MAGNESITE IN PENNSYLVANIA

By

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Magnesite is a white mineral occurring usually in veins and consisting principally of magnesium carbonate. Its principal use is for lining open hearth steel furnaces and in normal times the steel plants in Pennsylvania consume many thousands of tons annually. The second largest use is in oxycarbonate cement which is employed widely for sanitary flooring. Magnesite is used also as wall plaster, for making artificial marble, tile, sinks, fireproof and damp-proof paints, heat insulation, and the light metal, magnesium. To prepare it for any of these uses magnesite is first burned, which drives off the carbon dioxide gas that constitutes one-half of its weight.

Previous to 1914 practically all of the magnesite used in the United States was imported from Greece and Austria but during the war, deposits in California and Washington supplied the country's need, which is very largely as a refractory lining for furnaces at steel plants. The principal market for magnesite therefore is between Chicago and the Atlantic Coast. As the only developed domestic source is on the Pacific Coast, the cost is high.

The demand for magnesite on the Atlantic seaboard and the high cost of the material resulted in the summer of 1921 in an investigation of the possibility of working the Pennsylvania deposits profitably. The magnesite deposits in Pennsylvania are in Chester and Lancaster counties near the oxbow of Octoraro Creek on the Pennsylvania-Maryland State line. According to F. A. Gent in his preliminary report on the Mineralogy of Pennsylvania published in 1875, the magnesite deposits were first opened in 1835 and for the next 5 years about 150 tons per annum were shipped to Messrs. Handy and John Ellicott of Baltimore; between 1840 and 1850, on an average also about 150 tons a year, to Samuel and Philip Ellicott. The mines were idle for 4 years, then reopened in 1854 and worked until 1871.
by Powers and Weightman of Philadelphia, producing annually an average of 500 tons. According to Rogers in his report on the Geology of Pennsylvania published in 1858, "The excavation of this material is no longer pursued; it was dug only in superficial pits". The magnesite was used as a source of Epsom salts (magnesium sulphate) and other preparations of magnesia. Mining operations were discontinued when large masses of kieserite (magnesium sulphate) were discovered in rock salt mines at Stassfurt, Prussia, and magnesia products were imported at low cost.

It was these old pits abandoned 50 years ago that were the scene of operations last summer. The development work was done in the old workings in Chester County just east of Goat Hill which is five miles southwest of Oxford. The locality is within a few rods north of the State boundary in a hilly country unfit for cultivation and covered with scrub timber. The time elapsed since mining ceased is indicated by cedar trees 15 inches in diameter growing in the old pits. The reexcavated workings show that the magnesite occurs as a fine net or stockwork of small veins in the State line serpentinite. Most of the veins are less than one inch wide. Two principal systems of veins cross at right angles; the veins of the north-south system stand nearly vertical but those of the east-west system dip south at a high angle. In the reopened quarry two veins were disclosed, one about fourteen inches wide and the other, which extends a few rods farther east into an open cut, about twelve inches wide. There seem to be few veins more than one inch wide except the two mentioned. A thorough exploration, including the reopening and drainage of a shaft with underground drifts, failed to disclose any larger veins, but it is reported that a body of magnesite about thirty inches wide was found in the shaft at the crossing of two main veins.

The development work completed last fall shows that the quantity of magnesite available close to the surface is very small and that many tons of waste would have to be handled to produce one ton of ore. Production on a commercial scale was therefore not attempted. The magnesite is of the white amorphous kind, like that produced in California and Greece. It has the typical curved porcellaneous fracture and is apparently of high grade. Analyses have not been made by the Federal or State Survey because the small quantity of ore would not justify it. During the development work last summer a few tons of ore was extracted, but as taken from the quarry and pits it is mixed with serpentinite and to prepare it for market would require breaking and careful sorting by hand. The small quantity of ore available would not justify the expense of cleaning.

Magnesite was mined also in Lancaster County about 75 years ago. The report of the Second Geological Survey of Pennsylvania on that county records the occurrence of the mineral in Fulton township. It is reported that magnesite forming the gangue of the ore at the Wood chrome mine was obtained in considerable quantity and that a large quarry showing abundant magnesite was opened in the serpentinite belt about three miles southeast of Peach Bottom. At these localities, however, it is not in commercial quantity.
In view of the large quantity of magnesite used annually in Pennsylvania it might be regretted that large deposits of this mineral have not been discovered within the boundaries of the State. However, there is in Pennsylvania an abundance of dolomite or magnesian limestone which can be substituted for magnesite in some of its uses. Dolomite is now being dead-burned to make refractory lining for steel furnaces and has long been the source of magnesia for pipe covering and other heat insulation, for pharmaceutical purposes, face powders, toilet articles, and in the rubber trade.