

## Common Monument and Gravemarker Materials

Below are brief descriptions of the most common stones and monument material types found in Georgia. Stones vary in hardness and therefore in their ability to survive satisfactorily outdoors in cemeteries, as well as their ability to withstand cleaning or restoration. The Mohs Scale of Mineral Hardness, created in 1812, establishes talc as the softest mineral material and diamond as the hardest. There is no need to determine the exact hardness of a stone you are working on. However, seeing how some common cemetery materials rank on the Mohs Scale can guide your choice of the best methods for working with them:

<u>Talc (see "soapstone" below)</u>	<u>Marble</u>	<u>Sandstone</u>	<u>Granite</u>	<u>Diamond</u>
1	3-4	5	7-8	10

If identifying the type of stone is difficult, but will be important to a cemetery preservation project, referring to a stone/mineral field guide is recommended, or consulting with a geologist or other expert.

### Marker Material Descriptions

#### MARBLE

Marble has been used for a great many markers in historic cemeteries in Georgia. The state's marble industry dates back to the late 1830s, when outcroppings of surface marble were discovered in north Georgia. Quarrying began, and markers were carved and sold throughout the area. The Georgia marble industry still thrives today.

Several different types of stone that can be polished are called marble. A true marble, though, is a metamorphic rock made up of calcium carbonate, traces of silica and iron oxides; it is rather soft and easily carved. Normally the marble used for grave markers is white, with very few veins. This stone is very susceptible to the deteriorating effects of acid rain, which causes the surface crystals to loosen. Those crystals then can be brushed off like sugar - a condition commonly called "sugaring." Pollution containing sulfuric acid causes marble's surface to convert to gypsum. The gypsum combines with other elements and forms a black crust that ultimately blisters and crumbles away the surface of the stone.

#### GRANITE

Granite is one of the hardest stones available and holds up quite well in a graveyard because it is more resistant to the elements than several other stone types. Since the late 1880s the trend has been toward using granite for grave markers and monuments, as well as in other construction. Monument builders describe granite as a very durable, heavy and hard stone that resists the ravages of weather and pollution. It is a coarse grained igneous rock composed primarily of quartz and feldspars. Depending on the feldspar content, granite may be pink, or light gray to black in color. Granite can however be damaged when run off from other stones such as limestone comes in contact with it and a chemical reaction occurs. Often staining is the result, although disintegration is possible.

#### SANDSTONE

This is a sedimentary rock made up of sand grains held together by natural cements, which can be a variety of different binding agents. Sandstone's strength depends upon the binders that hold the grains together but it is generally soft and easily worked. It is gray or buff and sometimes red in color. Because of the way this type of stone is formed, breaks do not tend to follow along a particular line or plane. Deterioration of this stone varies depending upon environmental conditions but spalling is commonly

seen, which is where a surface crust forms and the layer below begins to deteriorate. As the crust falls off and exposes the inner layer, the softer inner core is vulnerable to damage. Salts that form on or in the stone can also cause deterioration. The accumulation of salts behind the surface causes the surface to break off as the salts crystallize. Efflorescence is the term for salts crystallizing on the surface. As the salts work their way into the stone, the expanding salts break apart the surface a small amount at a time, causing the stone to crumble. The result is flaking, or exfoliation.

## **LIMESTONE**

This stone is also a sedimentary stone similar to sandstone, made up of fine to medium grains of the mineral calcite. It is not uncommon to see calcite streaks or spots in the stone or fossils or shelly formations. Limestone is gray or buff in color, though some varieties are brownish-blue. Under normal conditions, this stone weathers to a light silver gray or white depending on the stone variety. Limestone is usually a bit darker than the bright white of marble used in cemeteries. Because the stone is formed like sandstone, it deteriorates in much the same manner. Salts and acids from pollution cause significant deterioration. Breaks are often not along specific lines and will appear jagged. Certain types of limestone have shown particular susceptibility to deterioration in areas with high pollution levels.

## **SOAPSTONE**

Soapstone is a metamorphic rock having a talc base. This soft rock is primarily made up of talc or magnesium silicate and can contain variable proportions of other minerals. Soapstone can be distinguished by its ease of carving and soapy or greasy feel. It can be greenish, off white, gray or even black in color. This stone occurs naturally in parts of Georgia and because of its malleability, it has been used as a carving material for centuries. Prehistorically it was used by Indians to make bowls, and during historic times, it has been used to make tombstones, among many other items. The stone is very resistant to acids and ages well. Unlike marble, another soft stone, soapstone does not "sugar."

## **CONCRETE**

To a lesser extent than some other materials, poured concrete has been used for cemetery monuments within the state. This material is readily identified by the variety of textures of the aggregate contained in the mix. The surface is often rough with exposed aggregate, and gray in color unless other coloration was added. Its hardness is related directly to the type of mix used. This monument material, though unconventional, appears to be a reasonable choice in light of its low cost and high resistance to the elements. Please note, however, that the bagged concrete available today in premixed measurements is not recommended for repairing historic grave markers made of natural stone.

## **SLATE**

Though not often found in Georgia, slate has been used for headstones with great regularity in the Northeast. It is metamorphosed shale, which is very hard and brittle. Normally black or gray in color, slate is fine grained, usually with a very smooth finish. It is not uncommon for it to have a bluish-gray or a gray-green appearance and can often be identified by the clean, crisp look of carved lettering on this stone. Slate is very resistant to acids and normally holds up pretty well; however, when it does break, it often delaminates or splits apart in thin layers. Because slate is so brittle, breaks are difficult to repair.

## **ZINC**

This uncommon material is a bluish-gray, nonmagnetic, metallic element that is generally brittle but can be worked when heated. The Monumental Bronze Company in Bridgeport, Connecticut produced zinc markers from the 1870s to 1912. The pieces were cast at the foundry in Connecticut, shipped to the cemeteries, even in the Southeast, and assembled there. Over time, zinc markers develop a protective coating of zinc carbonate or zinc oxide, which protects the markers from deterioration. They are readily identified by the hollow metallic sound produced by a light tap of the finger, and their light gray or white color.