Stonework of the Eighteenth and Nineteenth Century in the House Mountain Area

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Through the centuries stone has been regarded as one of the most durable and sturdy building materials known to man. As a building material, it was especially valued in the construction of walls, piers, chimneys and foundations because of stone's ability to support enormous weights. This is true because large heavy stones in massive groups can resist active forces because of their inertia and because only great forces can overturn them. The stone walls of Liberty Hall which have endured both the forces of weather and the forces of gravity for hundreds of years nicely exemplify this trait of stone. This paper will discuss the use of stone as a building material in the area of Rockbridge County during the eighteenth and nineteenth century with special attention given to the House Mountain area.

The colonial structures of Rockbridge County varied greatly in function, but they were very similar in design. The foundations chimneys and sometimes the floors of these structures were almost exclusively made of stone. The walls of the structures varies but were typically made of wood especially in the hollows where good trees were readily available for this use. The structures we have encountered in the hollows area definitely reflect their surrounding environment resources. The abundance of timber encourages its use in the construction of the houses framework. Similarly, the abundance of limestone
and sandstone in the area makes these the dominant stone types used in the building of the foundations, chimneys and floors.

Sources of Stone

The stone used in the construction of these structures was almost always sandstone in the hollows area. In other areas of Rockbridge County where there were limestone deposits, limestone was used. In the case of sandstone, no quarrying was needed because of the abundance of surface stone. Settlers transported the sandstone to the building site where it was worked and finished and utilized as needed. Limestone could also be found on the surface, but the best rock was quarried. The process of quarrying stone was very similar throughout the Appalachian mountain area during the eighteenth and nineteenth century. First, a cliff face was located or a trench was cut. On the floor of the recess or trench, blocks were outlined in the desired size and then separated by channels several inches wide and cut to the desired depth. There were several methods of channeling hard stone. Perhaps the most widely used method involved the use of metal wedges and hammers. In this process, metal wedges (See Fig. 1) were driven into the stone along the previously outlined border. In some cases, wedges were facilitated by drills. These drills were bored into the rock about six inches deep. Then wedges were placed on either side of the bored hole. Every pound with a sledge on the wedges or turn of the drill bit cracked the rock until
finally the desired piece was separated. Once stone has been quarried it is usually transported to the building site by means of a stone boat (See Fig. 2) which was pulled by a farm animal. Sometimes the rock was allowed to weather for a year to test its durability. After a year had passed, the rock which showed the most wear was used in the foundation of the structure where it would be less exposed to the elements. The remaining rock was used for chimneys or walls that would be more exposed.

Working and Finishing

After the stone was brought to the building site, it had to be shaped into its final form. This was usually done by an experienced stone mason if the stonework to be done was complicated. According the Alvis Reynolds, a stone mason in the Rockbridge County area, the masonry involved in building the structures of rural Rockbridge County at this time was not complicated. He believes that the stonework involved in chimney and foundation making was performed by the settlers themselves. Still the question of how settlers of that area acquired this knowledge remains. Mr. Reynolds seems to believe that at the onset of the settlement of the area, nomadic stone masons worked and taught others their skills. Mr. Reynolds is fairly certain that their was not an apprenticeship for stone masonry provided by these nomadic masons. Instead, settlers gained this knowledge through participating in the stone construction with those masons. This seems to be a good
speculation when we consider that in general, the early colonists in the eastern United States rarely attempted to give a fine finish to stone. The stone work done was for practical purposes rather than for a decorative effect. Therefore it is quite possible that settlers could have learned enough masonry to do future stone-work themselves.

The dressing of stone is probably the most complicated step of stoneworking. Many tools are required to shape the stone to the size needed. The process of dressing stone usually involves these three steps:

1. First, the corners of the rough stone are established with a pitching chisel. A pitching chisel is a relatively heavy chisel about one and one-eighth inches in diameter with a cutting edge that spreads to two and one-half inches with the cutting edge unsharpened. (See Fig. 3)

2. The second step involves establishing sides extending from the previously established corners. This is done in part with a pitching chisel but usually involves picks and tooth chisels. Masonry picks were very similar to normal pick axes but were shorter and stouter than those used for digging. When the sides of stone blocks were struck by these picks pieces of stone would flake off. (See Fig. 4)

Chisels also flaked off pieces of stone, yet this
tool is considerably different from a pick. Tooth chisels were instruments similar to pitching chisels but with a serrated edge. (See Fig. 5) With this tooth chisel the stone was brought to its rough finish.

3. Finally, if more finishing was required, then a wide chisel (See Fig. 5) was used to remove the ridges left over from squaring up the stone. This was done until the surface of the stone was relatively flat. Then the stone could be rubbed with an abrasive to remove all pick and chisel marks.

Several other tools were involved in the process of working stone. Points were chisel-like octagonal iron rods about twelve inches long and sharpened to a point on one end. These were used during quarrying to extract hard stones quickly. (See Fig. 6) Masons used pean-hammers (stone axes) for a variety of uses. They were used along with wedges to help crack the stone during quarrying. Variations of these hammers were also used to add different decorative textures to the stones. (See Fig. 7)

The only parts of this finishing process that are applicable to the stonework we have encountered in the hollows area is, at the most, establishing corners and sides in the necessary shape. The techniques of decorative masonry were rarely if ever performed in the construction of that area.
Stone Laying

After the stone is brought to the building site and is finished into its desired form, it is then ready to be placed in the foundation, chimney or other structure being built. Every construction involved a different laying technique because each stone is different from the one before it in terms of size and shape. However, the tools involved were basically the same from one job to another. In laying stone, an iron or steel trowel shaped like a diamond was used. The trowel was used primarily to apply mortar and also to tap small stones into position. Levels were made of wood in the form of an A or an inverted T: a plumb bob was suspended from the top. When the plumb line hung in alignment with a mark at the center of the apparatus, then the two feet were level.\textsuperscript{15} Verticality was checked by an instrument operating on the same principle.\textsuperscript{16} A wooden or iron square was used to verify right angles. A compass with steel points was employed to draw arcs of small radius: steel points were used to draw straight scribe lines on stone.\textsuperscript{17} A leveling line was a cord stretched between corners to help aid in keeping the stone work level. Snap lines were cords to which chalk or ocher was applied so that a reference line could be transferred to a foundation, chimney, wall or other piece of stonework.\textsuperscript{18}

Mortar

The stones in this stonework were held together with
mortar in most cases but some foundations and garden walls of simple buildings were often dry walled. When stonework is dry walled, no mortar is involved. Instead, stones are stacked in such a way that the foundation or wall is sturdy enough to serve its purpose. However, most stone structures involved mortar.

During this time period, there were several types of mortar in use. Clay mortar was perhaps the earliest type. Clay was used with both brick and stone in areas where lime was difficult to obtain. This mortar was also popular because of its low cost. Clay mortar joints could bear heavy loads and was a good mortar. However, clay mortar cannot hold up in moist, humid climates and must also be protected from the rain. These characteristics were definite disadvantages which caused its popularity to decrease with the introduction of other mortar types.

Another commonly used mortar was lime-sand mortar. It was the most common type used in structures located above water level until the late nineteenth century when its popularity began to decrease. To make this lime based mortar, the lime had to be heated to 1650 degrees F. or in other words calcined, in order to produce quicklime. This quicklime (calcium oxide) was then mixed with a certain quantity of sand. After the mixing is finished, the mixture is then slaked. Slaking lime is done by adding a certain amount of water (usually by sprinkling)
to the quicklime. The water is quickly absorbed and leaves a dry powder. When the mortar is ready to be used, the slaked lime mixture is then hydrated with enough water to make a paste of good consistency. This paste will remain plastic for several hours while it is being applied. After several hours, the mortar will set and be able to support the weight of stones above it provided the work doesn't go too fast. After setting, mortar hardens at a very slow rate. It may take months or years to reach its maximum strength. 22

Another type of mortar that deserves mention is Portland Cement. Portland Cement was patented in 1824 by Joseph Aspdin, and English mason-builder. It was manufactured from 1871 on and gradually replaced natural mortars. Portland Cement was extremely popular then because it was stronger, more predictable and easier to work with than the natural mortars. 23 However, the hollow structures date before the twentieth century when Portland Cement was introduced to the area so it isn't encountered in the structures we have been studying.

Stonework in the House Mountain Area

Several structures which demonstrate the stonework described in this paper can be seen in the House Mountain area. One of these structures is the remains of a stone foundation at the Taylor site (44 KB143). The stonework in this foundation appears to be very rough. The stones used were probably not prepared
at all. Many rocks that would be suitable for such an unworked foundation are laying around the surface all over that area. The stones are sandstone which usually cleaves to form relatively flat sides. These stones were probably gathered and placed right into the foundation. Excavation has turned up a lot of mortar around the foundation. The mortar is yellow-brown in color, fairly brittle but not extremely hard. This would indicate little or no presence of lime. Lime is hard and almost cement-like when it hardens. Sand is indicated by the yellow tint. When sand is mixed with mortar, it adds a yellow color.\textsuperscript{24} Clay is indicated by the brittleness and softness of the mortar and also by the fact that clay is in abundance and would be much more practical than lime.

The information we have about the Taylor site fits in very well with the typical stonework of the area. Almost every house or cabin has the same foundation type in the House Mountain area. These foundations were made of sandstones which were relatively square and light enough to be lifted and set without the aid of hoisting devices. The cornerstones were a little larger than others however. The mortar consisted of clay and sand and is now very brittle. The foundations are only one stone thick (about one foot), and are set several inches into the ground. Many cabins and houses of this time period can be observed on Route 60 and Route 646 to Collierstown.

- 9 -
Almost every one of these had the same type stone and a clay-sand mortar. There are two exceptions that I have noticed, however.

The first exception is that of a log house about eight miles from Route 60 on Route 646 near the New Cave Farm. Everything about the foundation and chimney work is typical except for some of the cornerstones. Some of the house's corner stones were granite. This is somewhat peculiar because the granite stones were very square also. Granite would be advantageous to have especially as a cornerstone because it is more durable and sturdy. However, there is no readily available granite in the area, and to work granite to a square stone is more difficult than working sandstone. Perhaps this granite was part of some other structure at the time of construction. One possible source of this granite might have been someone involved with making headstones. There are several old cemeteries in the area.

The second exception is that of the log house behind the Suits Me Farm. This cabin is very typical in its construction, yet it has practically no foundation. Its foundation consists of large corner stones upon which the log house was built. There is a little rubble around the sides, but no other rocks give foundational support to the house. Why is this foundation so different from the others? No one really knows, but perhaps it had to do with water drainage. Behind the log house is a
bare field which slopes down to the house and the road. This type of foundation would allow the rain water to drain down to the creek without eroding the foundation or possibly flooding the house.

Stone working is an ancient skill and can be a very diverse field. However, the tools and techniques of this trade were very basic in the eighteenth and nineteenth century, especially in the House Mountain area. In this area, stonework was not very complicated and probably didn't require knowledgeable stone masons. In conclusion, the stonework of the area reflected the area's environment as far as materials were concerned, and it was for a strictly practical, not decorative purpose.
IRON WEDGES USED FOR SPLITTING STONE.

1. 2 1/4 inches long, 1/2 inch square. Mercer Museum, Doylestown, Pa.
2-3. Flat wedges.

4-5. Modern English wedges with slats.
6. Square plug and feathers.
7. Round plug and feathers.

DRILLS.
1. 19th century.
2. 19th century.
3. Italian, 16th century.
4. 23 inches long, 1 inch octagonal. Mercer Museum, Doylestown, Pa.
5. 31 1/2 inches long, 1 inch octagonal, 1 1/4 inch cutting edge. Mercer Museum.

FIGURE 1

STONE BOAT. Used for hauling stones.

FIGURE 2
POINTS.
1. Type used since ancient Roman times.
2. Italian, 16th century.
3. American, 19th century.

AXES AND HAMMERS.
1. Face hammer.
3. Ax or peen-hammer: 5 1/4 inches long. 3 inch cutting edge. Mercer Museum.
5. Sledgehammer.
6. Ax or peen-hammer.
Notes


2Ibid, p. 16.

3Ibid, p. 16.


5McKee, p. 18.


8McKee, p. 20.


10Ibid, p. 23.

11Ibid, p. 29.

12Ibid, p. 29.


14Ibid, p. 22.
Bibliography


The Teaford Papers