

Information on these points will be of interest in the search for oil and gas.

Important flows of gas have been met in several parts of southern Alberta and some also in central Alberta. Farther north, especially in the vicinity of Athabaska river, there are evidences both from borings and from natural gas escapes, of great accumulations over wide areas.

**The outlook for oil in southern Alberta** has been brightened by the recent finds and reports of occurrences near Calgary and at points farther north. But it is in the northern part of Alberta and in the vast area to the north and west of that province, that the best surface indications of the existence of oil are to be found.

Cairnes, in his report on the Moose Mountain district of southwestern Alberta, says: "There are several likely gas horizons in this district, any or all of which may be gas-producing at favorable points. Medicine Hat gas comes from about the middle of the Belly River formation; Langevin gas comes from the same horizon; the Cassils gas is from a higher horizon, just at the bottom of the Pierre. There is also a likely horizon at the bottom of the Edmonton, and one higher in the same formation." Of the indication of gas in the country between the Peace and Athabaska rivers, McConnell writes: "The natural gas springs have less value in themselves at present than in the indications they afford of the existence of petroleum beneath." Referring to the bitumens found in the valley of the Athabaska, the same writer says. "The tar sands represent an upwelling of petroleum to the surface unequalled elsewhere in the world, but the more volatile and valuable constituents of the oil have long since disappeared, and the rocks from which it issued are probably exhausted as the flow has ceased. In the extension of the Tar Sands under cover the conditions are different, and it is here that oils of economic value should be sought." He then points out that in other parts of the field the corresponding sands are overlaid by impervious shales, and that there is a probability that small anticlinals or other conditions in the beds and overlying shales may supply the necessary conditions for oil accumulation. Indications of oil as afforded by bitumen are not confined to the above locality, but are found on Peace river, Lesser Slave lake, and in many parts of the Mackenzie basin where Devonian limestones are exposed. Camsell, in a recent paper on the Mackenzie River region, writes: "The most important mineral products of the lowland portion of the basin, however, and possibly of the whole of this portion of Canada are oil and gas, evidences of which are found from the height of land on the south to the Arctic ocean on the north. The original source of both these substances is believed to be in the Devonian rocks, and since these rocks cover about half of the total area of the whole Mackenzie basin, the possibility of discovering oil pools of importance in this region is excellent. Gas has been proven in great quantity by several drill holes, but little intelligent effort has so far been directed to the search for oil."

In summing up, it might be said that there is a wide belt of country lying to the east of the Rocky mountains and extending from the United States on the south to the Arctic ocean on the north, which may practically all be regarded as geologically possible oil and gas country. The occurrence in this belt of large areas presenting all the essential conditions and many of the favorable ones for the accumulation of hydro-

carbons, makes it seem not too unreasonable to classify some large parts of the belt as geologically probable fields.

It would not be right to consider the probabilities of an area without noting some of the factors which may make more uncertain the finding of oil and gas. Overlying beds may not be sufficiently consolidated to check loss. The exposure of reservoir beds by erosion, which has caused an enormous loss of oil and gas in many parts of the world, is well illustrated by the occurrence of bitumen in the Dakota sands overlying Devonian limestone in the Athabaska basin. As was mentioned, this bitumen is undoubtedly the heavy residual oils left by the lighter oils of petroleum pools which had gained access to the surface. There are also the crucial possibilities that there was not sufficient oil and gas in the original sources, and that there were not the right conditions for accumulations. Unfortunately, the investigations relative to the hydrocarbons, have not put us in a position to hazard a guess on these points, and we are forced to reason by comparison to proved oil and gas fields.

### U. S. IRON PRODUCTION IN 1914.

Output of iron ore in the United States in 1914 decreased about 33 per cent. from preceding year, according to estimates of the Geological Survey.

Iron ore mined in the United States in 1914 is estimated at between 41,000,000 and 42,500,000 long tons, and quantity shipped from the mines to receiving ports and iron manufacturing centres between 39,500,000 and 41,000,000 long tons. In 1913, 61,980,431 long tons were mined. These estimates are based on preliminary reports from 52 of the important iron mining companies which represent the principal iron producing districts and whose combined output in 1913 was more than 90 per cent. of total tonnage of iron ore mined in that year.

The average decrease in quantity mined by these 52 companies was 33 per cent., compared with their output in 1913, and if this average decrease should hold for all the iron mining companies in the United States, the total output of iron ore in 1914 should approximate 41,440,000 long tons, compared with 61,960,437 long tons mined in 1913. A curve of iron ore production would, therefore, show the output of 1914 to be about on a par with that of the years 1905 and 1911.

In the Lake Superior district, where about 85 per cent. of the domestic iron ore is mined, the average decrease in production was about 37 per cent., thus indicating a total production for that district of about 32,915,000 long tons in 1914, compared with 52,516,156 long tons mined in 1913. The shipments of ore from this district apparently decreased about 34 per cent., and accordingly the shipments should approximate 32,790,000 long tons in 1914, compared with 50,168,134 long tons in 1913.

According to the preliminary reports the stocks of iron ore at the mines apparently increased more than 500,000 long tons during 1914, so that the total stocks at the close of 1914 should range between 13,400,000 and 13,500,000 long tons, compared with 12,918,633 long tons on hand at the close of 1913.

Prices generally were 50 to 75 cents a ton lower than in 1913—as low as or lower than those of 1912 and 1905. The depression in the iron industry affected seriously the lake carrying trade, which depends largely on the transportation of ore from the Lake Superior districts to ports at the head of Lake Michigan and at the foot of Lake Erie.—Boston News Bureau.