

stones, various types of schists, and bodies of dark basic rocks, all commonly grouped as the Hastings-Grenville series, and cut by bodies of granite. The gold deposits occur in the older rocks, generally near granite intrusions and along lines of fissures containing quartz veins or lenses, and, commonly, with abundantly associated mispickel, sometimes mined for arsenic.

Copper.—"Most of the copper won in the Laurentian plateau comes from the nickel-copper mines of Sudbury.

"In the Parry Sound district a number of discoveries of copper ore have been made. At a point about two miles east of Parry Sound a schistose diorite is more or less charged with bornite, chalcocite, and chalcopyrite, over a zone about 1,000 feet long and 250 feet to 400 feet wide. In places the ore is associated with stringers of quartz, but in general it occurs in bunches or pockets through the impregnated rock. At another locality in the same district, about eight miles south of Parry Sound, a garnetiferous gneiss is impregnated with copper and iron sulphides, over a band about 1,000 feet long and 30 to 75 feet wide.

Zinc.—"Zinc blende, usually accompanied by galena, occurs in workable deposits at a number of points in Quebec and Ontario. The Olden or Richardson mine, in Frontenac County, has been worked in recent years. The ore consists of a mixture of zinc blende and argentiferous galena. The deposit is irregular, and occurs in a band of crystalline limestone of the Hastings-Grenville group. Some work has been done on zinc deposits at Calumet.

Iron.—"Throughout Eastern Ontario and adjoining portions of Quebec, in the districts in which the Hastings-Grenville series occurs, are numerous deposits of magnetite. Many of these have been worked for years, and some are being mined at the present time. The deposits, though usually irregular in shape and distribution, are often of considerable size. In one instance, at the Mayo mine, Hastings County, the ore has been worked from an open pit 1,100 feet long by 220 feet broad, while a drill hole was sunk 140 feet without passing out of ore.

"In many cases the ore bodies lie along the contact of crystalline limestone and granitic or other igneous bodies. At times considerable pyrite is present, necessitating the clobbering of the ore. The general conclusion is that the ores are of contact metamorphic origin. Other iron ore deposits of the Hastings-Grenville districts lie within bodies of basic igneous rocks, are characteristically irregular in their occurrence, and doubtless are of direct igneous origin. Somewhat related in type are the masses of highly titaniferous magnetites so often associated with the various anorthosite bodies occurring throughout the eastern part of the Laurentian plateau. In size these titaniferous ore bodies vary widely, sometimes reaching large dimensions."

Recently some of the magnetite deposits of Eastern Ontario, referred to by Dr. Young, have been more energetically worked and a concentrator is now in operation at Trenton, treating the ore produced by the Canada Iron Mines, Ltd. A description of the mines and plant follows.

THE CANADA IRON MINES, LIMITED.*

The Canada Iron Mines, Limited, was organized for the purpose of operating the important magnetite deposits along the line of the Central Ontario Railway. It owns the Bessemer and Childs group of mines near L'Amable Station, the Coe Hill mines at Coe Hill, and the Blairton mines near Marmora.

The Canada Iron Mines, Limited, ships the ores to its concentrating plant at Trenton, where it undergoes magnetic concentration, making a marketable product. In this manner, by a centralization of treatment and of administration it is able to achieve low costs, and by mining the various ores in their proper proportion according to their different characters, it is able to produce a product admirably suited to the blast furnace.

It has been necessary so far to open only the Bessemer and Childs group, and we will consider these mines first.

The Bessemer and Childs group comprise 3,100 acres of mineral lands situated in the Townships of Mayo and Dungannon in the County of Hastings. These mines are not directly on the Central Ontario Railway, but are five to seven miles east from L'Amable Station on that railway. The Bessemer and Barry's Bay Railway connects the mines with the Central Ontario near L'Amable. It is owned and operated by the Canada Iron Mines, Limited.

Bessemer Post Office is situated five miles from the junction of the Central Ontario Railway and Bessemer & Barry's Bay Railway, and here is located the mine office, store, club and settlement, etc., for both Bessemer and Childs mines.

Bessemer No. 4 mine is the most important mine at Bessemer and is the only one being operated at the present. At this mine two large ore bodies are being developed—the north lens and the south lens. The latter lies to some extent under Little Mullet Lake, and although opened up considerably under this lake, the workings are unusually dry. Of course a thick pillar is left between the workings and the lake bottom. The ore bodies are both of large size and permit mining methods to be used which give low costs for underground mining. The ore is extracted by overhand stoping on the shrinkage system, no timber being used.

Hammer drills are used for stoping. Three and one-quarter piston drills are used for all drifting. Hammer sinkers were tried for shaft sinking, but have not yet been a success owing to a great breakage of steel. This will be overcome by using 1½-inch hollow hexagon, instead of 1-inch as now used.

The ore is hoisted in a one-ton skip and is dumped directly into a No. 6 "K" Gates gyratory crusher. The crusher discharges onto a 22-inch troughed belt conveyor equipped with ball-bearing idlers. The conveyor is 44 feet long and is installed on a slope of 18½ degrees to gain headroom. The conveyor discharges either into the car loading bins, or into the tramcar for stockpiling.

The management intends to install a magnetic clobber at the head of this conveyor to reject clean rock. At the present time this is handpicked to some extent.

Very little pumping is required at this mine, as the ground is free from fissures. There is just enough dampness to keep the mine from being dusty.

Power is produced entirely by steam. The boiler plant consists of two 150 horsepower horizontal return tubular boilers. The compressor is a Nordberg cross-compound, two-stage machine of a capacity of 1,400 cubic feet of free air per minute. It has an independent jet condenser. The hoist is a duplex 12 x 22 engine with a single drum 6 x 5 feet.

In the blacksmith shop is installed a Leyner Drill Sharpener, which sharpens the drill steel for both the Bessemer and Childs mines.

The ore deposit at Bessemer is very large, there being 200,000 tons of ore developed by the present work-

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