

The Life of a Quarry Worker - Post trip activity

Students will take on the role of a quarryman. Instruct them to write a one page biography of their life working at the Stone Mountain quarries. The attached information can be made available to students and the following questions can guide students in writing the biography.

Where are you from?

Why did you come to work in the quarry?

Write a paragraph about what your daily job was like.

What is one thing you liked about quarrying and one thing you didn't like?

BACKGROUND INFORMATION

The granites and granite-gneisses of Georgia are contained in four major bands running through the piedmont region. The most extensive areas of exposed granite in the state occur in DeKalb County, which includes Stone Mountain. Stone Mountain has, in fact, been billed as the largest deposit of marketable granite in the world, and with good reason. The volume of exposed granite in Stone Mountain proper has been estimated by engineers at more than 7.5 billion cubic feet, enough to fill 12.6 million railroad cars of 50 ton capacity.

The granite quarries at Stone Mountain were among the first to be worked anywhere in the state of Georgia. Tradition holds that the first quarrying was done in the mid-1840s, around the time the Georgia Railroad was completed. The primary use of the granite was for grave stones.

HISTORICAL OVERVIEW

The earliest record of quarrying activity appeared in the 1849 edition of *Statistics of the State of Georgia*, which stated that Stone Mountain contained "granite in quantities sufficient to supply the state of Georgia for a century to come." The 1850 census also listed five men in the town of Stone Mountain as stone cutters, indicating a small but established trade in cut granite. Ten years later there are

26 men employed in the quarry industry. It is the second most common occupation after farming.

Quarrying apparently continued unabated at Stone Mountain during the Civil War as evidenced in land deeds of the period. The effect of the war on the overall production of the quarries is not known. If anything, the need for head stones would have been even greater during the war.

In the years following the war, quarrying at Stone Mountain grew rapidly as an organized industry. This was due to the invention of the pneumatic drill in 1861 by a German engineer. Driven by compressed air, the bit of a pneumatic drill could strike and grind at the rock more than 2,000 times a minute. This made the difficult task of cutting the stone from a ledge much simpler and faster. The quarrying of granite on a large commercial scale was now practical.

The Stone Mountain Granite Company was chartered in 1867 and purchased most of the mountain for \$50,000. The Georgia Railroad provided the means for the company to get its product to distant markets, but to get the tons of granite to the Georgia Railroad, the company had to build a spur line from the quarries to the train depot in the town of Stone Mountain. By 1870 there were at least eighty men at work in the Stone Mountain quarries producing monument, building and paving stone for Southern cities rebounding from war time devastation.

In 1874 the Stone Mountain Granite Company changed its name to the Stone Mountain Granite and Railway Company. Deed records indicate that the company was on shaky financial ground, and the 1880 census shows only 42 men employed in the quarries, indicating a general decline in business. In 1886, the company sold its property and assets to the Southern Granite Company, composed of the following partners: George Morelin, Charles Horne, Samuel Venable and William Venable.

William and Samuel Venable entered the granite business in 1879 and began to purchase prime granite outcroppings in the as yet, unexploited Lithonia area. Under the name of Venable Brothers' Contractors they built granite quarrying into a major industry in DeKalb County. The Venables went into partnership with Messrs. Morelin and Horne for the Stone Mountain venture, but a year later bought out their partners and added the mountain to the holdings of Venable Brothers Contractors.

The chief difficulty of quarrying granite at the time was in getting at good stone. Most of the time the quarrymen were restricted to breaking up boulders or naturally exposed ledges which were made mostly of "sap rock," or partially disintegrated granite. Unlike the granite fields of New England, Georgia granite has few seams for the quarrymen to exploit. In the early 1880s, a quarryman at Lithonia experimenting with packing drill holes with black powder to blast rock loose accidentally stumbled upon the technique for raising a ledge suitable for

quarrying stone of any size desired. Further experimentation perfected the method and opened the way for full development of the industry.

The demand for skilled stone cutters attracted many itinerant craftsmen who followed the boom areas of their trade. About ten percent of the stone masons at Stone Mountain were immigrants from European countries, primarily Scotland, Wales, England, Spain, Sweden and Italy. These men gave an international flavor to the small Southern town, and some settled down here permanently. The population of Stone Mountain swelled at this time from 750 in 1880 to about 1200 in 1887.

Many of the quarrymen had some rough edges which came with a job that was fraught with hard and sometimes dangerous labor. It has been noted that drunkenness, street brawling and chicken shooting were common occurrences. One retired stone cutter once wrote, "local people like to think all the real bad characters were hanged publicly and thus excluded from their ancestry."

According to the state geology department, it was largely through the shrewd marketing of the Venable Brothers that Georgia gained its high ranking as a granite producing state, and Stone Mountain granite played a large role in building the reputation of Georgia granite as it was shipped all over the country and abroad. Annual export outside the state increased to 20,000 car loads under the Venable Brothers from just ten car loads under the Stone Mountain Railway and Granite Company. This "white gold" became a very important part of the local economy.

Stone Mountain granite was used for a whole gamut of purposes, including dimension stone for buildings, monuments, paving stone, curbing, tombstones, rubble and crushed stone. The production capacity of the Venable quarries at Stone Mountain at the turn of the century was 2,000 feet of curbing and 200,000 paving blocks a day. The demand for Stone Mountain granite for building purposes, however, declined in the early 1900s due to its inability to stand up to prolonged weathering. Lithonia granite-gneiss became the preferred choice for this type of work.

All the quarrying at Stone Mountain did upset some people because it conflicted with the mountain's other use as a place of recreation. A popular place for picnics was on top of the mountain at the Devil's Crossroads, a gigantic flat boulder whose wide cracks formed a natural compass. This unique formation was broken up by quarrymen in 1896 for its high-quality granite and the blocks lowered down the mountain. The Venables were decried at various times for this and other acts of "lawful vandalism" against the grand mountain.

In 1911, the Venable Brothers leased the mountain to the Stone Mountain Granite Corp. operated by the Weiblen family of New Orleans. Albert Weiblen was a German stone cutter who immigrated to the United States in the 1880s

and established his own business. Two of his sons, Fred and George, were given the responsibility of running the Stone Mountain branch of the business.

The Stone Mountain Granite Corp. had a large operation on the south side of the mountain and produced mainly dimension stone for buildings and other large structures. The company subleased other areas of the mountain to a few small operators. The most important of these was the Flat Rock quarry, located near the site of Memorial Hall. This quarry was worked from 1928 to 1933 by James New for curb stone, from 1935 to 1940 by the Works Progress Administration for crushed stone, and from 1945 to 1958 by W.H. Venable for rubble.

The decade of the 1920s was the peak period for granite quarrying at Stone Mountain due to the rapid growth and suburbanization of many American cities, including Atlanta. There were more than 200 men employed in the Stone Mountain quarries, about half of them African-American. This figure was almost twenty percent of the total number of granite workers in the entire state. (There were twenty producing quarries counted in Georgia in the 1920 census and twenty-eight in 1930.) The number of men employed varied during the year because of the seasonal nature of the industry. Employment during the winter months was generally two-thirds of the maximum employment of the summer months. Some of these men found employment on the great Confederate memorial carved on the side of Stone Mountain, which was worked on from 1923 to 1928.

Wages for quarrymen were also at an all-time high during the 1920s. The union bill for stone cutters was one dollar an hour, while non-union laborers earned less. About one in five men working in the quarries was a stone cutter. The rest were drill men, rock splitters, mechanics, loaders and other general laborers. In addition to their salaries the employees of the Stone Mountain Granite Corp. received coupons for credit at the company's commissary in town.

Some of the older residents of Stone Mountain recall a time in the late 1920s when the stone cutter's union called a strike and some non-union workers crossed the line. Some of the union men hung a stuffed dummy in front of the commissary building with a sign reading "SCAB" pinned to its chest to intimidate those who did not honor the strike.

Quarrying could be dangerous work, but the greatest tragedy to occur at Stone Mountain happened outside of the quarry and after hours. In February 1929, a compressed air tank exploded from excessive internal pressure, blowing the six-foot wide top off of the tank. This circular piece of one-inch thick steel smashed through the timekeeper's office where several men were checking out for the day. The impact killed seven men and injured six. The dead and wounded were loaded onto the small "Dinky" train normally used for hauling granite and carried into town where they were transferred to ambulances. One eye-witness described being at the depot when the Dinky pulled in: "It was probably the first

time I had ever seen a dead person, and the whole town had turned out there by the tracks. It was a very emotional event, everybody crying."

When the Depression hit at the close of 1929, granite quarrying suffered due to the lowered demand for stone and many of the smaller concerns went out of business. The Stone Mountain Granite Corp. continued to operate until 1934 when the railroads increased freight rates by thirty percent. The increased cost in transportation crippled the industry all over Georgia as profit margins shrank to almost nothing. The Weiblens decided to suspend operations until the rates were readjusted, but this never happened and the Stone Mountain Granite Corp. eventually closed down permanently. The quarries at Stone Mountain were taken over by the Works Progress Administration in 1935 and operated on a small scale by that agency until 1940. In 1942 the tracks of the spur line to the quarry were pulled up and sold for scrap for the war effort. The Dinky train was sold to a coal mine in Tennessee for use there.

During World War II, the only quarrying done around Stone Mountain was by George Weiblen in a small quarry he purchased. He worked this quarry until 1946 primarily producing rubble for local use. This quarry is now surrounded by the Stone Mountain Park golf course. After the war, some quarry activity resumed at the mountain. Willie Hill Venable, a nephew of Sam Venable, worked the Flat Rock quarry from 1945 until the state purchased the mountain in 1958. Arthur King and Sonny Kellogg leased a large quarry on the east side of the mountain from the Venable Brothers estate and operated their business here with about thirty workers from 1947 until 1978 when the state asked them to leave. The King & Kellogg quarry supplied all of the granite used in construction around the park, but the state eventually came to feel that this type of industrial activity was not compatible with the mission of the park.

Since the 1970s the wide-spread use of concrete has killed the demand for granite curb stone and rubble for house construction. Present uses for granite include gravel, rip-rap, and poultry grit and soil conditioner. Although there is still a major granite producer near Lithonia, the Stone Mountain quarries have been forever abandoned as the mountain has taken on a new role more valuable than the mineral worth of its granite.

QUARRYING METHODS

During a century of active quarrying at Stone Mountain the techniques employed to remove the stone changed considerably. When the industry first began here, the quarrymen had to utilize naturally occurring ledges and existing seams, of which there were few. Wooden wedges were hammered into the cracks and soaked with water which caused them to expand and split the stone. Later, the plug and feather method came into use. The feathers were two iron half-round pieces which were placed inside a drilled hole. The plug was an iron wedge which was driven in between the feathers to force the rock to split. Drilling holes

was an arduous task made much easier with the invention of the pneumatic drill in 1861 and the steam drill a few years later.

The accidental discovery of how to raise an artificial ledge revolutionized the granite industry in Georgia. Through trial and error this process was refined to an exact science. Quarrymen drilled holes six to eight feet deep in a zigzag pattern over the area to be raised. Then they poured in a teaspoon of black powder, tamped it down, laid a fuse and plugged the hole with clay. Then all the holes were fired off at once. The next day the holes are bored out and the process repeated with a heavier charge of powder. The charge is eventually increased to two pounds of powder per hole. After two weeks of exploding powder, compressed air hoses are inserted into the holes and the pressure run up to one hundred pounds per square inch. The air pressure is sufficient to crack loose the stone from the underlying layer. The successful raising of a ledge was accompanied by a loud boom as the pent up air under an acre or more of granite rapidly escaped.

Raising a ledge was the most critical part of the quarrying operation. The more time given to it, the smoother the stone would break along the crystalline layers. The work could only be done in the summer because warm granite split straighter and easier than cold granite. The quarrymen were kept busy all summer raising enough granite to supply the stone cutters the rest of the year. With a ledge raised, the quarrymen were ready to split off chunks of stone with plugs and feathers.

After a large block of stone had been separated from the main mass, it was cut on site into the approximate shape and size needed. This was accomplished by snapping a chalk line on the block to mark it off and then drilling more holes and hammering in more plugs. The lines were scored with a tracing tool to facilitate a straight tearing of the granite. This was done as often as necessary to break the block down to the correct size for its intended use, whether it be for paving, curbing or building.

From the quarry site, the roughed out blocks were carried over to the cutting shed by mule-drawn wagon to be finished properly by skilled stonecutters. The average curb stone weighed over 600 pounds, so only about two of these could be carried at one time.

Once in the cutting shed, the stonecutters, the craftsmen of the trade, began their work. By using a special concave-faced paving hammer, the stonecutters could quickly render the blocks the correct smoothness and uniformity for paving stones. Curbing was finished different ways depending on the desired appearance. Most of it only required the use of a special pointing chisel to knock off the most offending protrusions. For a smoother finish the curb cutters would use a bush hammer, which had from four to ten chisel-like blades, or cuts, clamped together. The more cuts the hammer had, the smoother it would render

the surface of the stone. The ends of the curbing also had to be made flat and smooth so that the pieces would join properly.

Highest in status among stonecutters were those who shaped building stone. These large blocks had to be cut in order according to a blueprint and numbered so that the builder could assemble them correctly. Each stone was unique and stonecutters had to cut them precisely, using little more than a straight edge and an experienced eye to guide them. The stonecutter also had to be able to render a variety of surfaces, whether textured in some fashion, fluted, flat or polished. Polished stone was placed on a special machine which used a coarse pad to put a shine on the prepared surface.

The act of quarrying produced large quantities of irregularly shaped stone called rubble. Rough rubble was used as is out of the quarry for rip-rap -or crushed for gravel. Coursed rubble was bankered up, or squared into a more regular form. No finish work was done on rubble, which was far less expensive work. Thousands of homes in the Atlanta area have granite rubble foundations. The finished product of the cutting shed was loaded by crane onto a flatbed railcar and taken to the depot in Stone Mountain for transfer to the Georgia Railroad for shipment.

Toward the end of the nineteenth century, new technologies were applied to the granite industry, most of these relating to the processing of stone. Motor and electrical driven saws of various types with diamond or silicon carbide embedded in a wire could cut through granite blocks quickly and smoothly. The gang saw could cut a large block into several pieces simultaneously. The saws had to have water sprinkled over them while in operation to keep the dust down. Breathing silica dust was one of the greatest hazards of the quarrying and stonecutting business. Pneumatic hammers and surfacing machines were also introduced to make finishing work faster. The stone cutters union, however, objected to these tools on the grounds that the hard vibration caused nerve damage to the cutters hands and arms.

The pointed tools used by stonecutters required constant sharpening, so blacksmiths were always on site to reheat the iron tools and hammer fresh points on them. In the early twentieth century, carbide-tipped tools were introduced that did not dull as quickly and could be resharpened on an emery wheel. Later innovations included the channel burning torch, but by then large scale quarrying was long over at Stone Mountain. The small operation that continued at the mountain into the 1970s still used the methods of fifty years before.

SOURCES

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Bureau of the Census, Mines and Quarries General Reports, U.S Government Printing Office, Washington D.C.; 1922 and 1933.

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Crystals, Minerals, Rocks!

Background

Minerals are the building blocks of rocks. Rocks are made up of more than one mineral. But what are minerals made of? Minerals are made of crystal shaped compounds of the earths naturally occurring elements. All of the crystals in a specific mineral are the same shape.

Materials

Preprinted crystal shapes (available at <http://bca.cryst.bbk.ac.uk/BCA/ed/Class.pdf> copied onto colored paper if desired, one color per shape)

Scissors

Glue

Masking tape

Glitter (optional)

Procedure

Divide the class into several groups with 5-8 members in each group. Pass out a preprinted crystal shape to each member of the group. Members of the same group should have the same crystal shape. Each group should have a different crystal shape.

Have students cut along the solid line and fold along the dotted lines. Glue should be placed sparingly on the tabs. Use the tabs to secure the sides of the crystal together. Now each group member should have a completed crystal.

Crystals are the building blocks of minerals. Have the group members note that their crystals are all the same shape. Have them try to place their crystals together so that the sides match up. Have them try several different arrangements until they find an arrangement that fits all of their crystals in the smallest amount of space. (Hint: sides with the same shape will fit together the most closely).

When the students have figured this arrangement out, secure the crystals together with a small piece of masking tape (so they will come apart later). When all the crystals are attached you have a mineral!

When all the crystals are taped together, have the class note the difference in shape between different group's minerals.

Challenge the students to try and fit the different mineral shapes together. This forms a rock. A rock is made up of two or more minerals. The minerals may not seem like they want to fit together. You can explain to the students that heat and pressure under the earth forces the minerals to join and form a rock.

To demonstrate heat and pressure have students place their hands flat, together in front of them. Have the students rub their hands back and forth quickly. This is generating heat. Have the students put as much pressure on their hand as they can and still rub their hand together, this should increase the heat. Now have students lessen the pressure so there is a small layer of air between their hands while still rubbing their hand back and forth, this should cool their hands off. It is in the hot, pressured environment that rocks are formed. Join the minerals together with masking tape as best as they will fit. Now the class has made a rock!

The rock can be disassembled and crystals given back to the students. At this point you can decorate your crystals with glitter or any other materials you choose.