EXCAVATIONS AT 38CH173 AND 38CH175, CHARLESTON NATIONAL GOLF COURSE, CHARLESTON COUNTY, SOUTH CAROLINA

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EXCAVATIONS AT 38CH173 AND 38CH175, CHARLESTON NATIONAL GOLF COURSE, CHARLESTON COUNTY, SOUTH CAROLINA

RESEARCH SERIES 41

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"They couldn't hit an elephant at this dist—"

Last words of Union Major General
John Sedgwick, who was mistaken.
Virginia, May 9, 1864

ABSTRACT

This study presents the results of excavation at 38CH173 and 38CH175, both located on the Charleston National Golf Course approximately 8 miles north of the city of Mount Pleasant. Both sites were surveyed by Brockington and Associates, Inc. in 1987 and were recommended as eligible for inclusion on the National Register of Historic Places. Site 38CH173 was recommended as eligible for the National Register based on its perceived ability to address research questions about Mississippian period lifeways. Site 38CH175 was recommended as eligible for inclusion on the National Register based on its ability to address questions about the Thoms Creek occupation of the area. It was determined that both sites would be preserved in place and an unspecified amount of fill was placed over the sites. Due to a change in development plans, the owners decided to conduct data recovery excavations at these two sites since development activities would adversely impact these areas.

38CH173 is a multicomponent prehistoric site with remains from the Thom's Creek phase to the Mississipian Period. The site showed evidence of damage from a number of sources including plowing, creation of a pond, tree removal, and possibly, golf course construction. Four hundred square feet was excavated as contiguous units to examine an area where a small shell midden was found eroding into the adjacent pond. Only one intact feature was uncovered during excavation. This feature is a shell pit with the latest pottery dating to the Deptford phase. The site was stripped at the end of controlled excavations and a number of other possible features were encountered including shell pits and postholes. All of these features were plotted, although no patterns or structures were discernable.

38CH175 is a dense shell midden dating to the Thom's Creek phase. After locating the densest midden area through close interval shovel testing, 350 square feet were excavated in contiguous units in order to better understand midden deposition and disturbance. Excavation in the area revealed that the top 1.3 feet had been badly damaged by historic land use. One shallow shell pit feature was identified at the base of excavations. After the excavations were completed, the surrounding area (approximately 150 by 250 feet), believed to contain the highest archaeological integrity, was stripped. During site stripping, at least two historic features (an old road bed and a burn area) were identified in the subsoil. Several prehistoric features were located including three possible posts and five possible shell pits.

Previous investigators noted minor topographic relief at the site which they believed was either push piles from the razing of a twentieth century structure or the remnants of a shell ring. Current investigations found no evidence to support the argument that the site was a shell ring. There was little artifact diversity (i.e., only sherds and a few lithics; no bone pins, worked antler, etc.), subistence remains were sparse, and artifact density was low. In addition, the characteristic stratigraphy associated with shell rings was not present. Sherds at the site were crushed and very small. It is possible that some seasonal occupation of the site occurred, but no evidence for structures was found in the area examined. Based on the artifacts and types of features, the site was primarily used as a staging round for shellfishing activities. It is also possible that some (perhaps even most) of the upper shell midden was brought in from elsewhere for use in the lime kiln identified at the site.

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ACKNOWLEDGEMENTS

These investigations were conducted through the auspices of Charleston National Golf Course in Mount Pleasant, South Carolina. We wish to particularly thank Mr. Walter Mueller of Charleston National Golf Course for administering the project and for his support of our efforts to better understand the prehistory of the Mt. Pleasant area.

Mr. Bob Morgan provided peer review comments. We are grateful for his time, energy, and insight. We also wish to thank Mr. Niels Taylor for reviewing the report. Also, thanks to Mr. Lee Tippett for adding insight from his experience when the sites were surveyed by Brockington and Associates, Inc. and for providing information on site green spacing in South Carolina. We sincerely wish to thank those who worked in the field -- Mr. Ryan Boera, Ms. Kris Fowler, and Mr. Chris Nichols. Their professionalism and dedication are greatly appreciated.

Many thanks to Dr. Bob Thorne of the National Clearinghouse for Archaeological Site Stabilization, Center for Archaeological Research, at the University of Mississippi for providing us with an annotated bibliography of archaeological site preservation and conservation papers and publications. We would also like to thank Dr. David Anderson and Mr. Bob Morgan for their willingness to discuss the green spacing issues that they have encountered and for providing direction to published documents on site green spacing.

Finally, we wish to thank the numerous golfers who stopped by the site and expressed an interest in the archaeology and history of the Mt. Pleasant area. We also appreciate their patience with the inconvenience our work caused.

INTRODUCTION

Natalie Adams

Background

Sites 38CH173 and 38CH175 are situated in Charleston County, approximately 8 miles north of the city of Mount Pleasant, within the confines of Charleston National Golf Course (Figure 1). The golf course is bordered to the north by Stratton Place development, to the east by Copahee Sound, to the south by Oakland Plantation, and to the west by U.S. Highway 17. Both sites are located in the south central portion of the golf course development, adjacent to Copahee Sound (Figure 2).

The sites referenced in this report as 38CH173 and 38CH175 were first recorded by Michael Trinkley and Jacki Carter in 1975. Based on that survey the two sites were originally recorded as 38CH175 and 38CH174 respectively. During the Brockington and Associates survey (Brockington et al. 1987), over a decade later, the sites were incorrectly located in the field, resulting in transposed numbering. Because of the confusion correcting these inconsistencies would cause, Chicora Foundation has elected, in consultation with Mr. Keith Derting at the S.C. Institute of Archaeology and Anthropology, to maintain the numbering scheme proposed by Brockington and Associates. Researchers, however, should be aware that this scheme differs substantially from the numbering used by the Trinkley and Carter (1975) survey.

Trinkley and Carter described 38CH173 (originally 38CH175) as shell midden debris exposed by the digging of a marina or lagoon. Most of the site was believed to have been destroyed by this excavation. Vegetation consisted of new pine forest in an area believed to have been plowed at one time (Figure 3). A 1967 areal photograph reveals that, indeed, the site had been plowed (Figure 4) and apparently was placed in planted pines during the mid-1970s. This areal photograph also reveals that the pond was excavated in a high ground area and does not reflect any prehistoric slough or marsh area. Brockington and Associates excavated a total of 27 shovel tests and a one meter square test unit at 38CH173, and described the site as dating "to the Mississippian period (with earlier components present)". According to Brockington et al. (1987) the site contained shell midden which was disturbed to a depth of 10 cm below surface. The site was recommended as eligible for inclusion on the National Register of Historic Places based on its ability to address research questions relating to Mississippian lifeways, in spite of only 15 (or 11%) of the sherds dating to this period.

Site 38CH175 (originally designated 38CH174) was described by Trinkley and Carter (1975) as a Thom's Creek period site located on a bluff adjacent to Copahee Sound (Figure 5). They described disturbances as consisting of house construction and possible plowing. The 1967 area photograph (Figure 4) indicates that the area was not plowed at that time, but a substantial house occupied the site. Based on aerial photographs, it appears that at least the core of the site had not been plowed in the twentieth century. Brockington and Associates excavated a total of 48 shovel tests and one 1-meter test unit. According to the field investigators there was minor topographic relief which may have been associated with push piles associated with razing of a twentieth century house, or a shell ring. A review of areal photographs and county road maps indicates that the structure was demolished sometime between 1971 and 1978, and Trinkley remembers that no structure was present during his 1975 visit (Michael Trinkley, personal communication 1994). Shovel testing also revealed that the area of highest archaeological integrity was located within a 50 by 115 foot area. 38CH175 was recommended as eligible for inclusion on the National Register based on its ability to address a number of research questions relating to the Thom's Creek Period.

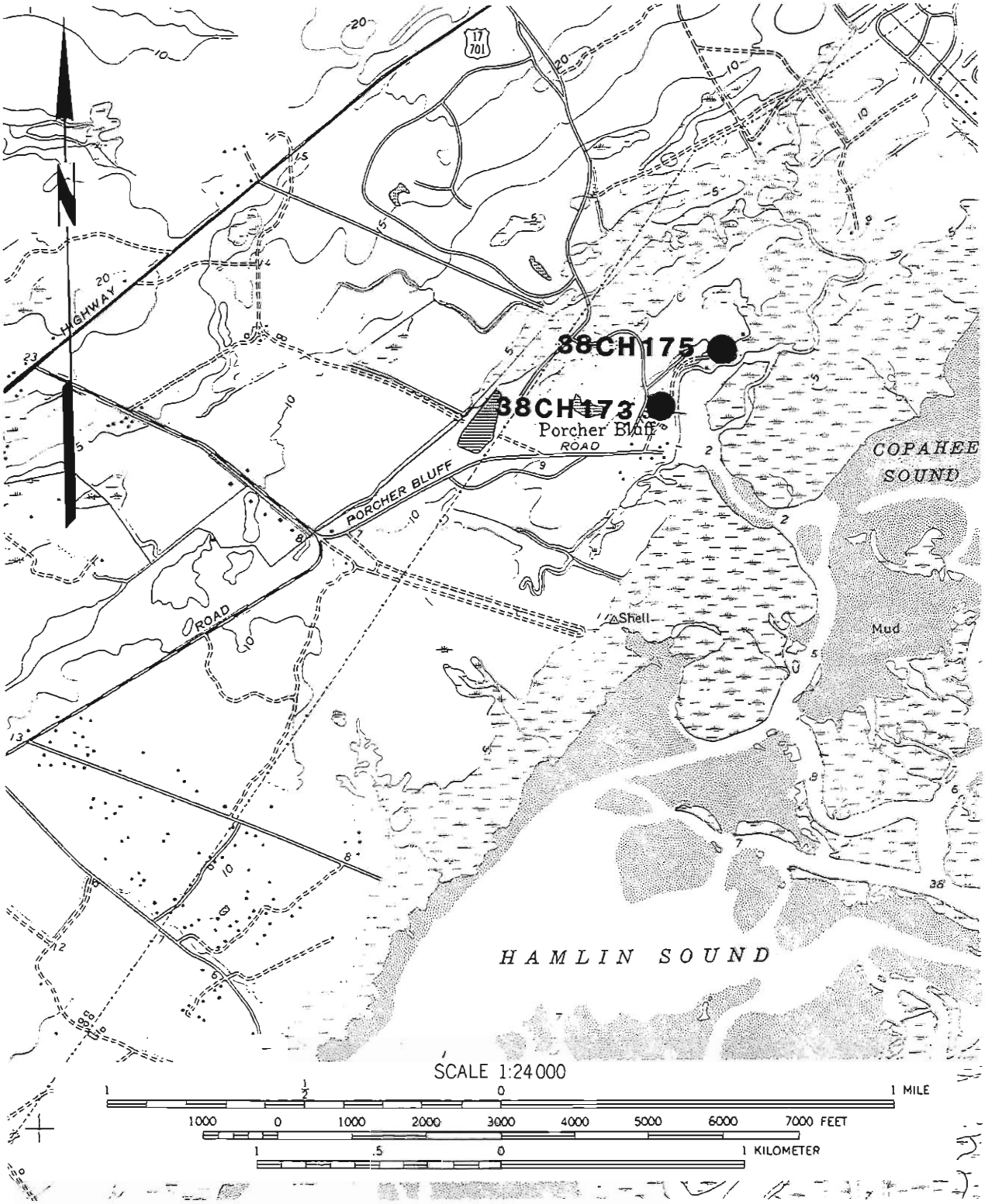


Figure 1. Location of 38CH173 and 38CH175 on the Fort Moultrie USGS Quadrangle.

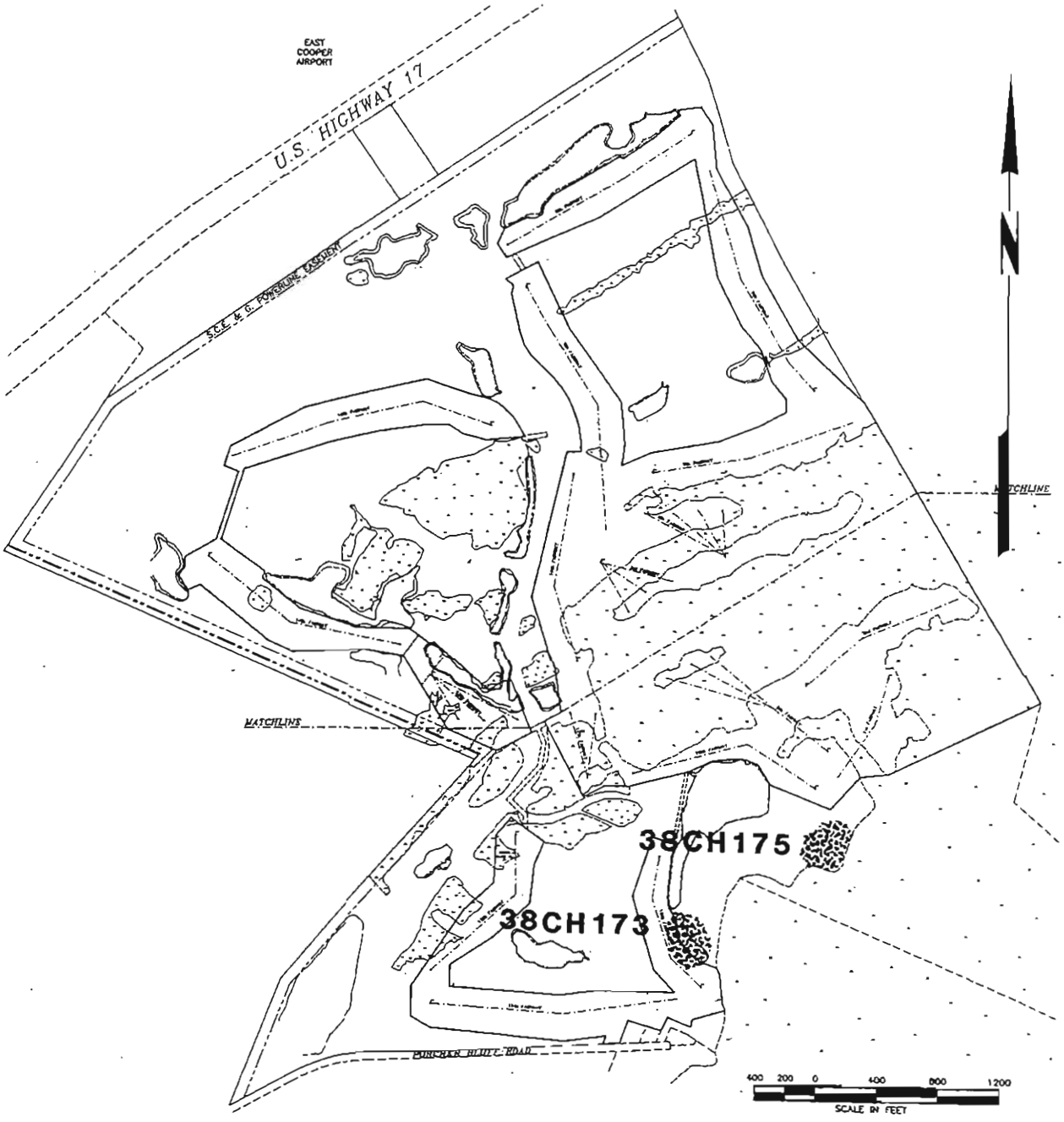


Figure 2. Location of 38CH173 and 38CH175 within the Charleston National Golf Course.

Figure 3. 38CH173, view of shell eroding from nearby road, suggestive of thick midden.

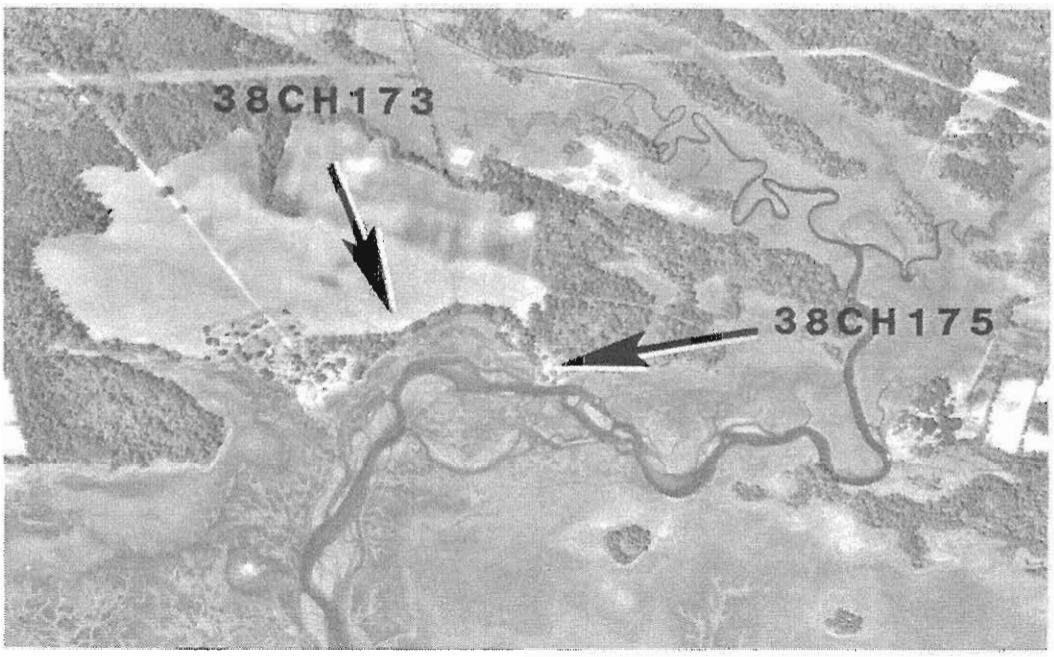


Figure 4. 1967 areal photograph showing 38CH173 and 38CH175.

Figure 5. 38CH175, view of lime lenses eroding from the bluff in 1975.

Chicora Foundation was requested by the developer's representative, Mr. Walter Mueller, to prepare a budgetary proposal based on the scope of work developed by Brockington and Associates. According to Mueller, this scope of work was developed in consultation with the State Historic Preservation Office and had been approved. Chicora's proposal for data recovery was submitted to and reviewed by the S.C. SHPO on April 14, 1993 (letter from Mr. Lee Tippett to Dr. Michael Trinkley). An agreement to perform the work was signed by Charleston National Golf Course on June 29, 1993.

The proposed investigations at 38CH173 were to include the excavation of approximately 400 square feet in the area considered by Brockington et al. (1987) to have the highest archaeological integrity. At the conclusion of the work, this area of the site was to be mechanically stripped to identify and plot additional features. At 38CH175 the investigations were to include the excavation of 300 to 400 square feet in the area of highest archaeological integrity. At the conclusion of the work, this area (measuring approximately 50 by 115 feet) was to be mechanically stripped to identify and plot additional features. The scope of work did not include excavation of these features

located in stripping.

The proposed development plan for the sites involves a number of single family dwellings and relocation of the existing fairways. This plan will involve the clearing, grubbing, filling, and paving of the road network; the construction of below ground utilities; and the development of individual lots. These development activities will result in considerable land alteration and damage to the archaeological sites known to exist on the property.

The background research specific to the project was conducted by Ms. Natalie Adams at the S.C. Institute of Archaeology and Anthropology on July 3, 1993. Subsequently, historical research sufficient to help understand the archaeological remains was conducted at the South Carolina Department of Archives and History. The field work at 38CH173 and 38CH175 was conducted on August 10, 1993 and continued through August 27, 1993. Site stripping and mapping at 38CH175 took place on September 13, 1993. A total of 106.5 person hours were spent in the field at 38CH173. At 38CH175, 262 person hours were spent in the field with an additional 34 person hours spent on laboratory analysis and field processing A total of 400 square feet was excavated at 38CH173 with the movement of 503 pounds of shell. At 38CH175, a total of 350 square feet was excavated with the movement of 5,922 pounds of shell.

Goals

The research proposed by Brockington and Associates included questions relating to subsistence focus; seasonality; sea level change and readaptation; ceramic typology, technology, and cultural relationships; Late Archaic period structures; and culture history. However, these general research realms were not specifically geared toward one site or the other. After reviewing this scope of work, Chicora refined some of these questions.

At 38CH173 significant research questions were largely exploratory and explanatory. For example, is there evidence of a major Mississippian camp at this location, or does the site represent a series of very small camps from throughout the Woodland Period? Does the site contain identifiable intact midden remnants, or has it been thoroughly impacted by plowing? If the site is plowed, can sufficient materials be recovered from the plowzone to warrant data recovery at future sites of this type?

The research realm at 38CH175 is considerably more refined than that for 38CH173. The expected recovery of abundant faunal, floral, and shellfish materials would allow research into the subsistence base of the site. These remains may also be suitable for seasonality studies. These data were expected to be comparable to that collected from other Thom's Creek phase sites, such as Bass Pond (Trinkley 1994), Lighthouse Point (Trinkley 1980b) and Stratton Place (Trinkley 1980b). The excavation of the site in carefully defined natural and arbitrary levels would allow examination of typological change through time. Efforts to collect charcoal from well documented features would assist in the refinement of local cultural sequences. Based on the survey, there was some evidence of a possible Thom's Creek structure. Further investigations may be able to recover data suitable for comparison with structural remains identified at other Late Archaic/Early Woodland sites.

The data recovery excavations at 38CH173 and 38CH175 attempted to integrate a number of recommendations for Woodland Period research developed by Chicora Foundation for the South Carolina Department of Archives and History (see Trinkley 1990a:31-37). These include typological and chronological analyses, subsistence studies, and settlement studies. In addition, excavations at 38CH173 attempted to better understand the use of the land by the Mississippian inhabitants. However, during the field work it became evident that the site was so disturbed by plowing and so few artifacts were related to the Mississippian period, that questions were reoriented toward the Middle Woodland period.

The typological and chronological questions involve primarily the Thom's Creek and St. Catherines phases. No radiocarbon dates were obtained at 38CH173 due to the sparsity of charcoal, the disturbance, and the diversity of ceramics identified. At 38CH175 a radiocarbon sample, consisting of carbonized nut shell and wood, was obtained from Zone 2, level 4 midden soils. For the St. Catherines wares the research was directed at providing an assessment

of paste and cordage. Efforts at analyzing the Thom's Creek wares were concentrated on the vertical locations of the various types to refine previous beliefs about the chronology of Thom's Creek period pottery types. In addition, types and varieties of punctation were noted for comparison with recent research by Sassaman (1991;1993a).

The subsistence questions involved the seasonality of the remains at both 38CH173 and 38CH175, the evidence they could provide regarding the habitats exploited, the intensity of that exploitation, and the methods of collecting being used. While determining the importance of each resource to the diet was also recognized as an extremely important research goal, it was tempered by the recognition that many analytical techniques, such as biomass, diversity, and equitability determination, while relatively easily determined for faunal remains, are very difficult to apply to ethnobotanical and shellfish materials. Unfortunately, the faunal and ethnobotanical remains were too sparse to allow detailed analysis.

In the past Chicora has routinely used ⅛-inch mesh to screen shell midden soils to improve recovery of floral and faunal remains. At many sites this has been difficult but well worth the effort, dramatically improving recovery and hence the interpretative potential of the collection. During the research at 38CH175 an effort was made to qualitatively compare several techniques: ¼-inch dry screening, ⅛-inch dry screening, and ⅛-inch water screening. The goal of this research was to understand the level of effort needed at these types of sites.

Besides some differences in screening, efforts were made to consistently collect subsistence materials throughout the site. This included the collection of floatation samples and the use of 2.25 foot square shell column in middens. In addition, all shell was quantified by weight, and the shell columns were used to provide soil:shell ratios.

Curation

The field notes, photographic materials, and artifacts resulting from Chicora Foundation's investigations have been curated at the South Carolina Institute of Archaeology and Anthropology. The artifacts from the excavations have been cataloged according to the institution's system. The artifacts have been cleaned and evaluated for conservation needs. All were found to be stable and no treatments were undertaken. All original records and duplicate copies were provided to the curatorial facility on pH neutral, alkaline buffered paper and the photographic materials were processed to archival permanence.

NATURAL SETTING

Natalie Adams

Physiography

Charleston County is located in the lower Atlantic Coastal Plain of South Carolina and is bounded to the east by the Atlantic Ocean and a series of marsh (such as Dewee's Island), barrier (such as Sullivans Island), and sea islands (such as James Island) (Mathews et al. 1980:133). Elevations in the County range from sea level to about 70 feet mean sea level (MSL). The mainland topography, which consists of subtle ridge and bay undulations, is characteristic of beach ridge plains.

Seven major drainages are found in Charleston County. Four of these, the Wando, Ashley, Stono, and North Edisto, are dominated by tidal flows and are saline. The three with significant freshwater flow are the Santee, forming the northern boundary of the County, the South Edisto, forming the southern boundary, and the Cooper, which bisects the County. The distinctions between these rivers were of particular significance to the area planters. The fresh water rivers became areas of extensive tidal rice cultivation. Rice cultivation was tried on the more saline rivers, but with limited success. The Wando River rice planters found early in the nineteenth century that they could not complete with the more favorable resources of rice planters on the Santee or Edisto.

Because of the low topography, many broad, low-gradient interior drains are present as either extensions of the tidal rivers or as flooded bays and swales. These are often seen as small creeks or even as low, poorly drained interior areas. This feature is also known to have been of considerable importance to the area planters. While these low soils were frequently fertile, they had to be drained. Not only did this require constant attention, but it was realized to be unhealthy work.

Sites 38CH173 and 38CH175 are situated on well drained soils adjacent to a large tidal creek feeding into Copahee Sound. The topography of the area is relatively flat, except in areas raised by landscaping the surrounding golf course. The elevation at both sites is approximately 10 feet above mean sea level (MSL).

Geology and Soils

Coastal Plain geological formations are unconsolidated sedimentary deposits of very recent age (Pleistocene and Holocene) lying unconformably on ancient crystalline rocks (Cooke 1936; Miller 1971:74). The Pleistocene sediments are organized into topographically distinct, but lithologically similar, geomorphic units, or terraces, parallel to the coast.

The Recent terrace ranges from about sea level to six feet above and occurs along the coast and for a few miles up major streams. Soils are primarily Capers series and Tidal marsh lands. The Pamlico terrace ranges from six to 25 feet above sea level. This terrace includes most of Charleston County. The Talbot terrace ranges from 25 to 42 feet and occurs southeast of Ladson, in parts of the western portion of the county, and along the Berkeley County line from southwest of Wambaw Creek almost to the Wando River (Miller 1971:74). Both sites occur within the Pamlico terrace.

Another significant aspect of coastal geology to be considered in these discussions is the fluctuation of sea level during the late Pleistocene and Holocene epochs. Prior to 15,000 B.C. there is evidence that a warming trend resulted in the gradual increase in Pleistocene sea levels (DePratter and Howard 1980). Work by Brooks et al. (1989)

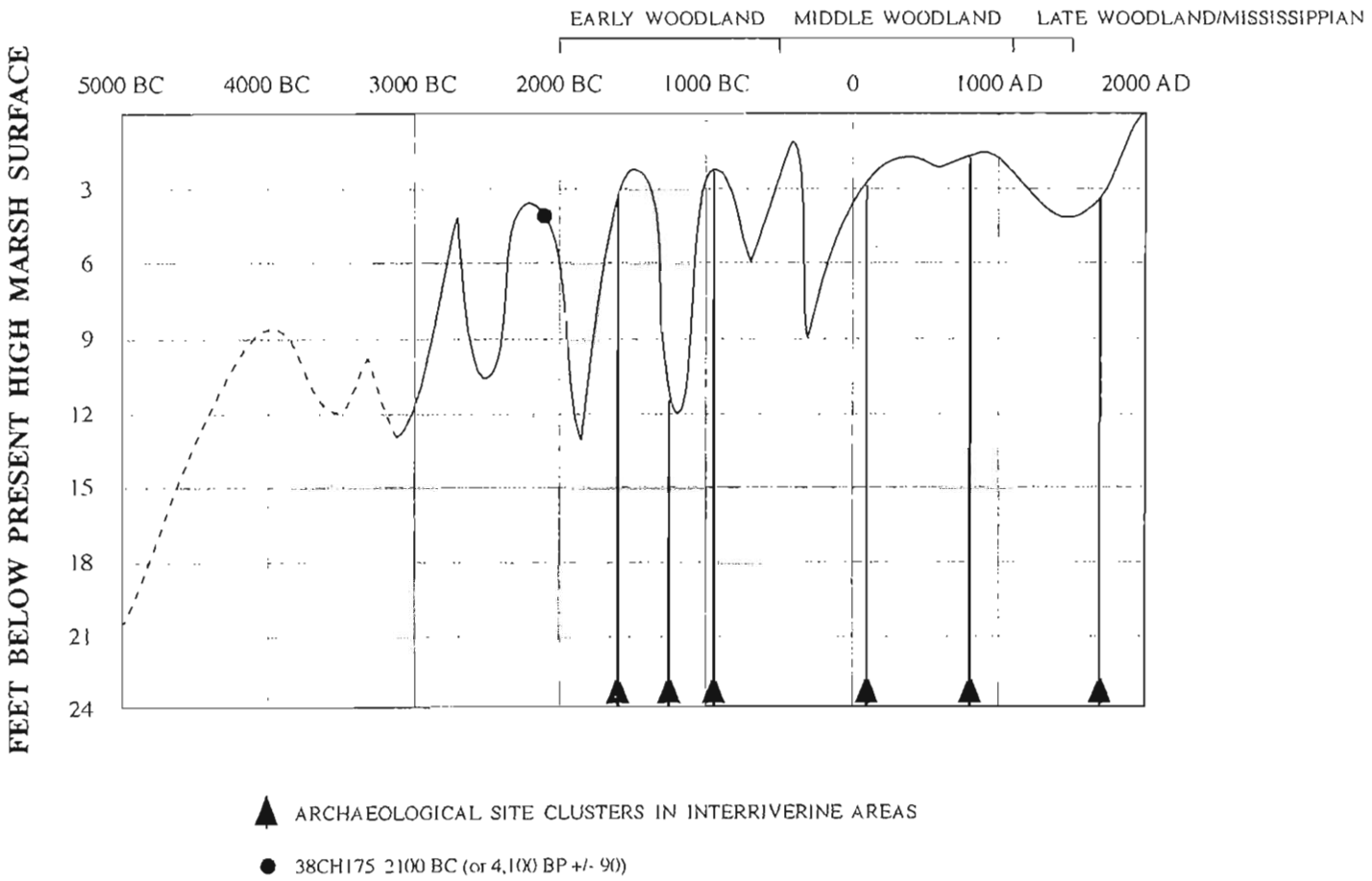


Figure 6. Sea level change curve for South Carolina (adapted from Brooks et al. 1989).

clearly indicates that there were a number of fluctuations during the Holocene (Figure 6). Their data suggest that as the first Stallings phase sites along the South Carolina coast were occupied about 2100 B.C. the sea level was about 4.2 feet lower than present. Following that period there was a gradual fall in the sea level to about 11.0 feet below current levels by 1850 B.C. Sea levels gradually increased during the Thom's Creek phase to a level within about 2.0 feet of the current stands by 1650 B.C. Following this was a second lowering about 1250 B.C., to a level of 9.7 feet below that of today. The sea level increased through the late Thom's Creek phase to a high about 2.8 feet below modern levels by 1050 B.C. Another low, about 9.7 feet, occurred at 350 B.C. after which the sea levels tend to maintain a gradual rise to their modern levels. Quitmyer (1985) does not believe that the lower sea levels at 2100 B.C. would have greatly altered the estuarine environment, although drops of nearly 10 feet would have reduced available tidal resources and would have affected the overall drainage patterns and soil moisture of coastal sites.

Within the coastal zone the soils are Holocene and Pleistocene in age and were formed from materials that were deposited during the various stages of coastal submergence. The formation of soils in the study area is affected by this parent material (primarily sands and clays), the temperate climate (to be discussed later in this section), the various soil organisms, topography, and time.

The mainland soils are Pleistocene in age and tend to have more distinct horizon development and diversity than the younger soils of the sea and barrier islands. Sandy to loamy soils predominate in the level to gently sloping mainland areas. The island soils are less diverse and less well developed, frequently lacking a well-defined B horizon. Organic matter is low and the soils tend to be acidic. The Holocene deposits typical of barrier islands and found as a fringe on some sea islands, consist almost entirely of quartz sand which exhibits little organic matter. Tidal marsh soils are Holocene in age and consist of fine sands, clay, and organic matter deposited over older Pleistocene sands. The soils are frequently covered by up to 2 feet of saltwater during high tides. Historically, marsh soils have been used as compost or fertilizer for a variety of crops, including cotton (Hammond 1884:510) and Allston mentions that the sandy soil of the coastal region, "bears well the admixture of salt and marsh mud with the compost" (Allston 1854:13).

Sites 38CH173 and 38CH175 are both characterized by excessively drained Lakeland sands. The surface layer is usually about seven inches of very dark grayish-brown (10YR3/2) sand overlying dark yellowish brown (10YR4/4) sand.

Climate

John Lawson described South Carolina, in 1700, as having "a sweet Air, moderate Climate, and fertile Soil" (Lefler 1967:86). Of course, Lawson tended to romanticize Carolina. In December 1740 Robert Pringle remarked that Charleston was having "hard frosts & Snow" characterized as "a great Detriment to the Negroes" (Edgar 1972:282), while in May 1744 Pringle states, "the weather having already Come in very hott" (Edgar 1972:685).

The major climatic controls of the area are latitude, elevation, distance from the ocean, and location with respect to the average tracks of migratory cyclones. Charleston County's latitude of places it on the edge of the balmy subtropical climate typical of Florida, further south. As a result, there are relatively short, mild winters and long, warm, humid summers. The large amount of nearby warm ocean water surface produces a marine climate, which tends to moderate both the cold and hot weather. The Appalachian Mountains, about 220 miles to the northwest, block the shallow cold air masses from the northwest, moderating them before they reach the sea islands (Mathews et al. 1980:46).

The average high temperature in the Charleston area in July is 89 degrees. Mills noted:

> in the months of June, July, and August, 1752, the weather in Charleston was warmer than any of the inhabitants before had ever experienced. The mercury in the shade often rose above 90°, and for nearly twenty successive days varied between that and 101° (Mills 1972 [1826]:444).

Charleston normally experiences a high relative humidity, adding greatly to the discomfort. Pringle remarked in 1742 that guns "suffer'd with the Rust by Lying so Long here, & which affects any Kind of Iron Ware, much more in this Climate than in Europe" (Edgar 1972:465).

The annual rainfall in the Charleston area is 49 inches, fairly evenly spaced over the year. While adequate for most crops, there may be periods of both excessive rain and drought. Mills remarks that the "Summer of 1728 was uncommonly hot; the face of the earth was completely parched; the pools of standing water dried up, and the field reduced to the greatest distress" (Mills 1972 [1826]:447-448). Another significant historical drought occurred in 1845, affecting both the Low and Up Country.

The annual growing season for Charleston County is 295 days, one of the longest in South Carolina. Along the "sea shore" the close proximity to the water extended this growing season allowing parts of Christ Church to rival the Florida growing season.

Hilliard (1984) points out that "any description of climate in the South, however brief, would be incomplete without reference" to a meteorological event frequently identified with the region – the tropical hurricane. Hurricanes occur in the late summer and early fall, the period critical to antebellum cane, cotton, and rice growers. These storms, however, are capricious in occurrence:

> in such a case between the dread of pestilence in the city, of common fever in the country, and of an unexpected hurricane on the island, the inhabitants . . . are at the close of every warm season in a painful state of anxiety, not knowing what course to pursue, not what is best to be done (Ramsay, quoted in Calhoun 1983:2).

The coastal area is a moderately high risk zone for tropical storms, with 169 hurricanes being documented from 1686 to 1972 (on the average, one every two years) (Mathews et al. 1980:56).

It is difficult to evaluate the climate in terms of Native American health. Clearly the seasonal weather would have been attractive, although the location of the sites on the edge of Copahee Sound would subject the occupants to bitter winds during the large part of the winter. It is likely that the climactic conditions noted during the historic period adequately reflect prehistoric conditions, especially during the late prehistoric period.

The climate of the Charleston area, regardless of storms, temperature, humidity, or rainfall, was often viewed during the historic period as harsh and unhealthful, especially for the white population. Mills states:

> the numerous swamps, bays, and low grounds which indent the low country, retain the waters that fall in rains; and in consequence of these, occasion thick fogs throughout the night, during the summer months. Under such circumstances it is a matter of little surprise that fevers prevail. . . . The two fevers most dreaded here, are, what are commonly termed the country and yellow fever. The first is peculiar to the country, and to avoid it, the planters are in the habit either of residing in Charleston during the sickly season, or retiring to the Sea Islands or Sand hills. The second belongs exclusively to the city, and is generally fatal to strangers only, who have not, as it is termed, become climatized (Mills 1972 [1826]:140-144).

Expounding on the evil of the swamps, Mills also explained:

> that to the extensive swamps and stagnant pools, which cover its surface, are we to attribute the cause of our epidemical diseases. The rank luxuriance of vegetation on these waste lands, their perpetual moisture, and the operation of a powerful sun, produce at certain seasons of the year, in a degree indeed extensive, the rapid decomposition of this vegetable matter: the miasma arising from this decomposition contaminates the surrounding air, which afterwards is wafted by the winds over the country, and poisons, more or less, the whole atmosphere (Mills 1972 [1826]:462).

Floristics

The Charleston County area contains three major ecosystems: the maritime forest ecosystem which consists of the upland forest areas, the estuarine ecosystem of deep water tidal habitats, and the palustrine ecosystems which consist of essentially fresh water, non-tidal wetlands (Sandifer et al. 1980:7-9).

The maritime forest ecosystem has been found to consist of five principal forest types, including the Oak-Pine forests, the Mixed Oak Hardwood forests, the Palmetto forests, the Oak thickets, and other miscellaneous wooded areas (such as salt marsh thickets and wax myrtle thickets).

In some areas of Oak-Pine forests palmetto becomes an important sub-dominant. Typically these forests are dominated by the laurel oak with pine (primarily loblolly with minor amounts of longleaf pine) as the major canopy co-dominant. Hickory is present, although uncommon. Other trees found are the sweet gum and magnolia, with sassafras, red bay, American holly, and wax myrtle found in the understory.

In the Mixed Oak Hardwood forests pine is reduced in importance and the laurel oak is replaced by the live oak. Yaupon holly and red bay or magnolia are found in the understory. The Palmetto forests are characterized by open palmetto stands with an understory of wax myrtle, red cedar, yaupon holly, and magnolia. The miscellaneous wooded areas include wax myrtle thickets found in low areas behind the dune fields.

Mills, in the early nineteenth century, remarked that:

> South Carolina is rich in native and exotic productions; the varieties of its soil, climate, and geological positions, afford plants of rare, valuable, and medicinal qualities; fruits of a luscious, refreshing, and nourishing nature; vines and shrubs of exquisite beauty, fragrance, and luxuriance, and forest trees of noble growth, in great variety (Mills 1972 [1826]:66).

The loblolly pine was called the "pitch or Frankincense Pine" and was used to produce tar and turpentine; the longleaf pine was "much used in building and for all other domestic purposes;" trees such as the red bay and red cedar were often used in furniture making and cedar was a favorite for posts; and live oaks were recognized as yielding "the best of timber for ship building;" (Mills 1972 [1826]:66-85). Mills also observed that:

> in former years cypress was much used in building, but the difficulty of obtaining it now, compared with the pine, occasions little of it to be cut for sale, except in the shape of shingles; the cypress is a most valuable wood for durability and lightness. Besides the two names we have cedar, poplar, beech, oak, and locust, which are or may be also used in building (Mills 1972 [1826]:460).

The "Oak and hickory high lands" according to Mills were, "well suited for corn and provisions, also for indigo and cotton" (Mills 1972 [1826]:443). The value of these lands in the mid-1820s was from $10 to $20 per acre, less expensive than the tidal swamp or inland swamp lands (where rice and, with drainage, cotton could be grown).

The estuarine ecosystem in the vicinity includes those areas of deep-water tidal habitats and adjacent tidal wetlands. Salinity may range from 0.5 ppt at the head of an estuary to 30 ppt where it comes in contact with the ocean. Estuarine systems are influenced by ocean tides, precipitation, fresh water runoff from the upland areas, evaporation, and wind. Estuarine systems are extremely important to our understanding of both prehistoric and historic occupations because they naturally contain a high biomass (Thompson 1972:9). The estuarine area contributes vascular flora used for basket making, as well as mammals, birds, fish (over 107 species), and shellfish.

While shellfish are only briefly itemized by Mills in the context of a food source, he elaborates in his

discussion of building material, observing that:

> lime is obtained from burning oyster shells. It makes a very good mortar, where good sharp sand is used, though it is not equal to the stone lime (Mills 1972 [1826]:460).

While the primary historic use of shellfish may have been for the production of lime, the large numbers of shell middens in coastal area clearly indicate the importance of shellfish in the aboriginal diet (see Trinkley 1991b:214-215).

The last environment to be briefly discussed is the freshwater palustrine ecosystem, which includes all wetland ecosystems, such as the swamps, bays, savannas, pocisins, and creeks, where the salinities measure less than 0.5 ppt. These palustrine ecosystems tend to be diverse, although not well studied (Sandifer et al. 1980:295).

A number of forest types may be found in the palustrine areas which would attract a variety of terrestrial mammals. The typical vegetation might consist of red maple, swamp tupelo, sweet gum, red bay, cypress, and various hollies. Also found would be wading birds and reptiles. It seems likely that these freshwater environs were of particular importance to the prehistoric occupants.

Environmental Setting at 38CH173 and 38CH175

The location of these sites on well drained soils next to a large tidal creek was clearly desirable. The estuarine ecosystem provided the prehistoric occupants with foods that naturally contain a high biomass and contributes a number of birds, turtles, fish (over 107 species), and shellfish (Thompson 1972). The large amount of shell midden remains at the sites clearly indicates the importance of shellfish to their diet. The adjacent upland forest areas provided nut masts which would be harvested during the fall. There were a large number of mammals which could have been taken, either opportunistically or during hunting forays. These mammals include white tailed deer, raccoon, turkey, rabbit, and squirrel. Many of these animals could be found by the marsh, while deer would normally be found in the vicinity of maritime forest edges.

The availability of a fresh water source was important to prehistoric settlement. While the majority of the water environments in the area were estuarine, the availability of spring water was important. In fact, Gregorie (1925:17-18) located a spring near Porcher's Bluff while visiting Auld mound with a member of the South Carolina Historical Society. She commented:

> Until the tile drains were put in some years ago, 1882-84, there was an excellent spring on Porcher's Bluff Plantation near the present plantation settlement and in the heart of the old village site. There is a famous spring at Hobcaw and one or two others at Belle Vieu Plantation on the Wando. These are the only springs I have ever heard of in the Parish, but ponds and swamps are numerous.... It was now plain why the Indians had chosen this spot. Springs are rare in the coastal region. A water supply must have been the determining farctor in choosing a camp site. The fresh water pond to the west of the round house supplied water for drinking and cooking. Through the channel from the shore, they brought their canoes loaded with seafood and tied them in the sheltered harbor of the salt pond. On all sides were the woods teeming with wild life.... It was the ideal home for the savage, supplying his every need (Gregorie 1925:18).

Not surprisingly, a cursory examination of the South Carolina state site files indicates that sites (both historic and prehistoric) cluster around drainages which probably contain fresh water springs. It is likely that during low level sea stands, some of these spring fed creeks were not contaminated by tidal salt water.

As illustrated above, the availability of a number of environmental areas in the area of the sites provided the Native Americans with a number of choices and opportunities for gathering food.

It is likely that maritime forests existed at the site area given its exposure to salt water and salt spray. Trees in the area would have probably consisted of live oak, palmetto, dwarf palmetto, and slash pine. Inward from this zone an increasing amount of loblolly pine and turkey oak would have been present. Other arborescent species found in association with maritime species are red bay, wild olive, and some laurel oak. After the sites were abandoned, a number of "shell mound species" would have appeared. In these areas the calcareous shells promoted thick growths of shell mound shrubs (*Sageretia minutifora*), southern red cedar, and Spanish bayonet. In addition, other normal maritime trees and plants would have been present (Barry 1980:178-182).

PREHISTORIC OVERVIEW

Natalie Adams

Previous Archaeological Research

Charleston County's prehistoric resources have received relatively detailed archaeological attention in comparison with the rest of the state. A number of survey and testing projects have occurred in the Francis Marion National Forest (see, for instance, Cable 1992; Gardner and Poplin 1992). In addition, the S.C. Department of Highways and Public Transportation has performed a number of reconnaissance and survey level studies associated with highway construction such as the Mark Clark Expressway and the Isle of Palms connector (see, for instance, Trinkley 1978a; Trinkley and Tippett 1980). Other activities include archaeological testing at Cape Romain National Wildlife Refuge (Anderson and Claggett 1979) and survey of the Seaside Farms tract (Adams and Trinkley 1993), as well as other survey level projects.

Most of the detailed prehistoric archaeological research which has occurred in Charleston County has been in association with shell ring research including the study of Lighthouse Point, Stratton Place, Spanish Mount, and Fig Island (see, for example, Sutherland 1973, 1974; Trinkley 1980). Work at other prehistoric sites include the Bass Pond site (38CH124) and 38CH125/126 (Adams and Trinkley 1994), Charles Town Landing (South 1971), and Buck Hall (Poplin and Jones 1993; Trinkley 1993). Gregorie (1925) provides a map showing the locations of a number of prehistoric shell midden sites in the areas (Figure 7).

Work at Thom's Creek shell ring sites in Charleston County indicate that they represent occupation sites for relatively large social units which lived on the rings and used the interior for communal activities. Artifacts characterizing these rings indicate a large number of different activities. These artifacts include pottery, lithics, bone and shell tools, abundant faunal remains, and sherd hones. Soil profiles usually indicate dense crushed shell overlying an old humus layer suggesting fast deposition of shell, and therefore intensive use of the site (Trinkley 1980).

At the Bass Pond site a similar diversity of artifacts was recovered, including evidence for a structure. This suggests at least a seasonally permanent occupation. In contrast, artifacts from a neighboring Thom's Creek non-midden site (38CH125/126) contained primarily pottery along with a relatively small amount of lithic debitage. Very little shell was encountered suggesting that the focus of activities was the exploitation of terrestrial mammals and possibly nut masts (see Trinkley 1994).

Further north in Georgetown County, the Minim Island site was occupied from the Thom's Creek phase up through the Mississippian period, with the major midden deposition occurring during the Deptford occupation, probably spanning 600 to 250 B.C. Seasonal indicators suggest that the site was most intensively used during the fall season (Espenshade and Brockington 1989).

Investigations at the Buck Hall site evidenced occupation from the Early Woodland to the Early Mississippian period. All occupations of the site appeared to be related to the seasonal collection, processing, and

Excavations at Charles Town Landing (South 1971) exposed a moundless ceremonial center representing a unique phenomenon in the southeast. In addition to palisade enclosures a number of features were identified including burials, sheds, and a large number of pits and postholes. Radiocarbon dates indicate an occupation between 1450 to 1600 A.D..

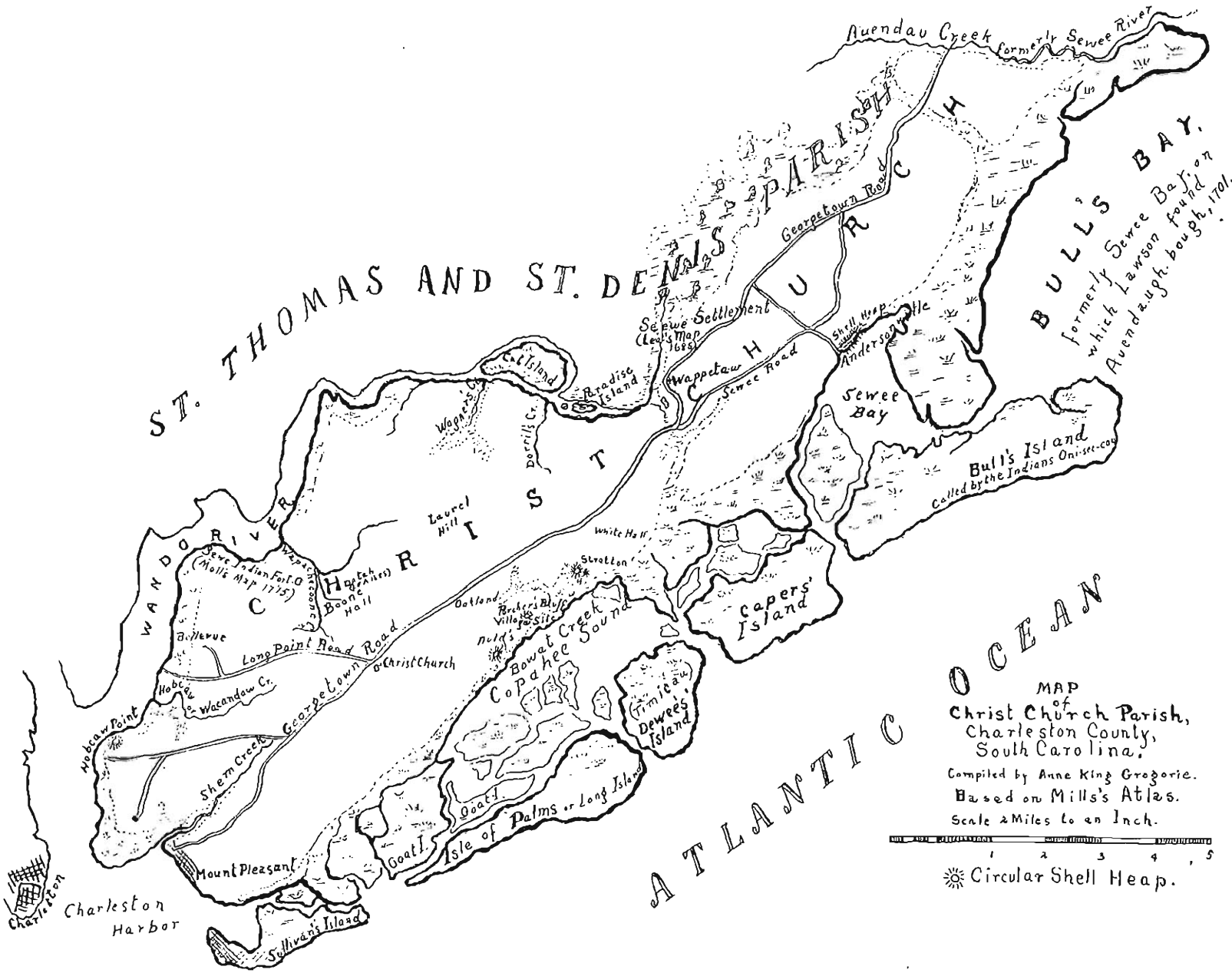


Figure 7. Gregorie's (1925) map of Christ Church Parish showing the locations of prehistoric sites.

consumption of shellfish by small groups of people (Poplin and Jones 1993).

Prehistoric Archaeology

Paleoindian and Archaic Periods

The Paleoindian period, lasting from 12,000 to 8,000 B.C., is evidenced by basally thinned, side-notched projectile points; fluted, lanceolate projectile points; side scrapers; end scrapers; and drill (Coe 1964; Michie 1977; Williams 1968; Goodyear et al. 1989). The Paleoindian occupation, while widespread, does not appear to have been intensive. Artifacts are most frequently found along major river drainages, which Michie interprets to support the concept of an economy "oriented towards the exploitation of now extinct mega-fauna" (Michie 1977:124). No Paleoindian projectile points, however, have been recovered from the Charleston County area (Michie 1977).

Sea level during much of this period is expected to have been as much as 65 feet lower than present, so many sites may be inundated (Flint 1971). Unfortunately, little is known about Paleoindian subsistence strategies, settlement systems, or social organization. Generally archaeologists agree that the Paleoindian groups were at a band level of society (see Service 1966), were nomadic, and were both hunters and foragers. While population density, based on the isolated finds, is thought to have been low, Walthall suggests that toward the end of the period, "there was an increase in population density and in territoriality and that a number of new resource areas were beginning to be exploited" (Walthall 1980:30).

The Archaic period, which dates from 8000 to 2000 B.C., does not form a sharp break with the Paleoindian period, but is a slow transition characterized by a modern climate and an increase in the diversity of material culture. The chronology established by Coe (1964) for the North Carolina Piedmont may be applied with little modification to the South Carolina coast. Archaic period assemblages are rare in the Sea Island region, although the sea level is anticipated to have been within 13 feet of its present stand by the beginning of the succeeding Woodland period (Lepionka et al. 1983:10). Brooks and Scurry note that:

> Archaic period sites, when contrasted with the subsequent Woodland period, are typically small, relatively few in number and contain low densities of archaeological material. The data may indicate that the inter-riverine zone was utilized by Archaic populations characterized by small group size, high mobility, and wide ranging exploitative patterns (Brooks and Scurry 1978:44).

Alternatively, the general sparsity of Archaic sites in the coastal zone may be the result of a more attractive environment inland adjacent to the floodplain swamps of major drainages. Of course, this is not necessarily an alternative explanation, since coastal Archaic sites may represent only a small segment in the total settlement system.

Early Woodland

The earliest phase of the Woodland period (Figure 8) is called Stallings, after the type site excavated by the Cosgroves in 1929 (Claflin 1931). These "Stallings Island people" produced a rich cultural assemblage of bone and antler work, polished stone items, grooved and perforated "net sinkers" or steatite disks, stone tools (including projectile points, knives, scrapers, and cruciform drills), and fiber tempered pottery (see also Williams 1968). It was over a decade before the typological significance of the Stallings ware was recognized and a formal type description was offered (Fairbanks 1942; Griffin 1943). The definitive feature of this pottery is its large quantity of fiber, now identified as Spanish Moss (Simpkins and Scoville 1981), included in the paste prior to firing.

The elaborate Savannah River drainage sites such as Stallings Island, Fennel Hill, Rabbit Mount, and Bilbo, are all characterized by large quantities of either fresh water mussels or tidal oysters, large quantities of artifacts, and abundant features. These middens, however, represent only one aspect of the Stallings settlement system. Another portion of that system is represented by Stallings sites which evidence little shell. While many of these are sparse scatters, such as Clear Mount (Stoltman 1974) and Pinckney Island (Trinkley 1981c), some evidence intensive

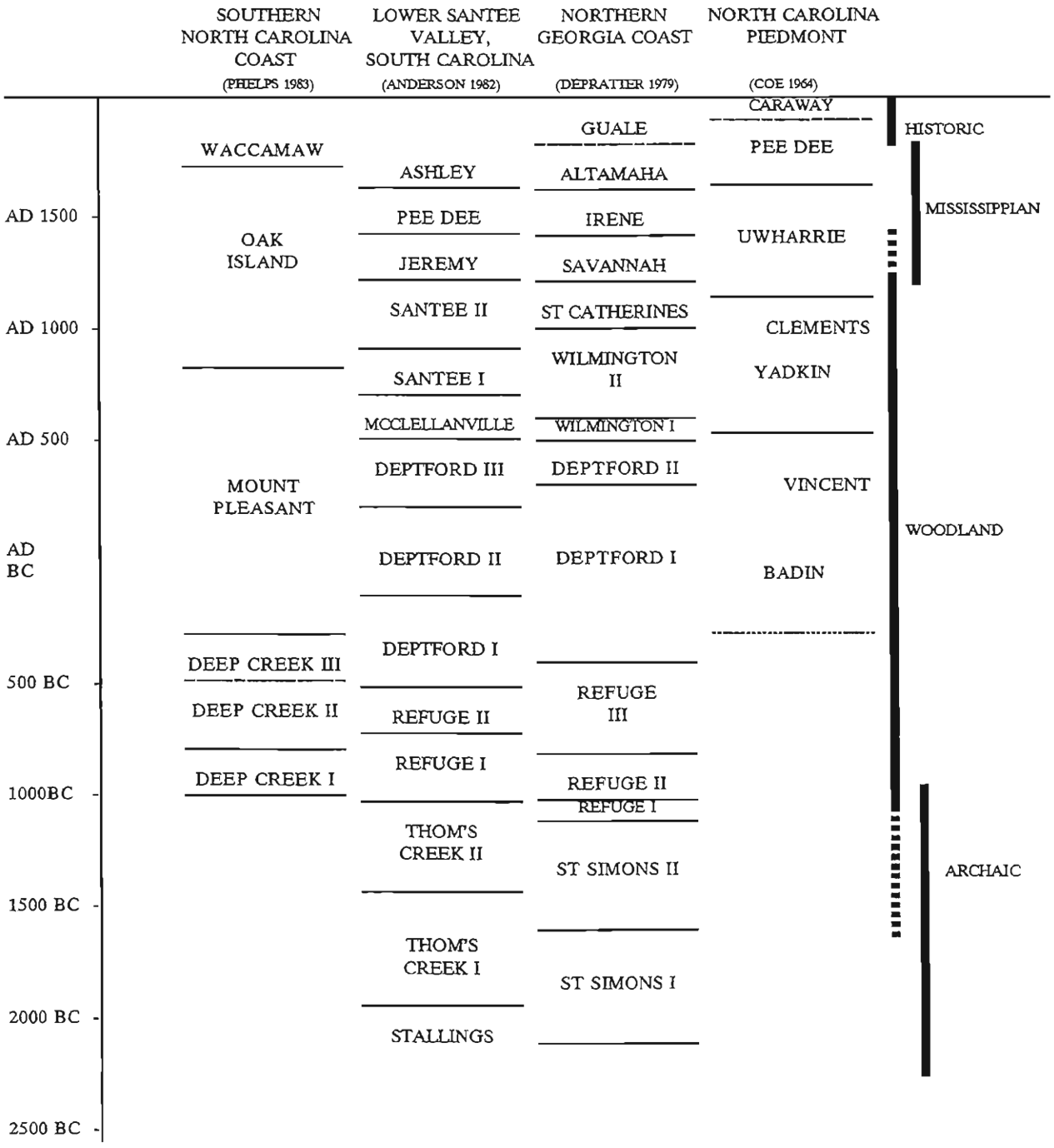


Figure 8. Woodland Period phases in the South Carolina locality.

occupation with features and a rich cultural assemblage, such as the Love (38AL10; Trinkley 1974) and Fish Haul (38BU805; Trinkley 1986) sites.

At the Fish Haul site a Stallings phase "D"-shaped structure containing about 90 square feet of floor area has been identified (Trinkley 1986:145-147) and Stoltman (1974:51-54) recovered a lean-to structure at Rabbit Mount. The function of essentially non-shell midden sites such as Love and Fish Haul is only partially understood at present, although shellfish seasonality and ethnobotanical studies (Claassen 1986a; Lawrence 1986; Trinkley 1986) are beginning to suggest late fall and winter occupation. These may represent early sites when the subsistence base was diffuse, prior to intensive riverine and estuarine exploitation. Alternatively, and more likely, they may represent a seasonal round in the Stallings settlement system. Riverine shellfish may have been gathered in the fall when the Savannah River and its tributaries were low and clear, while other resources away from the river were exploited during the period of high discharge in the late winter and spring (Anderson and Schuldenrein 1985:13). Additional work within the Savannah drainage is necessary to understand more fully the relationship between large shell middens, dense non-shell upland and coastal sites, and sparse upland and coastal "scatters."

The following Thom's Creek phase dates as early as 2220±350 B.C. (UGA-584) from Spanish Mount in Charleston County (Sutherland 1974) and continues to at least 935±175 B.C. (UGA-2901), based on a date from the Lighthouse Point Shell Ring, also in Charleston County (Trinkley 1980b:191-192). The Thom's Creek phase is characterized by an artifact assemblage almost identical to that of Stallings sites. The only major differences include the replacement of fiber tempering with sand, or a clay not requiring tempering, and the gradual reduction of projectile point size.

Thom's Creek pottery, first typed by Griffin (1945), consists of sandy paste pottery decorated with the motifs common to the Stallings series, including punctations (reed and shell), finger pinching, simple stamping, incising, and very late in the phase, finger smoothed (Trinkley 1980a). Investigations at the Lighthouse Point and Stratton Place shell rings, stratigraphic studies at Spanish Mount and Fig Island, radiocarbon dates from Lighthouse Point and Venning Creek, and the study of surface collections from a number of sites, have suggested a temporal ordering of the Thom's Creek series. Reed punctated pottery appears to be the oldest, followed by the shell punctated and finger pinched motifs. Late in the Thom's Creek phase, perhaps by 1000 B.C., there is the addition of Thom's Creek Finger Smoothed (Trinkley 1983a:44). Vessel forms include deep, straight sided jars and shallow conoidal bowls. Lip treatments are simple, and coiling fractures are common. Firing of the Thom's Creek vessels is certainly better than that evidenced for Stallings, but there continues to be abundant incompletely oxidized specimens.

Like the Stallings settlement pattern, Thom's Creek sites are found in a variety of environmental zones and take on several forms. Thom's Creek sites are found throughout the South Carolina Coastal Zone, Coastal Plain, and up to the Fall Line. The sites are found into the North Carolina Coastal Plain, but do not appear to extend southward into Georgia. There appears to be strong concentration of Thom's Creek sites in the Santee River drainage and the central South Carolina coast (see Anderson 1975:184).

In the Coastal Plain drainage of the Savannah River there is a change of settlement, and probably subsistence, away from the riverine focus found in the Stallings Phase (Hanson 1982:13; Stoltman 1974:235-236). Thom's Creek sites are more commonly found in the upland areas and lack evidence of intensive shellfish collection. In the Coastal Zone large, irregular shell middens; small middens with only sparse shell; and large "shell rings" are found in the Thom's Creek settlement system.

Limited testing has been conducted at one small Thom's Creek non-shell midden on Sol Legare Island (38CH779) in Charleston County, South Carolina (Trinkley 1984). The site evidenced very limited reliance on shellfish and faunal remains, with the bulk of the food remains consisting of large mammals. Excavations also identified a portion of a probable Thom's Creek post structure situated about 180 feet inland from the marsh edge.

Excavations at other Coastal Zone Thom's Creek sites includes the work by Sutherland (1973, 1974) at the Spanish Mount shell midden (38CH62). While this work has never been completely published, the site appears to

represent a seasonally occupied camp with a diffuse subsistence base, including reliance on shellfish, floral material, fish, and mammals.

By far the most work has been conducted at Thom's Creek phase shell rings (see Trinkley 1980b, 1985b). These sites are circular middens about 130 to 300 feet in diameter, 2 to 6 feet in height, and 40 feet in width at their bases, with clear interiors. These doughnut-shaped accumulations were formed as small mounds, arranged around an open ground area, and gradually blended together. The ring itself is composed of varying proportions of shell, animal bone, pottery, soil, and other artifacts. These shell rings were apparently mundane occupation sites for fairly large social units which lived on the ring, disposed of garbage underfoot, and used the clear interiors as areas for communal activities. The sites further suggest relatively permanent, stable village life as early as 1600 B.C., with a subsistence base oriented toward large and small mammals, fish, shellfish, and hickory nut resources (Trinkley 1985b).

Following Stallings and Thom's Creek are the Refuge and Deptford phases, both strongly associated with the Georgia sequence and the Savannah drainage (DePratter 1979; Lepionka et al. 1983; Williams 1968). The Refuge Phase, dated from 1070 ±115 B.C. (QC-784) to 510 ±100 B.C. (QC-785), is found primarily along the South Carolina coast from the Savannah drainage as far north as the Santee River (Williams 1968:208). Anderson (1975:184) further notes an apparent concentration of Refuge sites in the Coastal Plain, particularly along the Santee River.

The Refuge series pottery is similar in many ways to the preceding Thom's Creek wares. The paste is compact and sandy or gritty, while surface treatments include sloppy simple stamped, dentate stamped, and random punctate decorations (see DePratter 1979:115-123; Williams 1968:198-208). Anderson et al. note that these typologies are "marred by a lack of reference to the Thom's Creek series" (Anderson et al. 1982:265) and that the Refuge Punctate and Incised types are indistinguishable from Thom's Creek wares. Peterson (1971:153) characterizes Refuge as both a degeneration of the preceding Thom's Creek series and also as a bridge to the succeeding Deptford series.

It is difficult to reconstruct the subsistence base, although the sites suggest small, seasonal camps for small groups (Trinkley 1982). The settlement fragmentation, which began at the end of the Thom's Creek phase, around 1000 B.C., probably relates to the increase in sea level, from a Thom's Creek phase low of 10 feet below the current high marsh surface at 1200 B.C. to a high of about 3 feet below the current high marsh surface at 950 B.C. (Colquhoun et al. 1980; Brooks et al. 1989). This increasing sea level drowned the tidal marshes (and sites) on which the Thom's Creek people relied. The following Refuge phase evidences the fragmentation necessary when the environment which gave rise to large sedentary populations disappeared. Hanson (1982:21-23), based on Savannah River data, suggests that subsistence stress present during the Thom's Creek phase may have resulted in an expansion of the settlement system into diverse environmental settings. It seems likely, however, that the development of mature, upland tributaries was also essential ingredient in this process (see Sassaman et al. 1989). This same "splintering" is observed on the South Carolina coast.

The Deptford culture takes its name from the type site located east of Savannah, Georgia, which was excavated in the mid-1930s (Caldwell 1943:12-16). Deptford phase sites are best recognized by the presence of fine to course sandy paste pottery with a check stamped surface treatment. This pottery is typically in the form of a cylindrical vessel with a conoidal base. The flat bottomed bowl with tetrapodal supports found at Deptford sites along the Florida Gulf coast (Milanich and Fairbanks 1980:79) is very rare in South Carolina. Other Deptford phase pottery styles include cord marking, simple stamping, a complicated stamping which resembles early Swift Creek, and a geometric stamping which consists of a series of carved triangles or diamonds with interior dots (see Anderson et al. 1982:277-293; DePratter 1979).

The Deptford technology is little better known than that of the preceding Refuge phase. Shell tools are uncommon, bone tools are "extremely rare" (Milanich and Fairbanks 1980:77), and stone tools are rare on Coastal Zone sites. All of this indicates to some researchers that "wood must have been worked into a variety of tool types" (Milanich and Fairbanks 1980:75). One type of stone tool associated with South Carolina Deptford sites is a very small, stemmed projectile point tentatively described as "Deptford Stemmed" (Trinkley 1980c:20-23). This point is

the culmination of the Savannah River Stemmed reduction seen in the Thom's Creek and Refuge phases. Also found at Deptford sites are "medium-sized triangular points," probably similar to the Yadkin Triangular point (Coe 1964:45, 47, 49; Milanich and Fairbanks 1980:75-76).

Perhaps of even greater interest is the co-occurrence of the larger triangular points (such as Badin and Yadkin) with smaller triangular forms (such as Caraway) traditionally attributed to the Late Woodland and South Appalachian Mississippian periods. This situation has been reported at Coastal Plain sites (Blanton et al. 1986:107), Savannah River sites (Sassaman et al. 1989:157), and Coastal Zone sites (Trinkley 1990a). Blanton et al. (1986) suggest that these point types were used at the same time, but perhaps for different tasks.

The traditional view of an estuarine Deptford adaptation with minor interior occupations must be re-evaluated based on the Savannah River drainage work of Brooks and Hanson (1987) and Sassaman et al. (1989:293-295) who suggest larger residential base camps and foraging zones along the Savannah River, coupled with smaller, household residences and foraging zones in the uplands along small tributaries.

Throughout much of the Coastal Zone and Coastal Plain north of Charleston, a somewhat different cultural manifestation is observed, related to the "Northern Tradition" (e.g., Caldwell 1958). This recently identified assemblage has been termed Deep Creek and was first identified from northern North Carolina sites (Phelps 1983). The Deep Creek assemblage is characterized by pottery with medium to coarse sand inclusions and surface treatments of cord marking, fabric impressing, simple stamping, and net impressing (see Trinkley 1987b). Much of this material has been previously designated as the Middle Woodland "Cape Fear" pottery originally typed by South (1960). The Deep Creek wares date from about 1000 B.C. to A.D. 1 in North Carolina, but may date later in South Carolina, based on two radiocarbon dates of 120±130 B.C. (QC-1358) and A.D. 210±110 (QC-1357). The Deep Creek settlement and subsistence systems are poorly known, but appear to be very similar to those identified with the Deptford phase.

The Deep Creek assemblage strongly resembles Deptford both typologically and temporally. It appears this northern tradition of cord and fabric impressions was introduced and gradually accepted by indigenous South Carolina populations. During this time some groups continued making only the older carved paddle-stamped pottery, while others mixed the two styles, and still others (and later all) made exclusively cord and fabric stamped wares.

Middle Woodland

Although the Deptford phase is discussed as part of the Early Woodland, many authors place the phase intermediate between the Early and Middle Woodland (see, for example, Anderson et al. 1982:28, 250). Such an approach is not unreasonable, because Deptford exhibits considerable temporal range and cultural adaptations which are more characteristically Middle Woodland (see also Anderson 1985:53). The Deptford phase, however, is still part of the early carved paddle stamped tradition which is replaced by the posited northern intrusion of wrapped paddle stamping during the Middle Woodland. Clearly the Deep Creek pottery, at the same time period as Deptford, is part of this "Northern Tradition," yet the Deep Creek, on temporal grounds, is considered Early Woodland by Phelps (1983:17, 29). This is meant simply to indicate that the transition from Early to Middle Woodland is not as clear as one might wish.

The Middle Woodland in South Carolina is characterized by a pattern of settlement mobility and short-term occupation. On the southern coast it is associated with the Wilmington phase, while on the northern coast it is recognized by the presence of Hanover, McClellanville or Santee, and Mount Pleasant assemblages. Wilmington and Hanover may be viewed as regional varieties of the same ceramic tradition. The pottery is characterized almost solely by its crushed sherd (perhaps with grog as well) temper which makes up 30 to 40% of the paste and which ranges in size from 3 to 10 mm. Wilmington was first described by Caldwell and Waring (Williams 1968:113-116) from coastal Georgia work, while the Hanover description was offered by South (1960), based on a survey of the Southeastern coast of North Carolina (with incursions into South Carolina). The Wilmington phase was seen by

Waring (Williams 1968:221) as intrusive from the Carolina coast, but there is considerable evidence for the inclusion of Deptford traits in the Wilmington series. For example, Caldwell and McCann (1940:n.p.) noted that, "the Wilmington complex proper contains all of the main kinds of decoration which occur in the Deptford complex with the probable exception of Deptford Linear Checkstamped" (see also Anderson et al. 1982:275). Consequently, surface treatments of cord marking, check stamping, simple stamping, and fabric impressing may be found with sherd tempered paste.

Sherd tempered Wilmington and Hanover wares are found from at least the Chowan River in North Carolina southward onto the Georgia coast. Anderson (1975:187) has found the Hanover series evenly distributed over the Coastal Plain of South Carolina, although it appears slightly more abundant north of the Edisto River. The heartland may be along the inner Coastal Plain north of the Cape Fear River in North Carolina. Radiocarbon dates for Wilmington and Hanover range from 135±85 B.C. (UM-1916) from site 38BK134 to A.D. 1120±100 (GX-2284) from a "Wilmington House" at the Charles Towne Landing site, 38CH1. Most dates, however, cluster from A.D. 400 to 900; some researchers prefer a date range of about 200 B.C. to A.D. 500 (Anderson et al. 1982:276).

Largely contemporaneous with the sherd tempered wares are what have been termed the Mount Pleasant, McClellanville, and Santee series. The Mount Pleasant series has been developed by Phelps from work along the northeastern North Carolina coast (Phelps 1983:32-35, 1984:41-44) and is a Middle Woodland refinement of South's (1960) previous Cape Fear series. The pottery is characterized by a sandy paste either with or without quantities of rounded pebbles. Surface treatments include fabric impressed, cord marked, and net impressed. Vessels are usually conoidal, although simple, hemispherical, and globular bowls are also present. The Mount Pleasant series is found from North Carolina southward to the Savannah River (being evidenced by the "Untyped Series" in Trinkley 1981c). North Carolina dates for the series range from A.D. 265±65 (UGA-1088) to A.D. 890±80 (UGA-3849). The several dates currently available from South Carolina (such as UGA-3512 of A.D. 565±70 from Pinckney Island) fall into this range of about A.D. 200 to 900.

The McClellanville (Trinkley 1981a) and Santee (Anderson et al. 1982:302-308) series are found primarily on the north central coast of South Carolina and are characterized by a fine to medium sandy paste ceramic with surface treatment of primarily v-shaped simple stamping. While the two pottery types are quite similar, it appears that the Santee series may have later features, such as excurvate rims and interior rim stamping, not so-far observed in the McClellanville series. The Santee series is placed at A.D. 800 to 1300 by Anderson et al. (1982:303), while the McClellanville ware may be slightly earlier, perhaps A.D. 500 to 800. Anderson et al. (1982:302-304; see also Anderson 1985) provide a detailed discussion of the Santee Series and its possible relationships with the McClellanville Series. Anderson, based on the Santee area data from Mattassee Lake, indicates that there is evidence for the replacement of fabric impressed pottery by simple stamping about A.D. 800 (David G. Anderson, personal communication 1990). This may suggest that McClellanville and Santee wares are closely related, both typologically and culturally. Also probably related is the little known Camden Series (Stuart 1975) found in the inner Coastal Plain of South Carolina.

The best data concerning Middle Woodland Coastal Zone assemblages comes from Phelps' (1983:32-33) work in North Carolina. Associated items include a small variety of the Roanoke Large Triangular points (Coe 1964:110-111), sandstone abraders, shell pendants, polished stone gorgets, celts, and woven marsh mats. Significantly, both primary inhumations and cremations are known from the Mount Pleasant phase.

Based on work by Rathbun (see Conner 1985 and Hyman 1983) and Trinkley (1991a) it appears that both ossuaries and sand mounds are found along the entire South Carolina coast, although precise dating and thorough understanding of their cultural significance has yet to be achieved. As Wilson notes, "the sand burial mounds . . . cannot be associated with any one prehistoric physical type or aboriginal group," for in North Carolina they are found in the context of probable Iroquoian, Siouan, and Algonquin populations (Wilson 1982:172). The available information, however, suggests a relatively egalitarian society was common to all. Anderson suggests that, "these mound/ossuary complexes appear to represent principal burial areas for local lineages or other currently unrecognized social entities" (Anderson 1985:56).

These Middle Woodland Coastal Plain and Coastal Zone phases continue the Early Woodland Deptford pattern of mobility. While sites are found all along the coast and inland to the Fall Line, shell midden sites evidence sparse shell and artifacts. Gone are the abundant shell tools, worked bone items, and clay balls. Recent investigations at Coastal Zone sites such as 38BU747 and 38BU1214, however, have provided some evidence of worked bone and shell items at Deptford phase middens (see Trinkley 1990a).

In terms of settlement patterns, several researchers have offered some conclusions based on localized data. Michie (1980a:80), for example, correlates rising sea levels with the extension of Middle Woodland shell middens further up the Port Royal estuary. Scurry and Brooks (1980:75-78) find the Middle Woodland site patterning in the Wando River affected not only by the sea level fluctuations, but also by soil types (see also Trinkley 1980b:445-446). They suggest that the strong soil correlation is the result of upland sites having functioned as extraction areas, principally for exploitation of acorns, hickory nuts, and deer. Shell midden sites, they suggest, also represent seasonal camps and therefore exhibit small size, low artifact density, and infrequent re-occupation. Ward's (1978) work in Marlboro County suggests that interior site patterning changed little from the Early to Middle Woodland. Sites continue to be found on the low, sandy ridges overlooking hardwood swamp floodplains, which suggests that while pottery styles changed, site locations, and presumably subsistence, did not (see also Ferguson 1976). Drucker and Anthony's (1978) work in Florence County, South Carolina reveals virtually continuous short-term occupation along the terraces associated with the floodplain of Lynch's Lake. DePratter's work at the Dunlap site, however, suggests that a few, relatively stable villages were present in the Middle Woodland.

Late Woodland and South Appalachian Mississippian

In many respects the South Carolina Late Woodland may be characterized as a continuation of previous Middle Woodland cultural assemblages. While outside the Carolinas there were major cultural changes, such as the continued development and elaboration of agriculture, the Carolina groups settled into a lifeway not appreciably different from that observed for the previous 500 to 700 years (cf. Sassaman et al. 1989: 14-15). This situation would remain unchanged until the development of the South Appalachian Mississippian complex (see Ferguson 1971).

Along the central and northern South Carolina coast, Anderson et al. (1982: 303-304) suggest a continuation of the Santee series into the Late Woodland. The Hanover and Mount Pleasant series may also be found as late of A.D. 1000. Along the southeastern North Carolina coast, South (1960) has defined the Oak Island complex, which is best known for its shell tempered ceramics with cord marked, fabric impressed, simple stamped, and net impressed surface finishes. The phase is briefly discussed by Phelps (1983:48-49), but curiously this manifestation is almost unknown south of the Little River in South Carolina. Very little is known about the northern coastal South Carolina Late Woodland complexes, although sites such as 38GE32 may document the occurrence of village life in the Late Woodland.

The South Appalachian Mississippian is typically characterized by the construction of truncated temple mounds, reliance on cultivated crops, the development of a social elite, and complicated stamped pottery. The best information for the coastal area comes from the only incompletely reported excavations at the Charles Town Landing site (South 1971). In addition, Anderson (1989) provides an excellent synthesis of Mississippian research in South Carolina, observing that "while we have a fair appreciation for the culmination of the Mississippian in South Carolina, its origins and immediate Woodland antecedents remains largely unknown at the present" (Anderson 1989:114).

Anderson also notes the need for additional research in the area of

> relationships between Woodland and Mississippian occupations in South Carolina, particularly the mechanisms bringing about the transition between the seemingly markedly dissimilar forms of social organization and subsistence adaptation (Anderson 1989:113).

While Trinkley (1981b, 1983a, 1983b) has offered a cultural sequence for the Mississippian remains in the coastal

area that encompasses the Jeremy, "classic" Pee Dee, "post-classic" Pee Dee, Wachesaw, and Kimbel series, Anderson (1982:312-319) offers an alternative perspective incorporating Pee Dee and Ashley wares.

Protohistoric

The history of the numerous small coastal Indian tribes is poorly known. As Mooney noted, the coastal tribes:

> were of but small importance politically; no sustained mission work was ever attempted among them, and there were but few literary men to take an interest in them. War, pestilence, whiskey and systematic slave hunts had nearly exterminated the aboriginal occupants of the Carolinas before any body had thought them of sufficient importance to ask who they were, how they lived, or what were their beliefs and opinions (Mooney 1894:6).

In truth, our knowledge of these groups has also been limited because too few scholars have taken an active interest in the primary sources and there has been too little desire to evaluate critically the early research by Mooney (1894) and Swanton (1952). For South Carolina Anderson (1989:117-118) briefly notes the current status of ethnohistoric research.

The groups commonly associated with the Charleston County coast, such as the Wando and Sewee, are traditionally thought to be Muskhogean speakers, although little else is known about them (see Waddell 1980). The Sewee have recently been examined in some detail by Trinkley and Wilson (1988) who found that the traditional scenarios may be inadequate to explain the protohistoric settlement along the Carolina coast.

RESEARCH STRATEGY AND METHODS

Natalie Adams

Introduction

The primary goals of the data recovery excavations at sites 38CH173 and 38CH175 included examination of subsistence, settlement, and the associated cultural materials. The seasonality of the various remains at the sites were considered important to the overall settlement reconstruction. Likewise, questions concerning the exploitation of different habitats within the coastal zone were significant to an understanding of site settlement choices.

Excavations

Overview

The work conducted by Chicora at both sites meets the proposed data recovery requirements with the excavation of 400 square feet at 38CH173 and 350 square feet at 38CH175. Both sites were mechanically stripped at the conclusion of the field work. At 38CH173, an area measuring approximately 10,000 square feet was stripped as specified in the proposal At 38CH175, an area measuring approximately 12,800 square feet was stripped which exceeds the the specified area of 5,750. In order to locate the area specified by Brockington and Associates as containing the highest archaeological integrity several methods were used. The developer's representative, Mr. Walter Mueller, scaled off maps provided by Brockington et al. (1987) and located these areas in the field. Mueller indicated that there were a number of problems with the maps, primarily the disproportionate size of geographic features (Walter Mueller, personal communication 1993). The locations believed to be the areas represented on the maps were marked off by Mr. Mueller with spray paint. Our initial walkover of both sites indicated that these locations were essentially correct, based on Brockington et al.'s (1987) maps. In addition, at 38CH175 this marked area was shovel tested with at 20 foot intervals. Shovel testing of an area approximately 80 by 100 feet in size (27 tests) indicated that the densest and least disturbed midden was located slightly northeast of the area marked by Mr. Mueller. The excavation area was then modified to reflect this finding (Figure 9).

38CH173

The site grid was laid out to incorporate the area which Brockington et al. (1987) had identified as containing the highest integrity. Grid north was oriented with magnetic north and the southern corners of the grid were tied into a railroad spike in the base of a tree associated with a survey marker installed by Southeastern Surveying. The elevation of the survey marker was 9.28 feet above mean sea level.

Units were established using a modified Chicago 10-foot grid, with each square designated by its southeast corner from a 0R0 point off site. Thus square 800R200 would be located 800 feet north and 200 feet right (or east) of the 0R0 point.

The placement of the initial 10 foot square was guided by the presence of what appeared to be a small intact shell midden eroding into the pond. The additional units were placed in the same vicinity to expose a larger area to understand the eroding midden's relationship to the rest of the immediate site area to better understand intra-site spatial patterning within one area of the site.

Units were excavated in natural stratigraphic zones. The site evidenced heavy plowing and other

disturbances, not identified in the testing by Brockington et al. (1987). Stains in the subsoil indicated that in addition to plow damage, heavy equipment probably associated with the construction of the pond or golf course construction had damaged the site. These stains included rectangular gouges with clear, sharply defined edges, possibly made by a backhoe. Also, Mr. Walter Mueller indicated that since Hurricane Hugo, the site had eroded significantly in the area around the pond. For instance, a culvert which originally extended only one or two feet beyond the bank now extends about eight to ten feet beyond the bank (Walter Mueller, personal communication 1993). Additional disturbance to the site may have occurred when heavy machinery placed overburden in the area during golf course construction. Since 38CH173 had been plowed to subsoil (based on the presence of plowscars), the units were removed as one zone. The plowzone consisted of a very dark grayish brown (10YR3/2) soil intermixed with plowed shell midden. Although excavated as 10 foot units, each quadrant (e.g. northeast, southeast, etc.) was bagged separately to determine if tighter control would result in clearer identification of activity areas. Due to disturbances previously discussed, the tighter horizontal control did not add any significant information.

Plowzone (Zone 1) soils were dry screened through ¼-inch mesh using mechanical sifters. Only small areas of very thin intact shell midden were identified and no effort was made to screen these areas with ⅛-inch mesh. These areas were identifiable as pockets of shell at the base of the plowzone which contained denser amounts of shell than the surrounding matrix. Shell in these pockets did not exhibit extensive breakage due to plow damage. Two of these areas were identified and occurred between plowscars. Shell was weighed and discarded in the field, although a sample of left oyster valves was collected from features for analysis by our shellfish consultant, Dr. David Lawrence. Soil samples were also collected from each unit. Units were trowelled at the top of the subsoil, photographed in black and white and color, and plotted.

Features were plotted and photographed prior to excavation. Typically they were bisected, with the profile photographed and drawn prior to the excavation of the remaining feature. All feature fill, excepting a 5-gallon sample retained for water flotation, was screened through ⅛-inch mesh. Hand picked shell samples were retained for analysis.

At the conclusion of the excavations the area of the site noted by Brockington and Associates as most intact was mechanically stripped to reveal any other intact features or stains. These stains were plotted and photographed. Based on the scope of work, none of these were to be excavated.

38CH175

The site grid at 38CH175 was established with magnetic north and was tied into a temporary benchmark (a nail in the base of a tree at the bluff point). Vertical control was mantained through the use of the Southeastern Surveying elevation point (9.28 feet above MSL) located adjacent to 38CH173. Units were established using the modified Chicago 10-foot grid system.

Before the site grid was established, the area thought to be indicated by Brockington et al. (1987) as containing the highest level of integrity was shovel tested at 20 foot intervals in order to more clearly understand the boundaries of the intact shell midden. These 27 shovel tests covered an area approximately 80 by 100 feet in size. Based on these shovel tests, the location of the initial 10 foot test unit was established (Figure 9). Additional units were excavated to obtain a larger midden profile to better understand site dynamics.

Units were excavated in natural zones with arbitrary levels. Zone 1 consisted primarily of very dark gray brown (10YR3/2) humic soils containing primarily historic materials. This zone varied from 0.2 to 0.3 foot in depth. Zone 2 consisted of very dark gray brown (10YR3/2) midden soils varying from 1.5 to 1.9 feet in depth. These zone were divided into 0.5 foot levels. Generally, Zone 2 levels 1 and 2 were badly crushed and contained twentieth century materials to a depth of about 1.3 feet. Zone 2 levels 3 and 4 were almost entirely composed of Thom's Creek period remains and evidenced areas of intact midden. Zone 3 consisted of yellow brown (10YR5/6) subsoil-like sand with whole oyster shell and artifacts. Zone 3 varied from 0.1 to 0.5 feet in depth. The typical profile consisted of

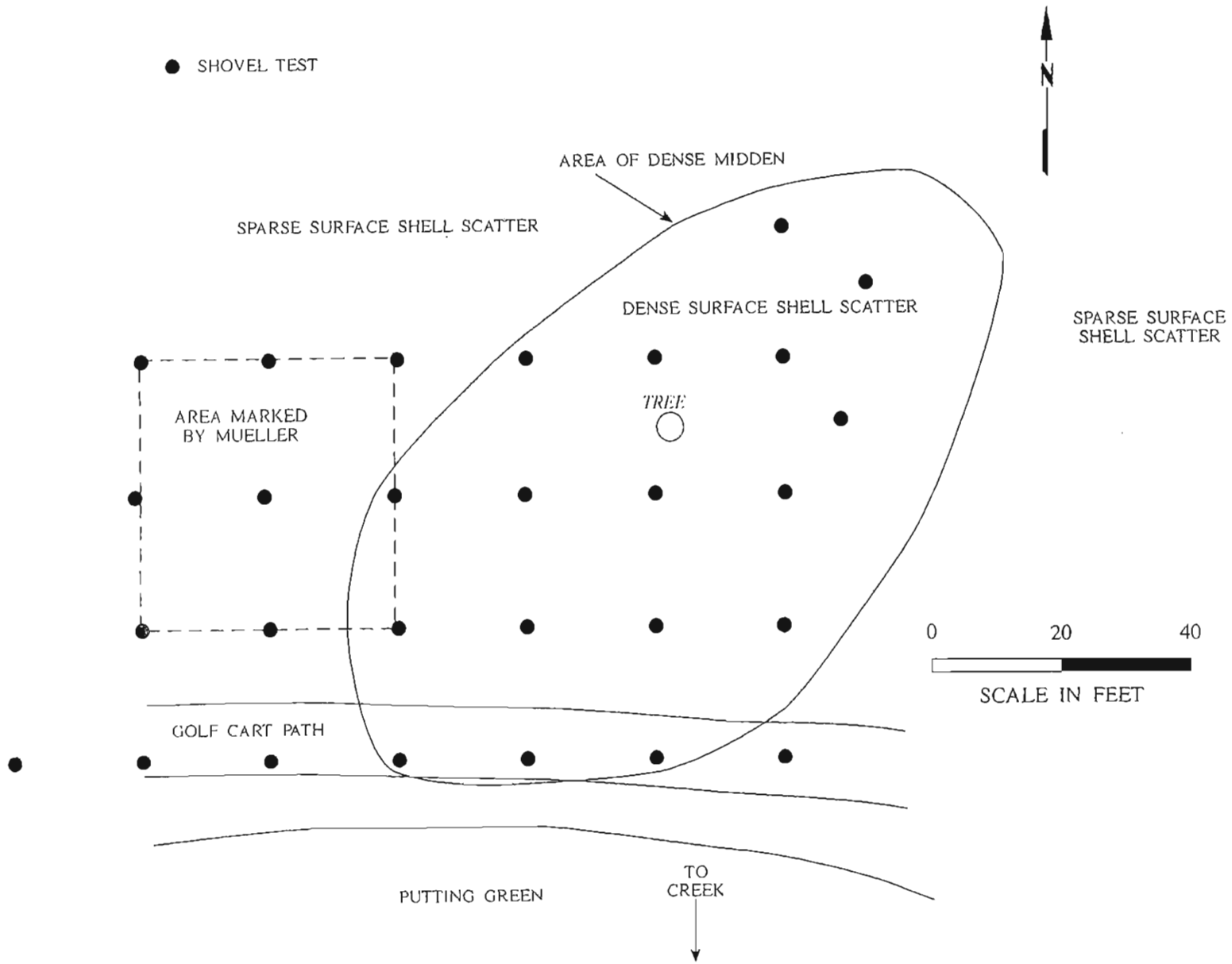


Figure 9. Map showing location of dense midden based on shovel tests.

0.3 feet Zone 1 soils, 1.5 feet of Zone 2 soils, and 0.3 feet of Zone 3 soils.

Non-midden soils (Zone 1) were dry screened through ¼-inch dry mesh using mechanical sifters. Midden soils (Zones 2 and 3) were either dry screened through ¼ or ⅛ inch mesh or waterscreened through ⅛ inch mesh. The purpose of the waterscreening was to determine if this method improved the recovery rate since faunal and ethnobotanical materials were found to be sparse in dry screening. This method improved the recovery of these remains, although the materials remained sparse. The waterscreening was practiced on shell column soils.

After the first two ten foot units were excavated, it was decided that the humus and disturbed midden layers (Zone 1 and Zone 2, levels 1 and 2) would be removed and not screened since the material could not yield any reliable stratigraphic information. The samples obtained from the first two units were believed to provide an adequate representation of this portion of the site. This sacrifice of the disturbed upper portion of the site allowed greater attention to the intact lower levels, increasing the sampling fraction at the site.

The shell from Zones 2 and 3 were consistently weighed prior to being discarded in the field. Hand picked samples of left oyster valves were collected for additional analysis, as were any other unusual or suspect shell material. In addition, Zone 2 column samples were collected from each unit. These column samples were consistently 2.25 feet square in a 10 foot unit and were designed to provide a 5% sample of the midden.

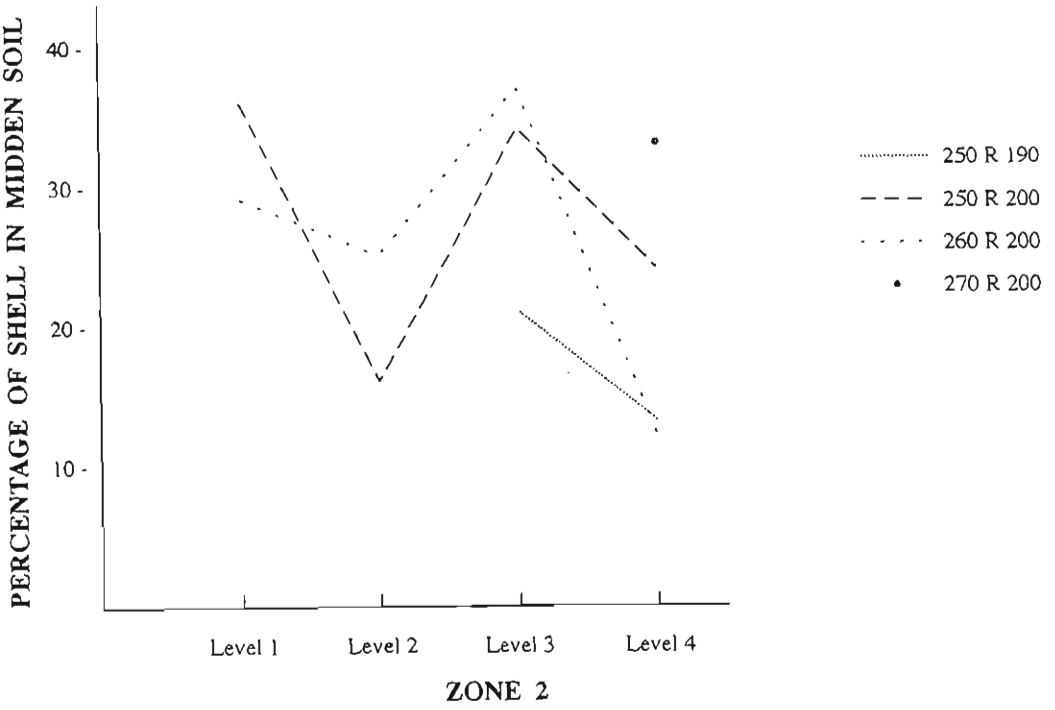
Each column sample was removed and weighed prior to screening. All shell was then weighed and bagged for detailed analysis. The weight of total column minus the weight of the shell provided the weight of the soil in the column and allowed a shell/soil ratio to be calculated. These ratios are presented in Table 1.

Table 1.
Shell/Soil Ratios for 38CH175

Provenience	Shell/Soil Ratio
250R190	
Zone 2, level 3	1:3.7
Zone 2, level 4	1:6.8
250R200	
Zone 2, level 1	1:1.8
Zone 2, level 2	1:5.4
Zone 2, level 3	1:1.9
Zone 2, level 4	1:3.1
260R200	
Zone 2, level 1	1:2.5
Zone 2, level 2	1:3.0
Zone 2, level 3	1:1.7
Zone 2, level 4	1:7.4
270R200	
Zone 2, level 4	1:2.0
Zone 3	1:1.9

Table 2 illustrates the relationship between level and density for three of the four excavation units in Zone 2. Density fluctuates consistently in each unit, being relatively high in level 1, decreasing in level 2, increasing again in level 3, and decreasing again in level 4. This may suggest periods of intensive use and either abandonment or sporatic use. However, this graph should be view with caution, keeping in mind that levels 1 and 2 have been

Table 2.
Percentage of shell in Zone 2 midden soils



disturbed by historic land use. It is possible that these disturbances have not been so complete as to totally obliterate evidence of density changes. changes which may be real.

Soil samples were routinely collected from each zone and level. Several examples of shells filled with soil were retained from the midden for pollen analysis. Units were trowelled at the top of the subsoil, photographed in black and white and color, and plotted.

Features were plotted and photographed prior to excavation. Typically they were bisected, with the profile photographed and drawn prior to the excavation of the remaining feature. All feature fill, excepting a 5-gallon sample retained for water flotation, was screened through ⅛-inch mesh. Hand picked shell samples were retained for analysis.

At the conclusion of excavations the area of the site determined by shovel testing in combination with Brockington et al.'s (1987) map to have the highest integrity was stripped to reveal additional features or stains. A number of stains were revealed including tree stains, possible shell pits, low midden areas, a burn area, and an old road bed. To determine if stains represented actual features as opposed to just areas of low midden, the stains were shovel shaved to determine if features exhibited depth. No areas were identified which clearly indicated structural remains. Based on the scope of work, none of these stains were excavated.

Laboratory and Analysis Methods

The cleaning of artifacts was begun in Mount Pleasant during the field work and completed in Columbia. Cataloging of the specimens was conducted at Chicora laboratories in Columbia in September 1993. All artifacts

were wet cleaned, at which time they were evaluated for conservation needs. All the prehistoric materials and historic ceramics were stable and no conservation treatments were undertaken.

Faunal materials were too uncommon to permit any detailed analysis and, consequently, have been incorporated into this study as weights with general comments. Likewise, the flotation samples from the middens were subjected to mechanical water flotation and yielded very limited charcoal. The results of that work are incorporated as only general comments. Shellfish remains are very plentiful at the site and have been examined in some detail by Lawrence, whose study is included in a following section. Claasen's work at shell midden sites has focussed on the analysis of clams. Her analyses require samples from features which are known to have been deposited in one episode to obtain the best seasonality information (Claasen 1982). While features were excavated at both sites, none of these yielded more than two clams.

EXCAVATIONS AT 38CH173

Natalie Adams

Excavations

The work at 38CH173 involved the excavation of four 10-foot units placed contiguously in order to investigate one specific area of the site (Figure 10). After scaling the location of the Brockington and Associates test unit from the southern edge of the pond using their site map, it was believed that this was in the vicinity of their test unit. Before excavation was begun, approximately one foot of overburden from golf course construction was mechanically removed. In most of areas where overburden was removed, an additional 0.1 foot of fill was shovel scraped off. The overburden was clearly discernable as yellowish tan sand overlying dark brown plowed midden soils. While the color of the fill was distinctly different from the Ap horizon at the site, there was no use of filter fabric or other techniques to distinguish the two zones. The first of the excavation units was place adjacent to a thin midden lens which was visibly eroding into the pond. Our units indicated that most of the midden existing in this area had been heavily plowed, leaving only thin basal remnants present in a few areas. During the 1987 survey of the site Brockington et al. (1987) found 25 cm (0.8 feet) of "non-disturbed" soils with only the top 10 cm (0.3 feet) evidencing heavy disturbance. Between 1987 and 1993 additional disturbance caused this profile to change somewhat dramatically from 0.8 feet to 0.5 feet of Ap horizon. In addition, only 0.2 feet of intact basal midden was found in small, spotty locations. Clearly, given the photographic evidence of twentieth century plowing, the field investigators did not see "non-disturbed" soils as they believed they had. As previously discussed, a variety of disturbances have occurred at the site including plowing (see Figure 4), the use of heavy equipment to excavate the pond, tree clearing, erosion, and possibly the placement of overburden on the site during golf course construction. Disturbances occurring after the 1987 survey would have consisted of tree clearing, erosion, and golf course construction. These activities could caused the site depth to change from 0.8 to 0.5 feet. Figure 11 shows an example of extensive plow scarring in one of the excavation units.

At the base of the plowzone these disturbances were evidenced by numerous shallow plowscars, tree stains, and relatively large, sharply defined rectangular stains. Since the midden was so heavily plowed, no effort was made to obtain shell columns. However, shell was weighed and discarded in the field. A total of 503 pounds of shell were recovered at the site.

Although several tree stains were identified in the excavations, only one was questionable enough to be excavated. The irregularity of its edges, absence of a clearly defined base, and irregular extensions further confirmed the belief that the stain represented a rotted out tree. One cultural feature was identified in excavations. This feature is a shell pit located in 540R490. The exposed portion of Feature 1, which was bisected by the N550 wall, measured 3.60 feet in width and an estimated 3.40 feet in width. The pit is oval shaped and 1.09 feet in depth (Figure 12). The pit contained 73 pounds of primarily oyster shell, with small amounts of whelk and clam. In addition, one Thom's Creek Plain, one Thom's Creek Shell Punctate, one Deptford Check Stamped, and 18 small unidentifiable sherds were recovered. Using a terminus post quem, the feature dates to the Deptford phase or later. Given that St. Catherine's pottery represents over 41% of the potteries dating to or after the Deptford phase, it is most likely that the feature dates to the St. Catherine's phase.

Site Stripping

At the conclusion of excavations the site was mechanically stripped to reveal additional features or stains (Figure 13). Most of the area contained either no stains or only plowscars. However, the northwestern portion of the

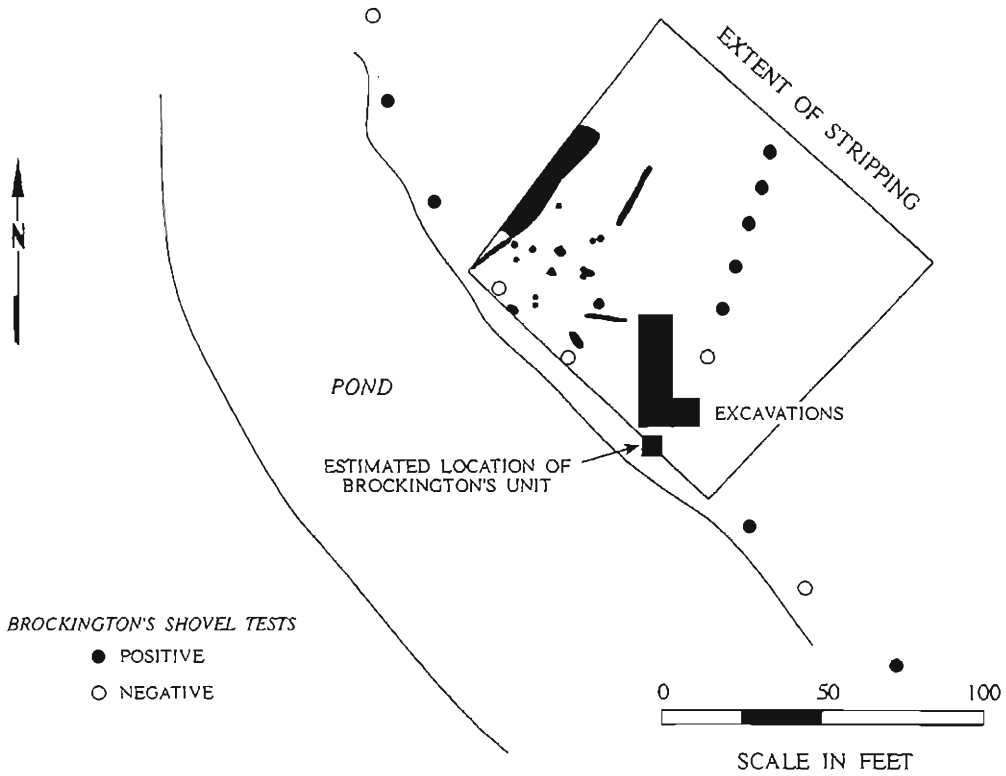


Figure 10. Location of excavation units and posited location of test unit and shovel tests excavated by Brockington and Associates (corrected for erosional factors) at 38CH173.

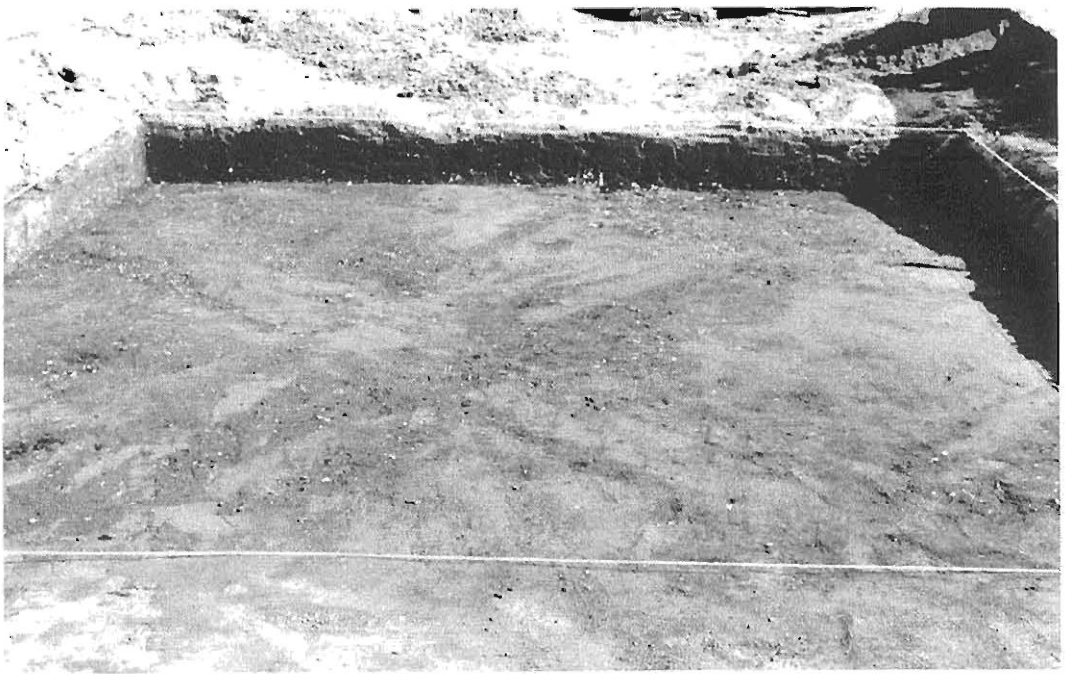
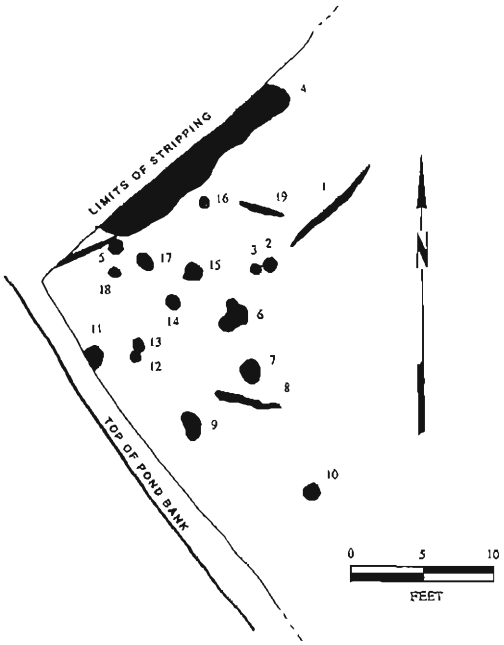


Figure 11. Unit 540R490, north view, showing plow scarring.

Figure 12. Feature 1, view to the north.

Figure 13. Shovel shaving during site stripping.



1, plowscar; 2, ? (1.2 x 1.0 ft.); 3, ? (0.7 x 0.5 ft.); 4, large, thin basal shell midden area; 5, ? (1.2 x 1.2 ft.); 6, tree stain; 7, ? (1.5 x 1.5 ft.); 8, plowscar; 9, tree stain; 10, tree stain; 11, thin basal portion of shell midden; 12, post hole? (0.7 x 0.7 ft.); 13, post hole? (0.5 x 0.5 ft.); 14, post hole? (0.9 x 0.9 ft.); 15, ? (1.3 x 1.0 ft.); 16, post hole? (0.8 x 0.8 ft.); 17, tree stain, 18, post hole? (0.9 x 0.9 ft.); 19, plowscar.

Figure 14. Location of features and stains encountered in stripping, 38CH173.

stripped area revealed a cluster of stains including trees, plowscars, and possible posts (Figure 14). It appears that the formal excavation units were placed in the same vicinity as the test unit excavated by Brockington et al. (1987).

Stains encountered during site stripping consisted of plowscars, basal midden remnants, tree stains, possible post holes, and other stains which origins were unknown. The location of the post holes did not reveal any clear evidence of a structure. However, there were four possible posts (Figure 14, feature nos. 12, 13, 14, and 18) which were located in close proximity to one another (average spacing of three feet) revealing a very rough L-shaped arrangement.

The possible posts identified at 38CH173 ranged from 0.5 to 0.9 feet in diameter. However, the irregularity in spacing of the four posts does not support the conclusion that they are associated with a house. In addition, there was no evidence in the area investigated that any of the other stains represented hearths (e.g., heavy concentrations of charcoal, burnt sand, and burnt animal bone) which are often found in association with Late Archaic/Early Woodland structures (see Sassaman 1993b:126).

Prehistoric structures have been found in a number of shapes and sizes. A Thom's Creek phase house identified on Kiawah Island was circular, about 18 feet in diameter and had a central hearth (Trinkley 1994). At the Fish Haul site, a D-shaped Stallings phase structure was identified (Trinkley 1986:147) which was similar to a structure uncovered in the Piedmont Georgia Cagle site (Crook 1984:38). That structure dated to about 600 B.C. In contrast, Stoltman (1974:51-54) found a Stallings phase lean-to at Rabbit Mount which is somewhat similar to a Deptford phase structure reported by Milanich (1971:62-65) from Cumberland Island, Georgia. Also, a possible Thom's Creek lean-to structure was identified at Sol Legare. According to a recent synthesis of hunter-gatherer site structure in the South Atlantic Coastal Plain by Sassaman (1993b:126), Woodland Period structure shape is hard to

predict. Late Archaic and Early Woodland houses are often rectangular or subrectangular, although there are a few examples of circular and oval structures. Many of these structures had interior and/or exterior hearths. It is likely that there is much variability in Middle and Late Woodland houses as well.

In sum, the features exposed in site stripping did not reveal clear evidence for a structure. The northwest quadrant of the stripped area yielded a cluster of features suggesting that this area represents a portion of the site core left after the pond was constructed. Based on Brockington et al.'s (1987) map of the site area, little was expected to be found in this area (see Figure 9). Given the problems encountered with the scale of geographic features shown on their maps, it is possible that their test unit was located further north, although it was not identified in the stripped area.

Artifact Analysis

Table 3 summarizes the artifacts recovered at 38CH173. The dominant material recovered from this site is pottery, with a total of 446 sherds collected from the excavations. Only 61 of these 446 sherds (or just under 14%) were over one inch in diameter. The large number of small sherds not suitable for analysis suggests that the site area has been heavily plowed. Six series have been identified from the work at this site: Stallings (n=1), Thom's Creek (n=24), Deptford (n=7), St. Catherine's (n=19), Santee (n=6), and Savannah (n=3). Given the sparsity of ceramic artifacts and their wide temporal range, limited detail will be provided by this analysis.

Type definitions for Stallings have been provided by Fairbanks (1942) and Griffin (1943). The definitive feature of this pottery is the large quantity of fiber, now identified as Spanish moss (Simpkins and Scoville 1981), included in the paste prior to firing. The pottery was decorated with punctations (usually shells, reeds, and sticks), finger pinching, and incising. Recent work by Sassaman (1991; 1993a) indicates that the various punctate styles change in frequency of occurrence through time for Stallings and Thom's Creek wares. He suggests that Phase I (2550-1850 B.C.) is characterized by plain pottery with plain and decorated vessels occurring in the later period. Phase II (1850-1450 B.C.) is a period of "abundant and elaborate decoration of pottery". Phase III (1450-1100 B.C.) is characterized by a high degree of interassemblage variability (Sassaman 1991:215). Given the similarity of design, it may be that, after further research, that these periods can be used for Thom's Creek wares as well. Only one example (or 1.6%) of Stallings pottery was recovered at 38CH173. This example is undecorated.

Thom's Creek pottery, first described by Griffin (1945), consists of sandy paste pottery decorated with the motifs common to the Stallings series, including punctations (reed and shell), finger pinching, finger smoothing, simple stamping, and incising. Studies at Lighthouse Point, Stratton Place, and Fig Island shell rings and Spanish Mount, have suggested a temporal ordering of the Thom's Creek series. Reed punctated pottery appeared to be the oldest, followed by the shell punctated and finger pinched motifs. Late in the Thom's Creek phase, perhaps 1000 B.C., there is the addition of Thom's Creek Finger Smoothed (Trinkley 1983a:44).

Thom's Creek pottery (n=25) accounts for 40.9% of the collection from 38CH173. It was also noted that a large percentage of the sherds less than one inch in diameter are probably Thom's Creek. Of those 25 sherds, 20 (or 80%) are plain, one (or 4%) is shell punctated, two (or 8%) are simple stamped, one (or 4%) is incised, and one (or 4%) was unidentifiable.

Refuge series pottery is similar in many ways to the preceding Thom's Creek wares. The paste is compact and sandy or gritty, while surface treatments include simple stamping, dentate stamping, and random punctate decorations (see DePratter 1979:115-123; Williams 1968:198-208). Anderson et al. note that these typologies are "marred by a lack of reference to the Thom's Creek series" (Anderson et al. 1982:265) and that the Refuge Punctate and Incised types are indistinguishable from Thom's Creek wares.

Type definitions of Deptford are offered by Caldwell and Waring (1939) and more recently DePratter (1979). The paste of the Deptford series pottery exhibits considerable variation, but tends to be gritty, with varying amounts of small rounded quartz inclusions present. Interior surfaces are only roughly smoothed. Exterior surface

treatments include check stamping, cord marking, simple stamping, and net impressing. Of the seven Deptford sherds recovered, five are plain examples (71.4%) with the remaining two (28.6%) being check stamped.

The St. Catherines wares are formally described by DePratter (1979) and briefly discussed by Caldwell (1971). The ware is characterized by the inclusion of finely crushed low-fire clay fragments. These investigations have not identified any sherds which exhibit "crushed sherd" tempering, although they may exist in other St. Catherines collections (e.g., DePratter 1979:131). In addition, these studies have failed to identify any pottery which is within the range of Wilmington's large sherd temper inclusions (see DePratter 1979:129). The interior of the St. Catherines pottery is roughly smoothed. Surface treatments include cord marking, net impressing, and fabric impressing. Brooks et al. (1982:22) also discuss the presence of fabric impressions on St. Catherine's pottery,

Table 3.
Artifacts recovered at 38CH173

Artifacts	A	B	C	D	E	F	G	H	I
Pottery									
Stallings									
Plain							1		
Thom's Creek									
Plain			8	5	3		3		1
Shell Punctate									1
Simple Stamped				2					
Eroded/UID						1			
Incised					1				
Deptford									
Plain						3	2		
Check Stamped							1		1
St. Catherines, type I									
Plain						4			
Cord Marked				4	4	1			
Fabric Impressed			1	1					
St. Catherines, type II									
Cord Marked					3		1		
Mt. Pleasant									
Cord Marked					2	1	1		
Fabric Impressed					2				
Savannah									
Complicated Stamped			1			3			
Small		1	8	87	108	101	55	6	18
Lithics									
Tan fossiliferous chert									
broken hafted CSPP		1							
Other									
Daub						1	1		
Total									
		2	18	99	123	115	65	6	21

Provenience: A) general surface; B) stripping; C) 520R490; D) 520R500; E) 530R490; F) 540R490; G) tree stain; H) Feature 1.

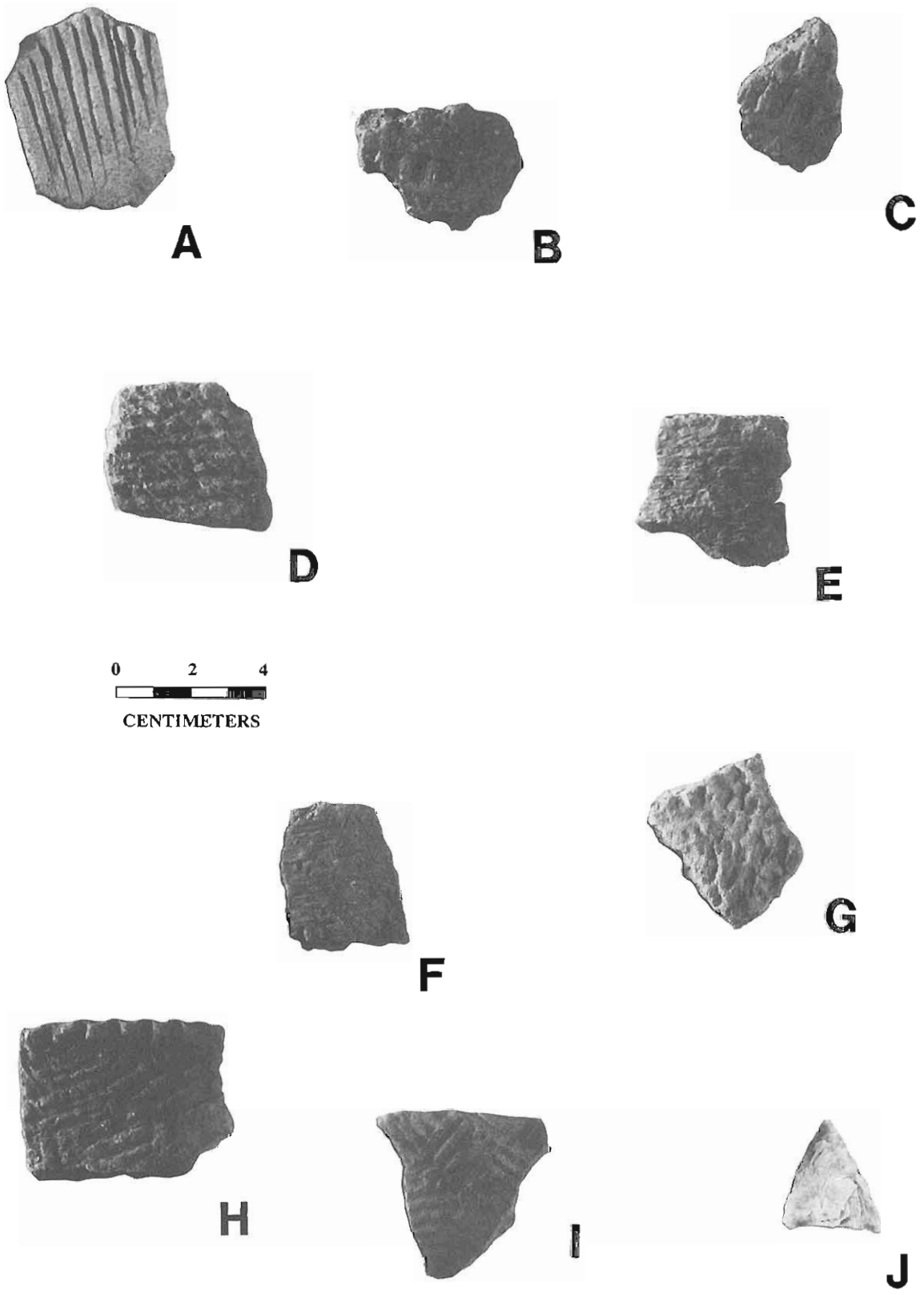


Figure 15. Artifacts from 38CH173: A) Thom's Creek Incised; B-C) Deptford Check Stamped; D) St. Catherines-type 1; E-F) St. Catherines-type 2; G) St. Catherines Fabric Impressed; H-I) Savannah Complicated Stamped; J) snapped projectile point-Coastal Plain chert.

although this is not a previously defined type.

Although all 19 (or 31.1%) sherds were classified as St. Catherines there were two distinct types identified. The first type is characterized by coarse tempering, based on USDA standard sizes for sand grains (ranging from 0.5 to 1.0 mm in size) and has a grainy texture. The sherds range in thickness from 8 to 11 mm. The frequency of inclusions is relatively sparse, and decorative motifs include cord marked and fabric impressed. The second type is also coarse tempered, with a grainy texture and a moderate amount of inclusions. The sherds are thinner, ranging from 6 to 7 mm, and decorative motifs included only cord marked. Cordage width and abundancy were also measured. Cordage width measured 1.4 to 1.9 mm with 2 to 4 impression per 10.0 mm on the first type. The cordage was softly twisted with 3.5 twists per 10 mm (see Hurley 1979). Cordage width on the second type ranged from 0.7 to 0.8mm with 8 impressions per 10.0 mm. The cordage was also softly twisted on this type with two twists per 10 mm (see Hurley 1979). While the sample size was very small (n=19), the types were different enough to suggest two distinct St. Catherines period occupations. This example clearly emphasizes the importance of performing detailed ceramic analyses which can assist in better understanding site use. For example, detailed ceramic analysis can help determine how many different groups used the site within. If intact features are present, do the types of features associated with the different potteries reflect changing site use?

The Mount Pleasant has been developed by Phelps from work along the northeastern North Carolina coast (Phelps 1983:32-35) and is a Middle Woodland refinement of South's (1960) previous Cape Fear series. The pottery is characterized by a sandy paste either with or without quantities of rounded pebbles. Surface treatments include fabric impressed, cord marked, and net impressed. The ceramics called Mount Pleasant can, under Anderson et al.'s (1982) scheme be considered a variety of Cape Fear. Six (or 9.8%) examples of Mt. Pleasant pottery was identified in the collection. Of these, four (or 66.65%) are cord marked, with the remaining two (or 33.35%) exhibiting fabric impressions.

The Savannah wares are formally described by Caldwell and Waring (1939), and Caldwell and McCann (1941). The ware is characterized by fine grit tempering consisting of small (coarse sand) rounded quartz inclusions. Interior surfaces are carefully smoothed and frequently burnished. Exterior surface treatments include check stamping, cord marking, and complicated stamping. Only four (6.5%) examples of Savannah pottery were identified in the collection. Two were curvilinear complicated stamped, while the other example was indeterminant.

Two pieces of daub were found in the excavations. Both exhibited grass impressions/inclusions and are most likely fired clay from a puddled clay hearth. None of this daub appears to be structural.

Only one lithic specimen was recovered during the field work at 38CH175. This surface specimen is a white/honey-colored fossiliferous chert projectile point blade with the haft broken off. Given the attributes present on the remaining portion of the projectile point, it is possibly a Palmer point; although lacking the diagnostic haft associated with Palmer points, this is only speculation. The blade length is 30.3 mm, the blade width is 26.3 mm, and the thickness is 7.5 mm. Its estimated full length is 39.0 mm.

The sparsity of lithic remains (one finished tool) at 38CH173 is typical of Woodland period sites in this area, due to the lack of good local lithic resources. It is likely that all finished tools were highly curated. It also suggests that activities at the site were very focussed.

Faunal and ethnobotanical remains were exceedingly sparse. Faunal remains consisted of 10 grams of small animal bone fragments from a plowzone context. A small amount of wood charcoal (0.8 gram) was obtained from Feature 1. This sparse quantity of floral and faunal remains will be discussed in more detail in a following section.

Summary

As discussed previously, 38CH173 was recommended as eligible for inclusion on the National Register of Historic Places because of its perceived ability to address questions relating to the Mississippian Period occupation.

It became clear in the field (and more so in the lab) that this site could not address any questions relating to the Mississippian Period. In an effort to salvage some research potential, an effort was made to shift research to the broader topics of typology and chronology. However, we found that the pottery collections were so small and the proveniences were so mixed that little substantive information could be obtained at this site. Excavation and site stripping revealed that the site has been subjected to a number of disturbances including plowing, construction of a pond, and perhaps hurricane debris removal and golf course construction.

Pottery consisted of 99.4% of the artifacts collected at 38CH175, nearly all of the artifacts recovered. Of the 446 sherds, only 61 (or 13.7%) were larger than 1-inch. This is most likely due to the heavy plowing the site has received over the years. Artifacts indicated that the site was occupied periodically from the Late Archaic/Early Woodland to the Mississippian period. Only one feature was encountered during excavations. The feature was a shell pit which, based on the ceramics present, probably dates to the St. Catherines phase.

Probably the most interesting aspect of the pottery was the identification of two distinctively different types of St. Catherines wares. One type was moderately thick with sparse clay temper inclusion and broad cord marking, while the other was thinner with more frequent temper inclusions and fine, closely spaced cord marking. This suggests that two different groups of people may have used this site during the St. Catherines phase. Both cordage examples exhibited soft twists which is common for St. Catherines pottery (see for example, Trinkley 1991b). The primary difference between the two types identified in this study was cordage width and the number of cord impressions per 1.0 cm. It is possible that width and number of impressions are dependant on one another, since the width of the cordage determines how many times it can be wrapped around a paddle.

Unfortunately, few reports have incorporated cordage studies into ceramic analysis. Several works (see for example, Trinkley 1991b; Trinkley et al. 1992) in the Beaufort area have examined cordage, but no studies could be found for the Charleston area. The first type of St. Catherine's pottery found at 38CH173 contains cord marking similar to wares found in the vicinity of Beaufort. For instance, at 38BU833 on Hilton Head Island the width of cordage averaged 2.0 mm with the average number of twists being four. However, inclusions were much more abundant in the 38BU833 collection (Trinkley et al. 1992). Table 4 summarizes the cordage studies at 38CH173, 38BU19, and 38BU833.

Table 4.
Comparison of St. Catherines cordage at several sites

Site	Temper	Thickness	Inclusions	Impressions per 1.0 cm	Twists per 1.0 cm	Width of cordage	Twist type
38CH173							
Type 1	Coarse	8-11 mm	Sparse	2-4	3.5	1.4-1.9	Z soft
Type 2	Coarse	6 to 7 mm	Moderate	8	2.0	0.7-0.8	Z soft
38BU833	N.P.	N.P.	Abundant	N.P.	4.0	1.0-2.0	Z soft
38BU19	N.P.	N.P.	N.P.	N.P.	N.P.	1.0-4.0	Z soft

As stated previously, the presence of the two types of St. Catherines phase potteries at 38CH173 suggests that two different groups of people occupied the site during that period. Future research will begin to fill in the many gaps in knowledge that exist about St. Catherines (and other) cord marked potteries. In the future, it may be possible to distinguish kin-based groups present based on cordage and vessel characteristics. After these groups are distinguished, it may be possible to plot their seasonal rounds, based on the distribution of the potteries.

Stripping at the site revealed a small cluster of features in the northwestern quadrant of the exposed area. Features included plow scars, tree stains, and possible post holes. The artifact collection at 38CH173 suggests a site at which a very focussed or narrow range of activities took place. Lithics were very insignificant and other artifacts,

such as bone and shell tools were completely absent. The artifactual assemblage essentially provides no evidence of specialized activities and argues against the occupants intending to process any quantity of mammals. While it can be argued that disturbances caused by plowing may have decreased the quantity of faunal material, there are examples of plowed Woodland Period sites which contained relatively high quantity of faunal remains. For example, at the Payne site (31MR15) in the central North Carolina piedmont, nearly 30% of the artifacts (excluding fire cracked rock, shell, and daub) were faunal remains (Mountjoy 1989: 12). Runquist (1979:12) argues that lack of preservation is primarily attributed to soil pH and the permeability of the soil to water.

The presence of shell and a shell pit feature, probably associated with the St. Catherines occupation, as well as the sparsity of bone and lack of clear structural remains, specialized tools, or evidence of tool maintenance activities indicates that shell fishing and processing was the primary activity. If the site had been occupied on a seasonally permanent basis, structures would have been present and there would have been a wider variety of artifacts since a wider variety of activities would have taken place. The lack of lithic debitage indicates that no tool maintenance took place at the site. All of these attributes are characteristics of a site with a narrow focus of activities.

EXCAVATIONS AT 38CH175

Natalie Adams

Excavations

The work at 38CH175 included the excavation of three 10-foot units and one 5 by 10 foot unit in a contiguous area (Figure 16). The presence of historic artifacts in Zone 2 level 2 of these units indicated that the top 1.3 feet had been disturbed by historic occupation of the site.

During the 1987 survey of the site Brockington and Associates found a dense midden about 75 cm (2.5 feet) deep. The top foot had been badly disturbed by the construction and razing of a twentieth century house. The field investigators noted that there was "minor topographic relief" at the site which suggested that the site may have been a shell ring. They also acknowledged the possibility that the relief could have been caused by bulldozing the twentieth century house. They located an area of high site integrity which measured approximately 49 by 114 feet in the central portion of the site. Anne King Gregorie (1925), who was very familiar with the prehistoric resources of the Porcher's Bluff area, does not mention the presence of a shell ring in that location, suggesting either that there was never a shell ring there or that by 1925 it had been altered beyond recognition. However, she does note the presence of a lime kiln at "Jervey's Point" which is probably the location of 38CH175.

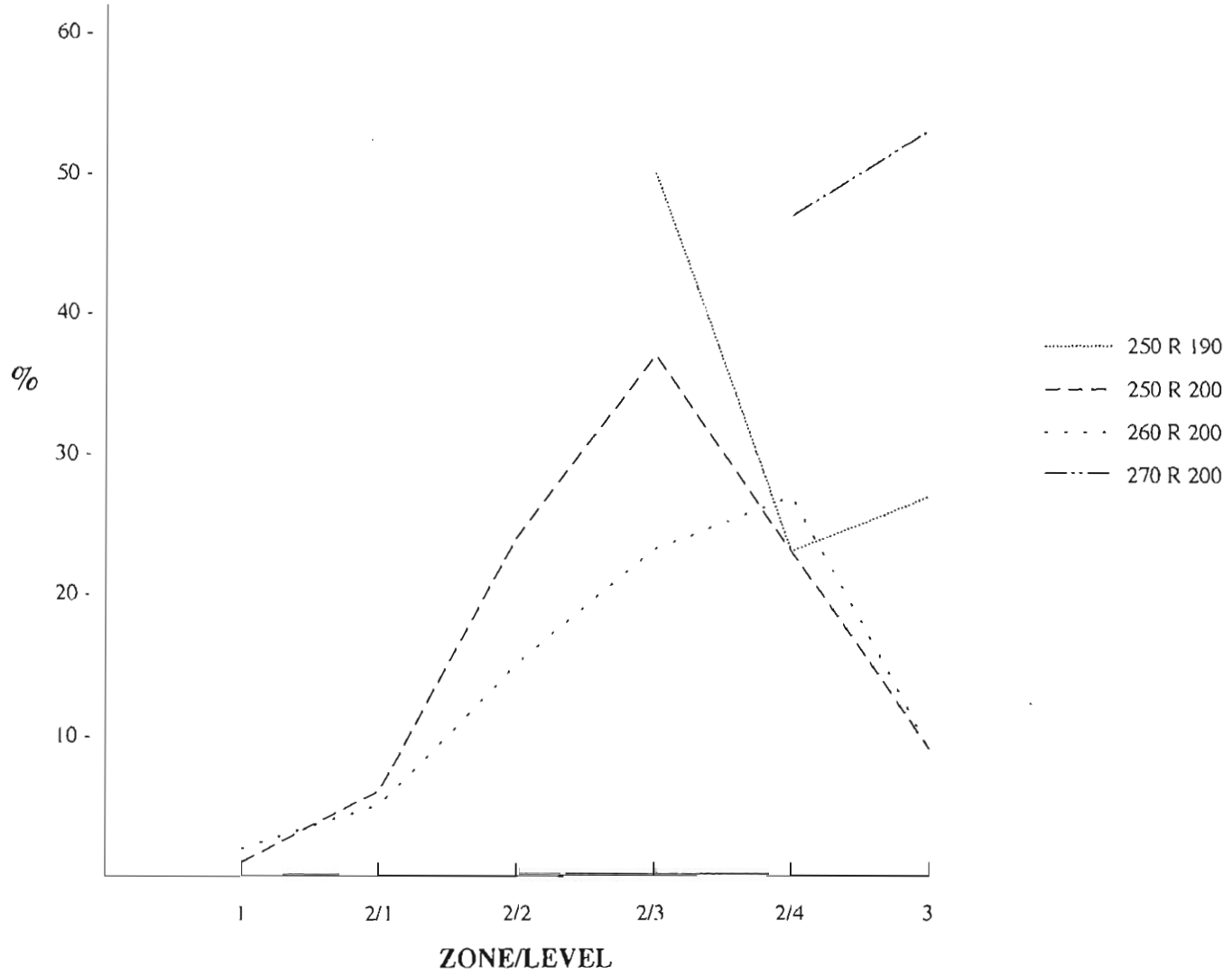
Sometime between 1987 and 1993, perhaps during hurricane debris clearing or clearing for golf course construction, this "minor topographic relief" disappeared from the site. However, close interval shovel testing in the area pointed out to us by Mr. Walter Mueller as the location of Brockington and Associates' work, indicated that dense intact midden was still to be found at the site. The field investigators scaled off this location with the map provided by Brockington et al. (1987) and it correlated with the area pointed out by Mr. Mueller.

One 5 by 10 foot unit and three 10 by 10 foot units, for a total of 350 square feet, were contiguously excavated at the site (Figure 16). Only one feature (Feature 1) was identified – a shell pit which began at the base of Zone 2 level 2 and was a maximum of 1.1 feet in depth (Figure 17). This feature contained only a small quantity of animal bone. No diagnostic materials were recovered from the pit. Intruding into the south side of this feature was a pocket of shell that appeared to have been dumped in one episode. This pocket was incorporated into the shell column for that unit. In addition, a linear stain was found at the base of 260R200 and 270R200. Upon excavation, the feature was found to be a large tree stain with the remnants of a burnt tree trunk in the central portion.

Table 5 provides a chart showing the distribution of artifacts in Zone 2 midden soils. When compared to the percentages in Table 2, there is a correlation between increased shell density and increased artifact density. This further supports the argument stated previously that this banding of midden represents period of intensive use and sporadic use or site abandonment. However, it is also possible that these "lenses" represent layers of fresh midden brought to the lime kiln, separated by layers of mixed shell and soil, representing periods when the kiln was not in operation. In 1843, Edmund Ruffin visited an old lime kiln site in the Beaufort area and described it as such:

> [u]pon inquiring for the marl, Mr. Capers carried me to the spot at his landing, on a creek, of Port Royal river. The body was only about 2 feet thick, and this, added to its peculiar appearance, different from all marls known, added to the previous doubts in regard to marl being found in such locality, soon convinced me that the deposite was artificial & accidental, & that it was probably

Table 5.
Distribution of artifacts in Zone 2 midden soils



> the refuse or damaged lime left at the bottom of an ancient lime kiln. The layer was indeed covered with some 18 inches thickness of over-lying earth, which might have been deemed an objection to my opinion. But this covering consists of oyster shells mixed with rich black mould & of course a deposite comparatively recent, such as is exhibited at every one of the thousands of heaps left by the Indians, & also at negro huts, & which still remain to encumber the fields of these islands. . . . There was no spot so likely for [the shells] to be placed, as on that already rendered worthless by the spoiled lime (Mathew 1992:124-125).

Midden profiles suggest that, at least, the bottom foot is midden original to the site. This layer contains pockets of dense, whole oyster shell as opposed to the highly crushed overlying midden.

Site Stripping

At the conclusion of excavations the area believed to contain the highest site integrity was mechanically stripped to reveal any additional features or stains (Figure 16 and 18). A number of stains were encountered. These were the result of several activities including natural disturbances (e.g., tree stains), prehistoric land use, and historic land use.

Although a large area was stripped, no evidence of structures was encountered. However, five of the stains appear to be shell pits (Table 6). While it may seem disturbing that a site with such a thick midden had no structures, this corresponds with the archaeological assemblage which will be discussed in the following section. As stated earlier, it is possible that some of the upper portion of the midden was brought in from elsewhere, for use in the lime kiln.

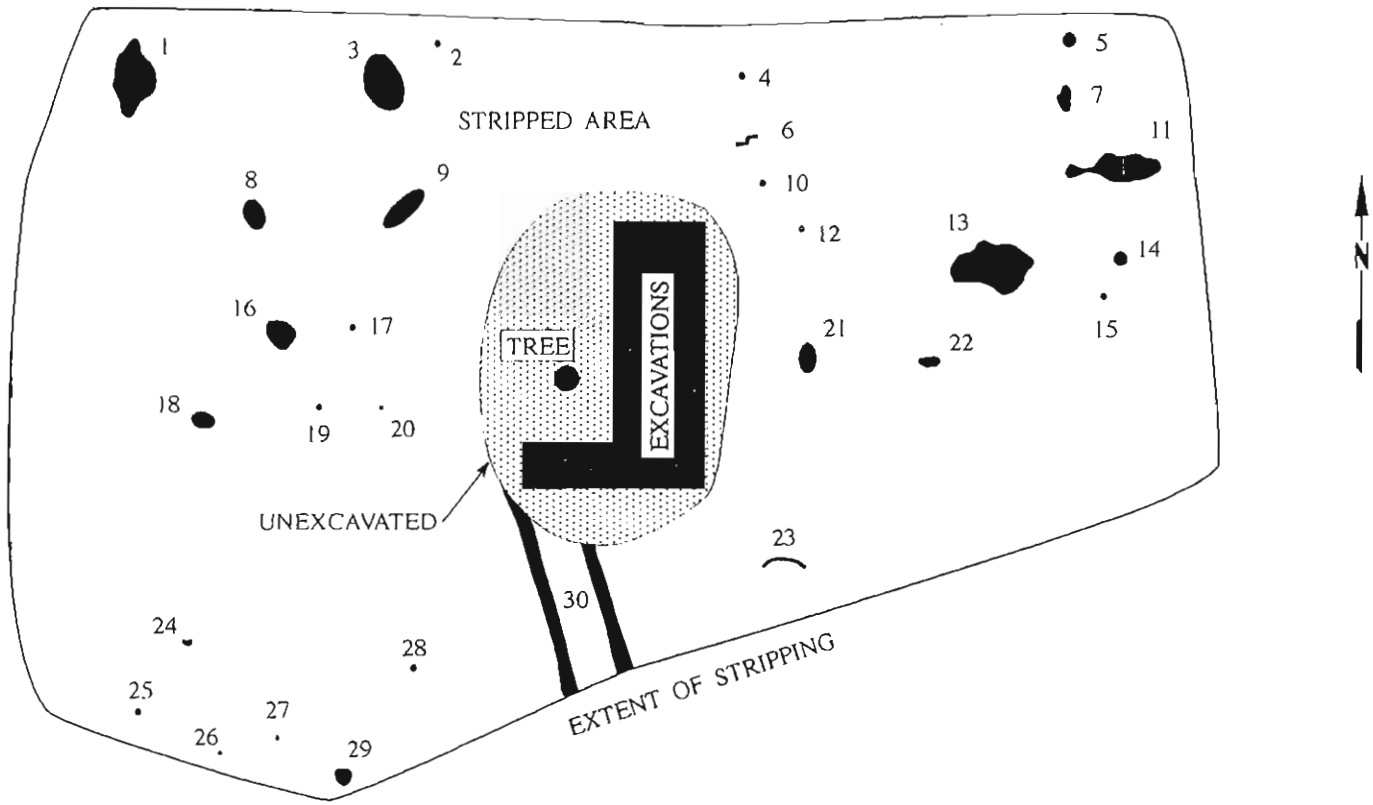
Table 6.
Size (in feet) and configuration of shell pits at 38CH175

Feature #	N-S	E-W	Shape
3 (possibly two overlapping pits)	5.0	6.0	Circular
8	2.5	3.0	Circular
9	2.0	3.4	Oval
16	3.0	3.0	Circular
21	1.5	3.0	Oval

The assemblage consisted almost entirely of pottery, little bone or floral remains, with little other artifact diversity. The assemblage suggests that the area was the focus of a specialized activity, most likely shellfish gathering, and that after oysters were gathered and processed, the individuals returned to their homes which were located nearby. The presence of these shell pits and the absence of structural features support this conclusion.

However, this conflicts with the information provided in the survey report (Brockington et al. 1987) since they found what they believed were two postholes in their test unit. As stated previously, the scale of the topographic features on their maps were inaccurate, and we may not have incorporated the area they tested. Nonetheless, we feel certain that our units and stripping incorporated most of the area they defined as containing the highest archaeological integrity given the density of the midden.

Interestingly, two clearly historic features were found in stripping. One feature appears to represent an area where trash and wood was burned. However, there was a small amount of lime in the area, suggesting that the feature is either associated with lime processing or that shell was accidentally burned in the fire. Several late historic century artifacts were found in this area while shovel shaving, including whitewares and clear machine made glass.



1. burn area with charcoal, charred wood, lime & late historic materials; 2. post? 3. shell pit;
4. very thin stain; 5. tree? 6. root; 7. tree; 8. shell pit? 9. shell pit? 10. root;
11. shallow depression with shell; 12. post? 13. tree with large roots; 14. post? 15. root; 16. shell pit;
17. shallow stain; 18. tree; 19. tree; 20. root; 21. shell pit? 22. shallow depression with shell;
23. root; 24. tree; 25. root; 26/27. shallow stains; 28. root; 29 root stain with large roots;
30. road bed.

Figure 16. Location of excavation units, features, and limits of stripped area at 38CH175.

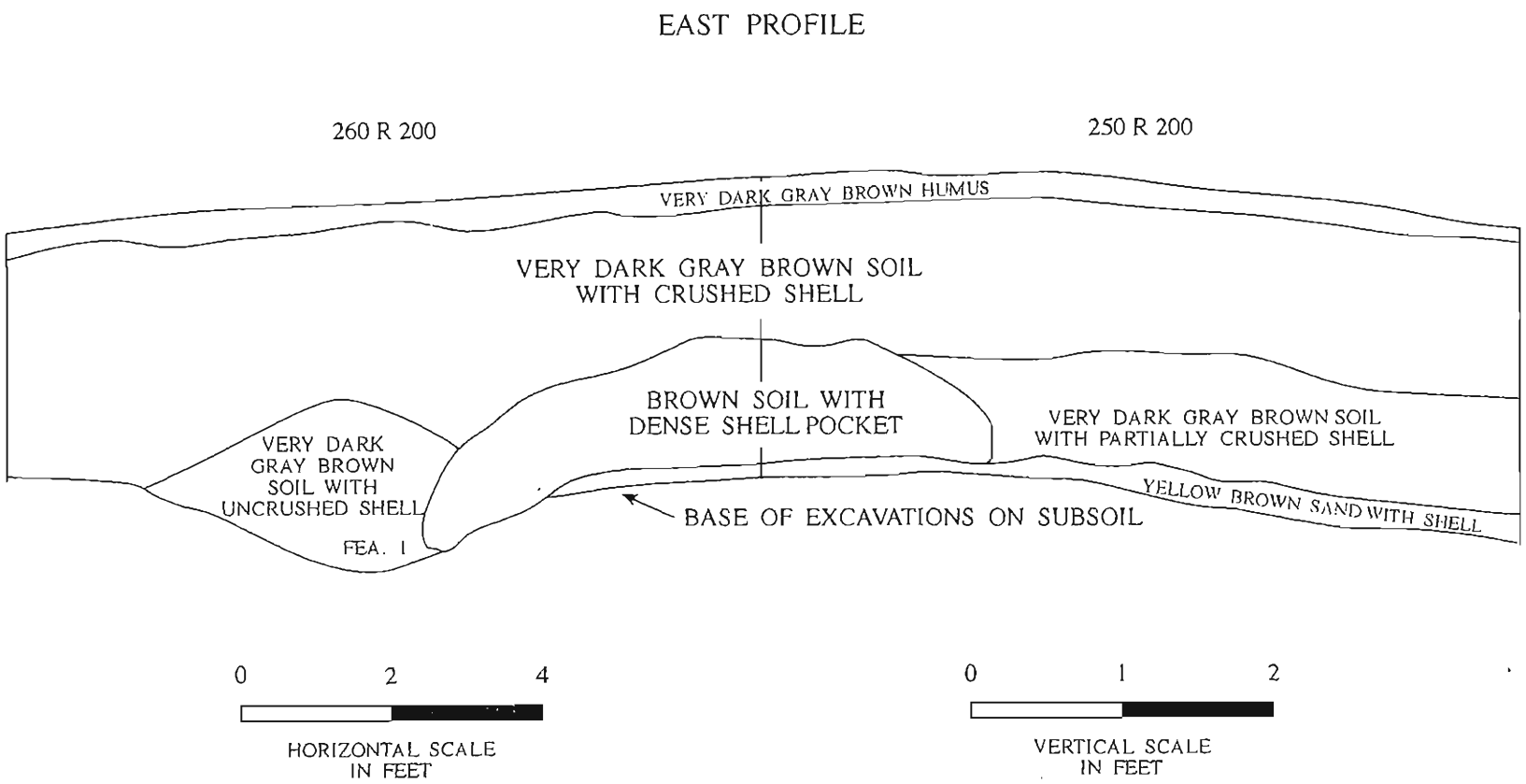


Figure 17. 250R200 and 260R200 showing Feature 1 and shell pocket, east profile.

Figure 18. A portion of 38CH175 after stripping.

Another historic feature was an old road bed which was exposed in the southern portion of the stripped area. This road was perpendicular to the shoreline and is directed to the point of land where lime and shell is eroding onto a beach. Given the depth of these historic disturbances, it is quite possible that the relief observed by Brockington and Associates is related to historic use of the property and the razing of the twentieth century structure and not a shell ring. As previously mentioned, it seems that Gregorie (1925) would have been aware of any shell ring on the readily accessible bluff and would have commented on its location (she provides considerable commentary on other shell rings in the area, such as Yough Hall, Stratton Place, and Hanckle).

Because of the historic disturbance discussed above, some basic land use history research was performed to better understand the impact of historic land use on 38CH175. Although the research is general, it provides a explanation for the phenomena observed.

An 1818 plat (Figure 19) was located which shows a lime kiln and landing at the site. Shell was probably taken from the surrounding midden to be burned for lime. In 1668 John Clayton wrote a letter to the Royal Society in which he described shell middens being used for lime making in Virginia:

> In some Places for several Miles together, the Earth is so intermix'd with Oyster shells, that there may seem as many Shells as Earth; and how deep they lie thus inter-mingled, I think is not yet known.... In several Places these Shells are much closer, and being petrified, seem to make a Vein of Rock.... Of these Rocks of Oyster-Shells that are not so much petrified they burn and make all their Lime; whereof they have that store, that no Generation will consume (Wiffen 1960:7-8).

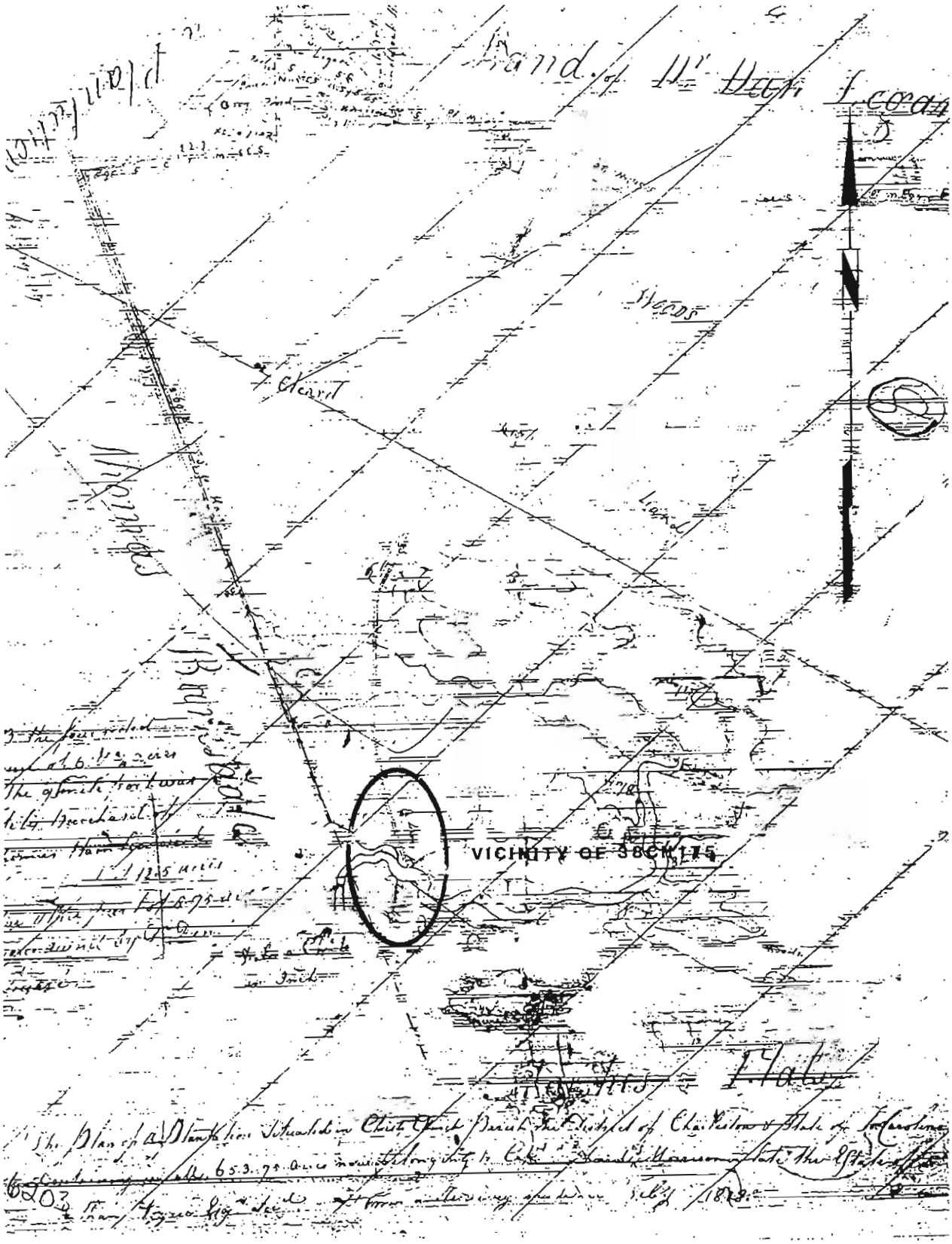


Figure 19. 1818 plat of lands owned by Richard Morrison, showing lime kiln, landing, and road (McCrady Plat #6203)

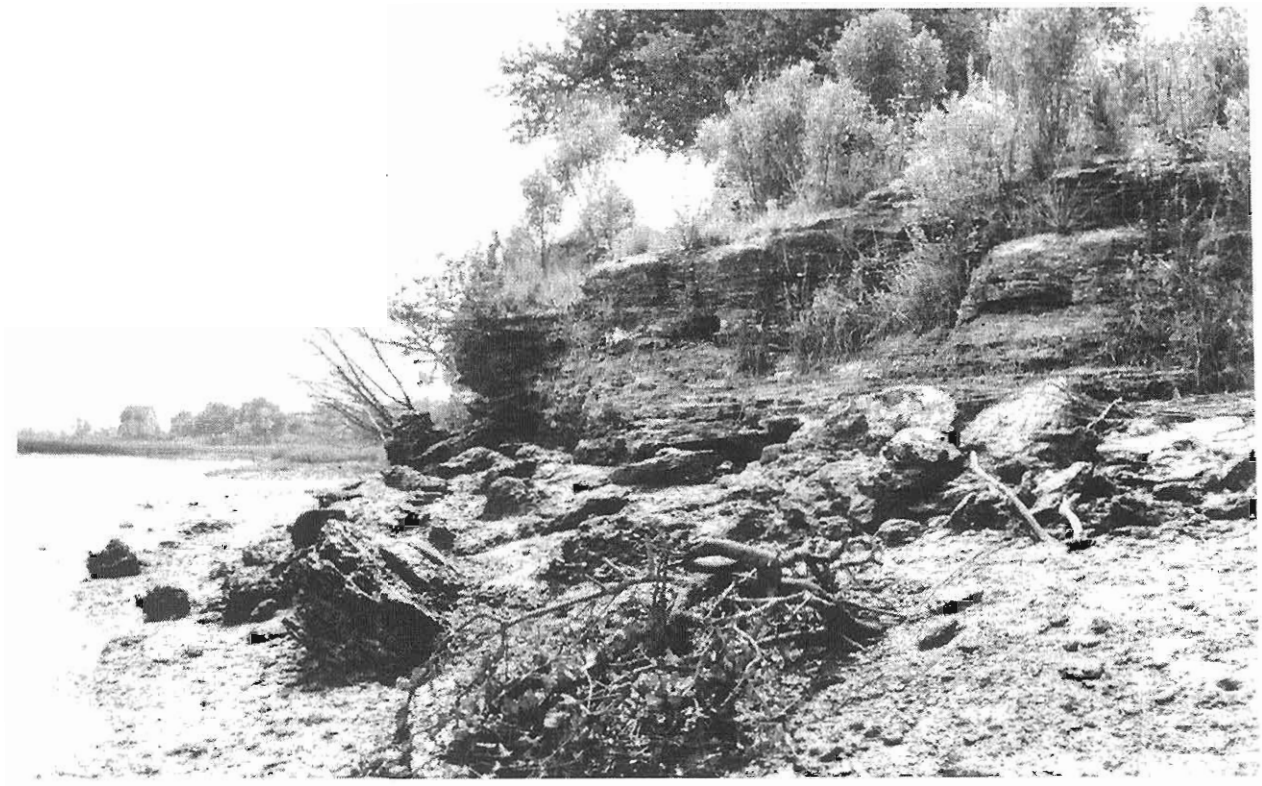


Figure 20. Eroding bluff at 38CH175 in 1993, west view.

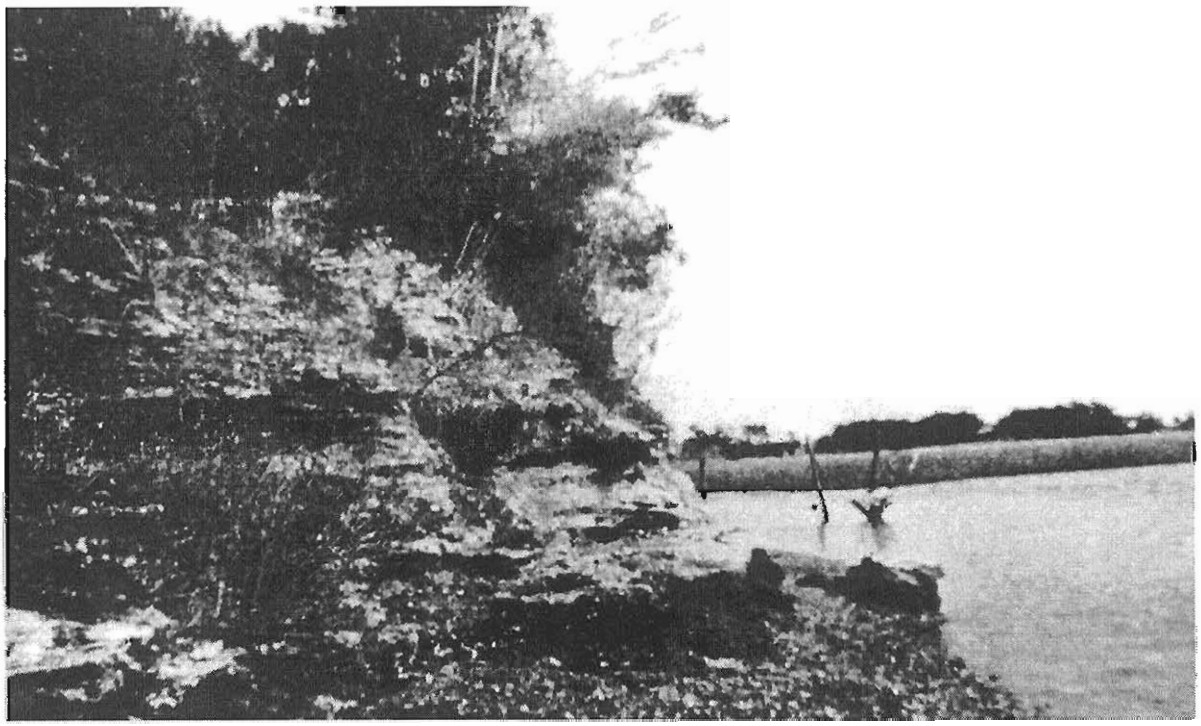


Figure 21. Old kiln at Jervey's Point (from Gregorie 1925:Plate XI).

In South Carolina, immediately south of the project area Anne King Gregorie (1925:15) noted,

> Most of my relics have been found on the site of an ancient village in the cotton fields of Porcher's Bluff Plantation. Here remains of shell heaps are plentiful – I have counted twenty-seven in a single field of seventeen acres. They are now almost obliterated, the shells having been hauled away by early settlers to burn lime – a very important building material in those times, as many remnants of tabby walls and old lime-brick works attest. At Porcher's Bluff there are three of these old lime kilns on the creek edge within a radius of half a mile.

The bluff along the creek, adjacent to the site, has a considerable amount of lime eroding from it (Figure 5 and 20) illustrating that a kiln was located at that spot. This kiln is probably the one illustrated by Gregorie (1925:plate XI) on Jervey's Point.

The plat also shows a road leading to the point of land which is probably the road located during site stripping. All of these early activities had a strong impact on the site. It is unknown how much shell was actually taken from the site for lime production. This 1818 plat shows that the road was in place at least by 1818 and a 1908 Coast Guard chart shows that the road was still in place. This suggests that either the kiln was still in operation or that the landing was still being used. Given the long period of use that the road has received, it is not surprising that road ruts were found at the base of stripping. Gregorie (1925:plate XI) show an "[o]ld time kiln at Jervey's Point, to the northeast of Porcher's Bluff". Since 38CH175 is situated on property once owned by the Jervey family, it is quite likely that this photograph was taken at 38CH175. Since Gregorie refers to it as an "old time kiln", apparently it had not operated for a long time (Figure 21).

Sometime in the early twentieth century, a house was constructed at the site. A 1938 Charleston County road map shows a structure in the vicinity of the site, and the 1967 areal photograph (Figure 4) shows that the structure was still standing. Based on areal photographs and county road maps, the site was bulldozed in the early 1970s.

After Brockington et al.'s 1987 survey of the tract, area defined as containing intact remains was to be greenspaced. One of the field investigators involved in the 1987 survey visited the site in 1989 after the golf course was constructed. He noted that the area which contained the minor topographic relief had been leveled (Lee Tippett, personal communication 1993). While debris removal may have further disturbed the site, excavations revealed that the top 1.3 feet had been badly damaged by historic land use. It is quite possible that what the field investigator witnessed was push piles associated with razing the twentieth century house.

In sum, there have been a number of historic disturbances which have adversely affected 38CH175. These disturbances include mining the site for shell to burn in the lime kiln, road use, house construction, house razing, tree removal, and golf course construction.

Radiocarbon Dating

One date was obtained from 38CH175 from pine and hickory nut charcoal recovered in the midden of Zone 2, level 4 of 250R200. This sample yielded an age of 4100 ± 90 B.P. or 2150 B.C. (Beta-69543).

Unfortunately no radiocarbon dates have been obtained from any of the shell rings or sites in the immediate area of 38CH175 (e.g. Stratton Place, Buzzard's Island, etc.). The closest Thom's Creek sites with radiocarbon dates are Seewee Shell Ring (Edwards 1969) near Bull Bay, Spanish Mount (Sutherland 1974; Trinkley 1980a) on Edisto Island, Lighthouse Point (Trinkley 1980b) on James Island and the Bass Pond site (Trinkley 1994) on Kiawah Island.

Spanish Mount has yielded a radiocarbon date of 2220 ± 350 B.C., the earliest radiocarbon date obtained for the Thom's Creek phase (Sutherland 1974; Trinkley 1980a).Radiocarbon dates from Lighthouse Point indicate that the Thom's Creek phase continues at least to 935 ± 175 B.C. (Trinkley 1980b: 191-192).

The Bass Pond site (Trinkley 1994) appears to be roughly contemporaneous with 38CH175, with the Thom's Creek phase radiocarbon material yielding a 2090 ± 90 B.C. date. The Seewee shell ring was occupied considerably later with radiocarbon materials dating to 1345 ± 110 B.C. (Edwards 1969).

Although no terminal date was obtained for 38CH175, it may have been occupied sporadically over time, given the relative sparsity of features, the lack of a buried humic layer, and the thickness of the midden.

Artifact Analysis

Prehistoric Remains

As at 38CH173, the dominant artifact recovered is pottery. At total of 3494 sherds were collected from the excavations and stripping. Historic disturbances and continued prehistoric site use have damaged the artifacts, resulting in 2802 (or 80.2%) small, unanalyzable sherds. The sherds were almost exclusively Thom's Creek, with one example of St. Catherines cord marked pottery. These potteries have been described earlier (see page 35) and will not be repeated here.

Of the 692 analyzable sherds, 691 are examples of Thoms Creek (Table 7). The most prominent decorative type found in the Thom's Creek collection at 38CH175 was Finger Pinched (N=79 or 11.4%), followed by Reed Punctate (N=78 or 11.3%), Shell Punctate (N=21 or 3.0%), Finger Smoothed (N=17 or 2.4%), Incised (N=17 or 2.4%), Simple Stamped (N=7 or 1.0%), and Jab and Drag (N=4 or 0.6%). The remaining examples are undecorated (N=468 or 67.6%).

This profile of the sherds collected is strikingly similar to that found at the Bass Pond site where 71.3% of the sherds were plain, 11.6% were Finger Pinched, 8.8% were Reed Punctate, 4.3% were Jab and Drag, 2.6% were Finger Smoothed, 0.4% contained mixed decorative motifs, 0.8% were Shell Punctate, and 0.2% were Simple Stamped. This is not surprising since both sites were occupied at roughly the same time period.

Trinkley (1980:22) has suggested a sequence for Thom's Creek wares, based on data gathered from Fig Island, Spanish Mount, Lighthouse Point, and Stratton Place. Based on this information, he has suggested that Thom's Creek Plain is the oldest pottery acknowledging that it will be found on all sites and represents the undecorated portion of otherwise decorated vessels. This is followed by Thom's Creek Reed Punctate, then Thom's Creek Shell Punctate. Thom's Creek Finger Pinched appears to follow the Shell Punctate wares, while Thom's Creek Finger Smoothed is probably the latest type. This suggestion is supported by a radiocarbon date on animal bone from the Venning Creek site of 980 B.C.

Recently, Sassaman (1991:121-122) has determined that certain types of fiber-tempered punctate styli exhibit discrete distributions when broken into temporal phases based on radiocarbon dates and stratigraphic trends. Phase I begins by at least 4500 B.P. and is characterized by a high proportion of plain vessels with thickened or flanged lips (an attribute not typically associated with Thom's Creek wares). This phase may have continued as late as 3800-3700 B.P.. Phase II begins at this time and vessel decoration becomes more dominant. Thickened and flanged lips completely disappear by 3400 B.P., the end of the Phase II period. The last phase (Phase III) is characterized by "extreme interassemblage variability". None of the assemblages contain examples of multiple design techniques. Some of the assemblages contain a high proportion of plain vessels. However, unlike the early assemblages the vessels have no thickened or flanged lips.

Both of these studies help to put the ceramic assemblage into a temporal context. Figure 22 is a distribution of ceramic types recovered at 38CH175. Plain pottery dominates the assemblage in all levels. The quantity of Reed Punctate fluctuates through time and Jab and Drag pottery is only found in the lower levels of Zone 2. Shell Punctate pottery increases slightly through time, as does Incised, Finger Smoothed and Simple Stamped pottery. Finger Pinched designs decrease from Zone 3 to Zone 2, level 3, but then begins to increase in the upper levels. The materials from Zone 1 and Zone 2, levels 1 and 2 should be viewed with caution since this area has been disturbed

Table 7.
Thoms Creek Sherds from 38CH175

Provenience	PL	SP	RP	JD	FP	FS	IN	SS	SM	Total
Marsh Edge	4		2							6
Stripping	13	3	1		4				15	36
T1ST1									2	2
T1ST2									38	38
T1ST5									1	1
T2ST1									7	7
T2ST2									2	2
T3ST3									3	3
250R190										
Z2 lv1.3	39	4	12	1	5	4	5		166	234
Z2 lvl. 4	36	4	1	2	4				60	107
Z3	28	1	10		4	3		1	81	129
250R200										
Z1									5	5
Z2 lvl. 1	1		1						57	59
Z2 lvl. 2	19	2	1		1		2		199	224
Z2 lvl. 3	36		5		1	1	3		299	345
Z2 lvl. 4	36		6		14	4		3	151	214
Z3	16		6		10				58	90
260R200										
Z1									26	26
Z2 lvl. 1	7				1				54	62
Z2 lvl. 2	7				2		2		166	177
Z2 lvl. 3	24	1	1		1				240	267
Z2 lvl. 4	42	2	3		7		1	2	255	312
Z3	16	1	6		5		1	1	78	109
260/270R200										
tree stain	33	2	9		8	4			161	217
270R200										
Z2 lvl.4	42	1	7	1	2		1		327	390
Z3	70		7		11	1	2		350	441
TOTAL	468	21	78	4	79	17	17	7	2902	3493

Pl = Undecorated, SP = Shell Punctate, RP = Reed Punctate, JD = Jab and Drag, FP = Finger Pinched, FS = Finger Smoothed, IN = Incised, SS = Simple Stamped, SM = Small

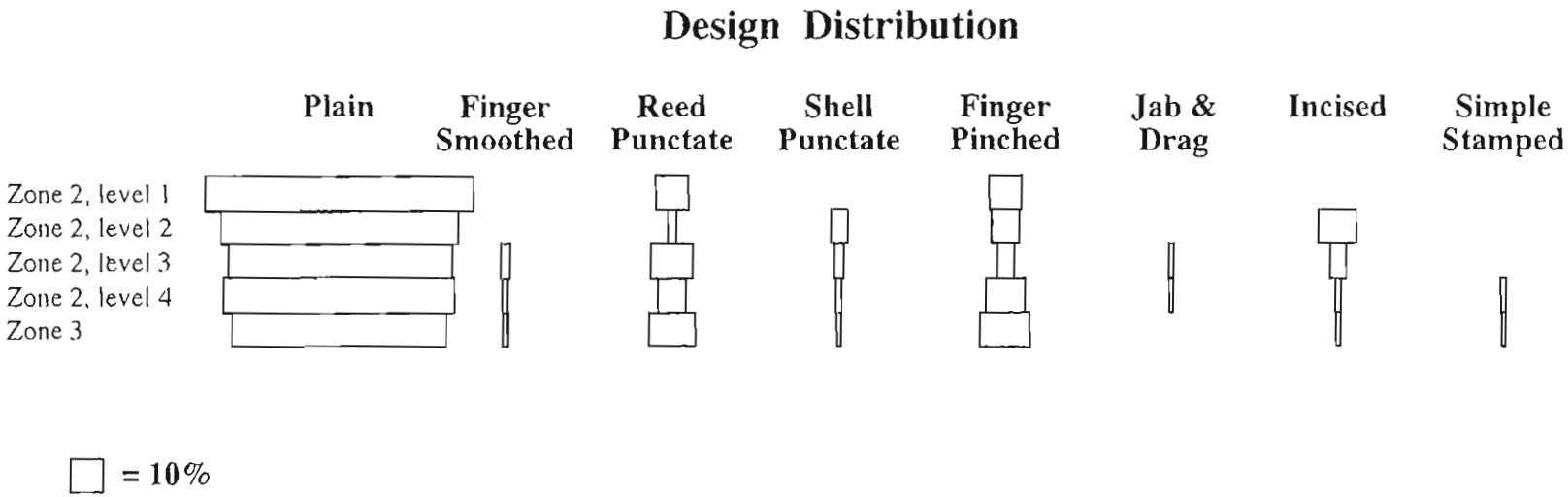


Figure 22. Distribution of Thoms Creek pottery at 38CH175.

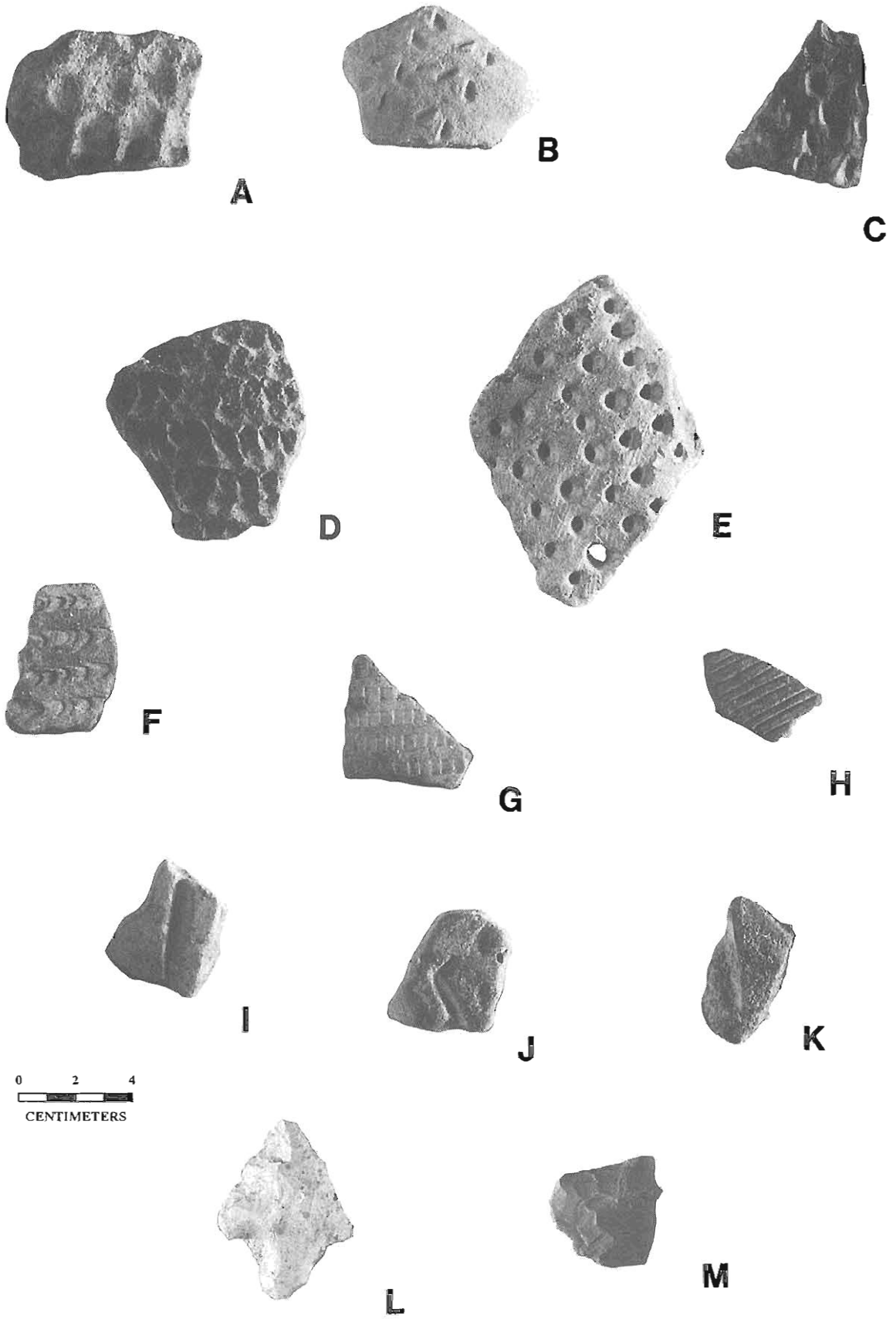


Figure 23. Artifacts recovered from 38CH175: A-D) Thom's Creek Finger Pinched; E) Thom's Creek Shell Punctate; F-G) Thom's Creek Jab and Drag; H) Thom's Creek Reed Punctate; I-K) hones; L) Savannah River Stemmed projectile point-Coastal Plain chert; M) metavolcanic biface.

by historic land use. As expected, none of the Thom's Creek Plain rim sherds exhibited thickened or flanged lips. Using Sassaman's (1991) model, the site appears to have been occupied during the Phase I period, since the percentage of plain sherds is so high.

Sassaman (1991:210-234) has also argued that stylistic clusters may represent sociocultural entities. For example, he has found that the shell point punctate design is widely distributed being found as far inland as Whites Mound. During the later phases, shell point punctate is restricted to the coast. Such a study will help to better understand changing sociocultural boundaries. Table 8 is a list of punctate styles (based on Sassaman 1991; 1993a) found at 38CH175. Of the sherds with clearly identifiable styli, the majority of them are finger pinched or finger nail punctate. Radiocarbon dates place this style in Phase III, between 3400-3200 B.P.. The second most common style is hollow half cylinder reed punctate. Sassaman (1991:220) states that while hollow cylinders were used for a long time, they were most common in Phase I assemblages. By Phase III hollow cylinder punctation is rare although an exception was found in Feature 18 at the Fish Haul site.

Table 8.
Punctate designs from 38CH175

Design	#	%
Shell, side	2	1.4
Shell, point punctate	19	12.9
Reed, crecent (hollow half cylinder)	22	15.0
Reed, bifurcated hollow cylinder	3	2.0
Reed, triangular w/ flattened head	7	4.8
Reed, wedge	2	1.4
Reed, chevron	4	2.7
Reed, subtriangular w/ pointed head	3	2.0
Reed, square/rectangle w/ flattened head	3	2.0
Reed, pinhole	2	1.4
Reed, mixed styli	1	0.7
Finger pinching/punctate	79	53.7
TOTAL	147	100.0

Probably the least biased, most accurate approximation of the proportion of the different pottery types in an assemblage is derived from estimated vessel equivalents (EVE). Orton explains that to calculate the EVE:

> we have to find a part of the pot that can be measured as a fraction of some whole. The most obvious is the rim; by using a rim chard [the most common vessel diameter chart to which is also added the ability to measure a rim sherd as a percentage of the whole] one can, unless a rim sherd is very small, abraded or not truly circular . . . measure it as a percentage of a complete rim. One can then let the rim stand representative of the whole pot and use this figure as the eve (Orton et al. 1993:171-175).

In analysis, eves are the only unbiased measure for measuring proportions within an assemblage and for comparing different assemblages. Eves, however, are not the same thing as minimum number of vessel counts (for a more extensive discussion, see Orton et al. 1993:171-175).

Estimated vessel equivalents (or EVE's) were used in addition to pottery counts to look at the ceramic assemblage from 38CH175. It is not surprising that the correspondence is best with the largest collection and becomes less consistent with the smallest assemblage. It should also be kept in mind that this procedure is thought to be a more accurate approach when the goal is to compare assemblages. That is, just because there are more sherds

of a particular type in an assemblage that doesn't necessarily mean that there were more pots of that type in the corresponding population -- we may simply be seeing the difference in how pots break. The eve avoids this problem -- when comparing assemblages. Although there are no other collections to which this study can be compared, the use of eves is an appropriate supplement to strict counts (see Table 9).

Although the vessel count is quite low, shell punctate and finger smoothed pottery increase somewhat in importance through using eves, and several minor decorative styles are not represented at all.

Table 9.
Comparison of Estimated Vessel Equivalent (EVE) and Counts

Pottery	EVE	% of Series	Count	% of Series
Reed Punctate	3	18.75	27	7.4
Shell Punctate	3	18.75	14	3.8
Pinched	3	18.75	56	15.2
Smoothed	1	6.25	10	2.7
Plain	6	37.50	252	68.7
Jab & Drag	–	–.–	4	1.1
Incised	–	–.–	1	0.3
Simple Stamped	–	–.–	3	0.8

Three of the Thom's Creek sherds were later used as hones. The width of the honing groves measured 7.87 mm, 6.20 mm, and 4.9 mm. The specimens are similar to those found by Trinkley (1980b) at the Thom's Creek phase Lighthouse Point Shell Ring (38CH12) and the Fish Haul site on Hilton Head Island (Trinkley 1986).

These grooved hones appear to have been held stationary and had a hard, rounded object rubbed across their surfaces. The size of the grooves suggests that they were used in the production of bone pins, to smooth the roughly shaped pin during the final stages of manufacture. Abraders were tools of convenience and opportunity -- picked up from a nearby refuse pile and used for a specific purpose, only to again be discarded.

Excavations yielded 17 lithic specimens. Only one projectile point was recovered. This specimen is a resharpened Savannah River Stemmed point manufactured from a white/honey colored fossiliferous chert. It has a maximum length of 64.1 mm, blade length of 45.9 mm, blade width of 47.7 mm, a haft width of 26.2 mm, and a blade thickness of 11.5 mm. The only other worked item is a snapped plain rhyolite biface.

Fifteen pieces of lithic debitage were recovered in excavations. They included 11 plain rhyolite flakes, three orthoquartzite flakes, and one fossiliferous chert flake. In addition to these items, one large piece of quartz fire cracked rock was recovered.

This small lithic assemblage was compared to assemblage collected at nearby Stratton Place shell ring (Trinkley 1980:266-272). While Trinkley (1980) does not individually list all of the items he observed which had been collected over a 40 year period, a photographic plate shows almost equal proportions of Coastal Plain chert and metavolcanic tools. Anderson (1979:10-13) has reviewed the sources for quartz, rhyolite, chert, and steatite in South Carolina. The coastal plain is generally a poor producer of good quality stone except for the massive chert outcrops near the Savannah River. There are also a few small local isolated chert sources throughout the coastal plain. Orthoquartzite outcrops occur on the banks of the Santee River and was well used by prehistoric people as a lithic resource on the Coastal Plain. Given that these outcrops are located within 30 to 40 miles of the site, it is surprising that it is not well represented in the collection. The piedmont contains sources of good quality quartz, rhyolite, and steatite. However, their acquisition would have entailed a large amount of effort (see Trinkley 1980a:208-209).

Binford (1979) suggests that the lithic materials present in an assemblage reflect the "mobility scale" of a group. Procurement of materials would have been an activity carried out as opportunities presented themselves such as during subsistence rounds. In addition, these materials could have been obtained during social interaction with groups who frequented the fall line area. As a result, it appears that their subsistence rounds did not incorporate the Santee River region which would have provided the closest source of lithic material. They may have obtained most of their material from the western piedmont slate belt, about 130 miles away.

Historic Remains

Table 10 presents a summary of the historic remains collected from the excavations at 38CH175. While the bulk of these remains were concentrated in Zone 1 and Zone 2 levels 1 and 2, there were some areas where historic artifacts were found as deep as Zone 2 level 4.

These remains date from the eighteenth/early nineteenth centuries to the twentieth century. Early artifacts include colonoware, delft, lead glazed slipware, porcelain, pearlware, black glass, and cut nails. The remaining artifacts probably date to the twentieth century occupation of the site. In addition to these remains, one Civil War item was noted along the marsh edge. This item appeared to be a 9 pound, ca. 4 ½-inch shell (see Dickey and George 1980:32-38). This artifact was observed, but not collected because of its badly deteriorated condition. In addition, these items have a black powder charge which is unstable; proper conservation and defusing would have been too involved for a surface artifact.

It is possible that the twentieth century occupation and use of the site destroyed any intact remains associated with the earlier historic component. It should be noted that the bulk of early historic materials was

Table 10.
Historic Artifacts from 38CH175

	A	B	C	D	E	F	G	H	I	J	K	L	M
Colonoware	2									1			
Delft												1	
Br. SGSW	2												
Lead glz. redware									1			1	
Lead glz. slipware										1			1
Ann. pearlware													2
Undec. whiteware							2	1		3			
White porcelain								1					
Underglz. Chinese porc.												1	
Modern bottle glass		3	1	2			23	28	10	42	4	22	
Black glass					2								
Window Glass			2					19	46	14		14	1
Wire Nails							3	1		5		1	
Cut Nails							1	1			1	1	
Spike						1							
.22 cal shell										1	1		
12 gauge shell											1		
Flower pot frag.								1					
UID iron							1					1	
Total	4	3	3	2	2	1	30	52	57	67	7	42	4

Proveniences: A) marsh edge; B) T1ST2; C) T1ST3; D) T2ST2; E) T2ST3; F)250R190 Z2 lvl. 3; G) 250R200 Z1; H) 250R200 Z2 lvl. 1; I) 260R200 Z1; J)260R200 Z1 lvl. 1; K) 260R200 Z2 lvl. 2; L) 270R200 Z1; M) 270R200 Z2 lvl. 4.

concentrated in the northern portion of the excavations, suggesting that a structure was probably located just north of this area.

Summary

38CH175 is a Thoms Creek phase site containing a thick midden of which at least 1.3 feet has been disturbed by historic land use. The previous field investigators noted minor topographic relief which they believed represented either push piles from house razing or perhaps the remains of a shell ring. The archaeological evidence does not support the conclusion that the site was a shell ring. Given the disturbance the site area has received since at least 1818, it is likely that the relief was associated with push piles.

Shell rings are distinctively doughnut shaped with clear interiors. Trinkley (1985:1-2-118) has described midden profiles as consisting of levels of shell and food bone, "sand lenses, periwinkle shell pockets, burnt sand and ash", and subsoil. The distinct stratigraphy indicates a long span of site use. House and other features are found underneath the shell midden. Food bone and carbonized ethnobotanical remains are abundant. Artifacts indicate a relatively large range of activities. These artifacts include pottery; lithics; hones; worked shell, bone, and antler; and ground stone tools (Trinkley 1980).

The vast majority of remains consisted of pottery which represents 99.5% (or N=3495) of the collection. Most of the pottery is related to the Thom's Creek period, with one analyzable sherd dating to the St. Catherines phase. Three sherd hones were recovered, providing evidence of bone tool manufacture. A small amount of lithics were recovered, most of which are manufactured from metavolcanics. Since lithic sources are scarce in the lowcountry, it is not surprising that they travelled relatively far for good lithic material. This also accounts for the sparsity of lithics reflecting maintenance of existing tools rather than "on site" manufacture. Food bone and floral remains were sparse.

Table 11 presents the artifact categories and counts from 38CH175 and Lighthouse Point shell ring. Worked bone comprises a significant amount of the artifacts at Lighthouse Point and is the third largest artifact category (Trinkley 1980a). The large quantity of hones and worked bone indicates the importance of bone tool manufacture at shell ring sites. No bone tools were found at 38CH175 and there is only one abrader for every 1164 sherds as opposed to one abrader for every 32 sherds at Lighthouse Point. In addition artifact density is much higher at Lighthouse Point. For every 100 cubic feet excavated at Lighthouse Point pottery density ranged from 655 sherds in the interior of the ring to 1642 on the exterior of the ring.. At 38CH175 pottery density was 453 sherds per 100 cubic feet. This comparative information clearly indicates that the two sites were different, and that 38CH175 is not a shell ring site.

Table 11.
Artifact summaries from 38CH175 and Lighthouse Point shell ring

	38CH175		Lighthouse Point	
Artifact Category	#	%	#	%
Pottery	3494	99.52	8066	94.3
Abraders	3	0.08	248	2.9
Worked Bone	0	0.0	179	2.1
Lithics	13	0.4	41	0.5
Shell Tools	0	0.0	15	0.2

Excavations and site stripping provided no evidence for structural remains. However, several possible shell pits were uncovered, suggesting that the site's primary function was a staging area of shellfishing and shellfish processing. During Brockington et al.'s (1987) survey of the site, a one meter square test unit uncovered what was believed to be two structural posts. While structures may have existed in this area of the site, it is possible that the current excavations did not incorporate their test unit. Nonetheless, based on the dense shell remains found in these investigations, the area investigated was within the portion of the site believed to contain the highest archaeological integrity by Brockington and Associates.

ANALYSIS OF SHELLFISH FROM 38CH173 AND 38CH175

David Lawrence

Introduction

This report summarizes findings from an analysis of archaeological oysters and other shellfish from sites 38CH173 and 38CH175 at Charleston National Golf Course in Charleston County, South Carolina. The materials examined were all supplied by Chicora Foundation, Inc. of Columbia, South Carolina, and consisted of both bulk (unsorted) samples and hand-picked specimens of primarily larger left valves of oysters (heights greater than 7.5 cm, which is the minimum marketable size for oysters in the State of South Carolina).

Site 38CH173 has been heavily disturbed and the only intact feature found during excavations was a bowl-shaped shell pit dating to the Deptford phase or later (Adams 1993). Hand-picked shell from this feature was examined. The uppermost portions at 38CH175, a Thom's Creek site, were likewise disturbed (Adams 1993). Materials inspected did include bulk and shell column samples from excavation blocks 260R200 and 270R200; these were supplemented by hand-picked valves from: (a) the lowermost shell-containing portions (Zone 3) of block 260R200 and (b) a shallow shell pit (Feature 1) exposed in the eastern wall of block 260R200 (Adams 1993).

Working methods followed those developed in Lawrence (1988). A more recent summary of criteria and interpretations used, in the analysis of archaeological oysters, may be found in Lawrence (1991). Because of their potential for providing additional (or alternate) measures of seasonality in site occupation, the larger oysters and catfish otoliths have been temporarily retained by the writer. These faunal remains, after further analysis, will be permanently curated at the South Carolina Institute of Archaeology and Anthropology.

The Faunas

38CH173

Sample 23-2, Feature 1, Hand-picked sample

Over 70 percent of the 54 larger left valves are from intertidal cluster oysters. With attachment areas that are but moderate in size, these oysters most likely came from flats or elevated areas within major drainage systems; they do not appear to be creekbank-lining oysters. (Indeed, clusters collected from flats do occur throughout the materials examined from 38CH173 and 38CH 175.) The subordinate, more robust, and ovate-to-subtrigonal scatter oysters, from lower parts of the tidal zone, display common (7 of 10 individuals) infestations of boring clionid sponges; obvious evidence of polydorid bristleworms is less common (2 of 10 individuals). Very likely, then, bottom sediments in the lower intertidal (or higher subtidal) area or areas of collection were not composed overwhelmingly of muds (see Lunz 1941).

Numerous stabbing notches indicate that these shellfish were utilized as food. Discolorations and fabric alterations associated with valve heating (baking or steaming) are not obvious and the oysters were most likely shucked raw. The meats could have been directly eaten, or perhaps used in stews or soups.

Using the ligament growth model of Lawrence (1988), examination of the larger left valves yields a strong inference of collection during the late Spring-early Summer seasons of the year. This latter statement, however, does not preclude gathering during other portions of the year; additional checks upon seasonality have not been made with

the materials supplied.

38CH175

Sample 25-2, Feature 1, Hand-picked sample

Of the 33 smaller left valves, the majority have appearances in-between true cluster and true scatter oysters, but undoubted scatter oysters are more numerous than are certain cluster oysters. The same statement of appearances does hold for the 31 larger left valves. The valves, regardless of size, commonly display brown, calcitic overgrowths; in some instances, the geometry of these features suggests a possible relationship to the presence of rootlets or fungal mats during the post-mortem history of the oysters.

Among the 14 undoubted larger scatter oysters, there are six with evidence of polydorid bristleworms but only one of the largest valves shows any significant infestation. Thus bristleworms were present but were not a significant oyster pest in the area(s) of collection. The possibility exists that bottom sediments were not totally muds in the latter area(s) (see Lunz 1941).

Stabbing notches are present and include those between left valve ribs. This placement suggests that, during shucking, the shells were held with left valve down, and entries made at points of the complementary topographic highs or ribs along the margin of the right valves. Food use is thus established. With the overgrowths it is difficult to recognize, with certainty, valve discolorations associated with shell heating; other common fabric alterations associated with heating, however, do not appear to be present. Most likely these oysters were shucked raw and immediately eaten or used in stews or soups.

Ligament geometries suggest the possibility of late Spring-early Summer gathering, but no strong inference of collection periods can be made on the basis of this relatively small sample and single means of seasonality analysis.

Sample 24-2, 260R200 Zone 3, Hand-picked sample

Scatter and cluster oysters occur in the 20 smaller and 21 larger left valves, but scatter oysters predominate in both size classes of valves. In the 10 larger and undoubted scatter oysters, six contain evidence of boring clionid sponges and five, of polydorid bristleworms. Infestations levels of the polydorids, however, are not severe. The interpretation of bottom sediments in the collection area(s) echoes that given for Feature 1, above.

Stabbing notches, ranging from narrow to quite broad, are present in the valves, indicating food use. Brown and calcitic overgrowths, possibly rootlet or fungal-related, also occur in both size classes of valves. Despite this more recent overprint, gray discolorations occur on at least three smaller valves and five larger ones; two of the larger valves have lost their sub-nacreous lusters and taken on more crystalline appearances. At least individual valves, if not entire shells, were heated. Whether or not this heating took place during food preparation may be decipherable after examining the entire archaeological context of these oysters. Ligament preservation in this rather small set of left valves is not sufficient to yield even suggestions of seasonal use.

260R200, Zone 2 Level 4, Column sample

Non-oyster faunal remains in this bulk sample include bone fragments and vertebrae; four catfish otoliths, fragments of quahogs, mussels, stout tagelus, cockles, and barnacle plates; four fragments of possible fresh-water clams, an oyster drill, 100+ marsh periwinkles, and 30+ mud nassas(?); and knobbed whelks including one entire shell, body whorl and shoulder fragments, and columellar remains. None of the whelks show obvious abrasional evidence of use by humans.

Of the 75 larger left valves (Table 12), about two-thirds have the appearance of scatter oysters. By general

source environments, these same percentages are reflected in the smaller left valves. Galleries and perforations of clionid sponges are prominent on 11 of the scatter oysters; evidence of polydorid bristleworms occurs in a similar number of valves but infestations are relatively minor. Interpretations of bottom sediments mimic those given for the proveniences previously described. Calcitic overgrowths are present but are not as eye-catching as in the overlying Zone 2 Level 3 materials. Exfoliate ventral margins and stabbing notches point to food use. Gray discolorations are present on several valves but in every case are associated with extensive clionid sponge galleries; these colors may have no relationship to valve or shell heating. Although at least three valve interiors display slightly sucrose textures (another possible indication of heating), no unequivocal statements about food preparation methods can be made. No indication of seasonality can be read from the left valve ligamental areas examined.

Half of the 24 larger right valves are elongate but not one has the paper-thin appearance of typical high intertidal cluster oysters. Indeed the more ovate forms are most common among the smaller and massive right valves; the large, massive, and elongate valves were a relatively minor fraction of the entire population of oysters which was gathered. The disproportions between larger left and right valves (Table 12) are most readily explained by loss of marginal right valve "bills" (see below, 270R200, Zone 2 Level 4) and the more fragile nature, and loss through time, of the larger right valves from the truly intertidal cluster component in this collection of oysters.

260R200, Zone 2 Level 3, Column sample

Other than the oysters, fauna preserved in the bulk sample include the elements mentioned for the underlying Zone 2 Level 4 sample (see above), with the exception of the possible fresh-water clams and the additions of two fragments of an arcoid clam and a single crab claw. Fragments of quahogs are rather uniformly small and display sharp edges. Perhaps they represent discarded blanks from the production of ornaments such as beads. Knobbed whelks do include one individual collected dead and also involve examples with abraded columella; one small, chalky, abraded oyster right valve may also have been used as an implement by humans.

The calcitic overgrowths again appear on the majority of the 25 larger left valves (Table 12). Over 80 percent of these individuals represent scatter oysters. Evidence of clionid sponges and polydorid bristleworms appear in these valves; one valve exhibits clionid perforations on the interior and was most likely collected after death of the oyster. Infestation levels, in the seven valves with bristleworms, are not high and bottom sediments in the source

Table 12.

Numbers of larger (height in excess of 3 in or 7.5 cm, which is the minimum marketable size for oysters in the State of South Carolina) left and right valves in oyster bulk or column samples from Site 38CH175 at Charleston National Golf Course, Charleston County, South Carolina.

Sample	A	B	C
Block 260R200			
Zone 2 Level 3	25	17	1.5
Zone 2 Level 4	75	24	3.1
Block 270R200			
Zone 2 Level 4	46	14	3.3
Zone 3	31	21	1.5

A= number of larger left valves
B= number of larger right valves
C= left-right valve ratio

area(s) were most probably like those described for the previous samples examined (see above). Several of the 17 larger right valves are elongate but none display the thinness commonly associated with high intertidal cluster oysters; all of these latter valves could represent scatter oysters.

Stabbing notches and exfoliate ventral margins occur on left valves and two of the right valves exhibit classic shucking cracks. Food use is certain. No undoubted valve discolorations appear, suggesting that these organisms were shucked raw and eaten, or secondarily used in preparing other foodstuffs.

Smaller valves, both left and right, support these general descriptions of the shells. With a relatively small sample size, no indication of seasonality can be deciphered from the examined left valve ligaments.

270R200, Zone 2 Level 4, Column sample

Faunal elements present in this bulk sample include a bivalved molluscan coquina rock fragment; vertebrae and vertebrate molar teeth; two catfish otoliths; fragments of stout tagelus, quahogs, giant Atlantic cockles, and ribbed mussels; 12 more or less entire knobbed whelks with no obvious signs of wear, two whelk columella fragments and two whelk knobs; and over 100 marsh periwinkles and 27 mud nassas(?). One chalky, abraded, and small oyster right valve may have been used as an implement for scraping.

Scatter oysters, with relatively thick valves and ovate outlines, form the majority of the 46 larger left valves (Table 12). At least one ovate individual was collected after its death. Although one-third of the scatter oysters display infestations of polydorid bristleworms, these organisms were not pervasive and bottom sediments, in the lower intertidal or upper subtidal area(s) of collection, were most likely not pure muds (see comments under Feature 1, 38CH173, above). Cluster oysters, although not the prominent elements, include one quite large individual (height of 178 mm). Brown and calcitic, botryoidal overgrowths are conspicuous on some valves.

Only three of the 46 larger left valves (Table 12) display signs of valve discoloration which might be attributed to shell heating; these colors, however, are beiges and not the grays more indicative of heating events. Stabbing notches are present in both cluster and scatter oysters. The majority of these shellfish may have been shucked raw and the meats then directly eaten or used in soups or stews but, given the subtleties of valve alterations, the possibility that some of the shells were heated during food preparation must also be considered.

The larger right valves, and smaller left and right valves, conform to the general description of the above paragraphs. The disparity between numbers of larger left and right valves (Table 12) is most likely explained by the presence of thin marginal areas ("bills") in the right valves of scatter oysters. These valve areas are commonly lost during shucking and the post-mortem period. With valve sizes close to the arbitrary large-small division, these right valves could have been displaced into the smaller size class.

Ligament analysis suggests that these oysters may have been collected during the late Spring-early Summer seasons of the year, but a strong inference cannot be made from the specimens. Nor has an independent check upon seasonality been made using the materials at hand.

270R200, Zone 3, Column sample

Non-oyster faunal elements include those noted for the overlying unit (Zone 2, Level 4, described above) with the exception of the coquina and molar teeth, and with the addition of one channeled whelk. In contrast to the overlying materials, at least 4 of the more entire knobbed whelk specimens display columellar abrasion and/or missing body whorl areas, suggesting their use as implements. Five smaller, chalky, oyster right valves display abraded dorsal or umbonal margins, suggesting that they also might have been used for digging or scraping.

Only two of the 21 larger right valves (Table 12) appear to be cluster oysters; the rest are scatter oysters collected from the lower intertidal to higher subtidal portions of the coastal environments. One massive right valve

is riddled with the perforations and galleries of clionid sponges and was most likely collected after death. Broad stabbing notches appear in the scatter oysters and both of the cluster individuals display shucking cracks.

Again, all but two of the 31 larger left valves have the appearance of scatter oysters. Evidence of boring clionid sponges appears on seven valves and remnants of polydorids occur in at least 9 of these larger individuals. Except for sponge colonies on two valves, infestation levels for these oyster associates are not striking and the interpretation of bottom sediments, in the collecting area(s), remains that cited for the other samples from 38CH173/175. Valve modifications brought about by barnacle attachment are also exhibited on several individuals.

Stabbing notches, both narrow and broad, appear in these latter valves indicating their use as food. The brown, calcitic, botryoidal, rootlet or fungal(?) related overgrowths are also present in 270R200 Zone 3 left valve materials. However older and gray discolorations are prominent on 4 valves and these 4 plus others display altered and sucrose lamellar textures which are most prominent on valve interiors. Some portion of these shells was heated either during or after the food preparation interval of time; oyster steaming or baking is a distinct possibility for at least part of these individuals. Poor ligament preservation and a rather small sample size deterred seasonality analysis. In addition the geometric model was developed for primary use with the elongate, intertidal cluster oysters of the Carolininan Biogeographic Province (Lawrence 1988) and this model may not yet be satisfactory for application to scatter oysters, from lower in the tidal column, within our local settings.

Summary and Discussion

For various reasons the Thom's Creek inhabitants of 38CH175 gathered rather diverse shellfish which live in a variety of coastal environments. The mussels live in high marsh areas; the quahogs and stout tagelus, in sand bars or flats; the whelks, close to oyster beds; the periwinkles, in nearby cordgrass marshes (additional discussion in Lawrence 1991). Oysters were doubtless collected alive and the inference for live collecting of periwinkles is rather strong.

Applications of whelks included the utilization of skeletons for digging and/or scraping. A minor number of small, abraded and chalky oyster right valves may have served similar functions in the economy of the site inhabitants. Quahog valves were likely selectively broken and the preserved angular fragments may represent abandoned blanks for the production of ornaments such as beads. The presence of cockles strongly suggests that the aboriginal peoples visited nearby beaches, but behaviors involved in collecting these latter shells are unknown.

The abundance of marsh periwinkles clearly indicates their utilization by the Thom's Creek site occupants and the small size of these snails points toward their use as food, in soups and stews. This cooking likely separated meats from the univalved shell. The small and thin opercula might have been softened and made unobjectionable by this process; they might also have been separated from the meats by cooking and hence easily skimmed off the top of any food preparation vessel or pot. If concentration bands or lenses of these snails were observed at the site, each would indicate the discard of residual shells after the pot contents were eaten (Lawrence 1991). The mussels and stout tagelus might also have been occasional or lesser contributions to these soups or stews. Catfish were another part of the occupants' diet, but the nature and means of fish preparation for consumption must remain conjectural.

The Thom's Creek people primarily and actively gathered scattered oysters from lower portions of the tidal gradient. Based upon the analysis of preserved oyster associates, the same source area or areas could have been utilized throughout the time involved in the creation of the 38CH175 midden. The presence of oysters collected after death, in both 260R200 and 270R200 column samples, suggests that these shellfish were gathered in bulk and were not sorted at the collecting site or sites. The oysters were indeed utilized as food. Distinctive gray valve colorations, alterations which are taken as evidence of shell heating, are present in 38CH175 oysters but are not numerous. While oyster cooking (perhaps baking) is a possibility, the likelihood exists that many of these shellfish were shucked raw. If the latter is true, then the oysters could have been directly eaten or might also have become part of the snail-based soups or stews.

Attempts to establish seasonality were not successful using the oysters from 38CH175. Many factors contributed to this lack of success, including poor preservation of certain oyster ligamentl areas, the rather small size of some of the samples, and the prominence of scatter oysters at this site. As noted previously, the the ligamental growth model presently utilized for seasonality analysis was developed primarily for the common, elongate, intertidal cluster oysters of the Carolinian Biogeographic Province; this model may not be appropriate for scatter oysters from lower in the tidal column (see Lawrence 1988).

By contrast, the younger post-Thom's Creek shell pit from 38CH173 is composed primarily of intertidal cluster oysters. It is tempting to suggest that the change in exploited oyster resources is a consequence of overfishing of the apparently desired, scattered oysters through the millenia between the times of these occupations. However since the coastal environments, as we know them today, along our coast are less than 6,000 years old (Colquhoun and Brooks 1986) and we do not yet understand the development of oyster communities within this most recent time frame, such a suggestion is out of order at present.

POLLEN ANALYSIS OF SAMPLES FROM 38CH175

Arthur Cohen

Introduction

Four pollen samples were obtained from midden soils (inside of oyster shells) during the excavations at 38CH175. Two were from 250R200, Zone 2, level 4 and two were from Feature 1. All samples were macerated for pollen and ten slides were made for each sample.

Results

There were not enough pollen in the 250R200, Zone 2, level 4 samples to construct a valid diagram nor to reconstruct the paleoecological setting. However, Table 13 presents the types identified.

Various plant fragments were also encountered. These included pine tracheids, numerous resin globs, unidentified cuticles, root fragments, cells such as vessel, and a few pieces of charcoal.

Table 13.
Pollen identified in 250R200, Zone 2, level 4 samples

Types Identified	Sample A # Counted/10 slides	Sample B # Counted/10 slides
Arboreal		
Pinus (pines)	31	13
Cedar/Juniper Type	3	3
Carya (hickory)	11	18
Nonarboreal		
Lycopodium (club moss)	4	
Sphagnum (peat moss)	1	
Polypodiaceae (ferns)	1	1
Graminaea (grasses)	1	
Cyperaceae		1
Chenopodiaceae	4	1
Compositae	3	2

As with the previous samples, there were not enough pollen to construct a valid pollen diagram nor to reconstruct the paleoecological setting. The pollen that did occur were very highly corroded and fragmented. Table 14 presents the types identified.

Various unidentified plant fragments were also encountered. These included cuticles, root fragments, cells such as tracheids and vessels, some resin globs, and a few pieces of charcoal.

Summary and Conclusions

The samples obtained from the midden soils at 38CH175 did not provide enough pollen to aid in the reconstruction of the paleoecological setting at the site. Since the examples of pollen from Feature 1 were highly pitted and corroded, the soils were oxidized which allowed micro-organisms to eat away at the pollen grains. This suggests that this context may have been disturbed.

Table 14.
Pollen identified in Feature 1

Types Identified	Sample A # Counted/10 slides	Sample B # Counted/10 slides
Arboreal		
Cedar/Juniper Type	5	3
Unidentified, corroded, triporate (Ostrya/Carpinus type)		3
Nonarboreal		
Plantage - type	1	
Lycopodium (club moss)	4	
Polygonum sp.	1	
Polypodiaceae (ferns)		1
Cyperaceae	4	3

SUBSISTENCE INVESTIGATIONS

Michael Trinkley

Faunal Materials from 38CH175

Introduction and Analytical Techniques

Twenty-four proveniences have yielded small assemblages of faunal materials. It is likely that a variety of factors, including extensive disturbance of the site during the nineteenth and twentieth centuries, reduced the recovery of faunal remains. Certainly the large component of small and unidentifiable mammal remains indicates that the materials have been fragmented through time. In addition, this site yielded samples far smaller and far less diverse than have been previously identified with Thom's Creek phase shell rings elsewhere in Charleston County (see, for example, Runquist 1980). The nature of the recovered assemblage, especially when taken in conjunction with other evidence previously discussed, indicates that 38CH175 was not a shell ring, although it likely represented a small Thom's Creek phase midden. Regardless, given the extensive disturbance and heavy fragmentation of the associated materials, it is impossible to provide more than a glimpse of the original subsistence system.

Table 15 lists the faunal materials recovered from the site by provenience. I have chosen not to incorporate either bone counts or minimum number of individuals given the highly fragmentary nature of the collection and the limited recovery opportunities[1]. The table does, however, indicate bone weights and allometric biomass calculations which is an appropriate level of documentation for the materials present. In fact, this may be more documentation than is often offered for assemblages of this sort, but it represents the minimal level of information necessary to offer general comments concerning the observed subsistence pattern.

Beyond these limitations the collection was studied using standard zooarchaeological procedures and Chicora Foundations comparative faunal collections (as well as standard comparative references). The bone material was sorted into class and suborder or species. The bones of all taxa and other analytical categories were weighed.

Identified Fauna

Only one species of domestic mammal – cow, *Bos taurus* – was identified in the collection. The single element is a sawn fragment of long bone. Identified from unit 260R200, Zone 2, Level 1, it is likely that the element is intrusive from the historic occupation. This finding is most significant as a indicator of the amount of disturbance associated with the site remains and the necessity for caution in interpretation of the zooarchaeological study.

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[1] As a measure of zooarchaeological quantification, the minimum number of individuals (MNI) method has a number of problems (see Grayson 1973:438, 1984:28-92; Klein and Cruz-Uribe 1984:26-32). How one aggregates the MNI will affect the number of individuals. In addition, the technique emphasizes small species over large one. Further, it seriously under represents dietary sources when a large proportion of the remains are small and unidentifiable. Given these problems, an estimate of biomass contributed by each taxa to the total available for use by the inhabitants of the site is calculated. The method used here is based on allometry, or the biological relationship between soft tissue and bone mass. In particular Casteel 1978; Reitz 1982, 1985; Reitz and Cordier 1982; Reitz and Scarry 1986; and Wing and Brown 1979 should be consulted for more information on the technique, as well as its limitations. The allometric values used in this study to determine biomass are derived from Table 4 in Reitz (1985:44).

Table 15.
38CH175, Faunal Remains Recovered from dry screen proveniences, quantified by weight in grams

Provenance	Deer	Squirrel	Raccoon	Opossum	Rat	UID Mammal	Bird	Turtle	Fish	Crab	Cow	Burned	Total	
Transect 1, ST 2						5.90								
Transect 2, ST 1						3.89								
250R190, Zone 2, Level 3	37.98					36.64							8.36	
250R190, Zone 2, Level 4	11.98					22.39	0.27	1.99	0.50				8.60	
250R190, Zone 3	81.47					16.31		3.44					1.21	
250R200, Zone 1						0.82	0.12	1.28	0.23					
250R200, Zone 2, Level 1	12.65	0.98				28.82	0.33							
250R200, Zone 2, Level 2	35.82		3.15			49.19	0.18	11.29	1.35	4.74			2.26	
250R200, Zone 2, Level 3	24.70	1.07	3.45			105.66	3.31	15.59	0.28				5.11	
250R200, Zone 2, Level 4	9.96		0.45			38.19	2.49	7.96	1.35	1.75			0.35	
250R200, Zone 3	21.65					27.78		0.90						
260R200, Zone 1						2.71				0.75			0.72	
260R200, Zone 2, Level 1	7.06			4.25	0.20	22.57				0.57	53.77			
260R200, Zone 2, Level 2	12.45					34.69	1.00	2.79	0.15				0.78	
260R200, Zone 2, Level 3	31.05			4.25		81.79		12.09	4.57	2.16			9.82	
260R200, Zone 2, Level 4	21.34		1.30			106.20	0.78	8.96	2.02	0.26			9.10	
260R200, Zone 3	15.26					28.39		1.99					1.29	
260-270R200, tree stain					0.55									
270R200, Zone 1	16.32					15.72		1.37	0.23				6.16	
270R200, Zone 2, Level 4						0.98								
270R200, Zone 3	5.83		5.43			2.49								
General surface, site stripping	49.54													
General surface, tree stain						0.40								
Total	395.06	2.05	13.78	8.50	0.20	632.08	8.48	69.65	10.68	10.23	53.77	53.76		1204.48
Percentage of total	32.8	0.2	1.1	0.7	t	52.5	0.7	5.8	0.9	0.8	4.5			

The most numerous of the wild mammals in the assemblage is the white-tailed deer (*Odocoileus virginianus*). A variety of uses exist for the different parts of this animal, so that almost all of a deer was utilized prehistorically by the Indians in some manner (Runquist 1979:169; Swanton 1946:249). In general, the deer's preferred habitat is the edge of deciduous forests and open forests, although they will move to mudflats around marshes to feed on the grasses found there. Of all the animals found archaeologically, Smith (1974:27-42) notes that the deer are ubiquitous; Shelford (1963:28) supports this characterization by stating, "whitetailed deer was originally a dominant or major influence because of its abundance." Found in densities of about 40 per square mile, the deer offered an excellent source of protein as well as a broad range of other useful objects. Deer remains may provide a seasonal indicator, with the male developing and shedding his antlers on a predictable schedule. In South Carolina the antlers begin to form in mid-March with the velvet development complete in late summer. The antlers are not hard and fully developed until September, and are then shed from January through March. Consequently, preserved crania with hard antler development would date from the fall and winter, while shed antlers would likely date from the late winter and early spring.[2]

Raccoon (*Procyon lotor*) bones are present in small numbers and are often found at both prehistoric and historic sites. Raccoons served as a food source for Native Americans, the furry skin was used for clothing, and claws were used as ornaments (Swanton 1946:250). The animal is able to adapt to a variety of habitats, although they prefer wooded areas near water. Nocturnal, the raccoon was likely taken in traps, providing a source of meat and fur with relatively little associated expenditure of energy.

The fox squirrel (*Sciurus niger*) is present in two assemblages. It prefers heavily forested habitats, or forests with mature hardwoods and an understory of smaller trees and shrubs, although they can sometimes be found in more open forest and among large trees at the forest edge. During prehistoric times squirrels were used as food, the skins as clothing, the entrails for bowstrings, and the claws for ornaments (Swanton 1946:250).

Remains of the opossum (*Didelphis virginiana*) are present in equally small quantities and was probably used as a food resource. The preferred habitat of the opossum, a nocturnal animal, is wooded areas near water, but they are often found in and around human settlements, scavenging on food scraps.

Commensal species, animals commonly found near human occupation as pets or vermin, are limited at 38CH175 to the rat (*Rattus* spp.), found in one upper provenience. While this may indicate that structures were present, a variety of rats are found at the marsh edge as well as in the edge area between open fields and wooded tracts.

The categories of birds, turtles, and fish were not consistently further subdivided because of the extensive damage to the bone elements and the small sample sizes. Turtle fragments casually recognized, however, include the diamondback terrapin (*Malaclemys terrapin*) and the cooter (*Chrysemys floridana*). The diamondback terrapin is found in an estuarine setting and feeds on marine molluscs (Obst 1986:113). The cooter is found primarily in and around bodies of freshwater such as ponds, lakes, rivers, and canals (Obst 1986:109-111) and on occasion in brackish waters. These turtles use the land to lay their eggs at some distance from water, to sun themselves, and occasionally to feed. Turtles could have been used as a food resource, likely gathered during other activities, and their shell could have been made into rattles by the Indians.

Fish remains include a number of catfish (*Ictalurus* spp.) which are often found in pools and backwaters of sluggish streams, usually in areas of heavy vegetation (Lee et al. 1980:442). Catfish tend to be more plentiful in

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[2] It is unlikely that shed antler not picked up very shortly after being shed would be found later in the year as they are quickly consumed by rodents (see Moore and Bevill 1978:8).

the fall, although they can be taken in small numbers throughout the year. Also identified is the drum, a marine species. Drum are commonly found in bays and estuaries. Several proveniences produced evidence of rays or skates (order Rajiformes), in particular the bands of plate-like teeth which are designed for crushing rather than cutting.

Faunal Remains from 38CH175

Table 16 lists the weight of the various taxa from the site, as well as biomass data for each taxa, excluding the commensal and the cow remains. The collection is dominated by mammal remains (representing over 93% of the collection's biomass), in particular the white-tailed deer (which accounts for 34.19% of the biomass). This is likely the effect of differential preservation, with these bone elements being larger, more difficult to reduce and remaining identifiable even when fragmented. The category of unidentifiable mammal, accounting for 55.83% of the collection, consists of remains which are heavily fragmented and lack clear taxonomic indicators (although many are likely deer, based simply on their size and morphology). Small mammals account for under 3% of the total collection. Birds, turtles, and fish combined account for less than 7% of the collection's biomass.

Wild mammals account for 93.04% of the site's biomass, followed in ranking by turtle (3.57%), fish (2.38%), and birds (1.01%). Comparison of Table 17, which identifies the taxa recovered from ⅛-inch waterscreening, with Table 1 reveals that fine mesh waterscreening dramatically increased the recovery rate for fish. Of the total weight of fish bone from 38CH175, 57.7% was recovered from the waterscreening, while only 42.3% was retained by the ¼-inch dry screening mesh. If the biomass contribution of the various taxa is calculated comparing the two recovery methods for this provenience, the relative rank remains unchanged. Mammals still dominate the collection, although their contribution of 5.4 kg falls to 86.4%. Turtles are the next largest contributor, with their biomass of 0.41 kg accounting for 6.6% of the total. Fish, with 0.30 kg of biomass, rank third, followed by bird at 2.2% and 0.14 kg of biomass.

Table 16.
Weight of recovered faunal material by taxa and estimated meat yield for 38CH175.

		Biomass	
Species	Wt. in grams	kg	%
White-tailed Deer, *Odocoileus virginianus*	397.60 5.75	34.19	
Raccoon, *Procyon lotor*	13.78	0.28	1.66
Eastern Fox Squirrel, *Sciurus niger*	2.05	0.05	0.29
Opossum, *Didelphis virginiana*	8.50	0.18	1.07
Unidentified Mammal	686.05	9.39	55.83
Subtotal	1107.98	15.65	93.04
Bird	10.24	0.17	1.01
Turtle	81.26	0.60	3.57
Fish	25.23	0.40	2.38
Crab	10.99	-	-
Total	1235.70	16.82	100.00

Table 17.
38CH175, Faunal Remains Recovered from Waterscreening, quantified by weight in grams

Provenance	Deer	Squirrel	Raccoon	Opossum	Rat	UID Mammal	Bird	Turtle	Fish	Crab	Cow	Burned	Total	
250R200, Zone 2, Level 1	2.54					13.87	0.24	3.05	2.13					
250R200, Zone 2, Level 3						40.10	1.52	8.56	2.55	0.76				
250R200, Zone 2, Level 4									9.87					
Total	2.54					53.97	1.76	11.61	14.55	0.76				85.19
Percentage of total	2.9					63.4	2.1	13.6	17.1	0.9				

Consequently, in terms of gross dietary reconstructions it possible that ⅛-inch waterscreening does not appreciably change dietary reconstructions. However, when finer reconstructions are attempted and especially when efforts are made to understand prehistoric estuarine use, it seems likely that reliance on ¼-inch mesh will yield flawed interpretations. Of course, this is not a new revelation. Wing and Quitmyer (1985) offered this same conclusion nearly a decade ago. They stated very simply that:

> as these data must form the basis of the conclusions to be drawn about the relative importance of various hunting, fishing, and gathering techniques used to procure the species represented, the differences demonstrated in the data by using more complete recovery techniques inevitably impacts any conclusions about prehistoric resource use (Wing and Quitmyer 1985:58).

In order to investigate questions concerning variety and degree of specialization exhibited by the prehistoric vertebrate faunal assemblage, measures of diversity and equitability are often calculated for biomass based on the identified species. The calculation of such measures for small samples such as those from 38CH175 are generally discouraged (Grayson 1984). In spite of this the statistics are offered, with the caution that the results of the computations for the assemblage are preliminary and must be carefully interpreted. Given the nature of this collection, the calculations are based on the four taxa – mammals, birds, turtles, and fish.

The results of the Shannon-Weaver (1949:49) diversity calculation is 0.3205, representing a very low taxa diversity.[3] The Sheldon (1969) formula for equitability is 0.2311, also a very low figure.[4] These figures are interpreted to mean that a small number of taxa supply the bulk of the food that could have been obtained from animal resources and confirms the reliance on deer.

Comparison with Other Thom's Creek Sites

The faunal assemblage from 38CH175 represents a fairly small collection from a potentially disturbed context, making comparison with other collections difficult. Posing equal, if not greater, difficulty is the dearth of suitable comparable collections with allometric data. Four sites have been selected, Lighthouse Point (38CH12), Stratton Place (38CH24), Bass Pond (38CH124), and Fish Haul (38BU805). The first two are Thom's Creek phase shell rings, Bass Pond is a Thom's Creek phase irregular midden, and the last site (and the only one of the four not situated in Charleston County) is a Stallings phase non-midden site. Table 18 compares the biomass percentages from the various sites. In addition to the temporal and site type differences, there are also some differences in collection strategies typical of most comparative studies. In spite of these problems the data from 38CH175 bears a much closer resemblance to the data from Bass Pond, a small Thom's Creek phase irregular midden than from either the earlier Stallings phase non-midden site or the Thom's Creek phase shell ring sites.

At both 38CH175 and Bass Pond, the collection of wild mammals dominates the assemblage, accounting for over 90% of the biomass reconstruction. Reptiles rank second, followed by fish and birds. At Lighthouse Point, the most representative shell ring collection in terms of both sample size and incorporation of different midden areas[5], not only do mammals represent a smaller proportion of the total collection, but fish rank second in biomass (in spite of the use of ¼-inch dry screening recovery methods), followed by reptiles and birds. This seems to suggest a difference in resource procurement orientation of the shell ring and non-shell ring sites.

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[3] The scale goes from 0 (low diversity) to 4.9 (high diversity).

[4] The scale goes from 0 (low equitability) to 1.0 (high equitability).

[5] The Stratton Place collection includes not only a much smaller sample, but the faunal materials were recovered only from the ring interior.

Table 18.
Comparison of the Faunal Category Patterns from Selected Prehistoric Sites by Biomass Percentages

Faunal Category	38BU805[1]	38CH124[2]	38CH12[3]	38CH24[4]	38CH175
Wild Mammals	66.5	94.1	86.0	89.5	93.0
Birds	4.5	1.9	1.6	6.5	1.0
Reptiles	14.9	2.0	5.9	2.4	3.6
Fish	13.2	1.9	6.5	1.6	2.4
Commensals	0.9	0.1	-	-	-
Total Biomass (kg)	2.89	103.18	1226.80	58.3	16.82

[1] Wilson and Wilson 1986:Table 31 (Stallings component)
[2] Wilson 1993:Table30
[3] Runquist 1980:Table 4
[4] Runquist 1980:Table 4

The research illustrates the need for additional faunal studies at Thom's Creek sites to determine if this posited pattern of increased emphasis on mammals, decreased reliance on fish, low species diversity and low equitability when compared to shell ring sites will be found consistently. If so, the irregular midden sites may represent areas where a more focused subsistence economy was practiced, with greater reliance on deer. In contrast, the shell ring sites may reflect a diffuse subsistence economy with more equal attention to a range of resources, especially fish.

Conclusions

Site 38CH175 provides a small collection representing four mammal species, a single commensal species, at least two reptile species, fish, and birds. The estimated MNI is below the threshold level of 200 and the total number of identifiable bone elements is under the 1400 threshold required to document that a representative sample is being studied. Biomass, using allometric formula, is 16.82 kg, representing a relatively large collection. Consequently, while MNI have not been calculated and the collection must be carefully interpreted because of its small size, it does contain the potential to further our understanding of Late Archaic Period Thom's Creek phase foodways. An examination of the taxa represented reveals a strong reliance on mammals, especially deer, an interpretation further strengthened by an examination of diversity and equitability.

The faunal analysis suggests that the site was used by a relatively small group of individuals focused on the exploitation of deer resources. The presence of antler suggests a fall/winter occupation, a speculation supported by the occurrence of catfish, which are most numerous in the fall. A fall/winter occupation focused on deer procurement would have allowed the site occupants greater access to this resource since during the rutting season deer tend to congregate in larger numbers. The other faunal remains observed at the site were likely exploited on an opportunistic basis, with small nocturnal mammals trapped and reptiles collected during other activities. The size of the fish species present suggest largely capture by nets, although at least some of the fish (such as the catfish and rays) would likely have been taken by hook and line. Consequently, 38CH175 appears to represent only one aspect of the Thom's Creek settlement and subsistence system.

Ethnobotanical Materials from 38CH175

Ethnobotanical remains were recovered from several excavation proveniences associated with 38CH175, including two flotation samples from 250R190 and one sample from Feature 1. Handpicked samples were not incorporated into this study -- both because of their small size and also because of their limited distribution. Flotation samples, offering the potential to recover very small seeds and other food remains, are expected to provide the most reliable and sensitive subsistence information. Samples of 10 to 20 grams are usually considered adequate, if no bias was introduced in the field. Popper (1988) explores the "cumulative stages" of patterning, or potential bias, in ethnobotanical data. She notes that the first potential source of bias includes the world view and patterned behavior of the site occupants -- how were the plants used, processed, and discarded, for example. Added to this are the preservation potentials of both the plant itself and the site's depositional history. Of the materials used and actually preserved, additional potential biases are introduced in the collection and processing of the samples. For example, there may be differences between deposits sampled and not samples, between the materials recovered through flotation and those lost or broken, and even between those which are considered identifiable and those which are not.

In the case of 38CH175 the soil samples were each 5 gallons in volume (representing soil prescreened through ¼-inch mesh to remove the large shell) and were water floated (using a machine assisted system) after the excavations at Chicora's Columbia laboratories. While field flotation is often preferred, since it allows the sample size to be increased, site logistics made field flotation impossible.

Procedures and Results

The three flotation samples were prepared in a manner similar to that described by Yarnell (1974:113-114) and were examined under low magnification (7 to 30x) to identify carbonized plant foods and food remains. Remains were identified on the basis of gross morphological features and seed identification relied on Schopmeyer (1974), United States Department of Agriculture (1971), Martin and Barkley (1961), and Montgomery (1977). All float samples consisted on the charcoal obtained from 5 gallons of soil (by volume). The entire sample from this floated amount was examined. The results of this analysis are provided in Table 19.

Ignoring the uncarbonized component in each sample, the collections are composed almost entirely of wood charcoal. Hickory nutshell is present in all three samples, with the percentage by weight ranging from a low of 2.5% in 250R190, Zone 2, Level 3 to a high of 8.3% in the Feature 1 sample. Only one seed was recovered, a badly fragmented seed coat from 250R190, Zone 2, Level 4. No identifiable seeds were recovered from the samples.

There are four hickories common to the Charleston area -- bitternut (*Carya cordiformis*), water (*C. aquatica*), mockernut (*C. ovalis*), and pignut (*C. glabra*). These species occur on a variety of soil types, from dry woods to rich or low woods to swamp lands. In South Carolina they fruit in October, although seeds are dispersed from October through December (Bonner and Maisenhelder 1974:269; Radford et al. 1968:363-366). Good crops of all species are produced at intervals of up to three years when up to about 16,000 nuts may be produced per tree (Bonner and Maisenhelder 1974:271). Complicating this simple seasonality is the ability of the nuts to be stored for up to six months.

The presence and diversity of hickories is significant given their suspected contribution to the prehistoric diet. The occurrence of hickory nutshell at Stallings-Thom's Creek sites has been previously noted (see Trinkley 1976, 1986, 1993; Harris and Sheldon 1982) and is perhaps most significant because of its high protein and fat content, providing a caloric value equal to that of many meats (Asch and Ford 1971; Hutchinson 1928:261).

Wood charcoal, as previously mentioned, is present in all of the Thom's Creek proveniences examined. This study found that it consists almost entirely of pine (*Pinus* sp), although small quantities of hickory (*Carya* sp.) and

Table 19.
Flotation sample components, weight in grams

Provenience	Wood wt	Wood %	Uncarb. Organic wt	Uncarb. Organic %	Shell wt	Shell %	Bone wt	Bone %	Hickory Nutshell wt	Hickory Nutshell %	Seeds wt	Seeds %	Total	Seeds
250R190, Z 1, L 3	2.01	55.1	1.09	29.9	0.41	11.2	0.03	0.8	0.11	3.0	-	-	3.65	
250R190, Z 1, L 4	5.61	70.3	1.99	25.0	0.17	2.1	-	-	0.20	2.5	0.01	0.1	7.98	1 UID frag
Feature 1	4.68	73.2	0.98	15.3	0.10	1.6	0.10	1.6	0.53	8.3	-	-	6.39	

oak (*Quercus* sp.) were also identified in the samples.[6]

Discussion

The flotation samples are dominated by wood charcoal, primarily pine, and a single plant food remain -- hickory nutshell. Although neither is unusual for Thom's Creek assemblages, the sparsity of plant remains in the flotation samples, as well as the highly fragmented appearance of the materials, is unexpected. Since similar results have not been found at other Thom's Creek sites it seems likely that the samples have been affected by site transformations -- that is, events specific to 38CH175 which have reduced the preservation of plant remains. Given the nature of the recovered samples it is perhaps inappropriate to place much reliance on this study.

The charcoal represents woods which could reasonably be associated with a maritime forest, such as hickory and oak. The dominance of pine, however, suggests a fire sub-climax pine forest with minor components of oak and hickory. The choice of reconstruction is therefore determined by the weight given to the pine -- does it represent the species' occurrence prehistorically, or does it represent intentional cultural selection (perhaps as fuel)? Studies of charcoal assume that the different species tends to burn, fragment, and be preserved similarly so that no species naturally produce smaller, or less common, pieces of charcoal and is less likely than others to be represented -- an assumption that is dangerous at best. Such studies also assume that the charcoal was being collected in the same proportions by the site occupants as found in the archaeological record -- likely, but very difficult to examine in any detail. And finally, an examination of wood species may also assume that the species present represent woods intentionally selected by the Native Americans for use as fuel -- probably the easiest assumption to accept if due care is used to exclude the results of nature fires. While this method probably gives a fair indication of the trees in the site area at the time of occupation, there are several factors which may bias any environmental reconstruction based solely on charcoal evidence, including selective gathering by site occupants (perhaps selecting better burning woods, while excluding others) and differential self-pruning of the trees (providing greater availability of some species other others). Smart and Hoffman (1988) provide an excellent review of environment interpretation using charcoal which should be consulted by those particularly interested in this aspect of the study.

The most conservative, and hence safest, approach is simply to note that these taxa were present in the site area about 2150 B.C. when the site was occupied. If, however, the ethnobotanical record from other Late Archaic and Early Woodland sites in the coastal region is examined, pine seems to consistently dominate the collections. While this suggests that we are observing a consistent pattern, it still cannot tell us whether the pattern in cultural (i.e., the Thom's Creek occupants selected for pine) or whether the pattern accurately represents the taxa present for use (i.e., pine was simply the most common tree in the site area). There are good arguments on both sides. Autecology reveals that a fire sub-climax is possible in the project area and ethnohistoric accounts are replete with examples of Native Americans affecting their natural environment through the use of fire. Likewise, pine is an excellent self-pruner, provides hot fires, and is easy to ignite -- all qualities which would support intentional selection.

It is impossible for the investigated site to provide a clear answer to this question. Future research at other Thom's Creek sites, combined with extensive pollen studies, will be necessary for anything approaching a definitive explanation. Existing pollen studies (e.g., Cohen 1991) suggest that pine, in fact, dominated the aboriginal landscape and that its occurrence in the archaeological record parallels its presence "on the ground." If this is found to be the case, then the dominance of hickory nutshells becomes that much more significant. In the midst of oak-pine forests, presumably maintained through fire, sites like 38CH175 may represent "islands" where hickory resources were

[6] Wood charcoal from the flotation samples were broken in half to expose a fresh transverse surface and examined under low magnification. The larger pieces of wood charcoal were identified, where possible, to the genus level, using comparative samples, Panshin and de Zeeuw (1970), and Koehler (1917).

especially prevalent. Even today in Charleston County, hickories tend to be found in small, localized areas. Being intolerant of salt, they also avoid maritime forests and near marsh areas.

It therefore becomes important that the only plant food remains found at Stallings and Thom's Creek sites have been hickory nutshells and acorn (see Trinkley 1974, 1976, 1986, 1993; Trinkley and Zierden 1983). In each case acorn is so rare as to suggest accidental inclusion (even recognizing the differential preservation potential). As previously mentioned, the hickory is a high quality protein with a caloric value equal to that of many meats. It appears reasonable, given the ubiquity and abundance of the nutshell fragments, to interpret these Late Archaic-Early Woodland people as using hickory as a major food source. The hickory nuts suggest a fall or winter occupation of the site, although they can be collected and stored for future use, perhaps as late as March or April.

Given their small numbers, it seems unlikely that hickory nuts were an important subsistence resource at 38CH175, perhaps indicating opportunistic collection in the course of other subsistence activities. If so, it may be that plant foods were relatively unimportant to the site occupants and the site was primarily oriented toward either shellfish or mammal resources and not floral taxa.

SUMMARY AND CONCLUSIONS

Natalie Adams and Michael Trinkley

38CH173

The archaeology at 38CH173 revealed that a number of groups occupied the site from the Early Woodland to the Mississippian periods. Originally, the site was found to contain an Ap horizon of 0.8 feet. During the current excavation, the Ap horizon was found to be an average of only about 0.5 feet deep. This suggests that the site was truncated either during hurricane clean up efforts or during golf course construction. Other damage to the site included plowing and pond construction, prior to initial site identification.

Based on the survey, the site was believed to be able to address significant research questions relating to the Mississippian period, despite only 11% of the pottery being related to that period. Due to disturbances and the sparsity of Mississippian related materials noted during data recovery, these questions could not be addressed.

The most interesting aspect of the site was the identification of two distinctively different types of St. Catherines wares. One type was moderately thick with sparse clay temper inclusion and broad cord marking, while the other was thinner with more frequent temper inclusions and fine, closely spaced cord marking. This suggests that two different groups of people used the site during that phase.

One shell pit feature was encountered during hand excavation at the site which dates to the Deptford phase or later based on the ceramics present in the feature. Shellfish seasonality indicators point to the collection of the oysters during the late spring - early summer. These oysters were most likely shucked raw since there was no evidence of heating.

Stripping at the site revealed a small cluster of features in the northwestern quadrant of the exposed area. These features included plowscars, tree stains, and possible post holes. Artifacts consisted almost exclusively of pottery. Only one lithic specimen was collected from the surface. The presence of shell and a shell pit feature, probably associated with the St. Catherine's occupation, indicates that shell fishing was the primary activity.

38CH175

38CH175 is a Thoms Creek phase site containing a thick midden of which at least 1.3 feet has been disturbed by historic land use. The previous field investigators noted minor topographic relief which they believed represented either push piles from house razing or perhaps the remains of a shell ring. The archaeological evidence does not support the conclusion that the site was a shell ring. Given the disturbance the site area has received since at least 1818, it is likely that the relief is associated with push piles from house razing.

Shell rings are distinctively doughnut shaped with clear interiors. Trinkley (1985b:112-118) has described midden profiles as consisting of levels of shell and food bone, "sand lenses, periwinkle shell pockets, burnt sand and ash", and subsoil. The distinct stratigraphy indicates a long span of site use. House and other features are found underneath the shell midden. Food bone and carbonized ethnobotanical remains are abundant. Artifacts indicate a relatively large range of activities. These artifacts include pottery; lithics; hones; worked shell, bone, and antler; and ground stone tools (Trinkley 1980).

The vast majority of remains consisted of pottery. Most of the pottery is related to the Thom's Creek period. Only one analyzable sherd was St. Catherines cord marked pottery. Three sherd bones were recovered, providing evidence of bone tool manufacture. A small amount of lithics were recovered, most of which are manufactured from metavolcanics. Since lithic sources are scarce in the lowcountry, it is not surprising that they travelled relatively far for good lithic material. However, it was surprising that they did not take more advantage of the orthoquartzite outcrops on the Santee River, only 30 or 40 miles away. Food bone and floral remains were sparse.

Excavations and site stripping provided no evidence for structural remains. However, several shell pits were uncovered, suggesting that the site's primary function was a staging area of shellfishing and shellfish processing.

Throughout the lower midden levels (Zone 2, level 3; Zone 2, level 4; and Zone 3) there was a relatively high degree of uniformity. The occupants primarily gathered scattered oysters form lower portions of the tidal gradient and they probably gathered from the same source area throughout the use of the site. Seasonal indicators from Feature 1 suggest that they were gathered during late spring - early summer.

Faunal and ethnobotanical evidence indicates that the site was occupied during the fall and winter seasons which is in conflict with seasonal indicators provided by the shellfish. While there was insufficient quantities of clams in feature association for seasonality studies, Claassen (1986b) has consistently found that clams at sites along the Atlantic coast were collected from fall to early spring. This suggests that there may be problems with the accuracy of present methods of oyster seasonality studies. Dr. David Lawrence is currently studying alternative sources (such as fish otoliths and parasitic snails) of seasonality information.

One of the goals of the research at 38CH175 was to compare the use of ¼ inch dry mesh, ⅛ inch dry mesh, and ⅛ inch water screening. Since faunal and ethnobotanical materials were sparse, the goal was to determine if ⅛ inch water screening would provide evidence of species that were not recovered either in ¼ inch or ⅛ inch dry screening. Waterscreening was generally performed in Zone 2, levels 3 and 4 of the shell column. It should be stated that during the fieldwork it was noted that only a sparse amount of animal bone was recovered in dry screening. Waterscreening improved the visibility of very small faunal materials (such as fish vertebrae and small otoliths) and it was believed that this may have aided in identifying species that dry screening might have missed. While no additional species were identified in waterscreening, it dramatically increased the recovery rate for fish by nearly 60% and also increased the recovery of turtle by over 14%. The vast majority of ethnobotanical remains was recovered in waterscreening which included very small pieces of nut shell.

The results of the waterscreening through ⅛ inch mesh strongly argued for at least samples of shell midden soils to be screened in this manner. Although no additional species were identified, it allowed us to recognize that fish and turtle were more important to the diet than would have otherwise been acknowledged. In addition, it allowed us to gather larger samples of charred nut shell. This would be particularly important at sites where radiocarbon dating material is sparse in ⅛ inch or ¼ inch dry screening.

It is clear from Gregorie's (1924) observations that the Copahee Sound area was important to the Thom's Creek people as well as other Native American groups. Not only was it the location of 38CH175, but also Stratton Place shell ring, Yough Hall, Hanckle, as well as a number of other sites). She mentions the presence of a freshwater spring which she considers to be "rare" for the area. This spring, as well as the estuarine ecosystem which provides high biomass species of foods which made it highly desireable for prehistoric occupation.

Problems Associated with Green Spacing Archaeological Sites

Introduction

Site green spacing is much more complicated than setting the site aside to be "preserved in place". It takes a long term commitment to assure that the site is not damaged during construction activities that take place in the

area and that the site is monitored and maintained to prevent damage through neglect. As Henry has noted:

> [a]n archaeological site cannot be protected merely by buying it, acquiring an easement on it, or setting it aside as open space in a residential development. Responsible site protection can best be achieved through an aggressive long-term management program that includes thorough documentation of site characteristics and condition, site stabilization, security, maintenance, monitoring, compatible use, and where appropriate, eventual research. Effective long-term management begins with the preparation of a site management plan that addresses these issues (Henry 1993:77).

The examples of 38CH173 and 38CH175 illustrate that for there to be responsible site protection, guidelines for green spacing archaeological sites need to be detailed and need to provide for long term monitoring.

Green Spacing at 38CH173 and 38CH175

There appear to have been several problems with green spacing both 38CH173 and 38CH175 at Charleston National Golf Course. These problems included clear definition of site location and damage resulting from site clearing and initial filling.

When developers choose to "green space" an archaeological site instead of having it excavated, the Memorandum of Agreement (MOA) or preservation plan created by the State Historic Preservation Office (SHPO), is usually very vague concerning guidelines for green spacing. Normally, they require a protective covenant which follows the deed, that the site boundaries be identified on a plat, and request that an unspecified buffer be placed around the site (Lee Tippett, personal communication 1994). If a developer wants to put fill over a site, for example to create a golf course fairway, it is a favorable situation since fill *can* serve to protect an archaeological site. However, in the example of 38CH173, a portion of the site was in woods which had to be removed before this fill could be placed and before the fairway could be created. This probably caused additional disturbance to the site. It may have been at this stage that a portion of the plowzone was removed.

Additional damage occurred at 38CH173 during Hurricane Hugo in the form of erosion. According to the developer's representative, at least six feet of the pond bank had eroded away in the area of a culvert. During the current investigation, a small shell midden was found eroding into the pond.

At 38CH175, the "minor topographic relief" was apparently brought to grade perhaps when the putting green was constructed.

The goal of this discussion is to point out that there are problems with green spacing archaeological sites since no clear guidelines are normally provided in Memorandums of Agreement (MOAs) or preservation plans. Surely, the situation at Charleston National Golf Course is not unique. Certainly other archaeologists have returned to excavate sites which had been previously green spaced and found that the site had been damaged. There are a number of things that can be done to assure that a site is protected from damage during green spacing. The following discussion deals with marking sites in the field, site burial, and erosion since these are issues that directly concern 38CH173 and 38CH175. There other types of green spacing or stabilization methods which are not discussed here, but also require a strict outline of implementation, if a developer chooses to green space a site in such a way.

Marking Sites in the Field

At both 38CH173 and 38CH175, archaeological survey maps did not present landscape features to scale, resulting in difficultly in exactly locating the area of previous work. It is important that in the future sites to be green spaced are clearly marked in the field. This could include placing permanent datums at the edges of the sites. Such datums could consist of poured columns of cement in the ground with a metal marker at the top which could be later

located with a metal detector. Afterwards, these points should be surveyed into another permanent point off site. Even if a large amount of fill were placed over the site, preventing identification of the metal and concrete markers with a metal detector, these points could be relocated using the off site permanent point. An easier method of marking site boundaries would be the use of magnetic tape that is normally used to mark the location of pipes and utilities. This could most easily be done during the archaeological survey for all sites to be recommended as eligible or potentially eligible for inclusion on the National Register of Historic Places and would ensure that the site could be relocated. During the development phase, the site should be clearly marked above ground so that construction crews can either avoid the area or take special care when filling in these areas.

If a buffer is to be used at the site, it should be no less than the shovel testing interval used to establish site boundaries (e.g. 25 or 50 feet), if the boundaries were determined using a grid testing pattern. On sites where a cruciform testing pattern was used, a larger buffer is necessary since one can not assume that a site is completely circular or oval in shape. In these instances, the buffer should be 100% of the size of the site. For instance, if a site measures 100 by 100 feet, then the buffer should be 100 feet. This buffer should be able to incorporate areas of the site which fall outside of the "circle" established through cruciform testing. Figure 24 provides a graphic example of the accuracy of establishing site boundaries using these two survey methods.

The site (including the buffer) should be fenced off, at least during construction in the immediate area. Reusable orange polyethylene safety fences would provide excellent protection since they are highly visible to construction crews. Permanent fences would help provide damage from looters or changing development plans. Regardless of fencing, security patrols should be used to provide surveillance protection.

Site Burial

Any site burial which requires clearing away trees to be useful to the developer (as at 38CH173) should be green spaced using special clearing. Tree clearing causes a great deal of damage and can destroy archaeological features even beneath the plow zone. Tree clearing should be done using a number of careful techniques, including cutting trees at grade, removing the debris using non damaging methods (such as horses or rubber tired vehicles), and using a large number of skid trails instead of just a few. Any clearing to be done at the site should be done by hand. No tree roots should be removed since they can go quite deep.

If there are unwanted irregularities in the ground surface, such as the landform noted at 38CH175, these irregularities should be eliminated with by filling in around them, not by grading.

A number of studies have been done by the National Parks Service and the U.S. Army Corps of Engineers on the effects of burying archaeological sites (see, for example, Thorne et al. 1987; Hester 1988; Nickens 1989a and 1989b). Factors to be examined include the nature of the site, amount of fill, type of soil to be used as fill, and the type of barrier to be used between the original ground surface and the fill material.

No detailed long term studies were found which defined how much dirt can be safely placed over an archaeological and for how long. However, a study by Hester (1988a) found that 75 feet of embankment placed over an archaeological site produced some damage to the artifacts buried for a 20 month period. He noted that "[c]harcoal sticks placed with the artifacts were slightly bowed but otherwise undamaged after retrieval. Some faunal remains were damaged, and one very fragile "sand dollar" was badly fractured. Also, a small obsidian flake was damaged" (Hester 1988a:8). It is unknown how much additional damage would have occurred to the artifacts over a much longer period, such as 20 years. In addition, deeply burying a site may prevent future archaeological research. Hester recommends that if a site is to be deeply buried, then a plan must be developed to permit later access. If a site is known or has the potential to contain human burials, then it should be determined whether filling is an appropriate site preservation method. Given the lack of more detailed and longer term damage studies, it is safest to assume that if a site is to be buried, it should not be deeply buried. While most of 38CH173 was buried underneath only about one foot of fill, other areas were buried underneath at least six feet of fill, if not more, which may have the potential

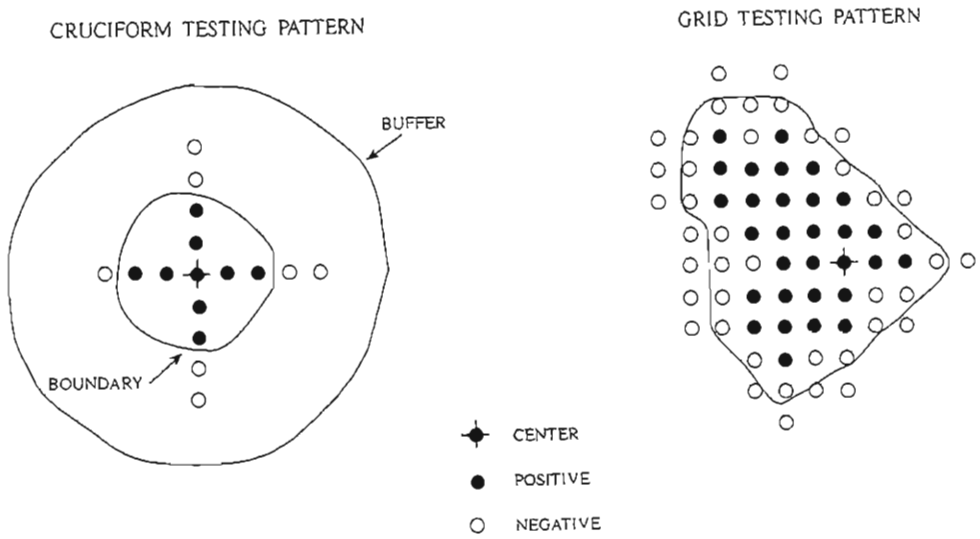

Figure 24. Example of determining site boundaries using cruciform and grid patterns.

of causing detrimental effects in the long term.

The fill to be placed over a site should be chemically compatible with the matrix to be covered, as well as with the artifacts and biofacts within that matrix (see Thorne et al. 1987:24). For instance, shell midden should be covered with soils with a comparable pH.

To ensure the separation of fill and the original site matrix, a covering of permeable fabric should be placed between the two layers. Filter fabrics all have a finite useful life, but even after the separator has decayed, subsequent excavation should be able to pick up the stratigraphic line created at the junction of the fill, the separator fabric, and the site matrix. A thin lens of sand could also serve as a barrier between the fill and the site soils (Thorne et al. 1987:25-26; Thorne 1988:1).

The process of filling should not be damaging to the site. In cases where the site area will be farmed or subjected to other surface damage, sufficient material should be placed over the site to permit these activities.

Erosion

If a site is to be green spaced when erosion is a concern, there are a number of materials which can be used to stabilize the site. These include natural materials such as rock and filter cloth, sandbags and filter cloth, timber bulkheads and fill, or vegetation; and man-made materials such as bulkheads, used tire mattresses, and gabions. In a golf course or housing development situation such as Charleston National, natural-looking materials are probably preferred since they are more aesthetic. In some instances, it may be necessary to prepare the bank (such as changing

the slope or smoothing it out). In these situations, some salvage archaeology will be necessary in the area to be impacted, even though most of the site is to be green spaced.

While both sites have been damaged by erosion, the largest amount of damage occurred at 38CH173 where approximately six feet of shoreline was eroded away during Hurricane Hugo. While normally there is not enough water action in man-made ponds to cause concern, places such as Charleston, where hurricanes are not unusual, will need to take extra precautions at shoreline sites.

Conclusion

Although the previous information may seem tangential since both sites have now been excavated, the point of these discussions is to stress that preservation plans should be very specific about how a site is to be preserved in place, so that no misunderstanding can occur. There have been a number of studies (e.g. Henry 1993; Thorne et al. 1987) to provide guidelines for site protection.

While both of the sites at the Charleston National Golf Course received some damaged before they were recommended as eligible for inclusion on the National Register, they should not have been subjected to additional damage during green spacing. This additional damage may not have occurred if the developer had been provided with clear and specific green spacing guidelines. The development of such guidelines would not only protect archaeological sites being preserved, but would also provide a firmer basis for prosecution of developers who may purposefully damage or destroy archaeological sites which are supposed to be green spaced.

At present, most green spacing guidelines are vague. Since development is quickly eating away at coastal archaeological resources, it is important that neglect or misunderstanding does not cause destruction without recordation of sites to be preserved in place.

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