

pected that in a few months a large increase in production will be possible.

In the mill running at present there have been no radical changes made. A coarser screen, about 4 mesh, is now used to advantage since the installation of an additional tube mill. Gradually the output has been increased until now it is over 450 tons per day.

The Dome mill was constructed under circumstances far from favorable. The Merrill Metallurgical Company was called upon to design hurriedly a plant to treat an ore of which little was known. Speed was necessary in order to take advantage of the winter roads for transportation of heavy machinery from Kelso, the nearest point on the railway. The Porcupine branch of the T. & N. O. Ry. had not then been constructed.

Fire destroyed the plant under construction and again a hurry order was sent in for a complete plant.

The mill was not one specially designed for Porcupine ores; but rather an experimental one to be used in testing the ore bodies and in determining the best method of treating the ores. Naturally, therefore, the results at first obtained were not as satisfactory as those obtained later. A great deal of information has been gathered by the metallurgists in charge of the investigations, and some of this information is given in Mr. Forbes' paper.

During the past year the mill has been giving better and better results and is now treating about 450 tons per day and making a very high recovery of the gold contained in the ore.

The Dome Mines Company in enlarging its plant is undertaking still further important investigations. While the present plant is now giving what might be considered fairly satisfactory results, it is thought that still better results can be obtained by separating the sands for treatment without regrinding. Every effort is being made to determine the best method of treating the ore. The men who have done the work, the staff of the Dome Mining Company and the staff of the Merrill Metallurgical Company, deserve much credit for their contributions to our knowledge of Ontario gold deposits and methods of treating the ores.

BRITISH COLUMBIA IN 1913.

The British Columbia Bureau of Mines has published a preliminary review and estimate of the mineral production of the province for the past year, together with some notes on the progress made in the mining and metallurgical industries.

The prompt appearance of the bulletin is creditable to the Bureau and to the Provincial Mineralogist, Mr. Wm. Fleet Robertson.

The estimated production is as follows: Gold, 266,547 oz.; silver, 3,569,642 oz.; lead, 54,205,594 lb.; copper, 46,042,379 lb.; zinc, 7,100,000 lb.; coal, 2,136,694 tons (2,240 lb.); coke, 285,123 tons.

In general, the report agrees with the earlier summary of our correspondent, Mr. E. Jacobs, which was

published in our January 15 issue. It contains also considerable additional information, some of which will be found in this issue of the Journal.

The total value of the 1913 production was \$30,158,793, as against \$32,440,800 in 1912. Copper and coal outputs were considerably smaller than in the previous year. Gold, silver, lead and zinc show an increase.

THE RECOVERY OF SILVER FROM COBALT ORES.

Remarkable progress has been made in the treatment of the silver ores of the Cobalt district. Previous to the discovery of the phenomenal silver deposits in Northern Ontario no ores of this type were being mined on this continent, and little was known of the methods of treating the similar ores mined in Germany.

The ores consist chiefly of native silver, associated with arsenides of cobalt and nickel. The gangue mineral is chiefly calcite. Silver sulphides and antimonides occur also, although in much smaller quantity than the native silver.

Fortunately much of the ore is so rich that large profits were made by simply roasting the ores to drive off the arsenic, and then smelting the product, and refining the base bullion. When the deposits were first opened cobalt and arsenic commanded good prices and the marketing of these constituents helped to defray the cost of recovering the silver. The price soon fell, however, when large quantities were produced.

High grade ore was for some time the only marketable product of the mines, if we except a comparatively small amount of low grade used by some of the smelters.

Soon, however, the lower grade material was investigated carefully and in a few years several mills were erected to crush and concentrate the ore. Straight concentration methods proved very satisfactory and a high recovery was, and is, obtained by the millmen at Cobalt.

Then cyanidation and amalgamation were successfully introduced, and some very remarkable and entirely new methods of treatment were worked out. To the staff of the Nipissing Mining Company and to its consulting metallurgists belongs the credit for many of the more recent marked advances in methods of treating both high and low grade ores.

In this issue we publish a few pages from a very interesting description of the mill and metallurgical methods of the Nipissing mine, by James Johnston. Mr. Johnston's paper was prepared for the annual meeting of the American Institute of Mining Engineers and has been published in the January bulletin. Mr. Johnston is to present a paper on the same subject at the annual meeting of the Canadian Mining Institute in March. The author describes carefully the construction and equipment of the mill and the methods of treating the ores. The costs for several operations and the results obtained are clearly stated. The paper should prove to be one of the most interesting ones presented at the annual meeting.