

COPPER AND NICKEL OF SUDBURY, ONTARIO

The Sudbury district of Ontario is noted for its deposits of copper and nickel ore; and the magnetic iron ore of Moose Mountain, which has only recently been opened up and connected to port by rail, is destined to have an important influence on the iron industry of Central Canada. Something will be said later about this iron ore. Meanwhile the copper-nickel ore mines of Creanhill and the Copper Cliff smelter, belonging to the Canadian Copper Coy., claim our attention. The deposit of ore at Creanhill lies in a great mass or vein 100 feet wide lying at an angle of 72 degrees. It has been proved to be over 10000 feet in length and 300 feet in depth, and is excavated both by quarrying and underground working. The ore is raised from the quarry or mine to the crusher, where it is broken up by machinery and passed over packing belts and the refuse material thrown out. The ore, as it leaves the crusher, is composed of from 2 per cent. to 4 per cent. of copper and 2 per cent. to 4 per cent. of nickel, and there are large proportions of other substances, notably silica, iron, and sulphur, which have to be separated out. The first part of the process is roasting in great heaps, a little wood being required to set off the fire, after which the sulphur in the mass is sufficient to keep it burning for months. The bare aspect of the country surrounding Copper Cliff, where the roasting takes place, proves the deadly effect of sulphur fumes on vegetation. The bins of ore and coke at Copper Cliff smelter hold 15,000 tons. The coke for smelting is got from Pennsylvania. The ore is to all intents and purposes self fluxing, only a small proportion of silica or lime being required, depending on the quality of the ore treated. Ore and coke in the necessary proportions are put into four furnaces taking 100 tons a day each. The product of these furnaces (called matte) in a liquid state, which now contains 35 per cent. of copper and nickel combined, is run into pots of 10 tons capacity, and taken to another building where the pots are caught up by a travelling electric crane, which, like a thing of life, carries them to Bessemer converters—large pot-like furnaces swung like a hot-water kettle. Into these the contents are emptied as easily as a hot-water jug is emptied into a teapot. After treatment in the Bessemer furnace for an hour and a half, the liquid or matte, which now contains 50 per cent. of copper and 50 per cent. of nickel, is run into the pots again, taken by the crane to another place, and run into large thin moulds, and after cooling, is broken up and sent to Deloro and New Jersey for further treatment, a small percentage of gold and platinum being got from the residue after the copper and nickel have been separated out. The total output of Bessemer or refined matte is about 1800 tons per month. The description of other processes more or less subsidiary would be tedious, but enough has been stated to show the large scale on which this industry is carried on here and elsewhere in Canada. The machinery required in blowing the furnaces and carrying out all mechanical arrangements of these extensive works is electrically driven, a waterfall about thirty miles distant providing the necessary power.