

# TREATMENT OF GOLD ORE AT DOME MINE, SOUTH PORCUPINE, ONTARIO\*

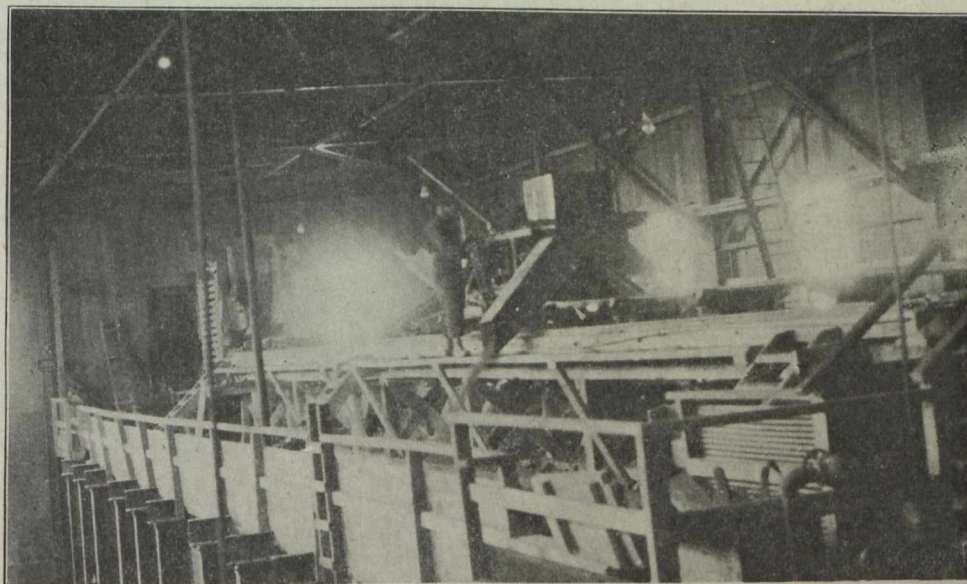
By D. L. H. Forbes.

Late in the fall of 1910 it was decided to erect a mill at the Dome mine. The Porcupine branch of the Timiskaming & Northern Ontario Railway had not then been built, so that supplies and machinery had to be transported in winter over rough roads from Kelso. It was a matter of the utmost importance to the Dome Mines Company that the mill should be designed without delay, to insure that all material and machinery for construction could be ordered in time to reach Kelso before the breaking up of the winter roads. Two separate samples of Dome ore were sent to San Francisco for testing; but, as these samples were taken from the mine in its early stages of development and differed considerably in value, the design of the mill had to be of the most flexible nature, to provide for a high extraction even if future development of the mine should disclose ore of different character to that tested.

It was originally planned that the building should be a wooden structure, but after the disastrous fire in

slate have been heavily mineralized with pyrite so that the ore is heavier than most quartz gold ores, its specific gravity averaging about 2.8. The ore is reduced under stamps and in tube mills to a granular slime with the production of relatively only a small proportion of colloids, giving a material that is almost ideal for settling and pressure filtration in the cyaniding part of the treatment. While some of the gold is coarse, no large nuggets have been found in the mortars of the stamp batteries, and, in general, a considerable proportion of the gold occurs in such fine particles that tube mill grinding is necessary for its liberation preparatory to either plate amalgamation or cyanide treatment.

In order to be prepared for an acid ore which might come from the lower workings of the mine, as well as to insure efficient amalgamation, with the consequent quick and complete cyanidation of the amalgamation tailings, it was decided to crush and amalgamate in water. This provides against an excessive consump-



Filling Stamp-Mill Bins with the Crushed Ore, Dome Mill

the summer of 1911, when the work of construction was already well under way, a change was made to steel construction, thus ensuring a fire-proof building.

In spite of delay caused by the fire, the mill was completed in record time and placed in operation on March 22, 1912. Acting for the Merrill Metallurgical Company, Mr. Henry Hanson supervised the installation. To his energy and ability in overcoming the many obstacles incidental to construction work in a new mining camp, the success achieved was, in a large measure, due.

The Dome ore consists of quartz and schisted slate that has been sheared and metamorphosed to such an extent as to be scarcely distinguishable, except in toughness, from the darker colored schists of the Pearl Lake section of the district. Both the quartz and the

tion of cyanide in the cyanide treatment, and also safeguards against losses due to the presence of coarse gold.

The mill as first designed was considered a testing unit of a daily capacity of 350 tons to prove the economic value of the ore in the mine, and to indicate the best metallurgical treatment for future adoption, when additions to the milling plant would be required. Regarded as a large experimental mill for Porcupine ores, the results of the operations to date are interesting. It is the purpose of this paper to present a general outline of the plant, and to refer to the results of its operations from the technical rather than from the economic aspect, as many factors, such as power, water supply, and ore tonnage, which affect operating costs, have been of a temporary nature; hence costs based on such conditions might be misleading.

\*A paper read at Annual Meeting of C. M. I., 1913.