The manager and chemist at the works said the average of the last month production was that about six tons of ore produced one ton of matte. The directors say that the records of the office show that, since the smelting works were started, about five tons of ore produced one of matte.

The ores from the three bins are smelted here, the company having no other furnaces, and they are combined so as to smelt readily. About one ton of coke is used for every ton of matte run off.

At the time of our visit only one furnace was running; the other was repairing. The average daily production of matte for the last month was 25 tons.

The full capacity of the two furnaces per diem would be about 60 tons of matte. The matte averages 17 per cent. nickel and 23 copper.

The daily output of nickel would be, at this rate, 10.2 tons.

There is at present about 6,500 tons of matte ready for delivery, and the ore on the roast beds will produce about 6,000 tons more, containing 1,105 and 1,020 tons of nickel respectively.

To run one furnace the following men are required:

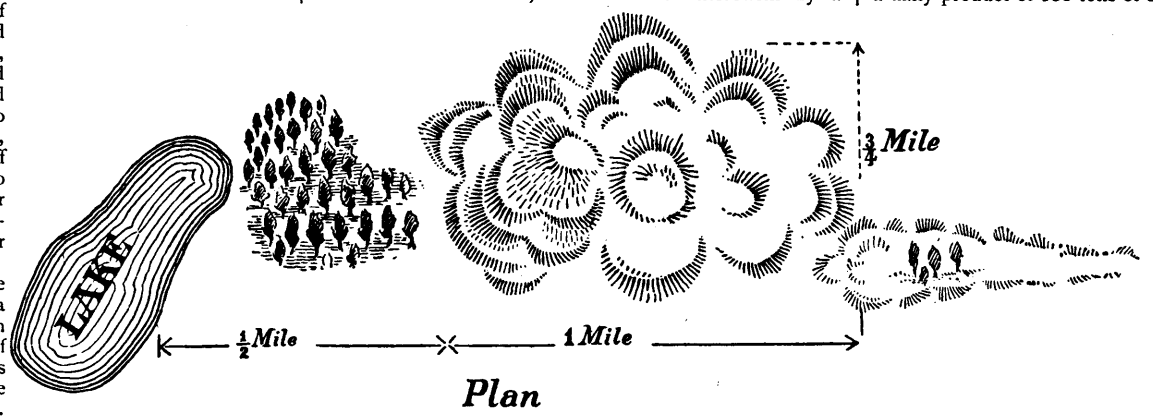
One weigher.
Two engineers.
Two furnacemen.
Two slag-wheelers.
Two charges.
One yardman.

Total, ten men, at an average pay of $1.80 per diem.

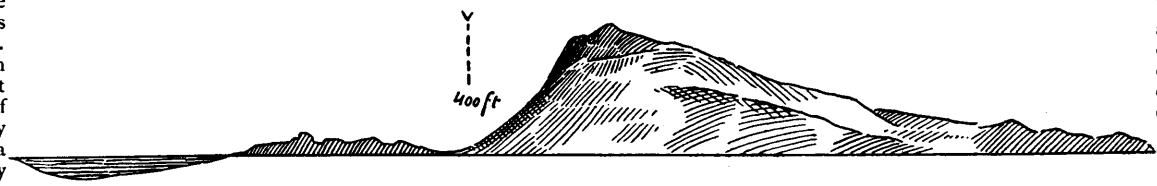
Attached to the furnaces is a well fitted laboratory with F. L. Sperry, chemist, in charge, and two assistants. Here each run of matte is analysed, and assays made of ores as needed.

The whole disposition of the plant is well planned for working with economy, and it will be observed that the ores are handled but four times: 1st, into the cars in the mines; 2nd, into the crusher; 3rd, off the roast beds; 4th, into the furnace. At other operations it falls by gravity into or from the bins or cars.

To increase the plant the company has purchased a "Gates Crusher" from the Gates Iron Works of Chicago, and it, with its accessories, is now on the grounds ready to be set up. It is the largest size they make, with three apertures, 18" × 42" each, and its capacity is listed in the catalogue of the makers 100 to 150 tons per hour. Gates, whom we saw in Chicago, stated that it would crush 200 tons of the friable ores of Sudbury per hour. This will give a per diem crushing capacity at the Canadian Copper Company's of 6,000 tons.




Plan




Elevation

THE VICINITY OF THE COPPER CLIFF MINE.

Starting from the hill into which the shaft of this mine is sunk, we rode over a range of hills to the point named on the map "McConnell mine," a distance along the range of about 2½ miles. On the hill just back of the shaft of the Copper Cliff mine borings have been made, all finding good ore. One was sunk to a depth of 291 feet at 15° from perpendicular, and the core extracted showed good ore for 226 feet along this length. Following along the ridge, which we estimated was from 100 to 250 feet above the level of the valley at Copper Cliff, and from 300 to 1,000 feet broad at base, the surface indications are continuous. At the Lady Macdonald mine and the McConnell mine the hills of ore were most conspicuous, and at places of each the surface had been blasted away to a depth of several feet, where rich ore, unaffected by exposure, was found. The surface indications are so evident that no expert knowledge is needed to pick out the ore-bearing rock, which is reddish brown, and quite friable, very different from the granite and diorite range which bound it. The assays of both the above mines show rich ore, better than at Copper Cliff, and in the case of the Lady Macdonald, blasting at the top of the hill and about 150 feet lower, at the small lake, finds good ore, leading the prospectors to assert that the hill was a rich mass throughout.

From this range to Stobie mine, the land is lower, and the country hardly passable. We were told that surface indications at various points connected these with the range of Stobie deposits three miles to the north east. We did not attempt to ride through this country.

Specimens from the various points blasted out were procured on the spots, and can be analysed if the department so directs.

*The Evans mine* is situated about 1½ miles south west of Copper Cliff station, near the Algoma branch of the C.P.R., and is connected therewith by a half mile of track. It was opened in the summer of 1886, but work was not pressed, and in 1887 only a depth of 20 feet was reached. Now the shaft runs down to the second level of 186 feet from the collar of the shaft. The first level has been blasted to the surface, and a large pit about 90 feet deep and 200 feet in diameter is exposed. The sides appear to be for the greater part, ore, and no limit has yet been reached.

The mining plant here is practically the same as at the Copper Cliff. The hoisting machinery, however, is somewhat heavier, and the steam power is provided by a battery of four boilers, capacity, 220 H.P., of which two are sufficient to run the plant. The crusher capacity is the same as at Copper Cliff, about 400 tons maximum per day. 32,817 tons of ore have been taken from this mine to roast previous to October 1st, 1890. At present about 180 tons are crushed daily.

The grade of the ore is not quite as high as at Copper Cliff, and averages about seven per cent. Some roasting has been done here, but in future all the ores will be taken to the main roast yards. A short line, about half a mile, connects with the main line, and facilities for handling ore are the same as at Copper Cliff.

THE VICINITY OF THE EVANS MINE.

A granite range between the hill now worked at Kelley Lake seems to bound the deposits in a south-easterly direction. The company owns the lots which are shaded by etching in addition to those colored red on the map. Surface indications are found to the north connecting with the Copper Cliff Range, and the hill halfway between has promising deposits; thence across the valley to Copper Cliff are no surface indications, nor have any borings been made, but it is thought that the bed of ore connecting the two may be found at a moderate depth.

*The Stobie mine* is situated about 3½ miles north of Sudbury, near a branch of the C.P.R., built to serve this and the Blezard mine, and connected therewith by a quarter of a mile of track. It was opened during the summer of 1887, by running two tunnels horizontally 100 feet into the hillside, about 150 feet apart, both of which developed excellent ore. Since then mining has been carried on by simply blasting off the face of the hill to about 50 feet depth, and 300 feet across the face. No limit to the deposit has yet been reached. 15,690 tons of ore have been carried from this mine to the roast yard up to October 1st, 1890, and the daily average at present is about 110 tons.

The mining plant is about the same as at the Evans mine; one Blake No. 5 crusher, drilling and hoisting machinery.

The blasted rock is broken up in the pit, loaded by hand into buckets, which are dumped into trucks, hoisted up an incline to the crusher, and thence passing to the bins.

The percentage of nickel and copper at this mine is smaller than at either of the others, hardly averaging above five per cent., but several pockets very rich in nickel have been worked.

The ore is remarkable for its fluxing qualities, and forms a valuable mixture to smelt the less fusible ore of the other mines, and entirely obviates the necessity of the addition of any foreign fluxing substances.

The crushed ore is carried on cars to the roast yard as Copper Cliff.

THE VICINITY OF THE STOBIE MINE.

Stobie is, in the opinion of the Canadian Copper Company, the north-west limit of the valuable belt of ore deposits. Passing over the hill now worked, which is about 90 feet high, and about 600 feet at the base, and seems almost entirely a mass of ore, and over a valley, a ridge is found extending to the south-west in the direction of the Lady Macdonald mine. The range is almost bare of timber, and the deposits could be easily seen. We were told the length of the ridge was two miles, but we did not take time to go over the whole of it. The height is estimated from 50 to 150 feet above the level of the railroad at Stobie, and from 300 to 1,000 feet across the base of the mounds forming the ridge.

THE DEPOSITS IN CREIGHTON TOWNSHIP.

These we reached from the railway above Naughton station by a ride of five miles through an almost inaccessible country. The size of the deposit is far more striking than any we visited. It is a mound of the general dimensions shown in this sketch, the dimensions of which are estimated. The height of the mound is taken from the level of a body of water as indicated on the map. The hill, over the greater part of which we rode, seems to be entirely ore-bearing rock. No assays have been made of the ore of this deposit, and we can only say that the indications of an immense deposit were more striking here than at any other point. This property was acquired by the company in 1886 and 1887.

THE DOMINION MINERAL COMPANY.

*The Blezard mine.*—This, the principal mine of the company, is situated on a branch built by the C.P.R., and owned by it, in the quarter section marked "Du Charme" on the map, and colored yellow. It is about 4½ miles north of Sudbury, and it is the northern extreme of the deposits now worked or known to us to exist. Three shafts are sunk into the hill vertically, about a hundred feet apart. The main one is sunk about 90 feet, and chambers worked from this level. They extend for about 200 feet in each direction, and the manager said that since July 15th, 1889, 45,000 tons of the ore had been taken out. The rumours in the neighborhood are that the mine had been worked out, but they were from competitive sources. The chambers seem well cleaned from ore, and though lighted by electricity, we could see but few evidences of active mining. The manager claimed a daily product of 180 tons of ore; that it took from nine to twelve to make one ton of matte, and that this averaged from 20 to 30 per cent. nickel, and from 12 to 15 per cent. copper.

The hill which was being worked was about 100 feet high, and about 500 feet in diameter. We saw no evidences of other deposits near, and the manager claimed none. The plant is excellent, and copied after that of the Copper Cliff mine in the selection of machinery. One Blake No. 5 crusher, and rock drilling and pumping machinery, of the same pattern as before mentioned—the whole rather better installed than at the Copper Cliff mine. The roast beds, however, were placed all about the grounds, and could not be so economically handled. We counted 26 heaps in all, and estimated there was about 13,000 tons of ore upon them.

In the smelting works is one furnace similar to those at the Canadian Copper Company's works, with similar accessories. They had not more than ten tons of matte on hand, in two heaps, which they claimed to assay 30 and 33 per cent. of nickel. We procured samples from each pile, which can be assayed if the department directs. The manager claimed that the company owns 5,000 acres of land, upon which were nine places they contemplated working, six for copper and three for nickel. He spoke of the Worthington mine as being the richest, and gave us a sample of ore which he claimed would assay 40 per cent. nickel. He said that one shaft had been sunk 72 feet (Crean mine), one 25 feet (Worthington mine), and at four other places cross-cuts had been blasted. Although the deposits at Crean mine as shown on the map had been represented to us as worthless, owing to his representations we visited them.

*The Worthington mine* is situated on the Algoma branch of the C.P.R., about seven miles west of White Fish Station. We found a mound about 30 feet high and 50 in diameter, with a small shaft sunk in the middle about 25 feet deep. From it had been taken a few tons of ore, which appeared quite rich in nickel. The man in charge, however, said it appeared to be only a pocket, and that the end had been probably reached. He mentioned one very fine specimen of ore, half of which he had sent to the principal office, and showed us the other half of the piece we had in our possession. As the property is alongside a railroad now seven years in active operation, it seems reasonable to suppose that it does not pay to work.

*The Crean mine* is within a few hundred feet of the Worthington. The shaft was sunk by previous owners to a depth of about 70 feet, and was abandoned as unprofitable. No work has been done on it since.

H. H. VIVIAN & COMPANY.

*The Murray mine* is situated on the main line of the C.P.R., 2½ miles north-west of Sudbury. The railway cuts through the deposits. On the left side is a hill about 75 feet above the track, and extending about 300 feet perpendicular to and 150 along the same. This embraces