

C.S.

GEOLOGIST.

Peet

(Specimens)

1921.

No. 220/21

Govt. Geologist

SUBJECT.

192 1

1st March

Previous Paper.

Forwards box of Geological specimens to  
the Imperial College of Science and  
Technology.

C.S. 69/21

MINUTES.

Hon: Treasurer,

Please withdraw Pay Voucher for £1.0.10. freight  
on one box of geological specimens shipped per s.s. "Duendes" on  
4th March last.

*A. C. S. 1/4/21.*

Hon. Col. Sec.

Vouchers withdrawn accordingly.

*M. Craig Harker*  
2. 4. 21

H.E. the Governor,

Submitted, for information.

*A. C. S. 2/4/21.*

*4 April 1921.*

Government Geologist,

Please note &amp; return.

*A. C. S. 5/4/21.*

Subsequent Paper.

Hon. Col. Sec.

*Noted. H.A. Baker*  
31. 5. 21.



Letter from Crown Agents dated 21st April 1921  
Encl ②

Govt:Geologist,

For your information. Do you desire to make  
any observations ?

*K. Thompson*  
A. C. S. 14/7/21.

Hon. Col. Sec.

Thank you. I have been advised by Mr G. S.  
Sweeting that the box of geological specimens alluded to  
arrived intact at the Imperial College of Science and  
Technology.

*H. A. Baker*  
Government Geologist.  
15/7/21.

H.E. the Governor,

Submitted for information.

*K. Thompson*  
A. C. S. 15/7/21.  
*H. A. Baker*  
16 July 1921

Minute from Govt Geologist d 22nd March 1922 — Encl ③

Letter to Crown Agents, 23. 3. 22, Encl. ④

Minute from Govt Geologist d 22nd March 1922 — Encl ⑤

Letter to Director, Imperial Institute, 27. 3. 22, Encl. ⑥

Letter from Imperial Institute of 7th June 1921 — Encl ⑦

5 of S. despatch etc 98 of 26th Sept 1923 — Encl ⑧

*J. E. Submitted.*

*G. H. B.*

*O. C. Sec*

*16 Nov 1923*

I do not think that there is any-  
thing more to be done in this matter  
now

*15 Nov '23*



G/S.

Please forward to (a) Govt. Nat. & (b) E.E. f. t. i.

(a) I think this may be the same "Coal" as in the Museum.

(b) The tar content would make this useless for road making (?)

"Possibly a small amount used in the hearth might get the work piece to burn. Why not try?"

*[Signature]* 15/11/41

Govt. Naturalist J.E.D.  
E.E.

Referred to you. J. J. C.  
16/8/41.

A.C.S.

Baker evidently hoped that this substance would prove to be of scientific rather than economic value.

It is very different from the "bitumen" (Ref 46).

Lignite is apparently a stage in the formation of true coal. I believe the brown "coal" from Nagpall-ones which has occurred here is in fact a lignite: like that it produced an extraordinary amount of ash.

There can be no doubt that this substance would serve as fuel, if it could be found in sufficient amount although its marked tendency to crumble might be a disadvantage (Ref 46).

? Might heat have been necessary to form this substance. There is an old print, I think in a Miscellaneous Enquiry m.p., showing what is apparently meant to be a good deal of tarsac S. of Engineer Point, if, as is likely the tarsac was burnt it would supply the heat, if it was an essential.

The specimen labelled "low grade coal from West Point" in the Museum is one of a series of black specimens bearing various labels.

Baker's Final Report n.d. pp 35-36 implies that there is a variety of black deposits in the rocks of the Colony. I might like to know of the ammonium sulphate (p. 2 of I.I. Report) J.E.D. 8.11.41



Honorable Colonial Secretary.

Dear Sir, Thank you. The only use as far as I can see for this material is, as His Excellency suggests, an additional fuel supply. Whether it can be obtained in sufficient quantities & early I cannot say. I will try to make an early opportunity of inspecting the area to which reference is made in order to find out.

W. E.  
19. VIII. 41

S. J. A.

to see

C. J. A.  
for 19/8/41

Best many thanks. The N is probably in an insoluble form or growth. The deposit would be phenomenal  
for 21/8/41

Y. E.  
Submitted for information.

C. J. A.  
for 22/8/41

Can I have a bucketful to play with?

✓ C. J. A. 25/8/41

E. E.

Will you please endeavour to obtain a "bucketful".

C. J. A.  
for 25/8/41

Honorable Colonial Secretary.

I am having a search made in the area mentioned in (46) with a view to obtaining the necessary amount.

W. E.

26. VIII. 41.

~~for 27/8/41~~  
~~for 27/8/41~~  
~~for 31/10/41~~  
~~for 2/10/41~~  
~~for 30/9/41~~  
~~for 27/9/41~~  
~~for 31/12/41~~  
~~for 31/10/41~~



220/21.

1st March,

21.

Gentlemen,

I have the honour to inform you that Dr. Baker, Government Geologist, is forwarding to you per the s.s. "Duendes" on the 3rd March, a box containing geological specimens, which in accordance with instructions from the Colonial Office, are to be transmitted to the Imperial College of Science and Technology.

I am to request you to be so good as to forward this package to Mr. G. S. Sweeting of the Imperial College, who has arranged to take delivery of same.

I am,

Gentlemen,

Your obedient servant,

*G. L. B.*  
for Colonial Secretary.

The Crown Agents for the Colonies,

4, Millbank,

London.

● K  
Misc.330

ALL COMMUNICATIONS  
TO BE ADDRESSED TO THE  
CROWN AGENTS FOR THE COLONIES,  
THE ABOVE REFERENCE AND THE  
DATE OF THIS LETTER BEING QUOTED.

TELEGRAMS, "CROWN, LONDON."  
TELEPHONE, 7730 VICTORIA.



4, MILLBANK,  
WESTMINSTER,  
LONDON, S.W. 1

21st April, 1921

Sir,

With reference to your letter No.220/21 of the  
1st March, I have the honour to report that the box of  
geological specimens ex s.s."Duendes" has been delivered  
to Mr.G.S.Sweeting at the Imperial College of Science and  
Technology as requested, pending the arrival of Doctor H.A.  
Baker.

I have the honour to be,

Sir,

Your obedient servant,

The Colonial Secretary,  
Falkland Islands.

for Crown Agents.



FALKLAND ISLANDS.



MINUTE PAPER.

Departmental Number.

From Government Geologist

Date 22/3/1922.

To Hon. Col. Sec.

SUBJECT.

Reports forwarding of boxes of specimens to Crown Agents.

Reference  
Numbers.

Sir,

I have the honour to report that I am forwarding by the "Orcoma" three boxes of geological specimens addressed c/o Crown Agents.

Two of these boxes are destined for the Imperial College of Science and Technology, but the third (marked "For D.I.I.") is for the Director, Imperial Institute.

I shall be glad if the Crown Agents are advised of the despatch of these boxes.

I have etc.,

Herbert A. Baker, D.Sc.

Government Geologist.

The cases are marked

O. H. M. S.

H.A.B. Liverpool.

% Crown Agents for the Colonies,  
London, S.W.1.

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220/21.

23rd March,

22.

Gentlemen,

I am directed by the Governor to inform you that three cases marked "H. A. B. Liverpool", containing geological specimens collected by the Government Geologist are being shipped to you by the s.s. "Orcoma" which is due to leave this port on the 2nd April. Two of the cases are intended for the Imperial College of Science and Technology and the third, separately marked "For D.I.I." is for the Director of the Imperial Institute.

2. I am to request that you will be so good as to make arrangements for the delivery of the cases to the addresses in question.

I am,

Gentlemen,

Your obedient servant,

H. Henniker-Heaton,

Colonial Secretary.

The Crown Agents for the Colonies,  
4, Millbank, Westminster,  
London, S.W. 1.



FALKLAND ISLANDS.



MINUTE PAPER.

Departmental Number.

From Government Geologist.

Date 22/3/22.

To Hon. Col. Sec.

SUBJECT.

Requests forwarding of letter to Director, Imperial Institute.

Reference  
Numbers. }

Sir,

With reference to the box of specimens to be despatched to the Director, Imperial Institute, I have the honour to request that the enclosed letter may be forwarded.

I have etc.,

*Herbert A. Baker*, D.Sc.

Government Geologist.



C o p y.

43

Government Geologist's Office,  
Port Stanley, Falkland Islands  
22nd March, 1922.

The Director,  
Imperial Institute.

Sir,

I am forwarding, by this mail, some specimens of an interesting material which occurs in the peat of the Falkland Islands. My attention was first drawn to it in consequence of its close resemblance to the specimens of "bitumen" or cannel coal which have been found washed up on the shores of these islands. There are, however, certain differences between the two materials. That from the peat appears brownish-black in colour alongside the dead black colour of the "bitumen". The fracture of the latter is conchoidal, that of the former sub-conchoidal. The substance from the peat is also often full of cracks and shows a tendency to fall apart and crumble to small pieces. There is a difference in specific gravity. The "bitumen" floats in sea-water, the other substance sinks. The "bitumen" can be ignited from a lighted match, the other material cannot. Placed on a fire, the "bitumen" burns fiercely, whilst the other substance takes some time to ignite and then burns steadily. Presumably the new substance is to be described as allied to lignite, in which case it throws new light on the subject of the formation of coal. It is in no way a product of pressure, as I found it occurring in peat from  $1\frac{1}{2}$  to 2 feet below the growing surface. At the spot where I found this material (just outside the Narrows, Stanley Harbour, a little N.E of Engineer Point) the peat grows in small isolated clumps or patches, forming little hummocks. These hummocks can be torn up and overturned



by the combined efforts of three or four muscular people, when the lumps of lignite-like material can be picked out from amongst the peat. Here, as elsewhere in the Falklands, the peat is to a very large extent composed of the decaying fibres of the "diddle-dee" plant (*Empetrum rubrum*) a variety of crowberry, with red berries. The "diddle-dee" contains a highly inflammable resin, so that the growing green plant will readily ignite and burn fiercely, giving off dense volumes of smoke, even when wet, on the application of a lighted match. This fact is commonly made use of for the purpose of signalling to or from the outlying islands. Perhaps the lignite-like material has been produced as the result of a process of exudation and aggregation of the resinous substance of this plant. A comparison of the distillation-products of the material and the plant should be interesting, and for this purpose I send also a quantity of the "diddle-dee" plant.

The lignite-like material appears to afford a fuel superior to ordinary peat for household purposes, but I am unable to give any idea of its abundance, except that I have heard of its occurrence in the peat in various places of the Falklands.

I am, etc.,

Herbert A. Baker, D. Sc.,

Government Geologist.



220/21.

27th March, 22.

Sir,

I am directed by the Governor to transmit herewith a letter addressed to you by Dr. H. A. Baker, D.Sc., Government Geologist, relating to specimens of a substance resembling bitumen which have been forwarded to the Crown Agents for the Colonies for delivery to you.

I am,

Sir,

Your obedient servant,

H. Henniker-Heaton,

Colonial Secretary.

The Director of the Imperial Institute,  
South Kensington,  
London.





1197

7

No. 2176/22  
Correspondence to be addressed—  
"THE DIRECTOR,  
IMPERIAL INSTITUTE,  
SOUTH KENSINGTON,  
LONDON, S.W. 7."  
and the above number quoted.  
Each letter should be confined  
to one subject.

IMPERIAL INSTITUTE  
OF THE  
UNITED KINGDOM, THE COLONIES AND INDIA.

SOUTH KENSINGTON, LONDON, S.W. 7.

7 June, 1922.

Sir,

I have to acknowledge the receipt of your letter No. 220/21 of the 27th March, forwarding a letter from Dr. H.A. Baker, Government Geologist, and to inform you that the samples referred to therein have arrived at the Imperial Institute and are receiving attention.

I am, Sir,

Your obedient Servant,

*Ernest Goulding*  
for the Director.

The Colonial Secretary,  
Falkland Islands.



(8)

Reference to previous correspondence:-

A  
1~~Secretary of Islands~~  
Governor'sDespatch No...9.... of the  
1st February, 1923.

.....19.....

FALKLAND ISLANDS.

No.....78.....

DOWNING STREET,

.....26th..Sept.....19.....23

Sir,

I have the honour to transmit to you the  
papers noted below on the subject of a report by the  
Imperial Institute on peat from the  
Falkland Islands.

I have the honour to be,

Sir,

Your most obedient, humble servant,

THE OFFICER ADMINISTERING

THE GOVERNMENT OF THE FALKLANDS ISLANDS.

DEVONSHIRE.

Date.	Description.
1923.	
4th Sept.	From the Imperial Institute (with enclosure)



No. 3880 23  
Correspondence to be addressed—  
"THE DIRECTOR,  
IMPERIAL INSTITUTE,  
SOUTH KENSINGTON,  
LONDON, S.W. 7."  
and the above number quoted.  
Each letter should be confined  
to one subject.

IMPERIAL INSTITUTE  
OF THE  
UNITED KINGDOM, THE COLONIES AND INDIA.

SOUTH KENSINGTON, LONDON, S.W. 7.

14 September, 1923.

Sir,

I have the honour to enclose a report on the material, supposed to resemble bitumen, which was forwarded to the Imperial Institute by the Colonial Secretary and is referred to in his letter No. 220/21 of the 27th March 1922. It is regretted that, owing to pressure of work, the report has been unavoidably delayed.

It will be seen from the report that the material is not bituminous, but that it may be regarded as a form of peat.

With reference to the sample of the "diddle-dee" plant which was also forwarded, it does not appear that any useful information relating to the origin of the peat could be gained by examining the distillation products of this material in comparison with those

obtained

His Excellency  
The Governor,  
FALKLAND ISLANDS.



obtained from the peat; and in any case the quantity of material ( $\frac{3}{4}$  lb.) was too small to permit of such an investigation. If however it is particularly desired to ascertain the nature of the products obtainable by destructively distilling the plant a further quantity of about 56 lbs. should be forwarded for the purpose.

I have the honour to be,

Sir,

Your obedient Servant,

Ernest Goulding  
for the Director.

No. 3880/33  
Correspondence to be addressed—  
"THE DIRECTOR,  
IMPERIAL INSTITUTE,  
SOUTH KENSINGTON,  
LONDON, S.W.7."  
and the above number quoted.

IMPERIAL INSTITUTE  
OF THE  
UNITED KINGDOM, THE COLONIES AND INDIA.

REPORT ON  
PEAT FROM THE FALKLAND ISLANDS.

The material which is the subject of this report was forwarded to the Imperial Institute by the Colonial Secretary, and is referred to in his letter No. 220/21 of the 27th March 1922, enclosing copy of a letter from the Government Geologist dated the 22nd March, 1922. It was desired to ascertain whether the material could be regarded as a lignite produced from peat without pressure.

Description.

The sample weighed 25 lb., and consisted of a dark brown to black, compact material, intermediate between lignite and peat in appearance.

Results of Examination.

A proximate analysis of the material gave the following results:-

	Per cent
Fixed carbon	29.02
Volatile matter	55.10
Ash	3.83
Moisture	12.05
<hr/>	
Sulphur (S), per cent	0.64
Calorific value	4553 small calories

In the following table these results are shown in comparison with corresponding figures for two samples of Falkland Islands peat previously examined at the Imperial Institute (see Imperial Institute report, dated 5th July, 1907), the results in each case being expressed as percentages of the dry, ash-free material.

(Table)



(2)

	Present Sample	Previous samples of Falklands Islands peat.	
		<u>No.1.</u>	<u>No.3.</u>
	per cent	per cent	per cent
Fixed carbon	34.49	34.77	34.77
Volatile matter	65.50	65.23	65.23
Calorific value in small calories	5412	6716	6093

The material was submitted to destructive distillation at a temperature of about 700° to 800°C, yielding 36.5 per cent of coke and 3.6 per cent of tar, the latter being equivalent to a yield of 10 gallons per ton. The yield of ammonium sulphate was 7.98 per cent, equivalent to 178 lb. per ton. These amounts are characteristic of the yields obtained under similar conditions from air-dried peat, whereas a true lignite would have given a larger yield of tar and a smaller amount of ammonium sulphate.

The tar was a thick, semi-solid black substance, which on fractional distillation gave the following fractions (expressed on the moisture-free tar):-

<u>Fraction distilling at</u>	<u>Description.</u>	<u>Per cent by weight.</u>
(1) Below 110°C	Petroleum spirit	1.7
(2) 110°C - 170°C		4.9
(3) 170°C - 240°C	Kerosene	33.1
(4) 240°C - 270°C		14.1
(5) Above 270°C	Lubricating oil etc.	31.9
(6) Residue		14.3

The crude tar contained about 10 per cent of paraffin wax, which on distillation would be distributed mainly among fractions 4, 5 and 6.

Considerable quantities of the oil obtained from the tar were soluble in caustic soda or in sulphuric acid, and, as these reagents are used in refining the crude oil, the yield of purified products obtainable in practice would be markedly less than those of the crude distillates indicated in the above table.

The

The fractions distilling below  $110^{\circ}\text{C}$  were clear and almost colourless when first obtained, but became thick and dark on exposure to the air. In this connection it may be mentioned that the behaviour of these fractions in absorbing atmospheric oxygen is characteristic of the products of distillation of peat tar.

The analysis of this material shows that it is practically identical in composition with samples of Falkland Islands peat previously examined at the Imperial Institute. The yields of coke, tar and ammonium sulphate obtained on distillation are moreover in conformity with results generally recorded for peat.

In order to investigate more completely the question regarding the supposed transition of the peat to lignite, the original sample was divided into two portions, viz. "A", representing the top inch, and "B", representing the second inch. Proximate analyses of these portions gave the following results:-

	<u>A.</u>	<u>B.</u>
	per cent	per cent
Fixed carbon	30.05	30.16
Volatile matter	50.34	49.32
Ash	2.93	3.03
Moisture	16.68	17.49

A partial ultimate analysis gave the following results:-

	<u>A.</u>	<u>B.</u>
	per cent	per cent
Carbon	45.98	45.34
* Hydrogen	3.59	3.53
Oxygen }	30.18 (approx.)	29.97 (approx.)
Nitrogen }		

\* Exclusive of the hydrogen in the moisture present.

When



When expressed on the dry, ash-free material, the results are as follows:-

	<u>A.</u>	<u>B.</u>
	per cent	per cent
Fixed carbon	37.38	37.94
Volatile matter	62.62	62.06
Carbon	57.19	57.05
Hydrogen	4.46	4.44
Oxygen     )	37.5 (approx.)	37.7 (approx.)
Nitrogen   )		

These results show that the materials obtained from the top inch and second inch of the original sample are practically identical in composition. The divergences are so slight that no definite conclusions can be drawn from them regarding any supposed transition from peat to lignite.

#### Remarks.

It is extremely difficult, if not impossible in many cases, to distinguish between lignite and peat which may approximate very closely in composition and appearance. It may be of interest, however, to consider the position that would be occupied by the present material in two of the more important systems of coal classification.

According to Grout's classification, lignite contains 65 to 76.2 per cent of total carbon and 30 to 60 per cent of fixed carbon, whilst peat and turf have less than 65 per cent of total carbon and less than 55 per cent of fixed carbon, calculated on the dry ash-free material. On this basis the present sample may be regarded as peat. //

According to Campbell's classification, air-dried ash-free and sulphur-free lignite has carbon-hydrogen ratio varying from about 11.2 to 9.3, whilst that

of peat lies between 9.3 and some figure higher than 7.2, which is the ratio for wood. On this basis also the present material may be regarded as peat, its carbon-hydrogen ratio being about 8.4. // *W.C.*

*14* September, 1923.