500 grains of ore assaying 1.70 per cent. molybdenum were agitated four minutes with 5 c.c. acid, 2 c.c. Beaumont oil, then four minutes more with 5 c.c. acid and 1 c.c. oil—2.5 c.c. acid were used for gas, and test was under vacuum 2.25 minutes. The following products were obtained:—

20 grains concentrates ..... 42.90 per cent. molybdenum.
472 " tailings..... trace.

This gives the ratio of concentration of 25 tons into one and a recovery of 100 per cent. The recovery figures are slightly in excess of 100 per cent. owing probably to discrepancy of a few hundredths in crude assay. The tails showed acid reaction and were quite clean.

The amounts of acid and oil used could probably be lowered very materially, but owing to the lack of time and urgent requests to rush the work these investigations were not undertaken.

Fig. 2 will serve to indicate the principles involved and the type of apparatus used in this process of concentration.

At the Great Knaben mine in southwestern Norway, which has produced from 25 to 30 tons of molybdenite annually since 1902, water concentration with jigs and tables has been abandoned, and more satisfactory results are said to have been obtained by the use of the Elmore oil concentration. The ore is first cobbed, and the poorer ore sent to be concentrated.

In 1899, Professor J. B. Porter, of McGill University, made some experiments on the concentration of molybdenite for the Geological Survey. From the two samples examined he concluded that the most satisfactory method was cobbing and hand-picking.

The following extract from the Report of the Geological Survey of Canada gives the main results of Professor Porter's investigations:—

The first, or Egan Township, sample, weighing 789 pounds, and containing in all 15.92 per cent. of molybdenite, was cobbed and hand-picked in the Survey, yielding 39 pounds of clean mineral in crystalline flakes. The remaining 250 pounds of the cobbed ore was then sent to Professor Porter, who ascertained that it still contained 2.8 per cent. of molybdenite. By a dry process of rolling and screening, followed by jigging, nearly all the molybdenite was extracted from this ore, in a series of concentrates ranging from 70 per cent. to 15 per cent. in molybdenite. It is not necessary to refer to the details of treatment here, but the results appear to show that in the case of molybdenite ore of this class, in which the crystalline masses are of considerable size, it would not be economically possible to employ any crushing and concentrating process. The problem resolves itself into one of cobbing and hand-picking at remunerative rates. The associated minerals in this case were: pyroxene, iron pyrites, and mica.

The second, or Ross Township sample, weighed 250 pounds. The gangue was chiefly quartz, and, although the molybdenite made a considerable showing, it was found by Professor Porter to amount to only about one per cent. This specimen was not cobbed or hand-picked. By concentration it was determined that about 52 per cent. of the molybdenite could be saved in the form of a concentrate containing 33.50 per cent. of the mineral. The grade of this concentrate appears, however, to be too low for present commercial requirements.

The ores of molybdenum, so far as is known at present, occur in Canada in Yarmouth county, Shelbourne county, Lunenburg county, Halifax county, Cape Breton county, and Victoria county, Nova Scotia. In the vicinity of Burnt Hill Brook and the Main Southwest Miramichi, New Brunswick. At St. Jerome and Mamkuagan Bay, Quebec. In Haliburton, Victoria, Hastings, Addington, Carleton, Frontenac, Leeds and Renfrew counties, Ontario; also in the Nipissing and Rainy River district and in several localities in British Columbia.

The present annual world production of molybdenum ores is quite insignificant—only a few hundred tons. Norway, Queensland, New South Wales, Japan, and the United States, are the chief producing countries. In all of these the output is much subject to rapid variation.

In Canada there has been no regular production of molybdenum ores up to the present time.

The production of 150 pounds of molybdenum is listed in the mineral statistics for 1886. The place where the ore was mined is not indicated. This appears to be the first appearance of molybdenum in the mineral statistics of Canada.

In 1902 about 4 tons of molybdenite bearing ore valued at $400 were mined in the township of Laxton, Victoria county, Ontario.

In 1903, 85 tons of crude ore containing about 4 per cent. molybdenum were mined in the east half of lot 5, concession XIV., in the township of Sheffield, county of Addington, Ontario. About 500 tons of rock had been blasted out in order to obtain this ore; so that the ground as broken contained less than one per cent. molybdenum.

In 1894, in the township of Aldfield, in the county of Pontiac, the Foote Mineral Company of Philadelphia carried on operations, not with a view to producing molybdenite in a commercial way, but to securing specimens for museums and for teaching purposes. The amount of molybdenite obtained was very small.

During the summer of 1909, Lieut.-Col. John Carson and associates, of Montreal, carried on explorations near Romaine, on the north shore of the Gulf of St. Lawrence. They made at least one shipment of about 2 tons of ore. This was shipped as samples, and for experiments in concentration.

With regard to foreign production, it is equally difficult to obtain satisfactory statistics, as the amount involved is small and the production spasmodic. In recent years Queensland and New South Wales have become relatively large producers.

FIREPROOFING TIMBER TRESTLES.*

Timber railway bridges which need fireproofing most are those on high speed lines and those which are visible for only a short distance to the engineman. The larger the bridge the greater the need of fireproofing.

Most fires on timber bridges are started from the top by sparks and coals from locomotives. Not many bridges are ignited by fire from outside sources, and it is therefore hardly necessary to fireproof for these causes, beyond cleaning away vegetation from the vicinity of the bridge. Fire dropped from locomotives has burned many bridges and almost all such fires can be avoided by the use of a good type of fireproofing. The types of fireproofing used mostly at the present time are as follows:—

A. Ballasted floor pile bridges; about the same amount of ballast being placed under the tie, on the bridge, as on an embankment.
B. Metal covering on the ties.
C. Ballast covering from 2 to 4 ins. thick on the ties; a wood filler being placed between the ties to support the ballast.
D. Metal covering on the caps and stringers.
E. Metal covering on the ties with 2 ins. of ballast thereon.

*From the committee report read before the American Railway Bridge and Building Association ot St. Louis, October, 1911.