Muddenpully, a colder climate, to be sown there. Should the experiment turn out favorably and the seed be productive, I shall on a future occasion report the results to the Board as well as sending them specimens of the fibre produced. I am however very much afraid that the season has already too far advanced and the scorching winds will prevent the plants coming to their proper height and maturity. I also propose obtaining a quantity of the stalks of the flax plant and attempting to obtain the fibres from it. Should I be successful the Board of Revenue will be duly informed, but as the experiment cannot be performed under my own observation, I have great fear that it may turn out a perfect failure.

13. The export of the different fibres to the sea coast in Madras will not be attended with any difficulty further than the badness of the roads between Cuddapah and Madras, which are in such a state that the bullocks will be worn out and Carts broken if not upset, this road I am in great hopes will be soon made a first class trunk road, as I have lately received a detailed estimate of its formation from the Civil Engineer.

14. The extent of land occupied in the production of janapum and that occupied in Cocoanut gardens will be forwarded with as little delay as possible.

I have the honor to be, &c.,

M. MURRAY,

Collector.

Cuddapah District, Collector's Office,
On Circuit Markapoor, 5th February 1855. }

No. 3.

FROM L. D. DANIELL, Esq.,

Agent to the Governor of Fort St. George at Kurnool,

To B. CUNLIFFE, Esq.,

Acting Secretary to the Board of Revenue,

Fort St. George.

SIR,

With reference to Extract from the Proceedings of the Board of Revenue dated 25th September 1854, together with Extract from the Minutes of Consultation dated 19th Idem, I have the honor to subjoin a Statement according to the form sent of the textile plants cultivated or found in the jungles of this District, but for reasons hereafter stated all the particulars called for in the different columns cannot be given.

all the particulars called for in the annexed						
Teloogoo Names of Fibres.	English Names of Fibres.	Description & extent of land cultivated.		Estimated produce per Acre.	Selling price of Fibre per Maund.	Remarks.
		Dry. | Wet.				
		Acres.	Rs.	Acres.	Rs.	
1	2	3		4	5	6
కోసునారా. ...	Coarse fibre or hemp ..	...	...	6	0 8 0	The information required in Columns 3, 4, and 5 cannot be given because the Fibrous plants cultivated in this District are usually planted in small quantities mixed with other
ఎసిసారా. ...	Saul.....	...	...	...	0 2 0	
యాశనారా. ..	Date.....	...	...	...	0 1 0	
మోడుగనారా. }	Modooga	...	...	...	...	
	Butea Frondosa..... }	...	...	...	...	
యెర్రపొలికినారా.	Yerra Poleky Naroo...	...	...	...	0 1 4	
ఆరనారా. ..	Ara Naroo.....	...	...	...	0 1 4	
చాగనారా. ..	Chaga Naroo.....	...	...	...	0 4 0	
జిల్లెడునారా. }	Yercum Nar..... }	...	...	...	...	
	Calotropis gigantea. }	...	...	...	...	
అరటిసారా. ...	Plantain.....	...	...	...	...	
బెండకాయనారా	Bendacoi...	...	...	...	...	
భంగివెట్టునారా.	{ A species of hemp plant, Canabis Sativa. }	...	...	...	...	
తాటినారా.	Palmyra tree	...	...	...	...	
ఓంకాయనారా.	Cocoa tree	...	...	...	...	

Gogoo naroo, coarse fibre or Hemp.

2. Is cultivated in small quantities in nearly every dry field. The leaves are used as a vegetable and the stalks are subsequently taken up and soaked in water for some 12 or 15 days, and the fibre is then separated from the bark and made into rope chiefly for agricultural purposes. A small quantity of this fibre is occasionally exported to adjacent districts.

It is stated that an acre of land will produce about 8 maunds of Fibre; and should a demand arise, any quantity could be produced on the waste lands of this District.

Yapay chettoo, saul tree (shorea robusta.)

3. In the Nulla mulla range of Hills the Saul tree called in Teloo goo "Yapay-chettoo" is abundant and grows wild, and the natives make a good rope from the fibre which is much used among the ryots for agricultural purposes. A small quantity of this fibre is also said to be exported to the neighbouring Districts.

Eata, Date tree.

4. This tree grows in several parts of the District. A very indifferent coarse rope is made from the fibre when required for house purposes.

Modooga chettoo, Butca Frondosa.

5. The fibre of this tree is sometimes used immediately after the bark has been stripped off. From the root also a fibre is procured which is much used when fresh, but it is not made into rope as it becomes brittle when dry.

Yerra Poleky, and Ara Trees.

6. These trees are plentiful in some jungles and the fibre is prepared and used in the same manner as that of the Saul tree, but only in localities where the Saul tree is not to be found.

Chaga naroo, Sanseveira Zeylanica.

7. This plant also grows wild. The hemp is prepared by bruising the stalk and burying it in sand for some 15 days and then cleansing it with water. The fibre is made into coarse gunny, used for packing cotton and is also used as matting for floors and for other purposes.

Yercum nar, (Calotropis gigantea.)

8. The Yercum plant alluded to in para 3 is not cultivated but grows wild in most parts of the District. The fibres taken from it are in this District used for fishing lines and for other purposes, when a strong and pliable line is required, but although the fibre is known to possess great strength I cannot discover that it is used to any extent. The mode of preparing it is to strip off the smaller branches and to bury the stem of the plant in the sand in the bed of a river for about the space of 2 hours during

the heat of the sun after which the fibre is easily separated from the wood. This plant appears to grow on any description of soil and a very large quantity could be grown if there was any demand for it, and much more than sufficient for the wants of the District can now be obtained for the labour of preparing the fibre.

Plantain.

9. Very little use is made in this District of the fibre procured from the Plantain tree, although a considerable quantity of the fruit is grown. If the inhabitants were made acquainted with the mode of preparing the fibre and a market could be obtained for the same, a considerable supply might be obtained provided the mode of preparation should be within the means of the ryots.

Bendacoi.

10. Is also considerably cultivated as an article of food, but I cannot learn that the fibrous portions are used for any useful purpose.

Bhang or Hemp Plant, (Cannabis Sativa.)

11. Only a small extent of land is cultivated with this plant and the inhabitants do not prepare any fibre from it.

Palmyra and Cocoa Trees.

12. Cordage or other fibrous materials are not prepared from these trees in this District.

Janapa narah, Sunn Plant.

13. The Janapa Narah or Sunn plant is not grown in any part of the District, but gunny made from the fibre is imported from the Nizam's Territories.

14. The information I have been able to obtain is I regret to say very deficient but as fibrous substances for the wants of the inhabitants can generally be procured for a very small cost beyond the expense of preparation and there has been little or no demand from other Districts, these plants have hitherto never been looked upon as valuable as an article of commerce, and little attention seems therefore to have been paid either to cultivation or preparation.

15. I beg to recommend that samples of the more valuable fibres mentioned in the above list, which might find a market at Madras may be prepared under the directions of a person acquainted with the process, and that small quantities of the fibres may then be sent to this District with printed instructions of the mode of preparation in Teloo-goo and Hindoostanee, and if the mode of preparation should be simple and within the means of native merchants and others, persons may be found willing to try the experiment.

16. I do not think the selling prices entered in the last column of the Statement can be taken as correct, but there is no doubt that those fibres can be procured to meet the present wants of this District at a very low rate, and if an approach to the prices named in the Extract from Minutes of Consultation can be obtained the more valuable fibres will bear the expense of carriage to Kistnapatam or Madras and still yield large profits. A certain market and remunerative prices would induce the ryots to cultivate fibrous plants to any extent.

I have the honor to be, &c.,

Kurnool, Govt. Agent's Office,
On Circuit at Nundicootoor,
23d January 1855.

L. D. DANIELL,
Agent to the Governor.

FROM P. B. SMOLLETT, Esq.,

Collector of Chingleput,

TO B. CUNLIFFE, Esq.,

*Acting Secretary to the Board of Revenue,
Fort St. George.*

SIR,

In compliance with the instructions of the Board of Revenue conveyed in Extract from their Proceedings under date the 25th September last, I have the honor to forward herewith a Return showing the different Fibrous Plants grown in this District.

2. The Janapa or sunn Plant is cultivated in Chingleput only in the Talooks of Ootramalloor and Peddapollium. The average extent of Produce raised during the last 5 years on an area of $24\frac{3}{8}$ Cawnies is estimated at 1,171 $\frac{1}{4}$ viss. The profit to the husbandman, after paying the Government demand, is calculated at about 45 per cent. The most favourable season for the growth of this Plant is the month of December. At this period of the year it is sown, and is reaped in April. The stalks are then subjected to fermentation, being thrown in water, and on the expiration of about 4 or 5 days, they are taken out, cleaned, and the fibres, when prepared, are used in the manufacture of gunny Bags.

3. The Goga naur or Cauchoorocay is likewise produced in this district, but on a small scale. It does not appear to be used as an article of Commerce, but answers the various requirements of the Ryot in the shape of Cordage, &c.

4. The fibres of Cocanoot shells, and the branches of Palmyra trees are also employed in making ropes in Chingleput, but they are scarcely brought to the market for sale, being considered of little or no value.

5. And on the whole it is the universal opinion of the cultivating classes in Chingleput that the soil and climate of the Jagheer are little suited for the growth of Fibrous Plants, the produce of which could be profitably made an article of external Commerce.

I have the honor to be, &c.,

P. B. SMOLLETT,

Collector.

Chingleput District, Collector's Cutcherry,
Sydapet, 10th January 1855.

*Return showing the particulars of the different description of fibrous
Plants grown in the Chingleput District.*

Name of the Fibre.	Name of the Talook where the Fibre is grown.	Description and extent of land Cultivated.				Estimated produce.	Price at which sold.	Remarks.
		Dry garden and wet.						
		Cawnies.	Rs.	As.	P.			
Janapa or sunn plant.	Ootramalloor.	2-7	6	12	6	91½	13 11 0	Profit per Cent. 45-3-0
	Peddapolliem.	21-11 ¹ / ₈	84	1	5	1080	152 0 0	
	Do.	24-21 ¹ / ₈	90	13	11	1171½	...	
Goga...	Do.	15-13 ³ / ₈	84	7	0	0	...	

P. B. SMOLLETT,

Collector.

Chingleput District, Collector's Cutcherry,
Sydapet, 10th January 1855.

No. 9.

FROM H. A. BRETT, Esq.,

Collector of Salem,

To B. CUNLIFFE, Esq.,

*Acting Secretary to the Board of Revenue,**Fort Saint George.*

SIR,

1. Adverting to an Extract from the Proceedings of the Board of Revenue dated 25th September last, circulating a printed copy of Extract from Minutes of Consultation dated the 19th Idem calling for returns in the form furnished, shewing the particulars of the different descriptions of fibrous plants grown in the district, with full and accurate information as to the mode of cultivation and preparation of the fibres, &c. I have the honor to submit the required statement and to offer the following explanation on the points named by Government.

Plantain tree.

2. The Plantain tree in this district is cultivated to a considerable extent, but the uses to which the fibres of the tree may be applied are little known among the people. The leaves, the flowers, the fruit, the bark, and the inner stock are turned to some use, but often the tree is cut down and allowed to rot on the ground after the leaves and fruit have been removed. The bark is sometimes stitched into plates for food, and the inner part of the stem, as well as the flowers, is eaten as a vegetable. The fibre from the bark is only used in an unprepared state for making garlands of flowers or for some temporary purpose of that kind.

Junupum plant.

3. The Junupum plant is cultivated from seed in dry lands, which are regularly ploughed for the purpose. At the end of 5 or 6 months the seed is gathered and the plant cut down, which is then soaked in water for 20 or 25 days, at the end of which period it is taken out and well washed. When the pulpy substance has been removed by this process the fibre is drawn out and dried in the sun. This fibre is extensively used in the manufacture of gunnies. The Junupum plant is cultivated exclusively for the sake of the fibres.

4. This plant is cultivated in Poonjah lands chiefly as a vegetable, but occasionally the fibre is also used. The process of preparing the fibre is similar to that described in the preceding para. The ropes made from it are used by the ryots for tying up their cattle, drawing water from wells, and similar purposes.

Cocoanut tree.

5. The mode of cultivating coconut trees is so well known that it is scarcely necessary for me to describe it. The tree is chiefly cultivated in Nunjah lands. The outer rind of the cocoanut is peeled and soaked in water for a month and then beaten out on stones. The manufacture of rope from the cocoanut fibre is not so extensive as to form an article of trade with other districts.

Palmyra tree.

6. There are large plantations of this tree in most of the talooks. They are considered Government property and are given on rent both for the toddy and the leaves. Fibres are prepared from the stems of the leaves after the tree has attained a growth of 3 or 4 yards. The stems are beaten on stones to prepare the fibres which are then made into a useful kind of rope. These ropes are not manufactured for more than local use.

Cotton plant.

7. The extent of Cotton cultivation is regularly entered in the annual accounts sent to the Board. The way in which this plant is cultivated and the process of extracting the cotton are too well known to require any description.

Kathalay or aloe,
Yerakum plant.

8. Besides the six descriptions of trees and plants entered in the statement, there are two other plants from which fibres are obtained, viz. the "Kathalay" or aloe and the "Yerakum," but the extent to which these plants are grown cannot be ascertained. The aloe is planted as a hedge. The Yerakum is a wood which grows in waste lands.

9. The Ryots make a useful kind of rope from the aloe but it is not often that these ropes are offered for sale in the markets. To prepare the fibres the leaves are soaked for some days in water and are afterwards dried in the sun till they are fit for use.

10. The branches of the Yerakum plant are cut and allowed to dry in the sun for 4 or 5 days when the fibre is fit for use. This fibre is not used to any considerable extent.

11. The cultivation of the different fibrous plants above enumerated may be viewed, with the exception of cotton, as sufficient for local requirements only. At present the Ryots shew no desire to extend the cultivation of such plants for the sake of the fibres they yield, as the demand hitherto has not presented any great encouragement to their doing so. If they find that this increases they will be induced to pay greater attention to the subject. There are no natural obstacles in the Salem District to a much more extensive cultivation than at present exists; and the means of carriage, though the district is inland, is not unfavourable.

12. As the best means of promoting increased cultivation the merchant or his agent should deal directly with the Ryots, but this course is not practicable without a degree of local information which strangers cannot easily obtain. In this respect the local authorities might afford important aid to those who wish to buy for the English market. They could point out to such parties the villages in which fibrous plants are procurable and might assist them in communicating with the Ryots.

13. The details given in the statement are not perfectly accurate as the village accounts do not shew what extent of land is occupied for cultivating any of the plants or trees, with the exception of cotton. It should also be explained that the statement embraces 10 Talooks only as accounts from the Sub Division have not yet been received.

I have the honor to be, &c.,

H. A. BRETT,
Collector.

Salem, Collector's Office, on Circuit
Ahtoor, 5th February 1855. }

Statement showing the particulars connected with the cultivation of certain fibrous plants in the Salem District.

Name of Fibres.	Description and extent of land cultivated.				Estimated produce per acre in maunds.	Selling price of fibre per md.	Cost for cultivating one acre of land.	Remarks.
	Dry.		Dry garden and wet.					
	Extent.	Assessment.	Extent.	Assessment.				
1 Plantain trees....	1,242 30 11	2,396 7 2	811 33 15	3,036 0 4	0	0 0 0	0 0 0	
2 Janapum plants.	1,669 11 4	2,687 4 5	42 6 3	108 14 9	15	0 12 0	1 8 0	
3 Pooleecha plants.	2,155 2 12	3,610 15 8	284 6 6	645 5 4	12	0 9 0	1 8 0	
4 Cocanut trees...	171 24 10	687 9 5	1,816 3 6	9,391 0 11	11	0 10 0	1 8 0	
5 Palmyra trees....	6,209 36 9	10,633 1 6	332 36 15	1,012 13 9	10	0 4 0	0 0 0	
6 Cotton plants.....	13,896 12 9	21,673 9 3	12 10 11	69 9 8	15	1 0 0	2 8 0	

Salem, Collector's Office, on Circuit Ahtoor,
5th February 1855. }

H. A. BRETT,
Collector.

No 47.

FROM C. WHITTINGHAM, Esq.,

Collector of North Arcot,

To B. CUNLIFFE, Esq.,

*Secretary to the Board of Revenue,**Fort St. George.*

SIR,

Para 1. With reference to an Extract from the Proceedings of the Board of Revenue dated 25th September 1854, forwarding Extract Minutes of Consultation dated 19th Idem, requesting my attention to the orders of Government in para 13, and directing me to submit a Return in the prescribed form showing the different descriptions of fibrous plants grown in the District, accompanied by information on the several points, adverted to by Government in the para quoted above, I have the honor to forward the required return with remarks, as directed, showing the mode of cultivation and preparation of the several descriptions of fibres. I regret that I am unable to give the extent of land on which these fibrous plants are cultivated, as they are only cultivated to a limited extent, and are not generally grown alone but with other crops.

The Janapah or sunn plant is an exception, it is cultivated entirely for its fibres and is grown alone. The extent of its cultivation is given in the tabular Statement.

2. The modes of cultivation and preparation of the fibrous plants found in this District are subjoined.

1. Janapum.—This plant is generally cultivated in the month of November or December. The seed is sown after the land has been well ploughed and manured. Much rain is injurious to the crop, but when the weather is dry the land requires to be irrigated once in 10 days at least. In three month's time, the plants have grown to a height of about 4½ feet, and are as thick as a finger; they are then considered to have attained their maturity and are cut, exposed to the sun, and beaten to separate the seeds. They are afterwards tied in small bundles, and soaked in water for 5 or 6 days. They are taken out and beaten on a stone, then washed and again beaten. This is repeated as many times as is necessary to thoroughly cleanse the fibres, which are then exposed to the sun, to evaporate the moisture. This fibre so obtained is chiefly made into ropes, and woven into gunny, a coarse kind of cloth. The Janapum is cultivated in eight talooks of this District, viz. Chittoor,

Vellore, Satghur, Wandavash, Trivellum, Arcot, Tertany, and Arnee. The ryots cultivate the plant and sell it to the Janapurs, men whose chief trade is the manufacture of ropes, gunnies, &c. from the Janapum fibre.

No 2. Cachoorookoo. Roselle.—This plant is never cultivated in this District as a separate crop, but is raised in the same land with chilly and brinjal. The Cachoorookoo is planted on the borders of the gardens cultivated with these crops, and along the trenches or channels of irrigation. This plant like the Janapum is a three months' crop. The method of preparing the fibre is similar to the Janapum. The ryots cultivate the plant chiefly for culinary purposes. The extent of land cultivated with this plant cannot be given for the reason before stated.

No. 3. Annay cuttaly, Hill aloe.—This plant grows wild. It is also planted as a fence round gardens &c., and requires three years to arrive at its full growth. The pulpy leaves after the removal of the thorns are buried in the mud, and allowed to rot for 20 days. They are then taken out and beaten on a stone, well washed, and the moisture wrung out. Some Ryots place them on a board and scrape them with a blunt knife, or slip of bamboo. The fibre again undergoes a thorough washing. This fibre is twisted into twine with which mats are woven. The ropes made of it are used as halters for bullocks—and for other agricultural purposes.

No. 4. Ccoanut.—The fibre is obtained from the rind of the cocoanut, by soaking it in water for 3 months; it is then taken out, dried and beaten with a wooden hammer, till the fibre is separated. This fibre is used for making ropes and for domestic purposes. None of this fibre is exported from this district.

No. 5. Plantain.—The Plantain tree has in this district been hitherto cultivated on account of its fruit alone, and its fibre has never been turned to any profitable account. The extent of its cultivation cannot be given with any accuracy, as the plantain is often grown on land partially occupied by cocoanut, betel, and other trees.

No. 6. Yercum or Jilladoo.—This plant grows wild in every part of this district, and though its fibre is of the best description, the plant is only used as manure.

3. The expenses attendant upon the cultivation and preparation of the fibres generally cannot be given, as with the exception of the Janapah or sunn, the extent of cultivation is not known, and the manufacture is exceedingly limited, and confined as stated above to domestic

and agricultural purposes. The expenses of the Janapah are inserted in the statement.

4. The quantity of Janapah grown in this district during last Fusly was 93 maunds, not more than sufficient for local requirements, and none was exported. Of the other fibres the quantity was very small, and was entirely reserved for home consumption.

5. The ryots do not evince any desire to extend the cultivation, but would undertake the manufacture of the fibres on receiving advances from any one engaged in the trade—as before stated the finest description of fibre is obtained from the Yerkum which grows wild. The improved means of transport now in progress in this district will, with the reduction of the assessment, doubtless, give an impetus to the cultivation and manufacture of fibres.

I have the honor to be, &c.,

C. WHITTINGHAM,
Collector.

North Arcot, Collector's Circuit Cutcherry, }
Nagalapoor, 18th May 1855.

Statement shewing the different descriptions of Fibrous Plants, &c., produced in North Arcot.

Name of the Fibre.	Description and Extent of Cultivation.													Cultivated produce per cawny in maunds.	Selling price of fibre per maund.	Probable expense attend- ing the preparation of the fibre produced in a cawny of land.	Remarks.				
	Poonjah.		Nunjah.		Totacal.		Total.														
	Land.	Teerwah.	Land.	Teerwah.	Land.	Teerwah.	Land.	Teerwah.													
1	117	7 10	371	6	6 81	6 13	981	9 11	13	9 13	4	199	11 7	1,362	15 9	131	1 12	12	13	The profit per maund is therefore 14½ annas. The mode of preparation is very bad and the article produced consequently very inferior.	
1. Janapum																					
2. Cachoorkoo, or Roselle																					
3. Annay Cathalay Hill Aloe																					
4. Cocanutt																					
5. Plantain																					
6. Yercum or Jilladoo.																					

North Arcot, Collector's Circuit Cutcherry, }
Nagalapoor, 18th May 1855.

C. WHITTINGHAM,
Collector.

No. 4.

FROM A. HALL, Esq.,

Collector of South Arcot,

TO B. CUNLIFFE, Esq.,

*Acting Secretary to the Board of Revenue,**Fort St. George.*

SIR,

I have the honor to report that I have promulgated throughout this District the information contained in Extract from the Minutes of Consultation dated 19th September received with Extract from the Proceedings of the Board of the 25th Idem; relative to the demand in England for Fibres, and that I have also made known among the people the sentiments and views of Government on the subject.

2. I beg to send the required statement shewing, (as far as I can ascertain) the extent to which Fibrous plants are actually cultivated in this part of the country, by which it will be observed that no attention whatever has been hitherto paid by the ryots to the culture of this species of produce. The small quantity which has been cultivated has been raised solely for local consumption.

3. As there is abundance of land suitable for the growth of Fibrous plants, the cultivation would undoubtedly be extended if there was a ready sale for Fibres on the spot.

1. Hill aloe.
2. Yercanar.
3. Talleyinar.
4. Katartinar.

4. The Fibrous Plants noted in the Margin are to be found in great quantities growing wild in this district, but they have not hitherto been turned to any good account by the Natives.

5. At present the prime cost of Fibres is so high in consequence of the crude and tedious mode by which the natives extract and prepare them that it seems to be the prevailing opinion among the commercial community of this place that it would be incurring too great risk to make purchases for export to England, even with the prospect of obtaining there the high prices quoted by Government.

6. I have been informed that the average price of a candy of fibres, as they are now prepared by the Natives, is about 30 Rupees, which at $4\frac{1}{2}$ Candies the Ton, would make the latter cost 135 Rupees, to which must be added the expences of shipping, freight and sale in England.

7. The Natives of this part of the country extract and clean fibres by the same process as that alluded to in Para 9 of the Extract of the Minutes of Consultation under reply, viz. by rotting the stalks of the plants and then separating the fibres by the hand, after which they wash, beat, and expose them to the sun, till they are ready for use.

8. The best kind of assistance and encouragement which the Government could extend in order to promote the production of Fibres fitted for the English Market, would be, I think, to introduce among the people some simple machinery for extracting and cleaning them, by which the prime cost might be lessened; with this appliance and with merchants on the spot ready to purchase their productions, the Natives would soon prepare large quantities for sale, and when they found it profitable, would cultivate the plants. It would also be an advantage, I should think, to have screws for packing the fibres for shipment, but this would be done by the exporters.

9. I have forwarded to the Madras Exhibition some samples of the fibres grown and prepared in this District, some of them were extracted by the process which Doctor Hunter recommends, should be substituted, instead of the common native mode of allowing the stalks of the plants to rot. The rest were prepared by the Natives themselves in the ordinary way.

South Arcot, Collector's Cutcherry, }
Cuddalore, 4th January 1855. }

(Signed) A. HALL,
Collector.

No. 1.
Statement shewing the particulars of the different descriptions of Fibrous plants growing in the District of Southern Division of Arcot.

Tamil name of Fibre.		Botanical Name of Fibre.	Description and Extent of Land cultivated in South Arcot.				Estimated produce per Cawny.	Selling price of Fibre per	Remarks.
			Dry.		Wet.				
			Cawnies.	Rupees.	Cawnies.	Rupees.			
1	Auleenar.	Flax.....	233	12½	962	9 7 51	2 517 11	3 One candr. 34 Rs. per candy	Flax (Linseed) is not grown at all in this District.
2	ஆனிநார்.	Hemp.....	...	...	...	...	...	...	
3	சனப்பநார்.	Marool (Sansevieria Zeylanica).....	...	...	...	...	...	30 Rs. per Do.	Grows wild.
4	மஞள்.	Yercummar.....	...	...	...	...	...	Do. Do.	Do.
5	யெருக்கநார்.	Yercummar (Calotropis gigantea.).....	...	...	...	...	...	Do. Do.	Do.
6	மலத்தாலை.	Hill aloe.....	...	...	...	...	...	Do. Do.	Grows in the fields mixed with other dry grain.
7	காச்செருக்கநார்.	Country Roselle.....	...	...	...	...	...	Do. Do.	
8	வாழைநார்.	Plantain.....	358	15	1335	3 11 26	12½ 272 10	9 One candr.	
9	அன்னை.	Pine Apple.....	...	...	...	...	...	Do. Do.	Grows in small patches for the sale of the fruit, but the fibre has never been extracted.
10	அன்னகுசிநார்.	(Screw pine or Culdera bush)	...	...	...	...	...	Do. Do.	Grows wild in the hedges.

(Signed) A. HALL,
Collector.

No. 16.

FROM H. FORBES, Esq.,

Collector of Tanjore,

TO B. CUNLIFFE, Esq.,

Acting Secretary to the Board of Revenue,

Fort St. George.

SIR,

I have the honor to afford the information on the growth of fibrous plants in Tanjore, required in an Extract from the Minutes of Consultation dated the 19th of last September.

Knowing how almost exclusively the cultivation in Tanjore is confined to paddy, the Board will be prepared to hear that but few fibrous plants are produced, and but little fibre made.

The shenul or janapoonar, is grown in some villages, but is more generally laid down as manure as soon as it is cut, than applied to any other purpose. When land is to be cultivated with shenul, it is ploughed three or four times, and then left for ten days to bake in the sun—manure and ashes are mixed with the soil, the seed is sown, and the land again ploughed, and then bush harrowed—in three months the plant is cut, and soaked in mud for ten days, when it is washed and dried in the sun for a day, after which the fibres are separated from the husk. The cost of cultivation, and of the preparation of the fibres, is from 40 to 55 rupees the valey, and the produce is valued at from 70 to 80 rupees.

Although the cocoanut tree is extensively grown, but little fibre is extracted—it is only to a small extent an article of sale, and by no means one of export—each owner of a plantation makes what ropes he may require for his cattle, his well, and his house, and having done that, reserves all the remainder of his husks for fuel, they are particularly used in brick kilns. When cocoanuts are exported it is with the outer shell on.

The tree does not bear until it is six years old, two thousand may be raised on a valey of land, and the aggregate expense before any profit is received is about 550 Rupees. When fibre is required it is obtained by soaking the husk in water for five or six weeks, and then beating it violently, the fibre is washed to remove impurities, and then allowed to dry in the sun.

There are extensive plantations of plantain trees along the river banks, the fruit is in very general consumption, and the leaves no less

in demand, fibres are very little taken, and are used only for making mats. The land on which plantains are to be grown is very deeply dug, the plants are placed six feet apart, and watered every five days after they have begun to sprout, they bear fruit in a year after they are planted, and the cost of cultivation is about 200 Rupees a valey. If fibre is to be taken, the outer part of the tree is removed, and the inner substance scraped with a knife on a board, until all moisture is removed—what remains is then dried in the sun, and afterwards made into mats.

The Marool or aloe, is not cultivated in Tanjore, it, and the yer-rookum, and the talai or wild pine, grow spontaneously, and from all, fibres might be extracted if there were a demand created on the spot, and the people were instructed in the best way of proceeding.

Enclosed is a statement in the form prescribed by the Government.

I have sent several specimens of fibre and of ropes to the forthcoming Madras Exhibition, and if they should attract any favorable notice, it is possible that a demand for the articles may arise. Many lacs of plantain trees are annually thrown away in Tanjore, from the ignorance of the people that they can be turned to good account—but I find that in this, as in all respects, they require something more tangible to lead them into new ways, than the translation of a Government minute, or the Collector's assurance that a great European War has created an annual demand for fibres from places whence they have not hitherto been drawn. I am satisfied that the presence of the representative of one European mercantile house, prepared to purchase, and to pay for, the articles wanted for export, would be by far the most effectual stimulus to their production, would afford the speediest means of circulating among the thousands of land owners—the wants of the European markets, would so regulate supply and demand as to prevent risk of loss, and would be a means of introducing new products, of less questionable expediency than favorable terms of assessment, advance, or bounties, to be offered on behalf of the State.

I have the honor to be, &c.,

H. FORBES,

Collector.

Tanjore, Vellum, }
9th February 1855. }

Statement shewing the cultivation of Fibrous Plants in Tanjore District.

Name of Fibre.	Description and extent of land cultivated.										Estimated produce per cawny.	Selling price of Fi-			Remarks.
	Nunjah.		Poonjah.		Bagayet.		Tope.		Total.			Ruppes.	Annas.	Pice.	
	Cawny.	Ruppes.	Cawny.	Ruppes.	Cawny.	Ruppes.	Cawny.	Ruppes.	Cawny.	Ruppes.					
Janapum or Sunn.	116,470	14, 38	152	1,079	..	..	282	1,587	11½	1	5	10 11	{ As fibres are seldom ex- tracted, the produce for a cawny cannot be as- certained. Little fibre is extracted from this plant. These 3 plants are never cultivated but grow spontaneously in the hedges.		
Cocoa	..	3 26 368	22	573	2,206	17,583	2,254	18,727	..	..	..	..			
Plantain	30 315	74,244	1,201	6,639	1	6	1,306	7,204	..	..	..	..			
Marool	..	..	..	..	..	..	..	..	..	..	..	..			
Yercum nar.....	..	..	..	..	..	..	..	..	..	..	..	..			
Talay nar.....	..	..	..	..	..	..	..	..	..	..	..	..			

H. FORBES,
Collector.

Tanjore, }
9th February 1855. }

No. 121.

FROM J. BIRD, Esq.,

Collector of Trichinopoly,

TO B. CUNLIFFE, Esq.,

*Acting Secretary to the Board of Revenue,**Fort St. George.*

SIR,

In accordance with the instructions conveyed by Extract from the Proceedings of the Board of Revenue of the 25th September last I have to the best of my ability made known to the Ryots of this district the information collated by Government and the sentiments of his Lordship in Council as promulgated in Extract from the Minutes of Consultation No. 954 dated the 19th September 1854.

2. The growth and cultivation of fibrous plants is very limited in this Province, and I cannot learn that fibres of any descriptions are articles of foreign exportation and trade.

3. I beg to submit a return according to form shewing particulars of the different descriptions of fibrous plants obtainable or grown in the district.

4. I am not aware of any obstacles existing to the general cultivation of fibrous plants and trees. A ready and immediate sale for his products is what the Ryot requires, as well as advances of money from the Merchants seeking such commodities. Ensure him these, and he will grow anything to meet a certain demand.

I have the honor to be, &c.,

J. BIRD,

Collector.

Trichinopoly, Collector's Office, }
9th December 1854.

Name of fibre.	Description and extent of land cultivated.				Estimated produce per Cawne.	Selling price per Viss.	Remarks.
	Dry.		Wet.				
	Caw.	Rs.	Caw.	Rs.			
Plantain or Vaulay,.....					600		This fruit tree is most extensively grown in the District. The fibre is used very limitedly generally by the flower garland makers. Its culture is more for its fruit and leaves than any other purpose. The fibre for small twine is taken by the rolling process. This plant is cultivated on dry lands and in gardens, never alone, but always with some other product. The cord is for Home consumption and trade from village to village, none is exported. The Cocoonut abounds in the District. But it is cultivated more for its valuable fruit than for its coir. The fibre is obtained by rotting the green husk. Very little coir rope is made in the Province. The natives here use the husk for fuel. None is grown in the District. This country hemp is imported into the city of Trichinopoly. This plant is found in the jungles and rocky parts of the country. The fibre is obtained by steeping in water for many hours. The fibre is fine and of little use, not an article of trade, though small quantities can be purchased in the Bazars.
Poleechee nar Hibiscus Cannabius.....	525	.....	.....	.....	6 Viss.	Annas 1-10 pice.	
Coir or Tennam nar or Cudumbay nar.....	1000	.....	.....	.....	15 Viss.	Annas 1.	
Jennappa nar.....					..	Annas 3.	
Marul or Manjee nar.....					A wild jungle plant	Annas 5-6 pice.	
Yerkum.....					A common shrub all over the country	.....	
Taily nar, Pandanus odoratissimus					Another common shrub	Annas 1-6 pice.	
Pannay nar, Palmyra.....							
							
							

Trichinopoly, }
9th December 1854.

J. BIRD,
Collector.

No. 15.

FROM R. D. PARKER, Esq.,

Collector of Madura,

TO B. CUNLIFFE, Esq.,

*Acting Secretary to the Board of Revenue,**Fort St. George.*

SIR,

1. With reference to the Extract from the Proceedings of the Board of Revenue dated the 25th September last, I have the honor to transmit a statement in the form entered in the Proceedings of Government dated the 19th September 1854 of the fibrous plants existing in the Madura District whether cultivated or wild.

2. The only plants of this description cultivated are the Sunnamboo or Sunn and the Poolichee or Poolimanjee (*Hibiscus Cannabinus*) and these to no great extent. The Sunn fibre is exported in small quantities to the neighbouring districts, but the Poolichee is consumed in Madura itself.

3. A larger quantity of fibre is obtained from wild plants, chiefly Marool (*Sansevieria Zeylanica*), Salce and Authee which are trees and Velampoory. Some of the Marool is exported to Trichinopoly and Tinnivelly. The produce of the others is not more than sufficient for home consumption.

4. The part of Madura in which fibrous plants most abound is the Cumbun Valley which is a long way from the Coast. The Board is aware also that the Madura ports are small and too shallow for any large vessels. It would enter into the export trade by sea therefore under great disadvantages; and I am very sceptical as to the probability of any advantage arising from an endeavor to force production in this district by bounties of any description. If the neighbouring districts export by sea, Madura will immediately feel the stimulus in the manner most suitable to her powers. At present she exports grain largely to Tinnivelly; and should Tinnivelly which by possession of a tolerably good port, Tuticoreen, and the Agents of several European Mercantile houses, is favorably circumstanced for foreign trade, appropriate more of her land to raising products for export by sea, Madura will be called upon to supply her with still more grain and possibly for aid in the supply of the exportable commodity. I should fear that if the cultivators were induced to raise fibrous plants by a reduction of assessment on that particular cultivation

any similar direct encouragement, they might suffer loss from the absence of an immediate demand for the produce, and become prejudicial against the cultivation in consequence. Whereas if an effectual demand (by which I mean offers to purchase made in the district itself,) should spring up, I have no doubt that cultivation would increase in proportion as is the case with cotton. The plantain is already grown in abundance, but as no merchant enquires for plantain fibre, none is extracted. When the demand is so real as to render it worth the while of the inhabitants of this district to expend labour in obtaining this fibre, it will answer the purpose of a Madras Mercantile house to send an Agent to the district to seek for it.

I have the honor to be, &c.,

R. D. PARKER,

Collector.

Madura,
6th February, 1855. }

P. S.—A list shewing the Botanical and Tamil names of the Fibrous Trees and Plants, is also enclosed.

Return shewing the different descriptions of Fibrous Trees and Plants growing in the District of Madura.

The different descriptions of Fibrous Trees and Plants growing in the District of Madura.																											
Name of Fibre.	Description and extent of land cultivated.						Estimated produce per Cawny.	Average selling price of Fibre per Toolam.	Cost of labor, &c., per Cawny.														Remarks.				
	Dry.		Wet.		Total.				Tax.	Hire for ploughing.	Price of manure.	Hire for reaping.	Price of seed.	Total Cost.													
	Cawnies.	Rupees.	Cawnies.	Rupees.	Cawnies.	Rupees.								A.	P.	R.	A.	P.	R.	A.	P.	R.		A.	P.	R.	A.	P.	R.
Sanamboo..... சணம்பு. Sunn or Indian Hemp.	37 ⁸ / ₁₆	254 0 4	25 ¹⁴ / ₁₆	145 13 6	63 ⁷ / ₁₆	399 13 10	15	1 0 0 2 1 0 1 1 1 0 4 8 0 1 1 0 0 0 4 0 10 2 0																The seed of the Sanamboo (the Sunn plant) is sown in July, August or September, after the soil has been properly moistened and ploughed. The plant is fit to be cut in the 5th month. It is dried in the sun for three days, then soaked in water for ten days, after which it is beaten on a stone and washed. After this process the rind becomes fit for use. In the Madura District the fibre is applied to a small extent to the manufacture of gunnies, & more generally to that of thin ropes.			
Poolchee புளச்சி. Hibiscus Can- nabinus.	...	...	...		...		20	0 8 0																			This is cultivated mixed with grains. The seed is sown either in September or October. The plant attains its maturity in the 3d month, and then it undergoes the same process as the Sanamboo or sunn plant to produce fibre. It is manufactured into ropes for drawing water and various other domestic and agricultural purposes.
Poolichee or roselle Marool	...	...	...		...		...	0 8 0																			All that follow are found wild but are not cultivated.
Yerookum	...	...	...		...		...	1 1 0																			This grows wild to a considerable extent in the Cumbum Valley and the Iyempully and other Talooks, and is exported to other Districts by land. In Madura it is used for ropes.
Mottamunjee Thainkoye	...	...	...		...		...																				Grows wild and the fibre extracted is used for the strings of bows and slings, and for the same purposes as tape about the person.
	...	...	...		...		...	0 10 0																			Ropes, &c. Do. Coconut Trees do not abound in Madura.

or any similar direct encouragement, they might suffer loss from the absence of an immediate demand for the produce, and become prejudiced against the cultivation in consequence. Whereas if an effectual demand (by which I mean offers to purchase made in the district itself,) should spring up, I have no doubt that cultivation would increase in proportion as is the case with cotton. The plantain is already grown in abundance, but as no merchant enquires for plantain fibre, none is extracted. When the demand is so real as to render it worth the while of the inhabitants of this district to expend labour in obtaining this fibre, it will answer the purpose of a Madras Mercantile house to send an Agent to the district to seek for it.

I have the honor to be, &c.,

R. D. PARKER,
Collector.

Madura,
6th February, 1855. }

P. S.—A list shewing the Botanical and Tamil names of the Fibrous Trees and Plants, is also enclosed.

Return shewing the different descriptions

Name of Fibre.	Description and extent of land cultivated.						Estimated produce
	Dry.		Wet.		Total.		
	Cawnies.	Rupees.	Cawnies.	Rupees.	Cawnies.	Rupees.	
Panay	...	...	...		...		Too
Vailah	...	...	...		...		
Caroovailah.....	...	...	...		...		
Velvallah.....	...	...	...		...		
Authee	...	...	...		...		
Cattathee	...	...	...		...		
Malayauthee	...	...	...		...		
Thootthee	...	...	...		...		
Malay thootthee...	...	...	...		...		
Thaulay	...	...	...		...		
Vaulay	...	...	...		...		
Kuttalay... ..	...	...	...		...		
Caroonkuttalay...	...	...	...		...		
Perunday.....	...	...	...		...		
Indoo	...	...	...		...		
Valookay.....	...	...	...		...		
Auvi	...	...	...		...		
Auli	...	...	...		...		
Osah	...	...	...		...		
Poongoo	...	...	...		...		
Valampoory	...	...	...		...		
Saley	...	...	...		...		
Seetay	...	...	...		...		
Kanjory	...	...	...		...		
Poonaly	...	...	...		...		
Thegilancody	...	...	...		...		
Oddai	...	...	...		...		
Peroonkuttoocody.	...	...	...		...		
Seroonkuttoocody.	...	...	...		...		
Karoonkuttoocody	...	...	...		...		
Odancody	...	...	...		...		
Poovacody	...	...	...		...		
Vellooduncody ...	...	...	...		...		

Madura, 6th February, }
1855.

Madura, 6th February, 1855.

R. D. PARKER,
Collector.

Memorandum shewing the different kinds of Fibrous Trees and Plants growing in the District of Madura.

No.	Tamil Names.	Tamil Names in English Characters.	English Names.	Botanical Names.
1	சண்மீடு	Shanumboo	Sunn or Indian hemp.....	Crotalaria Juncea.
2	புளுச்சி - அல்லது புளிமஞ்சி	Poolichy or Poolimanjee	Roselle.....	Hibiscus Cannabinus.
3	மருள்	Marool	.....	Sansevera Zeylanica.
4	யெருக்கிவரி	Yerookum	.....	Calotropis Gigantea.
5	மொத்தமஞ்சி	Mottamunjee	.....	Cocos nucifera.
6	தேக்காயி	Thainkoye	Cocoanut.....	Acacia Arabica.
7	பவளி	Panay	Palmyra... Varieties of the Babool	Leucophleca.
8	வேலா	Vailah	Thorn	Bauhinia.
9	சருவேலா	Caroovalah	.....	Bauhinia Tormentosa.
10	வென்வேலா	Velvallah	.....	Hill do.
11	ஆத்தி	Authee	.....	Sida Populifolia.
12	காட்டாத்தி	Katauthee	.....	Hill do.
13	மவல் ஆத்தி	Malayauthee	.....	Pandanus Odoratissimus.
14	துத்தி	Thoothee	.....	.....
15	மவல் துத்தி	Malay Thoothee	.....	.....
16	தாவளி	Thaulay	Plantain	.....
17	வாவளி	Vaulay	Aloe.....	Agave Americanos.
18	கத்தாவளி	Kuttalay	Black Aloe.....	.....
19	கருங்கத்தாவளி	Karoorkuttalay	A Prickly Shrub.....	Mimosa.
20	பிரண்டை	Perunday	.....	.....
21	இண்டு	Indoo	.....	.....
22	வளுக்கை	Valookay	.....	.....
23	ஆவி	Auvi	.....	.....
24	ஆலி	Auli	.....	.....
25	வசா	Osah	.....	.....

No.	Tamil Names.	Tamil Names in English Characters.	English Names.	Botanical Names.
1	சணம்பு	Shanumboo	Sunn or Indian hemp.....	Crotalaria Juncea.
2	புஞ்சி - அல்லது புளிமஞ்சி	Poolichy or Poolumanjce	Roselle.....	Hibiscus Cannabinus.
3	மருள்	Marool	.....	Sansevieria Zeylanica.
4	யெருக்கிவி.	Yerookum	.....	Calotropis Gigantea.
5	மொத்தமஞ்சி	Mottamunjee	Cocoanut.....	Cocos nucifera.
6	தேங்காயி	Thainkoye	Palmyra.....	.....
7	பவிர	Panay	Varieties of the Babool Thorn	Acacia Arabica.
8	வேலா	Vallah	.....	Leucophloe.
9	சருவேலா	Caroovallah	.....	Bauhinia.
10	வெள்வேலா	Velvallah	.....	Bauhinia Tormentosa.
11	ஆத்தி	Authee	.....	Hill do.
12	காட்டாத்தி	Katauthee	.....	Sida Populifolia.
13	மலர் ஆத்தி	Malayauthee	.....	Hill do.
14	துத்தி	Thooththee	.....	Pandanus Odoratisimus.
15	மலர் துத்தி	Malay Thooththee	.....	.....
16	தாவிர	Thaulay	Plantain	.....
17	வாவிர	Vaulay	.....	Agave Americanos.
18	கத்தாவிர	Kuttalay	Aloe.....	.....
19	கருங்கத்தாவிர	Karoonkuttalay	Black Aloe.....	Mimosa.
20	பிரண்டை	Perunday	A Prickly Shrub.....	.....
21	இண்டு	Indoo	.....	.....
22	வளுக்கை	Valookay	.....	.....
23	ஆலி	Auvi	.....	.....
24	ஆலி	Auli	.....	.....
25	ஆசா	Osah	.....	.....

26	புங்கு	Poongoo	.....	Dalbergia Arborea.
27	வலம்புரி	Valampoory	.....	Helicteres Isora.
28	சாலி	Saley	.....	.....
29	சிட்டே	Seetay	.....	.....
30	காஞ்சேரி	Kanjory	.....	.....
31	புனலி	Poonaley	.....	.....
32	திவிலாங்கொடி	Thegilancody	.....	.....
33	ஒடை	Odai	.....	.....
34	பெருங்கட்டுக்கொடி	Peronkuttoocody	.....	.....
35	செருங்கட்டுக்கொடி	Seroonkuttoocody	.....	.....
36	கருங்கட்டுக்கொடி	Karoonkuttoocody	.....	.....
37	ஒடங்கொடி	Odancody	.....	.....
38	புருக்கொடி	Pooracody	.....	.....
39	வெள்ளுடன்கொடி	Vellooonocody	Varieties of Creepers.....	.....

Madura,

E. E. per

R. D. PARKER,

6th February 1855.

Collector.

Return shewing particulars of the different descriptions of Fibrous Plants grown in the District of Tinnevely.

No.	Name of Fibre.	Description and extent of land cultivated.								Estimated produce per Cawny.		Selling price of Fibre per Candy of 500 lbs.	Remarks.	
		Dry.				Wet.				Dry.	Wet.			
		Cawnies.	Assessment.	Expense of Cultivation.	Cawnies.	Assessment.	Sawny bogum or Landlord's share.	Expenses of						
								Cultivation.	Preparation of Fibre.					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	
	சுட்டி.						C.R.S. A. P.	C.R.S. A. P.	C.R.S. A. P.	C.R.S. A. P.		C. M. lbs.	C.R.S. A. P.	
1	Hemp				281 ⁵³ / ₆₄		From 8 13 To 17 9	From 8 3 To 4 13	From 8 0 To 0 0	From 9 6 To 10 7		1 6 19	23 11 3	This is generally cultivated on one crop wet land in the month of Vicausey, (May-June.) The land is twice ploughed and the seed sown chiefly in mire and the fields supplied with water once in 8 days. Weeding takes place only once and that during the first 10 days, after the sowing. The crops generally come to maturity in the month of Poorattasy or five months after sowing. When they are cut the stalks are spread out on the field for three days to dry. Afterwards the stalks are tied up in bundles, taken to the thrashing floor where they are beaten in handfuls against stones to separate the seeds from them and then put in stocks. After this is done the quantity required at a time is taken out of the heap and put to rot in stagnant waters of Pools or Tanks, &c., for 5 days, and then they are taken up in handfuls and beaten against the water which separates the bark and removes it to the other end of the stalk and in that state the stalks are exposed to the sun in upright sheaves for about 10 Indian hours and then the bark is entirely removed when dry, which becomes the Fibre. From the fibre thus obtained ropes are made with which gunny cloths of 1st and 2d sorts are woven, the fibre is also twisted into small and large ropes and used for Kodee or cloth line and Oory a kind of coarse net work, &c., hung up in Native houses to keep things upon. The 1st sort gunny cloths are used for making gunny bags to keep grain &c. in. The fibre is also used to wrap round the ends of bandy axles before oiling them, to make the wheels roll more freely. 2d sort gunny cloths and thick ropes are used for packing up cotton bales. The 1st sort gunny cloths and their ropes are procurable in this District only in sufficient quantity for local consumption and 2d sort gunny cloths and thick ropes are just sufficient to meet the demand for them at Tutacurin and Chippicolum where they are used for packing cotton bales. Hemp is grown only in a few Villages in 6 Talooks of the District.
2	Fibre of Marool plants.											58 0 0		The plants yielding this fibre are not cultivated but grow spontaneously, not to any great extent, in the Jungles near Hills and in the hedges round Poonjah fields. They are plucked by the hand and to clean them, they are placed on a plank and bruised with a stick and then the fibre is separated from the bark which is thrown away. The fibre is used for tying up bundles. There are 3 persons in the Village of Lubbay Coodyeroopoo in Vullyoor Talook who prepare a small quantity of fibre. The price per candy of 500 lbs. is about Rupees 58. Marool grows to about the height of 6 feet.
3	Fibre of large Aloes.													The plants giving this fibre are not cultivated but grow spontaneously on the banks of Rivers, Channels, &c., and in Poonjah field enclosures. They are cut down and thrown into Ponds, &c., to rot for 3 days, at the end of which, they are taken out and placed on a plank and bruised with a bamboo lath to separate the fibre from the bark which is thrown away. The fibre is used in Mattings and for making packing Ropes, &c., 4 persons in the village of Ittycolum in the talook of Vullyoor and some Ryots of Sauttoor talook make a small quantity of fibre and sell it at 42 and 21 Rupees per candy of 500 lbs. In 2 other Talooks viz., Tencausey and Shenkerninarcoil it is reported that a very little fibre is made for matting or rope, &c.

26	புங்கு	Pongoo .....	.....	Dalbergia Arborea.
27	வலம்புறி	Valampoory .....	.....	Helicteres Isora.
28	சாவி	Saley .....	.....	.....
29	சிட்டே	Seetay .....	.....	.....
30	காஞ்சேரி	Kanjory .....	.....	.....
31	புனலி	Poonaley .....	.....	.....
32	திதிலாங்கொடி	Thegilancody .....	.....	.....
33	ஒடை	Odai... ..	.....	.....
34	பெருங்கட்டுக்கொடி	Peronkuttocody .....	.....	.....
35	செருங்கட்டுக்கொடி	Seronkuttocody .....	.....	.....
36	கருங்கட்டுக்கொடி	Karoonkuttocody .....	.....	.....
37	ஒடங்கொடி	Odancody		
38	புருக்கொடி	Pooracody		
39	வெள்ளூடங்கொடி	Vellodoocody		
			Varieties of Creepers.....	

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Madura, }
6th February 1855.

E. E. per

R. D. PARKER,

Collector.

No. 5. Palmyra, *Borassus Flabelliformis*.

The branches when sufficiently mature are taken off the tree, and the stems cut into a small size, they are then beaten with a mallet, the fibres obtained are made into ropes, very coarse and used in husbandry, they are strong and last longer than other ropes, the quantity now obtainable is not so great as it would be if there was a demand for it.

No. 6. Large Aloe, *Agave Vivipara*.

There are two modes in which this fibre is obtained, the 1st is, the plant is cut, soaked in water for about 15 days, and then beaten upon a stone, all the fleshy substance then disappears and a fine silvery white fibre remains—2d, is drying the plant, tearing it to pieces and taking the fibre from it by hand a tedious one, this is made into string required for the manufacture of mats, &c., the aloe grows wild and is not cultivated, but the quantity that can be had in this District would not be so great as the Cocoa and Palmyra hemp. Sometimes it is planted for field enclosures, not so much for the value of its fibre as for its usefulness as a hedge.

No. 7. Authee Naur. *Bauhinia Purpurea*.

Straight branches of the trees are cut into small pieces held over the fire for some hours during 2 days, then barked and the bark beaten with a mallet, the fibre obtained by this process is made into ropes which are considered strong, these kind of trees are found on hills and ravines being natural productions.

No. 8. Caroovalanaur, *Acacia Arabica*.

The process is nearly the same as the one described above, the ropes made of this fibre can be had only in small quantities, but it would keep pace with the demand.

No. 9. Marool Munjee, *Sansiviera Zeylanica*.

This plant grows wild in or near jungle streams or where the climate is moist, it is cut, placed on a flat stone, and beaten with a peculiar kind of wood known as the "Coottoo Munjee," again laid upon a stone and rubbed with a bamboo, the quantity of fibre thus obtained is small, but fine and white.

No. 10. Valumberec Naur.

The process is nearly the same as that observed in the extraction of "Autteenaur" No. 7.

No. 11. Vuccoo Naur.

Taken from a tree known as the "Vuccoomarum" botanical name unknown for particulars, vide No. 7, the ropes made from the fibres of this tree are made use of in dragging heavy timber down the hills and ghauts by means of elephants, large quantities may be had if paid for liberally.

No. 12. Cotton, *Gossypium herbaceum*.

appears called for.

No. 13. Yercum, *Calotropis Gigantea*.

the bark a very tedious process, can be had only in small quantities.

No. 14. Neilgherry Nettle, *Urtica Heterophylla*.

"coarse thread, it produces a beautifully fine and soft flax like fibre
"which the Todanurs use as thread."

E. B. THOMAS, *Collector*.

No. 3.

FROM F. N. MALTBY, Esq.,

Collector of Canara,

TO THE SECRETARY TO THE BOARD OF REVENUE,

Fort St. George.

SIR,

With reference to the Proceedings of the Board of Revenue of the 25th September 1854, I have the honor to forward to the Board two samples of coir. The smaller is a sample of the coir as usually sold in the bazars of the Coast. The larger is one of the same fibre from the same place carefully prepared under the instructions of the Tahsildar of Oodipy P. Gonsalves.

2. In a report to the Central Committee for the Exhibition of 1855 I have given an account of the coir of the Luccadivi Islands, and of the

To Board 5th December, 1854.

Coast, of which I have already laid an Extract before the Board. The present samples bear out the statement there made, that the difference of preparation, not of the fibre, causes the difference in value.

3. The bazar coir may be considered to be worth Rupees 20 to 25 per candy, while the better sample is estimated as equal to the second kind of Luccadivi coir, and at present rates is worth at least 35 Rupees.

4. If the natives can only be prevailed upon to see their own interests, the whole of the coir of the Coast might be thus prepared, but the ryots will continue to make, and the merchants will continue to buy the inferior article. But if the Government should enable me to offer the sum of 35 Rupees per candy for as much as the ryots may make equal to the quality now sent, up to 50 candies, I have some hopes that

they will be induced to adopt the better system of preparation and that when once adopted it may continue.

5. I have just sold by auction 10 candies of Luccadivi coir and it realized 42 Rupees per candy.

I have the honor to be, &c.,

F. N. MALTBY, *Collector*.

No. 19
1855.

FROM H. V. CONOLLY, Esquire,
Collector of Malabar,

TO B. CUNLIFFE, Esquire,
*Secretary to the Board of Revenue,
Fort St. George.*

SIR,

In reference to the Extract from the Proceedings of the Board of Revenue dated 25th September last and the Minutes of Consultation therein alluded to, I have the honor to report as follows:—

The only fibrous plant which is artificially grown in Malabar is Hemp.

Its cultivation is confined to the three Talooks of Shernad, Betutnad and Ernad.

The two first Talooks border on the Sea—the third is from 20 to 40 miles inland.

The following Statement shews particulars of the cultivation as at present existing.

Talook.	Average extent of Land.	Quantity of seed sown or 13 Parrals per Cawny.	Estimated produce or 30 Maunds per Cawny.	Selling price of hemp or about 2½ Rupees per Maund.	Deduct average expense at 1 Rupee per Maund.	Nett Amount.
Shernad	180	2,340	5,400	13,500	5,400	8,100
Ernad	80	1,040	2,400	6,000	2,400	3,600
Betutnad.....	80	1,040	2,400	6,000	2,400	3,600
	340	4,420	10,200	25,500	10,200	15,300

A reference to the accounts of five Fuslies from 1259 to 1263 ¹⁸⁴⁹⁻⁵⁰ ¹⁸⁵³⁻⁵⁴ shews that the average export of Hemp and Canvass amounted to 2,770 cwts. valued at Rupees 17,574, and in 1263 to 2,661 cwts. valued at Rupees 15,447. About half as much as this quantity may probably have been used in the country. It is to be hoped that the measures which have been taken to explain to the people the value of fibrous plants will have effect and that the cultivation will extend. There are many European Merchants who are ready to buy up all that is produced.

The best soil for Hemp is considered to be a red loamy earth. Prior to sowing, the land is ploughed twice.

The seed is sown in July and August. A cawny of land should have 13 Parrahs of seed.

The crop comes to maturity in 90 days after being sown. Ashes of any description are used as manure.

When the plants are gathered the upper ends are tied in small handfuls, and exposed to the sun for three days—after which the seeds are removed by thrashing and the upper ends of the plants cut off and again exposed to the sun for 2 days. After this the stalks are tied up in large bundles and soaked in water for 4 or 5 days and then taken and dried again in the sun—after which the stalks are broken at the bottom and hemp taken therefrom and made into small bundles. The seeds secured for the next cultivation are dried for 4 days.

I have the honor to be, &c.,

H. V. CONOLLY,

Collector.

Calicut, 26th February, 1855.

No. 229.

From H. STOKES, Esq.,

Acting Collector of Madras,

To W. H. BAYLEY, Esq.,

Secretary to the Board of Revenue.

SIR,

I have the honor to acknowledge the receipt of the Extract from the Board's Proceedings dated 25th forwarding copies of the Printed Orders of Government dated 19th September on the subject of Indian Fibres. The Board desire these sentiments to be made generally known and information to be furnished together with a Tabular form filled up as prescribed in para 13 of the Government Minute.

2. The area of arable land within the limits of this Collectorate is too small for any importance to attach to the steps taken here to encourage the production of Fibres. Indeed, with the exception of Palmyra and Coccoanut trees none of the fibrous plants seem to be cultivated here as such. The quantity hitherto available of each description for export and the wholesale prices will be made known I presume by the Collector of Sea Customs; I shall therefore, in submitting the form called for, simply offer a few general remarks that occur to me on the subject in question.

3. Fibres are chiefly in demand here for shipping, and fishery purposes and for domestic use. Those most in use are,

The Palmyra fibre for binding.

The Culdera fibre for do.

The Coccoanut coir for ropes and cables.

Indian Hemp, or Jute for ropes, cords, and nets.

Sunn or Junapa, for nets and lines.

Cotton Wool for cords and nets.

Yerkum nar for fishing lines.

4. There are various other fibres which doubtless are capable of being turned to profitable account, though the Natives do not as yet make use of them.

5. The fibres of the Palmyra and Culdera, seem too coarse and weak for the Europe Market. The Yerkum bush grows wild wherever land is left to itself; but the preparation of the fibre, though it seems to surpass the rest in fineness and strength as managed by the Natives is a costly and tedious process, and unless European skill can remove this drawback, I fear it is not likely to be available in any quantity.

The cultivation and preparation of Indian Hemp and Sunn are well understood by Natives in all parts of the country, and I should suppose nothing more is needed to stimulate their cultivation to any amount than an urgent call for them by the Mercantile houses through their local correspondents in the Provinces. But should this fail, owing to the imperfect connexion subsisting between the principal exporting houses and the interior, I think the end in view would effectually be secured by Government authorising Collectors to receive these commodities at a stipulated rate per maund, in payment of the land assessment. The quantities so collected in each Talook might after due advertisement as is done in the case of Mysore Sandalwood, be sold by auction to the highest bidder. I am aware that many objections may be brought against this plan, and I only mention it as a temporary expedient which might be resorted to under the present exigency.

6. I do not see why both Hemp and Flax may not eventually be articles of export from India, but Europeans must lead the way in their adoption for the purposes of fibre. The same remark applies to the other fibres such as those of the Plantain, Aloe, and Pine apple, which are not already in general use.

7. Lastly, I think attention should be called to the extensive use which is made in this country of Cotton cordage. I do not see why the coarser and cheaper kinds of cotton grown here, should not pay well in Europe for this branch of manufacture.

I have the honor to be, &c.,

H. STOKES,
Collector.

Madras, 30th November 1854.

Statement shewing the names of Fibres, description and extent of land cultivated, estimated produce per Cawny and their selling price for Madras.

Names of Fibre.		Description of and extent of land cultivated			Estimated produce per Cawny.	Selling price of Fibre.	Remarks.
		Dry.	Wet.				
English Names.	Botanical.	Tamil.					
1 Palmyra Fibre	Borassus Flabelliformis	Panai Nar.			200 Maunds.	2 Annas per Maund.	
2 Caldera do.	Pandanus Odoratissimus	Talai do.			...	2 Rupees per do.	
3 Plantain do.	Musa Paradisaica	Valai do.			...	This Fibre is not sold.	
4 Aloe do.	Agave Americana	Anai Kattalai.			...	7 Rupees per Maund.	
5 Indian Hemp	Hibiscus Cannabinus	Kusiri Nar			30 Maunds.	1 Rupee 8 Annas per Maund.	
6 Sunn do.	Crotalaria Juncea	Janappa do.			40 do.	2 Rupees per do.	
7 Cocanut Coir	Cocos Nucifera.	Tengay do.			20 do.	2 Rupees per do.	
8 Yercum Fibre	Calotropis Gigantea	Yercum do.			...	This Fibre is not sold in bazars. If required, it will cost 40 Rupees per Maund.	
9 Cotton Wool	Gossypium Indicum	Panju			50 do.	3 Rupees per Maund.	

H. STOKES,
Acting Collector.

Madras, }
30th November 1854.

No. 294.

FROM W. E. UNDERWOOD, Esq.,
Collector Sea Customs,

To G. S. FORBES, Esq.,
Acting Secretary Board of Revenue,
Fort St. George.

SIR,

Para. 1. I have the honor with reference to Official Memo. dated 13th September 1855 No. 2385, to transmit a Statement of the value of and the duty paid on Fibres imported and exported.

2. The Aloe Fibre exported is of a very inferior description. I brought a sample under the notice of Dr. Hunter who condemned it. The export of this article in its present shape is a matter of regret not of congratulation and likely seriously to injure any attempt to establish a trade in fibres.

I have the honor to be, &c.,

W. E. UNDERWOOD,
Collector Sea Customs.

Sea Custom House,
Madras, 24th September 1855. }

Statement shewing the Quantity, Value and Duty of Fibrous Substances Imported into and Exported from the Madras Territories including Fort Saint George for the last Five Years.

	Imports.			Exports.		
	Quantity.	Value.	Rate of Duty.	Quantity.	Value.	Rate of Duty.
1850-51 Hemp	cwt. qrs. lb.					
do. Aloe.	3 1 24	325 12 0	0 5 per cent.	10,577 3	10,008	3 per cent.
1851-52 Hemp	474 0 0	2,992 0 0	...	10,008	18,074	...
do. Aloe.	Dozens 39½	...	...	18,074	28,609	...
1852-53 Hemp	575 0 0	4,333 0 0	...	28,609	31,013	...
do. Aloe.	1,751 0 0	5,634 0 0	...	31,013	27,095	...
1853-54 Hemp	1,549 0 0	8,372 0 0	...	27,095	31,053	...
do. Aloe.	240 0 0	2,992 0 0	3½ per cent.	31,053	21,506	...
1854-55 Hemp	4,592 1 24	23,948 12 0	...	21,506	38,752	...
do. Aloe.	Dozens 39½	...	...	38,752	2,243	...
Cair Fibre..				2,243	2,18,930	...
Total..				2,18,930	3,325 11 5	...
				3,325 11 5		

W. E. UNDERWOOD,
Collector Sea Customs.

Sea Custom House,
Madras, 24th September 1855. }

OFFICIAL MEMO.

The Collector Sea Customs has the honor to transmit the Memo. respecting Fibrous substances.

The Return contains the duty actually levied and the amount of each imported and exported whether to or from Home and Subordinate Ports.

W. E. UNDERWOOD,
Collector Sea Customs.

To the Acting Secretary Board of Revenue,

Fort St. George.

Sea Custom House,
Madras, 3d October 1855. }

Statement shewing the Quantity and Value of Fibrous Substance Manufactured Imported into and Exported from the Madras Territories including Fort Saint George for the last 5 Years.

Years.	Articles.	Imports.			Exports.		
		Quantity.	Value.	Rate.	Amount of Duty.	Quantity.	Value.
1850-51.	Coir Loose	Cwt. 3,656	Rs. 16,330	at 5 and 10 ¢ cent. ...	Rs. 826 15 10	Cwt. 2	Rs. 11 at 3 ¢ cent.
	Coir Rope	" 27,052	82,903	at 5 and 10 ¢ cent. ...	1,556 3 2	" 1,09,288	2,46,852
	Cordage	" 177	3,538	at 5 ¢ cent.	176 13 11	" "	" "
	Jute	" 30	101	at 3 ¢ cent.	3 8 11	" 167	749
1851-52.	Coir Loose	" 870	14,387	at 5 ¢ cent.	89 13 11	" 36	477
	Coir Rope	" 2,419	19,247	at 5 and 10 ¢ cent. ...	966 4 7	" "	" "
	Cordage	" 22,392	66,855	at 5 ¢ cent.	1,363 2 11	" 1,10,224	2,42,019
	Twine	" 121	12,249	" "	46 7 0	" "	" "
1852-53.	Coir Rope	" 185	3,236	" "	" "	" "	" "
	Coir Rope	" 16,458	51,746	at 5 and 10 ¢ cent. ...	61,317 12 11	" 1,12,281	2,43,412
	Cordage	" 404	7,699	at 5 ¢ cent.	230 11 5	" "	" "
	Hemp Rope	No. 50	7,113	" "	" "	" "	" "
1853-54.	Twine	Cwt. 1,458	13,844	at 5 ¢ cent.	103 1 10	" "	" "
	Coir Rope	Bundles 130	45,694	at 5 and 10 ¢ cent. ..	1,441 14 3	" 1,30,828	2,97,639
	Cordage	Cwt. 14,486	2,196	" "	" "	" "	" "
	Twine	" 953	8,224	at 5 ¢ cent.	95 3 2	" "	" "
1854-55.	Coir Rope	Bundles 80	77,618	at 3 1/2 and 10 ¢ cent.	3,052 6 9	" 1,00,552	2,33,831
	Twine	Cwt. 13,004	25,504	at 5 and 10 ¢ cent. ...	20 7 0	" "	" "
	Total...	Cwt. 1,07,834 Bundles 210 No. 50	4,58,484	.....	11,290 15 7	Cwt. 5,63,378	12,64,993
							Rs. 0 5 2 1,563 7 2 22 7 8 14 4 11 2,115 0 2 2,949 0 10 3,313 8 1 3,956 14 9 13,937 0 9

Sea Custom House, Madras, 3d October 1855.

W. E. UNDERWOOD, Collector Sea Customs.

No. 133.

FROM H. A. BRETT, ESQUIRE,
Collector of Salem,

TO G. S. FORBES, ESQUIRE,
Acting Secretary to the Board of Revenue,
Fort St. George.

SIR,

Adverting to your letter dated the 2d ultimo, calling upon me for a return of Fibrous substances grown in the Sub Division of the Salem District, I have the honor to submit a Statement shewing the required particulars.

I have the honor to be, &c.,

H. A. BRETT,
Collector.

Salem, Collector's Office,
Ossoor, 6th Nov. 1855. }

Statement shewing the particulars connected with the cultivation of certain Fibrous Plants in the Sub Division of the Salem District.

Names of Fibres.	Description and extent of land cultivated.						Estimated produce per Acre in Maunds.	Selling price of Fibre per Maund.	Cost of cultivating one Acre of land.	Remarks.
	Dry.			Dry Garden and Wet.						
	Extent.	Assessment.	Extent.	Assessment.	Assessment.					
1 Plantain trees...	Acre. G A	Rs. A P	Acre. G A	Rs. A P	Rs. A P	...	Rs. A P	Rs. A P	...	These trees being scattered over Porumboko land it is difficult to estimate their extent.
2 Janapum plants.	89 5 4	181 8 6	301 32 ...	4,598 ...	16 6 6	12	...	13 ...	1 8 ...	
3 Poolecha plants.	400 ...	800 ...	120 ...	176 ...	...	16	...	7 6	1 8 ...	
4 Coccanut trees..	...	...	...	...	...	17	...	7 1	1 8 ...	
5 Palm trees	...	...	...	...	...	13	...	2 6	...	
6 Cotton plants....	11,881 21 3	18,692 6 9	12 11 10	72 4 8	...	9	...	11 8	2 ...	

Salem, Collector's Office,
Ossoor, 6th November, 1855. }

E. E. per

H. A. BRETT,
Collector.

No. 2691.

FROM J. J. FRANKLIN, Esq.,

Secretary Marine Board,

TO SIR H. C. MONTGOMERY, BART.,

*Chief Secretary to Government,**Fort Saint George.*

SIR,

I have the honor by desire of the Marine Board to acknowledge the receipt of the Extract from Minutes of Consultation of 19th September last, No. 954, on the subject of the Fibres of India.

2. The Board have for some time past had under their consideration the advantages that might be generally derived by this country, equally with that of England, by bringing into notice the various fibres which are found, they believe, in all the Districts, as substitutes for the hemp and flax of which such large quantities have been annually imported into the English markets from other countries, but more particularly from Russia. In Mr. Gregson's letter to Sir Charles Wood, alluded to in the Minutes of Consultation under consideration, it is stated that in 1853 (pp. 4 and 5) 64,399 tons of flax and 41,819 tons of hemp were derived from Russia.

Years.	From Russia.	From other parts.	Total from all parts.
	Cwts.	Cwts.	Cwts.
1801 to 1810	6,521,235	468,694	6,989,929
1811 to 1820	5,323,717	284,210	5,607,927
1821 to 1830	4,859,096	295,868	5,154,964
1831 to 1840	5,773,150	1,009,853	6,783,003
1841 to 1850	5,618,473	2,851,181	8,469,654
1851 to 1853	2,008,108	1,572,229	3,580,337
Total Cwts.	30,103,779	6,482,035	36,585,814
Tons.	1,505,189	324,102	1,829,291

3. The quantities of hemp imported into the United Kingdom from 1801 to 1853 inclusive amounted to 1,829,291 tons, of which Russia supplied 1,505,189 tons or in the average of each of the 53 years 28,400 tons per annum, whereas only 324,102 tons were

obtained from all other places during the 53 years, or 6,115 tons per annum.

4. The value of all the imported flax from Russia during 53 years taken at £40 per ton amounted to £63,495,800, or on an average the

value was £1,198,033 per annum. The imports of flax from Russia and other parts, during each series of 5 years were as follows:

Years.	From Russia.	From other parts.	Total from all parts.
	Cwts.	Cwts.	Cwts.
1801 to 1810,	2,942,357	773,004	3,715,361
1811 to 1820,	2,886,027	684,993	3,571,020
1821 to 1830,	5,426,498	2,371,889	7,798,387
1831 to 1840,	7,453,994	3,780,301	11,234,295
1841 to 1850,	9,975,612	4,248,390	14,224,002
1851 to 1853,	3,063,410	1,441,965	4,505,375
Total Cwts.....	31,747,898	13,300,542	45,048,440
Tons.....	1,587,395	665,027	2,252,422

Quantities of flax and hemp received from and amount paid to Russia in fifty-three years is as follows:

	Tons.	Average value.	Amount.
		£	£
Flax,	1,587,395	40	63,495,800
Hemp,	1,505,189	35	52,681,615
Total.....	3,092,584	...	116,177,415

5. As the present war with Russia must to a great extent shut out the supply from that country, the question as to how the deficiency

is to be made good, has grown to be one of the greatest importance, provided that the produce of Russia, and mainly flax and hemp, which come from the Baltic Ports, do not find vent through the ships of the territories belonging to Russia.

6. The Board have not obtained any information regarding flax, for this plant requires a more temperate climate than is possessed by those parts of the Presidency from which the export of fibre could be effected at a moderate cost. Dr. Forbes Royle in his interesting and instructive paper appended to Mr. Gregson's letter (p. 26) mentions that Saugor is well adapted for this species of plant, but unless the navigation of the river Nerbudda be improved, or the Wurda which joins the Godavery, be made navigable, the distance from a port, and the difficulty and expense of transit from the place of growth may prove serious obstacles to its being brought into early use as an article of export on a large scale, even if it could be supplied on the spot at a moderate price, on which point the Board are not advised. Indeed they have not extended their inquiries to inland districts. But the question is also one of great importance as regards hemp, for this alone to the value of £52,681,615 and in quantity 1,505,189 tons was imported during the 53 years (1801 to 1853) from Russia, being an average of tons 28,400 per annum of the value of £994,000.*

7. Hoping to gain some additional information regarding a subject which was beginning to be of intense interest, they addressed the various Marine authorities in the Coast Collectorates with the view of ascertaining the substance which the fishermen and others made use of for their nets, lines and cordage. All that the Board can attempt is to shew what fibres are now obtainable without difficulty near places of export. The annexed table comprises an abstract of the information thus gained, from which it will be seen that the price of the Nars varies from 100 to 3 or 400 Rupees a ton; and that it is only in a few places that it is at present to be procured in large quantities, but that at those few places there is reason to believe that if its production is fostered and encouraged, an extensive trade might be formed of this article alone.

8. Mr. Gregson quotes the average price of Russian hemp during peace at £35 per ton, but observes that now it may be considered to be doubled. The Board would not, however, calculate on obtaining a higher rate than the peace price, as an adjustment of the Eastern ques-

* The aggregate quantity of hemp and flax imported from Russia from 1801 to 1853 was 3,092,584 tons of the value of £116,177,415, or an annual average of 58,350 tons of the value of £2,192,026.

tion would very soon lower the rates to those which they before stood at. The Calcutta merchants are now sending hemp to England which fetches £30 per ton. This price will therefore be taken as the probable value of the article delivered at any of the large markets, such as London or Liverpool. Allowing £9-10-0 per ton for freight, pressing, baling, insurance and all other expenses, it follows that if hemp as fit for rope as that from Calcutta can be brought into the English markets, it will command such a price as will divide between the producer and exporter £20-10-0 or 205 Rupees per ton.

9. The Board will now proceed to examine which of the several fibres mentioned in the statement* are likely to yield a return with a fair chance of profit.

* No. 1. Of the net return, 205 Rupees, 25 per cent should be set aside as profit to the exporter and to cover losses which must be expected to occur at the commencement when introducing a new article of trade. There will, however, remain Rupees 154-12-0 as the cost at which good fibre may be prepared and shipped in the confident assurance of its commanding a remunerating price.

10. The only fibre that seems to hold out this expectation, so far at least as the Board's investigations shew, is that of hemp; and as it is long, strong, easily prepared and grows plentifully near to where it can be shipped without much adding to its cost for transit, it would appear to be the one that should be first selected to experiment upon. Should its exportation be attended with success, no doubt other fibres which are now scarce and consequently dear owing to their cultivation being neglected from the want of demand, will be introduced at rates similarly promising good returns.

11. The first in the list appears to be the Sadambo, a species of hemp from which common gunny bags and gunny or baling ropes are made, and which can be grown to any extent in Tinnevely. The price 125 Rupees the ton, even at the bazaar rate for small quantities, is such that even if it only fetched the same as jute in the English markets, a very fair return would attend the consignment. Jute is now quoted at from £21 to 26 the ton. In January last it was £20 to 24. Supposing then that this hemp could only be procured in large quantities at the present bazaar rate and was only fit for the purposes to which jute is now put, and would only command the same price, say an average of £23-10-0 or 235 Rupees, there would be a profit of £1-10-0 or 15 Rupees per ton on the shipment after allowing 95 Rupees for freight, baling, &c., equivalent to about seven per cent., as the total outlay.

But from the specimen of the fibre which is herewith forwarded, the Board are under the impression that it will command a much higher rate in the English markets. It is strong and long, and seems well fitted for rope and twine. At Tuticorin there are facilities for baling and screwing which other ports do not possess, several cotton screws having been established there during the past ten years.

12. The only other place at which it appears that fibre can be at present obtained at a rate sufficiently low to remove any anxiety as to its making a profitable return, is Rajahmundry, where Major F. Cotton states that it can be supplied at about $3\frac{1}{2}$ Rupees the cwt. or 70 Rupees the ton. The Board forward a specimen of this production. It is rather brittle,

but is strong and long, the two qualities most desirable in fibre intended for rope, and the brittleness is probably occasioned by some defect in the preparation. If it only fetches the price of jute there will be a very ample return on the consignment of about £7 or 70 Rupees per ton. It is therefore in these two districts, Tinnevely and Rajahmundry, that the Board perceive a fair opening for an immediate commencement of such measures as the Government may be pleased to adopt towards encouraging the growth and preparation of fibre.

13. The purchasing prices set down for these hems are however those at which they are now sold in the bazaar in small quantities, but the Board have before them statements from two firms who have shipped the article from Madras and Rajahmundry, the first, a late transaction in which the cost was 80 Rupees the ton: the second, a consignment shipped 3 years ago wherein the whole expense of first purchase, baling and shipping was only 68 Rupees the ton. It may therefore be fairly presumed that when the production of the plant is conducted on a more extensive scale its cost will be reduced 20 to 30 per cent.

14. Regarding the hemp of Rajahmundry, Major F. Cotton writes to the Military Board under date the 10th March as follows.

"To try on a sufficiently large scale the real value of the hemp obtained from the *Crotalaria Juncea*, I took up a piece of land and sowed it in June last, but my experiment was ruined by the great Godavery fresh in the following month sweeping over it and entirely destroying the crop.

"Since that I have purchased and worked up some of the same material (the common hemp so called) and find that I can make rope for

about one *anna per lb. and as that we manufactured bore 1,900 lbs. on a rope weighing $4\frac{3}{8}$ of an ounce for the yard, there can be no doubt that cordage may be made here from that material to great advantage."

15. The Board are well aware that shipments of hemp have already been made by the merchants from Coringa, but the quantities are comparatively small, owing probably to doubt in the minds of the natives as to whether they could find a ready market for their produce. Of course the Government would not desire to interfere with the operations of the mercantile community, but as a great and increasing demand exists in England for good fibre, and as notwithstanding it can be cultivated to a large extent in Tinnevely and Rajahmundry, the opportunity of introducing it as an article of general export is passing away without being turned to much advantage, the Board think that it would be politic for the Government to come forward and offer to the ryots to take as much off their hands as they choose to grow and prepare at a fixed price, permitting them if the market value rose beyond that price, to sell it to the best advantage. It is very likely that to carry out these measures, the ryots may require a little assistance either in the shape of advances or by temporary remission of their kist, with the view of inducing them to follow up at once the species of cultivation. The Revenue Board and the Collectors of the districts will best be able to judge of the mode most likely to encourage the production of the plant and the preparation of the fibre on an extensive scale, but whatever assistance the Government may feel warranted in granting there is little doubt that it will not be required long. If the cultivator were satisfied that he could grow and prepare a crop that would repay him well and for which he had a ready market, and the merchant that he could purchase and ship that crop at an outlay offering a fair prospect of a handsome return, there would be no necessity for Government to interfere at all. But the uncertainty of all this keeps parties from entering on the speculation. When once the facts are established by actual trial, the matter may be safely left to private enterprise.

16. The Board would here call attention to the remarks made by the celebrated Roxburgh that—his experiments and inquiries both on the coast of Coromandel from the year 1786 to 1790, and subsequently in Bengal, led him to think that hemp might be cultivated, and probably the Records of Government during the years 1784 to 1790 when he was at Rajahmundry may furnish useful information on the

* Note.—140 Rupees the ton or 7 Rupees the cwt. English rope before the war with Russia sold for 25 Rupees the cwt. in the Madras markets.

subject. Roxburgh further observes, and this may be equally applicable at the present day, that at first some encouragement will be necessary to induce the ryots to undertake this new branch of agriculture, for although the plant is perfectly familiar to every Hindoo, yet its cultivation on an extensive scale for the fibres of its bark is perfectly unknown to them. It might be advisable to examine the Records to see what measures were taken in 1803, when the Lords of the Privy Council addressed the Honorable Court recommending encouragement to be given in India to the growth of strong hemp. From the papers it would appear that the failure to obtain supplies arose from the high freights at that time, £16 to £20 a ton. Probably a reference to the Minute of Sir F. Adam when he was at the head of this Government in 1834, and the Circular which the Government then issued may also afford valuable information. Royle seems to advise a careful revision of the Reports and Records of Government, and the Government of India appear to have authorized the Agricultural Society of India in 1840 to circulate to the different Presidencies a paper containing queries, which from the subsequent proceedings of that Society seem to have elicited many valuable suggestions regarding the growth of flax and hemp.

17. The first step then is to ensure to the ryots the sale of his produce at a remunerating price, and if necessary to assist him in commencing operations. It is difficult for the Board to fix a rate which will be considered remunerative by the cultivator, but they think it may safely be assumed at 25 to 30 per cent. below that for which it can now be sold in the bazaars in small quantities. At Tuticorin this rate is 125 Rupees and in Rajahmundry 70 Rupees per ton of cleaned hemp fibre, and as the return for this even if purchased at the bazaar rate, and if it only sell at the price of jute in the English market, would be about 7 per cent. on that from Tinnevely (see par. 11) after paying all expenses, there can be little or no hazard in the experiment. Probably before the time comes for shipment, merchants would come forward and be willing to ship on their own account; but if not, the Government could do so with but the remotest risk of loss.

18. There are doubtless other districts which would soon come into competition with the two the Board have selected, but in which probably from the small quantities now raised, the price of the fibre is too high to admit of its export with advantage. The Minutes of Consultation of the 19th ultimo, No. 954, will however, elicit valuable information on the subject, and it may be found that hemp can be raised

and prepared elsewhere as good and at as cheap a rate as in Tinnevely or Rajahmundry. The *Chedda-vakoo from the Sea Custom Manager at Calicut and the †Buckoo from the Master Attendant at Cochin, which appear to be identical, and

which are probably the Wuckoo-nar from Travancore which (page 27 of Mr. Gregson's paper) broke at a weight of 175 lbs. when Petersburg broke at 160, are both very strong and likely to be equally in demand with the Russian hemp, but the price at which they are now to be procured would preclude their shipments except as an experiment. Specimens of these fibres are sent herewith.

19. The following are the prices quoted in the English markets for the various specimens of hemp since January 1853. No quotation is inserted of that from Bengal which is only of late introduction, but they were informed by the member of a leading firm at Calcutta who arrived by the last steamer that the last prices realized were £30 per ton.

Extract from the London Price Current.

Extract from the London

	January 4th 1853.				January 3d 1854.				August 1st 1854.			
	£	S.	£	S.	£	S.	£	S.	£	S.	£	S.
Hemp Manilla.....	38	0 to	48	0 42	0 to	48	0 55	0 to	65	0		
„ Riga.....	0	...	38	0	...	0	0 65	0 to	66	0		
„ Petersburg.....	0	...	0	36 10	to	37	10 62	0	...	0		
„ Italian.....	32	0 to	44	0 32	0 to	44	0 66	0	...	0		
Jute.....	13	0 to	19	10 20	0 to	24	0 21	0 to	26	0		

20. The principal points to be attended to in preparing the hemp for market are,

1st. That the fibre should be as long as possible.

2d. That it should be perfectly free from mucilage and woody particles, and 3d, that its strength should not be injured in the process of separation and cleaning.

21. Should the Government be disposed to act upon the suggestions herein contained, it would be necessary, to ensure a fibre of a proper quality, that samples be exhibited in the locality where it was to be produced, and that the ryots should be shewn the weight a given portion was capable of sustaining, and which would be required of that to be purchased.

22. To insure a long staple the seed should be sown thick, and care should be taken in cleaning the fibre that it should be free from

all impurities. Maceration is generally adopted for this purpose, although Dr. Hunter thinks that mode unsuitable for a warm climate from putrefaction taking place so rapidly. It might be useful if the Doctor were to prepare short rules for the guidance of intending cultivators for distribution in the vernacular languages where required. They might then be informed that the Government would only receive fibre prepared in conformity with these rules at the price fixed for its purchase.

23. In conclusion I am desired to forward for the information of Government the accompanying copies of papers received on the subject of fibres generally, which perhaps it might be useful to circulate; and the Board would strongly advocate the printing and publishing all the information regarding the fibrous substances, and circulating the same.

- A. 1 Proposed letter from the Military Board to the Commissary General 17th May 1853.
- B. 1 Letter from Acting Assistant Commissary of Ordnance Cannanore, to Military Board, No. 39, 12th January 1854.
- C. 1 Letter from Commissary of Ordnance at Bangalore, to Military Board, No. 387, 10th August 1853.
- D. 1 Letter from Acting Assistant Commissary of Ordnance Cannanore, to Military Board, No. 23, 17th September 1853.
- E. 1 Letter from Manager in charge of Master Attendant's Office at Calicut, to Collector of Malabar, 22d October 1853.
- F. 1 Letter from Master Attendant Cochin, to ditto, No. 91, 28th October 1853.
- G. 1 Letter from Collector South Arcot, to the Secretary Marine Board, No. 509, 29th December 1853.
- H. 1 Letter from Master Attendant Vizagapatam, to Collector of Vizagapatam, No. 16, 7th March 1854.
- I. 1 Letter from Master Attendant Tellicherry, to Collector of Malabar, 10th October 1853.
- J. 1 Letter from Master Attendant Tuticorin, to Collector of Tinnevely, No. 65, 15th October 1853.
- K. 1 Letter from Doctor Hunter, to Military Board, 8th Sept. 1853.
- L. 1 Letter from Doctor Cleghorn, to Military Board, 6th Sept. 1853.
- M. 1 Letter from Doctor Hunter, to the Commissary General.

I have the honor to be, &c.,

J. J. FRANKLIN,.

Secretary.

Madras, Marine Board Office,
27th October 1854.

Abstract of information furnished from the Outports regarding the material used by the Coast Fishermen for their Nets, Lines and Cordage.

From.	Name of Plant.		Price.	Remarks.
	Ordinary.	Botanical.		
Captain Brecken, Master Attendant at Tellicherry, 10th October 1853.	Twine Plant.	.....	2½ to 4 Rupees per mannd of 32 lbs. 175 to 280 Rupees the ton.	This is evidently the common hemp but as it is not grown near Tellicherry, the price is high.
	Wild Aloe.	Agave.	50 to 80 Rupees the candy of 640 lbs. 175 to 280 Rupees the ton.	This fibre is extracted by scraping the outer part of the leaf with a coccanut shell. It is only used by the Natives for exportation. There is little demand for it now although it was in much request 3 years ago for shipment. It then rose to 80 Rupees the candy, of 640 lbs. but can now be procured at 50 Rupees.
Mr. Fernandez, Manager Sea Customs Department at Calicut, 22d October 1853.	Kaida Nar.	Agave.	45 to 50 Rupees the candy. 157 to 175 Rupees the ton.	The samples sent appear to have been injured by rotting. Some fibres are strong while others break with a slight strain.
	Chedda Vakoo.	.....	50 to 56 Rupees the candy. 175 to 196 Rupees the ton.	A strong, long and valuable fibre, well adapted for rope and if it could be purchased at a more moderate rate would afford a fair field for investment. Owing to limited production the price varies with the demand, and both this and the Kaida Nar have risen as high as 90 Rupees the candy.
Lieutenant French, Acting Assistant Commissary of Ordnance at Cannanore, 17th September 1853.	Junapen Nar.	Crotalaria Juncea.	2½ Rupees for 30 lbs. 187 Rupees per ton.	A strong, lengthy fibre that receives tar well and is fitted for all species of cordage. Very plentiful but the price is high.
	Pulchee or Cosrick Nar.	Hibiscus Cannabinus.	.....	A strong, soft and lengthy fibre also adapted for cordage, but not so good although more expensive than Junapen Nar.
	Cathalay Nar. Common hedge Aloe.	Agave Americana.	2 Rupees for 30 lbs. 149 Rupees the ton.	Strong, long and wiry, only adapted for the coarser kinds of cordage and gunnies. None of these Nars are of local produce but are said to be plentiful.
	Yercum Nar. Gigantic Swallow wort.	Calotropis gantea.	40 Rupees for 30 lbs.	Short, fine and tenacious, but being very scarce and dear could not be purchased with advantage at Cannanore. It is common in other parts of India.

Abstract of Information furnished from the Outports, &c.

From.	Name of Plant.		Price.	Remarks.
	Ordinary.	Botanical.		
Mr. Bennet, Master Attendant at Cochin, 28th October 1853.	Buckoo common Hemp.		4 Rupees for 30 lbs. 299 Rupees the ton.	This appears to be the same species of hemp as that sent from Calicut. It is sown in May, grows to the height of about 5 feet, according to the nature of the soil, and is reaped in September. The price is very high, but no doubt if it were regularly cultivated it might be produced at much less cost.
	Oday Maram.			A coarse fibre prepared from the bark of a tree, very common along the Sea Coasts of Tinnevely by maceration for 4 or 5 days and beating. Being strong it is used for turtle nets but is only adapted for the coarsest descriptions of cordage. No particular price is assigned, but a net weighing 20 lbs. can be purchased for 3 Rs. 8 As.
Mr. Robertson, Master Attendant at Tuticorin, 15th October 1853.	Sadambo.		3½ Rupees for 62 lbs. 125 Rupees the ton.	A species of hemp grown in the interior, from which gunny bags and roping are now made. Can be cultivated to any extent.
	Sunnoo common Hemp.	Crotalaria Juncea.	1 Rupee for 2½ viss. 320 Rupees the ton.	A good strong fibre which can be procured in large quantities. At present used only for nets, lines and coarse sacking.
Mr. E. Malby, Collector of South Arcot, 29th December 1853.	Kuttalai Nar. Hill Aloe.	Agave Vivipara	About the same as the Sunnoo.	Also used for the same purpose as Sunnoo but not so plentiful.
	Poolichee.	Hibiscus Cannabinus.		
	Benda or Bendakai.		Rather cheaper than Sunnoo.	This yields a strong fibre but is not in common use, as it is separated with difficulty and does endure maceration. A strong fibre used for large hunting nets and for the drag ropes of large fishing nets. Very common along the Coasts of India.
	Yercum.	Asclepias Gigantea.		
	Talam or Culdera.	Pandanus Odoratissima.		
Major F. C. Cotton.	Common Hemp.	Crotalaria Juncea.	3½ Rupees the cwt. 70 Rupees the ton.	Can be procured in large quantities in Rajahmundry a good strong and long fibre well suited for rope, &c.
	The common Roselle.	Hibiscus Cannabinus.	Not prepared for sale.	A beautiful silky fibre suitable for fine lines and cloth, well adapted also for packing steam pistons. The Marine Board have offered 10 Rupees the cwt. for it, that procured from England of an inferior quality costing 29 Rs.

Abstract of Information furnished from the Outports, &c.

From.	Name of Plant.		Price.	Remarks.
	Ordinary.	Botanical.		
Mr. Meppen, Master Attendant at Vizagapatam.	Junapum Nar.	Crotalaria Juncea.	4 Viss for 1 Rupee	Commonly used for nets and lines, very plentiful throughout the District.
	Common Hemp.	Hibiscus Cannabinus.	187 Rupees the ton.	
	Cate Nar.		3 Viss for 1 Rupee 249 Rupees the ton.	Strong and elastic, it is principally grown at Chepropillay and Poodemarkah; used for the smaller and finer hand nets.
	Ganapa Nar.		do.	Cultivated in Ganjam. Its quality is equal to the Catenar, but it is whiter.
	Samiva Nar. Wild Aloe.			Stronger and whiter than hemp. It is made into canvas and seldom used for lines and nets. It is not sold in the market but is picked and prepared by hired labor.
	Jullidar Nar.	Calotropis Gigantea.		Very scarce and seldom used.
	Durbah or Lun-kah grass.			Used for caulking the fishermen's boats and partly for large nets. The process of extracting the fibres of all these plants is by maceration for about a fortnight.

A.

FROM THE MILITARY BOARD,
TO THE COMMISSARY GENERAL.

SIR,

The Military Board having frequent demands made upon them for supplies of Rope or materials for making Rope, and the substances generally used Cotton and Europe Oakum, being expensive, often not obtainable at many stations and not suitable, and as it is well known that the country possesses an abundance of Fibrous substances well adapted for Ropes, I have the honor by desire of the Board to solicit your aid in endeavouring to develop the resources of the country and bringing them into more common use.

The results of the late Grand Exhibition have furnished us with much valuable information on the subject of fibrous substances, for, independently of the catalogue of the various substances produced in this country and deemed valuable for manufactures, the reports by the Juries

are most full and detailed on the subject of Fibrous substances adapted for Ropes and other manufactures.

Amongst the varieties of flax, hemp and similar fibrous materials commonly met with in the English market, and which were exhibited and all found to be good, there were belonging to the flax, one called *Jute*; and amongst the hems those designated the India Brown Hemp, the India Yercum Hemp, and the Manilla Hemp, some good samples of hemp accompanied by cloth manufactured from it, in the Himalayas, were also shown in the valuable collection of East India fibres.

A very large number of other fibrous substances used as substitutes for cotton, flax, and hemp, some of these new and but little known, were also contributed, and amongst them were several which from their valuable properties seem likely ere long to become important articles of Trade, not merely forming excellent substitutes for the substances already employed by manufacturers but likely in some cases to lead to the development of new branches of Industry.

In the Liverpool collection the following were shown.

Hemp Bombay,	Hibiscus cannabinus.
Jute,	Corchorus capsularis.
Sunn,	Crotalaria juncea.
Coir Rope,	Cocos nucifera.
do. Yarn,	do.
China Grass,	Urtica nivea.
Manilla Hemp,	Musa textilis.

The above are all articles in demand in England, for of the "*Jute*" alone 12,216 Tons were imported into Liverpool in 1850, and the importation of the other articles is increasing as their useful properties become known.

Of these the China Grass is one of the most interesting, and although this fibre is a comparatively new commercial article in Europe, yet it is abundant in China, and in many parts of the Indian Empire, where it has long been used under the Native or Chinese denomination of Chow-ma by the Natives, who by the simple process of maceration obtained from the plants a strong and very useful fibre, although, owing to the rude, wasteful and imperfect means employed by the natives in preparing the fibre for the manufacture of twine, thread and fishing nets by the mere process of scraping, it was found to be wholly inapplicable on a large scale, and gave besides only a very inferior result.

At the beginning of the present century (1803) Dr. Roxburgh introduced into India from the Islands and Malay Peninsula (Bencoolen)

the "*Callooe*" hemp, "*Kankhura*" or the "*Ramy*," the produce of an *Urtica*, to which he gave the name of *U. tenacissima*, and cultivated it in Calcutta; and in 1814 its practical value was tested in England by some competent authorities and the reports were highly favorable as to its strength and other valuable qualities. Recent investigations have showed that the *Urtica Tenacissima* and the *Heterophylla* may be obtained in almost unlimited quantities in various parts of India, and a process which has lately been patented appears to a very great extent to have removed the practical difficulties which previously stood in the way of its employment by manufacturers, so that in a few years, it is probable that Callooe Hemp will constitute an important addition to the fibrous materials employed in the arts.

The investigations of Dr. Roxburgh brought to notice many Indian Fibres, besides the *Jute*: instance the *Corchorus Capsularis* and *C. Olitorius*, and in 1804 and in 1808, he made experiments as to the comparative strength of several of these East India fibres as shown in the following table.

			Breaking Weights as ascertained in	
			1804	1808
1...	Hemp (English)...	<i>Cannabis Sativa</i>	105	.....
... 1	Bow string hemp...	<i>Asclepias spinosa</i> .....	.....	248
2...	Murga (Sansevieria)...	<i>Aletris nervosa</i>	120	.....
... 2	Callooe hemp ...	<i>Urtica tenacissima</i> .....	.....	240
3...	Aloe	<i>Agave Americana</i>	110	.....
... 3	?	<i>Corchorus capsularis</i> .....	.....	164
4...	Ejoo	<i>Saguerus Rumphii</i>	96	.....
... 4	Sunn	<i>Crotalaria juncea</i> .....	.....	160
5...	Donslia	<i>Æschynomone cannabina</i>	88	.....
... 5	Hemp (Indian) ...	<i>Cannabis sativa</i> .....	.....	158
6...	Coir	<i>Cocos nucifera</i>	87	.....
... 6	Donslia	<i>Æschynomone cannabina</i> .....	.....	188
7...	Hemp (Indian) ...	<i>Cannabis sativa</i>	74	.....
... 7	?	<i>Hibiscus strictus</i> .....	.....	128
8...	Woollet comal ...	<i>Abroma augusta</i>	74	.....
... 8	Musta paat	<i>Hibiscus cannabinus</i> .....	.....	115
9...	?	<i>Bauhinia</i>	69	.....
... 9	Banglee paat	<i>Corchorus olitorius</i> .....	.....	113
10...	Sunn	<i>Crotalaria juncea</i>	68	.....
... 10	Plantain	<i>Musa</i> .....	.....	79
11...	Bunghi paat	<i>Corchorus olitorius</i>	68	.....
12...	Ghee nela paat ...	<i>Corchorus capsularis</i>	67	.....
13...	?	<i>Hibiscus manihot</i>	61	.....
14...	Flax (Indian)	<i>Linum usitatissimum</i>	39	.....

9. Nar, or aloe fibre, the produce of the *Agave vivipara*, and other allied species. A valuable and strong fibre is prepared in many parts of India, from different species of aloe.

A very interesting series of these fibres, which are obtained from the large Hill aloe, and from the small aloe, illustrating the preparation of the fibre, exhibiting some of the uses to which it is applicable, and showing the facility with which it may be dyed of various colours contributed by Dr. Hunter of Madras.

10. Specimens of aloe fibre contributed from various parts of the Madras Presidency—Madras, Madura, Coimbatore, &c. and from Singapore.

11. *Yucca* fibre, obtained from *Yucca gloriosa*, also sent from Madras by Dr. Hunter.

12. Ejoo, or Gommuti, obtained from the *Arenga saccharifera* (*Saguerus Rumphii*), or Gummutee Palm, much esteemed in the Eastern Archipelago for making ropes and cables, in consequence of its extraordinary elasticity and durability in water; unfortunately, the value of this fibre is greatly diminished by its peculiar fragility.

13. Putwa, or Mawal fibre, obtained from the *Bauhinia racemosa*, a plant common throughout the lesser Hills of India, contributed from Bhaugulpore, in the division of Patna.

14. Talli Nanas, fibre of the pine apple, *Bromelia ananas*, from various localities. Good samples are exhibited from Madras, by F. Lima and Dr. Hunter; from Singapore by Captain H. Man; also from Travancore &c.

Some very beautiful specimens of fibre, called "ananas flax," are exhibited from Java, by L. Weber; the real source of this fibre does not seem to be very certain, for though from its name it might be supposed to be pine apple fibre, it more closely resembles that of the *Urticas*, or *Boehmerias*, already mentioned. It is so remarkably fine that the Jury awarded a prize medal to Mr. Weber for it.

15. Manilla hemp and plantain fibre obtained from the *Musa textilis* and *M. paradisaica* contributed from Madras, from Dacca, and by the Rev. M. Stork, from Chittagong. Excellent canvas and ropes are shown, made of this fibre, which is extensively used in the Government establishment at Ceylon.

16. *Marsdenia* fibre, obtained from the *Marsdenia Roylii*, and contributed by His Highness the Maharajah of Nepal.

17. Pulas, fibre of the *Butea frondosa*, used for making common cordage, from Beerbhoom, in the division of Moorshedabad.

18. *Parkinsonia* fibre, obtained from the stems of *Parkinsonia aculeata*, introduced from the West Indies, sent by Mr. Allan, from Madras; said to be well suited for the manufacture of paper.

19. *Roxburghia* fibre, obtained from the *Roxburghia gloriosoides*.

20. *Artocarpus* fibre, obtained from an *Artocarpus*: this and the preceding fibre are contributed by Mr. Simons, from Assam.

21. Trap fibre, obtained from the bark of the trap tree, a species of *Artocarpus*, contributed from Singapore.

22. *Trophis* fibre, from the *Trophis aspera*. (*Epicarpurus Orientalis*) the modern name.

23. *Daphne* bark, the fibrous barks of the *Daphne cannabina*, used in the manufacture of Nepal paper.

Besides these, several other fibrous substances from different parts of India were exhibited, such as the fibres of the Palmyra leaf, *Borassus flabelliformis*, from Madras; the bark of the Sissoo tree, contributed by Captain Reynolds and a series of vegetable fibres from Arracan, called Theng-ban-shaw, Pathayon-shaw, Shaw phyos, Ngan-tsoung-shaw, Shaw-me, and Ee-gywot-shaw, &c.

Several of the Indian fibres, already mentioned, are also contributed from Ceylon. Good samples were shown, both as mere fibres, and also in the various states of thread, rope and coarse cloths, of coir, aloe flax, and the fibre of the Plantain, *Hibiscus* and *Sansevieria*.

Aloe fibre, obtained from the *Agave Americana* and *A. vivipara*, both of which are grown in Madras, was sent from Barbadoes.

From St. Vincent, samples of the Mahant bark in its raw state, the fibrous part in the state in which it is employed in the manufacture of fishing nets, and samples of lapeto, used also in the manufacture of common cord and coarse lines for fishing nets used at St. Vincent.

Another was the Plantain fibre, *Musa paradisaica* and *M. Sapientum*, from Plantation Vigilance, East Coast, Demerara. It is calculated that about 8 cwt. per acre of this excellent fibre might be there obtained: at present very little of it is used. It is worthy of remark that, in some of the first lists of premiums offered by the Society of Arts, about 1762, special attention was drawn to the beautiful fibre of the Plantain:—Whereas the stem of the Asiatic and American fruit bearing Plantain affords three sorts of fibrous materials which resemble hemp, hard silk, and cotton, all which have been experimentally found capable of being

wrought into various sorts of manufactures; and, among others, into cordage, fustians, lawn, knitting, gauze, blonde lace and excellent candle wicks, sundry specimens of which manufactures may be seen in the hands of the Register of the Society, &c. This advertisement was continued for several successive years, but as no candidate came forward to claim the offered reward, it was at last discontinued.

Silk-Grass fibre, the fibre of the *Agave vivipara*, from Plantation Vigilaue, East Coast, Demerara; and Fibiiri fibre, obtained from the Ita palm, *Mauritia flexuosa*, from the River Berbice.

Mohoe or Mahoe fibre, *Hibiscus elatus* or *Thespesia populnea*, from Demerara. It is a very strong but coarse fibre, used for making cordage, coffee bags &c.

Some good samples of *Yucca* hemp, together with a leaf of the *Yucca serrulata*, from which it is obtained and rope and cordage manufactured from it; also specimens of the fibre of the Palmetto, and of rope made from it. These were deemed worthy of honorable mention.

In the Trinidad collection are some specimens of the fibre of the pine apple and aloe; and also of the fibre of the Mahagna, or Majagua, *Sterculea caribæa*.

Specimens of the leaf and fibre of the *Doryanthes excelsa* contributed from New South Wales, as well as some rope made of the latter. These were deemed worthy of honorable mention.

A bale of "New Orleans moss" (*Tillandsia usneoides*) prepared as a substitute for horse hair &c. as a stuffing material for upholstery purposes. This substance possess considerable elasticity and appears to be very well adapted for the above mentioned purpose: it is stated that it may be had in any quantity, and at a comparatively small price. The Jury awarded a Prize Medal for this fibre, which, though not altogether new in the London market, does not appear so well known as it deserves to be.

A sample of the fibrous husks of the Maize, or Indian corn, also used for stuffing mattresses. This substance, though not so good as the "New Orleans moss," being much more brittle and less elastic was deemed worthy of honorable mention.

A good fibre, prepared from the date palm together with rope string, nets, and brushes made from the fibres, are contributed from Broulos, Ghizeh, and other places in Egypt.

A new fibrous material proposed for wadding, for clothing, and for upholstery work, in stuffing mattresses &c. was exhibited by C. G.

Fabian, of Humboldsaw, near Breslaw. This substance, which is called "pine wood," is prepared from the leaves or needles of pine trees, it is soft and somewhat elastic; though the fibre is very weak, so that it would perhaps soon mat or felt together in mattresses. It has been found to be very cleanly, and peculiarly free from the attacks of insects, and might probably be advantageously employed, mixed with some stronger and more elastic fibre. The Jury awarded a Prize Medal for this substance.

A good sample of aloe fibre, prepared from the *Agave Americana*, exhibited by the Marquis De Ficalho. This was deemed worthy of honorable mention.

A fine and very beautiful fibrous material, called "Bejuco," was exhibited from the Island of Luzon by the Economical Society of Manilla. This substance is very strong, and is used in the manufacture of plaited work, and a sort of cloth remarkable for its strength and softness. The Jury awarded a Prize medal for it.

Samples of a valuable grass, the *Macrochloa tenacissima*, much used for the manufacture of cord &c. and which might probably be advantageously employed by paper makers, was exhibited by Dr. Villars, of Huesca. This was deemed worthy of honorable mention.

Plantain fibre, prepared from the stem of the plantain, *Musa sapientum*, exhibited by A. Vinas of Puerto Rico; and Pita, the fibre of the wild aloe, *Agave Americana*, shown by P. DeLas Heras, of Murcia.

The value of flax depends in part, on the climate and soil, in which it is cultivated; and in part, also, on the mode in which the fibre is prepared, on the care and skill with which the process is conducted, and on the constant and vigilant attention which is paid to it through the various stages of the operation according to its quality, its value varies from about 40£ to 180£ per Ton.

Another circumstance which has given a considerable impetus to the cultivation of flax, and is likely to produce, ere long, even yet more marked effects, is the introduction of the late R. R. Schenks' new process of steeping.

Formerly the separation of the fibre from the woody matter of the stem was effected by the process of "rotting" of which there were three modifications, dew rotting, pond rotting, and river rotting. The stem of the plant consists essentially, of two parts,—a wooden centre or cone, the shore or boon,—and the external fibrous portion, which when separated from the former, constitutes the flax. These two are cemented

together by a glutinous matter which being destroyed, the fibre could then be easily separated from the above. Whether this species of fermentation is effected by exposing the flax for some weeks to the action of the dew and rain, spread over meadows. Whether it is effected by steeping it in ponds or pits of stagnant water, or, lastly, by sinking it in large wooden frames in the current of a deep and slow flowing river; there are serious practical difficulties, which have long directed the attention of ingenious men to the possibility of discovering a new and less objectionable mode of preparing flax. During the slow rotting of the flax a large quantity of certain putrid vapours is given off, the water and the very air itself, are poisoned; and this, alone, is no trifling objection to the process. So serious an objection, indeed, have these putrid exhalations been found to the use of water rotting, that in some districts of Belgium, in Hainault and Namur especially, it is forbidden by law, as being dangerous to "public safety and the health of the Inhabitants." In Flanders, however, no such laws are in force, and it is there commonly believed that dew rotted flax is, of necessity, meagre and dry. Many different modifications and peculiar modes of rotting are followed in the various flax districts of Belgium, Holland, and France; and in different localities dissimilar modes of rotting have long been in use, often involving very considerable variations in principle. Thus, at Courtrai, the flax crop is dried in the field and stored for some months in barns, before it undergoes the process of rotting in the river Lys. In the district of Waes, it is rotted immediately after being gathered, the green stems being at once thrown into pits of stagnant water. As, however, the whole operation, in every kind of water rotting, depends on the amount of fermentation produced (which must be enough to ensure the decomposition of the glutinous matter, but not enough to cause any injury to the fibre), the process is necessarily slow, tedious, and very uncertain, especially towards the close of the operation, because then the flax must be more carefully watched, in order to put a stop to the fermentation in time or it may produce the most disastrous effects, the fibre being in fact ruined. Dew rotting is of course even slower than water rotting; depending, as it necessarily does, on the nature of the season, and being greatly retarded by long continued dry weather. In the very dry, autumn of 1810, it was found impossible to prepare flax by this method, and recourse was obliged to be had to other methods of rotting.

During the last half century, various attempts have been made to effect the separation of the fibrous from the woody portion of the flax stem by chemical and mechanical means. In several

cases the results at first appeared to be very promising, but in every instance it was soon found that there were insuperable practicable objections, which more than counterbalanced the advantages. Among chemical Agents, solutions of sulphuric acid, caustic potash, caustic soda, quicklime, and soft soap, were all, in turn, tried and discarded; and among mechanical processes the ingenious contrivances of Mr. James Lee and Messrs. Hill and Bundy shared the same fate. Mr. Lee having found a means of separating the fibre of flax without water-rotting, and the discovery being considered one of very great importance, obtained a patent for his mechanical process in 1812, with the singular protection of a special Act of Parliament, by virtue of which he was exempted from specifying the particulars of his process during the first seven years of the duration of his patent. In 1817 and therefore before the publication of this specification, Messrs. Hill and Bundy took out their patent for machinery, for breaking and preparing raw flax and hemp. The rival claims of these two inventors were investigated in 1817 by a committee of the House of Commons; but whatever may have been the comparative merit of the two processes, in the course of a very few years both were relinquished and forgotten. Since that time various other ingenious mechanical arrangements have been devised but hitherto they have had very little success.

Schenck's process, for which he obtained a patent in 1846, is undoubtedly a very important improvement; it consists merely in steeping the flax stems in warm-water, heated artificially to the temperature best suited to fermentation. By this simple means, the operation is rendered rapid and certain, all uncertainty from fluctuations in the temperature and weather is avoided, and the whole process is entirely under the command of the manufacturer. The temperature best suited for this purpose is about 80° , or from 80° to nearly 90° ; above this point the process proceeds too rapidly, and the fibre is almost sure to be more or less injured. The time required is from about 70 to 90 hours.

From the facts and evidence brought forward by various independent exhibitors, it appears satisfactorily proved that the warm-water steeping increased the per-centage of fibre obtained from the flax stem over that obtained by the old modes of rotting by nearly one-fifth; and that, whilst the fineness and spinning qualities of the fibre are increased, the strength is in no way weakened or diminished, unless the process be permitted to proceed too far, an effect which need never happen, from the complete control over it which the manufacturer has throughout. Although there is no doubt as to the practical value of the use of

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warm-water in flax rotting yet the introduction of Schenck's process is far from removing all the difficulties of the flax manufacture; much still remains to be effected, and it is by no means improbable that ere long, a yet more perfect process may be devised.

It is interesting to observe that the use of warm-water in the preparation of vegetable fibre is not altogether new, it having been long employed by the Malays, and by the Natives of Rungpoor in Bengal. The process adopted at Bencoolen is stated by Dr. Campbell to consist in steeping the stems of the hemp in warm-water, in which it is allowed to remain for two days and nights.

The old German process called "Molkenrost," sometimes used in preparing the finer sorts of flax, is also, to some extent, an application of the same principle. In this mode of rotting, the flax was steeped for four or five days in a warm mixture of milk and water, and thus the desired degree of fermentation in the flax stems was produced. This operation must be distinguished from the more modern one, in which sour milk was used in order to give a good colour to linen, a process introduced by the Dutch towards the middle of the last century. The linen was boiled in a weak alkaline lye, and subsequently treated with sour buttermilk, for the purpose of aiding in removing the alkali, and dissolving the earthy impurities present in the fibre. Occasionally, also salt of sorrel was used for the same purpose; and in 1775, Reuss states, that sulphuric Acid might be used for the same purpose; but that being too costly, they had not as yet come into general use. Of course all processes in which boiling or even hot water is used are quite different in their mode of action from those in which only warm water is employed. When boiling water is used, it is with a view of dissolving and removing the useless matters which encrust the fibrous part of the plant; whilst, on the other hand, warm water is used to soften them, and to aid in their putrefaction or decomposition, through the agency of fermentation. In 1787, much interest was excited in Ireland by the publication of a plan for improving the rotting of flax by the action of hot water; in this scheme, it was proposed to scald the flax stems in boiling water to soften them, and to remove a portion of the extraneous vegetable matters which they contain; and it was conceived that after this treatment the subsequent rotting of the flax would be more rapid, certain, and manageable; so that time would be saved, the noisome process of pond rotting be obviated, and the result be to yield a stronger and whiter fibre. The minute and careful experiments of Hermbstaedt, on the chemical principles involved in the rot-

ting of flax (made about the beginning of the present century) threw much light on the whole subject, and to some extent indicated the influence of temperature on the success of the operation.

A numerous series of specimens were contributed by P. Claussen, in illustration of his patent process of making flax cotton. This process (patented August 1850) consists essentially in boiling the cut and crushed stems of the flax, hemp, or other plant, in a dilute solution of caustic soda, containing about one two-thousandth part of alkali. The fibrous matter is then removed, and plunged into a bath of dilute sulphuric acid, containing one five-hundredth part of acid, in which it is boiled for about an hour. It is next transferred into a solution containing about ten per cent of carbonate of soda; and lastly, when it has remained in the latter for an hour, it is plunged into a weak solution of sulphuric acid, consisting of one part of acid to two hundred or five hundred parts of water; in this it is left for about half an hour, and the process is completed. The effect of these several processes is to divide and split up the fibre in a most remarkable manner, so as completely to alter its character. Flax thus treated is converted into a substance very nearly resembling cotton. It is probable that flax cotton can be advantageously used in the manufacture of mixed fabrics, as it appears capable of being spun with wool, silk and other fibres. It may therefore, perhaps hereafter lead to several new and important practical applications. For this ingenious process the Jury awarded a prize medal.

The process of Messrs. L. W. Wright & Co. for the preparation of China Grass &c. for which a Patent was obtained in 1849, consists essentially in a very ingenious arrangement for boiling the stems in an alkaline solution after they have previously been steeped for 24 hours in cold water, and for 24 hours in a water of a temperature of 90°. The fibres are then thoroughly washed with pure water, and finally subjected to the action of a current of high pressure steam till nearly dry.

17th May, 1853.

The above was drafted for dispatch to the Commissary General but being incomplete was not sent.

B.

No. 39.

FROM THE ACTING ASSISTANT COMMISSARY OF ORDNANCE,

Cannanore.

TO THE SECRETARY TO THE MILITARY BOARD,

Fort St. George.

SIR,

With reference to your letter No. 3709 of 7th October last, I have the honor to report having despatched by Banghy for the Board's inspection, in four small Parcels, a few specimens of cordage prepared by means of the Apparatus* constructed by Mr. Johnson, and with which greater facility and expedition are attained, as well as improvement in twist.

* A rough sketch of which is herewith sent.

A revised tabular statement accompanies, shewing the several data as nearly as they can be ascertained at present. On a more extended scale the cost and labour would probably be less.

I regret that notwithstanding my best efforts, by enquiry from every source available to me, nothing has been elicited to enable me to add to the number of nars already brought to the notice of the Board, nor can I find that any others are used for the purpose by the natives in this part of the country, than the Janapum, Pulchee, and Kuthally.

A native dealer here agrees to furnish them in any quantity required, on receiving a few days' previous notice, at the following prices.

Janapum	2½ Rupees	} Bazar maund of 30lbs.
Pulchee	3 „	
Kutthally	2 „	

The nars are received in the same state as the specimens already forwarded to the Board, freed of the straw or stalk. The finest of the fibre is picked out by hand and used for small cordage; nearly all the coarser portions are convertible into Rope. The Janapum appears the best adapted for general use.

I stated in my former letter* that a reference had been made to Hoonsoor by the Commissariat Officer then there, (the late Major Shepherd) in order to ascertain the resources in that locality for obtaining the yercum nar. A short time before that officer's death, he informed me, that he had received intimation to the effect, that the yercum is not procurable there and the supply of the plant in this vicinity is too scanty to be turned to

C.

No. 387.

TO THE SECRETARY TO THE MILITARY BOARD,

Fort St. George.

SIR,

I have the honor to submit for the information of the Military Board, that in order to obtain full information on the subject of your letter dated 5th July last No. 1518, I applied to the Superintendent of the Bangalore Division, a copy of whose reply is now forwarded along with samples* furnished by him.

* As per accompanying Memo.

II. No. 2. viz., the Junpum, is the material of which the Gunny Twine is made which I indented for,† and this appears to be the most likely of any of those materials to answer for Spun yarn.

No. 8. (Fourcroya cantula) appears a strong material but I doubt its taking Tar easily or well, and I am informed that it is liable to rot quickly if exposed to wet, but as it is recommended by Captain Haines it might be advisable to make up a small quantity of it on trial, may I therefore request the Board's authority for my doing so.

I have, &c.

(Signed) T. HAY CAMPBELL, BT. CAPTAIN,
Commissary of Ordnance.

Arsenal Bangalore, 10th August 1853.

No. 692.

FROM CAPTAIN G. HAINES,

Superintendent of the Bangalore Division,

TO THE COMMISSARY OF ORDNANCE,

Bangalore.

SIR,

I have the honor to acknowledge the receipt of your letter No. 317 of the 12th ultimo, with its enclosure, requiring some information regarding plants yielding fibrous substances, adapted to rope making, which may be growing in this Division.

2. I herewith forward 8 samples (being one in addition to those named in the letter from the Military Board) with the price per maund at which each is to be procured.

3. The Yercum nar No. 1 is not procurable in any quantity in this neighbourhood, although the plant could easily be grown here. I have heard that it is more common in the Astagram Division; it is a shrub of very rapid growth, but to procure the fibre, I fancy involves the destruction of the tree itself.

4. I recommend to your notice the samples No. 8 called in this country "Shemay Cutthalee" (*Fourcroya cantula*) or the foreign aloe, it is not nearly so common as the common aloe, which is of a bluish green, this plant is of a lighter green, and is much more elegant, it grows plentifully in the hedge of the Lal Bagh, but I doubt much, whether it is so common in the country, as to furnish a large supply of fibre.

5. With respect to most of the fibrous plants in this country, I suspect that their value is very much deteriorated by the means which the natives adopt of separating the fibrous, from the pulpy substance, by the process of decomposition, which cannot fail of being injurious to the fibre.

I have &c.,

(Signed) G. HAINES,
Superintendent Bangalore Division.

(True copy.)
(Signed) T. HAY CAMPBELL, BT. CAPTAIN,
Commissary of Ordnance.

Memorandum.

No. 1	Yercum nar.....	Not procurable.
„ 2	Janapum	Procurable at 1 8 0 per maund.
„ 3	Cutthalay nar	„ „ 1 0 0 „ do.
„ 4	Cotton	„ „ 3 8 0 „ do.
„ 5	Marop	Not procurable.
„ 6	Pooly munga.....	Procurable at 1 0 0 per maund.
„ 7	Coir	„ „ 1 0 0 „ do.
„ 8	Shemay cutthalay	„ „ 1 8 0 „ do.

(Signed) T. HAY CAMPBELL, BT. CAPTAIN,
Commissary of Ordnance.

Superintendent's Office, Bangalore 8th August 1853.

D.

No. 23.

FROM THE ACTING ASSISTANT COMMISSARY OF ORDNANCE,
Cannanore,
TO THE SECRETARY TO THE MILITARY BOARD,
Fort St. George.

SIR,

* No. 1518 dated 5th July 1853.

† Vide statement accompanying.

‡ Left on the 14th instant.

* In parcels Nos. 1, 2, and 3.

With reference to your letter No. 1516 dated 5th July last, and its enclosure* to the address of the Commissary of Ordnance Bangalore, on the subject of employing fibrous substances of Indian produce in the preparation of cordage for Magazine uses; I have the honor to report having experimented† on the four following and forwarded for the Board's inspection by a Lascar‡ proceeding on furlough to the Presidency (no expense being incurred thereby) specimens* of the different descriptions of cordage and of the fibres from which they are respectively made.

First is Janapum Nar (*Crotalaria juncea*) a strong, lengthy, and very useful fibre, receives tar well, and appears suited for either large or small cordage, in general requisition in arsenals.

Judging from the quality of this material, and the comparative facility with which it works up, I am of opinion that with some little improvement in the manufacture, spun yarn, gunny rope, gunny twine, log line, seizing line, fine and coarse twines, (in substitution of the Bengal and English twines now in use) sufficient for all ordinary departmental consumption, could be made from it alone. Of this however the Board will be better able to judge on the samples being received, and by submitting them to such tests as they may deem expedient. The present price of Janapum is 3 Rupees the Bazar maund of 30lbs.

Second. Pulchee or Cossick Nar (*Hibiscus cannabinus*), also a valuable fibre, strong, soft, and lengthy, well adapted for either large or small cordage, but not so well as Janapum; and is besides a Rupee maund dearer; Pulchee being 4 Rupees a maund. These Nars are no of local produce, but can be procured without difficulty in any quantity required.

Third. Cutthally or common hedge aloe (*Agave Americana*) a long wiry, strong fibre, but from its stiffness and difficulty of twist, is better

adapted for the larger kind of strong coarse rope than for cordage for general ordnance purposes. It is plentiful here at all times, and can be had at present at 2 Rupees the Bazar maund of 33lbs. I am informed this Nar is sent in great quantities to Bombay and Beypoor.

The prices of all the Nars fluctuate according to the state of the Market, or the demand there may be for them.

Fourth. Yercum Nar or Gigantic swallow wort (*Calotropis gigantea*) a short fibre of remarkable fineness and tenacity, but too scarce and expensive to be of any practical utility in this part of the country. The plant is said to be very abundant in the vicinity of Madras, Honsoor, Masulipatam, and many other parts of the Madras Presidency. The contractor, by whom the other Nars were supplied, stated that he could not furnish yercum for less than 40 Rupees the maund, as it would be necessary to send to collect it at and around Honsoor. A reference on the subject was made to the authorities at Honsoor sometime since, by the Commissariat Officer at this station, but no reply has as yet been received. Two skeins of twine made of yercum Nar, are enclosed in parcel No. 3, the Lascars of the Department having procured a sufficiency of the plant for that purpose: the fibre is found between the inner and outer skins of the bark, and was extracted here, by the Lascars simply separating it by hand; it was afterwards placed in the sun until quite dry: the process is extremely slow, but was found to answer better than either pounding the stalks or steeping them in water; the first cuts the fibre, and steeping discolors, if not otherwise injures it; before steeping the bark of the stalks, they should be exposed some hours in the sun and partially dried.

The specimens of cordage forwarded, having been prepared under the disadvantages of very rude and imperfect means, and by people wholly unpractised in work of that nature, will necessarily, in many respects, be found defective. With suitable apparatus for cleaning and spinning the fibre, (and which could be got up on the spot at a small cost should the Board permit) and with more lengthened experience greater efficiency would in time be attained to.

The prices affixed to the several items in the statement, although given with as much accuracy as circumstances enabled me, may notwithstanding, vary somewhat on further trial. I regret it was not in my power to add to the other data, the probable amount of labour required to make any certain quantity in a given time, but the diversified character of the experiments, and their novelty to all who were engaged in them, precluded any uniform system of working being adhered to.

With regard to the fishing Tackle in use with the Natives on this part of the coast; the nets are either of small coir, Janapun Nar, or hard twisted cotton: hand lines are of the latter, and lines for fishing-rods, of simple fibres of a species of sago-palm knotted to each other to any required length: a few inches at the point of the line (and to which the hook is attached) are of yercum Nar: this is the only use to which yercum is applied here by the Natives, as far as I have been able to ascertain: a small portion of the fishing-line fibre, knotted as I have described, and also some of it loose, have been put into No. 3 parcel, and a few leaves of the tree itself are enclosed in the cover with this letter: the Natives here call it cunnee punnah കുന്നേപ്പുന in Malayalam, coondah punnah கூண்டபுன in Tamil, Mahdee مہدی in Hindoostanee.

I have, &c.,

(Signed) J. FRENCH, LIEUTENANT,
Acting Assistant Commissary of
Ordnance in charge.

Arsenal Cannanore, }
17th September, 1853. }

N. B. I beg respectfully to state to the Board that the means I have alluded to, were some simple Machinery constructed by the ingenuity and exertions of Sub Conductor John Johnson, by whom the whole process was superintended, and to whom I am mainly indebted for any measure of success with which the experiments have been attended.

(Signed) J. F.

lar Statement of experiments on Cordage, made from Fibres, Country produce.

Botanical.	Price of Nar per Maund of 30 lbs.	Articles made from each description of Nar.	Breaking weight of each article.	Price of each article.	Remarks.
	Rs.		lbs.	Rs. A P.	
Crotalaria Juncea.	3	Log Line,	392	7 8 $\frac{1}{2}$	Per skein of 100 yards.
		Line Seizing,	301	10 $\frac{1}{2}$	Per skein of 12 yards.
		Rope Gunny or substitute for Bengal Rope, . . . }	558	4 4	Per skein of 18 yards.
		Spurn Yarn,	182	5 4 $\frac{1}{2}$	Per roll of 20 yards.
		Twine Gunny,	56	7 $\frac{1}{2}$	Per skein of 100 yards.
		Twine Fine,	24	2 $\frac{1}{2}$	Per skein of 100 yards.
Hibiscus Cannabinus.	4	Log Line,	168	6 10 $\frac{3}{8}$	Per skein of 100 yards.
		Line Seizing,	168	1 ...	Per skein of 12 yards.
		Rope Gunny or substitute for Bengal Rope, . . . }	413	4 11 $\frac{1}{6}$	Per skein of 18 yards.
		Spun Yarn,	140	8 3 $\frac{1}{2}$	Per roll of 120 yards.
		Twine Gunny,	63	9 $\frac{3}{8}$	Per skein of 100 yards.
		Log Line,	175	3 3 $\frac{1}{2}$	Per skein of 100 yards.
Agave Americana.	2	Line Seizing,	175	6	Per skein of 12 yards.
		Rope Gunny or substitute for Bengal Rope, . . . }	663	2 8 $\frac{1}{2}$	Per skein of 18 yards.
Calotropis Gigantea.	...	Twine Coarse,	32		
		Twine Fine,	32		

rate of 28 lbs. per Maund, there being a wastage of about 2 lbs. in 30 on the raw material, on a rough average. made in damp weather, and of new material care should be taken in testing them, that they are not allowed to lose their th. This remark applies more especially to the spun yarn and Gunny Twine.

(Signed) JAMES FRENCH, LIEUTENANT,
Acting Assistant Commissary of Ordnance in charge.

E.

To H. V. CONOLLY, ESQUIRE,
Collector of Malabar.

RESPECTED SIR,

With reference to a letter from the Marine Board dated 28th ultimo, I have the honor to forward the Sample* of Aloe leaves called in Malyalim Hanna Kaida, and its Fibre Kaida Naar, as well Hemp and its Grass known in Malyalim under the general denomination of Cheddavakoo, the hemp sold at 50 to 56 Rupees per Candy, and Kolvakoo the grass from which the hemp is drawn. The Fishermen have adopted the process of soaking it in water for some time, they then beat and extract the fibre thereon for manufacturing their Lines and Nets.

Aloe fibre in this Country is manufactured under the same process to yarn Rope &c. it is sold at 45 to 50 Rupees per candy. The prices on these articles vary and rise gradually to the extent of the demand in the market; some time back it was sold at 90 Rupees a candy.

I have, &c.,

(Signed) F. F. FERNANDES,

Manager in Charge of the
Master Attendant's Office.

(True Copy,)

(Signed) H. V. CONOLLY,
Collector.

Calicut, 22d October, 1853.

F.

No. 91
1853

To H. V. CONOLLY, ESQUIRE,
Collector of Malabar, Calicut.

SIR,

I have the honor to acknowledge the receipt of the Secretary to the Marine Board's letter to your address under date 28th September No. 2018 and in reply beg to furnish the following information.

The fishermen in and around Cochin make their lines and Nets from a plant called Buckoo, the time for sowing the seed is the month of May and reaping it in September following; it grows in stalks to the height of about five feet, this however depends mostly on the nature of the soil, the stalks are then pulled out by the root and made into small bundles, well dried in the sun and then steeped in water, for 6 or 7 days until the fibre separates from the stalks, it is then taken out, and again dried, after which it is twisted into twine for use.

I beg to forward samples of the line used by the fishermen and others, a plant with some leaves, the fibres and the seed.

The English name of this plant is Hemp, or in the Malyalum language Buckoo, the fibre of which is sold at Rupees 4 per maund of 30 lbs.

From the enquiries which I have made, it does not appear that the Buckoo plant is cultivated to any extent, nor does it appear that there are any other fibrous substances grown in or about Cochin.

I have, &c.,

(Signed) W. BENNETT,
Master Attendant.

(True copy)

(Signed) H. V. CONOLLY.
Collector.

Master Attendant's Office,
Cochin, 28th October 1853. }

G.

No. 509.

FROM E. MALTBY, Esq.,
Collector of South Arcot,

To J. J. FRANKLIN, Esq.,
*Secretary Marine Board,
Fort Saint George.*

SIR,

I have the honor to acknowledge the receipt of your letter of the 28th September stating the wish of the Marine Board for information on the following points.

1st. The fibrous plants from which the fishermen obtain twine for their nets and lines; (with their English and Tamil names.)

2d. The nature of the process by which the fibre is prepared for use.

3rd. The cost of such materials.

4th. The extent to which they are procurable.

The Board also ask for specimens of the different fibres.

2. The smaller nets and lines used by the fishermen of this district are made of strong cotton twist of which a sample is forwarded; larger nets are made with the twine obtained from the fibre of sunnoo plant or Indian hemp (*Crotalaria Juncea*) which is cultivated in parts of this district, and in many other parts in India. The cost of the twine sent as a sample is $2\frac{1}{2}$ viss for the Rupee, this fibre is also largely used in the manufacture of gunny cloth for sacking which may be obtained in any quantity and is, I imagine, of quite sufficient strength for the purpose the Board has in view. A specimen of the cloth as manufactured in this District is sent, its cost is about 10 annas the piece, which contains 9 yards by $1\frac{1}{4}$ yards in width.

3. The following plants also yield a useful and strong fibre and are partially in use in this District, either as a substitute for the hemp fibre or mixed with it in the construction of nets, cordage and gunny cloth: they are less common than the hemp but cheap and yield the fibre with brief and simple maceration.

1. *Kuttalay* or Hill aloe : *Agave vivipara*.

2. *Poolchie* or hemp leaved *Hibiscus*.

3: *Benda* a plant of the same family commonly called bendakai, and well known as a vegetable. Samples of a rough and unmacerated fibre of the two latter are sent (the specimen of the Kuttalay fibre has been macerated.) A piece of coarse gunny cloth made from the prepared fibre of the Poolchie and very common in Madras also accompanies them. The *Yerakum* or Gigantic swallow wort, a common wild plant (*Asclepias Gigantea*) yields a strong fibre which is not in common use as it is separated with difficulty, not enduring maceration.

The *Talambush* or *Caldeira* (*Pandanus Odoratissimus*) yields a strong fibre used for the larger kind of hunting nets and for the drag ropes of large fishing nets; it is not employed in making gunny cloth, the plant is common all along the coasts of India. A sample of its fibre is also forwarded.

4. The cost of these last mentioned materials is probably less than that of the Sunnoo, but they are not like it, articles of traffic, nor procurable in equal quantities. I am informed that a plant called the *Mul-lay Arulay* which grows wild in parts of Trichinopoly yields a long and serviceable fibre but it is not in common use in this District.

I have &c.,

(Signed) E. MALTBY,
Collector.

South Arcot, Collector's Cutcherry, }
Cuddalore, 29th December 1853. }

H.

No. 16.

FROM CAPTAIN R. W. MEPPEN,

Master Attendant,

TO A. ROBERTSON, ESQUIRE,

Collector of Vizagapatam.

SIR,

With reference to the Marine Board's letter of the 28th September 1853, No. 2019, I have the honor to state for their information that the Nets and Lines used by the fishermen at this Port and Bimlipatam are from the following plants.

2. Indian Hemp, or జనుమూ *Janumoo*, as it is termed in Teloogoo, is the chief material of which the fishermen in this District compose their nets and lines. It is cultivated in Ganjam, Vizagapatam and Rajah-mundry, and is divided into three sorts each called by a term denoting its quality.

3. Janapa Nar is the fibre most commonly in use, and of which all the Nets are made. It is procurable throughout the District, and sold, prepared in the Bazar at 4 viss for the Rupee. This is the ordinary hemp.

4. Cate Nar, as its term conveys, is more desirable for strength and elasticity, and is the superior hemp used in making hand Nets when its qualities are required. It is grown and prepared at Cheeproopilly and Poondemarkah in this district and sold at 3 viss for the Rupee.

5. Ganjapa Nar is the hemp cultivated at Ganjam and imported to this place. It possesses equal qualities with the Cate Nar, and

excels in whiteness, but is not always procurable being an imported article. The rate of sale is 3 viss for the Rupee.

6. Samiva Nar, or the fibre of wild aloes, is adapted but rarely in use for lines and nets. It is of superior strength and whiteness to the hemp, and is applied to the manufacture of canvas. It is not procurable in the market but if required people are hired to collect it from the interior where it grows wild.

7. Jillida Nar is a fibre extracted from a wild milky shrub (*Calotropis Gigantea*) but is very seldom put to use from its extreme scarcity.

8. Durba or Lunka grass is used by the fishermen for caulking their boats and form a portion of their large drag Nets: it is also manufactured into Ropes.

9. Process adopted in extracting the fibre. The plant is allowed to soak in water for a fortnight when it becomes fit and the fibre drawn out and bleached and spun into yarns.

I have, &c.,

(Signed) R. W. MEPPEN,

Master Attendant.

(True copy)

(Signed) A. ROBERTSON,

Collector.

Vizagapatam, Master Attendant's }
Office, 7th March 1854. }

I.

FROM THE MASTER ATTENDANT,

Tellicherry,

TO THE COLLECTOR OF MALABAR.

SIR,

With reference to a copy of the Marine Board's letter dated 28th ultimo, I have the honor to inform you of my having made particular enquiries of the fishermen and other Natives as to the names and kind of Plants from which the fibre is taken to make nets, and fishing lines, and also the mode of preparing it for the above purpose. It appears from the best information I could obtain that there is only one kind of plant in Malabar that produces the fibre, from which the nets and fishing lines are made, and the name of the plant in Malayalam is പാലക്കാട് in Tamil

it is called the சணல்நூல்செடி and Teloogoo சண்பட்டி in English Twine plant. As to the mode of preparing the fibre for use, the people here seem to know nothing about it, as the plant does not grow in this part: it is said to be cultivated to the Southward of Calicut, and in the southern part of Canara, and is brought here in small quantities for sale, the price varies from 2½ to 4 Rupees per maund of 32lbs. By this day's Post I forward a small sample of the Fibre No. 1, and Twine made from it. The Plant it is said grows to the height of 4 feet and about the thickness of a quill.

Sample No. 2 is from the wild aloe the mode of extracting the fibre is by scraping off, as shown in the accompanying Sample, the outer part with Coconut Shell; if the plant is soaked in water for any length of time the fibre it is said becomes black. This fibre was in great demand about 2 years ago for exportation to Calicut and Cochin and realized 80 Rupees per candy of 640lbs.; at present there does not appear much demand for it, the price is now 50 Rupees. The Natives here do not turn it to any account except for exportation, as to the quantity that might be procured, this would I imagine depend on the price offered.

I have, &c.,

(Signed) E. BRENNEN,

Master Attendant.

(True copy)

(Signed) H. V. CONOLLY,

Collector.

Tellicherry, 10th October 1853.

J.

No. 65.

TO THE COLLECTOR, TINNEVELLY.

SIR,

With reference to your letter of the 5th Instant with annexed copy of a letter from the Secretary of the Marine Board, I have the honor to inform you that after due enquiry I have ascertained that the fishermen here construct their nets and lines from three different kinds of plants viz. 1st, the Odaymarum (ஒடைமரம்) of which I send you a branch,* leaves and some of fibre

* Leaves only are sent.

prepared by the Boatmen of this establishment; also some new and old line manufactured from the bark of the same tree which is found in greater abundance at Vambar and Mookoor than about Tuticorin.

The Odaymarum is chiefly used for Turtle nets on account of its strength, durability, and small cost compared with other kinds of cordage. A net weighing 20lbs. can be purchased at Mookoor or Vambar for Rs. 3-8.

The process of preparing the bark of the above mentioned plant is very simple, it is allowed to remain in water for four or five days, when it is then taken out and beaten until it assumes the appearance of the fibre herewith forwarded and marked No 1.

No 2 is the Sadambo (சடம்பு) which you must be well aware grows principally in the interior, consequently I am only able to forward you a sample of the fibre ready prepared for twisting into line, &c. The cost of the latter at Tuticorin is about Rupees 3-8 per 62½lbs.

The 3d article is the common cotton of the district which is much used for fishing lines here as well as by the fishermen from Ceylon who frequent this coast at certain seasons of the year.

I have, &c.

(Signed) W. ROBERTSON,

Master Attendant.

(True Copy)

(Signed) C. J. BIRD,

Collector.

Tuticorin, 15th October 1853.

K.

FROM ALEX. HUNTER, ESQUIRE, M. D.,

TO CAPTAIN A. H. HOPE,

Acting Secretary Military Board,

Madras, 8th September 1853.

SIR,

True Copies of Letter No. 387 from Capt. T. Hay Campbell Commissary of Ordnance Bangalore, to your address dated 10th August 1853 accompanied with memo. of prices of fibres.

Also letter No. 692 dated Bangalore 8th August 1853. from Capt. G. Haines Superintendent Bangalore Division to the Commissary of Ordnance Bangalore.

my own superintendence.

In reply to your letter in the Ordnance Department No. 2606 bearing date 20th August 1853 accompanied by the enclosures noted in the margin, I have the honor to report for the information of the Military Board that the experiments on the best mode of preparing fibres for cordage which were commenced some years ago in the Jails and Monegar Choultry are still being carried on in a small way under

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From the results of these I hope soon to be able to furnish some practical information regarding the best and quickest methods of cleaning fibres, which I trust may prove of use to the Military Board.

2. An illustrated report with specimens of simple machinery for the cleaning of fibres, will be submitted to the Board as soon as possible. This was commenced some time ago and was being prepared for publication in the Newspapers in reply to solicitations from three of the leading houses of agency in Madras and some private individuals at up-country stations, who were desirous of carrying on the process of cleaning fibres for the English market.

3. As regards the samples received from Bangalore No. 2 Junpum, or fibre of the *Crotalaria Juncea*, appears to be the best substitute for tow for packing purposes, its strength is however completely gone from having been prepared by steeping and rotting, and it is almost useless as a material for such cordage as would be required to stand tear and wear, or friction. In its present state it might answer for coarse string or rope for tying up parcels, but for little else, it is badly cleaned and contains numerous small stalks and portions of bark. With careful preparation the plant yields tow and hemp of excellent quality.

4. The sample marked No. 6, Pooley Munga, or fibre of the *Hibiscus Cannabinus*, appears to be well adapted for spun yarn, though its color and quality are both partially injured by steeping and rotting. The fibres have become stiff from this mode of preparation. This substance bears a stronger resemblance to Hemp than sample No. 2.

• Excellent tow and hemp might be made from several species of *Hibiscus*, the staple in this class of plants is long, and the fibres are uniform, silky and fine. Cordage of greater compactness and density could therefore be made from these than from many of the coarser fibres.

5. The samples No. 3 Cattalay nar, or fibre of the *Agave Americana*, and the sample No. 8 Seemay Cattalay, or fibre of the *Fourcroya Gigantea*, are both possessed of similar properties and belong to the same class of plants. The fibres of both are strong, uniform, of considerable length, and of good color: they make excellent cordage but there is no doubt that they both rot more quickly than many other fibres when soaked in water; this defect might probably be remedied by tanning the fibres immediately after they are cleaned. After six days steeping, both of these fibres lose a great deal of their strength, and even after 3 days soaking, the fibres are weakened; this is a point of considerable importance, as the process of separating the fibre from the pulp by steeping and rotting is general throughout India, and will always be resorted to

if possible, as it saves a little labor, but damages the fibres, and the fraud cannot be detected in this class of plants as it can be in most others, by the impaired color of the fibres. Attention should always be paid to the strength of the materials when a sample is offered for purchase. A very simple method of testing the strength of fibre, and one which gives a pretty close approximation to their economic use, is to take five or six fibres at a time, make them up into a bundle and try if they can be broken with the fingers. Any fibre of good quality ought to resist a good strong pull even when four fibres are taken together, but if five or six break easily, and without a good snap, the presumption is that they have been injured by steeping.

6. The sample marked No. 1 yercum nar, *Asclepias*, or *Calotropis Gigantea*, is the produce of one of the most common plants in Southern India. The fibre is very strong and possesses many of the properties of Europe flax. It can be spun into the finest thread for sewing or weaving cloth; it resists moisture for a long time, and is selected by the natives as the strongest material for bow strings, gins and tiger traps. The plant does not yield very much fibre, and the ordinary process adopted by the natives for cleaning it, is tedious. A more economical and expeditious method of cleaning this and other fibres will be detailed in a subsequent report. The yercum fibre appears to be too valuable a substance to be employed for ordinary cordage—it would probably fetch a high price in the Europe market if prepared with care, and if attention could be attracted to its valuable properties and probable uses.

7. The sample marked No. 5 Marool, or *Sansevieria Zeylanica*, possesses several of the qualities of the yercum, it is longer in the staple, rather fine and uniform in the fibre—it has also the advantages of being very easily cleaned and of yielding a considerable percentage of fibre. It has considerable strength, is not so liable to rot with moisture as the Aloe fibres, and can be made into fine thread for weaving purposes. I am not aware that it has ever been grown in sufficient quantity to be tried as a material for coarse cordage. A very fine quality of paper was formerly made from this substance in several parts of Southern India.

8. It will be unnecessary to enter at any length into the properties or uses of sample No. 4 the common cotton, as these are already well known, and the market value of the article is so much above that of other fibrous substances which are abundant in India that it could never be brought extensively into use as a material for common cordage or as a substitute for Oakum or Tow. In point of strength and durability it is inferior to several other substances.

9. The sample No. 7, common coir, possesses one or two qualities which adapt it for particular uses, these are its elasticity, lightness, and the time which it resists rotting when steeped in fresh or salt water, the last property is owing to the presence of astringent juices which protect the fibre from putrefaction. Astringent woods also resist the effects of moisture for a long time and this suggests the idea that all cordage would be more durable in India and other warm climates if subjected to the process of tanning instead of tarring. The chief objections to coir are its coarseness, comparative shortness of staple—and the dust which it contains: its principal uses are for stuffing beds, packing stores—and for the manufacture of coarse cordage. A good coir cable is said to be one of the safest a ship can use during a gale.

Calotropis Gigantea or yercum.
Yucca Gloriosa or Adam's Needle.
Yucca Aloifolia aloe leaved
Adams Needle.
Fourcroya Gigantia or Seemay
Cuthalay.

10. Specimens of fibre and tow prepared from plants noted in the margin are herewith forwarded to show the superiority of color and quality when the process of beating and scraping is adopted instead of the common method of steeping and rotting. Larger samples of these and of other fibrous substances are now being prepared for addition to the collection at the College Museum.

Trusting that these remarks may prove of use.

I have, &c.,

(Signed) ALEX. HUNTER, M. D.

L.

TO THE SECRETARY TO THE MILITARY BOARD,
Fort St. George.

SIR,

No. 2606, 20th August 1853.

I have the honor to acknowledge the receipt of your letter No. and date as per margin, with its enclosure and specimens of eight fibrous substances from Mysore, and I now beg to annex a memorandum respecting the different plants which produce these fibres. In my remarks, I refer chiefly to the Geographical distribution and Economic value of the cordage plants, as observed by myself in the Peninsula. With regard to the mechanical processes by which these fibres are prepared, I have said little, the Board having applied to Dr. Hunter, who is a high authority, and whose practical experience was acknowledged by the Jury in Hyde Park.

Time was when hemp and flax yielded almost the only vegetable fibres manufactured in Britain into cordage &c., but the number of flax plants now in use is greatly increased, and there are numerous Indian species which may yet be added to the list. The large family of Mallows (Malvaceæ) abound in tenacious fibre, so do their neighbours the Linden Tribe (Tiliaceæ) the nettles and the pine-apples likewise produce delicate and flexible fibres, which may be used for many of the same purposes as hemp or flax.

A main point to be considered in the manufacture of these fibres is the amount of maceration required, or whether they should be steeped in water at all, to get rid of the Parenchyma (cellular tissue.) The strength of the material in most of the samples sent, appear to have been injured by rotting.

When any of these plants are grown for the sake of their fibres, it is important to know that they ought to be sown thick, under which circumstances, like other plants similarly sown, they grow tall and slender without branches, thus giving a greater length of straight fibre yielding stem.

Should I hereafter meet any information worth communicating to the Military Board, I will again do myself the pleasure of addressing you.

I have, &c.,

(Signed) H. F. C. CLEGHORN, M. D.,

Secretary Madras Agri-Horticultural Society.

Madras, 6th September, 1853.

REMARKS ON CORDAGE PLANTS.

No. 1. *Yercum nar*. The fibres of a plant (*Calotropis Gigantea*) which grows wild, abundantly in the Peninsula, preferring poor soil near the Sea. It may be seen in large quantities at Ennore, St. Thome, and Royapoorum. This plant has never been cultivated as a cordage plant, it is widely diffused throughout the Southern Provinces of the Peninsula while in the Bellary District and to the North it is replaced by the equally common *C: procera*. The fibre is of very remarkable strength, but unless carefully detached from the stem, it is not of sufficient length to be spun into rope yarn. I understand that this substance has been favorably reported upon by the flax and hemp committee of the Agricultural and Horticultural Society of India; when

however one of the most experienced Judges considered it "better adapted for cloth than cordage."

No. 2. *Janapum, Crotolaria Juncea*. This fibre is well known in commerce as *sun hemp*, and a variety of it as *Jubbulpore hemp*. The sample forwarded is not well prepared. I have seen large fields of this plant in Mysore where it is regularly cultivated, about Bangalore, and in still greater abundance on the banks of the Toomboodra, at Hurryhur and Shemogah; I have always looked upon it as one of *our best* cordage plants the fibre takes tar easily, and I concur with the Commissary of Ordnance, Bangalore, that this when properly dressed, is the most likely of any of these materials to answer for common yarn. It is highly esteemed by the Lumbadies, who manufacture gunny bags in this way.

The stems (about 5 feet high) are tied in bundles, which are steeped in water, and weighted with stones, just as flax was formerly treated in Britain; in a few days they are beaten, which detaches the integument and coarse cellular tissue, after this, they ought to be well washed in different water, and the individual fibres picked out free of the vegetable mucus and other impurities.

Good samples were sent to the Great Exhibition from Coimbatore by Dr. Wight.

No. 3. CUTHALAY NAR, *Agave Americana*, (Linn.)

No. 8. SHEIMAY CUTHALAY *Fourcroya gigantea*, (Ventenat.)

These are introduced and naturalized plants, common about Bangalore and Seringapatam as hedge plants, and the former is now diffused all over the country. They are not Aloes as usually denominated and are American not Asiatic plants.

No thread is so much prized in Mexico, (where they are indigenous) as that which is obtained from Agave leaves, which are sometimes 8 feet long 1 foot broad and 5 inches deep. It is a very long fibre and does not twist. Twine thread and rope are made of it the latter is used in the mines of Mexico, as well as for rigging Ships, the famous hammocks of Panama are made of the Agave fibre. I scarcely think the plants (the Sheimay Cuthalay especially) are sufficiently abundant in India to yield the fibre in large quantity. These plants are capable of enduring a variety of climates and the suckers are in considerable demand among the natives, so that in a few years the stock will probably be much increased.

No. 4. COTTON, *Gossypium herbaceum*. The qualities of cotton ropes are well known to the Military Board: the staple of the sample

sent is very short, and will not answer where a long fibre is required. Cotton ropes are weak and perishable, and not suited for out of door purposes, they suffer much from friction and are liable to be attacked by Insects.

No. 5. MAROOL, *Sansevieria Roxburghiana*, (Schult.)

A plant abundant in S. India especially near the Sea, yielding Bow-string hemp. The fibres of this plant were submitted to experiment in the Government yard Calcutta and found to be extremely strong ("plant required for India" p. 147) the expense of collecting the fibre in quantities, appear to be the chief difficulty in bringing it into extensive use. The Commissary of Ordnance, Bangalore finds it "not procurable" but it is used for Bow-string, fishing line and small cordage all along the Coromandel Coast.

No. 6. POOLY MUNGU, *Hibiscus Cannabinus*, (Linn.)

Cultivated all over India as a cordage plant the fibres of the sample sent are 5 feet long, bear a heavy weight, and do not appear to have been steeped too long in water, which is the chief point to be attended to in the manufacture of most of these fibrous substances.

No. 7. COIR. This well known material from the husk of the cocoanut may be obtained (I think) of superior quality and at a lower price from Cochin or Calicut. The peculiar advantage of this substance is that it does not suffer injury when wetted with Salt water while its strength and elasticity fit it for cable manufacture.

No. 8. SHEIMAY CUTHALAY, *Fourcroya gigantea* (Ventenat.) has been noticed under No. 3.

(Signed) H. F. C. CLEGHORN.

M.

FROM DOCTOR HUNTER,

TO THE COMMISSARY GENERAL.

Instructions for the preparation of Fibres from different plants.

1. That no more of a plant should be cut or collected than can be cleaned in one or two days. The drying up of the sap stains the fibres.

2. The sooner and the more quickly the Fibre is cleaned the stronger and the whiter will it be, exposure to the sun tinges the fibres and dries the sap, making the process of cleaning more difficult.

3. If the pulp skin, bark, or woody fibre be not thoroughly removed, there will be a risk of subsequent deterioration of the fibres, from

adhering gum, mucilage, or fecula which are apt to attract insects and moisture.

4. The ordinary process of rotting and steeping plants to clean the fibres is not suited to this or other warm countries, as putrefactive decomposition commences so soon, that discoloration and brittleness rapidly ensue.

5. The newly cleaned fibres must not be exposed to the sun while moist, as they acquire a brownish tinge. They may be immersed in clean water for a few hours or exposed once to the dew with advantage but too much wetting takes from their strength.

6. The old withered, dried or decayed parts of plants, yield coarse brittle or woody fibres. The young tender parts, produce silky fine fibres, but they are often troublesome to separate from the pulp.

7. Plants are usually in greatest vigor when in flower or fruit, and it is then that they yield the greatest amount of Fibre—very young, old, or diseased plants, should be rejected as unprofitable.

The following process will yield good strong, clean, fibres, almost free from color and in a few plants of a silky appearance. If a little simple strong crushing and scraping machinery that would not tear the fibres, could be invented, the process might be materially accelerated and cheapened.

The Plantain fibre is likely to be the cheapest, and most abundant from the ease with which the plants are reared.

To prepare the fibres take the upright stem and the central stalks of the leaves. If the outer-ones are old, stained, or withered, reject them, strip off the different layers, and proceed to clean them in the shade if possible soon after the tree has been cut down. Lay a leaf stalk on a long flat board with the inner surface uppermost, scrape the pulp off with a blunt piece of hoop iron, fixed in a groove in a long piece of wood, (an old iron spoon makes a very good scraper) when the inner side, which has the thickest layer of pulp, has been cleaned, turn over the leaf and scrape the back of it. When a good bundle of fibres has been thus partially cleaned and piled up, wash it briskly, in a larger quantity of water, rubbing it all well and shaking it about in the water so as to get rid of all the pulp and sap as quickly as possible. Boiling the fibres in an alkaline ley made of potash or soda dissolved in water or washing with Europe soap gets rid of the remains of the sap quickly. The common country soap, which

is made with quicklime, is too corrosive to be depended upon. After washing the fibres thoroughly, spread them out in very thin layers or hang them up in the wind to dry. The leaves of the above required to be well beaten before they can be scraped. The rest of the process of cleaning is the same as for the plantain fibres. Tough barks, that contain woody fibre, ought to be pounded or beat upon a brake, then softened and well washed in water, again beaten scraped and washed.

The Indian plants which yield fibres are the *Agave Americana* or common hedge aloe and the *Agave Cantula*.

Three or four varieties of *Yucca* as the *Y. Angustifolia* or Adam's Needle, *Y. tenacissima*, *Y. filamentosa* and *Y. regia*.

The *Sansevieria Zeylanica* or Marool, a spotted kind of small aloe.

Three or four kinds of *Musa* or Plantain.

Two species of *Crotalaria*; Jute, or hemp plant, *C. tenuifolia* and *C. Juncea*.

Two ditto. *Bromelia* or Pine apple *B. Annanas*.

Three ditto *Cannabis* or sour greens, Roselle and Bang plant.

Three or four species of the *Hibiscus*, as the shoe flower, purple, yellow and small orange flowered *Hibiscus*.

The *Asclepias* or *Calotropis gigantea* or Muddar, and the *Asclepias tenacissima*.

The *urtica tenacissima*, Rhea or nettle.

The bark of the root of the *Butea frondosa*.

The *Boehmeria* Grass, or hemp grass.

The Barks of the *Bauhinia purpurea* and, *B. racemosa*.

In addition to these there are several other plants the roots, bark or leaves of which are used by the natives as substitutes for rope or string.

The leaves of the Palms as the Palmyra, Talipot Tree, Date, and Cocanut, are also employed in the same way, the leaf stalks contain long and strong fibres but so associated with wood and Tannin that it is almost impossible to obtain the fibre free from wood by any of the ordinary processes of cleaning.

(True Copies,)

JOHN J. FRANKLIN,

Secretary Marine Board.

TO THE CHIEF SECRETARY TO GOVERNMENT,

Fort St. George.

SIR,

I have the honor to acknowledge the receipt of Printed Extracts from Minutes of Consultation of Government dated 19th September last relating to the subject of Indian Fibres and expressive of the desire of Government to encourage and promote as far as possible the culture and preparation of such of these substances as are of commercial utility especially Flax and Hemp.

The Committee observe with much gratification the interest which the Government are taking in calling forth by such means as are in their power the productive capabilities of the Presidency and which they sincerely hope will be attended with success and with permanent benefit and advantage to the Country. There are no doubt many articles which might be cultivated and produced of great Mercantile importance suitable to the soil and climate but to which the attention of the Ryots and others engaged and interested in the agriculture of the land has not yet been directed.

With regard however to the articles of Jute and Flax, I would beg to mention that these staples of trade have not been overlooked by the Mercantile Community of this place. It is but a few years ago since the greater part of the Jute used in Madras and in other parts of the Presidency was imported from Bengal, and at which time the quantity grown locally was very limited. There is now however nearly sufficient produced to meet the requirements of the country and some has even been exported from which it is to be expected that as the cultivation has been on the increase and as there is an ample field for its further extension there will be in time a considerable export trade in this product. The local consumption of Jute is large and before it can form a staple of export of any magnitude the home demand must be supplied by home growth.

Flax has been tried in several parts of the Presidency both by Europeans and Native and every inducement has been offered to the latter to cultivate it for seed by the temptation of high prices.

The result has been that small quantities of Linseed have been brought to market for sale now and then and which have been readily purchased at rates frequently much in excess of what would pay as a matter of trade with Europe. I am aware that during the present year contracts have been offered for the supply of Linseed at Rupees 17 to

18 per Candy, whereas the usual rate for it may be quoted at not more than Rupees 11 to 13 and if it is possible to produce it with advantage in any district from which it may conveniently and without heavy charge be sent to Madras or to a shipping port it is probable that the prospect of obtaining such a high price for it will induce the cultivation by the Natives wherever practicable.

Within the last three years the growth of Flax was attempted by an European Firm in the Rajahmundry and Vizagapatam Collectorates under every favorable circumstance of good seed and careful superintendence but the result has not been successful. The plant took root and seemed to grow well until it had attained some height above ground when it withered and died before coming to maturity. Whether this was owing to unsuitableness of soil, season or climate the experiment was not continued long enough to enable any correct inferences to be drawn. For the information of the Government I have much pleasure in enclosing extracts from some Correspondence which the firm in question have placed at the disposal of the Committee and which contain some useful practical hints with reference to the cultivation. I have likewise the pleasure to transmit with this communication a detailed statement of the nature and mode of cultivation of Flax in India which perhaps may be acceptable and useful to any who may be led under the present recommendation of Government to cultivate the plant.

I would only further add that as Flax is the growth of a cold or temperate rather than of a tropical climate the non-success of the experiments which have been made to produce it in this Presidency especially in low land near the sea may arise from this cause and it would seem advisable therefore that further efforts should be directed to the more inland and colder districts of Mysore and other places of equal altitude corresponding in climate and temperature with the districts in Bengal where the plant seems to vegetate freely and luxuriantly during the cold season.

I have the honor to be, &c.,

J. THOMSON,

Chairman of the Chamber of Commerce.

Madras, 21st October, 1854.

Extract from a Letter dated Chittivalsah, 26th May 1851, from MR. JOHN YOUNG, to MR. J. VANS AGNEW.

I have tried twice to grow Linseed, once three years ago at Palcondah and again this year at Bimlipatam from seed sent me overland by Mackenzie. Both attempts failed, the plants withering and dying away when a few inches high. Still there seems no reason why it should not grow here as well as in Bengal, and if you can get me a good supply of seed so as to enable me to try it under varied circumstances and at different seasons perhaps we may make something of it yet. Any information as to the season in which it is grown in Bengal and mode of cultivation would be useful.

Extract from a Letter dated Rajahmundry, 10th June 1851, from MR. J. HALKETT, to MR. J. VANS AGNEW.

I duly received your's of May, and have delayed so long answering it in order to get as much information about Linseed as possible, but that I am sorry to say is very little. There is none cultivated in this district and as far as I can find out none grown in the Northern Division; report says there is some in Nellore but I doubt it much. I only managed to see Mr. Prendergast yesterday and had a conversation with him on the subject but nothing came of it further than that he would try to establish the cultivation of it. His enquiries have not been more successful than mine. Some five years ago, Mr. J. J. Knox the then head assistant and a Mr. LeGras of Cocanada tried to introduce the cultivation of Linseed but without success, and but very lately Mr. Cornet of Neelapilly has and is still trying it, but as yet he also has not succeeded. There is plenty of spare land in this district whereon this crop might be raised, I have no doubt, but no one knows how to set about it. If you can send me a few bags of seed, I will try the experiment, but I should at the same time like to know, the kind of soil required, the proper season for sowing, whether the crop demands irrigation or not, the average returns per acre, and the time required to bring the crop to maturity. There is land here to spare close to us whereon I could try the cultivation of the Linseed if you can send me some for seed, and give me the above information.

Extract from Letter from K. McLEOD, Esq. to D. MACKINLAY, Esq., of Calcutta dated Ottar, 15th June 1851.

With regard to the cultivation of Linseed in the districts of Patna, Gyah, Shahabad, Sarim, Gazepoor, Gomakpoor, Champorum, and

Tirhoot, where I have been over, no cultivator sows a field with Linseed. When the lands are clear and adapted for other crops but in all these districts you see a few drills of Linseed in almost every field sown among the other rubbish crops. The seed grown in Tirhoot, Sarim, and Gomakpoor is of a smaller grain than that of Patna, Shahabad and Gazepoor. In the Gomakpoor District where the population is thin, and land cheap, and not well cultivated, a great deal of Linseed is sown and much mixed with other jungly seeds that grow with it, and in the Shahabad and Gyah Districts where the lands are cheap and thinly populated towards "Sasaram" and near the Rhotus Hills a great quantity of Linseed is grown and of much superior quality to the Gomakpoor seed owing entirely to the soil. 20,000 Mds. Shahabad seed could be procured with ease and the same in Gyah and Patna, all of very superior quality. Gazepoor, Ozeunghur, Iampoor, seed is also very superior.

Letter dated Calcutta, 20th October 1851, from MR. D. MACKINLAY, to MR. J. VANS AGNEW.

I have not been able to obtain such complete information as I wished regarding the cultivation of Linseed, but the general result of what I have been able to ascertain is this. It seems to grow well in all the soils from Tirhoot downwards, the best being produced at Patna. The sowings begin after the rains in October, and are continued in November; the ground is prepared in the same way as for any other seed. If a shower or two of rain comes after sowing so much the better, the dews afford sufficient moisture for the rest of the period, until the cutting takes place in February and March, and in June and July we get the cleaned seed in this market. It is surprising when you come to ask for information on the cultivation of this or any similar grain how very rarely a person is to be met with in this country who can enlighten one sufficiently. I have enquired of half a dozen old Indians, Members of the Horticultural and Agricultural Society, who referred me to the printed journals, but in looking up the volumes of it, in which I could lay my hands, I could see nothing that could be turned to practical account. I will write again to my friends in the Mofussil. In the mean time, here are the ideas of a Native upon Jute, Flax and seeds in general which has just been handed to.

Jute. This plant is cultivated in the Eastern and Western parts of Calcutta in an open field, it is sown in the months of February, March, and April, it requires rain continually till it is ripe, and is usually cut in August, September, or October, its height is from 3 to 6 feet

according to the fertility of the soil and after being cut down it is thrown into a tank or put in wet sand to rot for 10 or 15 days afterwards it is beaten on the ground to separate the fibre from its pipe or cane, it is then washed in clean water for completion. The seeds of Jute are kept very carefully, it is necessary to dry them every month three or four times for its next cultivation.

Finer sorts of Jute grow in the Western part of Calcutta and lower qualities in the Eastern.

Flax. This plant is cultivated on every side of Calcutta in an open field, it is sown in October and November, it does not require much rain, it depends only on dews from the sky; these plants are cut in February and March, its height is about 2 to 3 feet, it takes the same plan as Jute for its completion, production is more remunerative.

Linseed.
Mustard.
Wheat.
Barley.
Khasaree doll.
Moosery doll.
Teal seed.
Every sort doll.
Gram.
Peas.

These plants are cultivated on every side of Calcutta, in an open field and on the banks of rivers, it is sown in October and November, it requires rain once, and dews from the sky and it is cut from the end of January to the middle of March, its height is 1 to 3 feet.

Letter dated Madras, March 7th 1853, from Mr. D. S. O'GILVY, 20th Regiment M. N. I. to Mr. J. VANS AGNEW.

With regard to the cultivation of Linseed the following are the principal points which occur to me.

From what I have seen of Linseed I should say that it grows best in rather a light soil; composed of rich earth mixed with sand. The time at which it is sown in the upper provinces* of Bengal is the middle of November. The ordinary method of sowing is by drilling at intervals of ten to fifteen feet in land sown with other crops, such as gram or barley. The land is irrigated about once every ten days should a good rain not fall in the interval. The seed of the plant obtained by this method of cultivation is particularly fine. The crop is ripe about the end of February.

In lands which retain moisture throughout the cold weather Linseed might be, and is, cultivated without irrigation, but in my opinion the quality of the seed thus obtained is always inferior.

I have also myself sown Linseed broad cast in light dry lands, in which my Indigo crop had failed. There was good moisture in the lands when sown, but though the land was very ill adapted for retaining its moisture it was not irrigated, and but little rain fell during that cold season. Still the Linseed grew, but the yield per Beegah was very small, only 80 lbs English (or at the most 100 lbs) per Beegah of 27,225 square feet, which with us at least would not pay the rent. This method of cultivation therefore is only adapted to lands in which the "Bhadar" or rain crops have failed, and which would, if not thus sown lay fallow.

Linseed is entirely a "Rubbic" or cold weather crop. The only possible cause for failure which I could conceive down here is that perhaps the cold weather here is not cold enough.

Linseed should always be sown in lands having a good height and slope, so that in the event of heavy rains no water may lodge amongst it.

If tried as a crop not mixed with other crops I should recommend linseed to be sown by drilling at a width of about fourteen inches between the drill. About 20 lbs English of seed would then be required to a Beegah of the size abovementioned. It should be sown as abovementioned in the middle of November, and should be irrigated. Good moisture at the time of sowing is indispensable and the weather should not be too cold when the lands are sown, though this last is a risk to which you are not much exposed here. At the above quantity of seed one bag of Linseed would sow eight Beegahs of 27,225 square feet, the yield under this method of cultivation I cannot exactly estimate but if the Linseed succeeded at all decently, it ought to give from six to ten Maunds of 80 lbs per Beegah.

This is all I can think of on the subject, but if you have any further question to ask pray let me know.

P. S. A less quantity of seed per Beegah might do, say 16 lbs. I could give you an estimate of what the rates for cultivation, land rent, &c., would be up country, thus showing the probable cost of cultivation, but this I fancy would be no use to you here, when I say that the Linseed should be watered every ten days I mean until the plant arrives at maturity and the seed begins to ripen; with the usual amount of rain in the cold weather, three or at most four, good waterings ought to be sufficient.

To J. THOMSON, Esq.,

Chairman of the Chamber of Commerce.

SIR,

I am directed by the Right Honorable the Governor in Council to thank you for the information regarding Linseed contained in the Appendix to your letter of the 21st ultimo, and to beg you will intimate to the Chamber of Commerce that it will be hereafter printed and circulated through the Provinces together with the Reports on the subject of fibres invited by the Minutes of Consultation 19th September last.

I have &c.,

H. C. MONTGOMERY.

Chief Secretary.

Fort St. George, }
1st November 1854. }

MY DEAR SIR HENRY,

I have the pleasure to return the Chamber's letter, I see it was sent to you without the information referred to in the end of the 2d last para.

I wanted to see that "detailed statement" and my asking our Chairman for it lately, brought to his notice that it had been omitted, and he told me he would send it to you. I have not yet seen it and know nothing about it.

In September 1851 I got 10 bags of Linseed from Calcutta for seed, half of which I sent to Mr. Young at Bimlipatam and half to Mr. Halkett at Rajahmundry 700 lbs for each, and I asked them to experiment and compare notes, and for the present, my information stops here. Mr. Halkett was in bad health at the time and died in May 1852. Mr. Young went to England about the end of the same year, and we expect him back in the next steamer and his experience for the year 1852 will probably be worth having. Prendergast will also be here in a day or two, and he may know the fate of the seed I sent to Mr. Halkett.

Your's sincerely,

J. VANS AGNEW.

P. S.—I have made I believe all necessary alterations in the extracts.

Extract from the Minutes of Consultation, dated 19th September 1854.

The attention of Government has lately been attracted to the subject of the Fibres of India, and it has appeared to His Lordship in Council that measures should be adopted for making the value of this class of products generally known throughout the Provinces and thus pointing out to the population the advantages which the cultivation of fibrous plants holds out. With this view, the Governor in Council has had collated the following information which has been laid before him from time to time, and he resolves to circulate it to all the Revenue authorities through the Board of Revenue.

2. A deficiency being at present felt in the supply of Flax and Hemp to the English market, the demand for fibrous substances as substitutes for those articles is becoming great, and India is looked to for meeting this demand, her capability for growing cordage plants having long since been tried. Hemp and several descriptions of plants capable, under proper preparation, of yielding fibres of great length and strength are at present grown in different parts

Vide Royle on the productive resources of India—also Dr. Roxburgh's observations.

of the Presidency; but from their value not being sufficiently understood by the Native Ryot and Merchant, little or no care is bestowed on their cultivation and preparation, and there is reason to believe that much is now wasted which, by ordinary attention, might be turned to profitable account.

3. Among the great variety of Indian Fibres, specimens of some

	weight which each sustained.
	lbs.
* 1. Coir (<i>Cocos Nucifera</i>).....	224
2. Pooley Manjee (<i>Hibiscus Cannabinus</i>).....	290
3. Marool (<i>Sansevieria Zeylanica</i>).....	316
4. Cotton (<i>Gossypium herbaceum</i>).....	346
5. Catthalaynar (<i>Agave Americana</i>).....	362
6. Junapum or Sunn (<i>Crotalaria juncea</i>).....	407
7. Yercummar (<i>Calotropis gigantea</i>).....	552
† 1. Fibres of the Plantain—quality very good.	
2. Fibres of the large or Hill Aloe. Do.	
3. do. of the Garden Aloe or Adam's needle—Fibres a little finer and shorter than those of the large Aloe.	
4. Fibres of a variety of Roselle—Fibres very like English Hemp.	
5. Fibres of the Pine apple—very fine, strong and silky.	
† Vide their Report 17th April 1851.	

were examined and sent to England by the Madras Central Committee for the London Exhibition held in 1851 and results of their experiments* as of others† made about the same time under the direction of Dr. Hunter upon other fibres, are indicated in the margin. The Central Committee† thus refer to

the subject—Of the fibrous substances produced in India “some are altogether novel and some though long known in this country have not been used in Europe: of these the Committee particularly allude to the fibres of the plantain, of the yerkum (entered in the margin above as sustaining a weight of 552 lbs. while coir broke with 224 lbs.) and of the tongoos; specimens of all these have been sent home as they were considered by the Committee likely to be regarded with interest.”

4. Dr. Wight thus specially refers to the “yerkum” plant. “It yields by far the strongest fibre and leads to the inference that as it is a most common plant it may yet become a valuable article of export if a less costly mode of obtaining it without injuring its quality can be found.”

5. The Coimbatore Local Committee allude to “a very fine flax-like fibre, the produce of a large nettle abundant in Mysore and on the Neilgherries. The Todawars separate this flax by boiling the plant, and spin it into their coarse thread”

and Dr. Wight records of the same substance that “it produces a beautifully fine and soft flax-like fibre which the Todawars use as a thread material. The sample of this was too small to make a proper rope, but its examination convinced the Committee that if well prepared and procurable in quantity it is fitted to compete with flax for the manufacture of even very fine textile fabrics.”

6. Prominent reference is made likewise to the plantain fibre by those who have examined its qualities—Dr. Hunter observes “It yields an excellent substitute for hemp or linen thread. The fine grass cloth, ships cordage and ropes used in the South Sea Whale fisheries, are made from this substance. The outer stalks of the stem leaves yield the thickest and strongest fibres.”

It is described by another writer “as the most conspicuous amongst the Indian fibrous plants.” “It contains,” he adds “a valuable fibre and is every where cultivated in the plains of India for its fruit, an article of universal consumption by the Native population. It is a tree which bears fruit only once, and as soon as that is removed, it is and has been from time immemorial cut down and left to rot upon the ground—Persons who have paid close attention to the subject state

Central Committee's Report,
Page 176.

Central Committee's Report,
Page 176.

Do. Page 179.

Vide Indian Journal of Arts,
Sciences and Manufactures for
July 1850.

Part Second, Page 105.

Letter to Sir Charles Wood
by Samuel Gregson, Esq., M. P.

“that there will be no difficulty in obtaining from this plant alone any required quantity of fibre of admitted valuable quality and as fast as the mechanical appliances necessary for its preparation can be sent out.”

“Applicable as this fibre is to the manufacture of every species of cloth or other article usually made from flax or hemp, and of equal quality, it can be used with no less facility and advantage in the manufacture of paper.”

7. The janapa or sunn plant, which it will be seen from the marginal entries in p. 3 yields fibres next in strength to the yerkum or jilladon-nar, is cultivated, as the Government are informed, in Rajahmundry as a second crop on wet lands with profit to the Ryot and is even exported from that and other Northern Districts in some quantity.

8. The fibres of the roselle (*Hibiscus Cannabinus*) which is known to grow readily and without much care, all over the Madras territories, have been found to be an excellent substitute for tow now imported from Europe and it is probable that it might be profitably supplied in abundance at a rate below the present ruling price of imported tow, viz. Rupees 35 per cwt.

9. The capability of the Provinces under this Presidency to meet, in part at least, the present great demand for fibres in the English market, would thus appear beyond question; and indeed a pretty considerable and annually increasing quantity of

	Hemp. Rs.	Coir and Coir Rope. Rs.	Total. Rs.
1847-48.....	19,819.....	27,937.....	47,756
1848-49.....	23,242.....	1,38,617.....	1,61,859
1849-50.....	23,076.....	2,08,704.....	2,31,770
1850-51.....	10,577.....	2,46,852.....	2,57,429
1851-52.....	46,683.....	2,42,019.....	2,88,702

Colonel Cameron's Memo. p. 7.

is exported from Madras as shewn by the Sea Custom Returns; but it is believed that fibrous substances are wasted in large quantities in many parts of the country from ignorance of their value or “are greatly undervalued though in quality and texture far superior to the best ever imported from the Baltic,” and are hardly ever prepared with sufficient care to make them profitable articles of export. Much therefore depends upon a knowledge of the proper and most economical modes of cleaning and preparing them. The Native method of cleaning fibres by rotting, “it is observed, is not suited to warm climates as putrefaction sets in almost as soon as fermentation, and while one part of a heap of leaves or stalks is beginning to ferment, other parts are brown and stained from putridity

Dr. Hunter's Notes in the
Athenæum August 19th 1854.

Do.

"while the central parts remain fresh and un-
"altered." Dr. Hunter observes that "the
"general rules for cleaning the fibres of pulpy
"plants are first to bruise or crush the plant,
"keeping the juice for a coarse kind of vinegar required in another pro-
"cess. The common Native sugar-cane mill with two perpendicular
"rollers, a long lever handle, and a channel to convey the juice into
"some convenient vessel answers this purpose very well; the cost of such
"a mill is about 10 Rupees. Those who cannot afford to purchase or
"erect one but who can command plenty of coolly labour, will require
"to provide a few long planks and heavy wooden mallets to beat the plant
"till all the pulp is loosened. When it is in a pulpy mass, it must be
"taken at both ends and twisted, opposite ways to squeeze out the sap.
"It is then to be well washed in plenty of water, untwisted, and scrap-
"ed in small handfuls at a time on the board with an old blunt table knife
"or a long piece of hoop iron fastened into a straight handle. When all
"impurities are removed, the fibres may be soaked for an hour or two in
"clean water and then hung up in the shade to dry. Exposure to the
"sun at first is apt to discolor them. By this simple process, fibres
"of great strength, of a silky appearance and of a good color can readily
"be prepared. The scrapings must be well washed and set aside in the
"shade to dry as tow for packing, or as a material for making paper."

"The Indian plants to the cleaning of which this process is appli-
"cable are those of a fleshy or pulpy nature as the Aloe, *Agave*, *Sansevieria*
"and Plantain genera, of which there are many species. The prices of-

* Rs. 250 to 700.

† Rs. 120 to 180.

‡ Rs. 500.
§ Rs. 400.

"ferred in England for Indian fibres thus clean-
"ed varied from £25 to £70* per ton. Fibres
"of the same plants cleaned by the usual native
"process of rotting and sent home at the same
"time were valued from †£12 to 18 per ton, and
"were said to be only suitable for the manufac-
"ture of coarse twine or brown packing paper.
"The finest plantain fibre, when carefully
"cleaned and dressed, was said to be suited for
"the imitation of silk in carriage braid and car-
"pet work. The average value put upon the fi-
"bres was £50‡ per ton, when Russian hemp
"was selling at £40§ per ton. A profitable ex-
"port of plantain and aloe fibres has now been established on the West
"Coast and is likely to be extended to other parts of the Presidency."

"The native process of cleaning plants having bark and woody
"fibres"—of which kind are many of the cordage plants—"is very similar
"to that followed in cleaning fleshy and pulpy plants, viz. burying in
"sand or mud at the edge of a tank or in a river and leaving them to rot
"There is this difference, however, that the plants are steeped longer and
"are never exposed to the sun to dry, or stacked and covered with mat-
"ting to be cleaned by dry beating. If this were done, the woody fibre
"would get hard and brittle and would again adhere to the other fibre,
"which being partially rotten would break in the cleaning. To obviate
"this, the rotten plant is taken up in large handfuls, and beaten on flat
"stones first at one end and then at the other in the same way as clothes
"are washed by the Dhobee; they are next well rubbed and washed to
"separate the impurities, and are spread out on the ground to dry. We
"can hardly wonder that most of the string and rope made from fibres
"prepared in this rude coarse way should be dark in color, possessed of
"no strength and of little value. As a general rule every day's steeping
"of a fibre takes from its strength and imparts more or less color. To
"obviate this, woody plants should be first well beaten with a mallet;
"then the bark should be separated from the stalk, for it is on the inner
"part of the bark that the fibres for cordage usually occur. When the
"bark is brought to a pulpy state, it must be well washed in clean water
"to remove as much of the sap as possible, for this is the destructive
"agent which soon causes putrefaction."

10. Some idea of the extent of the present demand in the London
market for fibres may be formed from the fol-
lowing facts. The importation of foreign Flax
and hemp into England for the last three years
is stated to have been.

	Flax. Tons.	Hemp. Tons.	Total. Tons.
1851.....	59,709.....	64,671.....	124,380
1852.....	70,129.....	53,714.....	123,843
1853.....	95,169.....	63,142.....	158,311
3)225,007.....	181,527.....	406,534	
	75,002.....	60,509.....	135,511

11. Out of the average quantity of 135,511 tons thus annually im-
ported, 85,000 tons used to be supplied from a source which is no longer
available. The money value of this quantity at the prices which have
heretofore ruled is calculated at Rs. 2,72,04,700 and it is now enhanced
by the current high prices to upwards of Rupees 5,10,00,000.

12. The advantages that are likely to result to this country, in a commercial point of view, from a ready attention to so large a demand for articles for which it would appear so many valuable substitutes may be found in the Districts under this Presidency, and which with ordinary care and attention might be turned to profitable account, are manifest; and the Governor in Council is therefore willing to afford every reasonable encouragement to accomplish so desirable an object. At the same time, he is aware that nothing short of the certainty of a remunerative price for the articles produced can act as a direct incentive to exertion and that the Merchant alone can hold out this inducement, but it has appeared to him an object of great importance to point out to the Native Ryots and Merchants the value of a branch of trade which, if taken up and successfully prosecuted, might prove of such immense advantage to them, and it is desirable that all accessible statistics on the subject should be collected and published for general information.

13. Entertaining these views, His Lordship in Council resolves to call upon the Board of Revenue to instruct the several Collectors to make generally known in the Provinces the foregoing information and sentiments of Government, and obtain and lay before them, Returns in the accompanying Form showing particulars of the different descriptions of fibrous plants grown in the different Districts. The statements should be accompanied by full and accurate information as to the modes of cultivation and preparation of the fibres, the expences attendant upon them as far as they can be ascertained, the quantity grown, whether sufficient for local requirements only, or whether any part is exported, whether there is a willing desire among the Ryots to extend the cultivation under existing circumstances; if not, whether any and what encouragement is required; what are the capabilities of each district generally, and of particular localities for growing the articles and what the obstacles, such as distance from the sea-board, &c. to the free culture and transport of fibres.

14. Ordered that a copy of these Proceedings be forwarded likewise to the Chamber of Commerce who will be so good as to furnish such information on the subject as it may be in their power to afford and any suggestions which it may occur to them to offer.

(True Extract.)

Chief Secretary.

Name of Fibre.	Description and extent of land cultivated.				Estimated produce per Cawny.	Selling price of Fibre per	Remarks.
	Dry.		Wet.				
	Caw.	Rs.	Caw.	Rs.			

Additional columns to be opened, if necessary. The Native names and, if possible, their botanical synonyms should be distinctly entered in the first column.

APPENDIX.

Cursory observations upon the possibility of the Madras Presidency furnishing a sufficient supply of Hemp and Flax for the London market and remedying the deficiency, caused by the present contest, the effects of which at this moment are so severely felt.

Prefatory Remarks.

The sudden and total suppression of the Baltic trade, in consequence of the present war with Russia, has engendered the necessity of the mercantile community in England, turning their attention to other channels for the purpose of obtaining the necessary produce, now cut off by the breaking up of relations with the Imperial Government, and the blockade of all the Muscovite ports.

The chief articles of trade with the Baltic consist of timber, hides, tallow, hemp and flax, of the whole of which produce, it may be said the two last are the most important to Great Britain.

Measures undertaken to remedy the loss sustained by the cessation of the Baltic trade.

Since the breaking out of hostilities, entrepôts have been energetically sought for, from whence the materiel alluded to could be obtained, in several instances with every prospect of success,—timber

being procurable from Norway and Canada, while in reference to hides and tallow, it is generally admitted that the cities of Buenos Ayres, and Monte Video, and other towns of the Argentine Confederation, will be enabled not only to supply the amount required, at as cheap a rate as those imported from the Baltic, but on far more advantageous terms, viz. in taking a large proportion of British manufactures in exchange, a measure virtually prohibited at Saint Petersburg, Riga, and Revel, and other Russian ports, from the ultra restrictive tariff rigorously enforced throughout the Empire, to which few vessels ever proceed expect in ballast, every article of Russian produce, exported by them being paid for in *metallic currency*,—payment even in Muscovite Assignats, or paper money being severely interdicted.

Successful except in regard to Hemp and Flax.

But while channels have thus easily been found for the supply of the articles above enumerated, doubt, and perplexity to a considerable extent prevails, as to where the *two last*, by far the most important, are to be obtained, and already various substitutes are spoken of from the anticipated impossibility of procuring them, while, pending the solution of the question, to judge from articles in the city correspondence of the Times and Daily News, so pressed is the market at the present period for an immediate supply that the necessity is openly canvassed of obtaining it at all risks from Hamburg, a measure engendering not only the sacrifice of the enormous outlay, it would be necessary to disburse, but which would be virtually playing the game, the Muscovite Government have all along had in contemplation, it being the fixed opinion of the Czar, that the produce of his empire is so absolutely necessary to England, that though his ports might be blockaded, or even destroyed by the combined squadrons, and Prussia had rejected his proposed Commercial Treaty, it would still find a point of embarkation from Hamburg, and the other Hanseatic Ports, and would thus however interrupted, not suffer the material injury, if not absolute destruction, a war with England apparently threatened.

This supposition is not confined to the Emperor himself, it is the fixed opinion of a large portion of the Great Nobles, so deeply interested in the question, several of whom have openly avowed it to myself, with the addition, that as long as Russia is able to effect this, she will at least be enabled to maintain the struggle of "Passive Resistance."

Up to the end of the year 1852 the nett average price of *clean hemp* was about £30 Sterling per ton. At the present moment I am ignorant

what the price is, but knowing as I do from experience, the enormous expence of land carriage in the Russo-German provinces of the Baltic, which is quadruple that of the Ukraine and the southern Provinces of the Empire, I think I am not exaggerating when I assert, that under these circumstances, Russian hemp and flax, could not be brought into the London market, under £65 or £70 Sterling the ton.

Setting aside all political considerations, the question recurs of how is this enormous outlay to be avoided, and from whence can be obtained the articles so much required? Several countries have been mentioned both in Europe, and America, as capable of producing it, others as determined upon trying the experiment of doing so, but the practical query arises of Who has already got it, and where is it to be found? The answer is in various parts of the

The possibility of Madras being able to supply a large quantity, if not as great an amount as that imported from the Baltic.

Madras Presidency, where it seems to be greatly under-valued, though in quality, and texture, it is far superior to the best ever imported from the Baltic, it consequently therefore becomes a question of deep consideration, how far individual enterprise, supported, and assisted in the first instance by the Local Government, would enable the Madras Presidency to supply the articles required, to a considerable extent to the London market, if not altogether repair the deficiency created by the suspension of the former trade.

The drawbacks to the measure being successfully carried out, would consist, in how far a fixed, and *permanent* annual supply could be securely relied upon for consumption;—the difficulty in this country of cleaning, and extracting the fibre;—and lastly, the great expence attending its inland transport, previous to reaching its port of embarkation.

These objections I cannot believe are of a nature not to be overcome by diligence and attention, the more particularly when the cheapness of manual labor in India is considered, while for the successful issue, likely to prove the result of the experiment, I cannot do better than extract the following paragraph from a letter upon the fibre of the Banana, addressed to parties in India by Messrs. G. and J. A. Noble, the eminent Russian Brokers, 11, George Yard, Lombard Street, for a perusal of which I have been indebted to Mr. Richard Bell, of the Firm of Messrs. Binny and Co.

Extract of a Letter, from a Russian House of Agency upon the subject.

"If a regular supply (of Eastern hemp) could be depended upon, at about the price of Baltic hemp or a little below, the consumption would be *very great indeed* as the strength, and durability of the cordage made from it, would insure a preference, and the difference in the weight would compensate for extra expense in manufacturing it."

Observations upon this communication.

The letter from which this paragraph is extracted was written in the year 1852, before any question of the present war had arisen and when good Russian hemp all clean, and ready for manufacture, was selling for somewhat *under* £30 per ton. If the possibility was then suggested, that India could furnish a better article, at the same or even a lesser rate, the question very naturally arises, what could it not do at the present period, when the price must have so enormously increased.

Another material point may also be taken into consideration, which is, that if it could not be cleaned in this country, or only done so at very high rate, it could be shipped without this process to England, where it could be done, and certainly much better at the average rate of £2 per ton, according to a statement furnished me by Mr. Bell, the gentleman I have already mentioned.

In arranging these Memoranda, I may have diverged into abruptness, and perhaps not altogether explained myself with sufficient clearness, upon several of the points adverted to, my excuse must be found in the wish not to lengthen them to too great an extent, but to compress them into as small a space as possible, and I should observe in conclusion, that my object in submitting them for consideration, has originated in the supposition, perhaps erroneous, that the subject to which it relates may hereafter be productive of considerable benefit to Southern India and in the knowledge my own experience of the Russian Empire has suggested, that the surest way of checking its power of aggression is to crush every outlet for its trade.

(Signed) G. PAULETT CAMERON,

Lieut. Colonel.

Madras, 22d July 1854.

FIBROUS SUBSTANCES.

SUB JURY.

THE HONORABLE WALTER ELLIOT, Esq.—*Chairman.*

LIEUT. COLONEL BALFOUR, C. B.

LIEUT. COLONEL T. T. PEARS, C. B.

W. E. UNDERWOOD, Esq.

J. OUCHTERLONY, Esq.

J. D. SIM, Esq.

H. CLEGHORN, Esq., M. D.

A. HUNTER, Esq., M. D.—*Reporter.*

A very extensive and varied collection of fibrous substances has been contributed from all parts of the Presidency. Many of these are already known, and a few of them are cultivated as articles of commerce, but a number of interesting facts have been brought to light which show that Southern India is abundantly supplied with fibrous materials for every description of textile manufacture from the coarsest packing cloth, to the finest cambric, lawn, or muslin. The series also contains a number of novel specimens suited to particular manufactures, but hitherto little employed except for the commonest purposes. A good deal of trouble has been taken by the Local Committees, and by private exhibitors, to make this part of their collections as complete as possible, and in addition to the care bestowed on the preparation of many of the fibres the Jury remark that much trouble and expense have been incurred by some exhibitors, in proving that their contributions are suited to the manufacturing wants of this country.

It would be impossible to say how far the cultivation of fibrous plants might be carried, and what would be the demand for them in this Presidency, if properly prepared for the market; but there is no doubt, that the usual careless and slovenly mode of preparing these materials, has hitherto tended greatly to interfere with their sale in the European market. This fact is very clearly demonstrated, by comparing the samples of one or two of the common fibres prepared in various ways, and exhibited by 20 or 30 different parties. In almost every instance, the relative softness or clearness of the fibre has proved a good criterion of its strength and *vice versa*. The Jury are much indebted to the Principal Commissary of Ordnance, and the Military Board for a valuable series of experiments tried to ascertain the relative strength of the

fibrous substances exhibited. (See Report on Ropes sent to the Arsenal to be tested.)

As this collection is one of the most varied and extensive in the Exhibition, some classification will be requisite, but it is not necessary to describe every specimen, as a reference to the printed catalogue will show nearly all that have been contributed. A few samples arrived too late for insertion in the catalogue, but those which were considered of good quality have been noted in this Report.

The simplest and most scientific classification is that usually followed by Botanists, viz. under the head of *Endogenous* or inside growing plants, (characterised by the absence of bark, by having parallel veins in the leaves, and a single seed leaf,) and *Exogenous* or outside growing plants (characterised by having a true bark—reticulated veins in the leaves, and two cotyledonary or seed leaves.)

Under the head of Endogenous plants yielding fibres may be classed the

Palms.

Aloes and Agaves.

Yucca or Adam's Needle.

Sansevieria, or Marool.

Fourcroya, or Gigantic Aloe.

Ananassa or Pine Apple.

Musa or Plantain.

Pandanus or Screw Pine.

Rushes.

Grasses.

Sedges, &c.

The Exogenous fibrous plants embrace those yielding Cotton and Silk Cotton, Flax and its substitutes, viz.:

Calotropis, or Yercum.

Tylophora Asthmatica.

Cryptostegia Grandiflora, or Palay.

Damia Extensa, or Ootrum.

Hemp—Cannabis Sativa, and its substitutes.

Jute, Corchorus Olitorious.

Sunn or Junapum, Crotalaria Juncea.

Ambaree, or Hibiscus Cannabinus.

Bendee, or Abemoschus.

Toothee, or Abutilon.

Barks of Trees, including varieties of Ficus.

Bauhinia.

Grewia.

Dalbergia.

Isora.

Butea.

Vernonia.

and a number of plants which have not yet been identified, but which probably belong to some of the preceding classes:—

PALMS.

The most generally useful of this class, is the Cocoanut, or *Cocos nucifera*, which yields the Coir of commerce, prepared from the husk of the fruit. There is a very great difference in the specimens contributed, depending chiefly on the modes of preparation that have been adopted. While many of the samples are clean, pale yellow, and strong, others are coarse, dirty and brittle, from the apparent want of careful preparation.

The modes of cleaning the different fibres will be described at the end of this Report, so as to avoid repetition, and to facilitate reference. Good clean coir is contributed by the Tanjore, Travancore, and Cochin local committees. Also from Poodocotta, Chittledroog, and Cocanada. The best specimens have evidently been prepared from the fresh cocoanut by beating and washing the fibre before it was discolored by the sap. The Tanjore, Cochin and Travancore specimens are sufficiently clean to take dyes, and the ropes made from them are nearly equal in quality. There is a large export trade in coir from the Western Coast, the best of which comes from the Laccadive Islands, and the cocoanut appears to grow more luxuriantly there, than in other parts of this Presidency. The following quantities were exported in 1853-54. Coir and coir rope—cwt. 1,30—828—value 297-639 Rupees. A prize has been awarded in another class, to the Canara local committee for some colored flooring mats manufactured from this substance. When carefully prepared and well dyed, it might be applied to finer manufactures.

Borassus flabelliformis, or Palmyra of Europeans. Some clean but brittle fibres are exhibited by the Tinnevely, Madura and Travancore local committees and well twisted rope accompanies most of the sample, but the material is said to be stiff, brittle, and liable to rot when wet. This substance does not appear to have undergone any prepara-

tion, and it contains so much woody fibre, that it is questionable whether it would ever be suited for manufacturing purposes. Its chief uses are for securing thatch and tying bamboos in building native huts, the dried leaves of this plant are used for writing upon with an Iron style, also in thatching, making fans, and light baskets for irrigation.

Elate or *Phoenix Sylvestris*, wild Date. There are only three exhibitors of the leaves of this plant, and these are in a crude unprepared state, or simply split and twisted into rope, its chief uses are for thatching and making light mats, for building huts. The fibres of the leaf stalk are used for cables in the Red Sea.

Caryota urens, the nar of the Indian Sago palm, is exhibited from Cocanada, Nellore, Masulipatam and Travancore. It is much used by the natives for making fishing lines and bow strings, it is very strong, resists water for some time, but is liable to snap if suddenly bent or knotted. It resembles black horse hair and might be employed for similar manufactures.

Calamus rotang.—Among the palms, is also exhibited a sample of what is called the marsh date, the leaves of which are used at Cuddapah for making ropes and mats: this may be the ground rattan, or *Calamus rotang* which grows abundantly in marshy ground, and bears leaves resembling those of the date.

ALOE FAMILY OR LILIACEOUS PLANTS.

Agave Americana, Common American Aloe, Cuttalay, Bramarachasee Nar or Kitha Nara.—Some very fine specimens of this fibre are exhibited by the Tanjore, Travancore, and Nellore local committees, also by Dr. Riddell from Bolarum: Mr. Underwood, Madras: Major Dobbs, Chittledroog: the Lunatic Asylum, Bangalore: Mr. Thorpe, Monegar Choultry, Madras: Assist. Surgeon H. Nott, Tranquebar: Capt. Meadows Taylor, Nizam's Territories: and the Madras School of Arts. In addition to these, there are indifferent and bad specimens of the same fibre, from almost every part of the Presidency. Although this plant is not indigenous, it seems to be one of the most widely diffused in Southern India. It is particularly well suited for cordage, and from the repeated trials which have been made with it (see "Fibrous plants of India" by J. Forbes Royle, M. D. F. R. S. 1855. Reports of experiments made in the Arsenal Fort St. George, and the Madras Journal of Arts) there is no doubt that when carefully prepared, the fibre is as strong as Russian hemp. The Aloe fibre now forms an article of export from the Western Coast; in the year 1853-54, 3,658 cwts.

were exported, valued at Rs. 21,506. It was employed for several years, instead of English hemp, in the Arsenal at Madras, but it was ascertained that the fibre was liable to rot, when frequently wet, and its use was discontinued on this account.

It has also been tried in the Arsenal as a substitute for tow in packing shot, but is found to be more easily cut. Further experiments, however, would probably point out some means of overcoming this defect.

The Jury are indebted to Mr. Thorpe for pointing out the cause of this defect, viz. its tendency to rot, and to Mr. Underwood for suggesting a means of obviating it. (See process of cleaning the fibres of Agave.)

Agave vivipara.—A good specimen of fibre from this plant is contributed by Dr. Kirkpatrick. It is long in the staple, clean and strong and has been prepared without rotting, by the simple process of beating, scraping and washing. The manufacture of this and of rope have been introduced as an employment for the Lunatics in the Asylum at Bangalore. The rope finds a ready sale in the bazaar, and pays all the expenses of the manufacture, besides providing a few comforts for the most industrious inmates.

The jury consider Dr. Kirkpatrick entitled to Honorable Mention for the introduction of this useful manufacture.

A specimen of fibre said to be from the *Agave Viridis* is exhibited by the Cuddapah Local Committee. It is of fair quality, but not so clean as the last, it is probably the produce of the same plant.

Fourcroya gigantea.—Nearly allied to the Agave, is the Fourcroya or Semay Cathalay, this fibre is of 5 or 6 feet in length a little finer than the Agave fibre, but possessed of similar properties. Good samples are exhibited by Mr. Jaffray from the Horticultural Garden; by the Bangalore Local Committee; the Madura Local Committee; and the Madras School of Arts. The plant is one of the largest of its class, the leaves often attaining the length of 10 feet, but it is not so abundant as the Agave, though as easily propagated.

Sansevieria Zeylanica.—Marool, Murle, Moorva, Moorghabee, Dant Saga or Saga Nar. This plant appears to abound in most parts of this Presidency, it has narrow striped leaves and resembles the Agave in some of its characters, but produces finer fibres, which are easily separated from the pulp. The best specimens are contributed by the Travancore and Tanjore local Committees, the Madras School of Arts, Mr. Jaffray and Mr. Thorpe: several of the contributions from other

localities are discolored from steeping, and one or two are dirty, grey and brittle. This fibre has long been known as a useful material for cordage and it is soft, silky and pliant when well prepared. It is sometimes called Bowstring Hemp, and is about equal to the Agave fibre in point of strength; as it is a finer material, it might be applied to a better description of manufactures. The plant is easily propagated and yields a good crop under cultivation. It was tried against Russian Hemp, on board the *Thalia* East Indiaman, when commanded by Captain Biden, and was highly approved of; it has also been made into fine cloth. Some good thread, twine, rope, and cord made from this fibre in the Justice's jail, and house of correction are exhibited by Dr. Hunter, along with ropes made from the Agave, Musa, Yucca, and Calotropis fibres.

Yucca Gloriosa.—Adam's needle. This plant yields a strong white fine but rather stiff fibre, suited for the manufacture of cordage, it very soon becomes discolored by steeping, but is not so liable to rot as some of the other fibres of this kind. Very good specimens are exhibited by Dr. Riddell, Dr. Kirkpatrick and Revd. P. Methuselah; the plant does not appear to be abundant in Southern India, but grows easily and might be propagated to a great extent.

Yucca Aloifolia.—This fibre is white, pliant and strong when well prepared, it resembles the Agave fibre in some respects, but is liable to be discolored by steeping, which the Agave is not. A good specimen of this fibre is exhibited by the Madras School of Industrial Arts; the specimen exhibited by Mr. Jaffray is grey, stiff and chaffy, from too long steeping.

Pine Apple, *Bromelia ananas* or *Ananassa Sativa*.

Some very clean and well prepared samples of this fibre are exhibited by Dr. Riddell of Bolarum, from Cocanada, South Arcot and Travancore. The Madras School of Industrial Arts exhibits a series of well dressed and hackled fibres, thread, yarn, twine and tow for string, prepared from the common Pine apple, and the variegated variety introduced a few years ago from Singapore. All the above samples are nearly white, very soft, silky and pliant, and the material seems to be a good substitute for flax, as it is known to be strong, durable, and susceptible of fine subdivision—It has also the advantage of being as long in the staple as flax, and it can be worked up with the same machinery. The objection which used to be made to this material, that it would not bleach, has been found to arise from the faulty mode of preparation by steeping, which is resorted to in Manilla and Singapore,—where the fibre is pre-

pared in large quantities. The specimens sent from Travancore and Trahquebar are stiff, hard, dirty, and brittle from steeping.

PANDANUS ODORATISSIMUS.

Screw Pine—Keora—Kaldera bush—Thaïum, Thaulay Mazalie, See-thay Nar and Umbrella Tree.

The number of names by which plants are known in different districts of India is very confusing. The screw pine is a good instance of this. The only clean specimens of this fibre are exhibited by Mr. Underwood, and the Madras School of Industrial Arts. All the others are discolored by rotting. The leaves of the plant are used by the natives for making mats—baskets and hats. There are extensive manufactories of these articles at Pulicat, Cuddalore and several other localities. The fibre of the leaf is white, soft, and pulpy, but possessed of little strength. It appears to be a good material for the preparation of paper, but ill suited for cordage. The aerial roots are much used as coarse brushes for white washing houses, when beaten with a mallet, they open out like a soft brush.

RUSHES, GRASSES AND SEDGES.

Although these substances are extensively used in India for the manufacture of mats, ropes, baskets, and thatching, there is but a poor display of them in the Exhibition. The Travancore Local Committee and the Canara Local Committee exhibit the *Cyperus Textilis*, and a finer kind of grass called kooray or koaray both used for making mats. The celebrated mats of Paulghaut and Cochin are noticed in another class. Several species of Typha, Juncus, and Saccharum are known to abound in this Presidency, and to be applied to useful purposes. The *Phrynium dichotomum* of Bengal is used for making the sital patee mat.

The Saccharum Munja is used in Bengal for making strong ropes for tying up cattle and drawing water.

The S. Sara yields the common Reed Pen of India, specimens of which are exhibited in this class.

A few neat table mats are exhibited from Kimedý, and some teasing brushes made from the roots of a grass called Chepooroo valelloo. These are likely to command a ready sale, if they could be brought prominently to notice. The botanical names of the plants from which they are made are not yet ascertained. Further enquiries are requisite in this department of Raw produce.

MUSA PARADISAICA.

Plantain, Banana, Valey. This plant is cultivated everywhere in Southern India. It yields a fine white silky fibre of considerable length, specifically lighter than Hemp, Flax and Aloe fibre by 1-4th or 1-5th and possessing considerable strength. There are numerous varieties of the Plantain, which yield fibres of different qualities, viz.:

Rustaley, superior table plantain.

Poovaley, or small Guindy variety.

Payvaley, a pale ash colored sweet fruit.

Monden, 3 sided coarse fruit.

Shevaley, large red fruit.

Putchay Laden or long curved green fruit.

These varieties as might be expected, yield fibres of very different quality. The only samples in which the different plants are noted, are those contributed by the South Arcot Local Committee, but they are not well cleaned. Very fine specimens of this fibre are contributed by the Local Committees of Masulipatam, Tanjore, Malabar, Canara, Nellore and Travancore. Very carefully prepared Plantain fibre, Hackled Do yarn, string, rope, tow and half stuff for paper are exhibited by the Madras School of Industrial Arts. The same fibre is exhibited from almost every district in the Presidency, and varies in shade and quality according to the method of cleaning that has been adopted. This plant has a particular tendency to rot and to become stiff, brittle and discolored by steeping in the green state, and it has been ascertained by trial that the strength is in proportion to the cleanness of the fibre. If it has been well cleaned, and all the sap quickly removed, it bears immersion in water as well as most other fibres, and is about the same strength as Russian Hemp. The coarse large fruited plantains yield the strongest and thickest fibres, the smaller kinds yield fine fibres, suited for weaving, and if carefully prepared, these have a glossy appearance like silk. This gloss however can only be got by cleaning rapidly, and before the sap has time to stain the fibre, it is soon lost if the plant be steeped in water. By far the greater number of specimens of Plantain fibre exhibited are discolored from steeping, and they have acquired a dull ash grey or brown color, which in this plant is always accompanied by stiffness and brittleness; one or two of the specimens are so brittle as to break when gently rubbed; others are harsh and stiff. Some well made rope, line, and string are exhibited by several of the Local Committees. A 2d Class Medal is awarded for the ropes from Mayavaram in Tan-

jore, these are clean, strong, silky and well laid up. A 2d Class Medal is awarded to Mr. Thorpe for the cleanest and largest bundles of Plantain fibre, prepared in the Monegar Choultry. The Madura Local Committee exhibits fine specimens of fibre cleaned both by the quick process and by soaking, the latter have lost their gloss and are stiff and not so strong as the others.

The Travancore Local Committee exhibits some excellent fibre and rope, the latter very carefully laid up but stiff from over twisting. This kind of rope ought not to be hard spun, as it becomes stiffer when wet and is liable to snap if it gets into a twist or knot. The Plantain fibre being one of the most abundant in India, will be again noticed under the head of Cultivation and cleaning of fibres.

EXOGENOUS FIBROUS PLANTS, or those characterised by having a true bark and reticulated leaves: the most important of this class are the commercial varieties of cotton.

GOSSYPIMUM HERBACEUM, OR PAROOTY, OOPUM, PUNJEE.

There are several exhibitors of this staple of Indian commerce, though few of the samples are in large bales, and a large proportion are too dirty to attract the attention of the Mercantile community. The best series of cottons grown from imported seed is that exhibited by Mr. Jaffrey, consisting of samples of Bourbon, Sea Island, New Orleans, Mexican, Brazilian, and American cottons, all of these are carefully selected, well cleaned, and long in the staple, but as prizes have already been awarded for them at the annual exhibition of the Agri-Horticultural Society, they cannot now compete with recently grown samples.

The best bales of Cotton are those exhibited by Messrs. Fisher and Co. grown at Salem from Bourbon seed. This is fine in quality, clean and of good staple. The Jury award a 2d Class Medal for these bales.

Mr. Meppen also exhibits good samples of New Orleans, Sea Island, and Hybrid cotton grown in the Mysore Government experimental farm at Cuddoor. The two latter are clean, of excellent quality, and of fair staple. The experiments of Mr. Meppen on Hybridising the cotton plants of India and America are worthy of commendation, and the Jury award a 2d Class Medal for his contributions. Some well cleaned cottons are exhibited by the Guntoor and Tanjore Local Committees, and from Chittledroog, but they are short in the staple, and generally coarse in quality.

JUTE (*Corchorus olitorius*.) The true Jute of Bengal is not exhibited, the most abundant of the Hemp plants of this Presidency, are the species of Hibiscus and Abolmoschus, which appear to thrive in almost every district, and to be cheaply and easily cultivated. The species are sometimes mistaken for each other, and much uncertainty still exists regarding the local names by which they are known. The most common kinds are the *Hibiscus cannabinus*, or sour greens called Poolychay, Ambaree, Palungoo, Googoo, Gonkura, Poonrick, Poolymanjee and Thella Googoo.

The *Hibiscus Sabdariffa*, or Rozelle, called Yera'googoo. Kaserika, Poolychay keera.

Good samples of the Hibiscus vesicarius, or wild Ambaree are exhibited by Captain Meadows Taylor.

H. Vitifolia, H. Lampas, H. Rosa Chinensis and H. Mutabilis are contributed by Mr. Jaffrey and the Madras School of Arts.

The *Abolmoschus esculentus*, Bandikay, Bendee, Vendee, Ambaree. This plant yields long silky fibres possessed of considerable strength and pliancy, well suited for the manufacture of Rope, String, Gunny Bags, and Paper, and bearing considerable resemblance to the true Hemp of Europe. There is a great consumption of them in this Presidency, chiefly for Rope and Gunny Bags, and they are exported to a small extent as Hemp. In the year 1853-54 the following quantity was exported 6,112 cwt. valued at 27,113 Rupees. Samples of these fibres are exhibited from a number of Districts, but nearly all of them are discolored and their strength much impaired from steeping. They retain their gloss even when very brown and rotten. The best specimens are contributed by Dr. Riddell, Captain M. Taylor, Dr. Kirkpatrick, and from Trivady in Tanjore, Cocanada, and Masulipatam. Some of these appear to have been cleaned without steeping and are of good strength, soft, pliant, whitish yellow in color and very silky.

The *Abolmoschus ficulneus* belonging to the same class also promises to be a useful fibre for Gunny bags and paper. The bark contains a large proportion of white reticulated fibre, similar to that obtained from the Mulberry. Mr. Jaffrey exhibits a very good clean sample of this fibre which is of great length, but not very strong. It grows abundantly on the black cotton soil in this Presidency.

Nearly allied to this class is the *Abutilon tomentosum*, or Toothee; some small indifferent specimens of which are exhibited from two or three Districts. The *Abutilon polyandrum* also yields a silky long fibre resembling Hemp exhibited by Mr. Jaffrey.

Some small samples of fibres from the *Althæa rosea*, and varieties of Sida are also exhibited but they do not merit particular attention.

Some good white fibres from the bark of the *Isora Corylifolia* are exhibited by the Madura Local Committee, by Mr. Saldana and Mr. Jaffrey. The same fibre is called Googull and is made into excellent Ropes at the Training Depot.

Dr. Riddell exhibits fibres of the *Grewia Asiatica*, *G. Tiliæfolia* and *Maliopæ Grandiflora*, but they are coarse and indifferent.

The *Decaschistia Crotonifolia* exhibited by Mr. Jaffrey appears to yield a good fibre. It is to be regretted that no samples of Nettle fibre, *Urtica* or *Boehmeria*, have been contributed, as it is known that these abound on the Neilgherries, and other localities, and that they yield a long and silky fibre like the true Rhee or China grass. The *Girardinia Leschenaultiana* figured by Wight (Icon. t. 1976) is frequent all over the higher range of the Neilgherries, the bark yields a fine strong white flax-like fibre, which the Hill people obtain by plunging the plant in hot water like fibre, which the Hill people obtain by plunging the plant in hot water to deprive it of its virulently stinging properties, and then peeling the stalks. The textile material so prepared is of great strength, and the Todawars use it as thread.

A large and interesting class of Fibrous substances, which have hitherto attracted but little attention, is the unprepared Barks of Trees, many of these yield a strong and ready substitute for rope, and from the quantity of Tannin which some of them contain, they resist moisture, and retain their strength for a long time; with a little care and the employment of simple machinery, excellent ropes, mats and baskets might be prepared from some of these substances, and they would probably find a ready sale for agricultural and commercial purposes. One of the most common of these barks is the *Bauhinia diphylla*, called Authee nar, Yepy, and Apa. This is a strong coarse brown bark of which the Natives make a temporary rope for securing thatch, matting or fences. The barks of several other Bauhinias are used for the same purposes. The Ara nar is the bark of the *Bauhinia parvifolia*, of which matches for native guns are made. This class also includes the barks of the Banjan, *Ficus indica* or Ala nar, Peepul, *Ficus religiosa* Arasa nar, *Ficus racemosa*, Atti nar, *Ficus oppositifolia*, Bodda nar, *Ficus(?) Cullethy* nar. The Honorable Mr. Elliot exhibits fibre and cloth made from the bark of the *Ficus Tomentosa*. There are also the barks of several species of Acacia, as the Babool (*Acacia arabica*), or karoovalum nar, the white Acacia, or Oday nar, (*Acacia Leucophlea*),

Velvaila nar, Wrightia tinctoria, and a number of other plants not yet identified.

The trailing roots, twigs, tendrils, and drops of a number of plants are used for the same purposes, and this is a subject well deserving of further enquiry.

ON THE CULTIVATION AND CLEANING OF FIBROUS PLANTS.

Few subjects present a wider or more interesting field for investigation, than the best modes of cultivating and cleaning fibrous plants. Hitherto, these branches of industry have not been carried on in India, with sufficient care or energy, to make profitable returns to the Agriculturist or the merchant. Some very serious faults have been committed in the process of cleaning Indian fibres, which have tended in a great measure to deprive them of their value for manufacturing purposes. In order to save labour, the usual practice has been to steep the plants till the sap and vegetable juices are thoroughly decomposed, and the fibre can then in most instances, be easily beaten or washed out, but this method though applicable to a certain extent, in cold climates, where decomposition takes place slowly, is found to be very injurious to the fibre, and to be almost inapplicable in warm climates, where fermentation often passes into putrefaction within three days, and the decomposed sap acquires acid and other properties which not only deprive the fibres of their strength but discolor them in such a way as to render them quite unfit for manufacturing purposes. Most vegetable substances contain besides the fibrous tissue, sap, cellular tissue, and a little coloring matter; the sap consists usually of water, gum, fecula and alkali with occasionally tannin. When plants are dead or dried up, they pass into a red or brown usually streaked with deep yellow and grey. It is often possible to detect a regular succession of colors in the different parts of the same plant, and a few very useful lessons may be drawn from them—1st, that pale yellow or greenish parts of a plant contain fresh, tender fibres—2dly, that deep green parts of a plant contain fibres in full vigor, and 3dly that red or brown parts indicate that the fibre is past its prime and beginning to decay. In the latter case, the fibre becomes stiff harsh and often brittle. If plants be cut and exposed to the air or steeped in water, the same succession of colors may be observed, while they are drying or passing into decomposition, and these form a criterion by which the value of the fibre may be detected. As soon as a plant is cut, the circulation in its leaves ceases, and a new process is set a going which if carefully watched, will be found to be a

beautiful and wise provision for reducing the parts to their primitive elements; the fecula and gum begin to ferment passing first into sugar, then into spirit and lastly into vinegar, the rapidity of the changes is usually in proportion to the water in the sap and the temperature of the air: the drier the plant the more slowly does it usually decay, but if the sap be allowed to dry up in a cut plant, the above changes still go on, though they are less perceptible, and the plant undergoes another change which is an equally wise provision for reducing it to its pristine elements. It becomes stiff and brittle, light and crumbly, parts falling in to dust while the fibre and woody parts often remain to point out how the plant grew, derived its nourishment, and accomplished the ends for which it was created. It is from a careful observation of the laws of vegetable growth and decay, that man has been enabled to take advantage of many of the beautiful vegetable products that lie scattered about in luxuriant profusion, and in proportion to the pains he takes to observe the laws of nature, and the judgment he displays in applying this acquired knowledge to scientific or useful purposes, so are the results beneficial to the community at large; one man looks perhaps at the Chemistry of vegetation, another merely at the Physiology, while a third considers it useless to waste time with such abstruse studies, and enquiries merely what is the mercantile value of fibrous substances, and how cheaply they can be brought into the market. Now all these enquiries have their relative importance but unfortunately for India, scientific and practical researches have not been carried far enough, and mere economy of production has been studied, and as far as most of the fibrous plants have been concerned, the results are anything but satisfactory. It would be as useless as it is uncalled for, to enter into a detailed account of the method of cleaning every kind of plant, but some broad and simple principles may be laid down, which have been found by experience to be applicable to the cleaning of most fibres.

THE CUTTING OF PLANTS FOR FIBRES.

The leaves, stalks or barks of plants should be cut when in full vigor and of a bright green color—when old, dry or decayed, they yield coarse and stiff fibre—no more should be cut at a time, than can be cleaned within two days; and the cut plants should not be left long exposed to the sun, as the sap dries up, and the process of cleaning then becomes more tedious. The sooner the sap, pulp, and impurities can be removed from the fibre, the cleaner and stronger will it be. The process of rotting plants, or steeping till fermentation takes place, is objec-

PLANTAIN FIBRE.

This plant is extensively cultivated throughout India, but very little attention has been paid to the cleaning of its fibres. The plants being cut down and allowed to go to waste. The fibre is easily cleaned, but some simple machinery is requisite, of the description invented by Mr. Underwood, or by Major Maitland, both of which appliances have been found on trial to be efficient. Natives would require to be instructed in the use of these machines, and rewards should be offered for the best bales of fibres exhibited.

HEMP, JUTE AND SUNN.

Of all Indian fibres, these appear to hold out the best prospects of proving remunerative. They are easily cultivated, and appear to thrive in most parts of the Presidency. Though not so strong as flax and its substitutes, they are suited for cordage, coarse cloth and other manufactures. The demand for them is steady and would probably increase if they were prepared of good quality. They could be cleaned economically by the same machinery as is used for cleaning flax, but the machines would require to be made, and their uses taught to the Natives; liberal encouragement ought to be held out to cultivators and cleaners of the fibres. Further experiments might also be tried on the barks of some other promising plants as the species of Hibiscus, Abutilon, Abelmoschus, Althaea, Ficus, Bauhinia, Grewia, and Wrightia.

Another point of some importance, which still requires to be determined is, whether Tanning or Tarring is the better mode of preserving Cordage, and whether a substitute for tar might not be discovered in some of the numerous Resins and Gum elastics of Southern India.

It should also be borne in mind that it would be more advantageous for India to turn her fibrous substances to profitable account in manufactures, than to allow other nations to reap the benefits of her fertile soil and abundant vegetation.

• ALEXANDER HUNTER,

Reporter.

LIST OF INDIAN PLANTS YIELDING FIBRES.

Common Name.	Botanical Name.	Uses.
Sara.	Saccharum sara. . .	Moonshee's pen, reed grass.
Mat-Grass or Coar- ray.	Cyperus textilis. . .	Used in the manufacture of mats.
Camachy pilloo. . .	Andropogon schoenan- thus.	Used in thatching.
Moorghee or Ma- rool.	Sansevieria Zeylanica.	Bow string hemp, abund- ant along coasts.
Pita in Adam's Needle.	Yucca gloriosa. . . .	Fibre and Oakum, clean and strong.
Do. in.	Yucca aloifolia. . . .	Clean white and silky.
Pita fibre in great Aloe.	Agave Americana. . .	American aloe, now com- mon in every part of In- dia, used for cordage.
Kathalay.	Agave Vivipara. . . .	Long in the staple, clean and strong, used for cor- dage.
Seemay Kathalay.	Agave Viridis.	Not strong Do.
Pine Apple fibre. .	Fourcroya gigantea. .	White, strong, fit for cord- age or paper.
Plantain fibre. . .	Ananassa Sativa. . . .	Fibres of various kinds, and worked handkerchief, cords of different sizes.
Fragrant Pine. . . .	Musa paradisiaca. . .	Preserved fruit and meal, fibre, tow, cords, ropes, tarred rope, canvas, work- ed handkerchief and pa- per.
Cocoa.	Pandanus Odoratissimus	White, good for paper.
Palmyra fibre. . .	Cocos Nucifera. . . .	Cocoa mats, cord and ropes.
Flax.	Borassus flabelliformis.	Good colored fibre only fit for basket work or coarse cordage.
Jute.	Linum usitatissimum. .	Flax of commerce.
	Grewia asiatica. . . .	Coarse strong bark.
	Do. tilœfolia.	Do.
	Triumfetta angulata. .	Do.
	Corchorus olitorius. .	Jute, cloth, gunny bags and rope.
	. Do. capsularis. . .	Do.

LIST OF INDIAN PLANTS YIELDING FIBRES.—*Continued.*

Common Name.	Botanical Name.	Uses.
Poolychay fibre.	Hibiscus cannabinus.	Gunny bags and cordage.
Roselle fibre.	Do. Sabdariffa.	Strong and silky.
Wild ambara.	Do. Vesicarius.	Soft and silky, fit for weaving.
Shoe plant fibre.	Do. Rosa chinensis	Clean and silky, fit for cordage.
	Do. Vitifolia.	Good color, strong fit for cordage.
	Do. Lampas.	Fit for rope and paper.
Vendee fibre.	Abelmoschus ficulneus.	Good color and long do.
	Do. esculentus.	Strong and clean.
	Decaschistia crotonifolia	Strong, silky and of good color, fit for weaving.
	Abutilon tomentosum.	Silky, good color, not strong.
	Do. polyandrum.	Silky, stronger than the last, fit for rope.
Toottee.	Do. Indicum.	Clean and strong, fit for rope.
Cotton.	Gossypium indicum.	Canvas and rope.
Brazil cotton.	Do. acuminatum.	1½ inch staple, very clean.
Valumbrikai.	Isora corylifolia.	Strong, white, fit for weaving.
	Eriochloa Candollii.	Dark color, fit for rope.
	Guazuma tomentosa.	Slightly woody, only fit for rope.
Brown hemp.	Butea frondosa.	Gunny bags.
Sunn, or wuckoonar.	Crotalaria juncea.	Strong, clean, fit for cordage and weaving.
	Do. tenuifolia.	Stained but strong.
Malhun.	Sesbania cannabina.	Fibre and rope.
Yepy tree bark.	Bauhinia racemosa.	Makes strong ropes.
	Do. diphylla.	Used in Cuddapah, makes strong ropes.
	Do. Vahlü.	Do.
Odar fibre.	Acacia leucophloea.	Clean, young bark.
Karoovalum nar.	Do. arabica.	Coarse bark fibre.
Ak, Mudar, or Yercum.	Calotropis gigantea.	Fibres clean, a good substitute for flax, fit for cambric cloth and twine.
Ootrum ka bel.	Damia extensa.	Very fine, strong and like flax do.

LIST OF INDIAN PLANTS YIELDING FIBRES.—*Concluded.*

Common Name.	Botanical Name.	Uses.
Koorinja.	Tylophora asthmatica.	Strong, clean, and resembling the yercum.
Hemp.	Cannabis sativa.	Very good, clean, strong fibre fit for cordage.
Neilgherry nettle.	Girardinia Leschenaultiana.	Yields a fine strong flax.
Arasa nar.	Ficus religiosa.	A coarse fibre for ropes.
Atti nar.	Do. racemosa.	Dark coarse bark.
Aulamaram nar.	Do. indica.	Do.
Bodda nara.	Do. oppositifolia.	Soft fibre, fit for weaving.
Elavum parooty.	Salmaia malabarica.	Very fair for stuffing pillows.
Coat seeragum.	Vernonia anthelmintica.	Coarse fibre.
Parunday nar.	Cissus quadrangularis.	Dirty uncleaned fibre.
Arengae.	Antiaris saccidora.	Sacks made of bark for carrying rice.

H. F. CLEGHORN,

JURY AWARDS.

CLASS IV.

Section V.

FIBROUS SUBSTANCES.

2D CLASS MEDALS.

Pro. No.	Catal. No.	Names of Exhibitors.	Objects Rewarded.
cxxiv.	218	Messrs. Fisher and Co., Salem.	Bales of Cotton.
clxxvi.		Mr. Meppen.	Cottons.
cccxlv.		Bala Chetty.	Colored Yarns.
lxiv.		Mr. Thorpe, Monagar Choultry.	Aloe, yercum and Plantain fibres.
lxiv.	171	Mr. Crampton.	Yercum Fibre.
lxxiv.	123—126	Mr. Horne.	Hemp lines and Coir Rope.
cccxv.	127		
	236 to 240	H. Forbes, Esq.,	Rope made at Tanjore.

HONORABLE MENTION.

Pro. No.	Catal. No.	Names of Exhibitors.	Objects Rewarded.
ccxxi.	56—64	Travancore Local Committee. . .	Fishing lines.
ccxxi.	265 to 297	Mr. Sheddan of Travancore. . .	Fibrous Substances.
clxxvi	174—205	Dr. Kirkpatrick. . .	For introducing manufacture of Rope in Lunatic Asylum, Bangalore.
lxxxiii.	59—114	Madras Local Committee. . .	For Fibres.
lxiv.	143—170	Mr. Jaffray. . .	Do. do.

REVENUE DEPARTMENT.

No. 87.

Extract from the Proceedings of the Board of Revenue, dated 12th January 1856.

Read the following.

No. 96.

FROM JAMES FRASER, Esq.,
Acting Collector of Masulipatam,

To G. S. FORBES, Esq.,
Acting Secretary to the Board of Revenue,
Fort St. George.

SIR,

With reference to the Board's Proceedings of the 25th September 1854, forwarding printed Extract from the Minutes of Consultation of the 19th Idem, in which information is called for relative to the Fibrous plants grown in this District, I have the honor to state that with the view of making known generally the views of Government in this respect, Telloogoo proclamations were printed and circulated throughout the District; and while information was called for on the present state of the cultivation, the attention of the ryots was particularly drawn to the great importance of extending it and the large profit likely to be derived from it.

2. From the local returns which have been received, after much delay, I find that fibres of only four sorts viz. Cotton, Gogoo, Janoomoo or Sunn and Cocoonut, are cultivated; and that in such inconsiderable quantities as to be scarcely adequate even to meet the demands of this District. The ryots appear to be little disposed to extend their cultivation of this species of plants, unless induced to do so by advances, and an assurance of a sale for their produce—I think therefore that some time must elapse and a good deal of trouble be taken by the local Officers, before there will be any supply to spare for other markets, unless speculators choose to make money advances and repay themselves in fibre.

3. A Return showing the specific plants now cultivated in this District, with remarks as to the mode of preparing these fibres, is herewith sent.

I have &c. &c.,

Masulipatam,
Collector's Cutcherry, }
8th December 1855.

(Signed) JAMES FRASER,

Acting Collector.

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Ordered that a copy of the foregoing letter with its enclosure be submitted for the information of Government with reference to para 10 of the Board's Proceedings dated 15th and Extract Minutes Consultation 31st October 1855.

(A true Extract and copy.)

(Signed) G. S. FORBES,

Acting Secretary.

Return showing the Extent of Land Cultivated with Fibrous Plants, with the estimated quantity and Price of Fibre of Masulipatam District.

Name of the Fibre.	Description and extent of land cultivated.				Estimated produce per Cawny.	Selling price of Fibre per	Remarks.																								
	Dry.		Wet.																												
	Cawnies.	Rupees.	Cawnies.	Rupees.																											
1 Gogoo Fibre, . .	641	402	...	...	12 Tooms,	12 Rupees per Candy,	In most localities the Gogoo seed (believed to be a species of Roselle) is generally sown in the same ground with Poonasa crops, viz. Jonna, Mokka Jonna, Sujja, &c. It is however sown in separate fields also, the extent of which is here shown. After the plants have attained a sufficient stage of ripeness, they are cut, tied into bundles and put into water to soak, and allowed to remain so for 4 or 5 days; the fibre is then stripped off by hand; the cost of raising and preparing for the market the crop on each Cawnee of land amounts to Rupees 3-4, as particularized in the Margin. The fibre is used for cordage of all sorts and occasionally for Gunny weaving. The quantity raised in this District is so small that it is not more than adequate to meet the local requirements. The Ryots are unwilling to engage in the growth of this plant to any extent unless they are assured before hand that they will find a ready market for their surplus produce and advances of money are given them. In some Talooks no sist is levied for land cultivated with Gogoo, viz. when sown in back yards—when it forms a mixed crop with other grains—or a second crop after them. Thus 360 out of 641 Cawnies are exempt from any tax. <table><tr><td></td><td>Rs.</td><td>A.</td><td>P.</td></tr><tr><td>For tilling the land, -</td><td>1</td><td>8</td><td>0</td></tr><tr><td>Value of seed, -</td><td>0</td><td>4</td><td>0</td></tr><tr><td>For extracting fibre, -</td><td>1</td><td>8</td><td>0</td></tr><tr><td></td><td><u>3</u></td><td><u>4</u></td><td><u>0</u></td></tr></table>		Rs.	A.	P.	For tilling the land, -	1	8	0	Value of seed, -	0	4	0	For extracting fibre, -	1	8	0		<u>3</u>	<u>4</u>	<u>0</u>				
	Rs.	A.	P.																												
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For extracting fibre, -	1	8	0																												
	<u>3</u>	<u>4</u>	<u>0</u>																												
2 Janapa or Sunn, .	819	2,715	...	...	10 Tooms,	17½ per Candy, . . .	This plant is cultivated separately, to a considerable extent; and the land is charged with assessment. The fibre from this plant is prepared as above described. The charges for raising and preparing for the market the crops on each Cawny of land, are Rupees 3-14 as shewn below. The quantity of fibre may be considered sufficient for local consumption and is used for cordage and gunny-weaving. <table><tr><td></td><td>Rs.</td><td>A.</td><td>P.</td></tr><tr><td>For tilling the land,</td><td>1</td><td>8</td><td>0</td></tr><tr><td>For seeds,</td><td>0</td><td>6</td><td>0</td></tr><tr><td>For cutting the plant,</td><td>0</td><td>8</td><td>0</td></tr><tr><td>For stripping fibre,</td><td>1</td><td>8</td><td>0</td></tr><tr><td>Total...</td><td><u>3</u></td><td><u>14</u></td><td><u>0</u></td></tr></table>		Rs.	A.	P.	For tilling the land,	1	8	0	For seeds,	0	6	0	For cutting the plant,	0	8	0	For stripping fibre,	1	8	0	Total...	<u>3</u>	<u>14</u>	<u>0</u>
	Rs.	A.	P.																												
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Return showing the Extent of Land Cultivated with Fibrous Plants, &c.

Name of the Fibre.	Description and extent of land cultivated.				Estimated produce per Cawny.	Selling price of Fibre per	Remarks.									
	Dry.		Wet.													
	Cawnies.	Rupees.	Cawnies.	Rupees.												
3	Cocoanut Fibre, .	80	5	...	...	5 Candies, .	4 Rupees per Candy, .	There are but a very few Cocoanut Gardens in this District. The husks after being separated from the nut are soaked in water for 2 or 3 days and well beaten with wooden mallets. The beaten fibre is then rubbed between the hands to clear it of refuse and sold at from 3 to 4 annas per Maund. It is estimated that the husks of 200 coconuts yield 4 Maunds of fibre. The charge for this is 1 Rupee at 4 annas per maund. The people who buy the husks also prepare the fibre. The Ryots are willing to extend cocoanut plantations, but generally the soil of this District, is not adapted to their growth. The fibre is sufficient for consumption within the District. The Jilladoo or Yerkum plant grows extensively on waste sandy soils, but the process of preparing fibre from it is generally unknown here. <table><tr><td></td><td>Rs. A. P.</td></tr><tr><td>Value of 600 pieces of husk taken from 200 cocoanuts, - - -</td><td>0 4 0</td></tr><tr><td>For preparing fibre, &c., - - - - -</td><td>0 12 0</td></tr><tr><td>Total...</td><td>1 0 0</td></tr></table>		Rs. A. P.	Value of 600 pieces of husk taken from 200 cocoanuts, - - -	0 4 0	For preparing fibre, &c., - - - - -	0 12 0	Total...	1 0 0
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Value of 600 pieces of husk taken from 200 cocoanuts, - - -	0 4 0															
For preparing fibre, &c., - - - - -	0 12 0															
Total...	1 0 0															
4	Cotton,	5,861	8,896	...	...	10 Tooms, .	12 Rupees per Candy, .	The Cotton sowing takes place in the month of October after ploughing the land three times over. The plant comes to maturity in 6 months and the crop is gathered as it ripens twice in the year. The charges of cultivation per each Cawny of land amount to Rupees 3-8-4. The total extent of Cultivation in this District does not exceed Cutties 468$\frac{1}{4}$ or 5,861 Cawnies. A maund of Cotton (uncleaned) sells at 10 Annas ; a maund if cleaned at Rupees 2-8.								

Masulipatam, Collector's Cutcherry, }
 8th December 1855.

J. FRASER,
 Acting Collector.

Revised Tabular Statement of experiments on Cordage made from following Fibres, country produce.

No. of Parcels.	Names of Nars.			Botanical.	Specimens of Cordage forwarded.	Price of each Nar per Maund of 30 lbs.	Quantity of each Nar for making 100 yards of each description of Cordage.	Cost of Nar for 100 yards of each description of Cordage.	No. of Lascars per day of 8 hours for making 100 yards of each description of cordage.
	Malyalum.	Tamil.	Hindoostanee.						
1	ബക്കൂ നാർ. Buckoo nar.	சனுப்பநார். Janapa nar.	سنگ کا ڈار Sunkáh nar.	Crotalaria juncea.	Log line.....yards 12½ Rope 2 inches..... „ 2 do. 1½ „ „ 2 Fine twine „ 100 do. for cartridge „ 100 Whip cord „ 30	Rs. 21½ lbs. 3 oz. 11 doz. 8 Rs. 2 A. 7 P. 7	6 41 22 1 1 5		
2	പൂൽച്ചീനി Poolchee nar.	புலச்சிதார். Poolchee nar.	امارے کا ڈار Umadakè nar.	Hibiscus Cannabinus.	Log line „ 12½ Rope 2 inches..... „ 2 Gunny twine „ 50	Rs. 3 lbs. 83 oz. 5 doz. 5	5 31 1		
3	കിടാ നാർ. Kiedah nar.	கத்தாலேநார். Kuttaly nar.	راکاسپٹکی کا ڈار Rakusputteki nar.	Agave Americana.	Log line „ 12½ Rope 2 inches..... „ 2 Whip cord „ 30	Rs. 2 lbs. 20 oz. 5 doz. 12	6 24 4		
	യറക്കൂ നാർ. Yercoo nar.	எருக்குநார். Yercum nar.	آکے کا ڈار Ugkah nar.	Asclepias Gigantea.	Drum rope „ 4 Whip cord „ 10	Rs. lbs. oz. doz. ....	..... ..... ..... .....		
4	ജവട്ടി. Javattie nar.	நார்வள்ளி. Narvally.	گوندی کا ڈار Goondekah nar.	Cordia Obliqua.	Rope 1½ inch .....piece 1	Rs. lbs. oz. doz. ....	..... ..... ..... .....		

Note.—The prices are calculated at the rates at which the Nars are at present procurable. Wastage, time and workmen will much depend on the quality of the state in which it is received, whether well cleansed of the chaff or straw, or otherwise.

(Signed) J. FRENCH, LIEUTENANT,
Acting Assistant Commissary of Ordnance.

unt. Further trials have however been made in endeavor a more speedy and effectual method of extracting without any satisfactory results. The slow process of on the skin by hand, seems the best for obtaining the l and without discoloration, and which will be better ispection of the pieces of skin enclosed, having the fibre ed, and which is done when the skin is fresh and moist. for spinning, after having been placed in the sun until

nens of small rope, made from yereum, are put up in

4. contains a piece of small rope made from the bark of called in Tamil Narroovallay,* but this I have not been able to ascertain with certainty. The specimen was obtained from Calicut, a portion of s also some slit into shreds preparatory to being twisted, the same parcel. I have been informed that this bark urge coarse rope and used in some parts of the Malabar ing logs of timber by means of elephants. It appears of he sample forwarded sustained on trial here, a tension of

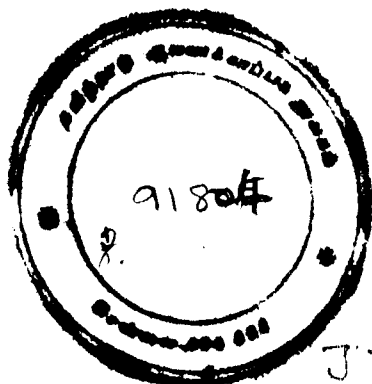
I have, &c. &c.,

(Signed) J. FRENCH, LIEUTENANT,

Acting Assistant Commissary of

Ordinance in charge.

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PUBLIC DEPARTMENT.

No. 1407.

Extract from the Minutes of Consultation dated 31st October 1855.
Read the following letter from the Acting Secretary Board of Revenue.

(Here enter 15th October 1855.)

Ordered that this letter from the Acting Secretary to the Board of Revenue and the reports submitted with it, together with the Reports already received from the Marine Board and Chamber of Commerce on the subject of the Fibrous Plants of the Presidency be at once printed and published as a Selection from the Records of Government.

The Extract Minutes of Consultation dated 19th September 1854, and its Appendix will be included in this Selection, as will be also the Report of the Jurors on the Fibres exhibited at the late Madras Exhibition, which has been submitted to Government.

(A true Extract,)

(Signed) T. PYCROFT,
Chief Secretary.

	Rs. A.
12. REDUCTION OF THE REVENUE ASSESSMENT OF NORTH ARCOT.....	Royal 8vo.... 0 8
13. GENERAL REPORT OF THE ROAD DEPARTMENT FOR 1854-55.....	do. ... 0 12
14. REPORT ON THE MEDICAL TOPOGRAPHY OF THE SOUTH WESTERN POLITICAL DISTRICTS.....	do. ... 0 4
15. REPORTS ON IMPORTANT PUBLIC WORKS FOR 1853.	do. ... 1 4
16. MEMORANDUM ON SALT.....	do. ... 2 10
17. REPORT ON PUBLIC INSTRUCTION IN THE MADRAS PRESIDENCY FOR 1854-55	do. ... 2 8
18. REPORT OF THE RAILWAY DEPARTMENT FOR 1854.....	Royal 4to.... 5 0
19. REPORT ON THE PORTS AND HARBOURS OF THE NORTHERN CIRCARS, &c.	unfinished
20. REPORT ON VACCINATION FOR 1854.....	Royal 8vo.... 0 8
21. REPORT ON CIVIL DISPENSARIES FOR 1854.....	do. ... 0 8
22. PAPERS RELATING TO THE REVISION OF THE LAND REVENUE ASSESSMENT IN SOUTH ARCOT.....	do. ... 0 8

1856.

23. REPORTS ON THE FIBRES OF SOUTHERN INDIA.....	do. ... 3 0
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