



CARETAKERS OF HISTORY



Posts

Blood From A Stone

🕒 March 27, 2019 👤 Michael Arce

The Conservation of Geological Collections

From an outsider's point of view, one might ask, "why would anyone want to conserve a rock?" The truth is lithic material may contain an abundance of information about a particular object, such as the people who made or used the object, where the material may have come from, and what it may have

come into contact with. Within the past decade, scientists have begun to debate whether or not objects of geologic origin really require the traditional cleaning with a toothbrush and water. Depending on what the object is, such as a projectile point or a sample piece of a concrete floor, contemporary archeologists have begun to sequester objects that may provide hidden clues to the answers we are seeking about a past culture.

For example, in October 2006, I attended a materials identification class in Tucson, Arizona, under the guidance of Scott Carlee and Nancy Odegaard. During the class, I was given the task to test for blood on a sample of concrete floor which appeared to me to provide the least amount of information about a past culture. I tested the sample using a 3% solution of benzidine. Within minutes, the sample proved to contain trace amounts of animal blood. I also learned from Scott and Nancy that the sample of flooring was retrieved from a site that once contained an 18th-century butcher shop. I was also told that the same test could be applied to objects with hunting and butchering activities from sites with precontact associations. Further testing for DNA would allow the tester to determine the type of animal the object came into contact with. Technically, you really could get blood from a stone.

But projectile points, scrapers, and concrete are not the only materials we can spend greater time on if budgets permit us. Artifacts of rock origin encompass a wide variety of materials and function. Architectural elements, for example, such as brownstone, marble, slate, and granite have all been

used by ancient cultures the world over to build temples, churches, homes, and even roadways right into the 21st century.

In 1997, I was hired as a field tech to assist in the excavation of the First Rhode Island State Prison. The site was significant to Rhode Island's history due to the associations it held with the African Slaves that were incarcerated from their efforts to take control of the Amistad. While we found no material evidence to support the claim of historians who believed the site to be the actual location of the prison that held the slaves, what we did encounter were large, cylindrical shaped sections of steatite. This grayish colored material (also referred to as soapstone) was found throughout the site in situ, often at times connecting to each other at various points. Our historical archeologist made the logical jump to determine that the soapstone served an important function for the site: plumbing.

Now that I provided you with two examples of the significance of geological material from archeological sites, I want to remind the reader of several other uses for geological material by past cultures. One that comes to mind is slate, marble, and granite for the common use of cemetery monuments and gravestones. Slate is also a common material for building roofs.

What about brick? Although bricks are commercially manufactured from fired or sun-baked clay, the material, nevertheless, comes from materials extracted from the ground. Occasionally we encounter yellow or Dutch bricks. This is an

interesting material that was shipped from Holland and can be identified as such by simply testing the material with dilute hydrochloric acid (HCL). One or two drops will generate the effervescence. Red brick, however, will not effervesce when tested with HCL. The difference is in the higher amount of calcium that is present in Dutch brick. Later during the 19th century, a robust industry began to thrive along the Hudson Valley. Because Hudson Valley clays held the proper proportion of clay minerals and the fluxing ingredients (iron, limestone, and dolostone) they were especially suited for the manufacture of bricks. These clays were deposited up to 250 feet above sea level in ancient glacial Lake Albany (Fisher, 2006)

Precious minerals have also been used for centuries by many cultures for jewelry and industrial use. Garnets, for example, serve beautifully as adornments but also are vital for manufacturing sandpaper and emery boards. Herkimer diamonds (the quartz crystals with two terminus ends) have been valued by lapidaries for generations but are also an important material in the manufacturing of machine tool sharpeners and glass cutting tools.

Anthracite coal can be found just about everywhere, although much of the material encountered on historic sites probably came from mines located in Pennsylvania. Finally, shell is also a material commonly found on sites with either historic or precontact associations. It may have been valued as a food resource, as a decorative item, to deacidify soils, or worked with a tool in the manufacturing of

wampum. Shell is also found in most geological text books or paleontology field guides.

Let's go back to the original argument supporting the need to keep the prehistoric lithics dirty. If the object is encountered in situ with other materials, such as a hearth with mixed components of food remains and bone, there is a chance to determine if the object was actually utilized in food processing and animal butchery. The suspect objects should be stored in a container by themselves unless they are so fragile they require storage in a sample of the deposit they were encountered in. The object's container should be clearly marked "DO NOT WASH." The sample can then be tested later at the lab for blood remains. Other lithic objects and artifacts that may have been broken can also be conserved and mended.

Believe it or not, stone objects also contain soluble salts that should be thoroughly washed away with passive baths of distilled or deionized water. Their removal, however, is not generally undertaken in the field unless a conservator is present. These salts may be all that is holding the stone together, and so do not attempt to remove them. Allow the stone to continue to dry out slowly and then keep it dry as possible (Sease 1994). Back at the lab when the objects are cleansed of soluble salts, the objects are given a topical application of microcrystalline wax to protect the object and its patina if one exists. Mending is accomplished with a variety of adhesives, such as the nonacidic and reversible Acryloid B-72® (acrylic resin), epoxies, or polyvinyl acetate (PVA).



When artifacts of geological origin are encountered on a site and collected, the type of treatment you prescribe to the object will depend on its weight, hardness, and condition. Muscovite mica, for example, is a member of the silica group with a hardness of 2.5-4. Often it can be scratched with a fingernail and can be floated on water. It also has perfect cleavage which means it breaks along parallel planes like sheets of paper. It would be prudent to handle this material very gently. For many years, the material was used as the protective and translucent viewing window in old furnaces and stoves. It was fireproof and an effective device used to check the fire on a cold winter's night. If you find sheets of this material on a site, try placing them between two stiff pieces of paper or cardboard and secure them with a rubber band. This will prevent the mica from becoming crushed in the bag with other artifacts.

Gemstones and fragments of jewelry containing gemstones should also be treated with plenty of care. The simplest abrasion against the item could remove the gem from its setting, or worse yet, cause it to disintegrate into powder before your very eyes. The burial environment was probably not very friendly to the object as it came into contact with other minerals, percolating waters, and abrasion

from harder materials. If the gem becomes separated from the remaining item, pack both items together with a small amount of soil or most preferably, cotton. Indicate on the container that the item is damaged or separated into two or more fragments. Certain types of precious minerals with an organic origin should never come into contact with water or cleaning fluids. This may include amber, opal, pearl, and jet to name only a few, and are often found combined with other materials. Objects of this nature are referred to as composites. Each material found in composite objects has its own physical and chemical properties. When conservation problems arise as a direct result of an object's manufacture or materials, the deterioration is called inherent vice; the best one can do is to stabilize an object and isolate very reactive materials (Hunt 1992).

Well before Bill Gates' time, our ancestors relied heavily on slate pencils to write in the schoolroom. Slate does not disintegrate with ordinary handling. However, most pieces of slate are rather thin usually averaging 3 to 5 mm in thickness, so handling them carefully is a good idea. Small pieces can be simply placed in empty film canisters when working in the field. Large fragments should be wrapped in tissue paper or lens cleaning paper and labeled "FRAGILE."

Asbestos is a member of the silicate family and fragments of the mineral can be found in exposed quarries containing both antigorite and steatite around Cranston, Rhode Island. Used as a favorite among contractors for fireproofing for many years, the material was declared to be carcinogenic in the

1970s as people became exposed to the fibrous material on work sites. And because the material was favored for its fireproof properties, it was also used in manufacturing brakes for automobiles. When encountered on sites, asbestos should only be collected under the judgment of the Project Director. Only a very small sample should be collected that could be placed into a film canister. Do not tear a small fragment from a larger sample because the fragments can become wind-borne and easily inhaled. Do not attempt to clean the material with a brush as well. Label the container "Contains Asbestos."

Mercury is another material that can pose a hazard to excavators. In its raw mineral form, mercury (or "quicksilver," if you prefer) can be extracted with heat from the mineral, cinnabar. Cinnabar is a scarlet colored mineral and a member of the sulfide family. It was favored for centuries among alchemists who believed the material was vital to turn base metals, such as lead, into gold. Years later, ship captains and physicians began prescribing mercury to kill *Spirochaeta pallida*, the organism responsible for the spread of syphilis. (One of the first areas to be ransacked by attacking pirates on unwary vessels was the captain's medicine chest for curatives.)

While it may be unlikely for an excavator to come across cinnabar or mercury, there still is the possibility that one may encounter small vials of mercury compounds or old thermometers containing mercury on historic sites. The object should be carefully wrapped in tissue paper and then placed into a rigid plastic container, separate from

other artifacts. Spilled mercury should never be handled with the naked hand, as mercury can be absorbed through the skin, or inhaled. Use a pipette, medicine dropper, or spoon to collect the material and carefully place it into a film vial. Be sure to seal the vial with a strong tape, such as duct tape or black electrical tape, and label the container.

Indigenous pottery should also be conserved. Once again, only those samples not selected for dating or materials' testing should be conserved. Typically, indigenous pottery was made from clay and temper, which could have been a mixture of shell, sand, quartz, and feldspar or organic material, such as grass or woody particles. Due to the lower temperatures of firing that was used (lower than the temps used by today's standards), the conditions of the soil, and weathering, much of the pottery is very fragile. Do not grasp the pottery by a remaining handle or by the lip of the container. Instead, block-excavate the object using one of the methods located in the Field Conservation manual. Back at the lab, the chosen material is then desalinated (cleansed of soluble salts) and consolidated. The mending of broken fragments can also be accomplished using one of the adhesives mentioned earlier. The type of adhesive will depend on the condition of the object and an analysis of the object's chemical properties.

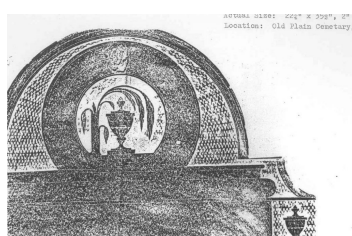
Not all objects can be taken back with us either. Large monuments or cemetery markers found to be too delicate and cumbersome to remove without compromise can still provide us with a "copy" of the objects themselves. For example, if you forgot your

camera back at the office, a simple and quick “rubbing” will do nicely. First try to gently clean the surface of the object you wish to copy with a stiff brush to remove all debris, such as dirt, moss, and animal droppings. Then cover the surface with a sheet of rice paper or blank newspaper print. Tape the paper to the surface with masking tape. Using a black crayon, graphite stick, or rubbing wax (by Oldstones®), rub the wax or crayon lightly until the image begins to appear. Rub small sections at a time and gradually darken in the design being careful to avoid tearing the paper. With a little practice, rubbings prove to capture a large amount of information, which can often be missed by the unaided eye or lens of the camera. Supplies are inexpensive and little material needs to be carried into the field.

A word of caution though; be respectful to cemetery monuments and passers by. Avoid contaminating the stone with your rubbing material. Remove all traces of masking tape and do not leave any materials or trash behind. For some cemeteries and public parks (especially those located in Massachusetts) a permit must first be obtained with the local Cemetery Registrar before rubbings can be obtained. This is because too many people have been leaving behind rubbish, tape, paper, and damaging stones from aggressive cleaning and rubbing. Respect the laws and seek guidance from the town clerk prior to your trip to the monuments with a pocketful of rubbing wax. They will appreciate your courtesy and may also provide you with additional information related to your search. Some yards also require a small admission fee for the privilege of using the yard. In

many graveyards, it would be cumbersome or impossible to enforce a rubbing-fee regulation, but in some popular urban graveyards and cemeteries a sign instructing rubbers to sign in and pay at the parsonage or caretaker's quarters or town hall, discourages careless rubbing practices. The money collected usually goes toward the maintenance of the yard (Strangstad 1995).

Finally, don't forget to list the type of stone material used and the size and location on the grounds. Report any damage or vandalism you discover to the cemetery registrar or town historian.



Geological materials can provide a plethora of information. Only greater familiarity with lithics, geofacts, or objects manufactured from geological material will improve your initial assessments of sites that contain geologic material. For the future, it would be wise to purchase your own rock and mineral field guide, and perhaps a rock hardness kit. These will not only assist you to identify the lesser-known types of materials you encounter, but you will develop a greater appreciation for their presence. With time, you will begin to identify the type of lithic materials that are either indigenous or exotic to the area you are working in.

Bibliography

Fisher, Donald W. 2006 The Rise and Fall of the Taconic Mountains, A Geological History of Eastern New York. Black Dome Press Corp., Hensonville, New York.

Hunt, Valerie Reich 1992 Composite Objects: Materials and Storage Conditions. Conservation Concerns, A Guide for Collectors and Curators, Smithsonian Institution Press, Washington, D.C.

Sease, Catherine 1994 A Conservation Manual for the Field Archaeologist. 3rd ed. Institute of Archaeology, University of California, Los Angeles, California.

Strangstad, Lynette 1995 A Graveyard Preservation Primer. Alta Mira Press, Walnut Creek, California.

Posted in: Geological

Filed under: conservation, excavation, geological, objects

THE SOLUBLE AND INSOLUBLE
SALTS GANG: A FREAKY FAMILY
WITH BAD INFLUENCES →