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11. The machinery which was employed in this research work is used by certain sections of the textile industry, but whilst demonstrating the process and proving the result, it is not designed for commercial production of this softened and split fibre. For this purpose it will be necessary to design machinery expressly for these operations, and the ready co-operation has been offered of Messrs. The Hydraulic Engineering Co.Ltd. who are makers of Sisal Machinery, and of Messrs. Fairbairn, Lawson, Combe, Barbour Ltd., textile machinery manufacturers. Their assistance should ensure the speedy development of an efficient plant.

12. Control of this process by patents has been given very careful consideration. The general opinion is that the process is patentable, as the action of flattening with high and controlled pressures between rolls of special construction, results in producing a condition in the fibre never seen before. This is in the nature of a discovery and is original, and the process has been provisionally protected. In order to make the position stronger however, it has been arranged between the writer and Messrs. Fairbairn Lawson Combe Barbour Ltd., that the machinery will be patented in their joint names and that the control and sale will be vested in the hands of the writer, vide their letter of 2nd July herewith.

13. Transfer of the process to Africa will take place as a natural development and after the machinery and technique have reached a stage which will enable the process to operate satisfactorily under the more primitive Estate conditions. For those reasons and also to more readily exploit potential markets and develop a sales organisation, it is evident that the initial plant should operate in England.

14. An estimate is subjoined of the cost of a small commercial plant to convert sisal in sufficient quantity to operate economically and to demonstrate and develop the

process.

-8-

process. Letters are also attached from the two Engineering firms who will make the softening and splitting machinery from which it will be noted that they are willing to assist to a marked extent, even to placing steam plant and premises at the disposal of this business at a purely nominal rental. More valuable still will be the assistance of Engineers skilled in fibre and textile machinery.

15. In framing these estimates, the importance has been realised of arriving at a total figure which will bring the undertaking up to revenue earning stage without danger of running short offunds. To ensure that this will be so, a period of six months has been allowed for the development and installation of the plant which should give ample margin. In addition the running costs to carry the business over the first two months have also been budgeted for, after which it should safely have entered the revenue earning stage and be able to function in the normal way of business. Provision has also been made for patent and registration fees in all principal foreign countries. All major items have been provided for in these figures, and also a sum to cover any contingent expenses which are liable to arise during the establishment of an undertaking such as this, and which cannot be seen in detail at this juncture.

16. The main channels of consumption for the converted fibre will be in the manufacture of yarns suitable for canvas fabrics of better qualities, for sail cloth, tarpaulins, wagon covers, mail bags, and for the stronger grades of twine and cordage. There is also a ready market for by-products such as Toy.

17. It is considered desirable to market the converted Sisal under a special name, so the word "L A S I S" has been adopted (the word "S I S A L" converted). This word has been granted protection and has been Registered.

18. An estimated costing of the softening and splitting process is also attached. Here the direct and overhead charges carry adequate margins. Raw No.2 fibre is debited at £18 whereas present day values are £16 for No.2 and the converted fibre is credited at well below the market value of European Hemp and Flax. Allowance has been made for amortization of capital and plant depreciation. There is a surplus balance to cover any likely advance in raw fibre. These figures are purposely framed higher than will actually be the case, but even so are able to show a reasonable surplus, when the object of the undertaking is considered.

19. When this process is carried out on plantations, the cost will be very considerably lowered as will be seen from the attached estimated costing. The items for labour will be much less when African natives are employed. There will be no travelling expenses, and as the department will form a small part of existing estate plant, no additional management charges will be incurred. The figure at which raw Sisal will be charged to this operation will be actual cost on the Estate, very considerably less than the figure at which it is taken at in the English estimated costing.

20. Under those conditions, the cost of producing "L A S I 3" will permit any planting concern in Africa to adopt it, and to easily carry a reasonable charge in the way of a Royalty fee for operating this patented process. This fee will be payable to the proposed development undertaking and will be used to liquidate loaned capital.

21. The dominating position which Manila has on the hard fibre market makes it evident that Sisal requires the stimulant which increased consumption would induce, and it is apparent that this end can be reached only by introducing

converted

converted Sisal to other trades. By establishing a commercial process such as is proposed in the foregoing, it may reasonably be expected that the industry itself would eventually be able to repay any funds loaned for the purpose of developing it, and be able to do so in a natural way out of the enhanced value of its product.

22. The opinion of those engaged in the Italian Hemp trade is that £30 represents the lowest economic cost of producing a ton of Hemp and selling it on the London market under present conditions of exchange. The estimated cost of producing a ton of Converted Sisal in Africa and delivering it in London is £18.7.0. When this margin of cost is considered it is reasonable to look forward to the permanence of this new fibre, and the steady increase of its use as it becomes known to the trade.

23. The strength of the patents controlling the process and machinery will be reinforced as is usually the case, by the prior establishment of this new undertaking and the creation of its trade connections. The business is expected to expand, and when the time comes for it to be placed on a firm footing, possibly by the formation of a Company, then those funds loaned for the purpose of assisting it over the early development phase will become a first charge on the assets of the new Company.

7th July, 1935.

ESTIMATED PRODUCTION COSTS OF Lasis.

Basis. Daily capacity 4 tons, producing:-

Lasis Line Fibre	3 tons	
Tow	16 cwts	or 20 per cent.
Loss	4 cwts	or 5 per cent.

Per week of 5½ days @ 4 tons = 22 tons

Lasis Line Fibre	16½ tons	
Tow	88 cwt	
Loss	<u>22 "</u>	<u>22 tons</u>

Revenue

Lasis Line Fibre	16½ tons @ £35.	577. 10. .
Tow	88 cwt @ 15/-	<u>66. - .</u>
		<u>643. 10. -</u>

Estimated Labour Costs per Week in United Kingdom.

Opening bales and hanking			
	6 women @ 30/-	9. 0. 0.	
Treatment	6 women @ 30/-	9. 0. 0.	
	2 men @ 45/-	4.10. 0.	
Softening	6 women @ 30/-	9. 0. 0.	
	2 men @ 45/-	4.10. 0.	
Combing	6 women @ 30/-	9. 0. 0.	
	2 men @ 45/-	4.10. 0.	
Drying	6 women @ 30/-	9. 0. 0.	
Packing	2 men @ 45/-	4.10. 0.	
	1 Foreman	3.10. 0.	
	1 Boiler Man	2.10. 0.	
	1 Mechanic	2.10. 0.	
	1 Clerk	2.10. 0.	74. 0. 0.

Overhead Costs.

Management		25. 0. 0.	
Travelling		10. 0. 0.	
Rent)			
Insurance)			
Power)		37. 5. 3	
Coal)			
Office)			
Oil)			
Depreciation on Machinery @ 26629 @ 10%		12.14. 9	
			87. 0. 0.
Amortisation of loan @ per ton	£1.		22. 0. 0.
Cost of 2 Sisal 22 tons @ £18.			396. 0. 0.
Surplus per week.			<u>64. 10. 0.</u>
			<u>643. 10. 0.</u>

Estimated costing of process when carried out in Africa to compare with estimated cost of the English operation.

LABOUR. There will be no opening, banking or treatment charges as the fibre will be processed directly from the decorticator; this cuts out 14 operatives. African labour is paid 10/- monthly plus housing, feeding, medical and other charges bringing cost to 20/- or 5/- weekly. There are 28 persons employed in the English process excluding opening and treatment operations.

In Africa 40 Natives may be required @ 5/- 10 0 0

No travelling charges and no additional management.

Depreciation on African value of machinery £10,000 @ 10% 19 14 7

Insurance and Maintenance 10 - -

Royalty fee 22 tons @ £1 22 - -

Ocean and railage freight 22 tons @ £6 132 - -

Marketing charges 22 tons @ 10/- 11 - -

Cost of raw Sisal when produced under modern conditions 22 tons @ £9 198

Surplus 240 15 5

£ 643 10 -

Estimated weekly Surplus in English operation £64 10 -

In African operation £240 15 5

95.

FAIRBAIRN LAWSON CONNER HARBOUR LIMITED,
Leeds & Belfast.

Associated with

Urquhart Lindsay & Robertson Groher Ltd., Dundee

LEEDS, 1. 1st April, 1936.

Jas. McCrae, Esq.,
The Great Northern Hotel,
LEEDS, 1.

Dear Mr. McCrae,

As you are going to Dundee to continue your experiments on the treatment of Sisal and I leave for the United States tomorrow our ways for some little time will lie in different lines. Before leaving, however, I would like to compliment you not only on your persistence and good work in the treatment of Sisal but on the results obtained.

As you are aware, my Company have for a number of years been actively interested in this work, and whilst many different individuals have brought to us Sisal treated chemically and mechanically with a view to permitting of its use for purposes other than those at present in force, none of these people have in any degree approached the successful results you have already obtained.

I took with me to Belfast on the evening of Wednesday, 29th ultimo, samples of your softened product, and I confirm that having shown these to parties expert in the use of Sisal they all agree with me that your method of treatment is far ahead of anything they have previously seen, is on the right lines, and has appreciated the value of the Sisal at least two fold.

I was actively engaged in the same work in conjunction with Dr. S.G. Barker of the Wool Research Association, and many of the results in the treatment of Sisal referred to in the publication

No.64

No. 64 of the Empire Marketing Board were obtained by me, and I confirm that opinion that the softened Sisal produced by Dr. Barker was not nearly as good as you are producing to-day.

There is no doubt whatever that, provided you can produce in bulk Sisal of a quality equal to the samples I took to Belfast (and I see no reason why you should not), you will have done work of inestimable value for the Sisal industry, work which should lead to further extensive use of Sisal, making it a fibre which for many purposes can be used as a substitute for Flax and suchlike materials.

We think so highly of your work that I have no hesitation in putting at your disposal part of our Dundee Plant so that you may bring your experiments to a successful conclusion, and I wish you all success and anticipate that on my return from the States you will have reached your aim.

I am, etc.,

(Sd.) Jas. K. Anderson,
Managing Director.

FAIRBAIRN LAWSON COMBE BARBOUR, LTD.

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FAIRBAIRN LAWSON COMEE BARBOUR LIMITED,
Leeds & Belfast.

Associated with

Urquhart Lindsay & Robertson Orchar Ltd., Dundee.

LEEDS, 1. 6th June 1935.

Jas. McCrae, Esq.,
The Sports Club,
St. James' Square,
LONDON, S.W.1.

Dear Mr. McCrae,

I wrote you on the 1st April dealing with the progress you had made on the treatment of Sisal up to that time. Since then you have carried your research work substantially further, but with a full knowledge of what you have done I am now of the opinion that you have gone about as far as is possible with existing machinery.

Undoubtedly you have obtained results never before approached on the treatment of Sisal. Your converted Sisal is unquestionably suitable for trades presently using the heavier counts of soft Hemp and Flax, and in this sphere alone its use is of great importance; but in addition, there are many other purposes for which it would be admirably adapted. Once you have established the technique of its conversion, progress should be rapid and the fibre should be in substantial demand, not only because of its cheapness compared with other fibres, but because of its intrinsic value.

The considered opinion of myself and my Technical Staff is that you have obtained such good results over machinery and Plant designed for an entirely different purpose that the time has now arrived when you should seriously consider the installation of a small Plant specially designed for the work to deal with it on a commercial scale. The cost of such a Plant would be small, and as a certain amount of experimental work would be necessary with it, and possibly certain

alterations

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alterations and modifications after first setting to work,
I would strongly advise its installation in this country
and not in East Africa.

As you are aware most of the practical work in the
treatment of Sisal done in this country in recent years has
been taken part in by me, and I have advised my Board the
result of your efforts and confirm that, being thoroughly
satisfied you are on the right lines, we are prepared to
continue our assistance to you in every possible way and to
place at your disposal a portion of our Works in Dundee for
the installation of such Plant as you may determine for the
continuance of your research work.

I am, etc.,

FAIRBAIRN LAWSON COMBE BARBOUR LTD.

(Sgd.) Jas. K. Anderson,

Managing Director.

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FAIRBAIRN LAWSON COMBE BARBOUR LIMITED,
Leeds & Belfast.

Associated with

Ureuhart Lindsay & Robertson Orchar Ltd., Dundee.

LEEDS, 1. 2nd July 1935.

James McCrae, Esq.,
The Sports Club,
St. James's Square,
LONDON, S.W.1.

Dear Mr. McCrae,

In connection with all the work you have done on the softening of Sisal fibre, you must bear in mind that the machinery you have used for flattening your fibre was not designed for that purpose, but the work was done on machines installed in Dundee for an entirely different purpose. In consequence, if you are to go further forward a special machine incorporating the principles now decided to be necessary would require to be developed.

Our knowledge of your requirements in this respect would enable us to produce a Flattening Machine without great difficulty, but before the ultimate machine is finally constructed a small experimental machine to obtain data for the commercial model would be necessary.

As you can appreciate, to quote a price for a machine not yet designed is extremely difficult. We have, however, co-operated with you throughout your experiments up to now, and are desirous of continuing to do so, and to assist you to bring your promising work to a successful issue we are prepared to share in the cost of developing this machine.

We therefore quote you a fixed price of £1,500, which will include the experimental work, for a Flattening Machine to your requirements, and trust that with this figure before you you will be able to arrange finance.

The

50

The question of the Treatment Tanks, Drying Machines and Combing Machines we do not deal with meantime as they do not present such difficulty as the Flattening Machine.

We confirm that we would be quite prepared to co-operate with the Hydraulic Engineering Co. and make use of their experience and knowledge as regards the Combing Machine.

With regard to premises, we are prepared, as before, to provide you with suitable accommodation at either Dundee or Leeds, together with the necessary steam boiler suitable for your work over a period up to one year, for a nominal rental of ££ per month, and we suggest that by installing the Plant in our Works you will have the benefit of the assistance of our expert Staff.

We have given consideration to the period which should be allowed to bring your process into commercial production, and we estimate that a safe margin of time would be say six months from setting to work again.

It is possible that the development of your process may evolve machinery or a system of a patentable nature, and if so, we are agreeable that application for protection be made on our joint account, and we will be prepared to enter into an Agreement with you giving you sole control of the sale of such machinery, provided we had the sole right of manufacturing same, and would be glad to co-operate with you to confine development of your process to East Africa during the next few years.

We would again like to say that in our opinion you have succeeded in producing a simple and inexpensive solution to a problem which has been engaging the attention of experts for a number of years. We believe your process is patentable, and certainly your results have been obtained with machinery unsuitable for commercial production, but we feel confident

that

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that with a Plant specially designed for the purpose you would produce a finer and better fibre which should find a ready market and enjoy a wide application.

At this stage it is impossible to judge the extent of the ultimate uses for such a fibre, but from what we have seen so far it would appear that your process can convert Sisal into a form suitable for a variety of new uses, in addition to its suitability for heavier yarns presently made from European Hemp and Flax.

If we can help you further in the matter, please do not hesitate to let us know.

We are,

etc.,

FAIRBAIRN LAWSON GOMBE BARBOUR, LTD.

(Sgd.) Jas. K. Anderson.

Chairman & Managing Director.

FINANCIAL SUMMARY.

- 1. Dependency: Kenya
- 2. Description of Scheme. Construction of factory in U.K. to carry out new process for softening sisal fibre
- 3. Date of commencement. ✓ As soon as approved.
..... months after approval.
on 2.....
- 4. Period of Scheme. 6 months for construction; two months maintenance
- 5. Total cost. £10,500.....
- 6. Allocation of cost. Local: £.....
U.K. £10,500.
or Nearly all expenditure will be [Local] [in U.K.]
- 7. Assistance desired. Loan of £10,500.... if project proves successful
Free grant of £10,500... .. unsuccessful
- 8. Suggested terms of loan. Free of interest for first two years; 4% per annum thereafter; repayable within seven years from date of issue, by equated instalments during 5th - 7th years, or earlier at borrower's option.
- 9. Probable yearly amounts required.

1934/35	£.....
1935/36	£10,500...
1936/37	£.....
Subsequently £.....	

NOTES.

Question 2. A very brief description only of the scheme is required.

Questions 3, 6 & 7 - delete words not required.

Question 8.
If a loan is not applied for, write "not applicable".

If application is being made for a loan state suggested period within which the loan should be repaid, suggested terms of repayment, and whether application is made for a loan free of interest for any period.

In the absence of special considerations to the contrary the rate of interest usually recommended at present on loans from the Colonial Development Fund is 3% and the method of repayment that of equated annual instalments covering principal and interest.

Question 9.
Assuming that the scheme is begun on the date given in question 3 state the estimated sums which will be required from the Fund during each financial year (ending 31st March) during the currency of the scheme.

Sisal Softening Process

1703
9/17
A. Hunt 8/7
Th. Hand 8/7
Th. Stoddard 9/7
S. J. Campbell
Sir C. G. ...
9.7 ...

1. In papers previously circulated to them the Committee's attention has been drawn to the urgent need of re-habilitating the Sisal industry in East Africa. Their sympathy has already been shown by recommendations for assistance from the Fund towards the improvement of machinery, and ^{Kenya} the prosecution of basic research, both in East Africa and in the United Kingdom, into various problems connected with the industry.

2. The annexed memorandum has been prepared by Mr. James McCrae, one of the more prominent and enlightened Sisal growers of Kenya, as a result of 15 months independent research conducted, in co-operation with spinners and textile machinery manufacturers, in England and Scotland. Mr. McCrae claims to have hit upon a simple mechanical process whereby it will be possible to transfer ~~over~~ Sisal from the category of hard fibres (selling price about £14-£17 per ton) to that of soft fibres, such as Italian hemp and the lower grades of flax which sell at between £40 and £90 per ton according to quality. The cost of processing the fibre (including provision for overheads, amortization and depreciation) is estimated at £8/6/6 per ton in the United Kingdom or £2/16/3 in East Africa.

3. Samples of Sisal fibre treated by Mr. McCrae's process have been submitted to Dr. Goulding, of the Imperial Institute, the acknowledged authority in these matters on fibres. Dr. Goulding writes:-

"The fibre produced by Mr. McCrae
"is the best softened East African
"Sisal which I have yet seen. The
"method may be regarded as distinctly
"promising but a good deal of work is
"required to ascertain the conditions
"which will give the best results ^{and} to
"determine the suitability of the fibre
"for manufacturing purposes and its
"behaviour on existing textile machinery."

"This sample represented the effect
"of combing on the ^{crushed} British fibre. It
"consisted of fine fibres ^{was very good but the} containing lust,
"flexibility and softness. The combing
"treatment further had caused it to be
"broken up into strands of variable length
"ranging from 15" - 36". Such fibre however
"would be quite long enough for spinning
"purposes and it should be possible to spin
"it into fairly fine yarn. The strength
"of the fibre was rather irregular but on
"the whole good."

Attention is also invited to the opinions
expressed by Messrs Fairbairn, Lawson, Combe &
Barbour Ltd., in the letters appended to
Mr. McCrae's memorandum.

4. The next stage in the exploitation
of the process is clearly the establishment of
a small plant to produce the softened fibre on
commercial lines and in marketable quantities.
The memorandum gives particulars of the capital
and operating costs envisaged; it will be seen

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that the amount necessary to establish the
plant and to operate it for two months is
estimated at £10,500.

5. The S. of S. invites the Committee
to recommend that this sum should be advanced
from the Fund to the Government of Kenya, to
be passed on to Mr. McCrae, on the following
terms:-

(a) The advance to be regarded as a
free grant of Capital, if the project has
not proved successful at the end of two
years from the date of issue.

(b) If at that date the scheme has
proved successful, the advance should be
regarded as a loan bearing interest at
4% ^{per} ~~an~~ the end of the two-year period,
repayable within five years of that date,
or earlier at the borrower's option.

(c) For the purposes of (a) and (b)
~~the~~ the S. of S. shall be the sole judge
whether the scheme is successful or not,
and his decision shall be accepted as
final.

(d) In the event of the promotion
of a Company by Mr. McCrae to exploit the
process, the advance from the Fund will be
recognised as a first charge on the assets
of the Company.

6. The Government of Kenya has been notified
^{under consideration} that this application is ~~being made~~ and has ^{been asked}
to express its concurrence.

Colonial Office
July 1975

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Telephone:
KENSINGTON 3264 (Four lines)
ADDRESS CORRESPONDENCE
TO THE DIRECTOR

REF. No. F.2039.

IMPERIAL INSTITUTE,
SOUTH KENSINGTON,
LONDON, S.W.7.

RECEIVED
12 JUL 1935
C. O. REGY

9 July, 1935.

Sir,

(5)

With reference to the questions raised in your letter No. 15010/G/35 of the 4th instant on the subject of Mr. McCrae's method for softening Sisal fibre, I have to make the following observations.

With regard to tests carried out with the softened fibre, you are doubtless aware that there is no plant available at the Imperial Institute which could be applied to such work. I am informed by Mr. McCrae that hitherto he has been unable to prepare sufficient of the material to enable spinning trials to be made, it being found very difficult to obtain the use of the necessary machinery for the purpose. It is of course mainly for this reason that he desires to establish a unit plant. This would enable the process to be thoroughly tested with a view to the definite determination of its possibilities. In this connection I may again say that the sample which I received from Mr. McCrae was distinctly promising and seemed to justify further investigation.

It is impossible to foretell with what grade of cheap softened Sisal would compete until actual spinning trials have been carried out, but on general grounds I should not anticipate

Yours faithfully

The Under Secretary of State,
Colonial Office,

S.W.1.

that it would be likely to serve as a substitute for Italian hemp except perhaps for the lower grades. My chief reason for this view is that the two fibres (Sisal and hemp) are widely different in their ultimate structure and constitution; for example, the ultimate fibres of the former are only 0.08 to 0.2 inch (average about 0.15 inch) in length, whilst those of hemp range from 0.2 to 2.2 inches (average about 0.9 inch). It may be added that the ultimate fibres of Indian hemp (Crotalaria juncea) are about 0.2 to 0.4 inch long.

With reference to Mr. McCrae's statement quoted in the "Note of a Meeting on 11th June 1935" that the price of soft fibre had increased over 100 per cent in the last twelve months, Mr. McCrae now tells me that he really meant to go back further than twelve months. At his suggestion I therefore give below the prices of hemp in June 1932 and June 1933, in addition to those for 1934 and 1935 which were quoted in my letter of the 20th June:-

	June 1932	June 1933	June 1934	June 1935
<u>Italian Hemp</u>				
PC	£43.10 - £44.10	£48-£49	£55-£56	£79-£81
TBH	£41.10 - £42.10	£46-£47	£51-£52	£66-£68
<u>Hungarian Hemp</u>				
Scutched	£37-£41	£43-£46	£49-£53	£47-£55
Peasant	(not quoted)	(not quoted)	£46-£50	£41-£45
<u>Indian (Sunn) Hemp</u>				
Benares No.1	£15-£16	£20-£23	£18.10 - £20.10	£17.10 - £19.10
Dewghuddy	£18-£20	£21-£24	£25-£31	£21-£26
Itarai	£17-£19	£19-£21	£23-£27	£18-£22
<u>Flax</u>				
Russian BKKO	£47-£48 (nominal)	£60-£61	£61-£62	£96

I am, Sir,

Your obedient servant,

Ernest Goulding

C. O.

1500/g.

6

E con.

Mr. Fratcher 6/7

Mr. Flood 6/7 at once

Mr.

Mr. Parkinson.

Sir G. Tomlinson

Sir C. Bottomley.

Sir J. Shackburgh

Permt. U.S. of S.

Parly. U.S. of S.

Secretary of State.

He To go today
Answered by No 9

Coded & sent 107
3 pm

6/7/35

C.D.
8-JUL
D 8

DRAFT. Tel.

Gyona Nandi

No. 172 With concurrence of

Governor JAMES TICCAE

has approached me with request for assistance in commercially exploiting new process for softening sisal fibre. Process has been examined by my advisers and is considered promising.

I propose to ask C.D.A.C. at an early date

for advance of £ 10,500 to Govt. of Kenya to be passed on to person named. No financial

FURTHER ACTION.

Return to Mr. Fratcher on 6/7

C. O.

15000/g.

6

E con.

- Mr. ~~Tranter~~ 6/7
- Mr. ~~Flood~~ 6/7 atoned
- Mr.
- Mr. Parkinson.
- Sir G. Tomlinson.
- Sir C. Bottomley.
- Sir J. Shuckburgh.
- Permt. U.S. of S.
- Parly. U.S. of S.
- Secretary of State.

~~the~~ To go today
 Answered by No 9

Coded & sent 107
 3 pm.

677/35
 R
 C.D.
 3 JUL
 8

DRAFT. T.d.

Gyovana Navidi

No. 172 With concurrence of

Gyovana JAMES TICCRNE

has approached me with request for assistance in commercially exploiting new process for softening sisal fibre. Process has been examined by my adviser and is considered promising.

I propose to ask C.D.A.C. at an early date for advance of £ 10,500 to Dept. of Kenya to be passed on to person named. No financial

FURTHER ACTION.

Return to Mr. Prescott
 on Monday

liability will be against Govt
of Kenya. Tel. as soon as
possible whether you agree.

15010/G

C. O.

Mr. Caine 1/7/35

Mr.

Mr.

Mr. Parkinson.

Sir G. Tomlinson

Sir C. Bottomley.

Sir J. Shuckburgh.

Parlt. U.S. of S.

Parly. U.S. of S.

Secretary of State.



Downing Street.
July, 1935.

and J
Si,

ET

DRAFT.

E. GOULDING, ESQ., D.Sc., F.I.C.,
IMPERIAL INSTITUTE.

I am, etc., to acknowledge
the receipt of your letter of the
20th June relative to the method
devised by Mr. McCrae for softening
Sisal fibre, and to thank you for
your valuable comments on the notes
of the meeting held at the Colonial
Office on the 9th June and other
matters connected with Mr. McCrae's
project.

2. Mr. MacDonald would be
glad to know whether any specific
tests have been conducted with the
softened fibres, or whether it is
proposed to conduct tests, and to
have particulars of the results if
and when available. It is noted
that you suggest that the softened
fibre

FURTHER ACTION.

Recie. to R. Lane
m47

manufactured by ~~W. H. H. H. H.~~ Nichols's process
fibre would chiefly compete with the
lower grade European hems and the
Indian hems. It is assumed that
you are doubtful whether it would
come into competition with even the
lower grade ^{of} Italian hemp, and I am
to inquire whether it is your view
that it would be classed rather with
the Indian hems or whether you
consider that it would compete with
grades of European hemp which are
at present priced at something over
£40. In the former event it would
appear unlikely that the process could
be a commercial success.

I am, etc.,

(Signed) R. V. VERNON

F.2039.



15010/G. 169/4
 IMPERIAL INSTITUTE
 LONDON, S.W.7
 20 June, 1935.

Sir,

In reply to Mr. S. Caine's letter of the 14th instant relating to the method devised by Mr. James McCrae for softening Sisal fibre, and enclosing notes of the meeting held at the Colonial Office on the 11th June, I beg to furnish some observations on the process and a short report on the examination here of certain samples of fibre received from Mr. McCrae.

Notes of the meeting. Regarding the notes of the meeting I venture to make the following remarks.

The statement is made that the price of soft fibre has increased over 100 per cent in the last twelve months. It is not clear whether this is intended to refer to soft fibres in general or to any particular soft fibre, but in either case it is not borne out by the market reports, as will be seen from the following quotations of prices in London in June 1934 and in the present month:-

	<u>June 1934</u>	<u>June 1935</u>
<u>Italian Hemp</u>		
PC	£55-£56	£79-£81
TBH	£51-£52	£66-£68
<u>Hungarian Hemp</u>		
Scutched	£49-£53	£47-£55
Pessant	£46-£50	£41-£45
<u>Indian (Sunn) Hemp</u>		
Benares No.1	£18 10s-£20 10s	£17 10s-£19 10s
Dewghuddy	£25-£31	£21-£26
Itarsi	£23-£27	£18-£22
<u>Flax</u>		
Russian BKKO	£61-£62	£96

The Under Secretary of State,

Colonial Office,

Downing Street, S.W.1.

It

BMSWD-5

(31)

It will be noticed that, so far from showing a large increase, the prices of the lower-grade European hems and the Indian hems, with which presumably the softened Sisal would chiefly compete, have actually fallen during the last year.

On the third page reference is made to a French process which, it is said, proved on examination to be based on Java Sisal. This is a mistake; the fibre treated by this process was found at the Imperial Institute to be not Sisal but *Cantala* fibre. This Java *Cantala* is a naturally finer and softer fibre than Sisal; it is derived from a different species of *Agave*.

*Mr. McCrae
made this
clear at the
meeting.
P. J.*

On the fourth page, Mr. McCrae is reported to have suggested £10 per ton as the possible cost of conversion of the Sisal into soft fibre. This seems to be an exceedingly heavy cost for a mechanical treatment but apparently the estimate is based on the production of small quantities. Naturally, with a larger output the working expenses would be correspondingly reduced.

With regard to the effect of the production of softened Sisal on the soft fibre markets, it is obviously too early to express a definite opinion. There is at present no means of forming any judgment as to the demand which might arise for the softened Sisal. This obviously depends on the extent to which it will be able to replace fibres already in use and on the readiness of spinners and weavers to adopt it for their manufactures. It is evident of course that, if large supplies of the softened Sisal were prepared and should find a market as a hemp substitute, the demand for the lower-grade soft hems would be reduced and their prices would tend to fall.

Mr. McCrae's process. Mr. McCrae has fully discussed his process with me and it may be summarised as follows.

Either ordinary commercial Sisal fibre, or the fibre fresh from the decorticating machine, is soaked in hot water and then submitted to a severe crushing between very heavy rollers, such as those of a calendering machine. The effect of this treatment is to crush the hard sclerenchymatous tissues in the strands and flatten the strands into fine ribbons. Subsequently

the ribbons are divided into finer filaments by means of a special form of combing machine. In this combing operation much of the fibre must necessarily be broken up into short pieces; Mr. McCrae estimates the loss incurred in this way as roughly about 25 per cent of the fibre treated. The waste combings, however, would not constitute an entire loss but would probably find a market for certain purposes, such as a substitute for engineers' cotton waste or perhaps as a cheap stuffing material for bedding or other forms of upholstery; they could also be used for paper-making.

The fibre produced by Mr. McCrae is the best softened East African Sisal which I have yet seen. The method may be regarded as distinctly promising but a good deal of work is required to ascertain the conditions which will give the best results and to determine the suitability of the fibre for manufacturing purposes and its behaviour on existing textile machinery.

Examination of Samples. A sample of untreated East African Sisal and specimens of the same fibre after being subjected to Mr. McCrae's processes have been received at the Imperial Institute and are described below.

(1) Untreated Fibre. Clean, lustrous, well-prepared, fairly fine almost white East African Sisal fibre of good strength.

(2) Crushed Fibre. This sample consisted of the East African Sisal which had been subjected to severe crushing between heavy rollers. The treatment had flattened the fibre strands and rendered the material rather soft to the touch, and had loosened some dried pithy matter (i.e. remains of the leaf pulp) which could be readily shaken out. Although most of the strands of fibre presented a somewhat woolly appearance owing to the extrusion of ultimate fibres, they had not been broken down to any great extent into short lengths. The strength of the material was, as might be expected, somewhat inferior to that of the original untreated fibre but was still remarkably good considering the severe treatment to which it had been submitted.

(3) Crushed and Combed Fibre. This sample represented the effect of combing on the crushed fibre. It consisted of fine fibres possessing good lustre, flexibility and softness. The combing treatment however had caused it to be broken up into strands of variable length ranging from about 15 inches to 36 inches. Such fibre however would be quite long enough for spinning purposes and it should be possible to spin it into fairly fine yarn. The strength of the fibre was rather irregular but on the whole fairly good.

Owing to the diminished strength of the fibre it is not improbable that a fairly considerable loss of fibre would take place in spinning it into yarn of very fine counts.

(4) Combing. This sample consisted of a tangled mass of combings consisting of short pieces of the softened fibre. Such material might find a market as a substitute for cotton waste or for other purposes. Moreover with comparatively mild mechanical and chemical treatment it could be converted into a paper-pulp of excellent quality.

I am, Sir,

Your obedient Servant,

Ernest Goulding

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Note of a Meeting at the Colonial Office
on the 11th June, 1935.

Present:-

Sir John Campbell,)

Mr. Stockdale,)

Mr. Clauson,)

Mr. Freeston,)

Mr. Caine,)

Mr. J. McRae.)

Colonial Office.

Mr. Freeston explained that the object of the meeting was to consider whether, and by what means, assistance could be given to the development of a process which Mr. McRae had discovered for converting sisal into a soft fibre. He explained that Mr. McRae had been a sisal producer for many years and was well known to the Governor of Kenya and the late Secretary of State.

Mr. McRae explained that the markets for fibre were divided into two broad divisions. The hard fibre market was the smaller and the uses of hard fibre were comparatively restricted. The supplies of soft fibre were larger, but the demand for it was very much greater as it had far more varied uses. The demand had recently exceeded the supply and the price had increased over 100% in the last twelve months. It would obviously be a great advantage if the uses of sisal could be extended by converting it into a soft fibre, capable of being used in place of the coarser "soft" fibres such as the lower grades of Italian hemp. Sisal would then become an intermediate product capable of sale either in the hard or the soft market.

Mr. McRae

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Mr. McRae went on to refer to the economic difficulties of sisal production at the present time. Small estates today could not, he estimated, sell sisal profitably and cover all expenses of upkeep, etc. at less than £18 per ton, compared with an actual price of about £16 per ton.

Technical changes were taking place in the methods of production, in particular as to the time and method of cutting the sisal, methods of decortication, etc. as a result of which it was now possible to produce "baby sisal" a much shorter time after planting and at a cost of only about £12 per ton. This new quality of sisal was satisfactory from the point of view of tensile strength but was of a shorter staple than the established quality, which had been produced to satisfy the requirements of the binder twine manufacturers, who liked a long staple and from whom the main demand for sisal at present came. It was not suggested that this new "baby sisal" would be entirely rejected by the manufacturers but its development afforded an additional incentive for the search for alternative uses. It is technically possible to use sisal for the manufacture of bags in replacement of jute bags, but sisal bags are definitely more expensive and as the jute bags prove satisfactory for all ordinary purposes, there is very little prospect of development in that direction.

Various efforts have, therefore, been made to produce a soft fibre out of sisal. Research for a chemical process to do this has been undertaken on behalf of the East African sisal industry at Lambeg in Northern Ireland and a French concern have claimed to have produced

Cantale

produced a satisfactory process. The French process proved, however, on examination to be based on Java sisal as raw material and there is no evidence that it could be satisfactorily applied to East African sisal, which is a coarser product than Java sisal. Mr. McRae, as the result of enquiries of his own, had, therefore, come to the conclusion that no chemical process was likely to be satisfactory and had tried to discover a physical or mechanical process. The essential objects were the softening and extrusion of certain gums in the sisal and the flattening of the actual fibres. He had succeeded by heating the fibre in water and then, by passing it through calenders under sufficient pressure, in producing a fibre which was very much softer than the original but retained most of its strength and other qualities. Enquiries in the trade indicated that the soft fibres which he had produced could be substituted for the lower grades of Italian hemp which are now selling for approximately £40 per ton.

Sir John Campbell said that from the description of the process he imagined that it was not capable of being patented, as it was merely an application to sisal of principles which were already familiar in connection with other fibres. Mr. McRae said that he was making enquiries on this point, but thought that Sir John Campbell was right. It was also agreed that it would not be practicable to attempt to use the process as a secret process.

It appeared clear, therefore, that there could be no question of the Government acquiring any rights in the process or developing it as a Government undertaking. What was really required was that commercial capital should be interested

interested

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interested in order that the process might be applied as widely as possible to East African sisal. Before such capital could be interested, it would be necessary to establish a unit operating on a commercial scale in order that the possibilities could be more accurately judged.

There was some discussion of probable costs. Mr. McRae said that it was impossible to give any exact data, but he did not imagine that the cost of conversion would exceed £10 per ton, which was well inside the margin between the present price of sisal (approximately £16 per ton) and the price of the soft fibre with which he intended to compete (approximately £40 per ton). There was also some discussion of the effect on the soft fibres market of the introduction of the new source of supplies. It must obviously tend to reduce the price prevailing in that market and the extent of the reduction, depending on the elasticity of demand was really a matter of guess work.

After discussion it was agreed that this would probably be a suitable project for submission to the Colonial Development Advisory Committee for assistance from the Colonial Development Fund. Such assistance might take the form of a grant of the cost of establishing the commercial unit, perhaps on terms which would provide that the grant should only be repayable if the thing turned out a commercial success. Particular attention would have to be paid to the following points:-

(a) How far does this proposal overlap with the investigation at Lambeg which the Colonial Development Fund is financing?

(b) What precisely would be the cost of establishing the commercial unit?

(c)

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(c) Would it be set up in this country or in Kenya? (As it would be essentially experimental and adjustments of machinery would probably be needed, it would almost certainly be desirable to establish it here).

(d) It would be very desirable to obtain from the Imperial Institute a report on the technical qualities of the softened fibre and also their opinion as to the effect on the softened fibres market of introducing this new source of supply.

(e) As close as possible an estimate of manufacturing costs should be given in order that the prospects of eventual successful exploitation could be judged.

(f) Indications should be given of whether there is any possibility of interesting other capital in the concern and in particular whether the industry itself cannot supply some of the necessary money.

It was agreed that Mr. McRae should be asked to go into these points and submit an application in due course. He should get in touch with Dr. Goulding of the Imperial Institute in connection with the points mentioned in (d). It was mentioned that the Colonial Development Advisory Committee would be meeting at the end of July and then not again until September. As applications for submission to the Committee should be in the hands of the Secretary a fortnight before their meeting, it would be desirable that any application should be submitted early in July.

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Telephone:
KENSINGTON 3264 (Four lines)
ADDRESS CORRESPONDENCE
TO THE DIRECTOR

REF. No. 2039

IMPERIAL INSTITUTE,
SOUTH KENSINGTON,
LONDON, S.W.7.

30th May, 1935.

Dear Sir,

With reference to our telephone conversation yesterday regarding softened Sisal (and in particular that prepared by the method devised by Mr. James McCrae) as a substitute for European hemp (the fibre of Cannabis sativa) and Indian hemp (derived from Crotalaria juncea), I have to send you the following statistics of the production of hemp, and of the imports of European hemp and Indian hemp into the United Kingdom, for the years 1931-33.

World Production of Hemp

The following estimates are extracted from the "International Yearbook of Agricultural Statistics":-

<u>1931</u>	<u>1932</u>	<u>1933</u>
metric tons	metric tons	metric tons
556,000	500,000	500,000

These figures do not include the production in China which is estimated by the Chinese Government at 110,000 metric tons in each of the above-mentioned years.

Imports

S. Caine, Esq.,
Colonial Office,
S.W.1.

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Imports of Raw Hemp (not including tow) into the United Kingdom.

<u>Country whence consigned</u>	<u>1931</u> long tons	<u>1932</u> long tons	<u>1933</u> long tons
U.S. S. R. (Russia)	588	288	760
Latvia	499	125	16
Netherlands	2,810	1,132	425
Germany	2,722	1,262	366
Belgium	3,508	1,376	1,133
Italy	5,827	6,036	7,313
Yugoslavia	<u>39</u>	<u>82</u>	<u>127</u>
Total	15,993	10,301	10,140
British India	<u>1,752</u>	<u>3,200</u>	<u>3,846</u>
Grand Total	<u>17,745</u>	<u>13,601</u>	<u>13,986</u>

I am,

Yours faithfully,

Ernest Goulding

for the Director.

Keep
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THIS AGREEMENT is made the _____ day of _____ 1935
BETWEEN JAMES McCRAE of Longonot Estate Naivasha Kenya Colony at
present residing at the Sports Club St. James's Square in the County of
London Sisal Planter (hereinafter called "the Inventor") of the one part
and HYDRAULIC ENGINEERING CO. LTD. whose registered office is at Chester
in the County Palatine of Chester (hereinafter called "the Manufacturers")
of the other part WHEREAS the Inventor has invented a process for
converting raw Sisal Fibre into a softer fibre for textile purposes
involving the use of certain machinery.
AND WHEREAS Letters Patent for the said invention and for the machinery for
use in connection therewith have been or will be applied for.
AND WHEREAS it has been agreed that the Manufacturers shall manufacture
machinery required for the said process upon the terms and conditions
hereinafter contained.

NOW IT IS HEREBY AGREED as follows :-

1. The Manufacturers will manufacture at prices to be approved by the
Inventor such machinery as shall be ordered by him for the partial equipment
of a factory to be established by him in Great Britain for the purpose of
operating the process above referred to.
2. Any such machinery or article forming part thereof and any improvement
thereof and addition thereto capable of being patented shall be patented in
the joint names of the Inventor and the Manufacturers. The Inventor shall
be entitled to assign his interest in any part of this Agreement or grant
a licence in respect thereof at any time during the continuance of this
Agreement subject to the approval of His Majesty's Secretary of State for
the Colonies (hereinafter called "The Secretary of State").

Agreement and for any extension of that period for which Letters Patent may be granted have the sole selling agency of the machinery and articles forming the subject of this Agreement.

4. No orders for the manufacture of any machinery or article the subject of this Agreement made by the Manufacturers shall be placed by the Inventor with any other maker except with the consent in writing of the Manufacturers and The Secretary of State except in the case of the Manufacturers going into liquidation in which case only the consent of The Secretary of State shall be required.

5. The prices to be charged for such machinery or articles shall not exceed those which will allow a margin of profit to the Manufacturers which shall be deemed by the Inventor and The Secretary of State to be reasonable and the Inventor and The Secretary of State shall have the right to inspect the books of the Manufacturers for this purpose.

6. *During the period of seven years from the date of this Agreement, no*
No sales of such machinery or articles shall be made to any purchasers for the purpose of using the said process outside the British Empire ~~for~~ *except with the consent in writing of the Inventor and of the Secretary of State* ~~the term of seven years or such longer period referred to in clause 3 hereof.~~

7. No sales of any machinery or articles as are subject of this Agreement shall be made to any person other than the Inventor except with the consent in writing of the Inventor ~~and of The Secretary of State.~~

DATED

1935

JAMES McCRAE ESQ.

-and-

HYDRAULIC ENGINEERING CO. LTD.

Draft

AGREEMENT

Ellis & Ellis,
2 & 3, The Sanctuary,
Westminster,
S. W. 1.

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AGREEMENT

AN AGREEMENT made the _____ day of _____ 1935
BETWEEN JAMES McCRAE of the Sports Club St. James Square in the
City of Westminster of the one part and THE CROWN AGENTS FOR THE COLONIES
of 4 Millbank in the City of Westminster (who and the Crown Agents for the
Colonies for the time being are hereinafter called "the Crown Agents")
acting for and on behalf of the GOVERNMENT OF KENYA (hereinafter called
"the Government") of the other part

WHEREAS the Crown Agents on behalf of the Government have agreed
to advance in instalments hereinafter mentioned the sum of £10,500 (herein-
after called "the advance") towards erecting a factory for developing
an invention made by the said James McCrae for softening and rendering Sisal
fibre suitable for textile purposes

NOW IT IS HEREBY AGREED as follows :-

1. The Crown Agents will on behalf of the Government advance the said
sum of £10,500 as and when required by the said James McCrae
2. If within a period of 2 years after the date of issue of the first
instalment of the advance the operations for which the advance was made have
not proved to be successful the advance will be regarded not as a loan but
as a free grant subject to such conditions as His Majesty's principal
Secretary of State for the Colonies (hereinafter referred to as the Secretary
of State) or the Crown Agents on his behalf may approve in connection with
the disposal of machinery stores and materials required in connection with
the operations aforesaid. The question whether the operations have proved
successful or not for the purposes of this clause shall be decided by the
Secretary of State whose decision shall be final.
3. Except as hereinafter provided and except for the two years next
following the date of issue of the first instalment during which no
interest shall be payable the said James McCrae shall so long as the

advance or any part thereof shall remain owing pay to the Crown Agents interest thereon at the rate of 4% per annum such interest to be computed from the second anniversary of the issue of the first instalment of the advance and paid annually to the Crown Agents together with repayment of the advance in such manner as is set forth in the columns numbered (3) and (4) of the Schedule hereto

PROVIDED ALWAYS that if the said James McCrae shall desire to accelerate the repayment of the advance or any part thereof and shall give not less than one calendar month's notice in writing to the Crown Agents the said James McCrae may at any time repay the whole or any part of the advance no part payment however being of a sum of less than £500 AND PROVIDED FURTHER that with every repayment the said James McCrae shall also pay all interest due on the sum repaid up to the date of repayment at the rate of 4% per annum as aforesaid

4. In the event of the said James McCrae failing to comply with any of *or such proportion thereof as shall then be outstanding* the conditions hereto the advance shall (except as provided in Clause 2 hereof) forthwith become repayable ~~to~~ and be recoverable from him by the Crown Agents *together with interest thereon at its rate of 4% per annum from the second anniversary of the issue of the first instalment thereof.*
5. The said James McCrae shall repay to the Crown Agents on demand

- (i) all sums paid or which shall become payable by the Crown Agents or their Solicitors for and in respect of the costs charges disbursements and expenses in and about and incidental to the preparation approval execution and stamping of these presents
- (ii) All sums which shall become payable by the Crown Agents to their Solicitors incidental to or in connection with all repayments of the loan
- (iii) All such other legal charges and disbursements as would be chargeable against a Mortgagor had this Deed been a Legal Mortgage by the said James McCrae in favour of the Crown Agents and/or the Government

6. Neither the Governor of Kenya nor the Crown Agents nor any of them or any officer of the Government shall be in anywise personally bound or liable for any default or omission in the observance or performance of any of the acts matters or things which are herein contained

IN WITNESS whereof the said James McCrae has set his hand hereto and one of the Crown Agents has hereunto set his hand and seal the day and year first above written

SCHEDULE

Repayment of Loan of £10,500 with interest at Four per cent by instalments of Capital and interest spread over SEVEN YEARS no payments being made during first two years

Year	Amount of Loan outstanding at beginning of year	Capital repaid	Interest	Total Annual payment
1st	£10,500. -- --			
2nd	10,500. -- --			
3rd	10,500. -- --	£1250. 11. 6.	£420. -- --	£2250. 11. 6.
4th	8,341. 8. 4.	£916. 2. 6.	£42. 9. 2.	£2558. 11. 6.
5th	6,345. 5. 10.	£696. 15. 6.	£61. 16. 4.	£2858. 11. 6.
6th	4,448. 10. 4.	£480. 15. --	£77. 16. 6.	£3158. 11. 6.
7th	2,557. 17. 4.	£267. 17. 4.	£9. 14. 4.	£3558. 11. 6.
		£10,500. -- --	£1292. 15. 4.	£11,792. 15. 4.

THE COMMON SEAL of } etc. }

SIGNED SEALED AND DELIVERED by }
one of the Crown Agents for the }
Colonies in the presence of :- }

DATED

1935

JAMES McCRAE, Esq

-and-

THE CROWN AGENTS FOR THE COLONIES

Draft

AGREEMENT FOR LOAN

Ellis & Ellis,
2 & 3 The Sanctuary
Westminster
S.W.1