SUMMARY OF IRON ORE RESOURCES OF CANADA

Important Occurrences in Several Provinces—Production Has Not Kept Pace, However, With Growth of Canadian Iron and Steel Industry.

A full account of the known iron ore resources of Canada, supplemented by a description of the Wabana iron mines in Newfoundland, is given in the report, entitled "Iron Ore Occurrences in Canada," compiled by E. Lindeman, M.E., and L. L. Bolton, M.A., B.Sc., with an introduction by A. H. A. Robinson, B.A. Sc., and issued in two volumes by the Mines Branch, Department of Mines. The report is timely, having regard to a deputation which recently visited Ottawa asking for a bounty on the mining of iron ores.

As early as 1667, iron ore was discovered in Canada, and in 1733 the Canadian iron industry was born in the shape of one forge producing iron. In 1737 the industry was represented by a group of forges at Three Rivers, Quebec, which "remained in active operation almost continuously until 1882, being at that time the oldest active iron producers in America."

The growth of the industry was very slow until 1896, when it began to grow rapidly and assume its modern form. In its infant years "sufficient ore was available locally to meet all the demands of the furnaces." Since then the production of native iron ores has not kept pace with the consumption of Canadian blast furnaces. It has fallen so far behind that in 1917 the total production of iron ore in Canada was only equal to 9·7 per cent of the total ore smelted in Canada.

The ore charged to Canadian blast furnaces has increased in quantity from 142,860 tons in 1896 to 2,176,296 tons in 1917, of which 92,065 tons were of domestic origin and 2,084,231 tons were imported. The imported ore included 874,134 tons from Newfoundland and 1,210,097 tons of "Lake" ore. The ratio of Canadian production to total ore charged has been steadily declining with the growth of the Canadian iron industry.

This is not due to lack of iron ore in Canada. It is because the native ores need preliminary treatment to make them suitable for economic smelting, and on this account are unable to compete economically with imported ores.

"Practically all the imported ores," states the report, "comes either from Wabana, Newfoundland, or from the Lake Superior iron ranges in the United States. It might be noted, however, that the word 'imported' has not the same significance as applied in the two cases. The Wabana ore, on which the Nova Scotian iron and steel industry is based, comes from a sister British dominion, and is owned and mined by Canadian companies for use in their own furnaces; on the other hand, the Lake Superior ores are owned and mined by United States interests, and are bought in the open market by Ontario smelters."

The Steel Company of Canada has recently secured control of iron ore resources in the United States lake region and will mine its own ores therefrom.

The report gives a summary review of the iron ore situation in the various provinces. In reference to the situation in British Columbia the report says that up to the present the production of iron ore there has been "an almost negligible quantity," due not so much to the lack of ore as to the lack of a market for the ore.

"The different varieties of ore found in British Columbia include magnetites, hematites, limonite or bog ores, and clay ironstones," the report states.

"The most important of the known ore bodies are a series of magnetite deposits which occur on the islands along the coast. The iron content is variable, ranging from 45 to 65 per cent. Phosphorus is often below the Bessemer limit; on the other hand, sulphur is usually so high that the ore would require preliminary roasting to render it suitable for economic smelting. . . . The coast magnetites are capable of producing a good merchantable pig-iron. They can be easily and cheaply mined. They are located close to tide-water. On the British Columbia coast, ore, coke, and limestone suitable for flux are all obtainable within easy reach of one another. . . . It is possible to say that in the aggregate, in the known magnetite deposits of the coast district there is a sufficiently large tonnage of ore to support a small local iron industry for many years when conditions justify its establishment. There is little doubt, also, that active exploration would disclose many bodies of ore at present unknown."

The comment of the report on the hematites and other iron ores in British Columbia indicates that these bodies, so far as known, are not of sufficient size to be of commercial importance.

ALBERTA, SASKATCHEWAN, AND MANITOBA.

"Up to the present time no iron ore deposits of sufficient size and quality to make them of commercial importance have been found in the Middle West provinces," says the report. "There are, however, very large areas unprospected in all three in which iron ores may be discovered in the future."

IN ONTARIO PROVINCE.

The report gives a table showing that the total production of iron ore in Ontario from 1869 to 1916 amounted to 4,349,144 tons, the largest total production of any of the Canadian provinces. The table shows that the percentage of Ontario ore used in Ontario blast furnaces is on the decline.

"Previous to 1889, all the ore mined in Ontario," the report says, "was exported to the United States with the exception of such small quantities as were used in the earlier attempts at iron smelting. From 1889 to 1895, both years inclusive, production ceased entirely. About 1896, a system of bounties inaugurated by Federal and Provincial Governments to encourage the manufacture of iron and steel from native ores stimulated the industry. Blast furnaces were erected at various points in the province. Strenuous efforts were made to use Ontario ores as far as possible, and thus obtain the liberal bounties offered. Prospecting for iron ores became general.

"In eastern Ontario old mines were reopened and for a time ore was shipped in small quanties. The quality of most of it was poor. As a result these mines have again lapsed into idleness.

"In northwestern Ontario, the discovery in 1899, of the Helen mine, a deposit of brown hematite, led to feverish activity in the search for iron ore. The net results of these efforts have been disappointing. The only large body of ore of high grade and good quality, yet discovered in Ontario, is that at the Helen mine.

"Since 1899, owing principally to the output of the Helen, the iron ore production has averaged in the neighbourhood of 220,000 tons per annum, and reached a maximum in 1913 when 394,054 tons were produced. This however is a long way short of the amount of ore used annually in the production of pig iron, and the proportion of native ore, as compared with foreign ore, used in Ontario blast furnaces, is disappointingly small.

"With the rapidly approaching exhaustion of the hematite ore at the Helen mine, the maintenance of the present rate of iron ore production will depend on the possibility of profitably utilizing the known bodies of inferior ores, or the discovery of new bodies of high grade ores.

"All the usual varieties of ore are to be found in Ontario, including hematite, (brown, red, and specular) magnetite, siderite, and bog ore. In the past by far the most productive class has been hematite, followed by magnetite. At the present time the bulk of the output is roasted siderite.

IN QUEBEC PROVINCE.

"Iron ore was first mined and smelted in Quebec in the eighteenth century and from that time until 1884 the industry was carried on almost continuously at Three Rivers. Other furnaces using local ore were operated at Radnor Forges and Drummondville, the last to shut down being the Drummondville furnace in 1911. The ores used were bog ores with charcoal for fuel. The output of the furnaces was small, and the industry derived its chief importance from the superior quality of the pig iron made.

"The output of iron ore, never very large, has latterly occupied a very subordinate place in the mineral production of Quebec.

"Types of ore found include: magnetite (titaniferous and non-titaniferous) ilmenites, bog ore and hematite.

IN NOVA SCOTIA.

"Nova Scotia, next to Ontario, has to its credit the largest aggregate output of iron ore, of any province in the Dominion. . . . Latterly with the exhaustion of the workable deposits of better-grade ore, production has declined until now it has reached the vanishing point. The extensive development of the Wabana iron ore field in Newfoundland, and the ease and cheapness with which Nova Scotia furnaces can secure a supply of suitable ore from that source, have operated to decrease interest in the development of local supplies.

IN NEW BRUNSWICK.

"New Brunswick, like all the other provinces in eastern Canada, except Prince Edward Island, had in early days, its small local iron industry based on local ores.

"As a producer of iron ores, however, the province has never been prolific. . . . The only known deposits that have any economic interest are known as the Bathurst mines, about 25 miles southwest of the town of Bathurst. In 1913 operations at these mines ceased. An estimate of the ore reserves is placed at 18,600,000 tons. Concentration was adopted in the last year of operation. . . . It is thought, however, that ore of merchantable grade can be produced by a system of selective mining without concentration.

IN NEWFOUNDLAND.

"On Bell Island, in Concepcion Bay, Newfoundland, and in submarine areas adjacent thereto, are situated iron ore beds the workings on which are known as the Wabana Mines. The owners are Dominion Steel Corporation, Limited, Sidney, Cape Breton, N.S.; Nova Scotia Steel and Coal Company, Limited, New Glasgow, N.S.

"The ore is composed of two principal iron-bearing minerals, hematite and chamosite, while a third, siderite, becomes locally abundant.

"The total ore shipments from Wabana mines from 1909 to 1915, inclusive, amounted to 7,140,046 gross tons. In 1916 1,012,060 short tons were shipped, and in 1917, 883,346 tons, by the two Canadian companies operating there. From 1910 to 1915 inclusive the amount of Wabana ore shipped to blast furnaces in Nova Scotia was 4,806,277 gross tons. This amount represents almost the entire consumption of Nova Scotia furnaces for the period mentioned.

"The Wabana ore beds are of a higher grade in iron than most other sedimentary ores; the total tonnage present makes up one of the very largest and by far the most compact ore reserves in the world."

Be a W.S.S. booster.

IRON ORE UTILIZED IN CANADA FROM 1896 TO 1916

Calendar Year.	Production of iron ore in Canada.	Iron ore charged to Canadian blast furnaces.			Canadian ore in total ore charged.	Ratio Canadian production to total ore charged.
	Short tons.	Canadian Short tons.	Imported. Short tons.	Total. Short tons.	Per cent.	Per cent.
1896	91,906	96,560	46,300	142,860	67·6	64·3
1897	50,705	53,658	55,722	109,380	49·0	46·3
1898	58,343	57,881	77,107	134,988	42·9	43·2
1899	74,617	66,384	120,650	187,034	35·5	39·9
1900	122,000	71,341	112,042	183,383	38·9	66·5
1901	313,646	156,613	361,010	517,623	30·2	60·6
1902	404,003	125,664	559,381	685,045	18·3	58·9
1903	264,294	82,035	485,911	567,946	14·4	46·5
1904	219,046	180,932	454,671	635,603	28·4	34·4
1905	291,097	116,974	861,847	978,821	12·0	29·7
1906	248,831	221,733	982,740	1,204,473	18·4	20·7
1907	312,856	244,104	1,117,260	1,361,364	17·9	22·9
1908	238,082	209,266	1,051,445	1,260,711	16·6	18·8
1909	268,043	231,994	1,235,000	1,466,994	15·8	18·3
1910	259,418	149,505	1,377,035	1,526,540	9·8	17·0
1911	210,344	67,434	1,628,368	1,695,802	4·0	12·4
1912	215,883	71,588	2,019,165	2,090,753	3·4	10·3
1913	307,634	139,436	2,110,828	2,250,264	6·2	13·7
1914	244,854	182,964	1,324,326	1,507,290	12·1	16·2
1915	398,112	293,305	1,463,488	1,756,793	16·7	22·6
1916	339,600	221,773	1,964,598	2,186,371	10·1	15·5

N.B.—This table is compiled from the figures given in the annual reports of the Division of Mineral Resources and Statistics, o the Mines Branch, Ottawa.