REPORT WEIGHS POSSIBILITIES OF OIL FIELD

Considerations Favourable and Otherwise to Presence of Commercial Oil Field in lower Fraser River Valley Discussed in Report

DRILLING OPERATIONS

In Part B, Summary Report, issued by the Geological Survey, Department of Mines, there appears a brief report by Mr. Charles Camsell, of the Geological Survey, on the subject of "Boring Operations for Oil in the Vicinity of Vancouver, B.C.," which is the result of a survey of the ground made some time ago by the writer. In its introduction the report says:—

"Much local interest has recently been taken in the possible occurrence of oil in the neighbourhood of Vancouver, and three holes are being drilled to test the ground. The possibility of oil in the sedimentary rocks underlying the Lower Fraser River district has excited the interest of local mining men for several years past, owing to the presence of seepages of both oil and gas at a number of points.

"Such seepages of oil or gas are said to occur at Point Grey, West Vancouver, Pitt lake, and other points farther inland, but the origin of these seepages and whether or not they are connected with pools of commercial importance has not as yet been demonstrated."

GEOLOGICAL OUTLINE.

The geology of the district is thus outlined by Mr. Camsell:—

"The Lower Fraser River district, from Agassiz to the coast, is in the main low and fairly level. . . . The whole of the low-lying country on both sides of the Fraser river is presumed to be underlain by sedimentary rocks of Eocene age, though at Sumas mountain Cretaceous rocks project through them.

"These Eocene rocks, which are made up of conglomerates, sandstones, and some shale, are the possible oil-bearing strata and the rocks from which the seepages of oil are believed to have arisen. They contain a variety of plant remains and a few small coal seams, and are in certain places intruded by dykes of porphyrite or andesite.

"The topographic features of the country about Vancouver and south of the Fraser river are such as to suggest to the layman that the underlying solid have been folded into a series of anticlines and synclines, creating structural conditions favourable to the accumulation of oil. There is, however, little evidence to indicate that the ridges and hills of this district are expressive of the attitude of the underlying bedrock, for they are frequently either accumulations of Glacial or Recent material deposited in the form of hills, or else they represent remnants of a higher land surface that has been completely eroded away. There is, therefore, very little structural evidence, in the district itself, on which to base conclusions as to the presence or absence of commercial bodies of oil in these rocks.

"As far as the lithology of the beds is concerned, there are great thicknesses of porous standstones capable of acting as reservoirs for oil, but so far as is yet known, there are relatively few beds sufficiently thick or impervious to constitute a cover capable of preventing the escape of oil to the surface.

"A thin bed of sandy shale outcrops on the south side of Burrard Inlet, east of Hastings, and other thin beds have been encountered in the boring near Burnaby lake.

CONDITIONS FAVOURABLE AND OTHERWISE.

"Admitting that two conditions necessary to a commercial oil field have been fulfilled in this district, namely, lithological composition of the beds and a favourable structure which would allow oil or gas to flow and accumulate in pools, there remains the question of the original source of the oil.

"In order that oil or gas may occur in any rocks it is considered necessary that organic material must have been present at the time the rocks were being laid down and that favourable conditions for the embedding of such organic material should have existed. It is generally considered, also, that marine animal life was necessary for the formation of deposits of oil.

"The Eocene beds of the Lower Fraser River district are mainly sandstones and conglomerates laid down along the shores of an estuary into which streams were discharging their loads of sediment. The beds accumulated so rapidly that under ordinary conditions the proportion of sediment to animal material would have been large and marine animal life itself was not particularly abundant.

NO COMMERCIAL DEPOSITS.

A certain quantity of vegetable material was present, however, as shown by the occurrence of fossil plants and small coal seams, but the information obtained from natural exposures and drill cores does not as yet indicate that the Eocene beds contain sufficient organic material to have produced commercial deposits of oil.

This is the conclusion arrived at by the geologists of the state of Washington, where the Eocene beds are better exposed and where they have been more carefully studied than in the province of British Columbia.

The possibility of older petroleum-bearing rocks underlying the Eocene and furnishing a supply of oil to the Eocene must, however, be considered.

At Sumas mountain the Eocene rests on volcanic rocks and on the north side of Fraser river on granitic rocks, neither of which is a possible source of oil. Triassic and older rocks form the mountains east of Chilliwack and may extend under some of the region covered by the Eocene rocks, though no evidence of such extension is available.

It is necessary to mention another possible source of the oil of the seepages, which has been referred to by J. B. Tyrrell. Tyrrell atributes the origin of the oil to distillation from coal seams that have been intruded by dykes of igneous rocks. If this theory of origin is correct the seepages have no particular significance and a commercial oil field is not to be expected.

The evidence bearing on the original source of the oil seepages and whether or not they denote commercial bodies of oil underground is so scanty that definite opinions cannot be expressed regarding the occurrence of an oil field in this district. In locating the sites of drill holes, however, operators should not neglect to use all the geological data available and especially those bearing on the structure of the rocks, for by these methods much territory can be eliminated as not likely to contain oil deposits and operations may be confined to those areas that are favourable. It is regrettable that these methods have not been used in every case in selecting the sites for the drilling operations that are now in progress, for they are the only methods that have been proved by experience to be effective in the location of commercial fields.

DRILLING OPERATIONS.

"The first deep drilling operations in the Lower Fraser district were conducted about thirty years ago by the Canadian Pacific Railway Company with the hope of finding workable seams of coal. Holes were drilled at the time in Kitsilano and at Port Haney, but no logs of these holes are now available. Gas is reported to have been struck in the Port Haney hole at a depth of 600 feet, and as a result of this a Vancouver group of men began drilling in 1914 near the site of the old Canadian Pacific Railway well, with the hope of obtaining gas or oil in commercial quantities. The drill attained a depth of 1,250 feet, and the hole was then abandoned. J. D. Galloway reports that the drill was in sandstone and shales the whole way.

"The Pitt Meadows well, which was begun in December, 1913, by the Pitt Meadows Oil Well, Limited, is situated in section 13, township 40, range 5, west 7th meridian. Broad, flat meadows, almost completely flooded at high-tide, extend from Fraser river up the valley of Pitt river to Pitt lake, the upper part of the valley lying between the granite hills of the Coast mountains, and having islands of these rocks rising up through it. The site of the well in these meadows is just inside the outer line of the mountains. The first hole put down at this point reached a depth of about 1,200 feet, and owing to some difficulties was then abandoned. The present hole was started in December, 1913, and on January 1, 1919, was down 1,990 feet, over 1,000 feet being in drift before the solid bedrock was reached. A small showing of oil is said to have been obtained at 1,964 feet, from a thin bed of sandstone. Owing to the loss of some tools in the hole only about 100 feet in depth have been made in the last three years. The site of the hole was located by a magnetically controlled instrument which is supposed to indicate the presence of oil beneath the surface.

"A company known as the Empire Oil and Natural Gas Company is sinking a well in section 27, township 10, range 4, W. 7th meridian, about a mile south of Otter station on the Great Northern railway. Drilling with a Keystone drill has been in progress since April, 1918. The first hole at this site was put down to a depth of 350 feet and then abandoned without reaching bedrock. A second hole put down beside the first reached a depth of 140 feet, and was also abandoned. A third hole at the same site had reached a depth of 65 feet on January 6, 1919. All the holes passed through a top stratum of coarse gravel and were continued in soft sands. None of the holes reached solid rock.

"A diamond drill hole is being put down by the Spartan Oil Company in the municipality of Burnaby, about a mile north of the west end of Burnaby lake, on lot 130. One of the most important seepages of oil occurs at this point alongside the tracks of the Great Northern railway. Drilling was begun on August 15, 1918, and was still in progress on January 15, 1919, when a depth of 1,060 feet had been attained. The surface drift at this point was found to be 110 feet in depth, and the strata encountered were sandstones, conglomerates, and some shale. Small showings of gas and oil have been obtained from sand streaks in the conglomerate at several points below 640 feet. A contract has been let to sink the hole to a depth of 2,000 feet."

MONTH'S COAL OUTPUT

The Dominion Bureau of Statistics issues the following monthly bulletin as a survey of the output of coal in Canada for April, 1919, as compared with April, 1918. The figures represent net tons:—

Districts.	Output for month of April, 1918.	Output for month of April, 1919.
Sydney	347,486	344,916
Inverness	23,906	12,661
Port Hood	108	585
Pictou	46,402	60,817
Springhill	48,004	41,516
Joggins	20,286	15,912
Total for Nova Scotia	486,192	476,407
Minto	22,892	10,998
Total for New Brunswick	22,892	10,998
Saskatchewan	15,639	14,962
Total for Saskatchewan	15,639	14,962
Alberta bituminous	268,047	237,305
Alberta anthracite	14,199	10,354
LIGNITES.		
Pincher Creek	96	67
Lethbridge	59,484	46,409
Magrath	7	36
Milk River	245	104
Taber	1,832	1,257
Bow Island	173	247
Medicine Hat	156	351
Aldersyde	284	149
High River	24	13
Drumheller	13,106	16,860
Big Valley	772	1,214
Brooks	194	152
Hanna	528	943
Lacombe	254	249
Trochu	123	624
Three Hills	464	283
Carbon	113	88
Battle River	17	0
Camrose	1,777	2,204
Tofield	2,448	580
Clover Bar	4,775	10,760
Edmonton	4,787	2,725
Namao	844	382
Cardiff	4,470	6,476
Wabamun	653	32
Pombina	2,373	7,742
Total for Alberta lignite	99,999	99,947
Grand total for Alberta	382,245	347,606
Crow's Nest	70,159	52,528
Inland	12,920	4,639
Island	166,505	111,378
Total for British Columbia	249,584	218,545
Grand total for Canada	1,156,552	1,068,518