

# Waite Blacksmith Shop: a Piece of Stone Quarrying History

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The 1820 Jonathan Waite granite blacksmith shop in Dunbarton, New Hampshire has the unique distinction of being the oldest building in the United States with examples of the commercial version of the plug and feather method of splitting stone.<sup>1</sup> This technological innovation in stone quarrying helped to propel New England's fledgling granite quarries into a major industry in the 19<sup>th</sup> century. Prior to 1820, there is a single experimental use of the method on one block of stone in the 1818 Customs House in Salem, Massachusetts. By 1823, the method had spread rapidly throughout several New England States and is found on a number of buildings dated to this year. The blacksmith shop represents a critical link during the five year period between 1818 and 1823 when the technique moved from the experimental stage to the beginnings of rapid adoption in the quarry business.<sup>2</sup>

The blacksmith shop is currently located on Route 13 but was moved to this location in 1980 by the Dunbarton Historical Society from its original location on Grapevine Road.<sup>3</sup> It was built by Jonathan Waite in 1820. Jonathan Waite (1791-1858) married Anne Huse (1796-1862) in about 1814 in Dunbarton. Caleb Stark in his history of Dunbarton (1860) wrote, he "was an ingenious blacksmith. He served the town as selectman, and was twice elected representative. In his decease his family as well as the public suffered a severe loss. His sons, George and James, carry on his establishment."<sup>4</sup> By 1902, the shop was being run by the third generation of the family.<sup>5</sup>

The large & medium size granite slabs that make up the shop walls have fairly uniform coloration and appear to come from the same source, either a large glacial erratic or a surface ledge quarry. The best quality granite slabs were used for the construction of the front and side walls of the shop. The poorest quality slabs that didn't split with flat faces were used in the lowest levels of the rear wall. The largest slabs were used up to just above the height of the top of the doors and windows. Some of these slabs were as large as 5 x 2 x 1 ½ feet in size and weigh in at around a ton. This represents the limits of the lifting method they employed. Unfortunately no tool marks or other evidence of the lifting method were found. With the exception of the lintel stone over the window in the peak of the front wall, the quarried stone blocks get smaller in size with height.

Two different stone splitting methods were utilized during this project and the tool marks indicate there were at least three different quarrymen hired. They all worked separately except for one slab in which we found two different sets of tools marks along the same split.

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<sup>1</sup> There is an earlier "farmer's" version used sporadically from circa 1790 to circa 1820 on farms. The farmer's version limited the technique to small field boulders and never saw use in commercial quarry operations.

<sup>2</sup> Gage & Gage 2022.

<sup>3</sup> Dunbarton Master Plan 2019

<https://www.dunbartonnh.org/sites/g/files/vyhlf6771/f/uploads/4.-historical-cultural-resources.pdf>

<sup>4</sup> Stark 1860, 25.3

<sup>5</sup> Mills 1902, 17.

Flat Wedge Method (c.1790-1860s) – When seen from the side after the rock is split, these quarry marks have a trapezoid shape \\_/. The quarry holes are spaced 3 to 4 inches apart along the length of the split. Two different size flat wedge holes were observed, a small size and a larger size. This indicates two different quarrymen were present who were using this method. They either had different size splitting wedges or different personal preferences as to hole size.

Commercial Plug and Feather Method (1818-Present) – This method is characterized by a series of round holes drilled in a line usually about 6 to 7 inches apart. After the rock is split they leave a distinct half round drill hole. In the blacksmith shop the holes were drilled closer together, typically 3 to 4 inches apart. The closer than usual spacing of the holes followed the spacing of the flat wedge method.

Sources:

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1902 *Sketch of Dunbarton, New Hampshire*. Manchester, NH: Manchester Historic Association.

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Front of Blacksmith Shop. The largest stone blocks and bars were used to construct the first story of the building. The second story of building shows a gradually decrease in the sizes of the stone with height. The notable exception being the lintel stone over the window.



Stone block to the left of main shop entrance on the front of the building. 5 ½ x 2 x 1 ½ feet in size weighed in at around a ton





Good quality stone blocks were used on both sides of the shop. The exception being two poorer quality stones without good flat faces in the middle of the ground level layer (arrows.) These may have originally been hidden from view by an earthen fill or an embankment.



Left side wall of shop. Photo scales are marked in one foot intervals. The stone is of a uniform color and texture suggesting it came from the same source, either a large glacial erratic or surface ledge quarry.





Rear wall of shop. Poor quality stone slabs were used for the layer at ground level. Some bars with orange stains were used as lintels near the roof line. The second story was wood on this end unlike the front of the shop where stone was used.





Angled view of rear shop wall. Arrow indicates a block with some non-flat surfaces utilized in the least conspicuous place.





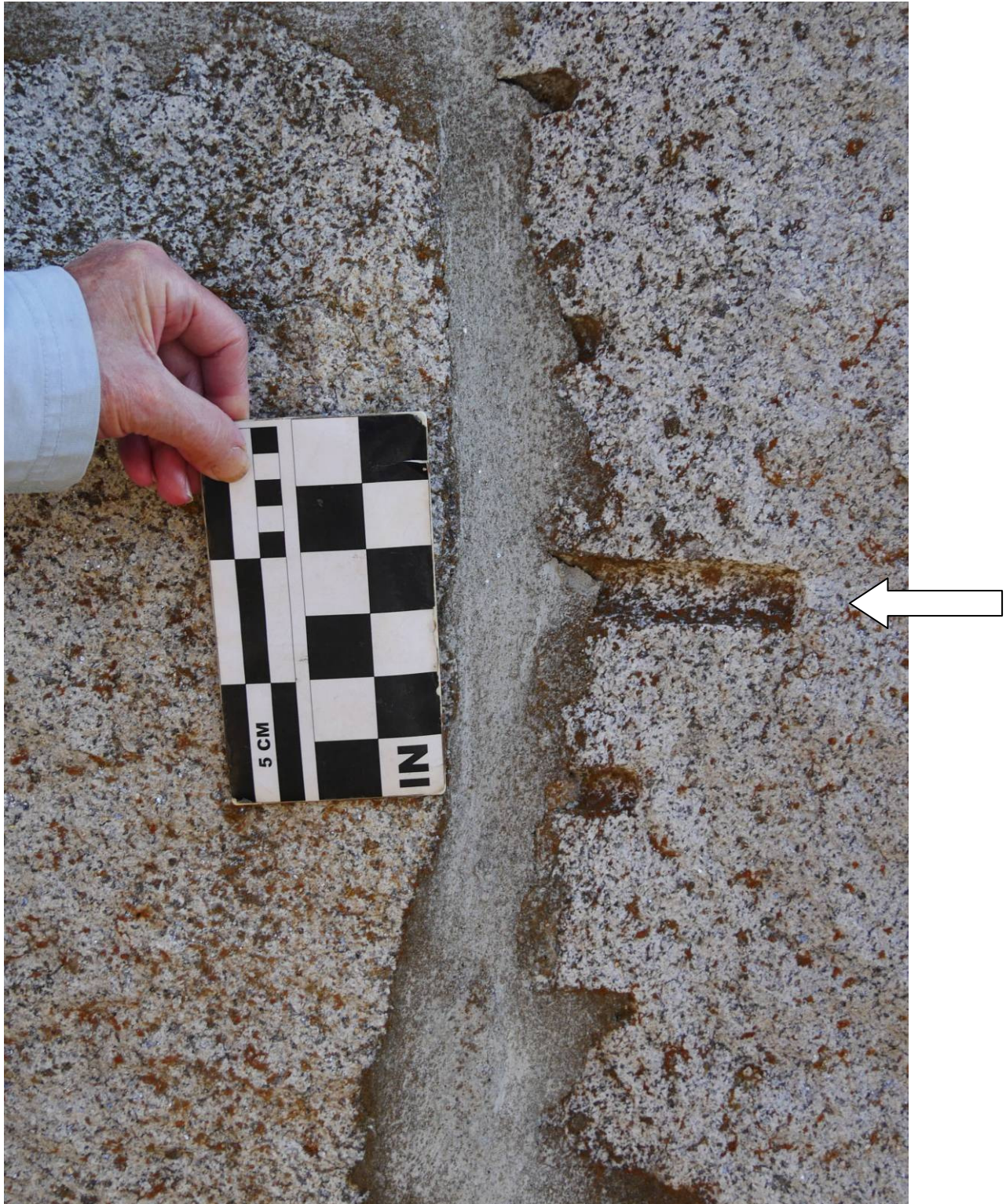
Half round holes of the commercial plug and feather method. Typically the holes are spaced 6 to 7 inches apart. In this case they are about four inches apart. The closer than usual spacing of the holes followed the spacing of the flat wedge method. This example dates to 1820 making it the oldest known (non-experimental) use of the commercial version of the plug and feather method,





The trapezoid shaped quarry marks are characteristic of the flat wedge method of stone splitting. The method was developed circa 1790 and came into widespread use in New England from 1803 onwards. It was the dominate splitting method into the 1820s when plug and feather method started to spread and eventually dominate the quarry industry by the 1860s.





The deeper 5 to 6 inch drill hole was likely a blast hole. This is the only example found on the shop walls.





A single bar of granite was found split using both methods: Flat wedge method (down arrows) and plug & feather method (up arrows).