Geological Survey Office,

Launceston,

3rd January, 1918.

Sir,

GOLD AND OIL-SHALE AT BANGOR.

On my recent visit to the slate deposits for which Bangor is so well known I examined some of the occurrences of gold-bearing quartz in North Bangor and an outcrop of oil-shale situate between Bangor and Baroola.

GOLD.

In the northern part of the district the slate beds are traversed by veins of auriferous quartz. These beds are a part of the gold-bearing belt of country which extends north to between Back Creek and Lefroy. In the central part of the Bangor district the slates are less mineralised, but here they are more indurated and veins and veinlets of quartz are fairly numerous. The region was prospected for gold at an early date, but while gold has certainly been obtained from alluvial and surface debris, no real mine has been opened up.

My examinations on this visit were confined to a small mine opening on R. McKenna's 91 acres 1½ mile N.W. of the Bangor slate quarry, and to some occurrences on G.W. Freeman's 100 acres.

McKENNA'S TUNNEL: Near the southern boundary of McKenna's land at the foot of a steep hill which descends to the river, a short drive has been put in for about 30 feet in slate country in a N.W. direction showing a small quartz reef containing much graphite and pyrite and a little gold and silver. The width of the reef as seen at the outcrop is about 10 inches, but below the water which now impedes examination it is said to widen out to between 3 and 4 feet. The present drive has been started only 6 feet above the present level of the river, and water must be expected if any deeper work is done here. -- Samples which I took from here have been assayed by Mr. W.D. Reid, Government Assayer, in the Geological Survey Laboratory and have yielded the following results:-

Gold	1 dwt. 10 grains per ton
Silver	5 dwts. 15 grains per ton.

The excess of silver indicates the sulphides in the vein as the source of the precious metals and the main return in working would probably be derived from the concentrates. The broken nature of the slate near the lode and the graphite together with a little copper pyrites may be considered as furnishing favourable indications. A little more work might perhaps be done here when opportunity offers, but caution is advisable, for the probability is that there is only just enough gold in the vein to tempt an outlay which will prove unprofitable. The gold contents would have to increase very much before, anything payable can be said to exist here, and the chances of much increase are doubtful.

FREEMAN'S TRENCHES: A long line of trenches has been cut on G.W. Freeman's land to the east of McKenna's property. Some of these have yielded vein quartz, hard, white, with rusty patches, and also lumps of graphite, altogether a congenial matrix for gold. Samples which I took have been assayed by the Government Assayer and have yielded:-

Gold	... ...	2 dwts. 3 grains per ton
Silver	. ...	4 dwts.11 grains per ton

The impression gained from an inspection of the work done is that a line exists here which may well yield a little gold but that the prospects of any body of quartz which can be worked profitably are slender. Small veins and stringers are -- indicated, just sufficiently auriferous to lead to expenditure for which the return will be inadequate.

It is said that when this was Crown Land some prospecting was carried on about 29 years ago, and a few pits were sunk in alluvial without much result.

On the whole the outlook for payable gold at Bangor is not bright. Further prospecting is desirable before laying out much money at the points where quartz has been located.

OIL SHALE.

About half way between Bangor and Karoola or 2 miles from either place is an occurrence of oil-shale which crops out on the top of a hill rising from the main road on the lot 68½ acres charted in the name of T. Windsor, and now occupied by Mr. Cornelius Macarthey. The strata exposed from the base to the summit of the hill are mudstones and mudstone shales belonging to

the Permo-Carboniferous system.

On the west side of the hill near the summit is a small cut exposed for about 6 feet of driving in a N.E. direction. The floor is covered with clay which has fallen from the roof and this prevented the examination of the seam on my visit. With its associated bands. the seam may perhaps be about 18 inches thick and dipping slightly into the hill. A few slabs of shale are scattered on the grass about the entrance. Until the cut is cleared of mullock the actual thickness of the solid seam cannot be determined. The probability is that there are a few thin layers of shale with intervening clay. We are here about 300 feet above the road.

The shale is a black carbonaceous variety, impure and heavy, about 50% of it is inert non-combustible material. Its colour is a dull black. It is sectile, that is, it can be cut with a knife, but not sufficiently so to yield shavings. It weathers with a light brown crust. It is not inflammable with a lighted match, but when heated, its smoke emits a tarry odour.

Some preliminary tests have been carried out on samples of this shale by Mr. D.M. Griffin, Manager of the Railton-Latrobe Shale Oil Works, and he has kindly communicated to me the analytical results which have so far been obtained, namely:-

Crude Oil	19.7 gallons per ton (2240 lbs)
Ammonical water	14.0 gallons per ton
Permanent gas	2000 cubic feet per ton

Mr. Griffin proceeds:- "The crude oil is of a paraffin base, "semi-solid at 62°F., dark green by reflected light and red by "transmitted light, odour not unpleasant and has a specific gravity of .920 at 60°F. The above products were not further examined as the known quantity of shale was considered to be too small to allow of profitable development."

As will be seen from the above, the oil is low. Shales are worked in Scotland with still lower yields, but only because the ammonia content is high enough to make them valuable for the production of ammonia sulphate.

The shale is being examined in the Geological Survey laboratory; the results so far are as follows:-

Moisture at 100°C	0.80
Volatile combustible matter	27.80
Fixed carbon	21.30
Ash	50.10
	100.00

The work done at present does not admit of an opinion being formed as to the extent and size of the seam, its behaviour or its real trend. What is required is (1) to open further on the outcrop at the present site; and (2) to trench deeply on the slope on the east side of the hill, especially towards its base, so as to ascertain whether the seam crops out at surface on that side or plunges deeper into the lower ground on the other side of the fence. If it is found at surface, there will be very little workable area on the dip in this hill. An attempt might then be made to trace the level course of the seam on the adjoining timbered hill.

Yours truly,

(Signed) W.H. TWELVETREES.

GOVERNMENT GEOLOGIST.

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