C.S.

Scientific Dept:
(Geological)

No. 457/21

MIN/GEO/1#10

Govt. Geologist

SUBJECT.

1921

21st June

Previous Paper.

Rock specimen forwarded to the Director Imperial Institute.

MINUTES.

Letter from Govt Geologist dated 20th June

H.E. the Governor,

Submitted.

A. C. S. 22/6/21.

H.C.S.

Is this any report on mineral ... for ... ? The only report which I have seen is the periodical report ... to May.

22 June 1921

Government Geologist,

The only report so far received from you is the periodical report mentioned by His Excellency in minute above. Will you kindly say whether there will be any other report for transmission to S. of S, by this mail ?

A. C. S. 23/6/21.

Subsequent Paper.

W. & S. Ltd.

3. In addition to the report mentioned above, I have prepared, and have deposited in your office to be typed, the following:-

1. Report on the possibility of the occurrence of Coal in the Falkland Islands.

2. Report on the possibility of the occurrence of Liquid Petroleum in the Falkland Islands.

3. Report on the occurrence of certain minerals, other than coal and oil, in the Falkland Islands.

Herbert A. Baker,
Government Geologist.
23/6/1921.

H.E. the Governor,

Submitted for information.

2. The reports mentioned above are in the rough, and Mr. Smith, the Record Clerk C.S.O, is now typing them for Dr. Baker's signature. When completed they will be "jacketed" separately and submitted.

A. W. Thompson
A. C. S. 23/6/21.

H.C.S.
This should await transmission of reports (3) above
[illegible]

[illegible]
23 June 1921

P.S. Is designation of Professor Dunstan correct?
[illegible]

H.E. the Governor,

Dr. Baker informs me that before Professor Dunstan received his knighthood, he knew him as:-

Professor Wyndham. R. Dunstan, C.M.G., L.L.D., F.R.S.

2. It is not known to what order his knighthood belongs, and in consequence Dr. Baker addressed him as he did. (Sir Wyndham. Dunstan. K.C.M.G. ?)

A. W. Thompson
A. C. S. 27/6/21.

[illegible]
28 June 1921

C.S.O. No. 451/21

Inside Minute Paper.

Sheet No. 2

S of S. Despatch No 117 of 11th October 1922 —— Encl (2)

Y.

Submitted.

20/11/22

(Professor Wyndham Dunstan still remains)

21 Nov. 1922

(1)

C.S. 457/21

FALKLAND ISLANDS.

C.S. No.....

MINUTE PAPER.

Departmental Number.

XV. B.

Date 21. 6. 1921

From Government Geologist

To Hon. Colonial Secretary.

SUBJECT.

Despatching rock-specimen and letter in reference thereto, to Director, Imperial Institute.

Reference Numbers.

Sir, I have the honour to report that I am forwarding to the Director of the Imperial Institute a rock-specimen and a letter, of which the following is a copy :-

Port Stanley,
Falkland Islands.
21 June 1921.

Sir Wyndham Dunstan, F.R.S. etc.,
Director
Imperial Institute.

Dear Sir,

You may remember that before I left England for the Falkland Islands last November we had a conversation, as an outcome of which you favoured me with a list of the mineral specimens from the Falkland Islands which have been examined at the Imperial Institute, with a request to forward additional specimens of those minerals of which further samples are required.

FALKLAND ISLANDS. C.S. No.....

MINUTE PAPER.

Departmental Number.

From

Date

To

SUBJECT.

Reference Numbers.

During the past six months I have borne your request in mind but I regret to say that, although I have seen a good deal of the Falkland Islands by this time, I have found no mineral which occurs in quantity sufficient to merit the attention of your department. In fact, 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 included minerals.

Apparently it has been the custom in the Falklands, in past years, to send to the Imperial Institute for examination, specimens of minerals which are notable, locally, solely on account of their rarity. Such specimens, having attracted local attention, have been forwarded to your Department in the hope that experts at home might be interested.

Nevertheless, in compliance with your request, I propose to forward to your department, as they come to hand, the minerals of which further specimens are desired.

I am now forwarding, separately, a

FALKLAND ISLANDS. C.S. No.....

MINUTE PAPER.

Departmental Number.

Date

From

To

SUBJECT.

Reference Numbers.

rock-specimen from Cape Meredith (Port Stephens, West Falkland). In the list supplied to me by your Department, a specimen of Iron Pyrites from Port Stephens is mentioned, with the remark that a larger sample is required for assay for gold.

The only possible gold-bearing area in this neighbourhood is the small outcrop of Archaean igneous and metamorphic rocks at Cape Meredith. I have examined this exposure and have noted the presence, in some of the igneous rocks, of a yellow metallic mineral which may be gold, but which I fear is not. I send you a selected sample which contains the yellow mineral in greatest abundance.

Apart from the possibility of the rock being gold-bearing, it is of interest inasmuch as it is from the Archaean of the Falklands, and is the very first specimen to come into the hands of geologists for examination.

This area of Archaean was discovered by J. Gunnar Andersson of the Swedish South Polar Expedition, in 1902, but his specimens were lost when the "Antarctic" sank. Skottsberg and Halle

C.S. No.....

FALKLAND ISLANDS.

MINUTE PAPER.

Departmental Number.

From

To

Date

SUBJECT.

Reference Numbers.

of the Swedish Magellanian Expedition, who visited the Falklands in 1907-08, did not succeed in getting to Cape Meredith.

The present specimen is of a very handsome chocolate-coloured dyke-rock which cuts through mica-schist and coarse pegmatitic rock, and which I secured with difficulty by climbing down the cliffs, a hundred feet or so, at the imminent risk of my neck.

I will not detain you further with remarks on other minerals mentioned in the list supplied to me, except to state that, much to my regret, the interesting "bitumen" or "torbanite", of which I hoped so much, has failed me. The mineral does not occur in the rocks of the Falklands. It has been searched for most carefully, for years, and I have searched and am still searching, very thoroughly. Only seven specimens of the material are known and each was found on the beach, at widely separated spots, and more often in the neighbourhood of the Devono-Carboniferous rocks than the Gondwana Beds. The material floats in sea-water

FALKLAND ISLANDS. C.S. No.....

MINUTE PAPER.

Departmental Number.

Date

From

To

SUBJECT.

Reference Numbers.

I regret very much that I am unable to speak more hopefully concerning the mineral possibilities of the Falklands.

I am, Sir,
Yours faithfully,
H. A. Baker
D. Sc., F. G. S. etc.
(Government Geologist)

I have the honour to be,—
Sir,
Your obedient servant,
H. A. Baker,
(Government Geologist).

COPY

A
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FALKLAND ISLANDS

No. 117.

Reference to previous correspondence

Secretary of State's Despatch

No. 147 of the 27th Nov. 1920.

Downing Street,

11th October, 1922.

Sir,

I have the honour to transmit to you, for your information, the papers noted below on the subject of a Specimen of rock from Cape Meredith, west Falkland

I have the honour to be,

Sir,

Your most obedient,

humble servant,

WINSTON CHURCHILL

The Officer Administering

the Government of

the Falkland Islands

Date.	Description.
1922.	
16th September,	From the Imperial Institute (with enclosures)

Copy

IMPERIAL INSTITUTE

OF THE

UNITED KINGDOM, THE COLONIES AND INDIA.

South Kensington, London, S.W.7.

No.3634/22

16th September, 1922.

Sir,

With reference to your letter No.57204/1920 of the 25th November, 1920 and previous correspondence on the subject of minerals from the Falkland Islands, I have to inform you that Dr. H. A. Baker forwarded last year a specimen of rock from Cape Meredith, West Falkland which he considered might possibly contain gold and in any case appeared to be of considerable scientific interest.

A report on this rock is enclosed, from which it will be seen that it is of no economic importance but that petrological examination showed it to possess several features of interest from a scientific standpoint.

A copy of the report has been sent to Dr. Baker for his information and for incorporation in his final report on the work carried out in the Falkland Islands.

I am, etc.,

(Sgd.) ERNEST GOULDING.

for the Director.

The Under Secretary of State,
Colonial Office, S.W.1.

Copy

No.3654/22

IMPERIAL INSTITUTE

OF THE

UNITED KINGDOM, THE COLONIES AND INDIA.

REPORT ON ROCK FROM THE FALKLAND ISLANDS.

The specimen which is the subject of this report was forwarded to the Imperial Institute by the Government Geologist and is referred to in his letter of the 21st June, 1921. The specimen was stated to have been obtained from Cape Meredith, West Falkland, and it was desired to ascertain whether it contained gold or other metals of economic importance.

It was stated by the Government Geologist that apart from the possible presence of valuable metals the rock was of interest as being the first specimen received for detailed examination from the Archean rocks of the Falkland Islands discovered by the Swedish South Polar Expedition of 1902; the specimens secured by the Expedition having been subsequently lost.

Results of Examination

Chemical Examination. The rock was analysed with the following results:-

(Table)

		per cent
Silica	SiO_2	47.76
Ferric oxide	Fe_2O_3	5.07
Ferrous oxide	FeO	6.68
Alumina	Al_2O_3	15.17
Titanic oxide	TiO_2	1.63
Zirconia	ZrO_2	0.04
Manganous oxide	MnO	0.17
Lime	CaO	7.12
Barium oxide	BaO	0.04
Magnesia	MgO	5.39
Soda	Na_2O	2.16
Potash	K_2O	4.72
Carbon dioxide	CO_2	0.63
Sulphuric anhydride	SO_3	0.03
Sulphur	S	0.28
Phosphorus	P	nil
Chlorine	Cl	0.03
Moisture	H_2O	0.90
Combined water	H_2O	1.73

An assay showed that neither gold nor silver was present, and the rock does not appear to be of any economic importance.

Petrological Examination. The specimen may be described as a purple-coloured dyke rock mottled with small porphyritic crystals of ferromagnesian minerals and red felspathic patches. There is some quantity of pyrites throughout the rock, but this is especially abundant in certain patches. As would be expected from its great age and also in part from the fact that the specimen was collected near the surface, the rock is somewhat altered, especially along minute cracks, where dilute acid was found to produce brisk effervescence.

The average specific gravity of the rock was 2.87.

Several thin sections were cut in selected directions

and

and examined microscopically with the following results:-

The rock is seen to consist essentially of idiomorphic crystals of pyroxene, amphibole and mica, in a ground mass of felspar, amphibole, and iron ore, with accessory pyrite and apatite. The pyroxene, which forms the most conspicuous phenocrysts, is a pale green variety of augite. It is frequently twinned and generally almost entirely replaced by pseudomorphs of pale green chlorite, serpentine and calcite, especially at the margin, but the crystal outlines are well retained. Amphibole occurs in two generations. The phenocrysts, which are of a brownish-green variety of hornblende, are much smaller than those of the augite. They are quite fresh, showing good crystal outlines, and are often zonally tinted. Phenocrsts of biotite mica are present only in small quantity, but are in some cases of large size. In every instance they have suffered alteration into a green chloritic product, which is strongly pleochroic. Generally a small fragment of the original biotite remains in the pseudomorph. These large biotite phenocrysts are frequently moulded on augite which they sometimes enclose. Their outlines are always irregular. Pyrite generally forms small round phenocrysts, but is in patches very abundant as irregular masses. Apatite occurs in small quantity as well-formed prisms of hexagonal cross-section. The red patches in the rock are seen to consist of altered aggregates of felspar exactly similar to that of the ground-mass.

The ground-mass consists of abundant long narrow laths of greenish-brown hornblende, and rectangular sections of titaniferous magnetite embedded in an iron-stained translucent mass of altered felspars. This altered felspathic material makes up a considerable proportion of the rock and gives it its purplish appearance. It is not possible to determine the felspar with accuracy, but a large part of it

is

is undoubtedly orthoclase, and plagioclase is also present. A tendency towards the development of sheaf-like structure is noticeable and it is evident that the ferromagnesian minerals were all crystallised whilst this more acid material was still plastic. Small quantities of secondary calcite and quartz occur owing to later alteration caused by percolating water.

Remarks

From the foregoing results the rock may be classed as an augite-hornblende-lamprophyre. It does not seem advisable to adopt for it the usual lamprophyre classification (of Rosenbusch) which depends upon the dominant felpsar, since the felspars are only vaguely determinable in the present case, but the analysis shows a considerable proportion of potash, and the calculated "norm" has nearly 28 per cent of orthoclase, so that the rock may be regarded as a vogesite. A rock of this class does not appear to have hitherto been described from the Falkland Islands or the vicinity.

The calculation of the "norn", according to the American classification based on chemical analysis, gives the following results:-

(Table)

	SiO_2	Al_2O_3	Fe_2O_3	FeO + MnO	MgO	CaO	Na_2O	K_2O	CO_2	TiO_2	S	Total [x]		
Analysis	47.76	15.17	5.07	6.68) 6.17)	5.39	7.12	2.16	4.72	0.63	1.63	0.28	99.55		
Molecular weight	60	102	160	72) 71)	40	56	62	94	44	80	32	Molecular Proportions	Molecular Weights	Per cent
Proportion	796	149	31	93 2)	135	127	35	50	15	20	8			
Orthoclase	300	50						50				0.050	556	27.80
Albite	210	35					35					0.035	524	18.34
Anorthite	128	64				64						0.064	278	17.79
Diopside	48					48						0.048	116	5.57
	37				37							0.037	100	3.70
	11			11								0.011	132	1.48
Olivine	14			29								0.014	204	2.86
	48											0.048	140	6.72
Magnetite			31	31								0.031	232	7.19
Ilmenite				20						20		0.020	152	3.04
Pyrite				4							8	0.004	120	0.48
Calcite						15			15			0.015	100	1.50
														96.47
												Moisture and H_2O		2.63
														99.10

[x] Includes H_2O, 1.73; moisture, 0.90; Cl, 0.03; SO_3, 0.03; BaO, 0.04; ZrO_2, 0.04.

These results show that according to this system the rock belongs to the Dosalane class; Germanare Order; Andase Rang; Shoshonose Subrang; and has the symbol II".5."3."3. This is an exceptional position for a Vogesite to occupy and is due to the great preponderance of salic (especially potassic) minerals in the "norm".

Although comparable with Vogesites from many other localities, notably from Switzerland (the Engadine) and Italy, this rock presents several features of special interest.

16th September, 1922.