

standard of the past three years, which is saying a good deal. An addition to the cutting shop at the mine was recently made.

The Phosphate King mine, Templeton, owned and operated by Mr. T. J. Watters, is producing mica of excellent quality, and the deposits are reported to be steadily enlarging as the work progresses. Steam drills and hoist are in operation here.

The old Blackburn phosphate mine, Templeton, under direction of Mr. H. C. Baker, B.A. Sc., a recent graduate of McGill, is being steadily worked for mica, the bulk of the product being obtained from a pit down 180 ft.

McLaurin mine, East Templeton. A small gang is employed here and a good quality of mica is obtained. The pit shows crystals cropping out bottom and sides.

The Palardeau mine, East Templeton, together with all the lands and property of the Canada Industrial Co., has been acquired by American people. Two pits operated by steam drills are worked. At last report it was the intention to move the working plant to another portion of the property.

The Canadian Mica Co. has acquired the following properties:—

Chubbick lot, Wilson's Corners, Que.

Mulvahill lot, Cascades, Que.

Perth lot, Burgess, Ont.

Work will be commenced on these properties at once. At the Dacey property, Cantley, a force of 18 men are employed night and day shifts, producing mica for shipment to England. The output is reported to be satisfactory as to size and quality. The Brown lot at Cantley, recently acquired by the company, is also being opened up, a small force being employed. At Murray Bay, the company's properties will be worked all winter.

A correspondent writes: "The demand for mica for electrical purposes is steadily growing, the bulk of the Canadian product going to the United States for consumption by street railways and manufacturers of electrical machinery. A notable feature, too, is the attention our Canadian amber is receiving in England and Europe, there being a very marked increase in the shipments to those countries.

"Prices for Canadian have not been very satisfactory to the producer, the average sales realizing but a comparatively small margin of profit when the uncertainty of many of the deposits and the necessarily high cost of mining and dressing is considered. The mica pedlar, too, is a growing nuisance and should be suppressed. He is generally some small farmer, owning a stump and rock farm in our mining country, who finds a small show of mica, and retails the crystals much in the same way as he does his cabbages and turnips. His prices vary. In the morning his mica is worth about \$1 a pound; no takers; about noon he is hungry and his price drops to 50 cents per pound; still no takers; about 4 o'clock it is time to be on the homeward tramp and the mica drops to 10 or 15 cents per pound and is generally purchased by one of the consumers who holds his purchase over the regular miner and dealer and tells him how cheaply mica can be bought."

The last pack-train to Kamloops brought 1,500 pounds of mica from the Tete Jaune Cache mines, Canoe River district, B.C., operated by Mr. J. F. Smith, of Kamloops. This shipment is reported to be excellent quality, large enough to furnish clear sheets squared to 12 x 18 inches, and should bring good prices.

One of the features of the exhibition in connection with the recent Street Railway convention at Montreal was the display of mica by the American Insulating Company. There were also one or two exhibits of the product of our mines, but when the consumption of the mineral by the electric street railways, particularly in the United States, is considered, it seems that our mica miners should have made a much better representation. The Mining Bureau at Quebec and the Geological Survey also should have been represented. A golden opportunity was missed of extending the mica trade of the country by this oversight.

## ASBESTOS NOTES.

The Journal of the Imperial Institute in a recent issue gives some information to its readers respecting the Canadian asbestos industry from which one would gather that the output of the mines had declined. This impression is entirely erroneous there being during the past two years a very marked activity in the production of this mineral. The production in 1880 amounted to but 380 tons, valued at \$24,700, while in 1890 it had reached 9,800 tons, of a value of \$1,260,240. Since then the shipments from Thetford, Black Lake and other stations on the line of the Quebec Central Ry. as per official returns furnished to the REVIEW were:

	lbs.
1891	14,672,180
1892	8,674,560
1893	10,677,900
1894	14,683,055

These figures do not include important shipments via the Grand Trunk Railway from the Jeffrey mine at Danville, or the exports from Ottawa County, Quebec, and Hastings, Ont. We are glad to see that a number of our companies have sent exhibits to the Institute, for the permanent collection, but the list is far from complete. Canadian operators who have an eye to extending their trade relations with the mother country, will find a good representation of their various grades at the Institute a remunerative advertisement.

Mr. F. Cukel, M.E., Ottawa, has a force at work culling the dumps of property formerly owned by the Templeton Asbestos Co., and is meeting with fair success.

The International Asbestos Co. of Newark, N.J., has been working steadily all summer on their property in the Township of Low, Ottawa County, and the shipments are reported to average about 75 tons per month. The mineral produced, though short in fibre, is of very fair quality.

Mr. A. W. Stevenson and Mr. R. T. Hopper were in Templeton the other day making arrangements for the opening up of the promising show of asbestos on the Stevenson property.

From the Eastern Townships mines there is nothing very worthy of note. The usual quantity of asbestos has been moving, and the principal mines have worked steadily throughout the season, that is to say, Bell's, Johnson's, King Bros., Anglo-Canadian and United. The American Company at Black Lake has simply had a few men working on contract in a quiet way, while the Beaver Company has remained closed down entirely, many being of the opinion, for diplomatic reasons. The Ross-Ward and Glasgow and Montreal mines have also been closed. There appears to be an increase in the consumption of asbestos and the trade is steadily reviving although prices are still far from being as good as the producers would like.

The Anglo-Canadian Asbestos Company will continue work throughout the winter. On this property a very promising deposit of chromite has been uncovered, extending over an area of two or three acres, and a considerable quantity of the mineral is being mined.

Messrs. W. T. Costigan and others have been doing considerable grinding of short-fibred stuff at their Montreal works. Their improved "Cyclone" mills, quite a number of which have been sold to the mining companies, are proving an excellent separator, and save large quantities of material that in former years went to the dumps.

The Danville Slate and Asbestos Co., as mentioned elsewhere, are pushing the development of their Jeffrey mine with great activity, a force of some 400 men finding employment in their various enterprises. The property has been thoroughly equipped with a first-class plant and the output of mineral is considerably larger than in former years.

## GOLD MINING IN QUEBEC.

Mr. Chalmers of the Geological Survey, who has spent the summer in an investigation of the surface geology of the Quebec gold fields, is reported to be greatly impressed with the possibilities of successful mining in the old river beds of the Chaudiere and other localities. He also reports the discovery of quartz veins containing gold at Dalswell as authentic.

Mr. John Hardman, S. B., of Halifax, for many years associated with the Oldham, West Waverly, and other successful gold mines in Nova Scotia, has commenced work on his property at Slate Creek near St. George's. Capt. George MacDuff an Australian miner with many years experience in quartz and alluvial mining in the antipodes, is in charge of the work of exploiting the property.

## Milling Arizona Gold-Ores with a "Colorado" Stamp-Mill.

By WILLARD S. MORSE, Prescott, Arizona.\*

Referring to Mr. Rickard's paper on "The Limitations of the Gold Stamp-Mill" (*Trans.*, xxiii., 137), and the discussions that have followed, and without entering into any controversy as to the relative merits of the "California" and "Colorado" types of stamp-mills, I wish to give the results obtained on ores from Lynx Creek district, near Prescott, Arizona, with a stamp-mill of the Colorado, or, more precisely, the Gilpin county, Colo., type.

The mines of the district have been worked for nearly thirty years, yet in that time very little, if any, work has been done on the veins below the line where the oxidized or "tree" ores end, and the sulphide or "base" ores come in, except in a few cases where the sulphide ore was high enough in value to ship to smelters. The surface or oxidized ores have been worked in arrastras and stamp-mills, but few attempts have been made to mill the so-called "base" ores. About thirteen years ago a smelter was built in the district by Mr. John Howell to smelt these ores, but was abandoned on account of the high transportation charges on fuel and bullion.

The saving shown in this paper is not claimed to be high, and the history of the district has been given to show that heretofore, at least, the ores have not been considered suitable for stamp-milling.

The ore from which the results are given was extracted from below water-line (100 to 250 feet from the surface), and is a quartz carrying zinc-blende, iron pyrites, galena, and a small percentage of copper and arsenical pyrites.

### MILL.

The mill is a typical "Gilpin County" stamp-mill of 10 stamps. No rock-breaker or self-feeders are used, the ore being fed by hand. I do not wish to be understood as advocating this method of feeding. It was adopted as a matter of economy in the first cost of plant, as the attempt to mill these ores was regarded as an experiment, in view of the history of the district.

The weight of stamps when new was as follows:—

	Pounds.
Stem.....	265
Tappet.....	35
Head.....	225
Shoe.....	85
Total .....	610

The stamps dropped 15 inches, 36 times per minute, in the following order: 1-5-2-4-3.

Fig. 1 shows a section of the mortar.

\* *Trans. Am. Inst. of Mining Engineers.*