# INVESTIGATION OF ROCK PILES, YORK COUNTY, SOUTH CAROLINA

**CHICORA RESEARCH CONTRIBUTION 469**

# INVESTIGATION OF ROCK PILES, YORK COUNTY, SOUTH CAROLINA

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# ABSTRACT

This study reports on the analysis of several rock piles in a residential development in Fort Mill, South Carolina. The work was conducted to assist Mr. Eric Greenway and Coulston Enterprises determine if the rock piles represented human burials that required further investigation or avoidance.

The surrounding area is being rapidly developed into residential and commercial properties. The topography in the area is rolling with the suspect rock piles located on a steep slope. A mixed pine and hardwood forest is located in the areas that have not been disturbed by construction.

For this investigation an area (APE) 0.5 mile around the rock piles was examined in an attempt to locate any previous sites that may be connected to the piles. An investigation of the archaeological site files at the S.C. Institute of Archaeology and Anthropology failed to identify any previously recorded sites within 0.5 mile of the project area. The S.C. Department of Archives and History GIS was consulted for any previously recorded sites. No sites were found within 0.5 mile.

Regional aerial photographs were examined at the Map Repository in the Thomas Cooper Library on the University of South Carolina campus. These maps were used to check for nearby cultivation and other land use activity.

The investigation included the recordation of the location of each rock pile using a Global Positioning Satellite (GPS) after which a penetrometer was used to check for differences in soil compaction around the area. One representative rock pile was chosen in which a test unit was excavated to check for cultural materials.

As a result of these investigations no cultural materials or evidence of human remains were identified within the unit. Given the steep slope on which the rock piles are located, the nearby historic cultivation, and the lack of bone or other materials, we believe that the area was not likely used as a cemetery.

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# INTRODUCTION

This investigation was conducted by Dr. Michael Trinkley of Chicora Foundation, Inc. for Mr. Eric Greenway of Coulston Enterprises. The work was conducted to assist Coulston Enterprises determine if the rock piles might mark human burials or be otherwise associated with significant cultural or historical activities.

These rock piles are located in Fort Mill, South Carolina (Figure 1). The property is in a newly developed area off Regent Parkway, however since the development is so recent, the modern topographic map (revised in 1980) does not reflect the construction (Figure 2).

As previously mentioned, the area is undergoing residential and commercial development. This will entail the construction of infrastructure, such as roads, stormwater drainage, and utilities, as well as the construction of residences. These activities will include clearing of timber, grubbing, and grading, which may cause significant damage to any archaeological resources present.

There will also be some short-term construction related affects, such as increased noise, construction traffic, and increased dust levels. There will be a need for erosion control, especially on the slope where the rock piles exist.

There are no considerations of long-term secondary affects, such as increased traffic, changes in property values, or additional development spurred by this undertaking. We understand from the client that the work does not involve any permits that would trigger Section 106 review or compliance.

We were contacted by Mr. Eric Greenway of Coulston Enterprises in January 2007 about the possibility of rock piles being a cemetery. A proposal for the work, which included historic research and a field investigation, was issued on January 29, 2007.

These investigations incorporated a review of the site files at the South Carolina Institute of Archaeology and Anthropology. As a result of that work, no sites were found in 0.5 mile of the project.

The South Carolina Department of Archives and History GIS was consulted to check for any NRHP buildings, districts, structures, sites, or objects in the study area. Although a comprehensive architectural survey has been performed for York County, no sites were found within 0.5 mile of the rock piles (Kissane and Kissane 1992). The GIS failed to reveal any archaeological work performed for the recent developments, consistent with the statement that the projects did not involve federal funding, licensing, or permitting.

Archival and historical research incorporated a review of secondary sources available in the Chicora Foundation files. In addition, aerial photographs were examined at the map repository of the Thomas Cooper Library at the University of South Carolina campus.

The investigation was conducted on March 29 by Ms. Nicole Southerland and Ms. Julie Poppell under the direction of Dr. Michael Trinkley. After an analysis of the rock piles, it is our finding the area was not used as a cemetery. While the exact cause for the piles is unknown, a more reasonable explanation has to do with agricultural activities.

This report details the investigation of the rock piles undertaken by Chicora Foundation and the results of that investigation.

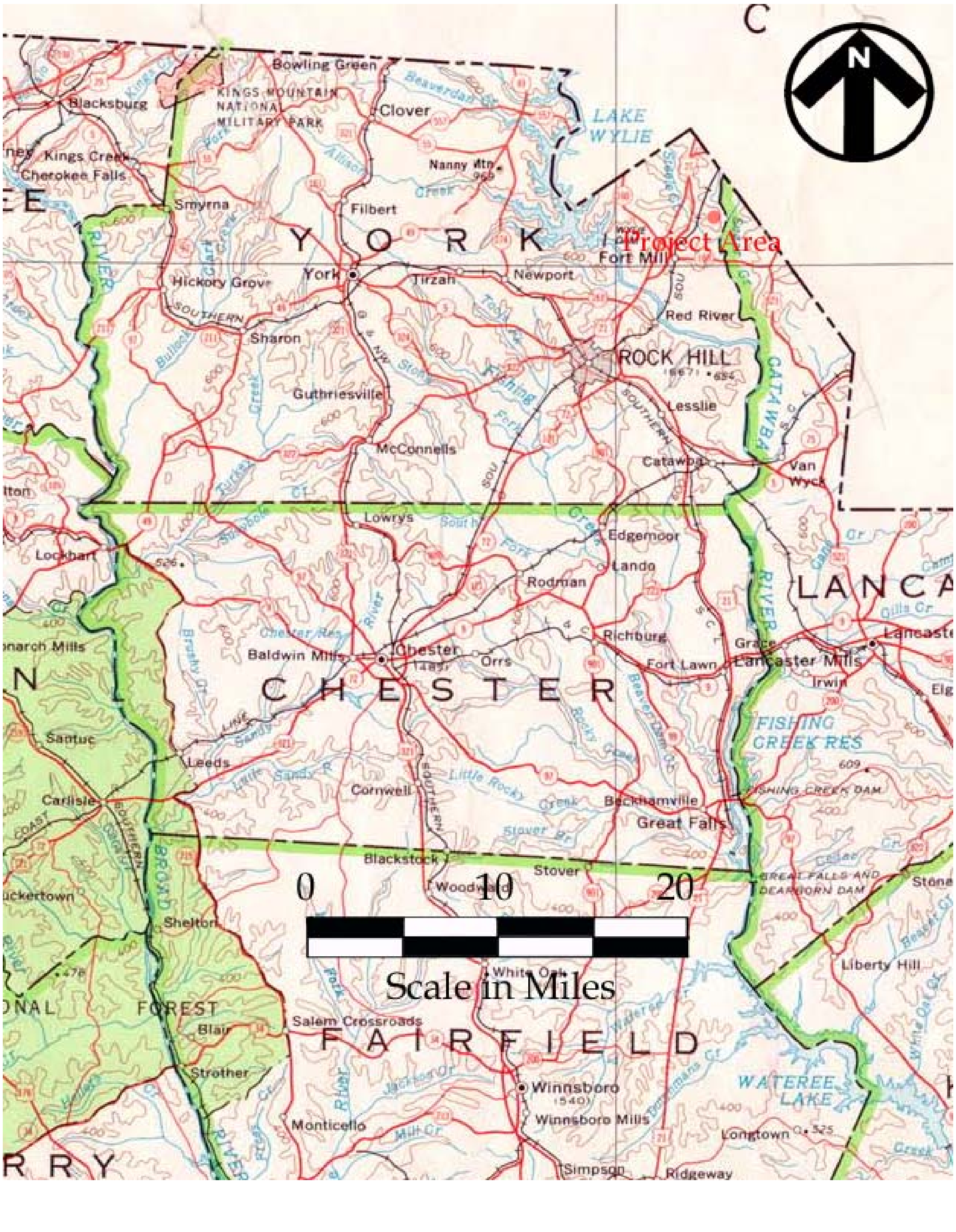


Figure 1. Project vicinity in York County (basemap is USGS South Carolina 1:500,000).

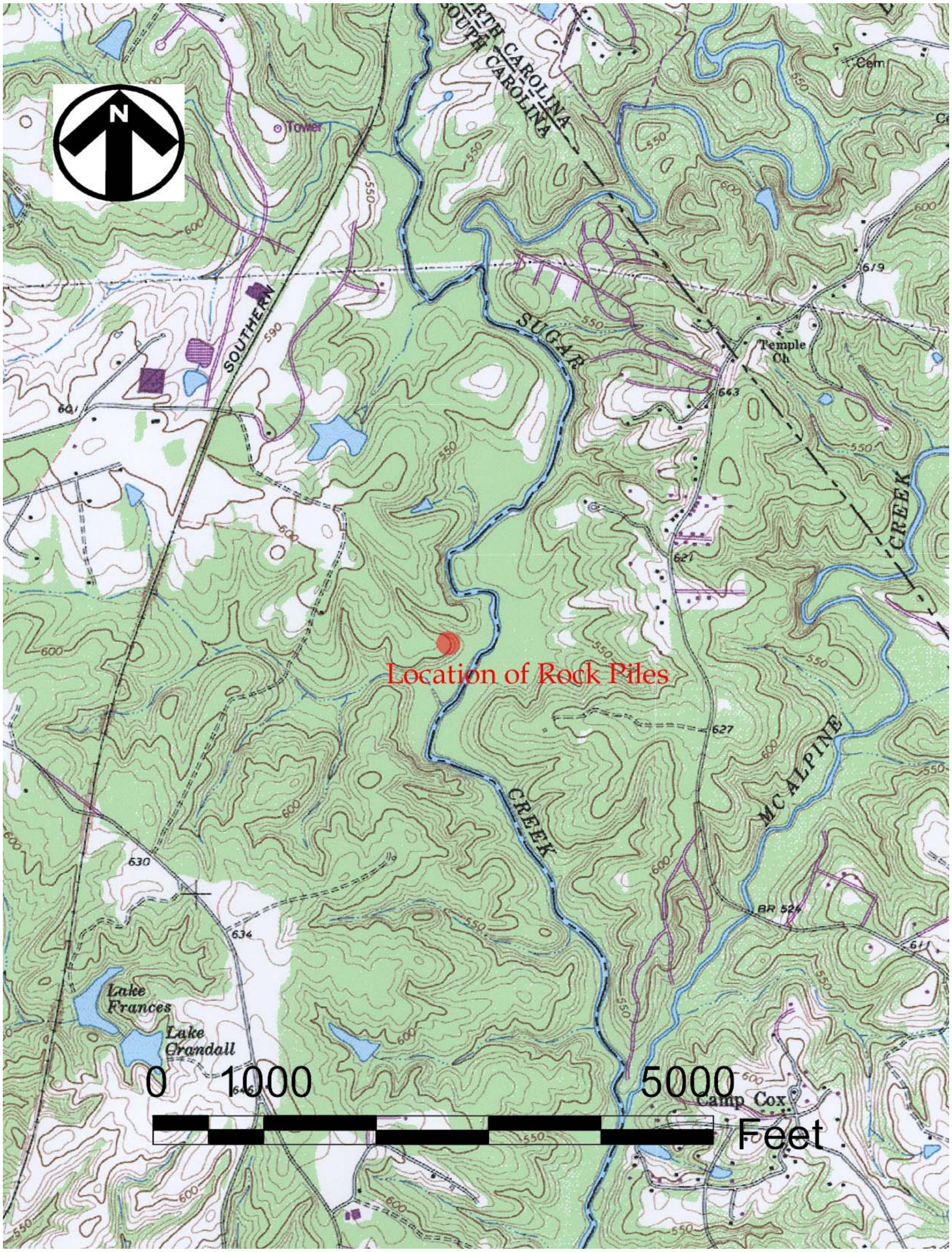


Figure 2. Location of rock piles (basemap is USGS Fort Mill 7.5′).

# NATURAL ENVIRONMENT

## Physiographic Province

York County, forming part of South Carolina's north central boundary with North Carolina, is bordered to the east by Mecklenburg and Lancaster counties, to the south by Chester County, to the southwest by Union County, and to the west by Cherokee County.

The county is located within the Piedmont physiographic area and has a topography ranging from nearly level to steep (Camp 1965). Slopes in the location of the rock piles are nearly 25%.

The Piedmont, possibly part of the peneplain, is characterized by the dendritic stream patterns. It is also characterized by a range of metavolcanic, quartz, and quartzite materials used by Native Americans for stone tools. To the south of the county is the Coastal Plain, where the topography changes dramatically with the hilly upper Coastal Plain giving way to the broad expanses of relatively flat, level ground associated with the lower Coastal Plain. These areas provide sources for Coastal Plain cherts, also used extensively for tool manufacture.

The elevations where the rock piles are located ranges from 510 to 550 feet above mean sea level (AMSL). In general, the land slopes to the southeast toward Sugar Creek.

## Geology and Soils

Most of the rocks of the Piedmont are gneiss and schist, with some marble and quartzite (Hasselton 1974). Some less intensively metamorphosed rocks, such as slate, occur along the eastern part of the province from southern Virginia into Georgia. This area, called the Slate Belt, is characterized by slightly lower ground with wider river valleys. Consequently, the Slate Belt has been favored for reservoir sites (Johnson 1970), as well as prehistoric occupation (see Coe 1964). In York County, many of the Piedmont soils are weathered from argillites rich in silica and alumina. Other soils are formed in sapprolite that weathered from crystalline rocks and "Carolina Slates." Soils from the river floodplains formed in sediment that washed from the uplands of the Piedmont province.

Figure 3. View of vegetation and steep slope in the area.

The rock piles are found exclusively on Cecil soils. These soils are well-drained and eroded. Generally, Cecil soils have an Ap horizon of dark brown (10YR4/3) sandy loam to 0.5 foot over a yellowish red (5YR5/8) clay loam to 1.2 feet in depth. A large amount of cobble-size rocks were found throughout the unit.

The 1934 *Reconnaissance Erosion Map of*

*South Carolina* shows this portion of York County as having 75-100% of the surface eroded, with occasional gullies.

**Climate**

Elevation, latitude, and distance from the coast work together to affect the climate of South Carolina, including the Piedmont. In addition, the more westerly mountains block or moderate many of the cold air masses that flow across the state from west to east. Even the very cold air masses that cross the mountains are warmed somewhat by compression before they descend on the Piedmont.

Consequently, the climate of York County is temperate. The winters are relatively mild and the summers warm and humid. Rainfall in the amount of about 46.7 inches is adequate, although less than in some neighboring counties.

**Floristics**

Piedmont forests generally belong to the Oak-Hickory Formation as established by Braun (1950). Regardless, the potential natural vegetation of the project area is the Oak-Hickory-Pine forest, composed of medium tall to tall forests of broadleaf deciduous and needleleaf evergreen trees (Küchler 1964). The major components of this ecosystem include hickory, shortleaf pine, loblolly pine, white oak, and post oak.

Besides mixed pines and hardwoods, the project area is impacted by wetlands of Sugar Creek to the southeast.

# RESEARCH METHODS AND FINDINGS

## Archaeological Field Methods and Findings

The initially proposed field techniques involved taking GPS readings at each of the rock piles (we identified 11 piles). A penetrometer would be used to test the compaction of the soil to see if any variations occurred, after which a representative rockpile would be chosen and a 1.5 foot square test unit would be excavated in the middle. This would confirm the soil profile and determine if there was evidence of a pit or disturbance below the rocks.

All soil would be screened through ¼-inch mesh with the test taken to a depth of at least 1.0 foot or until subsoil was encountered. All cultural remains would be collected. Notes would be maintained for the profiles from the unit.

The GPS positions were taken with a WAAS enabled Garmin 76 rover that tracks up to twelve satellites, each with a separate channel that is continuously being read. The benefit of parallel channel receivers is their improved sensitivity and ability to obtain and hold a satellite lock in difficult situations, such as in forests or urban environments where signal obstruction is a frequent problem. WAAS or Wide Area Augmentation System, is a system of satellites and ground stations that provide GPS signal corrections, yielding higher position accuracy – generally and accuracy of 10 feet or better 95% of the time. The dense tree cover was a vital concern for the project area.

As previously mentioned, eleven rock piles were recorded (Table 1). Each pile was a slightly different size with the smallest pile approximately 3 feet by 3 feet and the largest about 9 feet by 8 feet. The height varies depending on the size of the rocks (which ranged from about 0.4 foot to 1.0 foot in size). Most piles were about 1.0 foot in height. The pile selected for excavation measured approximately 9 feet east-west by 6 feet north-south.

The penetrometer was used in an attempt to identify soil anomalies that may appear to be possible grave sites. The penetrometer is a device for measuring the compaction of soil. Soil compaction is well understood in construction, where its primary objective is to achieve a soil density that will carry specified loads without undue settlement, and in agronomy, where it is recognized as an unfavorable by-product of tillage. Compaction is less well understood in

Figure 4. View of the rock pile chosen for excavations.

Table 1.
Coordinates of each rock pile

| Rock Pile | Easting | Northing | Notes |
|---|---|---|---|
| 1 | 508650 | 3878465 | Disturbed- someone has dug underneath pile |
| 2 | 508634 | 3878462 | Excavated test unit |
| 3 | 508638 | 3878449 | |
| 4 | 508626 | 3878442 | |
| 5 | 508620 | 3878439 | |
| 6 | 508614 | 3878444 | |
| 7 | 508627 | 387449 | |
| 8 | 508627 | 3878459 | |
| 9 | 508612 | 3878458 | |
| 10 | 508658 | 3878467 | |
| 11 | 508665 | 3878521 | Separated from 1-10 by modern road |

archaeology, although some work has been conducted in exploring the effects of compaction on archaeological materials (see, for example, Ebeid 1992).

In the most general sense, the compaction of soil requires movement and rearrangement of individual soil particles. This fits them together and fills the voids that may be present, especially in fill materials. For the necessary movement to occur, friction must be reduced, typically by ensuring that the soil has the proper amount of moisture. If too much is present, some will be expelled and in the extreme the soils become soupy or like quicksand and compaction is not possible. If too little is present, there will not be adequate lubrication of the soil particles and, again, compaction is impossible. For each soil type and condition, there is an optimum moisture level to allow compaction.

When natural soil strata are disturbed – whether by large scale construction or by the excavation of a small hole in the ground – the resulting spoil contains a large volume of voids and the compaction of the soil is very low. When this spoil is used as fill, either in the original hole or at another location, it likewise has a large volume of voids and a very low compaction.

In construction, such fill is artificially compacted, settling under a load as air and water are expelled. For example, compaction by heavy rubber-tired vehicles will produce a change in density or compaction as deep as 4 feet. In agriculture, tillage is normally confined to dry weather or the end of the growing season – when the lubricating effects of water are minimized.

In the case of a pit, or a burial, the excavated fill is typically thrown back in the hole not as thin layers that are then compacted before the


Figure 5. Excavating the test unit.

next layer is added, but in one, relatively quick, episode. This prevents the fill from being compacted, or at least as compacted as the surrounding soil.

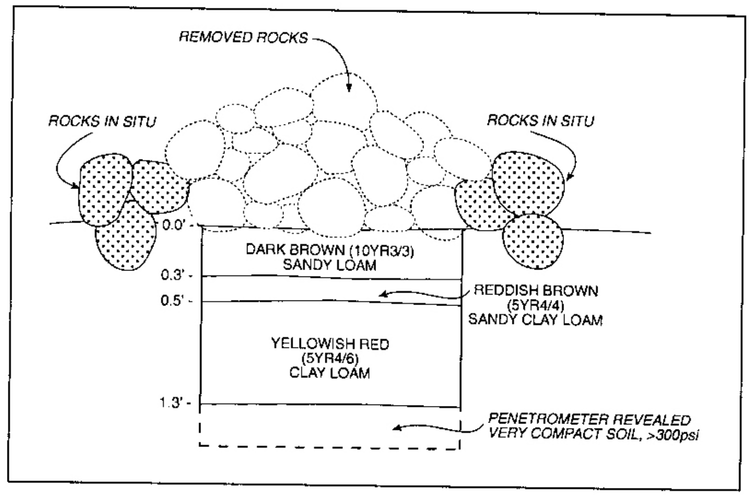


Figure 6. Sketch map showing the test unit.

Penetrometers come in a variety of styles, but all measure compaction as a numerical reading, typically as pounds per square inch (PSI). The dickey-John penetrometer consists of a stainless steel rod about 3-feet in length, connected to a T-handle. As the rod is inserted in the soil, the compaction needle rotates within an oil filled (for damping) stainless steel housing, indicating the compaction levels. The rod is also engraved at 3-inch levels, allowing more precise collection of compaction measurements through various soil horizons. Two tips (½ - inch and ¾- inch) are provided for different soil types.

Of course a penetrometer is simply a measuring device. It cannot distinguish soil compacted by natural events from soil artificially compacted. Nor can it distinguish an artificially excavated pit from a tree throw that has been filled in. Nor can it, per se, distinguish between a hole dug as a hearth and a hole dug as a burial pit. What it does is convert each of these events to PSI readings. It is then up to the operator to determine through various techniques the cause of the increased or lowered soil compaction.

Curiously, penetrometers are rarely used by archaeologists in routing studies, although they are used by forensic anthropologists (such as Drs. Dennis Dirkmaat and Steve Nawrocki) and by the Federal Bureau of Investigation (Special Agent Michael Hockrein) in searches for clandestine graves. While a penetrometer may be only marginally better than a probe in the hands of an exceedingly skilled individual with years of experience, such ideal circumstances are rare. In addition, a penetrometer provides quantitative readings that are replicable and which allow much more accurate

Figure 7. View of test unit.

documentation of cemeteries. In fact, as will be discussed here, our research in both sandy and clayey soils in Virginia, North Carolina, South Carolina, and Georgia suggests very consistent graveyard readings.

While it is important to compare suspect readings to those from known grave areas, we were unsure whether the current rock piles were indeed graves. For work at several grave yards where unmarked graves were identified, we have found that the compaction is typically under 150 PSI, usually in the range of 50 to 100 PSI, while non-grave areas exhibit compaction that is almost always over 150 PSI, typically 160 to 180 PSI (Trinkley and Hacker 1997a, 1997b, and 1998; Trinkley 2007).

In the project area, readings were taking directly under the rock piles, around the rock piles, and in areas where no rock piles were located. The readings varied dramatically. For example, some areas directly under rock piles gave readings over 300 PSI only an inch below the surface, while areas away from the piles read 150 PSI for approximately one foot in depth. However, some of the areas that read 150 PSI could be tested a foot away and exhibit readings over 300 PSI. In other words, the soil beneath the rock piles failed to present readings indicative of disturbed soils. Very few readings were under 200 to 300 PSI. The few readings of 150 PSI appeared to be isolated and could be the result of tree or animal disturbance. In almost all of the readings, a very hard clay subsoil was encountered from one inch to one foot in depth.

For the representative pile, rock was cleared off the surface and a 1.5 foot square test unit was measured into the soil. All soil was screened; however, no cultural material (e.g. flakes, pottery, or bone) was found.

The soil profile was similar to the Cecil soils found in the area. Generally the Cecil Series has an Ap horizon of dark brown (10YR4/3) sandy loam to 0.5 foot over a yellowish red (5YR5/8) clay loam to 1.2 feet in depth. With the test unit, the surface dark brown layer was closer to 10YR3/3 and only extended to 0.3 feet. A 0.2 foot reddish brown (5YR4/4) layer separated the dark brown and yellowish red (5YR4/6) layer of clay loam, which extended to 1.3 feet in depth. At the bottom of the test unit, the penetrometer was used and revealed a very hard clay about 0.2 feet past the excavated layer (Figure 6).

As previously mentioned, the investigation of the rock piles failed to identify any evidence that the area was used as a burial ground. The size and shape of the rock piles exhibited no uniformity, the penetrometer survey failed to give any readings indicative of disturbance in the soil, and the test unit in one rock pile produced no archaeological material.

The location of the rock piles on a steep side slope, which has a history of severe erosion, also makes a convincing argument against the use as a burial ground. A small prehistoric lithic scatter was identified on the ridge top just west of the piles, however no diagnostic artifacts were found and the remains were sparse. The ridge top was out of the project area, so no site form was produced.

While we are fairly certain that the area was not used as a burial ground, the question still remains as to why the rock piles were created.

Rock piles are somewhat common in South Carolina. One study in Saluda County (Brockington 1977) investigated a series of rock mounds, which appear to be close to the same size as those from the current study. Excavations were performed into each pile, but no artifacts were found. Brockington felt the piles were unlikely the result of agriculture (many farmers would remove rocks from fields and pile them on the perimeter), because of the lack of plow marks and the creation of ten piles as apposed to one large pile. Instead, Brockington's (1977) "best guess" indicates the rock piles were from "individual truckloads of rock dumped in the area." No additional investigations were recommended for the piles.

While our research fails to conclusively reveal the reason for the piles, we believe they are agriculturally related. Unlike Brockington's (1977) hypothesis that a truck dropped the rocks, the current project's location on a steep slope make it unlikely that a modern vehicle would have dumped them. A search of old aerial photographs of the region revealed that at least from 1949 to 1954, an area close by was being plowed (Figure 8). The piles of rocks could be the result of horse/mule carts dumping the rocks away from the field. The 1955 *Belknap Hardware & Manufacturing Co.* catalog reveals that singletrees and yokes, both used to connect horses or mules to wagons or plows, were still being sold, indicating that tractors were not yet being used in all areas. A pack animal would have an easier time maneuvering the steep slope than would a mechanical vehicle. Animal plowing is also more hindered by large rocks than modern plows, providing impetus for farmers to clear such obstacles.

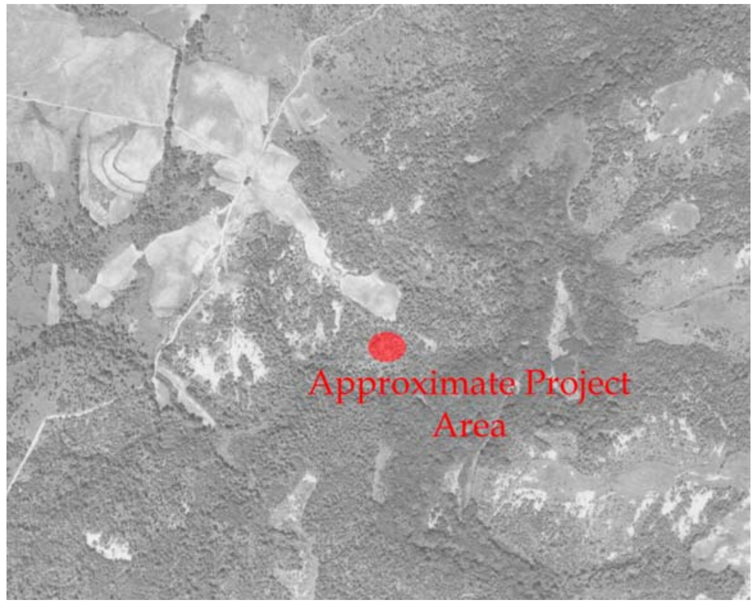


Figure 8. View of 1949 aerial photograph showing the approximate project area near a plowed field.

Without definitive evidence for the creation of the piles, we cannot be sure of why or when they were created. However, without any other cultural materials in the area, the piles do not appear to be able to address any significant research questions. We also failed to identify any evidence of human remains.

# CONCLUSIONS

This study involved the examination of several rock piles, in York County.  The area is being developed for a neighborhood of single family homes.  This work, conducted for Mr. Eric Greenway of Coulston Enterprises examined the rock piles and their possible use as a burial ground.

After recording the location of each pile with a GPS, examining the area with a penetrometer, and excavating a test unit in a pile, it is our conclusion that the features are not the result of a burial ground.  The steep slope and severe erosion also provide evidence against the use as a burial ground.

While the exact reason for the piles is unknown, we think the most plausible explanations is due to agricultural practices.  The mid-twentieth century saw plowing in the area, somewhat close to the location of the rock piles. Many farmers would remove large rocks from their fields to make plowing easier.  This area of the piedmont produces much rock in the soil, as evidenced from the large amount of cobble-size rocks found in the test unit.  While extensive title research and oral history may reveal who created the piles, why, and when the piles were created, the lack of other cultural materials in the area make it unlikely that the piles will be able to address significant archaeological research questions.

Construction activities should be allowed to proceed, however it is possible that archaeological remains may be encountered during construction activities.

# SOURCES CITED


Braun, Lucy
1950 *Deciduous Forests of Eastern North America.* Hafner Publishing, New York.

Brockington, Paul E.
1977 *Report of Reconnaissance: Summer-Graniteville-230kV Transmission Line (SCE&G): Station 1164+90 "Mounds."* Research Manuscript Series 114. S.C. Institute of Archaeology and Anthropology, Columbia.

Camp, Wallace J.
1965 *Soil Survey of York County, South Carolina.* U.S.D.A. Soil Conservation Service, Washington, D.C.

Coe, Joffre
1964 *The Formative Cultures of the Carolina Piedmont.* Transactions of the American Philosophical Society 54(5).

Ebeid, Zakaria
1992 Laboratory Experiments to Study the Effects of Compaction and Pressure on Artifacts in Archaeological Sites. *Archaeological Sites Protection and Preservation Notebook,* Technical Notes ASPPN II-5. Environmental Impact Research Program, Waterways Experiment Station, Army Corps of Engineers, Vicksburg, Mississippi.

Hasselton, George M.
1974 Some Reconnaissance Geomorphological Observations in Northwestern South Carolina and Adjacent North Carolina. *Geologic Notes* 18(4):60-67.

Johnson, Thomas F.
1970 *Paleoenvironmental Analysis and Structural Petrogenesis of the Carolina Slate Belt near Columbia, South Carolina.* Unpublished M.S. Thesis, University of South Carolina, Columbia.

Kissane, Amy C. and John A. Kissane
1992 *Survey Report: York County Historical and Architectural Inventory.* The Jaeger Company, Gainesville, Georgia.

Küchler, A.W.
1964 Potential Natural Vegetation of the Conterminous United States. *American Geographical Society Special Publication* 36.

Townsend, Jan, John H. Sprinkle, Jr., and John Knoerl
1993 *Guidelines for Evaluating and Registering Historical Archaeological Sites and Districts.* National Register of Historic Places, Washington, D.C.

Trinkley, Michael
2007 *Penetrometer Study of the Macedonia Baptist Church, Cherokee County, South Carolina.* Research Contribution 465. Chicora Foundation, Inc., Columbia.

Trinkley, Michael and Debi Hacker
1997a *Additional Boundary Research at the*

*Kings Cemetery (38CH1590), Charleston County, South Carolina.* Research Contribution 214. Chicora Foundation, Inc., Columbia.

1997b *Grave Inventory and Preservation Recommendation for the Maple Grove United Methodist Church Cemetery, Haywood County, North Carolina.* Research Contribution 230. Chicora Foundation, Inc., Columbia.

1998 *Grave Inventory and Preservation Recommendations for the Walker Family Cemetery, Greenville County, South Carolina.* Research Contribution 248. Chicora Foundation, Inc., Columbia.