No. 35

35

Fibres 1890s

Fibres

Fibres

(G 3)

Ag. S. 90.
94.

CS 307
94

From whom

S. J. S. (S. J. S.)

Place

21 12 13

Date

Forwards copy of letter from the D.
of New Jersey re the Principles
Fibre of the S. S.

Former Papers.

MINUTES.

Final Paper.

What is the history of the pine apple fibre
latter come (by Mr. Perry?)

SA 17 Jan.

23 1 94.

D. of Science

Please Report

SA 18 Jan.

25 1 94.

Hon. C.

The fibre referred to was obtained
by Mr. Perry in Massachusetts is referred
in the last no. of the Bulletin the price
offered is low & I am doubtful as
to its paying at that price a single
sample was made by John Perry

No minutes should be written on this page. A separate half sheet to
be used if required.

A
1

Straits
No 343

347
94

Downing Street
21st December 1893

Sir

I have the honour to transmit
to you, for your information and
for communication and for communication
to the Director of the Botanic
Gardens, Singapore, the paper noted
below on the subject of the
Pine-apple Fibre of the Straits
Settlements

I have &c

Sd. R. H. Meade

for the Sec: of State

The G. A. the Govt of the S. S.

Date.	Description of document.
16 th December	Copy of a letter from Sec.

Plantains
5 small stems 12 1/2 lbs

Received from St Omer's Reserve
on 10 Sept. 1 cart load pine. apple
leaves, at 4 p.m. leaves steeped
in lye.

1 Cartload leaves = 3475 leaves

weight 611 ~~lbs~~

Fibre produced 4 ~~lbs~~ 2032

F 35 / 6

Treasurer,

John A. ...
...
for the above service,

signature should be written or stamped
has been actually received.]

347
94

Royal Gardens Kew
December 16th 1893

Sir

I have the honour to inform you that Mr. Robert Derry, Assistant Superintendent Gardens and Forest Department Malacca who is now at home, on leave has brought to this country samples of locally produced Pine-apple fibre which is of excellent quality and of extraordinary length.

2 I enclose a report upon the fibre by Messrs. Ide & Christie which seems to hold out encouragement for the production and export of this fibre to this country in large quantities.

I have &c.

SD: W. J. Threlton Esq.

The Hon: R. H. Meade C.B.
Colonial Office
Downing Street S.W.

Ken. 22nd. May 1889

Dear Mr. Derry.

We are in receipt of your letter of the
11th March respecting fibre from an
indigenous Musa; and Malacca prepared
Cajuput oil. The latter arrived on the
5th inst and we submitted them at
once for the opinion of experts.

Cajuput oil

The largest and most reliable people
in connection with drugs and medicinal
oils are Messrs. Burgoyne & Co. They are

wholesale merchants who buy
largely and issue a very complete
Monthly list. I enclose their report
on your Cajuput oil which does not
appear to be acceptable in this country.
The colour is against it and also the
odour. Buyers of foreign produce are
very conservative in their ideas and it
would take many years to educate them
to take a brown oil when they have become
thoroughly accustomed to a green oil even
if the former were proved equally effective.
Your friends should make an effort

to produce an article exactly similar in colour
and odour to the Ambogyn white. There
would then be no difficulty in finding a
ready market at prices fairly remunerative.

Fibre from Nahuia Musa

The Report on this from Messrs Ide and
Christie quite agrees with what I had
thought of it. The individual fibres are flat
woody & rather weak. There is no substance
or weight in them and they could not come into
use as a substitute for Manila Hemp. If
you examine the latter you will find the
individual fibres are round, hard and
polished. They are very strong and in the mass
yield considerable weight. In fact there is

little if anything is common between the
two fibres although they are yielded by
plants so closely resembling each other
in vegetative characters:

These Reports, which are enclosed in
full, are of a very useful character
as they indicate the particular points
to which attention should be given in order
to produce a satisfactory commercial
article in each case.

With kind wishes

Very sincerely yours

D. Morris.

R. Denny Esq.

Messrs Ide & Christie

12 Mark Lane

London E.C. 8th Dec 1893

Dear Sir

We have have had to-day
a call from our manufacturer to whom
we gave samples of your pine-apple
fibre. Although his treatment of it
is not completed yet, he is satisfied
that he could use it in large
quantities say 1,000 tons a year
or more at a price of £30
per ton in London. This may
be some encouragement to you
and your planter friends in
the Straits Settlements to organise
the planting of pine-apple to
yield fibre on a commercial
scale. Of course as you cannot
make any engagement at present
to deliver a reasonably large
quantity within a period of six
or twelve months, it is impossible
to bring our friend to, actual
business just now. He tells us it
is more difficult to bring this
fibre

fibre to a spinning condition
for fine yarns or fabrics than
even Ramie or China grass, but
he thinks the results are good
and would reward the care taken
in its manufacture.

Yours faithfully
(Sd) J. de & Christie

colour is against it to the extent of £5 for ton
No III La tāk fibre from Bark of Hibiscus
^{flaccidus} - This material would find no
market in England. If it could be reduced
to the condition of filaments it might be
saleable but we could only assess its
commercial value after seeing it in that
form.

No IV Bark fibre used for tying pepper plants

Of no commercial value in the English market

No V Pining Hard - Wild plantain fibre

We regret that this is much too hard & coarse
to be of any use in its present state would
be quite unworkable. Were it better prepared so
that the fibrous filaments were free, as in Manila
hemp it might command same price. We
think the fibre very much weaker than that
obtained from *Musa textilis*

We are &c &c

J. H. Christie

Copy of a letter from Messrs J. & A. Christie.
Fibre Brokers. 92. Mark Lane London. E.C. 3.

Sir,

We are duly favoured with your letter of the
6th ult. & package of fibre samples upon which
we beg to report as follows

No I. Pine apple fibre obtained by scraping ^{leaf} the

This is well cleaned but we think that
possibly an even better colour might be
obtained - Pine apple fibres have never been
imported into England in sufficiently large
quantities to test their full capabilities &
value - Such parcels as have come into
the market, rarely exceeding a few bales
at a time have generally only found
purchasers among the rope & cord makers
& for such ordinary purposes we value your
sample @ £24 per ton today in London
We are of opinion however, that the fibre is
fit for much better purposes than this;
& if parcels of 5 @ 10 tons were prepared
& sent home an adequate test of its real
value might be found

No II Pine apple fibre prepared by maceration

This is not so well done as the other, neither
is it so long - while its somewhat dirty

No.

Gardens and Forest Department,

STRAITS SETTLEMENTS,

Malacca,

30th Aug., 1892

Dear Mr. Ridley, By today's mail I send two samples of pine-apple fibre for report. Some time ago I noticed a pine-apple growing in the ~~forest~~ *beluker* in some parts of the Pandan Reserve, with remarkable long leaves, called by the Malays 'pinang berdauri'. It differs from the ordinary cultivated pine-apple which has been abandoned and become wild, by longer leaves, and being much more thorny. Though doubtless this variety too has been cultivated and abandoned.

The samples now submitted for report are both specimens of 'pinang berdauri' but prepared by different methods.

One sample has been cleaned by simply scraping the leaves with a small basin & extracting the fibre. In this way the fibre can be prepared beautifully, but the process is so slow

that it could only pay at a fancy price.

The second sample was cleaned by macerating the leaves in water for seven days, by this time the leaves ^{had} sufficiently rotted so that the upper & under surfaces of the leaf could be separated between the thumb & finger. The fibres drawn out quite readily. The fibres were then again immersed in water for ^{about} twelve hours so as to wash off the mucilaginous matter. & then dried in the sun.

This is a quick process but the fibres slightly discolour.

Yours faithfully
T. Dancy

The samples were submitted for
analysis as both specimens of
the same material but prepared by
different methods.
The samples have been found to
be of the same quality the fibres
being clean & of the same length.

Experiments & notes on the produce of pine-apple fibre

Given a fibre possesses power, length, strength, & colour
& is, in fact a desirable marketable article the first point
of importance from a planter's view would be the yield
per acre.

There is considerable discrepancy in the published
accounts of the produce of different fibres. Thus -

Flax	400 - 1000 lbs per acre
Plantains	600 - 1000 lbs (this is a calculation)
New Zealand flax	1792 lbs per acre

But the fibre making the greatest stir in the market
& the present time is 'Sisal hemp'. The Govt of the
Bahamas has restricted the cultivation of Sisal
hemp to 10000 acres for 10 years & it is
calculated this will produce a maximum
output of 50000 tons, i.e., 10 cut, or 1120 lbs per acre.

~~At Malakka~~ A few days ago I counted the
pine-apple leaves contained in a square - 275
horizontal leaves not counted, 275 leaves. This makes a total
3475 green leaves weighs 611 lbs & produces 2028
of fibre. Therefore $275 \times 4840 = 1331000$ (leaves) & as
3475 leaves give 2028 of fibre. $1331000 - 3475$
= 1327525, & 4 lbs 2 oz $\times 383 = 1579$ lbs the produce.

Therefore pine-apple fibre compares with Sisal hemp
by 1579 lbs per acre against 1120 lbs per acre.

A very badly ^{cleaned} sample of pine-apple fibre
submitted by Tan Hui Juan to Singapore for
valuation was valued

the china market @ \$3.00 per picul, i.e. 16 picul
to the ton & \$7.00 to a 1/2 ton 70. £ a ton
It is calculated Siam hemp will pay @ 20. £ a ton
This is considered a fair price when large supplies
are being shipped, so that if 60 £ a ton be considered
an average price for pine apple fibre & allowing
the latter could not be cleaned by machinery, it will
be seen there is a large margin to cover working
expenses.

It will be observed that while the per cent
per acre of p.a. fibre is large, the per centage of dry
fibre to the weight of green leaves, as compared with other fibres, is low.
This is so, owing to (a) pine apple fibre, weight for bulk,
perhaps, is the lightest of all fibres & (b) the fibre was
cleaned by maceration, & the loss is greater than in
machine cleaned fibre. At least, this much is claimed
for maceration. As regards Death's wood, the well known
manufacturers of fibre machines consider (I believe)
anything below 2 p/c too low for machinery
(i.e. weight of fibre to that of leaves) pine apple is
~~only below this about this~~

~~This however really shows that the great~~
I mention these points in connection with
machinery but when it is considered that how
small pine apple leaves are compared with any
of the well known types it will be understood
that machinery could not help much, that in
handling so many leaves, the leaves could
be much quicker laid in water for ~~some~~ a
hours of maceration than ~~in~~ ^{and} the feeder of
machine to be cleaned.

Pine apple leaves compared with ~~some~~ most of the hemp
 such as Mauritius hemp, silk grass, Sea hemp,
^{say against} 3 1/2 lbs against 3 lbs. & I take it, if reliable
 information could be obtained, it would be found
 weight for weight, of green leaves, p.a. is very little
 below other fibres, but a leaf weighing 3 lbs could be
 cleaned by machinery ^{about} as quickly as a leaf
 weighing 3 ozs. & so that the output per hour
 must necessarily be much higher, ^{while} ~~the saving~~
~~in labor is a point.~~

I am led to this opinion from this, a
 sample of plantain fibre. I took 300 lbs of
 green (so called) plantain stems, it
 produced exactly of dry fibre 1/2 lb
 so that plantain & pine apple fibres
 cleaned by hand compare

Plantain 300 lbs green stem	1 1/2 lbs dry fibre
Pine apple 300 " " leaves	2 " " "

~~In process after machinery~~

611 lbs of green leaves produced 41 lbs 2 oz of dry
 fibre i.e. about 10/8 ozs of dry fibre per hundred
 lbs of leaves. ~~they would be about 1/2 lb of dry fibre~~
~~I find on an average of various fibres~~
 a fibre to, ~~about~~ 31 1/2 ozs. According to reports I note
 on an average most dry fibres have lost 3 times
 their weight, this would ^{give} of pine apple
 31 1/2 ozs of wet fibre to 100 lbs of green leaves
~~for all but~~ 2 lbs.

Whether p.a. leaves were cleaned by machinery,
 or by maceration, or the work entailed in gathering
 leaves & sorting would be the same in both cases.

but there would be a great saving of labour in the
latter against the former after this.
Thus; a machine would require one person to feed
one hand leaves into feeder, one to dress the
filene, one to hang up the filene & one to wash the
filene, & of course an engineer, at least 6 persons
but if these the leaves were to be cleaned by
macerating in water the whole work could be
done by one person. I take it machinery is only
adapted for hulky leaves such as already been
cited, which yield a large output per hand
& this I should think ^{is the reason} why machinery for
cleaning coir ^{filene} in the Straits by machinery for
the output per hour was so small not enough
to cover working expenses, as it is well known
cleaning coir filene by hand is done in Ceylon
forms a large & important colonial industry

2) Cleaned by hand there is plenty of native labour
in Malacca for such an industry & also
the undertaking much ~~more~~ ^{less} ~~expensive~~ ^{economical} ~~in~~ ^{to} ~~the~~
planter would cultivate a certain area
of coir leaves, the cleaning & ~~the~~
reelsters be done by contract.
In short, he would plant his coir & then
pay the filene cleaners to make him up & ~~the~~
reelers to reel the coir.

Can a manufacturer buy from natives at this price, if they have to bring it in small quantities ~~from miles and miles distances~~ ~~???????~~ 30.

Can a manufacturer obtain it from his own plantations, if situated all around his ~~factory~~ ~~???????~~ ~~.....~~ Yes, and cheaper

Therefore what ~~type~~ ~~with~~ the best machine, if you have not sufficient and cheap raw material. ~~???????~~

That machines, working fibres, exist, is I believe, known to every body.

Often, by European fibre merchants the question has been put, why Singapore does not export Pineapple fibre. ~~???????~~ ~~as it seems the raw material is plenty of raw material, and it is not necessary to cultivate more.~~ The reasons are very simple.

Pineapple (if cultivated in the sun for fruits) ~~is a~~ a very short and light fibre of only about 2% return, therefore to make one ton fibre (dry) it is necessary to work about 300 piculs of leaves. The price for one picul of leaves, asked by natives, delivered in Singapore, is \$ 0/60 and higher, or the cost of the raw material nearly \$ 480/- per ton of dry fibre, or more, than the value of the fibre on the London market. That are the reasons for this exorbitant price of \$0/60 asked by natives. ~~???????~~ The following.

1-) The very expensive bullock cart hire from the center of cultivation at the 9th mile in Thomson & Bukit Timah Road and Pasir Panjang

2-) The impossibility ~~to cultivate~~ ~~to the only Chinese cultivators~~, that it does not spoil the plant or ~~lose~~ the return in fruits, to cut from each plant some leaves.

3-) The ~~restriction~~ ~~of only few leaves from each plant~~, where high coolie wages. ~~When coolie wages are expensive~~

But on the other hand to expect a ~~factory~~ for the reason ~~near~~ near the plantations is impossible, because there exist no clean ~~sweet~~ ~~water~~ ~~nor~~ water to drive the engines nor cheap fire wood for this purpose.

Therefore to make Pineapple or any other fibre will only be possible if cultivated around a ~~factory~~ ~~pineapple~~ and some other fibres ~~under~~ ~~shade~~.

where leaves pineapples for instance obtain a length of 6 to 12 feet and contain up to 3 % fibre and will cost delivered ~~before~~ ~~the~~ only \$0/10 to \$0/15 per picul or as raw material \$ 80/120 per ton.

The points to be taken into consideration to start a fibre venture

which ~~shall~~ ^{will} work and pay are the following

- 1) Sufficient capital
- 2) Patience, Courage and a clear knowledge of the cultivation and
- 3+ manufacture.
- 3) Well situated and good land from the point of view of cultivation of plants as for the erection ~~of a factory~~ ^{factory} and the transport of leaves from field to ~~factory~~ ^{factory}.
- 4) Sufficient and cheap labour.
- 5) Good and clean ~~water~~ ^{water} in sufficient quantity and sun over 35' for bleaching purpose.
- 6) no cyclones ~~to~~ ^{to} spoil the leaves in the fields
- 7) cheap fire-wood, ~~water~~ ^{water} power to run the engines
- 8) suitable climate for the development of the plants
- 9) ~~long~~ ^{well} made machines with high precision, and ~~well~~ ^{well} erected.

All these points united constitute, what I call ; favourable circumstances; and I believe they exist all in the Straits and F.M.S. ~~better than~~ elsewhere. *in a greater degree than elsewhere.*

risk, as long the prices on the Sisal standard ^{is} in London ruled higher than £ 18 per ton. actually £ 37. and has never been under £ 16. with an average for the last 15 years of £24. does not exist, as all the fibre plants grow here ~~very rapidly~~ ^{very rapidly}, are free ~~of any sickness~~ ^{from disease}, never ~~attacked~~ ^{attacked} by insects (even cattle do not like meat of them) and can stand very wet and very dry long seasons without suffering.

Of course ~~the best~~ ^{it would be} ~~to~~ ^{to} induce the natives to take up the cultivation of fibrous plants and to assist them by advances and seeding etc.etc., but a ~~factory~~ ^{factory} must have its own plantations, in order to remain independent ~~in~~ ⁱⁿ planters, as regards price for the raw material and the regular supply, to run the engines.

Should you like to have any further information regarding this for the Straits very promising industry and produce I am at your disposal.

Yours very obedient servant.

J. Schuyler

Senawang Estate,

SEREMBAN

NEGERI SEMBILAN

June 3. 1905

H. H. Ridley Esq

Director. Botanic Gardens. S. S.

Singapore

Dear Sir.

I am obliged to you, for sending me the "Agricultural Bulletin" - for Jan - Feb; & March - & should like April, & following numbers.

I should also like back numbers - for 1904, if you have them - & is it possible, to obtain them even further back, in complete form?

If Messrs Kelly & Walsh have not paid my subscription, kindly let me know, & I will send it - & also amount for any back numbers -

In your March Bulletin, I notice an article on Coconut fibre - which, I think, is not quite correct -

There it gives as a reason, why

The local Coir is useless - that the nut is cut too soon. Now I have had some experience in Ceylon, & the nuts are taken when 8 months ~~old~~ old - if taken later, the husk is not good for fibre - even sh^d ~~it be~~ the nut be taken before 8 months old.

Further it is stated, that the husk is removed by iron spikes - I think not, but by a "Kitool" spike - This is a specially hard wood.

Now is it necessary to throw the husks into salt water tanks. The usual way is to dig a hole on sea-shore - in the sand, & place therein the husks, keeping them down with stones - for from 3 to 6 months - longer is unnecessary - Of course, the holes are made, inside high water mark - so that 2 tides daily, cover them -

This is, for what is known, as "Saltwater Yarn" - which is principally used for making cables, & such like -

Fresh water does not cause the fibre to become discoloured, or foul - on the

Contrary, fresh water yarn is of a better colour, than salt water yarn - & sells at a higher rate.

In this case, the husks are placed in water holes - & covered with logs &c. for from 2 to 4 months.

I hope you will not mind my interference, in this matter - but I think you will find all I say, to be correct.

People here seem to know nothing about the value of the Cocoa-nut - & its husk, seeing how it is simply thrown away!

I also send under another cover, sample of a creeper - which seems to me to contain good strong fibre - & I also send in this sample of the fibre, & leave, ~~the~~ former roughly made, by my daughter -

Can you tell me what it is? & if of value? It seems to be more of a ground creeper, than a tree one.

Yours faithfully
J. H. Momburse

F 35/16
P.S.

In 1901. I sold "Cogella" (a well known Southern Province - Ceylon.) yarn - No 7 - @ 8/12 per cwt.

Fresh Water Yarn - & Salt Water Yarn - @ 7/8 - per cwt - No 7. is the size most generally used. J.H.M.

Senawang Estate.

SEREMBAN.

NEGRI SEMBILAN.

June 13-05

H. H. Rowley. Esq

Dear Sir.

I am much obliged for your letter, & for sending the "A. Bulletin" back numbers - & I enclose cheque for \$19.50, in payment of a/c.

Fibre. I expect to be in Singapore shortly, & will bring with me, more of that creeper. So far my daughter has not found any flowers - or fruit.

She simply cleaned it by hand. As to Coir fibre, I will have some made treated, in the manner I related, & you shall know result - actual proof will go further than any assertions of mine, to prove what I said before.

Yours faithfully
R. M. M. M. M.

L. L. Ho

To
From whom

Hon. H. Councillor

Place

Malacca

Date

7. 10. 85

Fruit $\frac{43}{85}$

Informing him there are several
thousands Hemp plants at the
Nursery at Bukit Bruning, and
advising the sale of 500,000 of the
same to Mr. Tan Keng Hoo

Former Papers.

MINUTES.

Final Paper.

L. L.

Try and find this man I wish
to see him

(Sg) D. A. S. H.

16. 10. 85

Hon. H. C.

He is come

That

29. 10. 85

Supt B Gardens

He proposes, he tells me
to plant 200 acres with this

(Sg) D. A. S. H. 29. 10. 85

Hon Res Councillor

I will send to Mr. Kruang some 500 plants from here in a day or two of hump.

I care say Mr. Jackson will have some 10,000 plants in the nursery.

Countrij all sizes, kindly ask him to furnish a statement of what he has on hand and offer them to the Chinese gentlemen in question for a reasonable price.

The plants being for an experimental purpose they should be sold as cheaply as possible, say \$3 or 4 a thousand.

(Sg) H. C.

6/14/85

This paper has been sent by me for the first time today since my return from Spore.

For certain

(Sg) H. C.

Hon Res Councillor

I have about 8000 plants of different sizes I will offer them to Mr. Kruang at \$4 per 1000.

I will report the results (Sg) H. C.

26. 11. 85

Report Result on this paper

(Sg) H. C.

27. 11. 85.

Hon Res Councillor

As far as ^{no} plants have been supplied if Mr. Kruang does not want them perhaps some other enterprising individual would give the experiment a trial, it is worth while giving land free for this purpose to any one who will undertake to carry the experiments through.

I can give all information necessary as regards preparation for her (Sg) H. C.

8. 2. 86

A little more on the subject of the
state of the world at the present time. The
state of the world is such that it requires
a great deal of care to be taken to have
a success in the various the great of the plant
which is the most difficult to grow. It is
the most difficult to grow the most of the plant which
is the most difficult to grow. It is the most difficult to grow
the most of the plant which is the most difficult to grow.

In the plant, the most difficult to grow is the most difficult to grow. It is the most difficult to grow the most of the plant which is the most difficult to grow. It is the most difficult to grow the most of the plant which is the most difficult to grow.

The plant which is the most difficult to grow is the most difficult to grow. It is the most difficult to grow the most of the plant which is the most difficult to grow. It is the most difficult to grow the most of the plant which is the most difficult to grow.

The plant which is the most difficult to grow is the most difficult to grow. It is the most difficult to grow the most of the plant which is the most difficult to grow. It is the most difficult to grow the most of the plant which is the most difficult to grow.

1844

1844

Walden

10th October 1855

I have the honor to inform you,
that there are in the back garden
of the Rectory several specimens of
some plants which I have
found growing where I have
sowed the seeds collected in the
last year of growing a new seedling in
the garden.

I am the person who has collected the
plants for you for some time past and
I am now.

I have made several inquiries of
various people who have been
sowing seeds exactly what the
seeds.

I am quite sure that the seeds
which I have for you are the same
that I have the pleasure of growing
in the garden.

Yours faithfully
Walden (Capt. A. C. C. C.)

(G 3)

Yours to $\frac{46}{85}$

From whom

Place

Date

Superintendent of Forests

Singapore.

23. 12. 55

Forwards and hundred kinds of
fibres -

Also some other specimens

Former Papers.

MINUTES.

Final Paper.

No minutes should be written on this page. A separate half sheet to be
used if required.

Overseer of Forest
Palmer

It is not advisable to sell any
of the hemp plants for the present
& the seeds received are a fine
lot, but we want much more,
please make every effort to keep
the Jacksons collecting together with
whatever assistance you can give
them.

1. Where did the seeds come from?
(distance) what did the collector cost
how should have supplied this
information at the time.

4. How many watchmen have you
on hand.

5. Have you been sworn in yet?

Have your men been?

6. Please send me a short report
conveying in detail what has been
accomplished since the beginning
of the year.

Yours truly

W. B. F.

Perth

23/12/1852

Resident Council

Malacca

Sir

I found you to day by
opened hear the Chinese hands of
fibres prepared mostly from Malacca
Plant - the matter has been examined
paper prepared, but I find it has
been found to prove that there is in
Malacca a excellent industry in fibres
of which ^{of great quantity is known} ~~of great quantity is known~~ I
am very much surprised to find so many
good fibres can come from Malacca plants.

I found you by the way

by a note

of the Malacca Council

But after the birds appeared for
principal for collection purposes, and
Collection of smaller specimens, among
the latter are a good many fine
specimens and among the larger specimens
perhaps the one bird in the part of the
late morning of the - the one who
selected only part of the lot.

3. I have not been able to label them
all with their scientific names. The specimens (which have
been sent me) are chiefly leaves only, and
for the same reason I have mounted
them in such a manner as to accompany the birds
as the same would have been advisable.

4. You will observe that the specimens
mounted you have sent me are small
and very like to the specimens

Yours very truly
J. C. Smith

5. Among the timber are some of unimproved
quality and I flatter myself that I
discovered them. The common *Scirpus*
(*the Island Clay*)
discovered ~~is~~ a kind of *Scirpus* found
in *Madagascar* and much in demand.

6. - I should in the first duty of ~~the~~

show the specimen collected to each of
proper planning specimens of these timber
trees in order that the content of each
first specimen may be fully estimated.

List of Fibers for Exhibition

- ✓ 1 *Pterospermum acerifolium*
- ✓ 2 *Bunga saccharifera*
- ✓ 3 *Cocos nucifera*
- ✓ 4 *Ficus religiosa*
- 5 — do — . Sp
- 6 *Hibiscus sinensis*
- 7 — do — Mutabile
- 8 — do — variegata
- 9 *Annona* Sp.
- 10 *Ecodeudron* Kapok
- ✗ 11 *Cananga odorata* ✗
- ✗ 12 *Incarlia gambir*
- ✓ 13 *Sterculia* Sp.
- ✗ 14 *Ananassa sativa*
- ✗ 15 *Tourcroya gigantea* Ornamentus lamp
- ✗ 16 *Artocarpus Blumei*.
- ✓ 17 *Yucca glaucescens*
- ✓ 18 *Ficus utusa*
- ✗ 19 *Gmelina Asiatica*
- ✗ 20 *Abroma angusta*
- ✗ 21 *Musa* Sp
- ✗ 22 *Fibruaria torrefacta*
- ✗ 23 *Sarcocephalus esculentus*
- ✓ 24 *Pterospermum lanceaefolium*

25. *Tanseciera guineensis*.
 26 — *Do* — *bythindica*
 27 *Evania Coccinea*
 28 *Sabal Mexicana*
 29 *Corypha gebunga*
 30 *Stavensalia Madagascariensis*
 31 *Stenrites triloba*
 32 *Bromelia septum*
 33 *Gombeya viburnifolia*
 34 *Peperthes ampullacea*
 35 *Strocarpus incisa*
 36 *Boetmeria nivea*
 37 *Picinus communis*
 38 *Hymenaea verrucosa*
 39 *Strocarpus schinatus*
 40 *Stobus sp Clavum*
 41 *Lectona grandis*
 42 *Gossypium herbaceum*
 43 *Ficus carica*
 44 *Brownea grandiflora*
 45 — *do* — *coccinea*
 46 *Abutilon indicum* —
 47 *Sporia ambourensis* X *Widdow*
 48 *Lepesia populnea*
 49 *Melalotus paniculatus*
 50 *Azalia bijuga*
 51 *Maboumoua villosa*

Fibers Contd

- ✓ 52 *Ficus Anstralis*
- ✓ 53 *Serica elliptica*
- ✓ 54 *Stactis sideroxyloides*
- ✓ 55 *Terminalia sp.*
- ✓ 56 *Theobroma cacao*
- ✓ 57 *Bauhinia alba*
- × 58 *Pandanus sp* × white Banyan Palm
- 59 *Ficus sp*
- 60 *Artocarpus polyphemus*
- 61 *Boerhaavia carambola*
- 62 *Allamandra Schottii*
- 63 *Albizia moluccana*
- 64 *Freycinetia angustifolia*
- × 65 *Stipa fruticans* +
- 66 *Sida corchorifolia*
- × 67 *Commersonia platyphella* ×
- 68 *Pongamia glabra*
- × 69 *Leprosia candida* ×
- 70 *Musa superba* *textilis*
- 71 *Macaranga sp*
- 72 *Grewia laurifolia*
- 73 *Pterospermum argentum*
- 74 *Ficus sp*
- 75 *Terminalia catappa*
- 76 *Pithecolobium pumosum* Squarrose
- 77 *Eucalyptus salicina*
- 78 *Sterculia coccinea*
- 79 *Suria gibbifera*
- 80 *Lagerströmia Regina*

Fibers Const

- 77777
81 *Artocarpus integrifolia*
82 *Xylocarpus* sp.
83 *Leucaanthera* sp
84 *Pitoea elegans*
x 85 *Macaranga* sp II
x 86 ———— sp III x
87 *Ficus salisifolia*
88 *Alouretia Moluccana* 9 *tristis*
89 *Travesia palmata*
90 *Eucalyptus sideroxylon*
91 *Dammara robusta*
x 92 *Antiaria toxicaria* x
x 93 *Moringa pterygasperma* ✓ x
94 *Poinciana regia*
95 *Sterculia* sp.
x 96 *Grewia telfaefolia* x
x 97 *Lida* sp x
98 *Hibiscus* sp
x 99 *Nilot plantain* ✓ x
x 100 *Sporia orientalis* x

GENERAL VIEW OF THE FIELDS.

Photographed by Mr. Huisman at Buitenzorg.

Plant: Rameh.

Harvest: Second half of 1906.

Photograph from "Kali-Syndikat G.m.b.H." No 1.

Place: Tji-Kouneuh bei Buitenzorg, Java.

Experiment from Mr. Pit, Manager of the Agricultural Garden.

Soil: Red, volcanic loam.

Manuring in Pounds an acre.

Part	I	II	III
	A.	B.	C.
Muriate of Potash	3 372-	--	
Thomasphosph. (Basis slag.)	10 511-	--	10 511-
Sulphate of Ammonia.	14 387-	--	14 387-
Amount of expenses	Fl. 70.84		Fl. 50.56
manures in Batavia.	(± 5-18-1)		(± 4-4-3)

Harvest of rough-fibre from 3 cuts in Pounds an acre.

1 st sort (length)	July 31	Sept. 10	Oct. 22
2 nd " "	1470 ¹⁵	890 ⁷	1086 ¹²
3 rd " "	1257 ²	818 ⁷	1163 ¹³
	1182 ⁰	899 ¹³	1100 ⁵
Total	3911	2608 ¹¹	3300 ¹⁴

MANURING-EXPERIMENT with RAMEH.

(Translated from the Dutch.)

(*Feysmannia*, Year 1907, page 400.)

At the request of the representative of the "Kali-Syndikat", a manuring-trial was made in the Agricultural Garden at Buitenzorg (Java), the results of which are given in the following tables

Table I gives a survey of the whole experiment, taken in a year (1 June 1906 - 17 June 1907.).

Table II shows the figures, expressing the produce, and also the rainfall, and the number of rainy days "a cut".

Table I.

Amount of rainfall in mm.	Number of rainy days.	Ways of Manuring	Amount of Manuring	Area of the fields.	Number of the selected lengths	Amount of stems produced in 1/2 Gr.	Amount of dry ribbons produced in 1/2 Gr.	Average length of stems in cm.	Percentage of dry ribbons in comparison with the gross weight.	Produce of dry ribbons in comparison with that of B ₂ .	Amount of the produce of wet leaves in kg.	Number of cuts.
4319.6	270	480 Gr. Muriate of Potash	June 6.	M ²	a.	56.99	3.405	143	6%	B2a 70%		
		660 Gr. Thomasm. (Basis slag)	Decemb. 6.	28.38	b.	53.76	3.29	117	6.1%	B2b 482%	154.20	8
		500 Gr. Sulph. of Ammonia. XXX			c.	60.34	3.155	89	5.22%	B2c 28%		
		Not manured B ₂	--	28.38.	a.	31.10	2.005	130	6.44%			
					b.	35.175	2.22	106	6.31%	--	117.30	8
					c.	46.815	2.455	84	5.24%			
		660 Gr. Thomasm. (Basis slag)	June 6.		a.	30.595	2.062	128.6	6.74%	B2a 28%		
		500 Gr. Sulph. of Ammonia.	Dec. 6.	28.38.	b.	43.14	2.625	105	6%	B2b 18.24	115.65	8
					c.	50.70	2.905	79	5.73%	B2c 18.3%		

Thomasmal means : basis slag, or Thomas Phosphate.

It is apparent from the figures above mentioned, that full-manuring (B1) has had favorable results in every respect, as well with regard to the stems and leaves produced, as to the quantity of ribbons (fibres of rameh).

The proportion of the weights of the stems and layers of fibre (ribbons) is almost the same in the three experimented fields.

The result of B1 shows, that the produce of ribbons of the first and second lengths (with the highest market-price) may be

called exceedingly favourable in comparison with the produce of the half-manured and not-manured parts.

The manures worked gradually and steadily and not at intervals.

They met indeed with many ups and downs in the produce-figures during the trial-year, but these are to be imputed exclusively to influences of the climate, for the produce-figures of the three fields fell and rose simultaneously.

Also it is apparent from the obtained figures, that the full-manured part produced at all 47.45% (of dry ribbons) more than the not-manured field, while the increase in produce of the half-manured field amounted only to 15.15%.

Table II.

Survey of the produces of the successive Ranch-cuts.

1 st Cut. 31 July 1906 Rainfall 442.1 m.m. Number of rainy days: 23			2 nd Cut 10 Sept. 1906 Rainf. 440.6 m.m. Number of rainy days: 29			3 rd Cut 22 Oct. 1906 Rainf. 480.1 m.m. N. of rainy days: 32			4 th Cut Dec. 3-1906. Rainf 383.5 m.m. N. of rainy days: 30			5 th Cut Jan. 22-1907 Rainf. 774.1 m.m. N. of rainy days: 42.			6 th Cut. Mar. 12-1907 Rainf. 646.2 m.m. N. of rainy days 42.			7 th Cut. April 29-1907 Rainf. 508.1 m.m. N. of rainy days 41			8 th Cut. June 17-1907 Rainf 546.9 m.m. N. of rainy days 31				
Field.	Length of stems. c.H.	Weight of leaf-stems. Kg.	Weight of ribbons (dry) Gr.	Length of stems c.H.	Weight of stems (wet) Kg.	Weight of ribbons (dry) Gr.	Length of stems. c.H.	Weight of stems (wet) Kg.	Weight of ribbons dry Gr.	Length of stems c.H.	Weight of stems Kg.	Weight of ribbons (dry) Gr.	Length of stems c.H.	Weight of stems Kg.	Weight of ribbons (dry) Gr.	Length of stems c.H.	Weight of stems Kg.	Weight of ribbons (dry) Gr.	Length of stems c.H.	Weight of stems Kg.	Weight of ribbons (dry) Gr.	Length of stems c.H.	Weight of stems Kg.	Weight of ribbons (dry) Gr.	
B ₁	a	151	8	520	140	9	500	143	7.70	505	145	6.90	290	151	6.03	465	140	7.70	440	136	4.59	265	140	5.07	340
	b	116	6.70	435	110	4.25	255	115	6.30	420	120	8.60	610	120	9.80	528	106	5.50	410	120	7.28	400	116	5.28	340
	c	75	5.25	245	90	6.	340	92	7.70	445	96	8.50	465	100	11.01	410	85	7.20	395	90	7.64	390	91	7.04	435
B ₂	a	120	2	150	120	4.25	255	130	6.05	415	133	5.60	330	142	3.25	230	137	5	325	122	2.20	125	122	2.75	175
	b	95	2	200	103	4.75	290	100	5.65	330	100	4.10	235	120	5.60	380	108	4.50	160	107	4.75	245	100	3.825	250
	c	80	4.25	250	85	4.00	245	74	4.025	235	87	7.30	400	96	7.46	235	86	7.10	410	83	5.90	335	78	5.10	315
B ₃	a	124	6.50	400	130	4.30	290	126	3.25	215	137	2.39	152	130	2.85	195	132	5	320	125	4.335	275	114	1.95	135
	b	94	4.	290	102	5.55	355	108	5.85	410	110	7.10	450	120	6.30	410	105	5.25	310	106	6.24	216	95	2.85	185
	c	46	5.50	290	67	4.25	240	76	6.60	390	82	9.30	470	95	8.51	485	72	6.10	370	85	6.18	360	81	4.26	270.

x) With rainfall is meant the quantity of rain, fallen in the time between two successive cuts.

The manuring-expenses a bahoe should amount as to the full-manuring to Fl 101.50 (£ 8 - 15) and as to the half-manuring to Fl.72- (£ 6.).

If the market-price of the ribbons is of such a height, that the produce a bahoe of B1, the manuring-expenses deducted, is still considerably higher, than that ~~£~~ of the not-manured fields, full-manuring may be thought productive.

It is hardly necessary to be mentioned that:

1. The obtained results are very relative, the exact proportion of the manures to be given to every crop, and on every soil, only being able to be fixed in an experimental way.
 2. The results obtained on a larger scale under the same circumstances probably will be less favourable, which is cause, that people calculating the produce-figures into bahoe's or H.A., gets results, which are not in keeping with the reality.
-

(By J.H.Heyl, Buitenzorg July 1907.)

The following are the main conditons for cultivating Rhea:

Light sandy land free of water-logging. Plants should be planted for permanent cultivation 4' x 4' apart.

In purchasing roots buy them in lumps and place them in the ground as received 2' x 2' and after one years growth divide them into pieces of about 8" long and transplant them as described above 4' x 4' by burying them 2 to 3 inches below ground with about 1 inch of root above ground. Planting should be done in the months of July and August. After two years the plants should be ready for decortication.

Keep the cultivation clean of weeds by hoeing and ploughing between the bushes, and every 2 or 3 years prune away below ground the old roots which accumulate at the side and top of the roots, to induce the growth of stems from the fresh roots below the surface.

The stems when ready to be cut should be about 6 feet high and the bark should appear brown at the base to 15 inches from the ground.

Plant the roots in well manured land and keep giving back to the soil what is taken from it either in the shape of the refuse from decortication or the addition of other manures.

Bengal Rhea Syndicate Ltd
1 Pollock Street, Calcutta,

RESIDENT GENERAL'S OFFICE,
SELANGOR, MALAY PENINSULA.

No
Misc. 3779/03.

7 1/2 July, 1903.

Subject.

MURVA FIBRE.

Sir,

The Resident-General will be obliged if you
can find room for the enclosed report on Murva Fibre
by the Superintendent of Experimental Gardens, Federated
Malay States, in the Agricultural Bulletin.

I have the honour to be,

Sir,

Your obedient servant,

Choss. Marks

Acting Secretary to Resident-General, F. M. S.

Director

Botanical Gardens,

Singapore.

BATU TIGA, 27th May, 1903.

THE GROWTH OF MURVA FIBRE.

SIR,

I have the honour to acknowledge receipt of your letter No. R.G. 3531/03 of the 23rd instant on the subject of Murva fibre, or *Sansevieria zeylanica*, and to report as follows:

2. Murva, or Moorva fibre is the product of *Sansevieria roxburghiana*— Source.
now recognised as distinct from *S. zeylanica*, which plant was formerly supposed to yield this product—and is a member of the family of plants which yield the fibre known as bow-string hemp.

3. The *Sansevierias* belong to the natural order *Hoëmodoraceæ* and are small perennial plants with short, thick rhizomes and fleshy or leathery radical leaves, mottled or spotted, and varying according to the species from two to seven feet in length. Classification.

Most of the species are natives of tropical Africa, but are widely distributed throughout the tropics of both hemispheres. Probably the most common species in the Malay Peninsula is *S. guineensis*, which yields the Konje hemp. It is a somewhat similar plant to *S. zeylanica*, which also occurs here in a state of cultivation but has larger and flatter leaves and produces a more valuable fibre. Habitat.

4. *Sansevierias* are easily propagated by division of the rhizome or from seed, or more readily still from the leaves, which may be cut into small pieces about 3 inches long and placed in a moist situation when they will readily take root. Propagation.

5. With the exception of *S. Ehrhenbergii*, which is a native of Somaliland and would probably only thrive in an arid situation, these plants enjoy a good soil, moist climate and a moderate amount of shade, and for this reason would probably be valuable to Para rubber planters as an auxiliary crop. Cultivation.
Probably valuable as a "catch crop."

The young plants should be put out about two feet apart and the same distance between the rows, and when once established they may be regarded as a permanent crop, yielding regular cuttings of leaves several times a year.

6. The leaves of all the species contain an abundance of fibre noted for its fineness, elasticity and strength. Murva fibre is as yet hardly known to commerce, but is largely used by natives, who hold it in high esteem for making bow-strings, ropes, mats, etc. The fibre from *S. guineensis* (Konje fibre) and *S. Cylindrica* (Ifé hemp) are much valued in Europe for the manufacture of ropes, especially those used for deep sea soundings. Product.

7. The fibre is obtained from the fresh leaves, either by scraping away the cellular tissue by means of a blunt knife or by washing and beating. When the pulp is thoroughly removed the fibre should be washed in clean water and hung in the shade to dry, and when perfectly dry packed in bales and pressed and is then ready for export. Preparation of the fibre.

It will be seen that the method of preparation in vogue is quite simple, although the fibre would doubtless be improved by the aid of a suitable decorticating machine.

8. I am not in possession of any data with regard to the yield of leaves or of prepared fibre in this country; but, judging from the plants I have seen scattered about in the Peninsula, I should imagine that these plants could be grown quite as well here as in Jamaica, for example, where the return of fibre from *S. guineensis* is estimated at $1\frac{1}{2}$ tons per acre per annum, valued in London at £30 per ton. Yield.

Both *Sansevieria guineensis* and *S. zeylanica* are represented in the collection of the Experimental Plantations, but so far have only been used for propagating purposes.

Further investigation necessary.

9. There appears to be need for further investigation with regard to the cultivation of these plants and the preparation of the fibre, as the soil, climate and age of the leaves when collected have much to do with the length and strength of the staple and the quantity and quality of the fibre generally.

Sample.

10. I enclose a small sample of Murva fibre recently extracted from a young leaf. Had this leaf been fully developed the fibre would have been three or four feet long.

I have, etc.,

STANLEY ARDEN,
Superintendent, Experimental Plantations.

THE SECRETARY TO RESIDENT-GENERAL,
FEDERATED MALAY STATES.

FEDERAL SECRETARIAT,

Kuala Lumpur, 2nd FEBRUARY, 190 4.

No. H.C. 459/04.

Reference to Former Correspondence

Sir,

I have the honour to forward copy of the correspondence as noted in the subjoined schedule for publication in the Agricultural Bulletin.

I have the honour to be

Sir,

Your obedient servant,

The Editor,
Agricultural Bulletin,
S I N G A P O R E.

A. A. Wanning.

Federal Secretary, F.M.S.
M^g

SCHEDULE.

Letter No.	From.	To.	Subject.
			Report on a sample of Cotton grown in the Government Gardens, Kuala Kangsar, Perak.

Report on a sample of Cotton grown in the
Government Gardens, Kuala Kangsar, Perak.

Secretary, Manchester Chamber of Commerce to Royal
Botanic Gardens, Kew.

Chamber of Commerce, Manchester,
December , 5th 1903.

Dear Sir,

Yours of 30th November.

I have obtained the report of a competent expert
upon the sample of cotton referred to in your letter

The staple or fibre is described as too short for
Sea Island. It is classed, without reference to its
origin, as equivalent to "Fully Good Middling American"
and as being worth in the market yesterday 7d. to 7½d
per lb.

The staple is further described as "rough coarse and
very wasty". By "very wasty" the expert means that in
the processes preparatory to spinning, this cotton
would lose an inordinate amount of fibre as waste, fit
only for the spinning of low counts of yarn.

Faithfully yours

(Sd.) Klijsh Helm.

Secretary.

Fibres

Fibres

No. _____

Gardens and Forest Department,

STRAITS SETTLEMENTS,

Malacca, 24th Oct, 1892

Dear Mr Ridley,

I send you a box containing specimens of fibres as enclosed list.

These fibres were got together for sending to a firm of brushmakers in England. I have shown them to R.C. & as few of them could be of any use for brushes I send them on to you.

I should think some of these would be useful in the Jute market, notably the Akoe Pa. Kedah & Kayu Lutak.

In any case a report would stimulate enterprise generally in fibres in the Settlement.

I have made notes & experiments with pine-apple fibre & find it works out excellently in comparison with other fibres. I will send on my notes in a few days.

I trust we shall get a report at an early date on the samples of pine apple fibre. Already European enterprise is moving in the matter. I am told of a European who intends paying for 500 acres for this fibre.

Yours faithfully
J. W. Denny

No. _____

Gardens and Forest Department,

STRAITS SETTLEMENTS,

Malacca, _____, 18 .

Sedges

I

hmbai

II

Kerchut

XV

Siku dana

XI

chendarong

Pandanus

III

changkang darat

IV

changkang pandan

Lianas

V

akar Laliak

VI

akar Pa-Kedah

X

akar Karak

Trees ~~IV~~

VII

Kayu Lutok

VIII

Kapas-Kapas

IX

Getah Larap

alse

XII

mauritus hemp

Plantain

XIII

Pisang Karok

Palms

XIV

Kahong

XVI

Dam Palas.

No 18 April 13 - 1888 - 1 ca

19 April 20 - 1888 - 1 ca

Supplement (24 ¹⁸⁸⁸ ~~April~~)

20 April 27 - 1888 1 ca

21 May 4 - 1888 1 ca

22 May 11 - 1888 1

P.C. 602
86

L.H. No 15
86

Yester 11
86

From whom

Place

Date

His Excellency

Don la Malacca

19. 2. 86

Memo Regarding the

Former Papers.

MINUTES

Final Paper.

Supp B. G. L.

I send you copy of a
Regarding the same which
come across in overhauling some of
the old records in the office
that it have the same with
interest for you

19. 2. 86

How His Excellency

The memo is very interesting
I have kept a copy. It was very
good of you to think I should say
there are much of interest among
the old records, and I hope one day
to have a look at them

4. 11. 86

Honble H. C.

Have you such a thing as the following.

A statement, map or chart showing the area of land in Malacca under Fruit Trees; under Paddy; under scrub; under Forest uncultivated; unoccupied; occupied but not leased. The proportion of hills & level country. The streams & the direction, the chemical composition of the soils under each of these, & the distance of the principal villages or police stations from Town? The number of inhabitants of each district & nationally; - Recent imports & exports & quantities, Rainfall & temperature

2: - I have arrived at a point in my study of how to improve the present condition of Malacca, where superficial knowledge of any of the above is of no use to me, nor can I put my hand on the information.

3: - Can you help me & if so how far? what are the items in regard to which nothing has been done to determine the nature?

H: -

4: - Are there any sources of wealth lying immediately beyond the Malacca boundary mineral or vegetable which is likely to draw up country a different race, Chinese for example? Is there any prospect of the Country be traversed by a Railway within say the next fifty years?

5: - If you will help me to information when you get time say after your annual Reports have been cleared off you will greatly oblige me. - By the way! I have a lot of information to send you concerning what has been in Malacca Forest Dept - last year, I am now working at details of the work & will send you a statement a few days hence

(S) H. C.
26/2/86.

No minutes should be written on this page. A separate half sheet to be used if required.

Description of the Rami plant for
the information of His Honor the Governor

The Rami is a shrub and grows
in moist soil but not near water,
being improved by large quantities of
Manure, it is not common throughout
the jungle, it has been planted for
making fishing lines and the Juice
of the root is used as medicine for
sores and eruptions on the body, and
it is also rubbed with string made
from the Rami, it grows from cuttings
and also by transplanting the roots
broken such as potatoes, after being
taken from the nursery of cuttings in 3
months they grow sufficiently large
to get the fibre for string or rope, Malays
do not use the tree generally the shrub
is principally planted around Malacca
the leaves of which are eaten by Chinese
who market cattle from there called Chay
Tao.

The specimens sent were prepared
as follows

No 1 Fibre peeled off, nearly washed
and squeezed.

No 2 Fibre peeled off and washed

Squeezed between the fingers until
the color

No 3. Washed in a running stream 8
years ago

4 The sticks are soaked for 5 days in
water. Then beaten with mallets,
then the fibre peeled and washed
in fibre peels, squeezed and washed
then boiled and combed

(No L. F. L. Playfair

Capt. Resident Commissioner

December

2 March 1860

COCOANUT FIBRE AS A DEFENSIVE WAR MATERIAL.

—In the last report of the curator of the Nilgiri gardens, attention is drawn to a new use for the refuse fibre of cocoa nuts. Dr. Lawson says that his attention was drawn to the subject by Mr. Money, a planter in the Nilgiris, who sent him an article in the *Revue des deux Mondes* for August 1, 1886, by M. de la Barrière, entitled "Bâtiment de combat et de la guerre," in which the author described how the refuse of cocoa nut, after the process of retting, might be used for backing the iron plates of ships of war. The method of proceeding was to take a quantity of the powdered refuse before it was quite dry, and subject it to pressure, when the natural viscosity of the macerated cellular substance of the nut caused the whole to cohere and to form a plate which in general appearance was like a mill board, only much more brittle. Owing to the hygroscopicity of this substance, if a hole is made through it, the parts adjacent to the puncture absorb water, swell up, and immediately close the orifice. Dr. Lawson got a sack of this refuse and made a plate 18 in. square, by about $\frac{1}{2}$ in. in thickness, which he placed between two boards, and then fastened it to one side of a box, which contained a head of one foot of water. A bullet half an inch in diameter was fired through it, but not a drop oozed out. This experiment was repeated three times with the same result. Then a $\frac{1}{2}$ in. bullet was fired through the plate, when a few drops only made their way through. Lastly, a bullet nearly 1 in. in diameter was fired through the plate, when a large jet of water shot through, but in the course of a few seconds the stream decreased in volume, and in less than a minute had ceased to flow altogether. "Whether or not this material could be advantageously used for the purpose which M. de la Barrière suggested, or, for any other purpose, is a matter worth considering, for, as he truly says in his article, millions of tons float away annually down our rivers in India."

F 35/42

S or QUEEN ANNE CHAIRS.—**S** eight very picturesque QUEEN ANNE CHAIRS, covered in antique repoussé Cordovan leather. For full particulars J. Ichenhauser, Carved Oak Specialist, 68, New Bond-street, W.

OLD NUREMBERG PANELLED ROOM.—Beautiful, complete PANELLING of a ROOM, comprising also panelled ceiling, at present in Nuremberg; most interesting and desirable. Photograph and fuller particulars at J. Ichenhauser's, Carved Oak Specialist, 68, New Bond-street, W.

RARE OPPORTUNITY.—For immediate SALE by order of Trustees, a QUEEN ANNE DINING-ROOM SUITE, a Chippendale Boudoir Suite, a Queen Anne Bed-room Suite, all in the best preservation. The Dining-room Suite is in solid walnut, consists of a grand sideboard, set of extending dining tables to seat 10, six chairs, couch, and two easy chairs in morocco, three-tier dinner waggon. If cleared at once it is ordered to be sold for £32, cost over £60.

The Boudoir Suite, in real rosewood, inlaid Chippendale, covered in an expensive Genou velvet (embossed), comprising magnificent cabinet, octagon centre table, four occasional chairs, two tub easy chairs, two corner easy chairs, one settee, beautifully designed overmantel, and a corner cabinet. To be sold for 40 guineas, the price charged was 90 guineas.

The Bed-room Suite is in solid walnut, includes large double wardrobe with long bevelled glass door, 4ft. duchess table, 4ft. wash-stand, pedestal cupboard, towel-horse, and three chairs, large solid chest of drawers. £21, cost 40 guineas. Apply to Messrs. Cory and Co., Solicitors, Hart-street, Bloomsbury; or to Messrs. Lewin Crawcour and Co., 227 and 228, Tottenham-court-road, where the articles may be viewed.

WASTE PAPER, Old Parchment PURCHASED, in any quantities, old ledgers, newspapers, magazines, books, letters, invoices, &c. All papers destroyed, being reduced to pulp for re-manufacture. Price list on application. Country parcels booked "Waste paper, per goods train," receive prompt attention.—Phillips, Mills, and Co., Irongate Wharves, Paddington, W.

DEALS, &c., Oats, &c.—2 by 4, at $\frac{1}{2}$ d. per foot run; floorings, matched boards, &c., at low prices. Good Oats, 14s. 9d. per quarter, 394lb., ex docks. Catalogues post free.—The **CHEAP WOOD COMPANY**, 95, Bishopsgate-street within, E.C.

HUMPHREYS' IRON BUILDINGS. Italian Exhibition, for SALE. Sizes 50ft. to 1,000ft. long, 25ft. to 100ft. wide. Easily taken down and re-erected, home or abroad. Full particulars and drawings free.—J. C. Humphreys, Iron Buildings Works, Albert-gate, Hyde-park.

No. _____

Gardens and Forest Department,

STRAITS SETTLEMENTS,

Penang, 10 June, 1892

Dear Mr. Ridley,

I am sending a sample of fibre prepared by hand from a single plant of *Furcraea gigantea*. One twentieth of an acre was planted at $11\frac{1}{2}$ ft apart (= 2151 plants to the acre) in March 1889 so that it took just three years to produce the sample now sent. There is a great deal of waste in cleaning by hand, with proper machinery the produce would be much greater.

This fibre is I believe pretty well known in the market and I am told that there is some kind of machine in use in Singapore for cleaning it?

This is taken as a sample plant, some of the plots are larger others smaller.

Yours truly

Robert

Received
Oct 20 1883

Dear Jantley.

What you will see
is very satisfactory. Please
return to me. I have already
asked you to prepare two
good specimens one from
the aloe under shade, the
other in the sun.

What we have been anxiously
awaiting is a return from
you showing the cost of
planting, manufacturing
and transporting against the
Market value. Please let us
have this early.

Yours truly
H. E. Callum
28/6/83.

Memorandum.

From

SYME & CO.

SINGAPORE,

28 June

1883

To

My dear M. Callum.

Former report about your Hemp was from the London Market. Another from the Liverpool Market goes herewith. It is better, you will see, but the fault "brittleness" is again noted.

Our London firm adds - "If this fibre
" can be produced cheaply with you,
" we think it can be sold largely;
" but at the higher rate, and for the
" purpose named, the consumption
" would be very small. "If you can
" send some Bales, or a trial shipment
" we will be better able to advise".

For purpose of comparison I send this week's report on other Hemp.
Hemp always goes in Bales of 400 lbs.

Yours sincerely

James Graham

(Turn over)

Subject: new Liverpool report of
1883.

According to the several samples of
 gold received from you we should say
 it was good gold. It is very rich
 and pure; also very good colour.
 It is very little and for loose
 making the value would be about
 £50 per ton, but because of the
 good colour it is very likely £40 x £45
 could be got for small quantities for
plate ornaments.

Miss

8th. July. 1889

Dear Ridley,

Dyer has already
very fully taken up the topics
in your recent letters and he
has asked me to say a few
words with regard to your
inquiries respecting fibres in
your letter of the 16th. April.

In Mauritius and also in
Yucatan they use Deane's
fibre machines. These clean the

leaves of *Jurcaea*,
Agave, *Sansevieria* and
Ananas. These are other machines
very similar to the Death's
machine. None of them are quite
satisfactory as they do not treat
a sufficiently large quantity of
leaves per day. In Yucatan
where there are farms of 400 and
500 acres of fibre plants, they use
4 Death machines driven by
steam power. They appear to be
yielding fairly satisfactory returns

and especially now Manila hemp
is so high in price. All the white
monocotyledonous fibre of the
plants mentioned above depend
for their value on their similarity
to Manila hemp. They are in fact
used to replace this hemp.

It would be most difficult for
you to obtain a large quantity of
plants of Sisal hemp. The fibre of
Jurcaea gigantea, and *J. cubensis*
is quite as good and if you have
either or both of these it is not
worth while to introduce *Agave*
rigida. Pine-apple fibre is excellent

and more readily command a
market. As the individual leaves
one small or each one requires
handling it is not found possible to
extract the fibre as readily from
the pine-apple as from Agave and
Jucosca. This is the only drawback.

We have lately had specimens of the
wild plantain of Malacca sent here
by Derry. The Brokers' Report was
not very favourable and I fear this
fibre has neither the strength nor the
bright hard surface which characterizes
good Manila. It was soft & woody
with no strength. We have suggested
that Derry should send you the originals
of the Reports furnished him on this &
kindred subjects to be filed in your office.

You will find the fibre question well round
discussed in the Kew Bulletin.

very sincerely yours

H. N. Ridley, Esq. F.R.S. D. Morris

Address for Fibers

E. L. W. Bulkeley

Pioneer Press

Allahabad

Feb. 11. 1890.

Dear Sir

Remembering the very pleasant though wet afternoon I spent with you in December last I now write you on the subject of fibre then referred to. If you recollect I gathered a small sample of fine black fibre from the base of a palm, which struck me as being a very suitable article for a particular kind of paper. I have had the sample I then took tested and so far I think it answers my expectations, but I am desirous of having a good working test made of this fibre. Could you, therefore get me collected and made up into bales about five tons of this fine black fibre, and delivering it to the agents of the Holt Line of steamers for Liverpool. If this is convenient I should be glad to have a sample of the fibre sent to me here, together with particulars of cost of collection, packing and delivery to shipping co. and bill of lading made out in my name, where I will at once send you a cheque for the amount. It is desirable that the fibre should be collected as straight as may be. In the meantime I should be pleased to hear from you on the question of the palmyra or other fibrous substitute.

Yours faithfully
F. W. Billingsley

THE PIONEER,
ALLAHABAD.

August 17 1893.

Dear Mr Ridley

To-day I have received
your favour of July 31st together with
the samples of fibre. The fibre, I
feel sure I could find a market
for, but not at the prices quoted.
I am buying Kittool at £30 per
ton and the ordinary brown bass
in Ceylon at £25 per ton. The prices
you are asking run to £100 per ton
excluding freight, dock dues, and some
margin of profit for the buyer. I
can only think that there must have been
an unnecessary amount of labour put
in. The fibre itself is a waste product.
It simply wants collecting and drawing
between the teeth of a coarse comb of wood or iron,
picking out as far as possible the short and
very fine, the rest then being made up in
bundles. One woman, earning Rs 2 per month
can dress two cwt. = 224 lb. in a month.
Please do not prepare any for me at the
prices quoted. faithfully yours
E. W. Bullsey.

17 pic,
10
170 dollars

20 £
8
160.

Abdul Kuchit bei Hadji
Kerstaunell Fair. Tauplin.

IDE & CHRISTIE,

FIBRE, ESPARTO & GENERAL PRODUCE BROKERS.

Telegraphic Address:
ESPARTO LONDON.

72, Mark Lane,

London, 11 Oct- 1892
E.C.

Henry W. Ridley Esq.
Director of Gardens. Govt.
Strait Settlements
Singapore.

Sir,

We are duly favored with your letter of 6th
Ult^o. and packer of the Samples upon
which we try to speak as follows:
No I. Pine Apple skin obtained by scraping the
leaf: This is well chosen but we think
that possibly an even better colour

No. II Line apper prepared by maceration:
This is not so well done as the other
reuter is the 50 long - while the somewhat
dirty colour is against it to the extent
of 55. parts -

No. III. Lutea fibre from bark of Hibiscus ficaria.
This material would find no market
in England. If it could be reduced
to the condition of filaments it might
be salable but we could only assess
the commercial value after seeing it
in that form. -

No. IV Part fibre and for tying paper plants.
Of no commercial value in the
English market.

No. V Shang Karok. Cold Pantani fibre.

We regret that this is much too hard to
be of any use for its strength.
State would be quite unsuitable. Were
it better prepared so that the fibres
filaments were free as in Manila hemp,
it might command some price. We
think the fibre very much weaker than
that obtained from Urena textilis -

Wm. S. S.

Unfaithful Servants

might be obtained - Pine apple skins
have now been imported into England
in sufficiently large quantities to test
their true Capacitative values - Such
persons as have commented the market -
are securing a few bales at a time -
have generally only found purchases among
the rope and cord makers - & for such
ordinary purposes as value your sample
£24 per ton today in London. Now
if opinion is known that the fibre is fit
for much better purposes than this and
if parcels of 5 or 10 tons are proposed
and sent home an adequate test of
its real value might be found.

Maulmain June 15th 1889.

The Secretary

Agri. Horticultural Society
Singapore.

Dear Sir,

Our attention having recently been directed towards the extraction of Fibre from Pine-apple leaves we beg leave to address you on the subject.

Pine-apple grows wild in Burmah in almost any kind of soil and as large tracts of waste land are available for its cultivation, we are of opinion that as a Fibre producing plant the Pine-apple should take as prominent a place as Rhea.

Nothing is done in Burmah in this line and nothing is known of the methods of extracting the fibre. We have been informed that this fibre is prepared to a considerable extent at Singapore and shipped thence to China where it is woven into a species of silk called "Pine apple" cloth.

We shall deem it a great favour if you can give us any information in this matter and any expense you may incur in collecting same we shall be glad to pay for.

We particularly desire to know the methods of extracting fibre from the leaves and preparing it for market and the value of the fibre so prepared.

Any other information bearing on the subject will be of the greatest interest to us and be received with many thanks.

We Remain, Dear Sir

Yours faithfully

Crisp

10th November 1897

From J. Broadhead & Sons
To Messrs. W. Hill

Surgei & Sons

Shank & Sons

Dear Sir,

Replying to your letter which came to hand four days ago, we send by this mail a sample bundle of Bahia Passava (or Piacas), commonly called in this country by the trade "Bass" which is the stiff fibre, to get something equal to which we have been corresponding with the Indian Under Secretary.

You will probably know being we presume, a European that it is used to manufacture the brushes called "Bass Brooms" in this kingdom and in Germany and for this purpose the long lengths in which the Rough Passava or Bass come to this country from Bahia are cleaned and cut into various lengths suited to the various sizes of "Bass Brooms" usually 5, 5½, 6, 6½, 7, 7½, & 8 inch length and some generally the upper

and more flexible samples even longer lengths, (9 to 16 inch) this is used for "drawing" that is for making into either "Drawn Broom Brooms" for use in stove-holes of steamers, or into Broom Scrubbing Brushes, the principal portion however is used in 5 to 8 inch lengths into which it is cut by the Broom Dressers who clean it and cut it into the lengths required rather more of $5\frac{1}{2}$, 6, $6\frac{1}{2}$ inch sizes going into consumption than the other sizes named. There is a large demand for such a fibre in this country, but it has been much hampered during the past 3 or 4 years by prices advancing to such an extent (owing we suppose to shortness of supply) that the consumers in this country are holding back from buying over. You will understand the value of this fibre to a brush maker depends on its stiffness and at the same time its flexibility always returning to the straight position on being released, there is further

a fibre lately come into the market
in limited quantity called "African
Bass" but not being equally stiff
is not commanding equal prices
in the market, another substitute
sent us is really split Bamboo
and this material is not flexible
enough though very stiff in feel
other fibres used in the trade
are not stiff but soft and are
used for the making of "scrubbing
brushes" principally so that
whether stiff or soft if you
can send us samples of fibres
that can be put in the market
in large quantities and will
send for our inspection and trial
not an ounce, or so through letter
post, but several pounds weight
so that the material and its
capabilities can be tested by
actual use in a brush we can
then begin correspondence and
treaty for a regular consignment
of it, and although we have not
dressed or cut into lengths the
Bass material we should be
prepared to deal with your
consignment

consequently, if only time be
allowed us to get the same
placed on the market.

If when sending some fibre
or fibres for our inspection,
you could say approximately
the price per cwt. you think
it could be landed in London
or Liverpool we should be better
able to come to a decision of
its utility? Should you not
succeed in finding any fibre native
to your country & climated we think
you would be wise to make
inquiries as to whether the
tree that produces the "Massara"
fibre could be introduced with
success into your estate as we
are strongly of opinion that money
can be made by doing so, although
we have no knowledge as to how
that introduction and cultivation
are to be made, we have always
been given to understand that in
the Brazil it is a wild product
you might write to the British
Consul at Bahia about it
Trusting to hear favourably
from you.

Yrs. truly
To: J. Broadbent & Son

Gardens 9726

93

From whom

Place

Date

Director of Gardens

9. 10. 93

Fibre cleaning as an industry
in the Singapore Prison

Former Papers.

MINUTES.

Final Paper.

Col. Sec.

I gave the Tali ijak a trial
Mr. Ridley's man brought 5½ lbs of the
uncombed fibre & some combs. This
took 3 men working 4 hours to dress
& produced 4 lbs fibre, the rest being
refuse

2 There seems to be a difficulty in getting
the raw material in any quantity. & Mr.
Ridley's man would not supply it at
less than \$10. a pikul

3 It appears from Mr. Ridley's memorandum
that the price of the fibre must be kept
down to (say) £25. per ton (17. pikuls)

4 One ton of the raw material would
cost \$170. say £21. but 12 lbs of the raw
material only produces 9 lbs fibre

over 25%.

5 The raw material required to produce a ton of fibre valued at £25. would cost at the rate charged by Mr. Ridley more over £26.

6. After this ~~quantitative~~ calculation it is hardly necessary to go into the question whether combing the fibre is suitable work for the prisoners. The chief trader's report is, that there ~~is~~ no labour in it.

7 Mr. Ridley writes to me to say that if the Government will not take up the work, as the fact he will try to get it done at the Asylum and this would appear to be a more suitable place for the manufacture.

No minutes should be written on this page. A separate half sheet to
used if required.

In —

Hamilton

With respect to the Weirer Fibre machine,
and fibre cleaning in the Criminal prison.
That the amount of fibre plants cultivated
or wild in the neighbourhood of Singapore
is at present insufficient to ~~supply~~ keep
in work the machine which can work
10 tons of leaf a day. The leaves ~~of the~~
cultivation. This would entail a plantation
say of Mauritian Hemp four years old of

and to be a permanent manufactory should
be nearly four times as large.
The machine is capable it is said of
working Bowstring Hemp, Sisal, Mauritian
Hemp Banana, & possibly pineapple & Pina
of these Bowstring Hemp grows here fairly well
but slowly. It is not a popular fibre because
the plant seems to take up too much room in
proportion to its yield. Sisal is under cultivation
here in the gardens but grows very slowly. Mauritian
Hemp was formerly cultivated at Pulau Batang
but the cultivation has ceased. Banana fibre will
I think hardly pay as it is of an inferior quality. but
I hope for at things from the wild Plantain in the
native states. Pineapple it is not at present
proved is workable by this machine. It is a peculiarly
troublesome leaf owing to the hardness of the outer
skin. The leaves of the cultivated pine are too
short to be of any value. The plant has to be grown

for leaf only. Ramee is practically a failure here owing to the poverty of the soil.

It is clear that unless we can ensure a good supply, or say ~~about~~ of leaf a day, the machine cannot pay for its keep, and there is certainly not enough leaf of any of these plants in Singapore to keep a machine going.

Would it be possible to import leaf from the native states in quantity so as to pay? The most likely plants are pineapple, and wild plantain. Of the latter there is abundance in the native states and the next question is whether we can get it down in a fit state to work. It is a very succulent plant and would have to be dried first before shipping or the fibre would rot. Could it be worked after this?

Mr Ferry who is now in England has been examining into the working of the machine and thinks it would do for the Plantain. I have called his attention to the question of dried leaf, & a few other points as to cost of machine, fuel, etc. and expect to hear from him in a mail or two.

2. In the meantime there is a fibre work which I think would be well suited for the Criminal Prison which can be commenced at once, and I think will not only prove remunerative but also introduce a new trade into the peninsula. It is that of preparing Rabong fibre. Tali H. Jan for the brush

trade. The Rabong palm cultivated for its sugar bears at the bases of the leaves a quantity of black fibre, in the form of a mat, and some time ago ^{Mr} Bulkeley of Allahabad ^{was} ~~sent~~ ⁱⁿ Singapore seeking for a fibre to replace the almost lost bassine fibre of South America. I showed him this and he thought it would be just the thing for the brush trade, I prepared samples and sent them to him and he reported well on them, and wrote "I am desirous of having a good ton made of this fibre. Could you therefore get me collected and made up into bales about 5 tons of this fine black fibre and delivering it to the Holt line of steamers for Liverpool. If this is convenient I should be glad to have a sample of the fibre sent to me here together with particulars of cost of collection, packing & delivery to shipping co. & bill of lading made out in my name when I will at once send you a cheque for the amount. It is desirable that the fibre should be collected as straight as may be."

I then urged certain Malays to take up the trade & one of them has already commenced, but it appears that the combing out and cleaning & sorting the fibres makes it very expensive, in fact three times as expensive as Kottal fibre which is the most expensive in use. It appears to me that if the prisoners were set to this work, the

Malays could supply the raw material, at about 10 dollars apiece. (Their expense is mainly in transport as the palm is only cultivated to a small extent in many villages, and they have to go a good distance in order to collect a quantity. The greater part comes at present from Djambi in Sumatra)

The prisoners could clean the fibre and separate it according to thickness, (This is done with a small wooden comb, with wire teeth) and then it could be made into bales and in the first instance shipped to Liverpool as suggested by Mr Bulkeley if it proves a success. Doubtless the merchants here would take the prepared fibre for export eventually. From Mr Bulkeley I understood that a thousand tons a year could be taken off it by the same markets. [The price

The Malay who has taken up the trade is Abdul

Mohit bin Hadji Mohammed Saip, residing in Anglin. He is prepared to put a good deal of money into the business, but would like very much to get (should the project be entertained) a monopoly of supplying the Criminal prison with the raw material. He can bring in a large quantity having men to collect for him in the native States and Sumatra and visiting these places himself. Should this project appear feasible I can send up the man with samples of the raw material, prepared product, and combs as used for cleaning & sorting. And the Director of the Prison could make what agreement seems best.

Pine-Apple Cultivation in Penang and Province Wellesley

Pine-Apples are grown in Penang and Province Wellesley for local consumption only, no one having as yet taken to canning the fruit for export. I am told by the growers that their local market extends to Kedah.

There is no means of ascertaining the exact area under cultivation a large proportion being grown as a mixed crop between rows of Coconuts, Betel-nut, Bananas etc., but it may be taken approximately at from 800-1000 acres.

At Sebing Linggi, Province Wellesley, which is the most important centre of cultivation, there are about 500 acres, and were the demand to increase this would be rapidly extended. This locality being easily accessible both by road and water offers a most suitable position for a canning factory.

Only the Mauritius variety is grown in this district and indeed if quality only is considered it is the only one deserving of extended cultivation. Four other varieties are known and more or less cultivated under the local names of Mato besar, Mato kecil, Merak and hijai. These are grown, more especially in

Persimmon in places where the Mauniteus does not succeed, owing probably to the greater elevation.

Ripe fruit is obtainable nearly all the year but the principal season is May and June when the price of first quality Mauniteus is about \$1. per 100, smaller ones varying from 25 cts per 100 upwards.

The most suitable situation for Persimmon cultivation is well drained slopes at no great elevation.

Chinese methods are primitive and capable of great improvement if fine fruit are desired, but whether higher class fruit, involving an increased expenditure in labour &c., would bring a corresponding increase in price under present circumstances is the point to be considered.

There is no particular season for planting, or preparation of the soil, the ground being simply dug over two or three times and all root and weeds burnt on the spot. The plants are set out in rows at distances according to the fancy of the owner, the most general being 5-6 ft. between the rows and 2-3 ft. between the plants. After attention during the first year consists in keeping down the weeds and breaking the crown off the top of each fruit when about one-third grown. In from eight to twelve months, according to the strength of the plants put out and nature of the soil, the fruit begins to ripen and as each is gathered

the fruiting stem is cut out and two or more young shoots from the base allowed to take its place, so that as regards quantity the second years crop far exceeds that of the first. At this time an application of burnt earth is applied to the roots, and the treatment in subsequent years appears to be much the same. After the second year the fruit are small, but could be greatly improved by more severe thinning of young shoots, though it would probably pay better to replant entirely. Of insect pests and diseases there are practically none, and the principal enemies are Wild Pige, Porcupines, Squirrels, and Mink all of which are fond of the fruit.

L. B. Smith

13. 9. 92.

Punary

13.9.92

Dear Mr. Bailey,

Herewith the little
information I have been
able to obtain about Pear-
Apple Cultivation.

So far as I can ascertain
Sago is not cultivated at
all in this Settlement.
There is a tree here and there
near villages both in Punary
and Province Melling,

but I have never come across
any one that has worked out
a tree in this part. I should
like much to get a mature
tree and work it out just
to show the natives.

When I was in Ambonia,
Bachan & Crum we seldom
got anything else to eat
and it was a common thing
to see rafts loaded with
nothing else. I noticed that
instead of keeping it dry
as we do flour they aimed
at keeping it wet until
they were ready to deal with
it.

Yours truly

Blount

Singapore, 12 Jan. 1896.

Dear Mr. Ridley,

Thanks for the
two letters, which I
return.

Before doing any-
thing further in
the matter of fibre,
you should write to
Mr. Buckley, and tell
him the price per ton,
+ shipping + freight.

Also I tell him
that Government can-
not take any risk in
the matter, but if he
sends you a remittance,
you will ship some fibre

Yours truly

Richard Little

[Faint, illegible handwritten text, likely bleed-through from the reverse side of the page.]

Algarah

1. 2. 94

Dear Mr. Ridley

Some time ago there was
some correspondence about "jok"
fibre. One of my perphulins has
brought in about 70 Katis
valued at \$2.50 unpicked. If
it would be of any use to you
I could send it down. I
hear also that he cannot

More if required to make up
a sufficient sample

Yours sincerely
Samuel Johnson

ROYAL PALM NURSERIES.

SOUTHERNMOST

FLORIST'S ESTABLISHMENT IN THE U. S.

Rare Plants, Fruits and Flowers.

☞

REASONER BROTHERS,

Oneco, Florida,

Dear Sir,

It may be said to you to know that we are now the largest nursery for the genuine Sisal Hemp of commerce, being the chief exporters of plants from Florida. *Agave rigida*, var. *Sisalensis*. The large long-leaved, thornless sort, best for cultivation for fibre.

The Royal Gardens, New England have purchased extensively of us, and improve our system of packing for shipment, which ensures safe delivery to all parts of the world.

We have now upwards of 100,000 plants fit to send out at once, and have placed the price as low as is consistent with good quality stock plants, \$25.00 per 1000, packing free, and delivering in good order as far as New York, or New Orleans, or any other port. Our agents for forwarding goods are Messrs. B. & O. B. who have offices and agents in all ports. They forward quickly and reasonably.

Among the many government officers and others planting at different places we have supplied with nearly a half-million plants, as mentioned those at Hawaii, Australia, India, Ceylon, Jamaica, Grenada, Trinidad, St. Thomas, England for further forwarding, &c.

Remember the bounty given by the English here government for every ton of the fibre, - this is assured.

This is the genuine fibre plant of the world and too much cannot be said of it, especially for planting on cheap lands or on soils impoverished with other crops. Such a situation seems to suit this *Agave* precisely. It will grow in almost pure sand, and in the poor soil the fibre is the finer.

We issue a large catalogue of plants and trees, adapted to the tropics, which will be mailed you if you desire.

Kindly hand this to some friend, if the subject does not interest you. We oblige, Yours,

Very Resp. Truly,

Reasoner Bros.

Heath
Municipal ~~Engineers~~ Office.

Singapore 7 Dec 1893

Dear Redley

Re working fibre, I
have about 15 to 20 men
that might do this work if
profitable, all provided the
work does not require the
use of dangerous implements,
the combs I imagine must
be iron but if it does not
matter then being fixed
then never mind -

You of course will supply
the stuff, take that manufactured

away & forward to its market
crediting the Asylum with
the profit -

would it not be better for
us to have a talk over
it all before moving further.

Sincerely yours

W. Schure Van

No. _____

Gardens and Forest Department,

STRAITS SETTLEMENTS,

Malacca,

7th Nov, 1892

Dear Mr Ridley,

I send you some notes I have made on pine apple fibre.

Mr Ketschker has applied for 500 acres to cultivate pine apples for fibre should a favourable report be received from home.

2. Could you lend me for a day or two 'New Bulletin' for May 1890. Have you any other papers bearing on fibre cleaned by machinery?

3. I trust we may yet get the \$4000⁰⁰ for reserves next year. With this sum we can make some progress, and given reasonable time, the progress of the department will mean the progress of the Settlement.

Yours faithfully,
R. Denny,
Asst. Secy.

Experiments and notes on Pine-apple fibres

Given a fibre possesses length, strength and colour and likely to prove a marketable article, the first point of importance from a planter's view would be the yield per acre.

There is considerable discrepancy in the published accounts of the produce of different fibres thus:

Flax	400 -	1000	lbs per acre	
Plantain	600	1800	" "	(This is a calculation)
New Zealand flax		1792	" "	(has been obtained)

The fibre making the greatest stir in the market at the present time is 'sisal hemp'. The Govt of the Bahamas have restricted the cultivation of sisal hemp to 100,000 acres for 10 years. It is calculated this will give a maximum produce of 50,000 tons per annum that is, 40 cwt or 1120 lbs per acre. *

When at Malaka Pindah a few days ago I counted the pine-apple leaves contained in a square yard - 275 (shortest leaves not counted). This works out 3475 green leaves weigh 611 lbs and produce of dry fibre 4 lbs 2 oz. Therefore $275 \times 4840 = 1,331,000$ (leaves) and as 3475 give 4 lbs 2 oz, $1,331,000 \div 3475 = 383$ and 4 lbs 2 oz. by 383 = 1579 lbs the produce per acre.

So that pine-apple fibre compares with sisal hemp as 1579 lbs per acre against 1120 lbs

* It appears to be overlooked that 'sisal hemp' gives but one crop of leaves, flowers & dies, so that the area should be divided by 4 or 5. The number of years it takes before leaves are long enough to count.

One species of pine would clean much larger amount of fibre than - 1 but will little short of 2 per cent of dry material after fibre is cleaned

a very badly cleaned sample of pine-apple fibre sent by Tan Hun Guan to Singapore for valuation was valued @ \$30 per picul on the China market. 16 piculs - 1 ton and at \$7 to the pound this is nearly 70 £ a ton

It is calculated sisal hemp will pay @ 20 £ a ton and it is considered this will be a fair price when large supplies can be shipped so that if 50 £ a ton can be obtained for pine-apple & the yield set down @ 10 cwt an acre and it be assumed pine-apple cannot be cleaned by machinery. there is a large margin to cover working expenses.

Messrs Deane and Ellwood the well known manufacturers of fibre machines consider that a fibre plant should give 2 per cent i.e weight of wet fibre to that of leaves to pay to clean by machinery. Pine-apple does this exactly 2 per cent. Some plants (Sisal hemp) are said to give as much as 4 per cent. Pine apple fibre weight for bulk is one of the lightest of fibres. It is also claimed for machinery that the waste is less than with hand cleaned fibre? as was the case with my specimen. But I doubt very much whether it is so. 61 lbs of green pine-apple leaves produced 4 lbs 2 ozs of dry fibre, that is a little over 10 1/2 ozs per hundred lbs of leaves. Reports allow a dry fibre to have lost 3 times its weight (this was so with Peruvian in Jamaica a plant of the pine-apple family & this would give 32 ozs or 2 lbs of wet fibre to 100 lbs of leaves exactly 2 per cent

Pine-apple leaves compares with most of the humps such as Mauritius hemp, silk grass, Sisal hemp as 2 3/4 ozs against 3 lbs, i.e as 1 against 17. & a leaf weighing 3 lbs could be cleaned by machinery almost as quickly as a leaf weighing 30 ozs and the output per hour must consequently be much higher.

If reliable information could be obtained I think it probable that the percentage of fibre to that of leaves is very little higher with Sisal hemp than with pine-apple; the difference is chiefly the difference of output per hour.

I am partly led to this opinion from trying a sample of plantain fibre. I took 100 lbs of green plantain (so called) stem, it produced exactly 1/2 lbs of dry fibre.

So that plantain & pine-apple fibres cleaned by hand compares:-

Plantain 300 lbs (green stem)	1 lbs 8 ozs dry fibre
Pine apple 300 " (green leaves)	2 lbs " "

That the percentage of fibre to that of leaves with pine apple may be less than sisal hemp while the output per acre is more is quite in order as pine apples could not be cropped too closely, but space must be left between 'Sisal' plants. The material point is the produce per acre. the percentage of fibre to that leaves is only of importance so long as machinery is concerned. Although pine-apple comes up to the necessary standard for machinery

I mention these points in connection with machinery but when it is considered how small pine-a-leaves are compared with any of the well-known hemp, it will be understood that machinery could not help much, that in handling so many leaves, the leaves could be much more quickly laid in water for a process of maceration than laid in the feeder of a machine to be cleaned.

Whether pine-a-leaves were to be cleaned by machinery or by maceration, the work of gathering leaves & carting would be the same in both cases, but there would be a great saving of labour in the latter method after this. Thus: a machine would require 1 person to feed, one to hand leaves to the feeder, one to receive the fibre, one to wash the fibre, & of course an engine driven from 4-6 persons, whereas one person could do the whole work if cleaned by maceration.

Machinery is only adapted for bulky leaves such as those already cited & which give a large output per hour, and this, I take it, is the reason why cleaning coir (Coco-nut) fibre in the Straits by machinery failed, the output per hour was not enough to cover working expenses, as it is well known cleaning coir fibre by hand labour in Ceylon forms a large & important Colonial industry.

There is a lot of unemployed native labour in Malacca for such an industry.

R. Penny
Amthorp Forest
b. 11.99

MEMORANDUM.

:0:

From Asst Supt Forests

To Direction S.

Date 10 3, 1893

1. Best specimens of fibres required - noted. Thanks for names of those received.
2. Pl. cleaning plantain fibre - My specimen was cleaned by simply scraping the leaf-stalk with an old razor. Since then I have been able to get the contrivance used in China for cleaning pine-apple fibre. This is a piece of hollow bamboo with an incision about 10" long & 1" wide the edges rather sharpened like the knives of a mowing machine. This expedites the scraping part considerably & with I fancy prove more serviceable than the Manila knife.

I am preparing a sample of plantain fibre & I can safely promise you a sample which should earn a satisfactory report.

I am convinced that the preparation of this fibre depends entirely on the age of the stem. The sample referred to was from stems which had ripened. I find however younger samples give separate fibres & I am inclined to think stronger.

Malacca

17th June 1893

Dear Mr Ridley,

1. I attach some correspondence on the Kelong fibre question. I have not been able to get Malaya to take it up, but towards the close of the year when padi is short it might be done. Of course if your correspondent will pay for day labour it could be obtained.
2. Wild Arenga (Longkap. useless for fibre)
3. I send a box of dried specimens which include some of the tan barks you require.
4. Have sent specimens or samples of Karanti, Uligadong, preserved Linis, Rotans (3 samples) for Kew
5. Sleeping mats ornamented with silk. These are costly. I have not been able to get any.
6. I have passed on to Mr Frodenough a list of specimens I have been unable to get by time of leaving & which you require

W. R. Ridley
7.6.93

MEMORANDUM.

10

From Asst Supt Forests

To Dist. Officer, alor Gajah

Date 5th May, 1893

Could you get any Malays in your district to prepare bundles of kalong fibre as samples enclosed, i.e. varying from 'fine' to 'very coarse' I require to purchase large quantities of each, but principally the 'coarse'.

W. Pennington

5. 5. 93

Asst. Supt of Forests.

I made enquiries some time back about kalong fibre. The Malays apparently only manufacture the rope spasmodically, when they have nothing else to do. I am afraid it will take some time to collect a large quantity, however, I will try again.

L. Pennington
24.5

April 5 1933.

Prof. Ridley

Potential Gardens

Singapore.

Dear Sir

I am today in receipt of the samples of fibre sent per S.S. Chelva. I should be pleased to know in what quantity, they can be obtained and at what price per cwt. then they could be delivered at the Tanjong Pagar Dock or to the order of Bourne & Co. I conclude that you have duplicates of the samples sent me so that I need cable you. I wrote you on Feb 11. asking if you would prepare say five tons as a sample consignment of the black fibre "Avoenga Sarcatherigera" I should like some of each kind but more of the coarse and medium than fine. On hearing from you giving particulars of cost of this consignment of preparation and carriage I will send you a cheque. Thanking you for the interest you have taken in the matter yours faithfully.

T. W. Bullerby

MEMORANDUM.

10

From Asst Supt Forests

To Director J. & F

Date 28th March April, 1893.

1. There is a bill of \$17.00 due for coffee & nutmeg supplied in February & as the audit office are expected in a few days I should be glad if the money can be remitted at an early date.
2. A sample of pineapple fibre I gave our Waterhant firm, was valued in London at £32 a ton. By the following mail the same firm wrote saying they had underestimated its value that it was worth £40 a ton & asked for large shipments as there was a demand for it. I fear nothing can be done at present.

W. Denny

Asst Supt Forests

Perak Government Museum,

LARUT, PERAK, STRAITS SETTLEMENTS,

July 15th 1894.

Dear Mr. Ridley,

I cannot remember that
there is any *Wami* now
grown in Perak.

Some years ago Mr.
Dension introduced some *Wami*
to plant it in Lower Perak.
But at present beyond a
few odd plants growing
about in the *Wami*
there does not appear to

The very best.

Yours truly

Osney Jones

Sumbawa 18th April 1893

Dear Mr. Ridley.

I have been up in Celebes for the past week and tried to find the pisang fibre. The Malays tell me there are three sorts in Celebes. 1st the same as described by you as Pisang Karong. (they call it "Suru") This is very common. 2nd "Pisang Chadak" is your second sort with the flower spike erect & violet-colored. The plant grows here and there with the others ~~describing~~ the leaves are a brighter green and not so long nor the plant so high. 3rd My informant did not remember the name nor have I come across it.

I tried the parang dodge but I found that I wasted most of the fibre. indeed it gets all tangled. & I don't think I have the method right. I understand from Mr. Hale, D.O. Sampin who knows all about it, has had some made by the prisoners in jail & it was shown & exhibited at the Imperial Institute & also valued in Munich house at £38. per against £42 for best manila! In Manila I understand it is all hand made. Now if I could get a man from there who has the manipulation I would willingly pay his expenses & employ him for a time. I want to then get a some hand power machine ~~which is capable of doing~~

the work eventually to be converted into steam
or other power. This should be quite feasible.
Have you large quantities to experiment with
in Singapore? I am sure you have.

I will get you a bag of young plants of
the sort you want.

I am coming down for Mr. Preece
will bring you up. I am very anxious
to see what can be done.

Could you not find out the exact process
in vogue in Manila, through the British
Consul there. as far as I can see, this
is really what we want to get at.

Yours very truly
W. H. Preece

PAPER-MAKING.

Mexico.—*A new paper-making material.*—A large tree is found in Mexico, but more especially in the State of Tabasco, known as the jolocin (*elœocarpus Americana*), Majagua or poa tree. It grows with such rapidity that it is really dangerous to fields left lying waste. Hitherto the fibre obtained from the bark of this tree has been used merely for making cordage, its power of resistance being equal to that of hemp. Of late, however, trials have been made with this fibre by the paper factory at Belem, near Mexico, to use it in the manufacture of paper, and a successful result was obtained. In texture and colour "jolocin" paper greatly resembles parchment, and is far superior to the ordinary rag made papers. In all probability jolocin will soon be included in the raw materials used for making paper, and, thanks to its polish and fineness, it will doubtless some day play an important part in the manufacture of tissues. On a space of 105 acres 29,088 trees can be cultivated. Each tree produces 5 lbs. of fibre, making a total of 145,430 lbs. which, sold at the rate of 6 $\frac{1}{2}$ s. per 2000 lbs., bring in a sum of nearly 466 $\frac{1}{2}$ l. The expenses in piastres (1 piastre = 3s. 2 $\frac{1}{2}$ d.) are as follows:

	Piastres.
Interest: 10 per cent on a capital of 2000 piastres	200-00
1417 days' work at 0-37 $\frac{1}{2}$ piastres	531-38
Transport rate to San-Juan-Bautista (for exportation)	
at 4 piastres the ton of 2000 Spanish lbs.	200-86
Total	1,022-24
Receipts	2,908-00
Expenses	1,022-24
Net Profit	1,885-76

The cultivation is exceedingly simple, consisting merely of two or three weedings per annum. At the end of two years the tree is ripe for the market; it is cut down, the bark is taken off and steeped in water. After soaking for eight days a simple washing suffices to lay bare all the fibres.—*Belgian Legation at Mexico.*

January 1, 1892.]

THE BRITISH T

manufacture this glass for themselves have met with no success, as the prices were not sufficiently cheap to enable them to dispense with the foreign line. Native industry has, however, succeeded in ousting various articles from the market; amongst these are cheap tumblers, lamp chimneys, and opalescent lamp shades, which were formerly obtained from Germany. The Japanese will also soon be able to supply all the bottles used by the newly-opened breweries in Tokio and Yokohama; ball-stoppered soda-water bottles are still imported in large quantities. Plate-glass is imported in small quantities; only the best quality sheets, of various sizes, are in demand.—*German Official Report, from Hiogo-Osaka.*

Turkey-in-Asia; Smyrna.—In glass and glassware Austro-Hungarian trade was somewhat limited, as we could not successfully compete with Belgium and France; indeed, it is greatly to be feared that, unless Bohemia displays more energy in the revival of her once important glass trade, the whole of the Levantine market will be lost to Austria-Hungary. The only merchandise in which Bohemia still continues to command the market is articles for illuminating purposes. In optical goods Paris and Berlin still rule the market, although the few consignments obtained from Vienna gave every satisfaction.—*Austro-Hungarian Consul at Smyrna, 4th quarter, 1890.*

HOTELS.

Philippine Islands.—Why does not some one start an hotel here? A good manager and cook would undoubtedly be very successful.—*French Consul at Manilla.*

INDUSTRIES ABROAD.

Argentine.—In spite of the financial crisis, the industrial development of this country is making rapid progress. Several new establishments have been started in 1890, the most important of which are, the "Estrella" distillery at San Pedro, the "Cerveceria Argentina" brewery at Quilmes, a dynamite factory at Zarate, the "Cristalera" glassworks at Villa Catalinas, and a machine factory at Buenos Ayres. All the factories of this country are much hampered by the high price of coal, and the excessive duty on the necessary raw materials imported from abroad.—*Austro-Hungarian Consul.*

CIRCULAR

Downing Street,

2nd June, 1894.

Sir,

With reference to my Circular despatch of the 12th of August,

1893, I have the honour to transmit to you copies of a despatch from the

Gov. No. 64.

24th April, 1894.

Kew, 22nd May, 1894.

Governor of the Bahamas, and of a letter from the Director of the

Royal Gardens, Kew, respecting a machine for extracting fibre from

Sisal Hemp, manufactured by Mr. Todd, of New York, which is now

in successful operation in the Bahamas.

I have the honour to be,

Sir,

Your most obedient, humble Servant,

RIPON.

The Officer Administering

the Government of

Bahamas.

No. 64.

GOVERNMENT HOUSE, NASSAU, N.P.,

24th April, 1894.

MY LORD,

With reference to communications, verbal and otherwise, that I have received from the Colonial Office during the past three years on the subject of machines for the extraction of fibre, on which information was desired for the Fiji Government, I have now the honour to acquaint your Lordship that I am at length in a position to speak definitely of a machine that is now in successful operation in this Colony.

Address:—

J. C. Todd,
Patterson,
New Jersey,
U.S.A.

2. The machine in question is one manufactured by a Mr. Todd, of New York, and during my late visit to the Munroe Plantation at Abaco, I witnessed its performance and have no doubt it will be universally adopted here. It dresses the fibre perfectly and with a minimum amount of waste, and though half a ton is all that a single machine will yield as a day's work, the principle is so sound that all that is necessary is to increase the number to meet any required needs.

3. I may observe, however, it does not necessarily follow that the "Todd" machine will be suitable where the conditions of the plant are not similar to ours—I am not informed of the nature of the plant at Fiji—but it may be instructive to know that the leaves of the Bahama Plant which hold the fibre are from four to six feet long; that they are free from gum, and the threads separate without combing. Little washing is needed, and the whole process of extracting, washing, and drying is the work of one day.

I have, etc.,

(Signed) A. SHEA,

Governor.

The Most Honourable

The Marquess of Ripon, K.G.,

etc. etc. etc.

ROYAL GARDENS, KEW,

May 22nd, 1894.

SIR,

I have the honour to acknowledge the receipt of your letter of May 19th, transmitting a copy of a despatch from the Governor of Bahamas respecting the "Todd" machine for extracting fibre from Sisal Hemp.

2. This machine is described in Report No. 5 "Fibre Investigations in the United States," issued by the Department of Agriculture, pp. 25, 26. The Governor's despatch gives the first information as to its practical working which has reached Kew. As the success of the Sisal Hemp enterprise in Bahamas entirely depends on a satisfactory machine being found for the purpose of cleaning the fibre, the information contained in the Governor's despatch is decidedly encouraging. The price of Sisal Hemp is just now lower than it has ever been. It is quoted at £16 10s. per ton, compared with £54 three years ago.

3. Sir Ambrose Shea correctly points out that "it does not necessarily follow that the 'Todd' machine will be suitable where the conditions of the plant are not similar." In Fiji the most plentiful species is *Furcræa gigantea*, or Mauritius Hemp. It is possible that the "Todd" machine may clean *Furcræa* leaves, but it cannot be assumed.

4. The attention of the Governor of Fiji should be drawn to the Mauritius machine as likely to answer his purpose. It is described in the Kew Bulletin, 1890, pp. 98-104. It is very cheap, can be easily worked by a low horse-power, and attended by Indian coolies.

I am, etc.,

(Signed) W. T. THISELTON-DYER.

Edward Wingfield, Esq., C.B.,

Colonial Office,

Downing Street, S.W.

Colonial Secretary's Office,

SINGAPORE, 26th September, 1893.

It is requested that the following number be quoted in the reply to this letter.

S. of S. 9084-93.

Sir,

I am directed by the Acting Governor to forward, for your information, the enclosed copy of a report on Weicher's Fibre Extracting Machine, printed in the Kew Bulletin for June 1893, to which the Secretary of State invites attention.

2. His Excellency would be glad if you would be good enough to investigate the matter with a view of introducing fibre-cleaning as an industry in the Singapore Criminal Prison and to prepare a scheme for the consideration of Government.

I have the honour to be,

Sir,

Your obedient servant,

H. M. M. M.
Acting Colonial Secretary.

S.S.

The Director

Gardens and Forests,

SINGAPORE.

(Copy.)

Weicher's Fibre Extracting Machine.

This fibre extracting machine is constructed by J.J.Weicher, 108, Liberty Street, New York. It is now on trial in this country under Mr.Weicher's supervision at the Carlton Works, Printing House Yard, Hackney Road, London, N.E. The chief interest at the present moment attached to the fibre machines is based on their capability to clean leaves of the Sisal Hemp plant so largely planted at the Bahamas and elsewhere. This brief report is therefore almost entirely confined to the treatment of leaves of this sort.

Recently, accompanied by Sir Alfred Moloney, Governor of British Honduras, I accepted an invitation to see the Weicher machine at work on Agave leaves obtained from the Riviera. The leaves were those of *Agave americana*. They had been cut about a fortnight, and hence they were not in the best possible condition for being experimented upon.

The Machine. The machine consists of a drum fitted with beaters, and a feeding table mounted on an iron frame about $14\frac{1}{2}$ feet long and $2\frac{1}{2}$ feet wide. The whole structure is of iron, fitted with beaters composed of a mixture of copper,

copper, aluminium and iron attached to the drum where it comes in contact with the juice of the leaves. The general principle of the machine is similar to the "Gratte" in use in Mauritius, and the "Raspador" of Yucatan. The leaves, as in these machines, are presented endwise, and are cleaned by the beaters attached to the drum. About one half of each leaf is cleaned at one time. It is necessary to change the position of the leave before the other half can be cleaned. There is, however, no reverse action, and in this respect the Weicher machine possesses an advantage over other machines of the same type.

The Feed Table. The feed table consists of an endless band composed of flat iron laths fastened across two iron chains. The band is fitted with iron clamps for holding the leaves in position and presenting them to the beaters in such a position that at first about one half of their length is cleaned. After this the leaf is carried continuously back on the underside of the band, and brought out so that it can be seized by the operator and its position changed. When it is next presented to the beaters, the uncleaned part is treated and the whole of the fibre is then carried out and removed from the machine. The feed table is therefore automatic, and it will carry at one

time about four or five leaves. These may be any length up to about eight feet, and the quickness of the cleaning depends very much upon the activity and aptness of the operators.

Serving the machine. For regular working a man and two boys are required. The man and one boy attend to the feeding and the changing of the leaves, while the other boy takes out the cleaned fibre and hangs it up to dry.

The trial. The machine was worked recently at intervals for about an hour. It readily cleaned Agave leaves of various sizes, some only half an inch thick and others between two and three inches thick. There is an arrangement of levers to allow for yielding in case of very thick leaves, and the machine was not clogged or stopped during any portion of the trial. This is an important consideration. The quality of the fibre produced was on the whole good. There was but little waste, and none of the strands was damaged or broken. The samples cleaned are now at Kew. Nothing has been done to them since they left the machine.

Washing the fibre. Where there is an abundant supply of fresh water, an arrangement could be made whereby the fibre might be washed while passing under the beaters. This, however, is not an essential part of the cleaning. It may

be adopted or not according to local circumstances.

Particulars of the machine. The following particulars were obtained from Mr. Weicher. The total weight is 3,100 pounds (avoirdupois). The space occupied by the machine with feed table extended is $14\frac{1}{2}$ feet long by $2\frac{1}{2}$ feet wide. The power required is 10-horse power giving 500 revolutions per minute. The inventor has worked the machine in Yucatan for a period extending over nearly three months. One machine is still in Yucatan.

Yield of fibre. Mr. Weicher claims it will treat 10 to 12 tons of green leaves in a day of 10 hours. Allowing the leaves to yield 3 per cent. of fibre (in a prepared dry condition), this would be at the rate of 672 pounds per day as the lowest return, with a possible return (at 4 per cent.) of 896 pounds per day. As far as could be judged from the recent trial these returns are not improbable. It is, however, impossible to offer a definite opinion on the subject. The actual capacity of the machine can only be determined by continuous working on a Sisal hemp plantation, and with operators who have become thoroughly accustomed to it. In a Report on the Sisal hemp industry of Yucatan, prepared for the Government of the Bahamas by Captain E. Jerome Stuart, (Kew Bulletin, 1892, p. 275), it

is stated that the Weicher machine "requires 12 horse-power engine and the services of three men. Capacity, 2,500 lbs. dry fibre per day of 10 hours." Mr. Weicher judiciously disclaims all responsibility for the capacity here given. He prefers to indicate it by saying that the machine will treat at the rate of 10 to 12 tons of green leaves per day. The actual yield in dry fibre will therefore depend upon the quality of the leaves. Mr. Weicher hopes to obtain as high as 5 per cent of dry fibre from good leaves, and he thus estimates the out-turn per day of 10 hours at 1,120 to 1,340 lbs. These figures, it is needless to add, are given entirely on his authority. For comparison from actual working it may be mentioned that the Yucatan Raspador (with two men) acting on leaves of Sisal hemp will clean about 400 pounds of dry fibre per day. On the other hand, the Mauritius machine (also with two men) acting on leaves of the Green Aloe (*Purcraea gigantea*) will turn out only about 214 pounds of dry fibre per day. The difference in these returns may be due to the different qualities of the leaves, but it is evident that, so far, neither of these machines working on a commercial scale is able to turn out more than 400 pounds of dry fibre per day.

The conjectural figures given by Mr. Weicher require

therefore

therefore to be received with due reserve until the performances of the machine have been fully tested.

Summary. I may add that I have seen most fibre machines that have been brought forward and tested during the last 12 years. I am not yet in a position to say that any machine has fulfilled all the conditions necessary in cleaning Sisal hemp fibre. The whole of the Mauritius hemp (from *Furcraea gigantea*) exported from that island is cleaned by the Gratte, locally made and costing about £ 30. (Kew Bulletin, 1890, p. 98). This has to be fed with one or two leaves at a time, and there is considerable waste. There is also some risk to the workpeople, who have to hold the leaves in their hands while they are being cleaned. The Yucatan fibre is chiefly, if not entirely, cleaned by the rough contrivance known as the Raspador, also locally made (Kew Bulletin, 1892, p. 37, with woodcut). The working of this is slow and wasteful, but with very cheap labour the industry is apparently very remunerative when prices are high. There is probably little or no inducement, owing to cheap labour, to introduce improvements in fibre cleaning in Yucatan. In the Bahamas the circumstances are entirely different, and a satisfactory machine is indispensable. The various machines that have hitherto

sought

sought to supplant the Gratte and Raspador, such as the "Death machine," the "Barraclough machine," and others, have all turned out better qualities of fibre, it is true, but the total yield has been small and disappointing. In fact, taking into account the great efforts made to introduce and popularise these machines, their extended use on a commercial scale has made little or no progress of late years. The Weicher machine possesses distinct merit, and it is more promising than any (so far as I have observed) with an automatic feed table. It may be said against it that it is somewhat heavy and intricate, and its price (not yet fixed) must be higher than ^{either} the Gratte or Raspador. It deserves, however, to be tried under suitable circumstances, and those interested in the fibre industry of the Bahamas, for instance, cannot do better than carefully test it on the spot. The inventor would then have an opportunity of showing its capabilities in the presence of an unlimited supply of leaves. It is impossible to do more in this country than form an approximate idea of its merits. It may be added that it is claimed for the machine that it will clean the leaves of Bow-string hemp (*Sansevieria*), Banana (*Musa sapientum*), and possibly also pine-apple and Ramie. None of these, unfortunately, were available at the recent trial.

The Universal Fibre Cleaning Machine.

Fig. 1.

THIS Machine extracts and cleans the Fibre of the RHEEA, JUTE, HEMP, AGAVE, PINE APPLE and NEW ZEALAND FLAX Plants, as well as all other Fibre producing STALKS and LEAVES, when operated on in the green and freshly cut state.

The Fibres of the great majority of plants in the green growing condition are naturally white in colour, they become discoloured subsequently from the action of their juices under exposure to the sun and air, as also during the retting process to which many of them are now subjected, and which has frequently the effect of weakening them as well. These juices or saps in the fresh growing plants, before they have reached their full maturity, contain

the various gums and colouring matters in a state of solution, and are removed by means of cold or tepid water, but hot water or steam *coagulates* and *fixes* certain of the gummy substances in them, and also *sets* the colouring matters on the Fibres in a manner which often renders it impossible to prepare the Fibre afterwards in a satisfactory condition.

With the new Machine these juices are at once washed out of the Fibre by means of a thin sheet or flattened jet of water, the quantity and force used being regulated according to the condition of the leaf or stem operated upon. This jet or stream of water plays upon the Fibres, and at the same time holds them up to the action of the beaters, forming a species of elastic cushion, or backing of water, during the operation. In this way there is little or no waste of Fibre, and the whole of the juices, together with the green bark and broken up stems of hexogenous plants, and the pulpy and other adherent matters of endogenous Fibre yielding leaves, are at once removed. Their Fibres are extracted in their natural state, and only require to be dried and baled for exportation.

These Machines are already in use in India and other countries. The Fibres, from the first consignment of Bales delivered in London, presenting so beautifully white an appearance, were thought to have been subjected to some bleaching process; the fact being that, for the first time, the Fibres were obtained in their natural state, and in the pure condition in which they exist in the plant.

The introduction into commerce of the new Indian Fibre—the Moorva,* from the *Sausseiera zeylanica*—equal, if not superior, to Quilot Manilla Hemp—is one of the important results already obtained by the use of the new Machine, the action of which, by extracting the various Fibres in the state in which they exist in the plant, makes it at length, and for the first time, possible to determine the comparative merits of the different Fibre yielding plants, to select and bring to notice those most worthy of cultivation, and, at the same time, to fix the periods of growth of particular plants, when their Fibres are at their best for certain purposes, although there can be no doubt that, for fine textile purposes, in the majority of cases, it is necessary to abstract the Fibres before the plants which yield them arrive at their full maturity.

* The first consignment of this Fibre was sold at £30 per ton, but a second consignment lately received from Madras fetched £40, and as at the same time the best Quilot Manilla was selling at £55 per ton, the price of Moorva may rise still higher once its superior qualities become more generally known. It may be mentioned, however, that Roping Manilla at the above period was selling at only £33. 10s., and the ordinary Mauritius Hemp from the *Fourcroya gigantea*, or large Agave, at from £26 to £28 per ton.

In using the Machine for obtaining the Fibre in its best condition, stalk-plants, such as the Rheca, must be operated on as soon as possible after they have been cut, and they must in the interim be kept from exposure to the sun, or the drying action of currents of air. In cases where the plants are simply cultivated by the Ryqts, as in India, the conditions will be very similar to those which exist with regard to Indigo, which is cut and brought to the factory in a fresh state, where it is sold in bundles at a fixed rate, and it is believed that there are a good many Indigo planters who might with advantage add to their operations the preparation of Rheca and other Fibres.

THE SETTING AND WORKING OF THE MACHINE.—The Machine must be fixed firmly upon a level foundation, and driven at an average speed of 600* revolutions per minute, when, by careful attention to the following instructions the operator will be able to produce a beautifully cleaned Fibre.—

- 1.—The top of the feed plate or table of the Machine should be set about $2\frac{1}{2}$ inches *below* the centre of the spindle of the beater for large Aloe leaves averaging $3\frac{1}{2}$ inches in thickness, and *not less* than half an inch below for thin leaves, such as the Pine Apple and New Zealand Hemp, and about the same distance for Rheca and other Fibre yielding stalks.

NOTE.—The two sets of screws below the brackets, which support the feed table, are to raise and lower the same, care being taken to *loosen* the bolts in the side of the frame *before* moving it, and to see that they are properly fastened after the table is set.

- 2.—The edge of the feed plate should be fixed about one sixteenth of an inch from the edge of the beaters, and *quite parallel* to same.

NOTE.—The two screws in *front* of the feed plate are to adjust it to and from the beaters. Care must be taken that the two bolts which hold the table to the brackets are *loosened before*, and properly *fastened after* adjustment.

- 3.—Start the Machine, and then turn on the water tap.

- 4.—Take the leaves or stalks to be operated on by the small ends, put the large ends upon the feed table and press them against the revolving blades, when they will be drawn into the Machine and all the pulpy, woody, and other matters removed. Allow the leaves or stalks to pass in just past the middle, then withdraw, and the Fibre comes out *thoroughly cleaned* and straight.

- 5.—Take hold of the Fibre, then turn over and pass the small ends into the Machine as before, and withdraw when finished.

NOTE.—In handling, the Fibre must be kept as straight as possible, and *never twisted round the hand*.

It is so simple that any unskilled person can work the Machine after practising on a few stalks or leaves, and the whole operation of passing in the thick ends up to a little over one-half their length, withdrawing the cleaned Fibre, reversing and holding it firmly whilst passing the smaller ends through, and then withdrawing the Fibre in a cleaned condition only occupies a very few seconds. If at first the Fibre is not sufficiently cleaned, the feed table requires to be put a little closer (or all that is necessary may be simply to increase the pressure of water by turning the tap), but if on the other hand the Fibre appears *flattened* or *waved* from the action of the beaters, the feed table requires to be drawn a little farther away. When after the trial of a few leaves or stalks, the feed table has once been properly set, it will not require altering until the beaters become worn, and as these are made of a special metal of a very enduring description, they last, under ordinary circumstances, for a long time. When necessary, they are easily replaced, and in case of accidents, it is desirable to have a few spare beaters with each set of Machines. There is a guard fixed across the feed table of the Machine, and a second guard is formed by means of the sliding plate on the front of the cover of the beater wheel, and which should be fixed half an inch higher than the *thickest* of the leaves or stalks to be operated upon.

* For Rheca and similar stalk-plants, and also for small leaves, a speed of 500 revolutions will be sufficient, but for very large Agave leaves it may have to be increased to 700, and when both kinds have to be operated on in the same factory, the necessary pulleys must be provided.

The water used to wash and prepare the Fibre (by holding it up to the beaters), is applied from directly under the feed plate, and is projected against the wheel at a certain angle and pressure, which last is regulated by a tap. A pipe, three quarters of an inch in diameter, supplies as much water as is required for each Machine, and this can be supplied from a tank or stream at an elevation of not less than 70 feet, or by means of a small but very effective Pump on the rotary principle, and which answers for one or two Machines at a time, and from the simplicity of its construction is not liable to get out of order.

The amount of water required for each Machine amounts on an average to 400 gallons per hour, but it may, under proper arrangements, be used four or five times during the same day. The approximate quantity of water required per day for each Machine, thus need not exceed 1,000 gallons, but it is not advisable to keep it for any length of time on account of its liability to decompose, and to this end the tank containing it should be systematically emptied. When it is found necessary to economise the water, some ready plan of filtering it before it is allowed to enter the tank which supplies the Machine should be adopted; and it should, in the first place, pass through a strainer to stop the broken up stalks and other particles from passing through, and these should be collected for manure, whilst at the same time any waste Fibre from the Machine should be carefully separated and preserved.

Fig. 2.

General view of new Patent Bullock Gear, adapted for working the Fibre Machine with three or more bullocks, according to their size, and showing arrangement for tank in cases where water is scarce.*

The illustration above shows an arrangement for a filter tank for the above purpose. In it the division between two tanks side by side is arranged to act as a filter, but in other cases it will be more convenient as well as effective to have the filter tank placed at a higher level than the one for the supply of the Machine, into which the water from the former is allowed to run.

In addition to preserving for manure the broken up stalks and other refuse from the Rhea and other similar plants, the water used for preparing the Fibre of these should, whenever possible, be employed for irrigation as well, on account of the fertilising

* For particulars of Bullock Gear, see p. 16.

substances which it contains.* The broken-up stalks, after being dried, are likewise readily available for fuel, and the fire boxes of the boilers to the engines supplied by us are specially adapted for this purpose.

Fig. 3.

Two Universal Fibre Cleaning Machines on one shaft, with semi-portable Engine, adapted for burning, in addition to coal or wood, broken stalks, and other refuse.

THE OUT-TURN OF CLEANED FIBRE.—Each Machine requires two men to feed it, one on each side of the feed table, so that while one is changing the leaves and stalks end for end, the other is cleaning his part, and *vice versa*. In this way the Machine is fully occupied, and there is no waste of time or water. Although the operation is simple and easily learned, experience in working the Machine has largely to do with the amount of clean Fibre produced. With practice, the same hands can often turn out more than three times as much as they could at first, and of course in all cases the out-turn will also depend on the diligence as well as the quickness of the individual workman. The out-turn likewise depends to a very great extent on the proportion of Fibre existing in the leaves or stalks of the plants operated on. In a recent experiment carried out at Calicut, in India, with Plantain, cut down, as is the custom after the fruit has been gathered, the actual quantity operated on amounted to 67 tons, and it was cleaned by the Machine, fed by two men, at the rate of five tons per day of ten hours, but owing to the watery nature of the material, the actual yield of Fibre when dried ready for baling only came to 98lb. per day (or about seven-eighths per cent.), whereas in another case, about the same period, in South Africa, in which Agave leaves were used, the material was likewise operated on at the rate of five tons per day, but as the proportion of Fibre existing in it was four per cent., the out-turn would be more than four fold that from the Plantain in the instance above referred to.

* It is doubtful if the water for preparing the Fibre of Agave plants could be used for irrigation on account of the acrid nature of their juices, and it would appear that in some cases even the refuse stalks from certain other Fibre plants cannot be used for manure. In India, the straw of the Flax plant, grown in such enormous quantities for its seed, is not made into manure. The Ryots consider it deleterious if employed in this way, and they burn it and use the ashes instead.

Experimental working with Rheeas from Algeria shows that two men can clean from 30,000 to 40,000 stalks, averaging 3ft. 8in. to 4ft. in length, and weighing about 110lb. per 1,000, say from 1½ to 2 tons, which should produce at 3 per cent. from 100 to 135lb. of dried Fibre.

.. 4	..	..	135 to 180	..	} per day of ten hours for each single Machine.
.. 5	..	..	170 to 225	..	

These ascertained facts show clearly the capacity of the Machine for dealing with a very considerable bulk of material, as well as the dependence of the out-turn upon the per centage of Fibre existing in the plants operated upon.

An important result of the special action of the Machine is, that there is very little or no waste of Fibre, whereas in some existing processes the loss of Fibre is equivalent to more than the whole cost of working this Machine.

The Machine when properly worked, thoroughly cleans the Fibre, which in the growing plant is usually of a pure natural white colour, and removes a large proportion of the gum, which in the case of Rheeas is reduced to from 5 to 10 per cent. as against 25 to 30 per cent. usually found in hand prepared China Grass. No further operation whatever is necessary beyond careful drying and baling, the Fibre being in the condition most suitable for transport and sale.

SORTING.—Regularity of quality being a great desideratum, the material, whether leaves or stalks, must be as uniform as possible, when operated upon—in the case of Rheeas, etc., the stalks should be cut of same length—with Agave, Aloes, Pine Apple, etc., the leaves should be sorted, and each length separately worked and its Fibre kept distinct afterwards; and with those plants where there is a material difference in the quality of the Fibre, between the inner and outer leaves, each quality should also be kept separate.

With Rheeas—instead of cutting down the whole growth three or more times yearly—frequent cuttings may be made of the stems as they attain a certain standard height, say 3ft. 8in. to 4ft., leaving the smaller ones—thus an almost continuous crop may be secured of uniform quality, and the Machines kept more regularly employed.

DRYING AND BALING.—As the Fibre leaves the Machine, care should be taken to keep the butt ends quite level, placing the Fibre upon a wicker tray ready for removal to the drying shed.

In drying, there is a natural tendency to twist or curl, which should be prevented as much as possible; to obtain the best result, drying *must not be done too rapidly*, as this causes loss of strength by rendering the Fibre harsh and brittle. When the air is very dry, water may have to be occasionally sprinkled on the Fibre; on the other hand, when the air is very moist, artificial means of drying will have to be adopted.

When the Fibre is quite dry, it should be made into heads or small bundles, say not exceeding 3in. or 4in. in diameter—secured by a slight strand of the Fibre itself, about 6in. from the butt ends, which should be kept level—there must be no knots or twists in the bundle, which will involve labour or loss of time in undoing—the bundles may be doubled as required to fit into bales of 2cwt. to 3cwt. each, which may be pressed without injury. Iron bands are apt to injure the Fibre by rust, unless the bales be carefully covered. Strong rope or fibre bands are preferable, and when used bales may be sent without covering except where colour is very white, but a slight matting or gunny to exclude dirt is generally advisable.

It is in all cases necessary to sort the Fibre before baling, and to adopt standard marks, the quality of which should always be maintained as uniform as possible.

COST OF WORKING.—The cost per ton (dry weight) of extracting and cleaning Fibre by this Machine will be mainly determined by the rates paid for labour and fuel; the facilities, climatic and otherwise, of drying; the percentage of Fibre in the material operated upon, and the dexterity of the labourers employed; all these conditions may vary in different localities and with different plants.

Where water power is available, fuel will be saved; where steam engines are already in use for other purposes, and not always employed—the power required for these Machines may be obtained at a comparatively small cost. Semi-portable engines are supplied by Z. & W., specially constructed for the work, and to burn the refuse (not required for manure) in conjunction with wood, coal, or other fuel.

The following estimate is based upon the best information obtainable from sources where the Machines have been in actual operation:—

Approximate cost per week of working a plant of 20 Machines passing 5 tons of green leaves through each Machine per day, with an out-turn of 3 per cent. only of dry Fibre.

Forty men working at Machines	@ 3/0	£6	0	0
Twelve men and boys taking Fibre to dry	.. 2/0	1	4	0
Cutting of leaves and carriage to Machines, 600 tons	.. 1/0	30	0	0
Stoker and driver for engine		1	16	0
Fuel		4	0	0
Baling 112 bales, including hoop iron, etc. (7 bales per ton)	.. 3/0	16	16	0
Interest and wear and tear, say 10 per cent. upon an outlay of about £3,000		6	0	0
		£65	16	0

The above will produce say 16 to 18 tons of dry Fibre *per week*, at a total cost of £65. 16s., or £4. 2s. 3d. per ton, for 16 tons only:

Divided as follows:

Cost of labour, serving the Machine, about	£0	9	0	} per ton of dry Fibre.
.. Engine driver, stoker, and fuel	0	7	3	
.. cutting and carriage of green leaves	1	17	6	
.. baling dry Fibre	1	1	0	
.. interest on cost of machinery and depreciation	0	7	6	

Intending purchasers, by adjusting prices to their own local conditions of labour and fuel, may readily ascertain the approximate cost of working in their locality: it is evident that the cost per ton will be reduced by a larger out-turn of cleaned Fibre, which may amount to five or more per cent. in some of the more fibrous Aloes, etc.—and in like manner the cost of cleaning will be proportionately increased by a smaller out-turn. It will be found that the out-put of the Machines is largely increased after a short period of practical working—instances have occurred where the first week's working was only about one-third the quantity subsequently obtained.

NET PRICES.

	£	s.	d.
Single Machine, without pump	54	0	0
.. .. with pump, etc., complete	65	0	0
Two Machines on one shaft with double pump, complete	120	0	0
Semi-portable Engine for two Machines	92	10	0
Bullock Gear for driving single Machines	35	0	0
Draft Poles for ditto, each	2	10	0
Driving Pulleys and fittings extra.			
Plant of four Machines, with Engine and Boiler, for burning } wood, refuse, etc., complete	435	10	0
Plant of eight Machines, Engine, &c., complete	785	0	0
.. twelve ..	1,255	0	0
Hand Screw Press, for bale 3ft. by 2ft. by 2ft. 6in.	80	0	0

Packing and Cases for above about 10 per cent. extra, delivered free in Liverpool or Hull.

MEASUREMENT FOR FREIGHT.

One Fibre Machine, packed for shipment, measures about 57 cubic feet: gross weight about 12 $\frac{3}{4}$ cwt., nett weight about 10 $\frac{1}{2}$ cwt.

Two Machines, in one case, measure about 113 cubic feet; gross weight about 26 cwt., nett weight about 21 cwt.

Racine

JUGRA ESTATE,
SELANGOR.

19.5.99

Dear Mr. Ridley

Many thanks for your

interesting letter of 10th inst about Cassin's

A number of men, an intelligent
hunter, tells me that he knows the

variety growing wild there. He describes

it as a *canopy*. The rubbers are

sometimes used as *storing* but if the
rubber is available the latter is used

in preference. A Malayan man tells

me that a man likes the rubber -

grows in his country in the jungle.

I expect it is simply *imperfect* *man* grown
wild.

I have no doubt whatever about the

②

JUGRA ESTATE,
SELANGOR.

words of my former business.

I employed Messrs. R. H. Thompson

in carrying it & their charges, who
about two days with me at it, estimate
the costs at 50%. I shall make
a further attempt but ^{know} cannot make
it pay at such an ^{small} percentage.

Yours have determined some of
the matters I must have previously and
reports previously. When I am quite
satisfied that the necessary percentage
of films exists, I may recommend
the former process to my people & that
it is fair with the former process.

Yours very truly

G. H. B. B. B.

Guthrie & Co
ESTD 1821.

Scott & Co
1, Whittington Avenue,
Leadenhall Street,
LONDON.

MORFING & NEALS NEW GENERAL & MINING TELEGRAPH CODE, 1891.
A.B.C. CODE, 4TH EDITION.
SCOTT'S CODE, 6TH EDITION, 1885.
SCOTT'S CODE, 1880, & SUPPLEMENT, 1882.
WATKINS CODE, 1861, & APPENDIX, 1864.
UNIVERSAL SHIPPING CODE, 1896.
A.I. CODE, 1885.

Codes Used.

Singapore 19th. Feb: 1897.

OUR LAST

G.T.B.
H.B.W.

H.N. Ridley Esq:

Director, Botanical Gardens,

Singapore.

Dear Sir,

Enclosed we beg to hand you a copy of a letter we have received from the Resident, Labuan, British North Borneo, with reference to the proper method of planting the Ranie which we obtained from you for cultivation in British North Borneo.

We shall be much obliged if you will reply to us to the questions put by Mr. Kennedy on this subject and we should like if possible to have the information required in time to forward it by the "Ranee" leaving in about six days.

We are, Dear Sir,

Yours faithfully,

Copy.

Resident's Office,

Labuan, 13th. February, 1896.

To

Messrs Guthrie & Coy.

Singapore.

Dear Sirs,

With regard to the 6 cases of Rani which I received from you in January last Mr. Kennedy at Sapon, to whom I have sent them, writes to know if a pamphlet can be procured treating on the cultivation of this fibre. I would suggest therefore that you ask Mr. Ridley on the subject and you might also be able to get information on the following questions by Mr. Kennedy on the subject.

1. Can Rani stand flooding and for how long?
2. Does it like cold stiff clay?
3. Or sandy clay? Sandy loam? or palua land that would be flooded to a height of six feet?
4. Should it be grown on hills or flats?
5. When cut down does it grow up again or does it require to be replanted?
6. How often can it be cut down before replanting?

I remain Dear Sirs,

Yours faithfully,

(sgd). W. Raffles Flint.

Resident.

See today nearly c £20. further, first
time. -

This film is quite in a remarkable
condition & is of fine strength & colour -
Many of your local merchants can be
induced to make a trial exposure of
10/20 hrs to London we shall be
glad to see it to our advantage -

Sincerely

IDE & CHRISTIE.

FIBRE, ESPARTO & GENERAL PRODUCE BROKERS.

Telegraphic Address
ESPARTO LONDON

72, 2 Shaftesbury Lane.

London, 17th May 1893
E.C.

The Director

Gardens & Forest Department

Straits Settlements

Singapore.

Dear Sir,

Re your letter of 1st March

and this has been forwarded by the Sample

of Wild plantain fib.

We are happy to be able to report very

favourably of the Sample which would

U. S. DEPARTMENT OF AGRICULTURE,
OFFICE OF FIBER INVESTIGATIONS.

WASHINGTON, D. C., August 16, 1897.

H. N. Ridley,

Singapore, Straits Settlements.

DEAR SIR :

This Department has just published an important work on the fibers and fibrous substances of all countries, entitled "A Descriptive Catalogue of Useful Fiber Plants of the World." It has been prepared by the Special Agent in charge of the Office of Fiber Investigations, and an exceedingly limited edition has been issued.

A copy of this work has been ordered to be sent you. When it has been received, and you have examined it, the author will be pleased to receive from you any notes you may have time to prepare regarding the fiber plants of your locality, as, in a work of such scope, it is hardly possible that the entire field has been covered. It is especially desired that any fiber plants known to have been employed either commercially, or in what may be termed "native" uses, such as for rough textiles, cordage, fishing nets and lines, basketry, etc., that have been omitted, or that have had scant notice, shall be reported. Doubtless, also, many of the native or aboriginal names by which these plants are known in the countries where they grow have not been given. In all such cases the author will be glad to have such names reported, particularly where they can be authenticated and referred to the proper botanical species. I will also thank you to note any errors in nomenclature in the present work, as many of the common native names have doubtless been spelled phonetically, and some may have been carelessly reported. While the author has taken great pains to verify such names in the present volume, errors are possible, and these should be corrected in a future edition.

Any material submitted will be preserved for future use, and should a revised edition of the work be ordered, the new facts that are incorporated will be duly credited to the reporter or contributor supplying them, in the manner that credit has been given in the edition sent you.

I especially desire unmounted photographs of foreign fiber plants, and will be pleased to exchange similar prints of the fiber plants of the United States for them. I shall also be pleased to receive any pamphlets, catalogues, or other printed matter pertaining to the fibers or fiber plants of your country, or locality, in exchange for the Fiber reports of this Department.

Please acknowledge receipt of the volume when received.

I am, very respectfully,

Charles Richard Dodge

Special Agent,
In Charge of Fiber Investigations.

Kalitawang Estate 29. Nov. 96.

To the Direction of the Botanical Gardens
Singapore.

Dear Sir!

Perhaps it will interest you to hear something from my
Rammie cultivation here. The Rammie, I got from you, is
certainly much better than the rammie which I bought
from the natives. Your rammie becomes only half so
high as the other one, but the fibre is much thinner
and more like silk. Because that I think we will
get a better price for that fibre. The test with our
machine was not very good, because the machine
was not strong enough to be driven by motor power,
so we broke five wheels, which must be made stron-
ger in Europe. About the middle of February all things
will be ready to make another test.

I would ask you, if I could get from you the
seed of different vegetables, I want to plant them
here. ^{again} Let me get seed for twenty or twenty
five Dollars, and you will much oblige me.

I am Dear Sir
yours truly

Mumme

Copy of letter from Leadenhall St firm to
Messrs Waterhouse, Malacca.

Dear Sirs,

Referring to the fibre
we under-estimated its value when we last
sent you. This fibre in large quantities
would easily sell for £40 per ton and
there is a very large demand for it.

Feb. 24th 1892

Note.

1. In previous letter sample of Pine-apple
fibre was valued at £32 a ton.
2. Mr. Waterhouse does not wish name of firm
to be published.

R. Denny,

MEMORANDUM.

:0:

From Asst Supt Forests

To Director, G. & F.

Date 21st Feb, 1893.

I enclose p/r for 1 case (freight paid) containing a sample of wild plantain fibre (Pisang Karst) *Musa glauca*, which I have cleaned for you & submit to Messrs Ide & Christie for report. I think this sample is a decided advance on the previous one. It has been cleaned by scraping the leaf-stems with the bamboo contrivance I ^{write} ~~speak~~ to you about. The difference between this sample & the previous one is due to the age of stems selected & not to the cleaning. This sample has been cleaned from stems which have not frayed.

If a favourable report could be received on this sample there are people in Malacca would take up its culture & with this object in view I would ask you to be good enough to get a report as early as possible.

W.D. 20. 2. 93.

MEMORANDUM.

:0:

From Asst Supt Forests

To Director

Date 20th March, 1893

1. I send hill-padi, & 2 kinds of beans 'Kachang panjang' & 'Kachang pendek' for your New Guinea correspondent.

2. Kalong Fibre. I fear a large trade could not be done with this fibre as so very little of the fibre is fit for the purpose required. It would not pay to collect alone, I have therefore arranged to buy fibres from Kalong cord-makers as these persons could separate the stouter fibres while spinning without making special work of it & the fibre could thus be bought at a nominal cost.

As the padi harvest is not yet finished I shall be unable to get any of the fibre for some time.

R. Denny.

Asst Supt Forests.

S/S Idung long type

agent those who long ago the

Paid 10/10/04

18. 2. 04.

Dear Risley

All the padi around

Bentong this year is 'sam bang'.

I send you some of it. The Malays

tell me that this is the result of

a plague of insects which settled on

it some months ago just when it

was coming in to ear. The insects

are called pianggang and have a

very offensive smell. You probably

know all about it. Can you tell

me of any thing to prevent a

recurrence of the plague? I am

just at bottom a practically level
bed of corals.

40000 m. thickly

to one 500 m.

Marie

11 Boscombe Rd

Widbridge Rd W

England Jan 7th 1899

J. H. Killey Esq^r

Singapore

Trust Settlements.

Dear Sir

Having purchased the
six Thompson's machines that were
built to the order of the Rhea Fibre
Treatment Company at a cost of £50 each.
I am in a position to sell them at £20
each. Judging from the trials I
have given the machine I think they
are capable of doing a fair amount
of work and are well suited for
small plantations of this kind, the
machines can be used by the

can do - you may wish a more
expensive one

Yours very faithfully

H. Beethoven

I have pleasure in enclosing a
sample album described by the
no. 1000

purchase to colonist after colonist
at a fair profit on the purchase price
and you would be at perfect liberty
to make any improvements in the machine.
your mechanic may think advisable
to further improve.

Your representative in London could
inspect the machine and probably get
work; by appointment and I would
pack and deliver it to him at his
order for cash.

Even one such machine worked
on the farm where the scheme is grown
would indicate to you the possibilities
of producing ribbons at a profit
and after you had commenced
yourself of what a cheap machine

JUNE 8, 1895.

THE COMING TEXTILE.

RAMIE has been long known to our manufacturers, but the difficulties which presented themselves caused the ardour of its promoters to evaporate. More plodding and persistent workers, knowing its vast capabilities, have gone steadily plodding along, surmounting one obstacle after another till the *fait accompli* has been reached, and nothing now but capital stands in the way of its being rapidly taken into use.

Ramie, Rhea, or China grass, is a nettle, and produces a fibre unequalled for its strength and brilliance. It is several times stronger than hemp and three times that of flax. Herein alone lies a future for it. For ropes, twines, sail-cloth, rigging, fishing lines, and nets, it is almost indestructible, and does not rot. For machine belting, belting for soldiers' use, and a hundred other uses where strength is a factor it is equally useful. The extraordinary characteristics of this fibre is that it does not possess one quality, but is so elastic in its possibilities that it will work out wool, while goods made from a mixture of wool and flannel will prove so durable that the wool gains by the alliance. The same applies to cotton flax and even silk. Its possibilities are so great that samples have been prepared which have been said to baffle silk experts. Its alliance with other textiles adds to their merit, but it is quite capable of working alone. It will make cloths—equal to the finest cotton or flax—damasks, diaper, and even plush and velvet. In short, there is nothing now made by flax, cotton, or silk that this fibre Ramie will not imitate, and that brilliantly, and when the question of durability is taken into account, will surpass them all. We have to thank Messrs. Burrows & Radclyffe, of Lower Kennington-lane, S.E., for the advances that have been made in bringing this fibre to the front. They, after careful and diligent research and experiments, have succeeded in perfecting a set of machinery which is protected by seven patents.

The process, which may be described as simplicity itself, is as follows:—The Rhea or China-grass ribbons are subjected to a chemical bath which is very naturally a secret of the inventors. The fibre is then treated to a boiling in open tanks, the fibres being kept in motion by a very simple and ingenious mechanical arrangement attached to the boiler. On leaving this boiler they are placed in a solution for bleaching, or where whiteness is no object, it is taken immediately to a drawer-separator; this machine does its work rapidly and effectively, drawing it into a lap of disentangled and parallelised fibres. Another process—and this depends greatly on the quality and softness of the fibre on leaving the boilers—is to dry the material and draw it in a dry stage; both processes give good results, but as a question of economy the wet process is preferable. The lap is now dried, and is ready for use for all rough purposes such as rope, sail-cloth, belting, &c. For finer uses it is subjected to a softener, a machine which simply reduces it to a soft and silky texture. It is then ready for the gill box, and when drawn into a sliver is ready for the manufacturer, as it is then in a condition to be treated by existing methods as either flax, silk, or wool. The patentees, however, are prepared to carry it further, as their patents cover a very ingenious comb, specially for this fibre, and a spinning frame. There is now no necessity for our manufacturers to put down special plant, as Messrs. Burrows & Radclyffe claim they are in a position to produce sliver which can be used by any spinners. We are informed the plant is easily grown in England; if so, as its stems produce fibre and its leaves are useful for fodder or paper making, a good time may yet be open to our agriculturists. We think it will be a reflection on our go-ahead principles not to give this subject a searching investigation. The United States Government are alive to its possibilities, and are voting some \$250,000 for experiments and to encourage the growth of Ramie, and are bent on adding it to their agricultural economy. Our own Indian Government are urging its cultivation. Surely this is incentive enough for an Englishman, and he should not be behindhand. If it's a question of capital, surely with the wealth we have seeking employment this could or should be surmounted at once. We certainly think the days of Ramie are dawning.

Ramie

INTERNATIONAL FIBRE SYNDICATE LTD

(REGISTERED OFFICE:-16, DAWSON STREET, DUBLIN.)

TELEGRAMS:-

"DEARWORTH, LONDON."

A B C, A 1 & PREMIER CODES.

28, VICTORIA STREET,
WESTMINSTER,
S.W.

Dr Ridley,
Botanical Gardens.
Singapore.

December 12th 1899.

Dear Sir,

Our representative, Mr W H South, had the pleasure of discussing the question of ramie with you some little time back, and I shall be glad if you can give me any information as to the following points:- We find in Dominica where we cultivated some roots sent us by Monsieur Riviere from Algiers that these stems only attained the height of from 3' to 3'4", when they at once began to seed. Now these same stems in Algeria grow to 1 metre, 65 centimetres, or an average of 5'6". A root or two taken from the same consignment and grown in a hot-house here has grown to the height of about 5'. Can you give us any explanation of this peculiarity? Naturally the stems being so short there is a very small yield of fibre, but the same is very fine as you will see from the enclosed piece which has not been properly combed owing to the fact that we did not have sufficient. The fibre enclosed is far superior and finer to China Grass. Of course this sample is only to show you the quality of the fibre, as until we have a goodish quantity we cannot put it through the combs necessary. I shall be obliged if you can let me know about the above problem.

Yours faithfully,

E. J. Davis
E. J.

~~Puteh~~ Ramie

JUGRA ESTATE,
SELANGOR.

12.11.99

Dear Ridley

You will, I know, be interested to hear of my latest doing in Ramie.

I started work with the "Eke" machine last month. This is the first time that the machine has been tried ~~out~~ on green stuff and the inventor told me he was quite uncertain if it would work.

I am fairly well pleased with result. The principle is excellent, but some of the details are feeble, while the construction in general is faulty.

I have suggested about five alterations and have asked them to come out to discuss my id

JUGRA ESTATE,
SELANGOR.

The main point is whether
we are to make ramie pay or
not - depends on our spinning
friends carrying out their idea
of erecting a degumming factory
on this estate. I lose money by
sending "Che" ribbons to London
- thanks to Straits Shipping Conference.

I am getting splendid crops
from the big variety, but do not see
how "sun fiber" can be made
profitable, unless the value rises to
about £30/- per ton.

Can you tell me anything of the Mal-
cotton tree "Kapas"? I have the name
"Kala - Kala" - I believe it is planted on
a large scale in Sumatra (?) Java.
What is it used for - do they have a European
market?

Yours sincerely
Cyril B. Baugh

Jibre

Batu Tiga

Selangor

21st July 03

Dear Mr Ridley -

I am sorry I
have been unable to answer
yours of the 4th inst before
this, but I only returned
from Perak yesterday & my
letters have been following
me round all over the
place.

With reference to the
fines you mention the you.

The Imperial Institute was
on fibre prepared by me?

It is true I prepared a
small sample some time ago
(about 2 months ago) which I
enclosed in a letter to the
Res. General on the subject,
but this was a very small
sample & very roughly prepared,
— the product of one small
leaf. I simply scrapped
away the cellular tissue with
the lid of a cigarette tin,
washed the fibre in cold
water & hung it up in the
sun for about 24 hours —
nothing more. The fibre was

given in the Expil. Garden
about 10 months old.

I understood from your
letter of the 16th ult. that the
sample referred to was
prepared by the Selangor
Rubber Co., but I will make
enquiries & will let you
know if I can glean any
information regarding any
such samples.

You have probably
heard that there has been a
Committee appointed to report
as to the advisability of
forming an Ag. Board of
Agriculture for the F. M. S.

I visited of A. R. Dunning, Chairman
Tanner, (Rev. Wellesley) T. H. Hill, Cury
& Bailey. I believe there is
some idea about making one
dept. for the S. S. & the F. M. S.
which the Board will
exercise authority.

Many thanks for information re
the letter in Lahore. I am
writing Barker by this mail,
but I am afraid my limited
knowledge of the Tamil language
will severely handicap me
altho' I can get along with
Malay alright; anyhow I
think it worth a try.

With kind regards

Yours sincerely,
C. J. Dunning

9 June

Pekam
12th May 1903

Dear Mr. Ridgway

Re: the "Phy. Princ. Linn.
of Jungle Produce"; "Kaya
Abauk" shd be "Abauk Kaya
Gham" is the reverse of the
"Kaya Gham".

"Kaya Lakai" shd be
"Kaya Laka", I have not seen
it, but am told that it is
a parasite, and the wood of
it is used in concocting certain
medicines, I am informed that
it is usually to be found for
sale in some Kling shops in
Piprah. It is rarely exported
here.

"Akur Paku" is not the
root of a fern. It is a species,
Bull. ~~quadratus~~ are expected
to find where it is used.

I have ordered a number of
the King's new edition of "The
Study of the Bible", and will
send them to you of 100
each before I have for myself.
I am sending you a new edition
of the King's new edition of "The
Study of the Bible", and will
send them to you of 100
each before I have for myself.

The King's new edition of "The
Study of the Bible", and will
send them to you of 100
each before I have for myself.

in the construction of 'blots'
of 'kalongs' instead of 'blots',
being cheaper.

I have asked a native
to bring me samples of 'Kaya
Luka' & 'Aka Paka', and will
send them on to you if I get
them before I sail for Europe.

I am afraid as I am leaving
Siam very shortly that you
will have to ask some one else
to procure specimens of 'blots'
for you. I had suggested Mr. A. B. Smith
of the F. S. S. Co., who for some time
will be in good deal in the
country.

Many thanks for the 'Book
Mentary' seeds you sent
me, they are all coming up.

Yr Truly

J. H. Murray

25, Birchington Road,
West Hampstead, N.W.

THE COTTON CRISIS—A SUBSTITUTE.

Dear Sir,

Herewith I send you a copy of a letter sent to the Agricultural Department of our Colon . It will interest your readers, and, I hope, induce them to agitate for State support, or, failing this, our leading Capitalists would find it a highly profitable industry. Could you not follow it up by a leader? There is no end to the possibilities of Ramie, and now that the Americans are cornering the Cotton trade, it is a splendid opportunity to prevent these tactics in future. You will confer a blessing on our Colon if you induce the start of this industry. You may rely on my co-operation.

Yours faithfully,

D. EDWARDS-RADCLYFFE.

“ To

“ I would call your attention to the possibilities of Ramie (Rhea), which undoubtedly is the Textile of the future. If you can grow this fibre, which is easily cultivated, there is a vast trade with Europe possible. It would be specially welcome in England as a rival to Cotton, and would do much to prevent the corner in Cotton so easily worked by American capitalists, as experience teaches us to our cost. A Lancashire Cotton Famine would not be possible if supplies of Ramie were forthcoming. It would also help to make a self-contained Empire—we should produce all we want independently of other countries. The fibre is as easily worked as it is grown, and I see no reason why the industry should not be fostered in your Colony, from cultivation to spinning, or even weaving (from the field to the loom).

“ I would suggest the government provides seed or plants. It is easily grown from seed. In every district where the plant is freely grown, set up decortication and degumming stations, such as mills grind the corn here or the central stations crush the sugar-cane in Queensland. If the government does not put up these stations, then they should encourage the capitalists to form syndicates by giving a bonus on the amount produced.

“ The degumming stations would be highly profitable. 1st. The fibre would be extracted in the form of filasse, easily packed, and a great saving in freight effected as compared with ribbons. 2nd. A profit would be made on the enhanced price the filasse would command as compared with ribbons over-burdened with freight. 3rd. The waste products would be a source of income, and would show a profit on the cost of working the fibre to filasse. The by-products are:—(a) The gum, which is very valuable, (b) the fibre in the leaves and lateral shoots could be worked into paper pulp—this would command a high price, as it makes the finest paper.

All these products—the filasse, the ~~the~~ ~~the~~ ~~the~~—would command good prices in England, and if your manufacturers will treat the fibre in the Colony there is no reason why the yarns should not be sent over here after retaining sufficient for your home supplies.

“If the government will fall in with my suggestions, I shall be pleased to offer my services on the principle ‘no cure, no pay’—i.e., I am content to take my remuneration in share of profit.

“If the government is of opinion the trade would be best conducted by private enterprise, I think the initial stages should be fostered by the government making the preliminary experiments as to growing, &c., offering planters the seed or plants, either free or at very low rates, and by offering assistance in the shape of loans for planters to get large tracts under cultivation, and to the District Councils to enable them to put up decorticating and degumming stations, and by recommending capitalists to take up the planting, filassing, spinning, weaving, &c. I think the government would do wisely to advertise the possibilities of the fibre and the reason the Textile of the future will have such a prominent place in our industries.

1st.—It is many times stronger than cotton, flax, hemp and the like.

2nd.—It has a very long staple from 3 to 9 ins.

3rd.—It is easily grown, as it acclimatizes itself in almost any zone where agriculture is possible—of course with varying results, as it crops in some latitudes as many as four times per annum.

4th.—It is beautifully lustrous, more after the nature of silk in appearance.

5th.—It does not rot, giving it, for many purposes, such as fishing lines, nets, sail cloth, ropes, boot and saddlery thread, tarpaulins, rick cloths, tents, hose, shop blinds, boot linings and other requirements necessitating exposure to damp, great advantages.

6th.—It is non-elastic—herein it is invaluable for machinery belting and ropes, measuring tapes, mixed with wool it imparts non-shrinking possibilities to that article, and many other purposes where rigidity is an advantage.

7th.—I could further expatiate on its merits, but space forbids. I will curtail my remarks by stating there is nothing, wool, cotton, flax, hemp, jute, and even silk produces, this fibre cannot imitate and in most cases excels. It makes splendid cloth for uniforms, and almost indestructible table linen, sheeting, dress goods, velvets, curtains, lace, tapestry and upholstery purposes, lamp wicks, waistcoatings, trousers duck, riding breeches, &c. It is an ideal hygienic clothing, invaluable for underwear. It is pronounced by the medical profession as the most advantageous surgical dressing and for body wear. I will wind up by pointing out its durability and toughness alone commend it as a material that is invaluable for its indestructible qualities.

There are many purposes for which its peculiar properties make it extremely valuable—for instance, incandescent gas mantles. It excels all other fibres, and in this alone an ever increasing demand will consume enormous quantities. I could instance many other purposes, but I think the foregoing quite sufficient to extol the merits of

RAMIE THE TEXTILE OF THE FUTURE.

“ Small farmers wishing to start Ramie growing can do so without any great outlay, and they can prepare the fibre for export without costly machinery. I do not recommend degumming stations except on large scale. Small parcels of fibre can be shipped and the degumming can be done here.

“ Stamps of Colony should accompany all requests for particulars as a proof it is not an idle enquiry.

“ If further information is required how to procure seed, plants, and cultivate and prepare the fibre for the market, and how to dispose of the produce, also advice as to the installation of degumming and filassing stations, manufactories, &c.—in short, any assistance I can give to encourage the world-wide cultivation of this fine fibre, you have but to apply to

“ D. EDWARDS-RADCLYFFE,

“ 25, Birchington Road,

“ West Hampstead, LONDON.”