1921

MIN/GEO/1#12

C.S.

Scientific
(Geological)
Minerals.

No. 500/21

Dr. H A Baker

SUBJECT.

1921

11th July

Previous Paper.

Report by Dr. H A Baker.

On the Possibility of the Occurrence of Coal in the Falkland Islands.

MINUTES.

Report by Dr. Baker dated 30 May 1921 Encl (1)

H.E.the Governor,

Submitted.

2. The duplicate copy was sent up as soon as received.

H Thompson

A. C. S.11/7/21.

Despatch to S. of S No 55 of 12th July 1921 Encl (2)

H.C.S.

I despatch degree etc. of Dr Baker should be given after his name.

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26 July 1921

C/C.
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28/7/21

H.C.S.
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[illegible]
28/7/21

Subsequent Paper.

FALKLAND ISLANDS.

No. 55.

GOVERNMENT HOUSE,

STANLEY,

12th July, 1921.

Sir,

With reference to my despatch, No. 47 of the 20th of June, I have the honour to transmit herewith a report by Dr. H. A. Baker on the possibility of the occurrence of Coal in the Falkland Islands.

In duplicate.

I have the honour to be,

Sir,

Your most obedient,

humble servant,

J. Middleton.

THE RIGHT HONOURABLE

W. L. S. CHURCHILL, M.P.,

SECRETARY OF STATE FOR THE COLONIES.

(9)

THE POSSIBILITY OF THE OCCURRENCE OF COAL IN THE FALKLAND ISLANDS.

Stanley,

Falkland Islands,

31st May, 1921.

THE POSSIBILITY OF THE OCCURRENCE OF COAL IN THE FALKLAND ISLANDS.

Sir,

I have the honour to submit herewith a report on the results of my investigations into the possibility of the occurrence of coal in the Falkland Islands, in so far as such investigations have proceeded at present.

I regret to state that the result of my enquiries is disappointing, and that the outlook, in reference to the possible occurrence of coal in the Colony, is not hopeful.

It will be seen, from my progress report on the general geology of the Falkland Islands, that there are two geological formations within the islands which could possibly be coal-bearing (1) The Devono-Carboniferous rocks (2) The The Lower Cretaceous or Lafonian rocks.

The outcrop of the Devono-Carboniferous rocks occupies the whole of ~~the~~ west Falkland, save for certain coastal fringes of other strata; and the whole of East Falkland, north of a line extending from Port Fitzroy to Port Sussex, is similarly occupied.

As I have indicated in my general report, these Devono-Carboniferous rocks consist of a lower barren formation of sandstones and quartzitic rocks, succeeded by strata which can be correlated with the Bokkeveld and Witteberg Beds of South Africa. Unfortunately the Bokkeveld and Witteberg Beds have never yet yielded coal, so far as I am aware.

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As is only to be expected in strata known to contain plant-remains, seams and other occurrences of carbonaceous material are to be found in the upper part of the Devono-Carboniferous formation. *There occur what the inhabitants call "coal-seams".* I have myself noted examples, and have had others pointed out to me by various guides. The thickest example which has come under my notice was less than 3 feet thick. These seams are simply bands of shale, sufficiently carbonaceous to be black in colour, which, happening to occur in a zone of pressure where the rocks have been folded and crushed, have had imparted to them, in consequence of slickensiding, a shining coal-like appearance. A good example occurs on the south side of Chantrey River opposite the settlement. Here, a diabase dyke cutting through the Devono-Carboniferous rocks, has disturbed and metamorphosed them for some distance. Near the intrusion occurs the coal-like shale-band. The material will not burn, although it appears to be fairly bituminous. In my opinion it is quite worthless, but even if it were a good coal, or a highly bituminous shale, it would make no difference since the seam is less than 2 feet in thickness and can be traced for a few yards only.

Another so-called "coal-seam" occurs in the Devono-Carboniferous rocks of West Point Island. I have seen the material and regard it as of no importance. Mr. A. H. Foxton, the occupant of West Point Island, and the discoverer of this seam, admitted to me that he could not succeed in making the material burn, even in his forge-fire.

In some instances where the pressure has been particularly intense, as for example, in the neighbourhood of faults, carbonaceous shales have become somewhat graphitic. Of several specimens which I have examined, from exposures noticed either by myself or shown to me by guides, I have seen none of any special interest. The graphitic material is very impure and

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the specimens can be made to mark paper only with difficulty. A good example of the occurrence of this graphitic material occurs at Port Howard, at a fault in the fossiliferous shales of the Devono-Carboniferous.

This graphitic shale, when weathered, produces a black clay, which, at times, becomes incorporated with the peat. I have seen several specimens of peat containing graphitic material.

So far, then, as the Devono-Carboniferous rocks are concerned, I see no signs of the occurrence of important coal-seams.

With regard to the Lower Cretaceous or Lafonian rocks, the occurrence in these strata of coal-like material, or bituminous shale, at Port Sussex, has long been known. The carbonaceous substance occurs fairly low down in the sequence of the Lafonian rocks, at an horizon above, but not very much above, the Lafonian Sandstone, which overlies the tillite. This material was examined by Bonney, during the "Challenger" expedition, and he reported that "the beds of so-called coal were simply very bituminous layers among the clay-slates, sometimes becoming a sort of culm which might possibly answer to mix with coal and burn in a smithy fire . . . . . but which could never be worked with advantage. The "graphite" was only the blackest samples of the same material."

More recently the same material has been re-examined. The Rev. C. McDonald Hobley, a former Assistant Chaplain at Christ Church Cathedral, Port Stanley, collected some specimens at Port Sussex, East Falkland, which included the alleged "coal" and "graphite". These specimens were examined in September, 1917, by Mr. E. G. Radley and Dr. H. H. Thomas, of H. M. Geological Survey. In their report they said "We consider that the materials submitted have no commercial value, the hard black sooty substance being only carbonaceous shale and of no use

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as a fuel. Further, the contained graphite is so intimately mixed with impurity that it could not be mechanically separated."

With regard to that portion of the Laforian Beds which lies above the deposits immediately associated with the basal part, i.e. the strata above the Laforian tillite, Laforian Sandstone and slaty and shaly beds associated therewith, I regret to say that, in so far as my investigations have proceeded, I have seen no evidence whatsoever of the existence of coal-seams, or even of seams of material to any degree carbonaceous or bituminous. It was reported to me that a "coal-seam" existed in the "camp" about an hour's ride (say 5 miles), north and slightly west of the settlement at North Arm (Bay of Harbours) I rode out to the spot and there saw an insignificant deposit of a peculiar black and shiny bog iron-ore (presumably limonite) occurring in the banks of, and on the bottom of, a small stream which has excavated a valley in Laforian rocks. Hopes raised on that occasion have been dashed more than once, subsequently. Even the bog-iron ore, such as it is, does not occur in quantity sufficient to attract any attention. I regret to say that, considering the extent of the area which I have at present under survey, I have never examined a series of rocks so barren, from the point of view of their exploitation for included minerals.

It should be recorded, however, that I have not, so far, had opportunity to examine the Laforian rocks in anything like detail. Nevertheless, I state now, with only a general knowledge of this formation, that, although I contemplate investigating these rocks in greater detail in the near future, I do not look upon them with any hope in reference to their coal-bearing possibilities.

I have indicated, in my general report, the evidence upon which I base my opinion that there are no strong grounds for hoping to find, in Labrador, any great thickness of Laforian Beds.

Beds, above the basal tillite. The unfortunate thing is that (comparing the Falkland Lafonian with the Conawana succession in the Southern Karroo - these two areas apparently being the most closely comparable) one can only build hopes of finding coal-seams of any significance when strata equivalent to the Ecca and higher beds of the Southern Karroo are represented, and I have yet to show certainly that such is the case. It may be that my future work will lead to a more hopeful outlook, but I state now, that I do not build upon any such possibility.

Certainly I have found the Glossopteris flora in several places in Lafonia and, so far as I am aware, this is not found in South Africa below the Ecca Series. I found it, however, in greatest abundance at North Arm (Bay of Harbours, East Falklands) and the association of fossil-plants there occurring, whilst not affording conclusive evidence, nevertheless suggested to my mind an early type of the Glossopteris flora. Yet the Lafonian beds of North Arm probably occupy an horizon as high, or nearly as high, as any in the Falkland Islands.

That the Lafonian Beds of the Falkland Islands soon let down into the older rocks by great faults, as Halle supposes, there would then have been strong reasons for expecting much younger Conawana Beds in Lafonia. It is to be feared, however, that the non-existence of any such faulting gives the death blow to hopes of finding these younger beds.

It remains for me to discuss the matter of the alleged occurrence of "oil-sand" in the Falkland Islands. It has been stated in correspondence, that there appear to be several outcrops of this material in the Falklands. I have made this point the subject of the most careful investigation and enquiry since I have been here, and have to state with regret that there is no evidence whatever of these alleged outcrops. A sample of the material under discussion (which I regret, personally, as much as could) was received at the

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Imperial Institute, from the Falklands in 1909. It was analysed by Mr. T. Crook, who reported favourably upon it. During my stay here I have traced down the original specimen, a portion of which was sent home for analysis. It came from Crooked Inlet, on the Devono-Carboniferous portion of Hill Cove Camp, West Falkland, and was picked up on the beach. Two other specimens have been referred to in official correspondence, viz. one from Lion Creek and the other from Bull Point, both these localities being in the southern part of Lafonia. In addition to these three specimens I have seen another which is said to have come from the beach at Ruggles Island. Further I have myself procured three other specimens from inhabitants, one from Spring Point (West Falkland) the second from Rocky Inlet (Christmas Harbour, West Falkland) and the third from a nameless creek at Port Stephens, West Falkland. The following points become apparent:-

1. The material is extremely rare. Local interest has been much attracted in reference to this particular substance since the time when Governor Allardyce requested a special look-out for it. I have found the shepherds etc., of the camp extremely ready and willing to keep a sharp look-out for any particular rock or substance which I signified was of any consequence, and have been assured on all sides that this "bitumen" has been sought for most diligently. In spite of this only seven specimens have come to hand.

2. The material is found both where Devono-Carboniferous rocks and also Lafonian rocks occur. Of the seven specimens known, four came from beaches where the surrounding strata are Devono-Carboniferous and three from beaches in the vicinity of Lafonian rocks.

3. The material is always found <u>on the beach</u>. The specific gravity of the specimen examined by Mr. Crook was 1·01. That of another specimen examined by myself was 1·008. The material floats in sea-water and sinks in fresh water.

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I give it as my opinion that the material is simply washed up on the beaches and may have travelled great distances. Every one of the seven known specimens shows some portion of its surface worn and battered and other portions apparently freshly fractured, but I do not think much can be made of these facts.

As I have said, I regard the material as cannel coal, and I surmise that it comes, probably, from some area of Cretaceous rocks, but rocks on a higher horizon than any seen in the Falkland Islands. As to where that area may be seems to me idle to speculate upon. I have seen nothing at all like this "bitumen", "torbanite" or cannel coal anywhere in the bedded rocks of the Falklands either in the Devono-Carboniferous or the Lafonian.

I have the honour to be,

Sir,

Your obedient servant,

Hebert A. Baker,
D.Sc, M.Sc, D.I.C, F.G.S.

Government Geologist.