

## CANADIAN IRON AND STEEL.

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### IV.

In my last article I described the location of the raw materials of iron-making, coal iron and limestone, in the Maritime Provinces.

No very large bodies of good iron ore have been proven to exist in the Province of Quebec, although there are widespread indications of iron, but it is possible that extensive beds of iron ore may yet be discovered or that some of the known deposits, now regarded as doubtful, may prove to be of great value.

There is some reason to believe that there may be extensive iron ore deposits along the Gatineau River in Hull Township, Ottawa County, Quebec, within a few miles of the City of Ottawa. Many years ago three mines were opened in what is known as the Hull Range, viz., the Forsyth, Baldwin and Lawless. From the Forsyth mine, 8,000 tons of ore were shipped to Cleveland, Ohio, between 1854 and 1858, averaging, it is said, over 60 per cent. in metallic ore. The ore was magnetite, low in phosphorus and sulphur. Shipments ceased because supplies of ore more conveniently situated for transportation to the Cleveland market, were discovered. In 1867 a charcoal blast furnace was started in the vicinity of the mine, but was only in blast for about a year. At the Baldwin and Lawless mines very little development work has ever been done. Mr. Fritz Cirkel, M.E., of the Dominion Department of Mines, who recently made a report covering 147 pages on the deposits along the Ottawa and Gatineau Rivers, thinks it probable that there may be a large body of ore in the Forsyth, and says that while the Baldwin deposits seem to be more irregular and to consist largely of pockets, the quantity of ore exposed, although scattered, is of sufficient importance to justify mining operations on a large scale. Of the Lawless mine he says that no solid ore bed of any extent can be seen on the surface, but there are some pockets of very good quality. He states that the principal constituent of the ores of the Hull Iron Range is magnetite, intermixed at some places with hematite and associated with a gangue material, and that they contain from 53 per cent. up to about 67 per cent. of metallic iron, the highest percentages being obtained from magnetite ores free from hematite. The ores are very low in phosphorus. Sulphur is present in the form of pyrites and is in some cases confined only to the edges of the deposit. Mr. Cirkel believes that in actual mining these parts of the deposits can be passed by or the pyrites can be eliminated by cobbing. The iron bearing area is estimated as having approximately a length of 6,800 feet, while the width ranges from 40 feet to 100 feet. The deposits are numerous in the eastern portion of the range, but thin out in the extreme western portions. In the Township of Templeton near the boundary of Hull Township, is the Haycock mine, where in April, 1873, rather extensive mining operations were begun and continued for several years. No work has been done for over thirty years. Very little information is obtainable regarding the old mining operations. Mr. Cirkel reports that all the deposits he examined so far as surface indications go are of limited extent, but he thinks it possible that large ore bodies may be found in the neighbourhood. The Haycock ore is hematite, having sometimes an admixture of magnetite, and samples taken from a number of pits indicate that it has a high percentage of iron, being low in both phosphorus and sulphur, but high in titanic acid. There are several other iron ore deposits in Templeton

Township, which appear to be of much the same character as the Haycock. Mr. Cirkel reports that there are many small outcrops of both magnetite and hematite in the different townships bordering on the Gatineau River, but the value of the deposits cannot be determined without development work.

The Bristol iron mines are in the Township of Bristol, County of Pontiac, about two miles north of the Ottawa River and a little over four miles from Wyman station on the Canadian Pacific Railway. Between 1885 and 1888 about 12,000 tons of magnetite iron ore are said to have been shipped, principally to Pennsylvania furnaces, but no mining has been done for twenty-one years. Samples of ore analyzed show that it is high in metallic iron, very low in phosphorus, somewhat high in sulphur, and contains a small percentage of titanic acid. Mr. Cirkel says that the ore, though generally called magnetite, is really a mixture of crystalline magnetite and hematite of varying proportions. Regarding the sulphur, he says: "In the Hull Iron Range, iron pyrites is met with mostly in a coarse form in certain portions of the ore bodies, and these can easily be separated by hand from the pure ore. The distribution of iron pyrites throughout certain masses of the ore bodies at the Bristol mines, in the form of fine irregular veins and disseminations, renders mechanical cleaving impossible, consequently such ores, which from outside appearance contain too much pyrites, must be submitted to a roasting process, in order to keep the contents of sulphur in the smelting ore below the admissible limit." However, Mr. John Birkenbine, M.E., who made a report on the Bristol mine in 1888, said that while the large quantity of pyrites in the upper levels of the mine necessitated roasting the ore, the pyrites had become so much diminished in the lower workings that roasting was no longer necessary.

The Bristol iron-bearing formation has an approximate length of about 1,500 feet and an approximate width of 500 feet. "As to the extension of the ore bodies in depth," says Mr. Cirkel, "it is known that in the main shaft a depth of 200 feet has been reached and that the ore there is still continuous. In another place a depth of seventy-five feet was reached and, according to the statement of the foreman who worked this pit, the bottom is still in good ore."

The Chats waterfall of the Ottawa River is within a few miles of the Bristol mine and electric power could be developed at very low cost.

There are a number of deposits of iron ore throughout the County of Pontiac. Some of them are evidently poor in quality and limited in extent. Others make a better showing, but only development work would prove whether they are of any value or not.

On Calumet Island, in the Ottawa River, both magnetite and hematite ores have been found, but no development work has been done and the quantity of ore is uncertain. An analysis of hematite ore showed it to be very low in both phosphorus and sulphur, but it contained a small percentage of titanic acid.

There are large supplies of limestone within easy reach of the iron ore deposits along both the Gatineau and the Ottawa Rivers, and there are a number of waterfalls not far distant, from which electric power could be obtained. It has been suggested that these ores might be smelted by electricity.