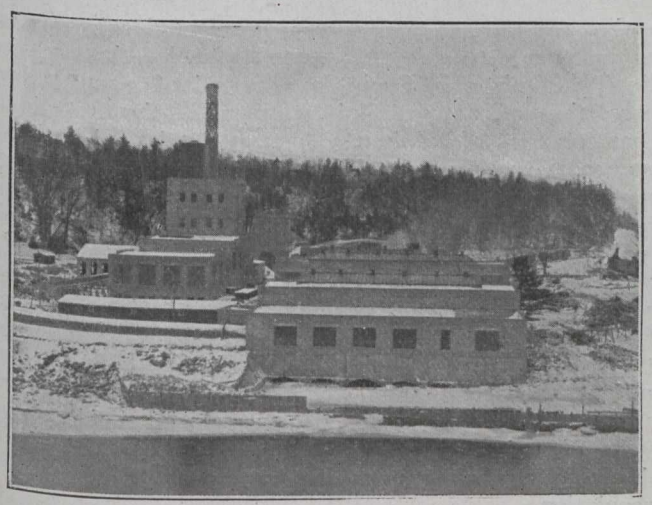
on the excavation and the construction of the timber spillway, a fairly good idea of which is conveyed by the accompanying photograph.

Excavation for this was done by means of travelling derricks and the material being disposed of below the dam site. The concrete for the cut-off wall and the timber for the spillway were placed by means of the cableway. A 1-cu. yd. Smith mixer was used, to which materials were fed directly from storage bins, these bins being located on a spur line from the Canadian Northern Quebec Railway.

Simultaneous with the construction of the dam and headworks, work was being pushed on the laying of the penstock and the excavation necessary for the section to



View of Completed Mill Buildings.

be laid underground, also on the construction of the mill buildings and power plant. The whole work was completed and water was turned into the penstocks on the 15th of January, 1914, since which time the mill has been in practically continuous operation.

We are indebted to Mr. G. M. Williams, resident engineer for the contractors during the construction of the plant, for the foregoing information.

PUMPING WATER WITH COMPRESSED AIR.

An instance is on record where a 12 x 14¼ x 14-in. compressor furnished air for a mine pump 14 x 8 x 3 in. No other uses were made of the air and the air line was tight. Indicator cards were taken from both the air and steam cylinders of the compressor. The valve adjustments were good and the pistons tight. The total pumping head of the pump, including suction and pipe friction, was 103.1 ft. The water pumped was measured by a 4-in. orifice in a tank at the surface. The over-all efficiency from steam indicated horsepower to useful work done on the water was only 6.81%.

Pre-cast reinforced concrete pipe, 9 ft. internal diameter, 9 in. thick, 6 ft. long, are being used to line a 12-ft. brick tunnel of the Baltimore water supply system, and convert it into a pressure conduit for water at a pressure of 35 lbs. per sq. in.

In our issue of February 4th it was noted that a Montreal firm had in hand the construction of two large elevators at Manchester, Eng., for a firm of brewers. In addition this firm, the John S. Metcalf Company, is just finishing the Manchester Ship Canal Company's elevator No. 2, a concrete structure with a capacity of 1,500,000 bushels. Elevator No. 1, of like capacity, was built by the same firm several years ago.

CANADA'S MINERAL RESOURCES, AND THE PROBLEM OF THEIR CONSERVATION.

By Dr. Frank D. Adams,
Dean of the Faculty of Applied Science, McGill University, Montreal.

[NOTE.—A year ago the Commission of Conservation, Canada, appointed Dr. Adams Chairman of its Committee on Minerals, which for two years previous had been without an acting chairman. The following is from a report presented by Dr. Adams at the recent annual meeting of the Commission in Ottawa.—EDITOR.]

OUR mines rank third among our natural resources in the value of their output and second in the value of their exports. All these natural resources except the mines can, by intelligent care and conservation, be made to produce a much greater annual yield than at present, while at the same time showing a steady increase in value. These resources—agriculture, forests, fisheries and the fur trade—if properly managed, may be compared to money well invested. They can be made to yield an annual return in interest while the capital remains unimpaired, or even increases in value.

The mineral resources of a country, on the other hand, are in quite a different category—they are like a sum of money or treasure hidden in the ground. It does not renew itself, and every amount abstracted leaves just so much less for future use. When in a country of great extent like Canada the more accessible deposits become worked out, others are discovered in more remote portions of the national domain, and the output is thus maintained, or even increased for a series of years. The sum total of the mineral resources are, however, continually decreasing in direct proportion to the vigor with which they are exploited.

The earliest explorers to set foot in the Dominion expected to find in it a territory of abounding mineral wealth, and they were encouraged in this belief by tales which they heard from the Indians. The first mineral deposits which were made the basis of regular mining operations were the coal beds of Cape Breton, where serious work began in 1720, and the bog iron ore deposits of the St. Maurice district in the Province of Quebec, which were opened up by order of Louis XV. in 1733. As the country was opened up to settlement other mineral deposits were found and other mines developed. The value of the annual production in Canada, however, increased but very slowly in the earlier years. By the year 1886, when the Geological Survey of Canada collected and published the first statistics for which approximate accuracy may be claimed, the output had reached a value of somewhat over $10,000,000, of which about one-third was derived from the coal mines of Nova Scotia. Since that time the rise in production has been rapid, reaching a value of $144,000,000 in 1913. This rapid increase during the past 27 years is shown in the accompanying table.

In comparing the individual items making up the mineral output for the year 1913 with those of the year 1886, it is found that there has been an increase in the output of nearly every mineral substance mined in the Dominion. While the increase has been relatively greater in the group of the metals, it has also been enormous in the case of the non-metallic minerals, and especially structural minerals and clay products. The only mineral substances which were mined in larger amount in 1886 than in 1913 are antimony ore, chromite, manganese ore, baryta, molybdenite, petroleum and phos-