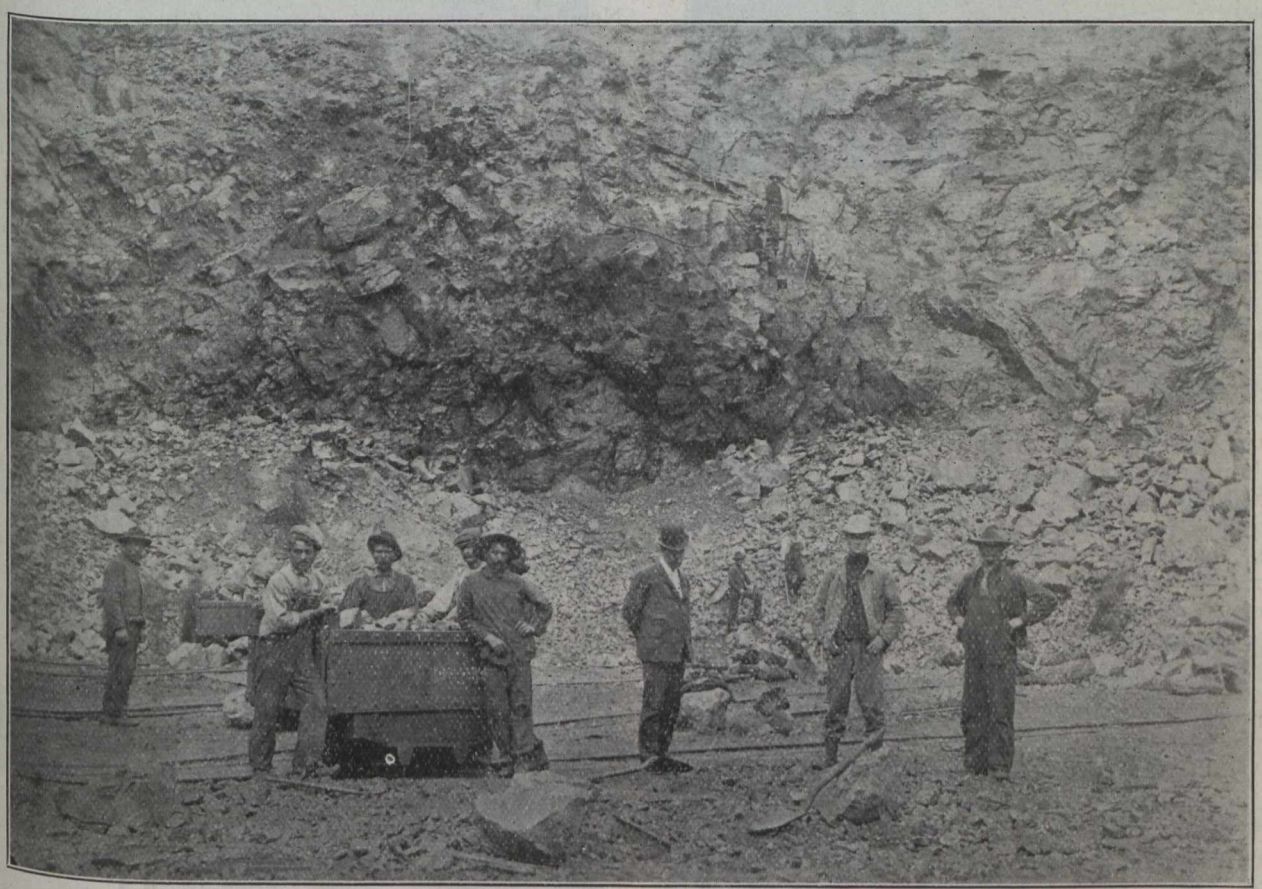
THE MINING AND SMELTING EQUIPMENT OF THE CANADIAN COPPER COMPANY.

By David H. Browne.

The last three years have been, for the Canadian Copper Company, a period of transition. In 1902, when this company was absorbed by the International Nickel Company, the smelting plant at Copper Cliff consisted of two furnace buildings, which had grown by accretions and additions, covering a number of small Hereshoff furnaces, all of which were fed by hand, and each was independent of the others. These furnaces produced a matte containing from 30 to 40 per cent. of copper-nickel, which was shipped a mile away to an auxiliary company, known as the Ontario Smelting Works. Here the matte was ground in a ball mill, roasted in long calcining furnaces, briquetted and smelted in brick cupolas to a matte containing from five to eight per cent. of iron.



Creighton Mine—Open Pit.

This procedure, as might be expected, was inefficient, and it was decided to consolidate the furnace work and the refining in one plant and to go back to the Bessemer process, which had been formerly used. Consequently, in 1903, a new furnace building was erected, and two modern furnaces 50 x 204 inches were installed. The matte from these furnaces was blown up to 80 per cent. copper-nickel in the same building in three converter stands. All this equipment was steam driven. In 1904 it was decided to make use of the water power on the Spanish River, owned by the Huronian Company, and in that year Messrs. Ross & Holgate, of Montreal, took charge of the construction of the dams and the installation of the machinery to generate the power required and to transmit it to the smelter at Copper Cliff.

The High Falls of the Spanish River is about four miles north of the town of Nairn, on the Soo branch of the Canadian Pacific Railway, and about 25 miles from Copper Cliff. In the spring of 1904 a railway was constructed from the Canadian Pacific Railway to the falls, and a camp was erected for the workmen. This preliminary work was done during the summer of 1904, and the construction of the dams and power house was begun in the fall of that year. The Spanish River at this point flows in two channels around a high, rocky island, about 2,000 feet long by 900 feet wide, falling about 65 feet in its passage. As this island rises some 75 feet above the upper level of the river, the engineers found it advisable to make use of this island as part of their system of dams, cutting out a large forebay at one side of the island and so gaining a total head of about 85 feet between the upper and lower water levels. This construction was also advisable in order to drown out a series of rapids which obstructed the river above the falls. The raising of the water twenty feet by this construction forms a storage basin about six miles long, and avoids the danger of "frazil" or mushy ice, which forms in the neighborhood of rapids.

Work on the dams was carried on throughout the winter of 1904-5, in weather sometimes as low as 30 below zero. Some very interesting problems were met by