

“The Granite Industry of Maine”

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Note: The information in this article is based on “Contributions to Economic Geology” for 1904, published as Bulletin 260, U. S. Geological Survey.

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The Granite Industry of Maine.

In "Contributions to Economic Geology" for 1904, published as Bulletin 260, U. S. Geological Survey, George Otis Smith writes as follows concerning the granite of the Penobscot Bay quadrangle in Maine:

Maine stands first in the list of granite-producing states. By the statistics for 1903, compiled by the division of mineral resources, Massachusetts appears to lead Maine slightly, but the figures for the granite output of Massachusetts include the value of trap rock quarried in large amounts for road metal and railroad ballast, whereas Maine's production is almost wholly true granite. Thus in value of granite production, Maine leads by about \$225,000. Of the total output of the state, valued at \$2,586,765 in 1903, approximately one-half is the product of the quarries included within the Penobscot Bay quadrangle. This production of nearly \$1,250,000 annually makes the granite industry of this area of considerable importance, and the geologic and economic survey of the quadrangle has furnished interesting data upon this subject.

The granite is distributed over the larger part of the land area included within the Penobscot Bay quadrangle and occurs in three principal areas aggregating over 100 square miles. Deep-water channels suitable for the largest coasting vessels extend to the very edge of the quarries, so that the largest blocks of granite can be loaded directly upon the vessels which are to take them to the large cities of the Atlantic coast.

Thus the cost of transportation is greatly reduced.

The granite of this region varies somewhat both in texture and in color. In general it is of a light gray color, although locally, as in the northern part of Deer Isle and in the vicinity of Stonington, it has a light pink tint. The granite contains both hornblende and biotite, but usually the darker minerals are not abundant, although evenly distributed throughout the rock. The grain of the granite ranges from fine to coarse, although most of the rock quarried might be termed medium grained. It is worthy of mention, as showing the uniformity of the granite both in color and in grain, that often work on the same contract is done at quarries several miles apart.

The granite found in this region is also remarkably free from mineral constituents of a nature to cause staining of the rock. This is shown in the slight amount of discoloration on the weathered surface of the ledge. In most of the quarries only a few inches of the surface rock is slightly weathered, so that a very small amount of work is necessary to develop a quarry, and, indeed, often even the surface blocks are used.

A most important feature affecting the granite industry is the distribution of joints in the rock mass. The rift, or plane along which the granite splits most readily, varies in direction in the different quarries. In the vicinity of Stonington the rift ranges from

north-south to N. 40 deg. W., while the joints in the same localities range from N. 50 deg. W. to N. 85 deg. W. The "bottom," or approximately horizontal, joints, are perhaps the most conspicuous features in the granite, as it is exposed in the quarry face. The presence and spacing of these well-defined planes are often what determine the location of a new quarry. The spacing of these parting planes in the rock determines the kind of work for which each quarry is especially adapted, and while in a few quarries in the Penobscot Bay area the joints are so close together that only material for curbing and paving blocks can be quarried, in many other quarries exceptionally large blocks suitable for monoliths can be easily taken out.

The largest of the granite quarries of the Penobscot Bay are those in the vicinity of Stonington and Vinalhaven, including the Crotch Island and Hurricane Island quarries. Several of these quarries doubtless rank as the largest in the United States, and are well equipped for a large output of both rough blocks and dressed granite. The works of the Bodwell Granite Company at Sand Cove on Vinalhaven has an equipment comprising traveling cranes, lathes, pneumatic hand tools, and plug drills, in addition to the usual number of derricks, hoisting engines, steam drillers, and surfacers necessary for a large quarry. At this company's Palmer quarry, at the mouth of Long Cove on the same island, there is a giant lathe, designed by Cheney & Spiller, of Boston, and built by the Philadelphia Rolling Machine Company, which will turn a monolithic column 70 feet in length and 7 feet in diameter.

On Hurricane Island the Booth Brothers and the Hurricane Isle Granite Company are operating two quarry openings. Their equipment, which well illustrates the capacity of these larger quarries, consists of 2 locomotive cranes, 5 derricks with steam hoists, 4 steam drills, 19 pneumatic plug drills, 8 pneumatic dressers, 34 pneumatic hammers, 2 compressors, 1 lathe, which will turn a column 20 feet in length and 3 feet in diameter, 4 polishing lathes, 6 Nelson polishers, 4 pendulum polishers, and 1 Cavicchi pneumatic polishing machine.

The Rodgers quarry, on the west shore of Webb Cove, in Stonington, is also equipped with both steam and pneumatic drills, and pneumatic surfacers, 9 hoisting engines, 10 derricks, a 10-ton crane, and a railway and locomotive. On Crotch Island the Ryan-Parker Construction Company operates a large quarry with extensive dressing sheds, with full steam and pneumatic equipment, as well as a railway, running to the two docks and the entire length of the quarry. John L. Goss has a well-equipped quarry adjoining the last-mentioned quarry, and also one on Moose Island, on the opposite side of Deer Island Thorofare.

The topographic features of the granite coast of this region are such as to facilitate the quarrying operations. In most cases the quarries are opened on the slopes of hills rising directly from the shore, so that although the older quarries have been operated from twenty-five to fifty years the present conditions favor continued production without increase in expense. The larger part of the equipment of these quarries, therefore, is for the finishing of the product rather than for quarrying.

The greater part of the output of the Penobscot Bay quarries in 1903 was in the form of dressed granite for building purposes and paving blocks. The value of granite quarried and dressed within this quadrangle that year was over one-half the output of the state and nearly one-sixth the total production of that class of stone in the United States. The paving-block production is only one-half that of the dressed granite, but amounts to nearly one-fourth the product of the United States and exceeds the output of Massachusetts.

Other stone quarried here is in the form of dimension material, "random," and curbing, and some, notably from the quarry of the S. Clinton Sherwood Company, on Thurlow Knob, is shipped in the rough to be dressed elsewhere for monumental work.

An interesting fact concerning these quarries is their capability to furnish large blocks of stone. Several of the quarries ship blocks weighing from 15 to 30 tons. The Bodwell Granite Company furnished the General Wood monument in Troy, N. Y., which is 60 feet in height and $5\frac{1}{2}$ feet square at the base. The discarded duplicate block remains at the Sands quarry and measures 65 feet in length and $5\frac{1}{2}$ feet square at the base, tapering gradually to about $3\frac{1}{2}$ feet at the top. The columns for the Cathedral of St. John the Divine, in New York City, were quarried at the Palmer quarry of the same company. The rough blocks for these measured 60 feet by 6 by 6, and weighed about 185 tons. One of these huge blocks was successfully turned in the giant lathe, but split after being finished and removed from the lathe. On this account the columns were turned in two sections. In this quarry the spacing of the joints is such that thick blocks are available even at the surface.

The principal markets for the Penobscot Bay granite are Boston, New York, Philadelphia, and Washington. Each of the larger quarries has furnished the dressed granite for many large and well-known buildings in these cities, while a few buildings have been erected of this granite in Chicago, Milwaukee, St. Louis and other western cities. Contracts that are being worked on at present include the New York bridges, the custom-house in New York, and the Naval Academy at Annapolis. Labor receives over 80 per cent of the value of the product of these quarries.