ABSTRACT

ELIZABETH MONAHAN DRISCOLL. Bioarchaeology, Mortuary Patterning, and Social Organization at Town Creek. (Under the direction of Clark Spencer Larsen).

This study represents a bioarchaeological approach to mortuary patterning and social organization at Town Creek, a late prehistoric (AD 1200-1400) South Appalachian Mississippian mound and village. The purpose of the research is to examine archaeological evidence of social organization and determine the impact of the social structure on the health and nutrition of the population buried at Town Creek.

I examined indicators of biological and nutritional stress from the 264 excavated individuals from Town Creek. I gathered data on linear enamel hypoplasia, cribra orbitalia, porotic hyperostosis, periostitis of the anterior tibia, carious lesions, skeletal trauma, stature, and cranial deformation. Archaeological evidence for social organization included site structure and layout, public building architecture, spatial distribution of burials, and a variety of information from each burial, including pit type and form, position, grave goods, and orientation of the body within the pit. The above data were combined to examine identified subgroups in the population.

Five specific hypotheses were tested:

1- Because Town Creek is a South Appalachian Mississippian ceremonial center, evidence of social ranking is discernable in the mortuary program.

2- Gender was an important organizing element for mortuary ritual because it was important in ordering daily life and social relationships.

3- Descent and kinship were important organizing principles for the mortuary ritual.

4- Fronto-occipital deformation indicated Pee Dee group membership and distinguished them from neighboring groups.

5- Elite individuals at Town Creek had better health and nutrition because of their social position.

The results of this analysis suggest that social ranking was present and reflected in the mortuary practices at Town Creek. Females were generally in poorer health than males, but displayed more indications of elite status and were the majority of the burials in the mound. Females without cranial deformation display more indications of poor health and diet, and were more likely to not be buried inside structures. Elite individuals do show indications of slightly better health and diet, but the differences by status are not marked.

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CHAPTER 1

INTRODUCTION: SOCIAL ORGANIZATION AND MORTUARY PATTERNING AT TOWN CREEK

Archaeologists have long been interested in the social organization of groups in the past, and have developed a variety of ways to discern patterns related to social life and structure. Of particular concern in the southeastern United States has been the identification and explanation of chiefdom societies in the late prehistoric period. One of the most fruitful methods for discovering and interpreting patterned differences has been an analysis of the mortuary practices of larger villages and towns. In particular, researchers focus on sites with examples of public architecture such as mounds at ceremonial centers. This study examines the mortuary patterning at Town Creek (31 $Mg^{o}2$ and $Mg^{v}3$), Montgomery County, North Carolina, through a combination of bioarchaeological and mortuary archaeological methodology and theory. The combination of approaches leads to a full consideration of the many factors that impact the ultimate pattern of human burials in the ground, and presents a model for interpreting these patterns.

The North Carolina Piedmont

In the Late Woodland period (AD 800-1500), the Piedmont of North Carolina was the home of people who made their living by growing maize and squash, and collecting the wild plant and game resources that were abundant in the area. These descendants of the earlier Archaic people settled down in semisedentary villages, began to make pottery and produced

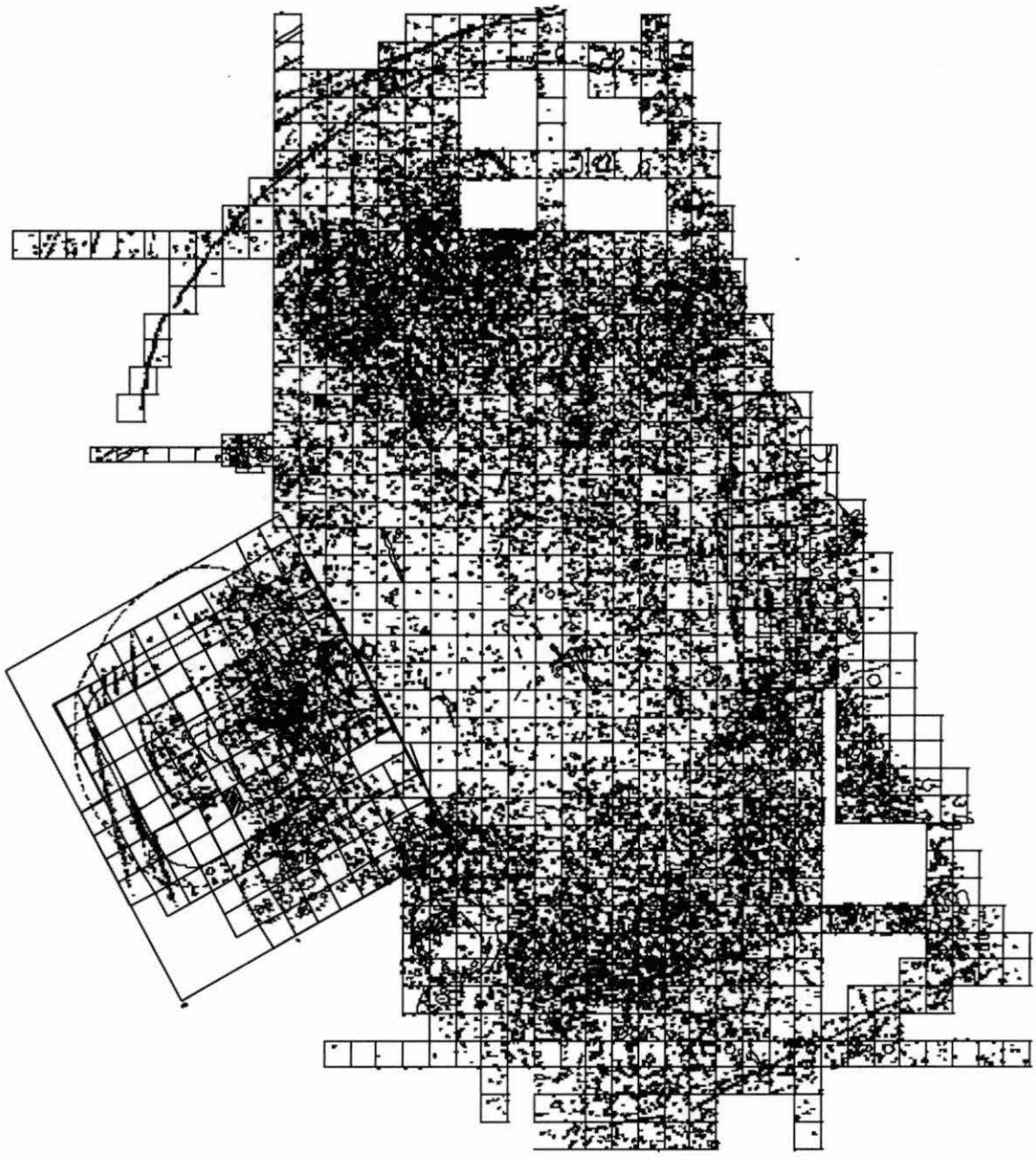

Figure 1-1. Digitized site map. This map represents the majority of the mapped and/or excavated area. Several trenches that extend north and south have been removed to fit the map on the page. Figure 2-1 is a simplified, schematic map that identifies important architectural features.

their own food rather than relying exclusively on gathered resources. Social interactions, including trade, with their neighbors to the south and west appears to have influenced the people on the Piedmont of North Carolina. Around AD 900, some of the people on the southern Piedmont began to develop practices similar to those of peoples farther to the south, in present day South Carolina and Georgia. Some of the new cultural features are also similar to the cultures of the people in the mountains of North Carolina.

The cultures of the people to the south and west of the Piedmont at this time are known as South Appalachian Mississippian and they shared several features. These patterns, described in greater detail later, included making pottery with distinct, complicated stamped motifs, practicing artificial cranial deformation by binding the heads of their children, and constructing large earthen platform mounds with square structures atop serving as both sacred foci for ritual practice, and the residences of the elite leaders. Mississippian society was arranged hierarchically, with elite and non-elite groups.

Pee Dee Culture

Archaeologists call the culture that developed on the southern Piedmont in the Woodland period Pee Dee (Coe 1952). For reasons unknown at this time, only part of the population on the Piedmont developed these elements of the regional culture archaeologists call the South Appalachian Mississippian (Ferguson 1971). Other groups, ancestors of the historic Siouan tribes, had their own trajectory called the Piedmont Village Tradition (Ward and Davis 1999) and never adopted the practices of other Mississippian-influenced groups. Pee Dee culture is different from that of their neighbors in a variety of ways, including

practicing artificial cranial deformation to produce a distinctive fronto-occipital deformed shape. No other groups on the Piedmont ever practiced this type of cranial deformation.

Only one town with a mound has been identified on the southern Piedmont of North Carolina at a site called Town Creek. At least 64 other Pee Dee sites have been identified (Oliver 1993), including two large villages, Leak and Teal. These sites appear to have been important ceremonial centers earlier and later than Town Creek, but neither had a mound (Oliver 1993). Town Creek is therefore a unique site.

Town Creek Mound and Village

This analysis of Pee Dee social organization focuses on the mortuary patterns discovered at Town Creek. The mound and village site was the focus of one of the longest excavation programs in the Southeast. Under the direction of Joffre L. Coe, near-continuous excavation took place at Town Creek for over 50 years, resulting in more than 96,000 square feet excavated to the subsoil and mapped (see Figure 1-1). Over half this area was fully excavated. Initial interpretations of Town Creek, made by Coe in the 1950s pointed to the uniqueness of the site. In addition to being a mound site on the Piedmont of North Carolina, it also has the largest burial population of any excavated site in the area. Most of the published accounts of Town Creek are based primarily on Coe's (1952) interpretation. Coe's recent manuscript on the site presents the culmination of 50 years of research at the site, but much of the interpretation remained the same as the original (1952).

Naturally, ideas about interactions between groups in the Southeast have changed a great deal since the 1950s, particularly due to numerous new excavations. The incorporation of data from sites excavated in the last 50 years, combined with new theoretical perspectives

and paradigms, have altered archaeologists ideas about cultural transmission, regional interactions, and models of local development of Mississippian cultures. This study represents a first application of recent archaeological theory, particularly mortuary and bioarchaeological theory, to Town Creek. All human burials and their contexts are considered. By analyzing all burials excavated from the site, instead of selected samples (e.g., Burke, in Coe 1995;Graham 1974), I am able to incorporate the entire range of the variability at the site, and better characterize the health and nutrition of the population. I combine this bioarchaeology dataset with information on the mortuary context and site organization to create a robust, nuanced interpretation of the social organization of Pee Dee people at Town Creek.

Goals of the Research

This study has two major goals:

1. the development of a model of social organization of Pee Dee people at Town Creek; and

2. an assessment of the impact of the social organization on the lives of men, women and children through an analysis of their diet and health.

To accomplish these goals, I closely examine intra-site variability in mortuary patterning and non-specific indicators of skeletal and dental health and nutrition to create a picture of social and political organization and power relationships at Town Creek. These findings are also used to begin to examine the relationship between Town Creek and other Piedmont sites to elucidate regional interactions. I use the framework of gender identity and relationships to help clarify these political and power relationships within the site and in the

region. Through an analysis of spatial and contextual relationships, I create an interpretation of the development and layout of the site, focusing on structures with burials and the location of burials specifically. Finally, I also consider kinship and descent as organizing principles for the mortuary areas at Town Creek.

Organization of the Analysis

This manuscript is organized into six chapters, including this brief introduction. Chapter 2 presents the archaeological background and context for the study. Town Creek is placed in regional context through a discussion of the South Appalachian Mississippian and other cultures that inhabited the Piedmont of North Carolina in the Woodland period. Part of Chapter 2 is also devoted to early interpretations of Town Creek and related sites such as Leak and Teal. I present my own reinterpretation of some of the earlier conclusions.

Chapter 3 begins with a discussion of mortuary archaeology theory and my model for combining recent theoretical models of mortuary practice and research goals concerning social organization. Today there seems to be a shift away from understanding past social systems and an emphasis on ritual, power and agency relationships. I argue that elements such as hierarchy and kinship continue to be important organizing principles for understanding past social relationships. The goals of understanding these social relationships require some reconstruction of age, sex, and status parameters.

Ritual can obscure the very relationships archaeologists are most interested in, but I argue that the full integration of bioarchaeological data and interpretations of skeletal remains can provide valuable information on the biological impact of social systems. The data derived from bioarchaeology can provide means for testing hypotheses concerning the

impact of social systems. These data can also produce parameters for interpretation of power and gender relationships. In Chapter 3, I explain a set of five hypotheses derived to meet the goals of this study outlined above. Each hypothesis necessitates a certain set of data to evaluate it. The means for testing each hypothesis are briefly described, and the expectations each hypothesis engenders are presented.

In Chapter 4, I describe the methods for collecting the data to test the hypotheses. Standard approaches to interpreting each dataset are also described. In other words, I explain why the data can be useful for evaluating the types of questions set forth by the hypotheses. Additionally, I explain why I chose certain datasets and present previous studies where these data have been successfully applied to the reconstruction of social organization in past populations.

In Chapter 5, I present all the results of the data collection organized by spatial and context information for each burial. Age, sex, and status form the main parameters for the description of the findings. This chapter and Appendix A present all the raw data used in this analysis. Statistical analyses are presented where appropriate.

I return to the framework of the five hypotheses and expectations in Chapter 6. Each hypothesis is evaluated separately along with my expectations. I discuss the hypothesis and how the patterns from Chapter 5 support or disprove it in detail, culminating in a summary of the findings. I conclude Chapter 6, and this dissertation, with a review of the two main goals of this project, described briefly above. I evaluate the goals and the ramifications of the analysis. I also present and summarize the major contributions of this study and outline future directions for the research.

CHAPTER 2

THE REGIONAL CONTEXT OF THE TOWN CREEK SITE AND PEE DEE ARCHAEOLOGY

This chapter provides a detailed description of the archaeologically defined cultures present on the Piedmont of North Carolina during the Late Woodland and Mississippian periods to provide a background for interpreting Town Creek. This section also includes a discussion of the origins of Pee Dee, the name Coe (1952) gave to the culture and ceramics of the people who inhabited Town Creek. As part of this discussion, an outline of the history of excavation and previous research at Town Creek and related sites by Coe, his students, and others is provided (Coe 1952, 1995; Ferguson 1971; Graham 1973; Mountjoy 1989; Oliver 1993; Reid 1965, 1967).

I begin with a discussion of Pee Dee culture in regional context and the archaeology of the North Carolina Piedmont in the Woodland period. This leads to a consideration of the Mississippian cultures in the Southeast in the late prehistoric period. Early models of population movement and cultural change have been used to explain the appearance of Pee Dee culture and ceramics in North Carolina. The model of Mississippian expansion through colonization has led to certain interpretations of Town Creek, supported by ceramic similarities with sites to the south of Town Creek in Georgia and South Carolina. I evaluate the model of population intrusion and discuss an alternate explanation for the appearance of

Pee Dee culture through indigenous development. Finally, I describe the layout of Town Creek, including the clusters of human burials, the earth-embanked lodge, the palisades, and the mound, in detail with both previous interpretations and my own reinterpretation of the growth and use of the site.

The Piedmont Village Tradition

On the Piedmont of present-day North Carolina, two cultural traditions emerged in the Late Woodland Period (AD 800-1600): the Piedmont Village Tradition in the northern Piedmont and the Mississippian Tradition in the southern Piedmont (Ward and Davis 1999:98). The Piedmont Village Tradition began as a time when populations came together to form relatively compact villages that eventually were palisaded for protection from intertribal conflict. These villages were more permanent than earlier settlements, and there appears to have been a concomitant increase in reliance (after ca. AD 1000) on maize agriculture, evidenced by grain storage facilities and larger settlements (Ward and Davis 1999).

Piedmont villages in the Late Woodland, such as the Hillsboro phase Wall site (AD 1400-1500), consist of a number of circular houses about 25 feet in diameter, a palisade or stockade wall surrounding the houses and burials. The Wall site is estimated to have had a resident population of about 100-150 people (Petherick 1987; Ward and Davis 1991).

Mississippian and South Appalachian Mississippian

The Mississippian period (ca. 800-1650) is the most geographically extensive and politically complex period in North America (Goldstein 1980). The term "Mississippian"

has been used to refer to aspects of material culture and a specific time period. In Holmes' (1903) early descriptive work, shell-tempered ceramics were the defining characteristic for Middle Mississippi group sites. Other characteristics, such as wall-trench houses, and flat-topped pyramidal mounds were later included as part of the material culture complex. Ford and Willey (1941) devised four horizons, the Archaic, Burial Mound I, Burial Mound II, Temple Mound I and Temple Mound II. Several years later, Griffin (1946) created a cultural chronology that divided the prehistoric occupation of the Southeast into the Archaic, Woodland, and Mississippian periods. Griffin's Woodland period corresponds to Ford and Willey's Burial Mound I and Burial Mound II. The two Temple Mound periods are equivalent to Griffin's Mississippian period. These classificatory schemes were based largely on ceramic analysis and mound types and all reflect the observation that important cultural changes occurred in the Southeast with the adoption of agriculture.

The meaning of the term Mississippian was later redefined to include all Southeastern populations that derived their subsistence primarily from agriculture, and fit a particular "adaptive niche" (Smith 1978). Smith (1978:486) argues that Mississippian should be used to refer to prehistoric populations in the eastern woodlands from AD 800-1500 with ranked social organization, and "a specific complex adaptation to linear, environmentally circumscribed floodplain habitat zones." More recently, greater emphasis has been placed on a particular sociopolitical organization characterized by social ranking and centralized leadership with an ascriptive element (Steponaitis 1986). Mississippian cultures share many common features, such as hereditary leadership, intensive maize agriculture, probable matrilineal descent patterns, and complex mortuary rituals (Hally 1994; Knight 1981, 1986, 1990).

The southern Piedmont of North Carolina exhibits a different cultural pattern during the Late Woodland than the northern Piedmont. In the area south of the Uwharrie Mountains, people began to develop cultural similarities with more southern groups in present-day South Carolina and Georgia, and people in the mountains of western North Carolina and eastern Tennessee. The culture associated with these groups is known as South Appalachian Mississippian, discussed below. South Appalachian Mississippian people appear to have developed these characteristics concurrently, much like other emergent Mississippian cultures in the Southeast during this period (Steponaitis 1986).

The Town Creek site, the focus of this study, is located on the southern Piedmont in Montgomery County. The culture and ceramics associated with the main occupation of the site is called Pee Dee (Coe 1952) and is part of the South Appalachian Mississippian cultural tradition (Ferguson 1971). Holmes (1903) described a South Appalachian Province of ceramics as a geographical variant of Middle Mississippian, characterized by ceramics finished with a carved paddle (Ferguson 1971; Holmes 1903). Griffin (1967) later characterized Mississippian cultures in terms of subsistence, not just material culture, and renamed the South Appalachian Province "South Appalachian Mississippian." This tradition was fully articulated by Ferguson in his dissertation in 1971.

Development of the South Appalachian Mississippian Model

Ferguson (1971) presented a three-part synthesis of South Appalachian Mississippian: a cultural model, a review of the archaeological record, and a synthesis. His review of the archaeological record of the South Appalachian Mississippian tradition covered five areas: central Georgia, northern Georgia, the Middle Chattahoochee River valley, the Atlantic

coastal plain, and the Mountains. Town Creek is included in the discussion of the Atlantic Coastal Plain. He divided the region into four cultural units based on the distribution of mound centers, climatological areas, time periods, and soil types. The earliest, Cultural Unit I, included Swift Creek, Deptford, and Connestee ceramics, and Middle Woodland sites such as Garden Creek, Swift Creek, Stubbs Mound, Kolomoki, Mandeville and Evelyn. Cultural Unit II, or Early Mississippian, included Ocmulgee, Macon Plateau, Roods Landing, and Hiwassee Island and reflects influence in some areas by Middle Mississippian culture during the early Mississippian period. He considered this cultural unit to represent the adaptation of Mississippian culture to local subsistence conditions. Responses to local conditions include smaller, more scattered villages and smaller ceremonial centers than other Middle Mississippian sites further to the south and west. Cultural Unit III, "Mature" to Late Mississippian, included Woodstock, Etowah, Savannah, Wilbanks, Pisgah and Pee Dee ceramics, at the Town Creek, Hollywood, Irene, Fort Watson, and Etowah sites. Ferguson's Cultural Unit IV, Late Pre-contact to Contact period, encompasses Lamar, which he considered to reflect a rapid spread of Lamar culture throughout the region over a relatively short period of time (1971).

Expansion of South Appalachian Mississippian

Ferguson (1971) proposed two "arteries" of South Appalachian Mississippian expansion into the Atlantic Coastal Plain, one towards the Irene Mound site in Savannah, Georgia and the other towards Town Creek to the north. These arteries reflect the physical movement of people to the coastal plain from the Deep South. Although this model of culture change was more common at the time, many archaeologists consider culture to have

changed during the Mississippian more though the transmission and appropriation of ideas, not the movement of colonizing populations (e.g., Smith 1984). Ferguson considered coastal plain sites to represent a combination of indigenous coastal plain characteristics and Mississippian. He drew certain similarities between the Irene site and Town Creek and used these similarities in ceramics and architecture to support the idea that similar people constructed both sites. He pointed to the evidence that mortuary houses are found only at Irene and Town Creek, although I will argue that these are two quite different kinds of structures. In fact, I do not believe that the "mortuary houses" at Town Creek were dedicated burial structures, at least not initially. They appear to be domestic structures with burials in the floors. These clusters may have changed in function over time, and are discussed in much greater detail below. Very few "Southern Cult" artifacts are found in the Atlantic Coastal Plain. Town Creek also appears to combine elements of indigenous Piedmont culture and Mississippian elements, but Coe and his students have not previously noted the similarities.

Placement of the Pee Dee Culture: Lamar and South Appalachian Mississippian

Pee Dee culture bears some similarities to both Lamar and South Appalachian Mississippian cultures. Therefore, a description of how Lamar and South Appalachian Mississippian are related to one another is warranted. Lamar is somewhat different from South Appalachian Mississippian in several ways. Although Lamar has been referred to as "a phase, a culture, a period, a horizon and a tradition" (Hally 1994:144), it is generally accepted as a culture *sensu* Willey and Phillips (1958). Lamar encompasses over two dozen

phases and spans nearly 400 years, from AD 1350 to contact and beyond in some areas. It occurs in most of Georgia and the adjacent parts of Alabama, Florida, South Carolina, and the mountains in North Carolina and Tennessee. Maps of the Lamar area (Hally 1994, Williams and Shapiro 1990) do not include the North Carolina Piedmont, but these were produced prior to the recent publication of Coe's (1995) research on Town Creek. Pee Dee ceramics are considered a regional variant of Lamar by many archaeologists (Williams and Shapiro 1990).

The Town Creek phase (AD 1300-1350), named for the Town Creek site, is considered Lamar by some (DePratter and Judge 1990). South (1973), on the other hand, considers Pee Dee ceramics to be part of the Chicora ceramic horizon. Hudson (1990) describes the Savannah River as an important geographic division-- Savannah ceramic horizon styles present in Georgia and South Carolina are later split into Lamar ceramics to the west of the Savannah River and the Chicora horizon style to the east. He refers to the Pee Dee phase as the "most characteristic development in the Chicora horizon style" (Hudson 1990:72).

There is some ambiguity in the literature about the relationship between Lamar and South Appalachian Mississippian. Williams and Shapiro state that "Lamar is the name we conveniently apply to the later South Appalachian Mississippian cultures that produced certain pottery types" (1990:6), implying that Lamar is a temporal division of South Appalachian Mississippian. This agrees with Ferguson's (1971) formulation. Anderson (1994) states that all regional variants of Lamar pottery styles occur within the South Appalachian Mississippian subarea of Mississippian culture, using South Appalachian Mississippian as a geographical area. Similar to Lamar, different aspects of the South

Appalachian Mississippian tradition are used in different contexts. However, it is generally agreed that Lamar culture falls late in the South Appalachian Mississippian tradition, and spatially, its distribution nearly overlaps that of the South Appalachian Mississippian. Town Creek and Pee Dee culture fall within the more encompassing tradition of South Appalachian Mississippian temporally, geographically, and culturally. The main occupation of Town Creek (AD 1250-1350) occurs just prior to the beginning of Lamar culture.

Pee Dee Ceramics

Reid (1965, 1967, 1985) analyzed a selection of the pottery from the mound at Town Creek in an attempt to create an intrasite chronology. Reid found temporal and activity related differences in the ceramics from the pre-mound humus and the mound flanks. He did not include ceramics from features, burials, postholes, or unassociated localities. Reid found that complicated stamped designs were more popular in earlier, pre-mound, contexts. Reid saw many similarities between Town Creek ceramics and other South Appalachian Mississippian ceramics, drawing comparisons to ceramics from the Hollywood site, Mulberry, and Fort Watson in South Carolina. Ceramics from Irene Mound in Georgia have the greatest similarity to Pee Dee ceramics (Caldwell and McCann 1941; Reid 1965, 1967). Irene and Town Creek ceramics share two types of complicated stamped motifs: a filfot cross and a conventional cross (Reid 1967, 1985). Early Pee Dee ceramics are similar to Savannah phase ceramics, and later Pee Dee ceramics are more similar to Irene phase ceramics.

In a companion piece to the description of test excavations at Hollywood, Reid (1965) compared the pottery to Pee Dee ceramics from Town Creek. A very small sample of 43 sherds from the Hollywood collection were studied. The similarities noted between the

collections are based on physical attributes of the sherds. Both ceramic samples have decorative nodes and punctations applied to the rim, similar to Irene phase ceramics. One design that was seen at Hollywood but not at Irene or Town Creek was a figure eight with a cross in each circle. Burials in large urns were found at Town Creek and Hollywood, with inverted bowl covers, complicated stamp designs, and each is "killed." The lower levels at Hollywood contained "Southern Cult" artifacts not seen at Town Creek. Bottles were also missing from the Town Creek assemblage, but present at Hollywood. Reid concluded that the similarities of the ceramics at Town Creek and Hollywood are striking.

Cultural Similarities between South Appalachian Mississippian and Town Creek

Cultural similarities between Town Creek and other South Appalachian Mississippian sites include mound construction that began with an earth-embanked lodge. This is a fairly common finding at South Appalachian sites, occurring at Irene, Beaverdam Creek, and Garden Creek Mound no. 1, among others (Anderson 1994; Caldwell 1942; Crouch 1974; Larson 1994; Rudolph 1984).

Coe (1995) looked to the other excavated South Appalachian Mississippian sites for comparison with Town Creek. Most notably, he compared the Irene site (Caldwell and McCann 1941) near the mouth of the Savannah River in Georgia, and the Hollywood site (DeBaillou 1965; Reid 1965), also on the Savannah River in South Carolina. These two sites were excavated and published while Coe was in the process of excavating and interpreting Town Creek, and likely had some influence on his interpretation. Few South Appalachian Mississippian sites had been excavated and published prior to 1952 when Coe first published information on Town Creek. Similarities between these three sites included ceramic types,

site organization, and mound construction. In particular, the ceramics were strikingly similar, as is discussed below.

Irene and Town Creek share a similarity in the variety of positions in which the dead were buried. Extended, flexed, and several forms of semi-flexed burials are found at both sites, and both have one type in which the body was positioned on its back, arms extended along the sides, but the legs are drawn up to either side with the knees rotated outward. Caldwell and McCann (1941) refer to this as the "jitterbug" position. At least three "jitterbug" burials were excavated at Irene, one was discovered at Town Creek, and one was also found at the Teal site, discussed below.

Differences between other South Appalachian Mississippian sites and Town Creek

The above similarities are important, but the differences between Town Creek and Pee Dee culture and other South Appalachian and Lamar sites are also significant. Few items that are considered part of the "Southeastern Ceremonial Complex" (Galloway 1989) were found at Town Creek. The ceremonial nature of the settlement at Town Creek is different from the Piedmont villages around and to the north of it, but features such as round houses connect Town Creek to the North Carolina Piedmont. Several Pee Dee complicated-stamped motifs are not found in Savannah and Irene wares (Reid 1967). Instead, the nested block, line block, herringbone, and arc-angle patterns may reflect influences from the Pisgah phase in the North Carolina mountains (Ferguson 1971). Ferguson (1971) also notes similarities between Pee Dee and Etowah styles. One surface finish technique that was popular at Town Creek is unique to Pee Dee pottery. Wet, unfired vessels appear to have been wrapped with

fabric, and then the entire surface of the pot was paddled. The fabric was pushed into the wet clay, and left an impression when the fabric was removed prior to firing (Coe 1995).

All the structures identified thus far at Town Creek are round with the exceptions of the earth-embanked lodge, the two townhouses, and the structure within the inner palisade along the riverbank. Round houses are typical for domestic structures during the Piedmont Village Tradition such as at the roughly contemporaneous Wall site described at the beginning of this chapter (Ward and Davis 1999).

Pee Dee culture seems to be a hybrid of Mississippian and Piedmont cultural elements. The ceramics, mortuary practices, and possibly the social organization at Town Creek appear to have been similar to Lamar and South Appalachian Mississippian practices, but elements of site structure and domestic, non-public architecture bear more similarity to northern Piedmont and western North Carolina mountain cultures. The early development of Pee Dee culture on the piedmont of North and South Carolina diverged from other groups in the northern piedmont, but retained similarity in house form and probably subsistence practices. For reasons that are unclear at this time, the people in the north and south piedmonts and the mountains had different cultural trajectories but interaction through trade and probably marriage alliances served to maintain the above-mentioned similarities.

THE TOWN CREEK SITE

This analysis focuses on the human burials at Town Creek, their context, and their spatial arrangement at the site. Interpretations of Town Creek and Pee Dee culture were formulated based on earlier models of population movement and dynamics (Coe 1952, 1995,

Oliver 1993, Graham 1973, Mountjoy 1989, although see Ward and Davis 1999). Town Creek has been wryly called the "center of the archaeological universe in the southern North Carolina Piedmont" (Ward and Davis 1999:131), and its reinterpretation will provide new insights into our understanding of the region.

The Town Creek site (31 Mg 2 and Mg 3) is located near the town of Mt. Gilead in Montgomery County, North Carolina. The site consists of a mound and an associated village. Human burials were located within the floors of what I interpret to be domestic structures, for the most part. The single platform mound and surrounding habitation and palisades are situated on the floodplain between the Little River and Town Fork Creek, about 15 miles upstream from the confluence of the Little River and the Pee Dee River.

Amateur archaeologists and collectors had prospected the mound since at least the 1880's (see Coe 1995: Appendix 1). In addition to numerous small-scale pothunting expeditions, several more damaging digging projects were conducted at the site. One group of local enthusiasts led by the principal of the local high school from Mt. Gilead excavated a pit about 12 feet in diameter into the center of the mound in 1926 looking for "relics." The principal returned the next year with a team of mules and a group of men and conducted more extensive and damaging excavations, digging to the bottom of the mound (Coe 1995). In 1929 Douglas Rights conducted limited sampling at the site. Finally, in 1935, H. M. Doerschuk dug into the mound, disturbing at least one burial. Both Rights and Doerschuk described finding blue glass trade beads in the mound, although none were found in later excavations (Coe 1995).

The mound was donated by the Frutchey family to the state of North Carolina in 1937. The site was originally called "Frutchey Mound" after the landowner. Professional

archaeological excavation at Town Creek began in 1937 as a Works Progress Administration project, and continued, with only a brief respite during World War II, until 1987 (Coe 1995). Joffre L. Coe was the principal investigator and director of excavation during this time. Most of the mound and surrounding area has been excavated at least to the level of the subsoil, a total of over 96,000 square feet.

Coe began excavations at the mound itself, using a separate grid and site number (31 $Mg^{0}2$) for the mound and immediately surrounding area. Later, another grid and site number was established for the village between the mound and the river (31 $Mg^{v}3$). As part of his research design, Coe decided to clear away the disturbed soil or plowed zone, and map the features for each 10' by 10' square separately. Excavators then mapped and photographed each square from a photographic tower. Many of the squares were then immediately backfilled. Thus, in theory, it is possible to see the entire mapped area at once through the use of a photographic mosaic created from the photos of the individual squares. In practice, this work has not yet been accomplished except for small sections of the site (see Coe 1995; Dickens n.d.) Coe intended the photos to serve as checks to the maps drawn in the field, and indeed Coe (1995:52-54) points out several instances where hand-drawn maps contained "gross errors." Although a digitized map has been produced, corrections from the photographs are continuing. Given the size of the mapped and excavated area at Town Creek, this is a prodigious amount of work.

Coe's research goal was to provide an interpretation of the mound before it was further damaged by erosion and looters, and to uncover and map the entire site. Additionally, he directed the reconstruction of the mound, several structures, a palisade, and the museum/visitor's center on the site.

Previous Interpretations of Town Creek

The main occupation of the site was originally placed in the 16th Century and the site was initially interpreted as being primarily a ceremonial center with no significant habitation area (Coe 1952). This interpretation may have been affected by Caldwell and McCann's (1941) interpretation of Irene in Georgia. The majority of features and artifacts excavated at the site are associated with Pee Dee culture, originally defined at Town Creek. Later dating and recalibration has led to reassigning the Town Creek phase, the major occupation of the site, to AD1200 to AD 1400 (Coe 1995; Eastman 1994; Oliver 1993), but the perception that the site was only used as a ceremonial center has not been reviewed (Coe 1995; Graham 1973; Oliver 1993; Reid 1967).

Mississippian Intrusion

Coe (1952) originally interpreted Town Creek using historic Creek villages as a model. He interpreted the area between the mound and the river as a squareground, complete with game pole (Coe 1995). He suggested that the group that built Town Creek came from outside the region (but within the South Appalachian Mississippian area), and that the intrusion of people bearing Pee Dee culture represents "one of the best archaeological records of the movement of a people in the Southeast" (Coe 1952:308). Although Coe and others do not specifically identify the area from which they believe the people migrated, several references to stylistic similarities are drawn to pottery from Irene Mound in Georgia and Hollywood in South Carolina (Coe 1952, 1995; Graham 1973; Oliver 1993; Reid 1967). These similarities, discussed further below, are indeed striking, and clearly demonstrate the existence of some type of interaction with people south of the North Carolina Piedmont.

Coe and others allude to the evidence for this proposed movement; however, it is not documented in the literature. The descriptions of the interactions between Mississippian people and the indigenous culture fit the "cultural colonization" models which were espoused around the same time as Coe's original publication (i.e., Willey 1953, see Smith 1984). This Pee Dee displacement model has been maintained even afer a reevaluation of the temporal placement of the occupation of Town Creek (Mountjoy 1989; Oliver 1993) and other research in Mississippian archaeology exploring the indigenous development of Mississippian cultures (i.e., chapters in Smith 1990). Mountjoy's (1989) excavation at the Payne site clearly establishes that Pee Dee ceramics were present much earlier than previously thought, as early as AD 1040±06 (calibrated mean is AD 1162) (Eastman 1994; Mountjoy 1989).

Pee Dee Archaeology

Origins and Settlement Patterns

Oliver (1993) describes the extent and nature of Pee Dee culture in North Carolina. Specifically, he describes the relationships between Town Creek (31 Mg 2 and 3) and the nearby Leak (31 Rh 1) and Teal (31 An 1) sites. He begins with the Coe's (1952) interpretation of Town Creek as an empty ceremonial center. He hypothesizes that because Town Creek was primarily an empty ceremonial center, there must have been villages associated with the site where the majority of the people lived. He outlines several research questions: When and where were the villages? What was the nature of the domestic lifestyle of Pee Dee people? Was Pee Dee occupation due to migration or did they develop from local people? How long was Pee Dee occupation, and why did it end?

Oliver quotes and accepts Coe's (1952) description of the sharp differences between Pee Dee culture and the cultures that came before and after them in the area, such as Yadkin and Uwharrie. Oliver uses the idea of a migration into the area from the south as a framework for his entire discussion of Pee Dee culture and settlement. He describes the general characteristics of 64 identified Pee Dee sites in the area, including Leak and Teal. He divides Pee Dee occupation into three phases, the Teal Phase (AD 950-1200), Town Creek Phase (AD 1200-1400), and the Leak Phase (AD 1400-1600). He reasons that the newcomers were constantly in danger from the Uwharrie people in the area, and proposes that Pee Dee sites should be located in defensible, nucleated, or fortified areas. This hypothesis is disproved by his analysis of Pee Dee settlement patterns in the southeast Piedmont, but is not discussed further. Instead, Oliver argues that there is a "growing body of evidence" that "supports the hypothesis that the Pee Dee physically displaced the former residents of the area (Coe 1952)" (1993:20). Even with the evidence of the Payne site (Mountjoy 1989), where Pee Dee, and Uwharrie, Caraway, and Dan River series types of pottery occur, there is no reevaluation of the hypothesis. Oliver describes Pee Dee culture as Mississippian-influenced, not actually "Mississippian" per se.

Teal, Town Creek, and Leak Phases

Oliver (1993) divides Pee Dee tradition into three phases based on his analysis of two other Pee Dee sites near Town Creek, Leak and Teal. He determined that Teal was occupied prior to Town Creek and was an important site in the area from AD 950 to AD 1200, the Teal Phase. The Town Creek phase dates from AD 1200 to AD 1400, when that site was prominent regionally. Lastly, the Leak site gained in prominence at the expense of Town

Creek, becoming dominant AD 1400 to AD 1600, although no mound was ever constructed at the Leak site. At Town Creek, rectangular structures are only found in areas that set them apart as public buildings. The presence of a rectangular structure at Teal supports the idea that there was a public building and therefore some sort of political power centralized at Teal.

Oliver's (1993) radiocarbon dates are uncorrected, and a corrected date of AD 1500 for the end of the Leak phase is probably more accurate. Calibration and correction of earlier radiocarbon dates from Mg2, the mound context, are presented below (Table 2-1) (Eastman 1994a, 1994b). These dates are problematic, because the dates for the second structure constructed on the mound, called "Temple II" or "Town House II" are earlier than the structure that it clearly predates by virtue of lying beneath it.

The Leak Site

Oliver directed the excavation of two prominent Pee Dee non-mound sites, Leak and Teal. The Leak site was less extensively excavated than the Teal site and was partially disturbed by flooding and erosion. A structure and one burial were found. The structure was about 25 feet in diameter, and was round or oval. The burial contained the remains of two partial individuals, the right leg of an adult male, and the skull of a young female, with fronto-occipital cranial deformation. Collectors reported finding burials urns at the site earlier.

The Teal Site

Oliver (1993) describes the Teal site in detail. Flooding also damaged the site but eight burials and one structure were identified and excavated. The structure discovered at

Teal is described as nearly square, about 25 feet in diameter, including a hearth with a clay walkway. Burials included both sexes and a range of ages, as well as urn, flexed, and semi-flexed burials. One of the urn burials was different from the pattern found at Town Creek in that the partially burned remains of two adolescents were found in one urn. At Town Creek all urn burials contained one infant or young child per urn, none over the age of 4.5 years. All but two of the 13 urn burials contained infants under the age of one year.

Cultural Chronology

Early Intrasite Chronology

Much of the chronology at Town Creek and Teal is still unclear, and no other attempt at ceramic seriation has been published since Reid's (1967) initial study (although, see DePratter and Judge 1986; Williams and Shapiro 1990). The indigenous development of Pee Dee culture has not been explored, mostly because it was seen as a non-problem. Local development was not considered because the appearance of Mississippian [or Mississippian-influenced (Ferguson 1971; Oliver 1993)] culture was already explained by migration (Coe 1952). This interpretation was understandable, given the emphasis on migration or diffusion as mechanisms of culture change in the first half of the century.

Regional Interactions

Coe (1937, 1952) proposed that Pee Dee culture was intrusive to the southern Piedmont and the people had hostile interactions with the indigenous population. This assertion has been paraphrased by others citing Coe, perhaps most colorfully by Mountjoy (1989:7) who notes that "after some 200 years of constant warfare, during which they are

Table 2-1. Radiocarbon dates for Town Creek. All dates come from Mg°2, the mound context. There is good stratigraphic control for these samples, but the dates obtained to not conform to expectations. The three premound samples should have the earliest dates due to their stratigraphic position, and "Temple 1" should predate "Temple 2." It is possible that the samples were contaminated.

Provenience	**Uncorrected Date**	**Calibrated Intercept(s)**
Refuse pit associated with Premound Occupation	> AD 1710	0 BP "Date is too recent to date pre-mound occupation"[1]
Temple I	AD 1355±140	AD 1397
Wall post from premound structure	AD 1350±140	AD 1328, 1333, 1395
Temple II	AD 1280±40	AD 1300
Pre-Mound Humus	AD 1205±140	AD 1283

1 Eastman 1994b, p. 47

said to have contributed nothing to and received nothing from the indigenous culture other than strife, the Pee Dee people were forced to withdraw by the Siouan tribes which were known to occupy the area."

Recent biological distance analysis on the non-metric genetic traits of crania and teeth of the individuals from Town Creek and other sites in Georgia and North Carolina and Virginia has suggested that the individuals buried at Town Creek are biologically closer to other groups in present-day North Carolina (including people from Warren Wilson and Upper Saratown) than they are to individuals from Irene Mound in Georgia (Griffin, Lambert, and Monahan 1997; Griffin, Lambert, and Driscoll 2001). This suggests that it is important to review Coe's model of migration and consider evidence of indigenous development.

"Mortuaries"

Human burials at Town Creek were mostly found in the floors of structures that were originally interpreted as mortuary houses (Coe 1995). Coe identified and assigned letters to 17 of these structures, each including from three to 40 individuals, around the plaza or squareground. Unfortunately, Coe's notes and drawings only identify "Mortuaries" A, B, C, D, J, and K. Coe began this lettering scheme early in the excavations at the site, and several of the clusters of burials excavated later fall in-between two previously lettered "mortuaries."

Each "mortuary" structure Coe identified contained a central hearth that showed evidence of extensive use (Coe 1995). I believe that the structures with burials were dwellings, not dedicated mortuaries. Unfortunately, the outlines of the structures were not identified in most cases, due to the excavation methods used at Town Creek. Each 10' x 10'

square was excavated, mapped and photographed, then backfilled before the next square was opened. Coe (1995: 53-55) found that the drawings made of the subsoil of each square contained many inaccuracies that were to be corrected with the photo mosaic (described above), but this has not yet been accomplished.

An Empty Ceremonial Center?

Another interpretation of Town Creek that should be reevaluated is that the site was an empty ceremonial center, with no significant occupation (Coe 1995). Coe (1995) posited that only priests and religious specialists lived permanently at Town Creek and the people from surrounding villages came to the center for ceremonial activities. While it is likely that Town Creek was an important ceremonial center for outlying communities, it is also probable that there was a substantial resident population. The map of features at the site shows numerous postholes from a large number of overlapping structures. It is unlikely that a small number of people would have produced such a large quantity of features (Ward and Davis 1999).

Site Structure and Layout

The site of Town Creek consists of a village settlement area and a mound that was built over an earlier earth-embanked lodge and other buildings, all surrounded by a series of concentric palisades. Each of these architectural features of the site is described below.

The Plaza

The focus of excavation at Town Creek began with the mound and expanded to include the area between the mound and the river. Much of the area between the mound and the river, and north and south along the river, has been excavated, revealing a large number of postmolds and features, and suggesting a significant human habitation. The area directly between the mound and the inner palisade is less densely scattered with features, and contains an unusual feature that suggests that a tall game pole had been erected in the space. Coe refers to this area as the "squareground" (1995). The squareground, or plaza, contains a lower density of features than other areas of the site and no burials.

Human Burials and Numbering

In the village, human burials are clustered in distinct areas (Figure 2-1). Coe referred to these spatial clusters of burials as "Mortuaries" and assigned letters to several of them as described above (Coe 1995). In the interest of clarity, I have numbered these burial clusters (Figure 2-2). The clusters where probable burial pits have been identified but not excavated are shown in light gray in Figure 2-2. In two of these Clusters, 9 and 16, very shallow burials were excavated, while the rest were left undisturbed. No human burials were placed in the plaza area itself. A total of 563 burial pits or probably burial pits were identified (Coe 1995).

Beginning with the structures that predate the construction of the mound, I have numbered the clusters of human burials clockwise around the circle of the village. It should be noted that these numbers refer to clusters of burials, *not* structures. Several clusters of burials fall within known, recognizable structures, and are referred to by the name of the structure, such as the Earthlodge, and Town Houses 1 and 2. Table 2-2 presents a brief

Table 2-2 Description of clusters of human burials.

Cluster	Description	Location	N	Males	Females	Subadults
0	Burials NOT associated with structures.	Scattered throughout site, except for plaza area.	32	3	5	15
1	Within large circular structure, all burials may predate construction of the mound.	Edge of structure is underneath southern mound embankment.	29	8	12	5
2	Probably within smaller circular structure.	On the southwestern edge of the plaza area, adjacent to the mound.	11	2	4	3
3	Line of burials outside the earthlodge.	Outside the earthlodge, within the mantle of the lodge on the southern side.	3	2	1	0
4	Probably within small circular structure.	To the north of the earthlodge, possibly slightly overlapping the earthlodge, completely underneath the mound.	5	0	3	2
5	Probably within small circular structure.	To the north of Cluster 4 on the western edge of the plaza area.	8	1	2	1
6	Partially excavated cluster, possibly within a circular structure. Several burials were disturbed by later burials.	Western edge of the plaza area, to the north of Cluster 5.	19	2	9	
7	Largest cluster at site. Extensive disturbance of earlier burials by placement of later burials.	Northwestern edge of the plaza area.	47	12	7	26
8	Cluster mapped but not excavated. May be within large circular structure.	Northern side of plaza area.	0	0	0	0
9	Cluster mapped but mostly unexcavated. May be within large circular structure. Two shallow burials were excavated.	Northern side of plaza area, may partially intrude on plaza.	2	0	0	0
10	Cluster may be within a small circular structure.	Northeastern edge of plaza area, along riverbank.	8	2	4	0

11	Cluster possibly within circular structure.	Along riverbank, within the interior palisade, but not necessarily associated with it.	8	1	3	3
12	Cluster predates construction of the rectangular structure. Six burials are in the area of overlap of the two structures. The round structure clearly predates the rectangular.	Within the interior palisade along the riverbank on the eastern edge of the site.	21	4	6	7
13	Burials outside the rectangular structure, may be associated with but not inside the structure.	Between the southern edge of the rectangular structure and the southern arm of the interior palisade, along the riverbank.	5	1	1	2
14	Within a circular structure, with a clear circular arrangement of the burials. Also contained one intrusive Historic burial not included in this analysis.	South of the interior palisade along the riverbank, on the southeastern edge of the plaza.	10	3	5	2
15	Unexcavated cluster, probably within circular structure.	Along the southern edge of the plaza.	0	0	0	
16	Mapped cluster. Only one shallow burial was excavated.	Along the southern edge of the plaza area.	1	0	0	0
17	Unexcavated cluster, probably within a circular structure.	Along the southern edge of the plaza area.	0	0	0	0
18	Part of Coe's "Yadkin Hearth" feature. Possibly within a circular structure.	To the south of the plaza.	16	5	1	3
19	Unexcavated cluster, possibly within a circular structure.	Outside the main ring of burial clusters, along the river on the southeastern edge of the excavated area. Outside at least one, possibly two palisades.	0	0	0	0

20	Partially excavated cluster, possibly within a circular structure.	Outside the main ring of burial clusters, along the river on the southeastern edge of the excavated area. Outside at least two, possibly three palisades.	6	2	0	1
Earth-lodge	Three infants clustered around the northeastern support post for the earthlodge.	Within the earthlodge.	3	0	0	3
Town House 1	One burial on the north edge of the hearth, one on the east edge, one burial outside double-walled townhouse to the south.	First structure atop the mound.	3	1	1	0
Town House 2	One bundle burial is in the debris of the burned townhouse on the southern side, the other bundle burial is outside the southern entrance of the townhouse.	Second structure atop the mound.	2	0	2	0

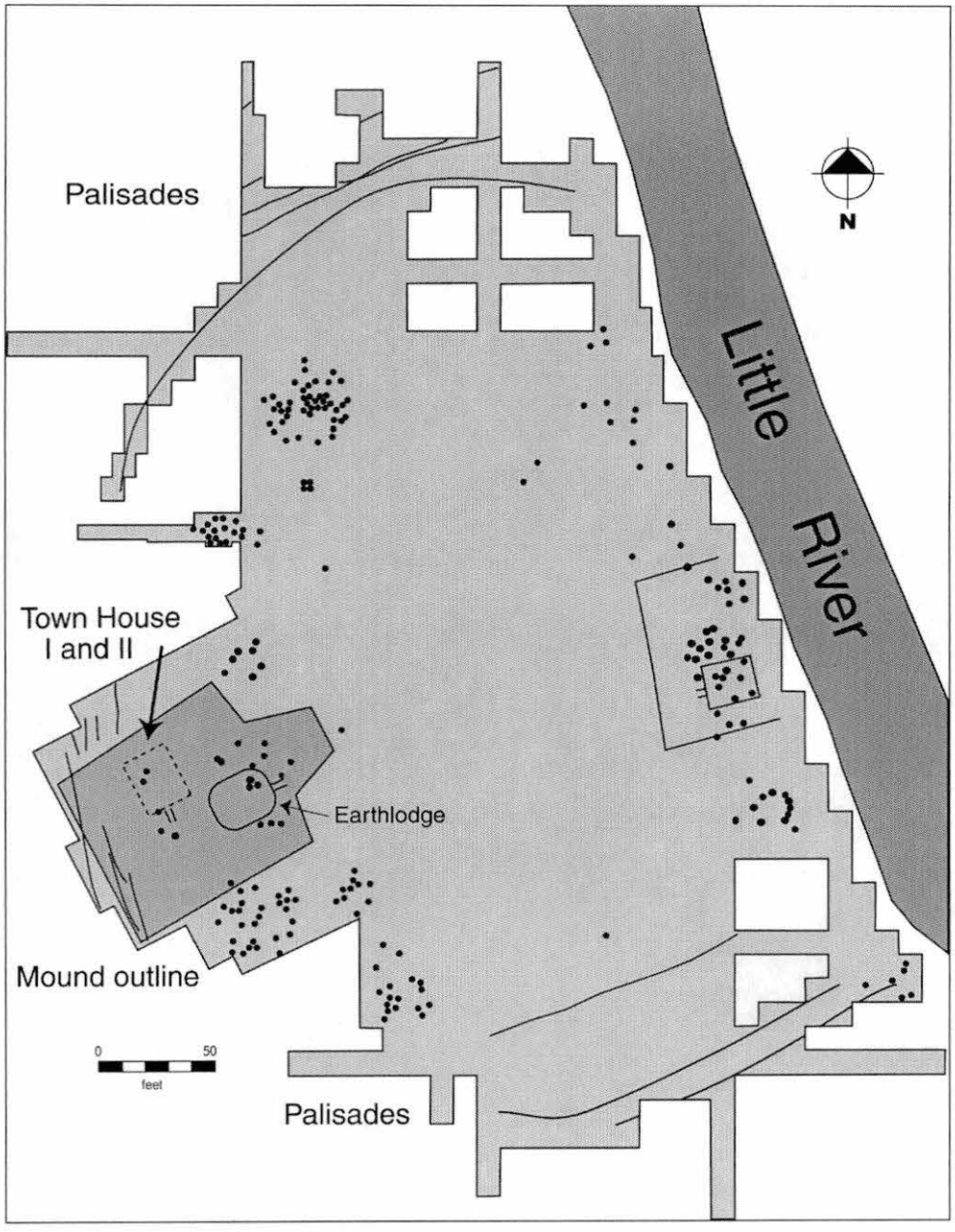

Figure 2-1. Schematic map of the location of excavated human burials and major architectural features. Several clusters of burials exhibit a clear circular pattern, indicating they were probably located in the floor of a round structure. Human burials only appear in the area surrounding the open plaza at the center of the village, although postholes and other features are found throughout the excavated area. This map also shows the location of the palisades, the outline of the mound and ramp, the earth-embanked lodge constructed prior to the mound, and the rectangular structures atop the mound and along the river. The two Town houses were constructed in virtually the same place, with about two feet of fill between them.

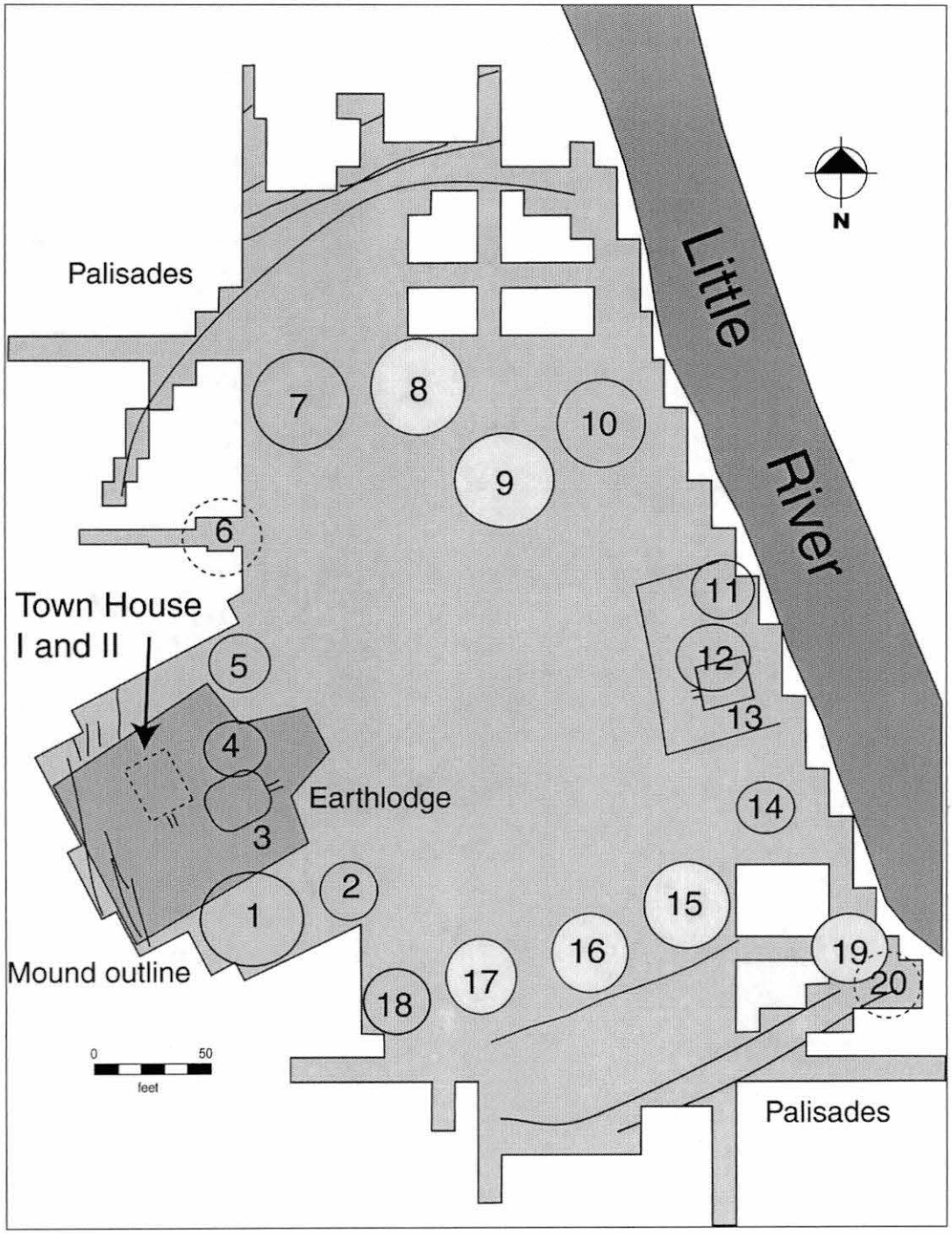

Figure 2-2. Schematic map of clusters of human burials and associated structures. The lighter grey clusters (8, 9, 15, 16, 17, and 19) contain mapped but *unexcavated* features that are likely to be burials. The outline of the associated structure is clear for clusters 1, 7, 15, and 16. Other structures are inferred from the patterns of burials and postholes. Two clusters, 3 and 13, are clearly *not* associated with structures.

description of each burial cluster, including the number of males, females, and subadults in each. A more detail discussion of the artifact and health associations is provided in Chapter 5.

Many of the larger clusters of burials are arranged in circular patterns that appear to correspond to the outlines of circular structures. This is more clearly illustrated by Figure 2-3, a drawing based on a reconstruction of the structure from the photographic mosaic of Cluster 16 along the southern edge of the plaza by Roy Dickens (Dickens n.d.). This map also shows that this structure was rebuilt, probably two or three times, in the same location. The density of postholes around several of the other larger clusters suggests that, as at the King site in Georgia, larger groups of burials in the floors of houses may be associated with houses that were rebuilt multiple times in the same location (Hally and Kelly 1998). The above evidence suggests that deceased individuals were interred in the floors of houses and not in separate cemeteries (e.g., Goldstein 1980). Figure 2-2 shows a schematic map of the proposed location of structures containing burials.

Again to avoid confusion, I have assigned each burial a unique number. Numbering of the burials began with Burial 1 for both Mg2 and Mg3, the site numbers assigned to the mound and village, respectively. In other words, there are two burials for each number between 1 and 60, one for each site. To minimize repetition and make it easier to distinguish the location of the burial within the site (at least mound and non-mound location), each burial number begins with a 2 or 3 to refer to Mg2 or Mg3, followed by a dash, and then the number. For example, Burial 4 from Mg2 is here referred to as 2-004. This numbering system also facilitated the process of entering the burials into a database.

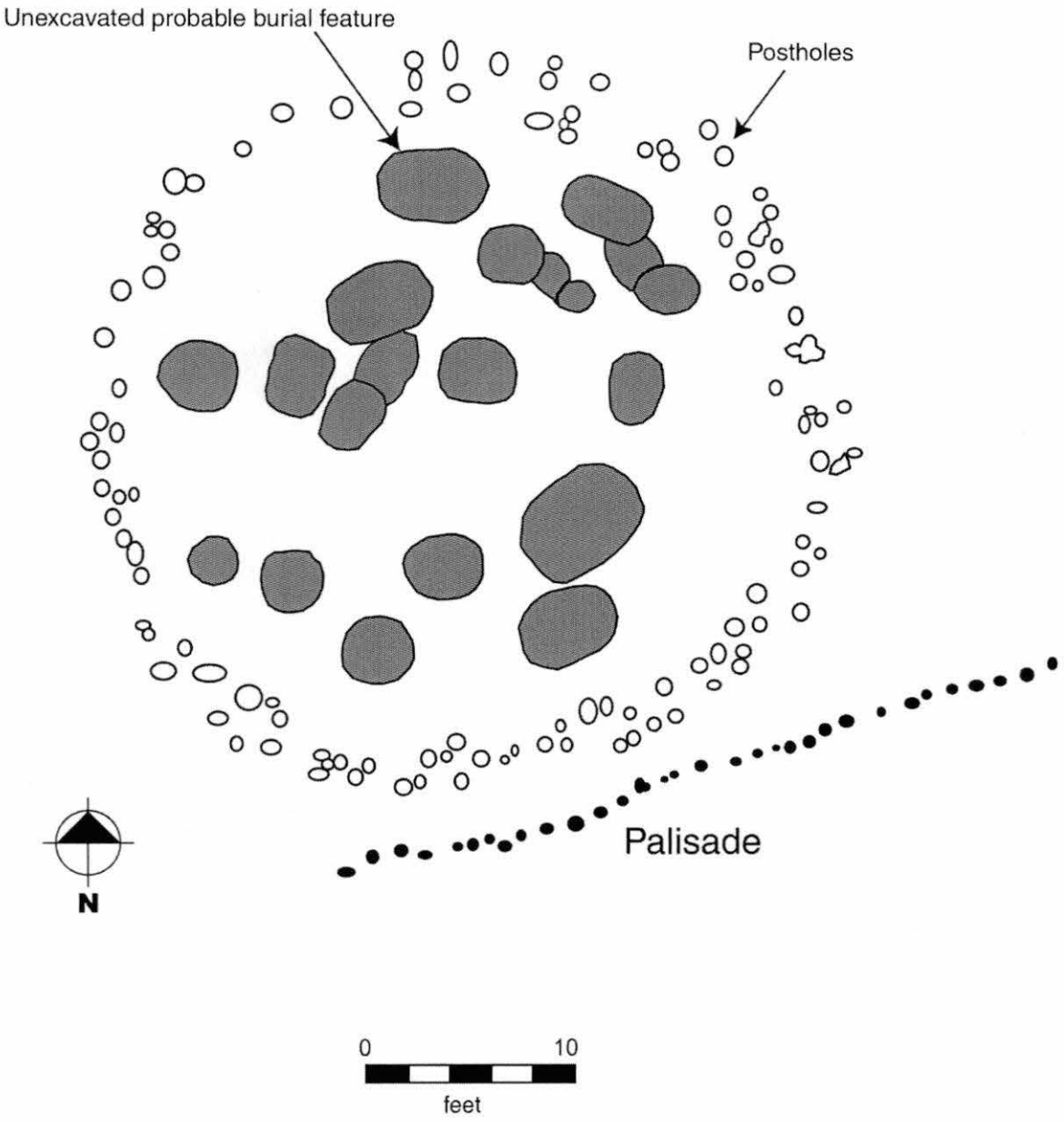

Figure 2-3. Schematic map of a rebuilt structure containing probable burial features, adapted from Dickens, n.d. This grouping is called cluster 16 in the revised system used here.

The Earthlodge

Coe (1995) describes several stages of public structure building. A roughly square earth-embanked lodge with four central support timbers, a log trench entrance, and a prepared clay central hearth was constructed first. Three newborn infants were interred in the northwest corner of the earth-embanked lodge, in the vicinity of one of the four central support posts. Three human burials (Burials 2-003, 2-004, and 2-006) were found in the subsoil to the west of the structure. Two burials were placed near the entrance to the lodge.

The Mound

The lodge eventually collapsed and a much larger rectangular embankment was constructed, incorporating a "crib" of debris, identified by Coe (1995) as squareground sweepings. This structure was constructed by driving a series of small, five-foot tall posts around an eight-foot by ten-foot area. The "crib" was filled with ash and soil, then covered with 12 inches of white clay.

Next, the collapsed lodge was covered with timbers and brush, which were burned, leaving a layer of ash and charcoal. The embankment was about five feet tall and 12 feet wide at the base. The embankment surrounding the crib and collapsed lodge was filled with topsoil, and debris from the plaza area (it contained 1,541 fragments of pottery and 94 projectile points) and built up to a height of about 10 feet (Coe 1995:81).

The Townhouses

On top of the mound, a structure similar in size and floor plan to the earth-embanked lodge was constructed, called Town House I (Figure 2-4). This structure was built of posts,

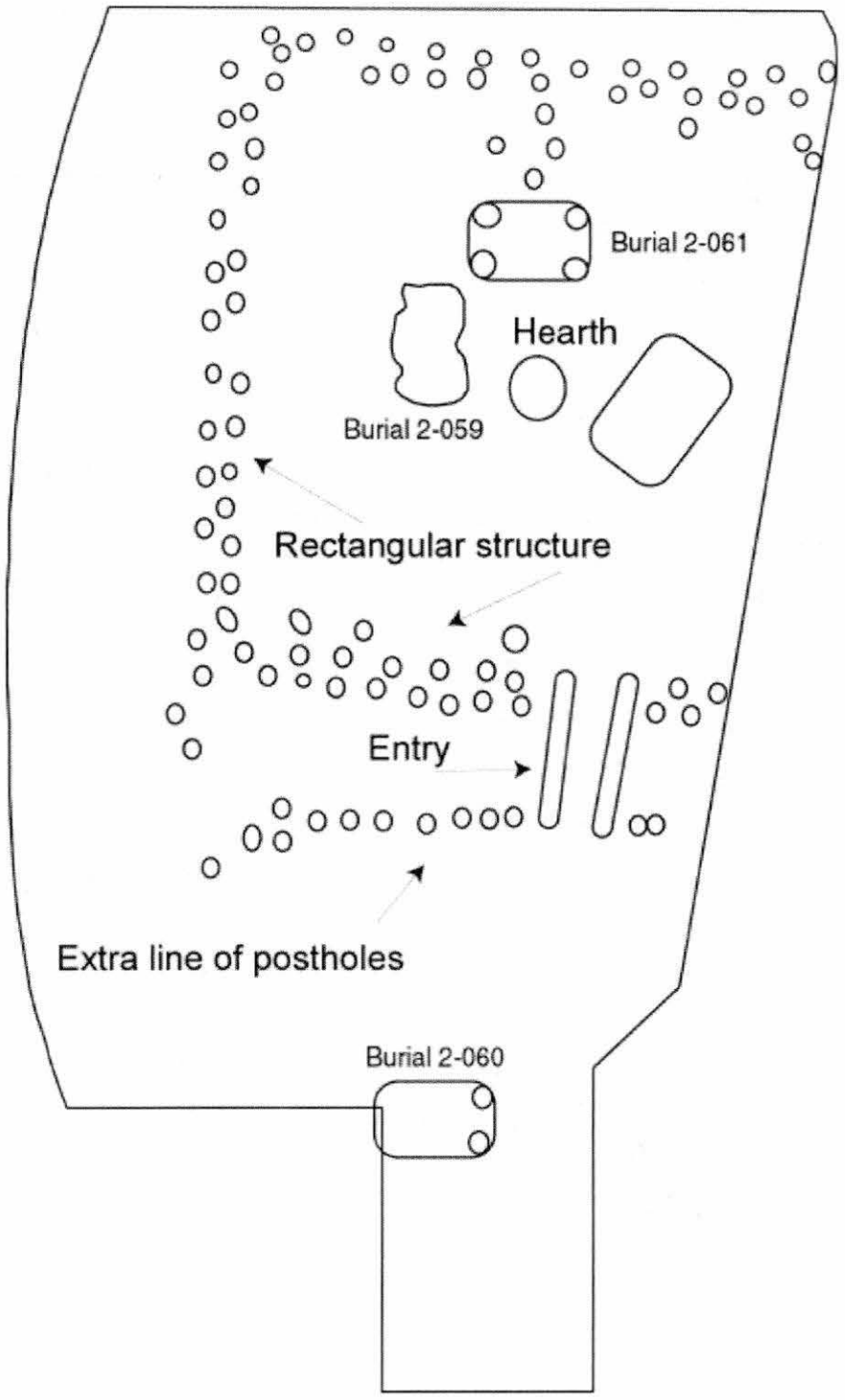

Figure 2-4. Digitized map of Town House 1. This map outlines the double-walled rectangular structure and the single line of postholes outside the trenched entry. Two burials were found within the rectangular structure. One burial was found outside the entry but may have been within another, lighter structure connected to the first.

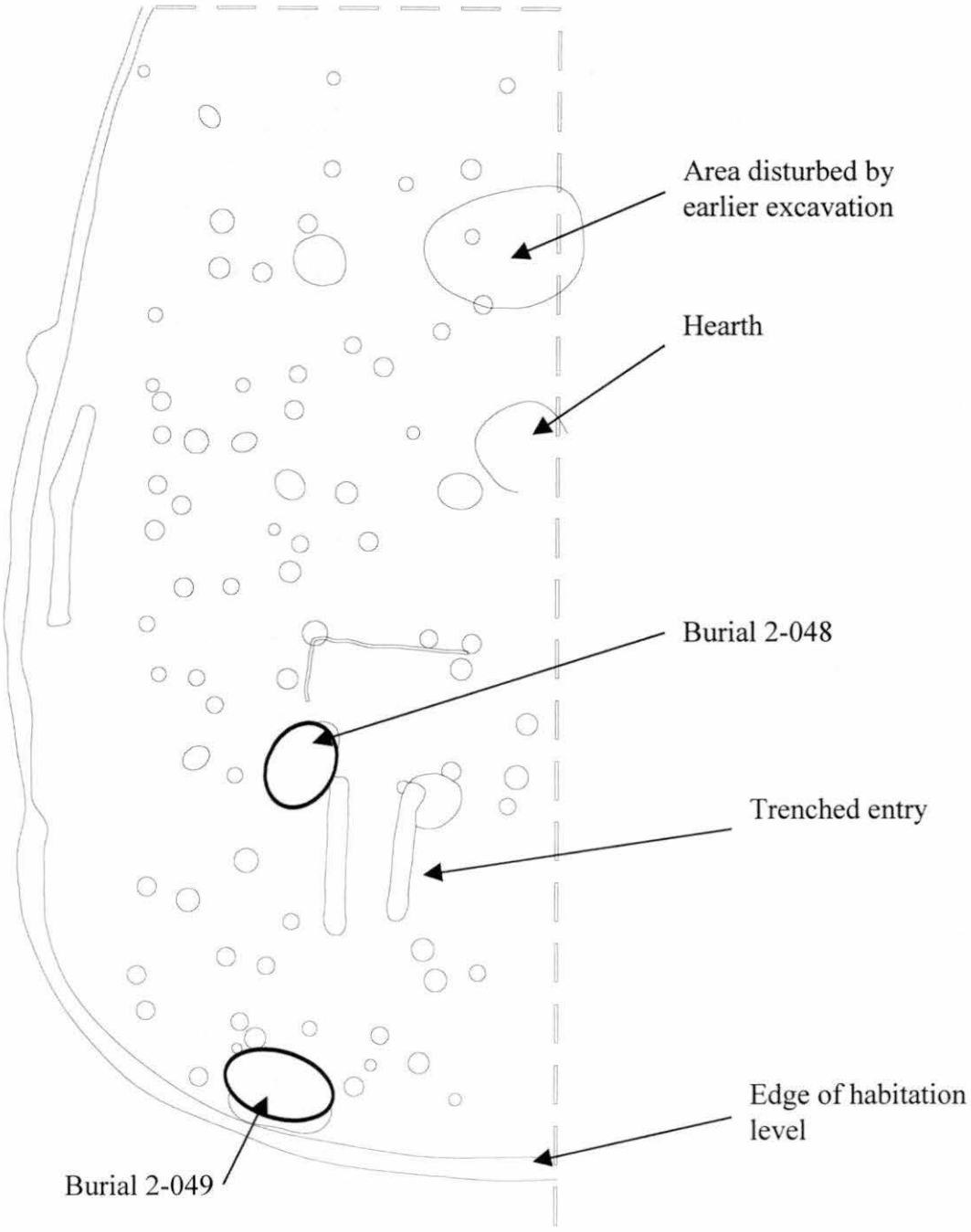

Figure 2-5. Digitized map of Town House 2. The outlines of the structure are less clear than those of Town House 1, but there was probably a double-wall, similar to that of the earth-embanked lodge and Town House 1. The two burials are both adult females who were skeletonized and placed in bundles prior to burial. Burial 2-048 was placed in the earth after the structure had burned.

plastered with daub, with a thatched roof. Four large roof support posts were placed towards the center of the structure. At least some of the posts for both townhouses were made of pine logs (Trinkley, in Coe 1995). A prepared circular clay hearth was found near the center of the structure (Coe 1995). Three human burials were associated with Town House I: one to the south of the structure (Burial 2-060), outside the entrance, and two under the floor near the hearth (Burials 2-059 and 2-061).

In time, Town House I burned, and the resulting ash and daub were covered with a layer of fill about two feet deep, making the mound approximately 12 ft in height. Town House II, the final structure identified on the mound, was then built and was about the same size and floor plan as the other two structures (Figure 2-5). It too eventually burned, and no evidence of rebuilding on the mound was found. However, a layer of fill was added to the mound, covering the remains of Town House II, and it is possible that a third structure was constructed. The surface of the mound was too eroded and disturbed to determine if any further building took place.

Coe suggests that the burning of Town House II marked the end of Town Creek as a ceremonial center (1995:82). Two bundle burials (2-048 and 2-049) are associated with this final structure. Bundle Burial 2-048 was placed in the mound an unknown amount of time after the structure had burned.

The Rectangular "Priest's House"

Another possible public building at Town Creek is the rectangular structure that was constructed along the riverbank, within the inner palisade. Coe (1995) refers to this structure as the "Priest's house" and interprets it as the dwelling of the superior religious specialist at

the site. This interpretation was based on a conceptualization of Town Creek as an empty ceremonial center, where only the priests and their acolytes resided (Coe 1952, 1995).

The rectangular structure may be associated with the interior palisade enclosing it along the river described below. The placement of these structures suggests that both may have been in existence at the same time, but there is no other evidence to establish the relationship of the two structures. It is also unclear when either structure was built in relation to the other public buildings. It may have been constructed early in the occupation of the site, paired with the earth-embanked lodge. It could also have been built later, and associated with the townhouses and the mound. The rectangular structure does overlap an earlier round structure.

The Palisades

At least five palisade walls were constructed at Town Creek. All but one was built prior to the construction of the mound and pass under the mound fill. The earliest, smallest palisade has been reconstructed at Town Creek State Historic Park (Coe 1995), although it has been moved slightly to encompass the reconstructed mound. The palisades have defensible entrances, by the river, and on the western side (Coe 1995).

An interior palisade or walled enclosure was constructed across from the mound along the Little River. As described above, at least two structures were built in the vicinity. Of the two known structures, the circular structure was constructed first. Twenty-one individuals were interred in the floor of this structure (Cluster 12). Later, a rectangular structure with a trenched entryway and largely overlapping the earlier round house was constructed. A third cluster of burials (Cluster 11) suggests that there was another structure

to the north within the enclosed area, but it is unknown whether or not it is associated with either of the other structures or the interior palisade. A fourth cluster of burials (Cluster 13) is aligned perpendicular to the palisade wall, between the square structure and the wall, and may be associated with the wall.

Square Buildings

It is significant that square structures only appear in two locations: the area of the earthlodge and mound, and across the squareground from the earthlodge. The locations and unique architecture of these structures point to a special, probably public, function and significance. The potentially limited access to these areas also sets them apart as special. It is beyond the scope of this work to analyze the features of these structures to determine whether they were used exclusively for ritual and other public functions, or were also residential buildings. Coe (1995) postulated that only the "Priest's House" was a dwelling, while the others were used for ritual purposes, such as renewal and fertility ceremonies.

INDICATIONS OF INTRASITE CHRONOLOGY

Following the recent completion of the digitized map of Town Creek excavations several additional observations can be made, and a new interpretation of the mound building and village growth can be offered. Because Coe (1952, 1995) believed that there was no substantial resident population at Town Creek (although see Coe 1937, reprinted in Coe 1995:284-286), he provided no discussion of the village. All evidence of round structures is interpreted as dedicated mortuary structures not domestic dwellings.

Village Growth

It appears that a circular arrangement of structures in the village began with the earth-embanked lodge, as at least one structure beside the earthlodge is partially underneath where the mound was eventually constructed (see Figure 2-2). The circular pattern includes the earth-embanked lodge. All but two (Clusters 19 and 20) of the circular structures containing human burials identified thus far are part of the circle. It is very likely, given the density of features, that other circular domestic structures can be identified beyond this circle, but most probably do not contain human burials.

The Mound, Revisited

It is probable that a third episode of mound-building, in addition to the two described by Coe, took place because a layer of earth was added to the summit after the second townhouse burned. It is possible that a third structure was constructed atop the summit, but the surface of the mound was eroded and disturbed, and no sign of another structure was discerned during excavation. If no structure was placed atop the mound, and fill was added, this would be yet another similarity with Irene mound, where the platform mound was eventually capped with a rounded layer of fill (Caldwell and McCann 1941).

A final reinterpretation of the mound concerns the structures built on the summit. The entrance to the earth-embanked lodge faces the river, as does the ramp of the later mound. It seems odd, then, that the entrances of the two townhouses atop the mound should face south and not the river. As mentioned above, the summit of the mound was eroded and damaged by previous amateur excavations. The size and placement of the structures that

could be located atop the mound leaves open the possibility that there were actually paired structures on the mound, with a trenched connecting passage, as at the Toqua site in Tennessee (Polhemus 1985) and the King site northern Georgia (Kelly 1988). Examination of the features excavated on the mound reveals a line of postholes perpendicular to what Coe (1995:78) interpreted as the open end of the entryway of Town House 1, or as an enclosed porch (see Figure 2-4). Additionally, two burials are associated with this level of the mound, Burials 2-060 and 2-061. Both have postholes in at least two corners, possibly all four. Burial 2-061 is beside the hearth, directly to the north. Burial 2-060 is outside this structure, but may have been inside a second structure, possibly to the north of another hearth inside that structure. Unfortunately, the only direct evidence of another structure is the line of postholes outside the entrance of Town House 1. The evidence for a second structure associated with Town House 2 is less obvious. Again, however, there is another burial outside the structure, Burial 2-049 (see Figure 2-5).

SUMMARY

This chapter has detailed the archaeological context of the human burials at Town Creek and provided a backdrop for interpreting the mortuary practices and social organization at Town Creek. Earlier interpretations are described, as well as my own rationale for reinterpreting these findings. In sum, I propose that Town Creek indeed served as a ceremonial center, but I do not agree that Town Creek provides evidence for a physical movement of people. Rather, the biological distance analysis of the people at Town Creek finds that they are indigenous and more closely related biologically to people living to the

west and north of Town Creek than to the south at Irene. Town Creek likely represents a development of ideas, and not a movement of people, in the late prehistoric period.

The high density of features, the circular construction of the structures with human burials, and the growth of the village likely indicated by the concentric palisades all form a picture of a growing South Appalachian Mississippian town, not an empty ceremonial center inhabited only by religious specialists. Other South Appalachian Mississippian centers typically had large residential populations (Anderson 1994; Dickens 1976; Ward and Davis 1999). As Ward and Davis (1999:133-134) note, "if Town Creek was the home of only a handful of high-ranking priests, they must have had voracious appetites and the itch to constantly move and rebuild their houses and surrounding stockades."

Finally, I have reinterpreted the "mortuaries" referred to by Coe as simply domestic dwellings containing the deceased members of that household or lineage. Several houses identified thus far exhibit signs of being rebuilt several times in the same location. These houses also tend to have large numbers of burials within the same area, indicating that they continued to receive burials, perhaps over several generations. It is possible that the function of these rebuilt structures changed over time and were no longer primarily dwellings, but set apart as mortuaries. The lack of structures with burials outside the innermost, perhaps earliest ring of structures indicates that a connection to these early dwellings was important to later generations who continued to place their dead within them. This possibility is further discussed in Chapter 6.

The structure and architecture at Town Creek indicate that social ranking and possibly stratification were part of the social and political organization at Town Creek. In the next chapter, I discuss the theoretical background for determining the most important aspects of

the mortuary practices and site structure that will ultimately allow an interpretation of the social and political organization at Town Creek. Bioarchaeological analysis is considered as a means for understanding the biological consequences of social ranking on the lives of men, women, and children at the site.

CHAPTER 3

THEORETICAL BACKGROUND AND HYPOTHESES

This chapter discusses mortuary archaeology theory, bioarchaeology, and ritual in chiefdom societies. The purpose of this chapter is to provide a theoretical framework for the formulation of hypotheses. These hypotheses are designed to test ideas about social organization and ranking. To determine the impact of social ranking, hypotheses about diet and health differences by age, sex, status and burial clusters are also generated. These hypotheses inform the collection and interpretation of data from the burial context.

Mortuary archaeology has undergone a transformation in the last few decades from archetypal processual beginning, to a highly theoretically informed and contextually sensitive series of models and explanations based on ethnographic analyses, current sociocultural interpretations of ritual behavior, and a full integration of archaeological and cultural understandings about mortuary practice as it relates to social behavior.

This revolution in mortuary archaeology has been impressive, but it still lacks an important element. Bioarchaeological data are rarely used to inform, test, or question interpretations of mortuary ritual and behavior. In this chapter, I review the current and past literature of mortuary archaeology, and present a model of how bioarchaeology can enrich archaeological reconstructions of social organization from mortuary remains.

SOCIAL AND POLITICAL ORGANIZATION

Understanding the social organization of prehistoric groups is a problem of general interest to anthropologists. The reconstruction of past social systems is best approached through a synthesis of various methods. I rely on a holistic approach to the study of prehistoric social organization, incorporating mortuary archaeology, bioarchaeology, and site spatial organization. Understanding the social organization of a group is not merely an exercise in uncovering patterns, but consists of interpreting how people in their daily lives and practices create order and negotiate power relationships. The methods I use help discern the patterns in the ground as a first step toward a more contextually-informed interpretation of the biological consequences of social organization.

MORTUARY ARCHAEOLOGY

The Saxe-Binford Approach

Mortuary archaeologists use the funerary context of past populations to analyze aspects of past social systems. The methods are based on the "assumption that an individual's treatment following death bears some predictable relationship to the individual's state in life and to the organization of the society to which the individual belonged" (O'Shea 1984:3). The first studies to look systematically at the linkage between past social systems and mortuary remains concentrated on proving such connections existed (Brown 1971a). Binford (1971) assessed the relationship between an individual's "social persona" (*sensu* Goodenough 1965) and the dimensions of the persona recognized in differential mortuary treatment. That is, each individual has a number of social identities, such as father, brother,

and husband. Together, these identities comprise the person's social persona (Goodenough 1965).

Binford (1971) searched the Human Relations Area Files (Murdock 1967) for the funerary distinctions based on the following social identities; age, sex, social position, and social affiliation. He found sex, social position, and social affiliation were the most common factors symbolized, but that there were differences in mortuary behavior based on the subsistence pattern (hunter-gatherer, shifting agriculturalist, settled agriculturalist, or pastoralist). In societies with minimal social complexity (hunter-gatherers), mortuary distinctions are based on personal qualities such as age, sex, and skills. Social position was the basis of differentiation in more complex societies (Binford 1971). Binford hypothesized that this was the result of the correlation of the relative rank of a person and the number of people in the society who had "duty-status relationships to the deceased" which had to be fulfilled in the final disposition of the remains (Binford 1971:226).

Saxe (1970) and Brown (1971b) further expanded the notion of social persona and the significance of social role in mortuary treatment. Brown used key diagrams to attempt to discern the structure of the social system at the Spiro site, a Caddoan ceremonial center (1971). Saxe applied componential analysis based on the work of Goodenough (1965) on the concepts of role and persona, stating that "death calls forth a fuller representation of ego's various social identities than at any time during life"(1970:6). Therefore, archaeologists are not merely excavating individuals, but a "coherent social personality" (1970:4).

Tests of the Saxe-Binford Approach

These approaches met with limited success in archaeological studies because they failed to delineate correlates for the concepts of social persona and role of an individual which would be identifiable in the archaeological record. They did, however, establish a firm link between mortuary treatment and social systems. This link was vital to continuing this line of inquiry. Following these studies, research was conducted to find the needed correlates.

Archaeologically-oriented studies include the work of Peebles and Kus (1977) at Moundville on the correlates of ranked societies, defined by Service (1971), and the compilation of a trait-list of correlates for a chiefdom by Renfrew (1973). These studies discovered correlates, but were based on an outdated model of classifying social systems. The evolutionary typology outlined by Service (1962) and Fried (1967) and used as the basis for these studies has been questioned (see Tainter 1978), and modified by Service (1971:156-157), but still remains widely used in archaeology. Some authors try to sidestep the problem of classification by speaking of increasing complexity of societies (Tainter 1978), but an adequate system for organizing levels of complexity in a way that can be compared cross-culturally based on current theories in cultural anthropology is lacking.

Post-Processual Critiques

The initial assumptions in mortuary analysis came under considerable criticism in the early 1980s, at the same time processual archaeology was under scrutiny (Trigger 1989). Processual archaeology often fails to take into account the importance of ritual and symbolism in society (Hodder 1982a, 1982b; Parker Pearson 1982, 1999; Shanks and Tilley

1982). This is especially important in mortuary analysis since disposal of the dead is often a ritually dominated practice (Hodder 1982a). Hodder (1982) argues that the entire funeral rite is the appropriate frame of reference for generalizations about social organization, not merely the physical disposal of the dead. Parker Pearson (1999:84) notes that "grave goods are not just elements of an identity kit but are the culmination of a series of actions by the mourners to express something of their relationship to the deceased as well as to portray the identity of the deceased."

Ritual and Mortuary Practice

The final disposition of the body of the deceased can be the culmination of a range of social negotiations. In other words, "the dead do not bury themselves, but are treated and disposed of by the living" (Parker Pearson 1999:3). The dead can be used by the living to obscure the social organization or complexity of a society, as reflected by mortuary practices. The survivors of the deceased may reinforce their own position by demonstrating their relationship to the dead (Huntington and Metcalf 1991). Or it may be in the survivor's interest to downplay the wealth or position of the dead (Shanks and Tilley 1982). This may lead to "masked rank" where internal tensions resulting from social inequality are neutralized by the appearance of egalitarianism in the mortuary (and other) ritual (Trinkaus 1995). In this way, ritual is often a reflection of how things *should* be, not how they actually are. Ritual is an idealized expression of power relations and in these expressions the dead are subject to manipulation by the living (Parker Pearson 1982). Burial does not happen outside the social life of the group; indeed, "funerals are political events at which the status of the

deceased as well as that of the mourners is actively negotiated and reevaluated" (Parker Pearson 1999:32).

A further problem raised for mortuary analysis is that its assumptions are not conversely true. For example, an increase in distinctions made in burials may coincide with an increase in the complexity of social organization, but the reverse is not true (Hodder 1982). Wason (1994) points out that when there are discernible differences in mortuary treatment, they do correspond with social differentiation. Therefore useful information about social structure can be inferred from mortuary practices of complex societies. Archaeologists cannot be as confident of their interpretation of societies that appear egalitarian based on mortuary analysis. Site structure and organization become even more important in making distinctions.

Regional Approaches to Mortuary Analysis

Several of the original proponents of mortuary analysis have responded to the post-processual criticisms. A recent edited volume addresses these concerns and incorporates more consideration of the importance of ritual and symbolism in mortuary analysis, especially using a regional approach (Beck 1995). The regional approach is useful for avoiding some of the pitfalls involved in the analysis of a single site. By assessing the mortuary practices of an area, differences and similarities across the region become the focus of interpretation. Employing a wider scope lessens the chance of basing an interpretation on anomalous burials, as well as providing a means for evaluating change through time. A third positive aspect of the regional approach is that it provides a way to test hypothesis generated

at one site through comparison to other sites which are expected to be similar (Beck 1995). It also avoids some of the pitfalls of cross-cultural comparisons that are too broad.

Contextual Approaches

Post-processual theoreticians have advocated a more culturally-contextualized interpretation of mortuary remains. Recognizing that any ritual is highly charged politically, socially, and emotionally, archaeologists have sought new ways to interpret mortuary features. This desire to understand the formulation and manipulation of mortuary ritual has lead to a new spate of ethnoarchaeological studies, particularly by Ian Hodder and his students. Parker Pearson (1999:5) summarizes this contextual perspective by noting that "the provision of a final resting place for someone's mortal remains is generally a carefully thought through procedure which may have taken days, months, or even years to plan and execute. Burial is thus a deeply significant act, imbued with meaning." It is important, then, to study funerary practices not in isolation but as a set of activities linked with other social practices such as the construction of domestic and public structures, and subsistence.

Mortuary remains are not a direct, passive reflection of political organization. In fact, the focus of recent mortuary archaeological studies has shifted from the direct interpretation of the deceased individual to an "archaeological study of the funerary practices that the living perform for the dead" (Parker Pearson 1999:3). Parker Pearson argues that mortuary archaeology "is not so much about the dead themselves as the living who buried them" (1999:3). He states that "funerary practices serve to create an idealized representation—a 're-presenting' of the individual by others rather than the man himself" (Parker Pearson 1999:4). Burials are good features from which to reconstruct ritual because an interment

"represents one of the most formal and carefully prepared deposits that archaeologists encounter" (Parker Pearson 1999:5).

The recent critiques of mortuary archaeology are important to keep in mind because they open the door to fresh perspectives and richer interpretation as the focus shifts from quantifiable differences between burials to a more contextual understanding of funerals as part of the ritual production and reproduction of a society. Understanding burials as a part of the social landscape offers new insights and allows for the meaningful incorporation of other information, such as gender roles and ideology.

Social Organization and Mortuary Practices Revisited

While I consider the criticisms of processual archaeological theory valid, especially the interpretive model underlying processual mortuary studies, I am still interested in many of the same questions that concerned early processual archaeologists. The presence of large differences in mortuary treatments and the presence of public architecture and public works like the mound indicate social ranking or stratification at Town Creek. The hypotheses I will detail below all revolve around a central set of questions: What was the social organization of the group that prepared the burials at Town Creek? If the inequality apparent in mortuary treatment indicates social inequality, how did this develop? What were the criteria for membership in the elite stratum? How much can we learn about the similarities and differences between people at Town Creek, based on their health and the way they were interred? Biologically, what was the impact of their social organization on the lives of individuals? Were there patterned inequalities that resulted in poorer health for some people?

I have sympathy for what Parker Pearson (1999:23) derides as "functionalist interpretations of funeral ritual" in that I think that the ritual does serve as an "affirmation of the existence of social bonds among mourners and as a strengthener of political authority." I think funeral ritual is an important way to effect reintegration of the social order. I argue that mortuary rituals were different for leaders depending on whether they died while active in their role as a leader, or if they died after leadership had been successfully passed on to another.

While Parker Pearson and Hodder have opened the eyes of many to the difficulties of interpreting the rituals of a group from the past, they have not provided guidance for how to move on from this realization. The interpretations that Parker Pearson provides mesh with his desire to understand power relationships, the manipulation of ritual, and the negotiation of social relationships in general. Unfortunately, he does not present any method for choosing among the many possible interpretations. Much of his reinterpretation at Moundville (Parker Pearson 1999), for example, has little grounding in the actual data, and no reason is given to accept his interpretation over others, except that it may seem more fitting to him. This is a real flaw, I believe.

The gap between theory and in-the-ground fact seems to be widening. I believe the biggest challenge facing archaeological theories today is the absence of (for lack of a better term) bridging arguments to link the fascinating realm of theory to what we find in the ground. This is not merely a problem for interpretation, either. Choosing sites for excavation, methods of analysis, and other aspects of research design should be informed by a new framework as well. Parker Pearson argues that a focus on agency, ideology, and reconstructing ritual leads archaeologists to "more satisfying meaning with new possibilities,

in contrast to the sterile enquiry into status differences and complexity, in which form and content are sundered and content is rejected" (1999:94). It seems to me that the "sterile enquiry" has to come first, with the layers of meaning added after the basic organization of a site is understood. Not enough attention is given to these basic interpretations, which should be as critically informed as the most intricate and subtle interpretations of agency, ritual, and power.

Ritual in Chiefdom Societies

I turn now to a consideration of ritual in chiefdoms societies; what it means, how ritual is used in chiefdoms, and how chiefdoms can be reproduced through mortuary ritual. Chiefdoms, or stratified societies, have been defined as those "in which members of the same sex and equivalent age status do not have equal access to the basic resources that sustain life (Fried 1967:186). Therefore, elite members of chiefdoms societies should enjoy better health and diet as a result of their exalted status and access to resources. More recently, chiefdoms have been defined as "regionally organized societies with a centralized decision-making hierarchy coordinating activities among several village communities" (Earle 18\987:288). Several levels of political hierarchy have been identified for chiefdoms, including at a minimum villages and political centers. Anderson (1994) predicts that the most important task facing chiefly elites is the coordination of the activities in the several communities. He also identifies the presence of cycling between different levels of political integration as a principal feature of chiefdoms (Anderson 1994). He defines cycling as "the transformations that occur when administrative or decision-making levels within the chiefdom societies

occupying a given region fluctuate between one and two levels above the local community" (Anderson 1994:9).

The stability of a given chiefdom is tied to the "nature and effectiveness of ideological and secular mechanisms used to maintain and legitimate elite authority structures" (Anderson 1994:19). Factional competition is also an important consideration in the creation, maintenance and manipulation of mortuary and other ritual. The chiefly elite rely on the support of other elite to maintain their position and status, but these people by nature of their birth are also the chief's competitors for the highest positions. Cycling, or disruption of society, could be caused by the death of a leader when rival elite vie for leadership that many may be qualified to hold. Mortuary ritual, therefore, could be subject to significant manipulation in the potential power struggle that followed the death of the leader. Close relatives may wish to perform public rituals proclaiming their right to ascension by virtue of this relatedness. Rivals could use the mortuary ritual as a means to proclaim themselves more worthy of leadership.

With a slightly different view of cycling, Nassaney (1992) points to the periodic disruption of Mississippian societies in the Southeast as evidence that people hung tenaciously to egalitarianism, and that agents of change, the elite, were not often successful in reproducing their positions for more than several generations at a time. Social reproduction of chiefdoms was subject to periodic discontinuities as these kin-based societies experimented with inequality. By and large, there seems to be a consensus that while social inequality and stratification was a feature of Mississippian communities, kinship was always an important element in ordering society and social relations.

In many chiefdom societies, access to esoteric knowledge can be a powerful tool to maintain power as elites trade amongst themselves the symbols of office and manipulate the distribution of exotic non-local goods (Helms 1979, 1992). At Town Creek, the elites apparently did not have access to the range of non-local and prestige goods that were present at other less peripheral sites, including items considered part of the Southeastern Ceremonial Complex (Galloway 1989). Helms (1992) points to the manipulation of this unknown, outside realm as a chief means of elite social reproduction. The fact that the elite at Town Creek did not extensively participate in this trade network of esoteric goods and knowledge may have a great deal of bearing on the apparently short-lived nature of Town Creek as a political center. However, the elite at Irene also appear to have been relatively "impoverished" when compared with paramount centers like Moundville or Etowah, and the mound at Irene was rebuilt eight times.

Most burials at Town Creek contained few or no artifacts, while others contain rare copper artifacts, stone discoidals, and other artifacts often associated with high status (Hally 1994). A variety of "prestige-goods" similar to those found at other Mississippian sites (Hally 1994) were discovered at Town Creek, mostly in burials. These include copper artifacts such as copper-covered wooden earspools, axes, a pendant, and thin pounded copper sheets. Other rare, exotic goods include marine shell gorgets and beads, stone discoidals, and stone effigy carvings (Coe 1995). The distribution of these artifacts is discussed in detail in Chapter 5, while the meaning of the distribution of artifacts, both in general, and by material and type, is discussed in Chapter 6.

Identifying Social Status in Mortuary Practices

Mortuary practices are an important tool for identifying elite individuals, including those thought to be leaders and for inferring the age and sex composition of elite groups in Mississippian studies (Sullivan 2001, Brown 1981, O'Shea 1984, Peebles and Kus 1977, Peebles 1974). Mississippian mortuary studies associate prestige goods and burial in a public places like mounds and public buildings with elite status. Many studies (Peebles 1974, Anderson 1996, Hatch 1974, Sullivan 2001) have found that the majority of these individuals were male, which is often interpreted to mean that Mississippian men were the political leaders and thus had more political power than women.

Gender and Status

Sullivan (2001), in her recent revision of political organization and power at Toqua, points out the many gendered spheres of, and avenues to, political power by drawing analogies with historic accounts of the roles of Cherokee men and women. She argues that political power was heterarchical (Crumley 1995, Levy 1995), and thus "allows for multiple lines of empowerment in different contexts and circumstances" (Sullivan 2001:103, Nelson 1997:148). If political power in Mississippian societies was contextual and heterarchical, it is likely that archaeologists are not getting the full picture of leadership and power relationships by looking only to those buried in public settings. However, most archaeologists agree that they are certainly looking at one dimension of political power. For additional, horizontal status differences, it is important to evaluate non-mound settings, particularly households, to view contexts where women may have wielded considerable power.

Sullivan (2001) proposes that men and women had different avenues to prestige according to age that should be visible in the mortuary treatments. She suggests that men had a chance to gain prestige through warfare that was not open to women, and thus indications of higher status should show up at earlier ages with men. Women's tracks to prestige may have been more reliant on their position as matriarchs, and thus come at a later age as the older women exercised control of a household. Generally, indications of prestige increased with age for both men and women, indicating an achieved aspect to status, in addition to the largely ascribed nature of the highest levels of the hierarchy.

Kinship and Status

Leadership roles probably were open to men and women, as at other Mississippian communities. Following Knight's (1990) reasoning, I expect that the people at Town Creek organized themselves into exogamous clans, with ranked lineages, possibly matrilineages. Knight (1990) examined ethnohistoric documents relating to social organization among Southeastern chiefdoms and concluded that while they were probably organized along clan lines, an arguably egalitarian system, the lineages within clans were often hierarchically arranged. Noble status was determined by degree of kinship to the chief. Leadership was often hereditary, but it is likely that on the death of a chief, particularly a paramount chief, rival claimants from within the family could arise and vie for the leadership. In other words, the office was only open to people of the right birth, but several people may have been eligible. Factors such as age, the strength of an individual's following, and alliances would be important at such times of transition. As Knight (1990:18) notes, "societies at this level of integration are afflicted by chronic political instability" and as such, the people "are not yet

prepared to submit to governance by a disconnected, despotic, and self-absorbed nobility." Individual agency and charisma probably played a large role in the determination of a leader.

Kinship should also be an important organizing principle for the arrangement of human burials. Unlike some Mississippian sites with clear cemetery areas (Goldstein 1980, Schurr 1989), Town Creek burials appear primarily in the floors of what are probably domestic dwellings. If the structures are built and rebuilt by members of a kin group, then each cluster may exhibit slightly different mortuary practices. Ritual in private spaces may have less public scrutiny and oversight. It is possible that mortuary practices will differ slightly by cluster in ways that are unrelated to social rank. It is unknown how much of the mortuary ritual took place within the structures, but final disposition was out of general view inside the house.

Hogue (1988) describes the mortuary practices of the late prehistoric and early Historic Siouan groups on the Piedmont of North Carolina and in southern Virginia. Historic Siouan groups are generally thought to have been matrilineal (Hudson 1976; Hogue 1988), and certain women are described in ethnohistoric accounts as "queens," but little evidence of preferential mortuary treatment of adult women has been discerned that would indicate high status in either prehistoric or historic burials on the Piedmont (Hogue 1988).

BIOARCHAEOLOGY AND MORTUARY RITUAL AND PRACTICE

Mortuary archaeology theory sometimes neglects the rich trove of information that can be obtained from the skeletal remains in the burials. Studies have often incorporated the age and sex distribution (usually provided by a biological anthropologist), but ignored the pathological and dietary evidence which can be useful in creating or supporting hypotheses

explaining the burial pattern discovered at a site. On the other hand, biological anthropologists have often neglected the archaeological context of the burials and focused solely on the skeletal information. I believe a combination of these two sets of methods and theory can be particularly fruitful for mortuary analysis and the reconstruction of social organization.

Bioarchaeology is "an emerging discipline that emphasizes the human biological component of the archaeological record" (Larsen 1997:13). Bioarchaeological approaches have been used to analyze dental and skeletal remains to interpret past subsistence economy and behavior. The combination of bioarchaeology and mortuary archaeology will result in the incorporation of all archaeological elements of the funerary context into the interpretation of a site. Skeletal analysis can go beyond limitations in interpretation by other means by determining if health and nutrition were consistently better for one group than another throughout childhood and into adulthood. Significant differences in nutrition and health between groups based on status may be "masked" through burial treatment, but they may be discernible in the skeletons.

STATUS AND HEALTH

The use of skeletal remains in studies of prehistoric social organization is based on the body of knowledge which demonstrates that certain health and nutrition factors which affect an individual during growth and development, as well as adult diet, are recorded in their bones (Larsen 1997). The use of health and nutritional indications of rank is tied to the proposition that in a non-egalitarian society, higher-ranked people will have better access to food resources, especially animal products, than lower-ranked people. In past populations,

better access to resources by elites has been indicated by trace element analysis studies which show a greater percentage of animal protein in the diet of elites as compared to non-elites in several groups (Hatch and Geidel 1985, Schoeninger 1979, Peebles and Schoeninger 1981). An example of a context in the Southeast which produced this archaeological pattern is the Natchez, a southeastern chiefdom, where high status individuals had redistributional powers over the products of a hunt, and after rewarding adherents, kept a disproportional amount of the protein for themselves and their family members, including children (Peebles and Schoeninger 1981).

Stable Isotope Evidence of Social Ranking and Diet

Stable isotope analyses also show different patterns of maize consumption by social rank (Schoeninger 1979, Ubelaker et al. 1995, White et al. 1993). Stable carbon and nitrogen isotope ratios can be used to determine the relative amounts of maize in the diet of different individuals, and trophic level of foods consumed. Both differences by status and by sex have been found in prehistoric populations (Reed 1994, White et al. 1993, White and Schwarcz 1989). Permission to conduct stable nitrogen and carbon isotope analysis on remains from Town Creek was not granted, so other, less specific means of determining relative health and diet by age, sex, and status were employed.

Hierarchy, Heterarchy, Ranking and Health

Hierarchical ranking was present in Mississippian societies, but the extent to which this social organization impacted the health of the population varies. It is important to keep in mind that status is negotiated, and changes over the lifespan of the individual. Also, non-

ranked or equivalent ranked statuses may also have been present. This type of social ordering, also known as heterarchy (Crumley 1995) describes a situation where multiple, fairly equivalent statuses are present, but not hierarchically ranked against one another. Bioarchaeology methods can be applied to the health and nutrition of selected cultural subsets of the population to examine this impact. Bioarchaeology provides the methods and perspectives for this type of intra-group comparison, as well as for inter-group analysis. In this study, I examine the differences in health and nutrition by age, sex, status, and cranial deformation to determine whether status had a substantial impact.

Methods of detecting rank differences are not absolute. They rely on discerning general trends and statistically significant differences between groups. The methods can be used to detect differences in a population, or to test the proposition that certain groups were dissimilar. If the lower status group lacked adequate nutrition, members will exhibit signs of growth disruption during development (Powell 1988). These propositions rely on the supposition that the lower status groups not only had less food, but inadequate nutrition at some point prior to reaching maturity. Conversely, the higher status group members usually had at least adequate nutrition, and consequently better health and resistance to disease and infection. For bioarchaeological studies, growth disruptions are most useful when there is more than one indication or more than one incident of growth disruption (Goodman and Rose 1990; Larsen 1997). In this way a single episode of severe illness unrelated to nutrition will be less likely to skew the picture. For this reason, the pattern of stress indicators is more important than are individual cases.

Non-specific Indicators of Diet and Health from Skeletal Remains

Diet information has been used to address a variety of archaeological problems concerning basic issues in human adaptation and organization (Larsen 1997). For example, changes in diet can be interpreted in light of climatic shifts. Fundamental changes in human organization were made possible by the adoption of maize agriculture in the prehistoric southeastern United States, with concomitant downward trends in diet and health (Cohen and Armelagos 1984, Lambert 2001, Larsen 1995). The adoption of intensive maize agriculture often corresponds with the emergence of stratified societies in which access to foods may be dependent on social class as well as age and sex factors (Buikstra and Milner 1991).

Bioarchaeological and mortuary analyses have found that there is often a correspondence between high status and lower incidence of nutritional and or disease stress (Hatch and Geidel 1985; Hatch et al. 1983; Hatch and Willey 1974; Huss-Ashmore et al. 1982; Powell 1988, 1991a, 1991b, 1992; Powell et al.1991; Schoeninger 1979). Stress episodes recorded in bones and teeth can indicate the timing, prevalence and severity of nutritional or disease insults (Goodman et al. 1980; Goodman and Rose 1990; Larsen 1987, 1994, 1997), but the specific cause of the stress is often impossible to identify. Also, as Powell (1991b, 1992) discovered, patterned differences in diet will only be discernible through paleopathological indications if one part of the population has inadequate nutrition.

Differential access to resources, including food resources, is a characteristic of chiefdoms, as defined by Peebles and Kus (1977, and Fried 1967). Food was used for personal consumption as well as supplying retainers and supporters, thus solidifying and simultaneously validating the position of the elite (Barker and Pauketat 1992, Peebles and Schoeninger 1981, Peebles and Kus 1977, Hatch and Geidel 1985). Ethnohistorical accounts

which support the differential access experienced by the elite are included in Swanton (1911).

Specific dietary information is not included in paleopathological assessments, only nutritional inadequacy or disease stress (Larsen 1997, Schoeninger and Moore 1992). If the elite in a population is over-nourished, and the non-elite have a different, yet still adequate diet, few or no differences will be found in disease patterns (Powell 1992).

Skeletal Trauma and Status

Skeletal trauma rates are often examined to evaluate behavioral differences between socially defined groups within a population. Powell (1988, 1992) predicted that trauma rates should differ by sex and status. Elite males should have more warfare-related trauma because prowess in war could be an avenue to achieving or enhancing elite status. Elite females, on the other hand, were predicted to display fewer trauma that was the result of "ordinary activities" (Powell 1992:47). Powell (1992) found that the elite males at Moundville showed fewer traumatic injuries than any other socially-defined group, but sample bias was suspected. Males at Moundville had twice the prevalence of trauma (1.0 percent of observed individuals) compared with females (0.5 percent) (Powell 1992:37). Elite females fit Powell's (1992) predictions, displaying no trauma. Other Mississippian sites that have been examined for indications of trauma by ranked status show a mixed pattern. At Chucalissa, elite males do show significantly higher rates of trauma (Robinson 1976, Lahren and Berryman 1984). At Etowah, burials in mound were more likely to display trauma than village burials, but the difference was not significant (Blakely 1980).

Artificial Cranial Deformation and Status

The final characteristic to consider from the skeletal series at Town Creek that may have bearing on the interpretation of social organization is cranial deformation. Artificial cranial deformation is the result of deliberate modification of the shape of the skull. Because the cranial bones of an infant are relatively plastic, their shape can be modified through cultural practices, or inadvertently flattened with frequent contact with a hard, flat surface (Buikstra and Ubelaker 1994). Cranial deformation was common in the prehistoric Americas, and a variety of deforming devices have been discovered, particularly in the Andean region (Buikstra and Ubelaker 1994, Allison et al 1981).

At Town Creek, a characteristic type of deformation called fronto-occipital deformation was common (Type 3, Neumann 1942, Figure 37). This type of deformation was produced by securing pads or boards to the developing head of an infant (Buikstra and Ubelaker 1994, Ubelaker 1978). How long the head must be bound to produce the desired effect is unknown. Adults with the deformation have skulls that are broad from side to side, with a flattened occipital (back of the head), and a forehead that slopes sharply back from the eyebrows. This pattern of bilobate expansion is common with fronto-occipital deformation (Anton 1989). At Town Creek, marked flattening of the frontal may indicate that a pad or board was also placed on the frontal, and not just on the occipital, as has been described elsewhere (Buikstra and Ubelaker 1994, Neumann 1942, Anton 1989).

The skulls of individuals who could be evaluated had not all been deformed. Because deformation is common, the question of why some were not deformed becomes intriguing. Several archaeologists and bioarchaeologists have incorporated data about cranial deformation in their discussions of prehistoric Southeastern and Mississippian social or

mortuary variability. Owsley and Guevin (1982) studied the Historic Overhill Cherokee and related cranial deformation to social organization. Blakely and Mathews (1985) found that at the Beaverdam Creek site in Georgia, only females had deformation, prompting them to assign a cosmetic purpose to the practice. At Etowah, Blakely (1984) found that deformation was divided almost equally between the sexes, but was more common in burials found in the village area than in mound contexts. However, these differences may also be related to temporal differences.

Garrett (1988) examined the crania of individuals from the King site and produced a hypothesis that cranial deformation "defined individuals who, under normal circumstances were eligible for particular status or membership in certain classes" (Garrett 1988:41). Garrett (1988) raises the possibility that there was a 'warrior class" at King. However, given that about 91% of the burials in the "public sector" had cranial deformation, with a slightly lower percentage in the private sector, most of the society must have been eligible for the status. Again, I think the more interesting question is who is *not* eligible for the status defined by having cranial deformation since most people are eligible.

Because most people are included in the proposed status group, what are the criteria for not being included? What type of social symbol is cranial deformation? Obviously, it cannot be a marker of achieved status, because deformation has to take place during infancy. Therefore, it must indicate ascribed status, or perhaps group membership. It seems unlikely that there could be a high status division that included the majority of the population. The small minority who would then be of low status would have great incentive to "vote with their feet," or perhaps resist the social order by practicing cranial deformation on their children. Unless the smaller group of individuals *without* deformation can be classified as

elite by other means, such as burial in public areas or elaborate burial including rare and exotic grave goods, it appears most parsimonious to discard the notion that cranial deformation is indicative of high status. It seems unlikely that a "class" of individuals to which nearly all the members of a society belonged would have much meaning. I do agree with Garrett that perhaps under normal circumstances, being a member of the group, indicated by cranial deformation, may have opened certain avenues to higher status. But I differ from Garrett in that I think that the individuals without deformation are probably outsiders who joined the community at Town Creek after infancy, possibly through marriage alliances with other groups in the region. No other groups on the Piedmont of North Carolina practiced fronto-occipital cranial deformation (see Lambert 2001).

HYPOTHESES

The above information, coupled with the description of the spatial organization of Town Creek discussed in the previous chapter is used to formulate the following set of hypotheses in order to meet the research goals. The hypotheses are followed by the expectations each engenders.

Hypothesis 1: Because Town Creek was a South Appalachian Mississippian ceremonial center, evidence of a social ranking is discernable in the mortuary program.

Expectations: The burials of elite individuals should be marked by the presence, high quality and high quantity of grave goods. Elites should also be conspicuous by their position in public spaces. "Prestige goods," or items of non-local material or manufacture, should be

interred with individuals in public places. Some grave offerings should be restricted in distribution by age and sex as well as location. The individuals in the mounds should be older, and predominantly male.

Hypothesis 2: Gender was an important organizing element to mortuary ritual.

Expectations: Men and women should have different indications of status, with males occupying the highest, most visible status positions, and outnumbering females in burials in public settings. Male burials should contain markers of status at younger ages than female burials, as males may have had avenues towards achieved status open to then at younger ages, such as warfare. Elite males should show a higher rate of skeletal trauma. Non-elite females may have gained status as they aged, and be present in domestic settings. Elaborate burials of young women may represent elite individuals and should occur primarily in public spaces

Hypothesis 3: Descent and kinship were important organizing principles for the mortuary ritual.

Expectations: Indications of status should increase with age for women. Elaborate female burials should be placed in the village, in the household clusters, as indications of the basis of their power and prestige. The most elaborate burials of females should be of older individuals.

Hypothesis 4: Fronto-occipital deformation indicated group membership to the Pee Dee and distinguished them from neighboring groups.

Expectations: Individuals without cranial deformation will be more likely to be male due to matrilineal descent. Additionally, elaborate burials of individuals without cranial deformation are more likely to be male, as males from outside the group gain prestige by marrying higher status women. Females without cranial deformation, as outsiders, are less likely to gain prestige by marriage.

Hypothesis 5: Elite individuals had better health and nutrition as a result of their social position.

Expectations: Individuals identified as elite should have lower rates of caries, linear enamel hypoplasia, porotic hyperostosis, cribra orbitalia, and anterior tibia periostitis. Individuals with grave goods (as a rough indicator of status) should display fewer growth disruptions and indicators of skeletal stress than individuals without grave goods. Individuals without cranial deformation, if they are indeed outsiders, should display a different pattern of biological stress and diet than people at Town Creek. Their diet and health may have been better due to lower resident populations at smaller Piedmont villages.

SUMMARY

This chapter has outlined the basic theoretical framework for data collection and interpretation of mortuary practices, and how the information can be used to reconstruct status and ranking relationships at Town Creek. This background highlights the importance of looking at individuals to reconstruct groups, and to collect information about a wide range of potential differences, such as mortuary treatment, biological attributes including age, sex, and non-specific indicators of health and nutrition, location in the site, gender, and position.

Incorporating this range of attributes allows an integration of information that is most useful for reconstructing not only social rank, but also the consequences of that ranking on the lives, health, and nutrition of the individuals at Town Creek. Specific hypotheses and expectations are described to test the relationships between diet, status, health, and social organization.

CHAPTER 4

METHODS OF DATA COLLECTION AND ANALYSIS

In this chapter, I describe the methods used to collect skeletal indicators of health and nutrition, as well as information about the archaeological contexts of each burial. I developed a biological profile of each individual represented by skeletal remains, including age, sex, trauma, incidence of carious lesions, stature, trauma, cultural modification of the cranium. I also collected data on several non-specific indicators of biological stress, including linear enamel hypoplaisia, porotic hyperostosis, cribra orbitalia, and periosteal reactions of the anterior tibia.

BIOARCHAEOLOGICAL DATA COLLECTION

The biological profile of each individual at Town Creek was completed prior to other analyses. In keeping with forensic anthropology methodology, it is important to complete the skeletal analysis without knowledge of the context of the burial to avoid bias. Additionally, keeping the archaeological context information separate from the biological analysis eliminates one possible source of gender-bias in the results. If the types of artifacts interred with an individual are not known at the time of the biological analysis, that information will not be a factor in determining the biological sex of the individual.

Information from the biological profile and the archaeological context information has been entered into an Microsoft Access database. The information has also been plotted onto a schematic map of the site to facilitate visual searching for spatial patterns in the data.

AGE ESTIMATION

Each individual was assessed for indications of age at death. Different methods were used for adults and subadults, due to the different processes that produce indications of age. Indications of age in subadult skeletons are the product of growth and development, while adult age estimation is based largely on indications of degeneration (Krogman and Işcan 1986, White 1991). Therefore, the methods used for determining the age of a subadult differ from those used for an adult.

Subadult Age

Subadult age was estimated using dental development, epiphyseal closure and long bone length. Available juvenile teeth were compared to the dental development chart provided in Ubelaker (1978:47). When available, the maximum length of subadult long bones were measured on an osteometric board. The maximum length obtained was compared to the mean values provided by Johnston (1962) to estimate developmental age. Johnston (1962) measured the long bone lengths of subadults from the Indian Knoll Native American sample and developed standard age ranges in conjunction with dental development. Skeletal growth occurs in the metaphyseal area of bones. As an individual approaches maturity, skeletal growth ceases and the cartilage plate separating the epiphysis from the diaphysis ossifies, resulting in fusion of the two elements, or epiphyseal closure.

Under normal circumstances, each epiphysis closes in a certain age range (Krogman and Iscan 1986, White 1991). In a subadult, age can be determined by evaluating which epiphyses are open, partially open, and entirely fused. For this study, the age at fusion for each bone was taken from White (1991).

Adult Age

Adult age was estimated from the degrre of dental attrition or wear, cranial suture closure, pubic symphysis morphological change, age-related morphological change to auricular surface of the os coxae, and age-related pathology. In some cases, young adults can be distinguished from older adults by examination of late-fusing skeletal elements, such as the epiphyses of the medial clavicle, the basioccipital synchondrosis, and the iliac crest (Buikstra and Ubelaker1994). The methods used for aging individuals are described below. A composite age range was developed for each individual following evaluation of the listed metods of estimation of age at death. This range was then used to assign each individual to an age category because the purpose of this analysis is to trace patterns of different mortuary treatment by age, sex and status. A description of the age categories can be found in the beginning of Chapter 5.

Dental Attrition

The dentition of each individual was compared with the dental chart developed by Smith (1984) to estimate age based on dental attrition, or degree of wear. In order to appreciate the range of attrition, a limited study of 20 adults with complete dentitions was performed prior to scoring the rest of the individuals. Dental attrition rates are highly

dependent on the diet of the individual, and thus produce fairly wide age ranges (Smith 1984, White 1991).

Cranial Suture Closure

Cranial suture closure can be used to estimate adult age. Cranial bones grow intermembranously and meet at sutures (Krogman and Iscan 1986). These sutures close as the individual ages, first endocranially, then ectocranially (Meindl and Lovejoy 1985). Only ectocranial suture closure was evaluated for this study. A difficulty in using cranial suture closure as a means for estimating age, compared with epiphyseal fusion in the subadult skeketon is that, in normal circumstances, non-cranial epiphyses always fuse, whereas cranial suture closure varies and can occur early, late, partially or not at all (Meindl and Lovejoy 1985). This variability is reflected in the wide age ranges provided in estimating age based on the amount of closure at different loci. Meindl and Lovejoy (1985) devised a method of examining particular loci on cranial sutures, grading the amount of closure and using a composite score to estimate the age of the individual. This technique is more accurate when most of the loci can be evaluated.

Pubic Symphysis Closure

Morphological changes to the symphyseal face of the pubis portion of the os coxae are considered to be one of the most reliable means for estimating age at death (Buikstra and Ubelaker, Ubelaker 1989, White 1991). The pubic symphysis can be used to estimate age based on age-related changes which occur on the symphyseal face. A variety of systems for scoring the changes have been developed (e.g. Todd 1920, Brooks 1955, McKern and

Stewart 1957, Katz and Suchey 1986, and Suchey *et al.* 1988). The method used in this study is based on the casts provided by France Casting for the male (Katz and Suchey 1986) and female (Suchey *et al.* 1988) pubic symphyses. The sex of the individual is determined first. Then the morphology of the intact pubic symphysis is analyzed for age-related changes such as the appearance of a ridge and furrow pattern, the development of the ventral rampart, dorsal plateau, dorsal margin ventral rim, and symphyseal face erosion (Suchey *et al.* 1988). The pattern is then compared to the six model casts provided, and the closest match chosen. A mean age, standard deviation and 95% age range is provided for each pubic symphyseal stage.

Age-related Skeletal Changes

Other age-related changes which are useful in estimating the broad age categories of sub-adult, adult and older adult include the degrees of osteopenia, especially in older women (Riggs and Melton 1991), and osteoarthritis (Buikstra and Ubelaker 1994, Steinbock 1976, White 1991).

SEX DETERMINATION

Criteria used for determination of the sex of a skeleton are largely based on average size differences between males and females found in human populations (Buikstra and Ubelaker 1994, Krogman and Iscan 1986, White 1991). The criteria used usually are not discrete or quantifiable, rather, the overall suite of traits must be evaluated in comparison with the population. For this reason, the sex of each individual was determined, then reevaluated after the researcher was familiar with the range of variability in the sample.

Upon completion of the analysis, each adult was assigned to a discrete sex category, depending on the indicators available, and the confidence of the researcher in the sex determination. The categories include Female, Female?, Undetermined, Male? and Male. I employ these categories to explore sex differences in the mortuary treatment. Due to the difficulties in determining the sex of subadults from skeletal remains, and the overall poor condition of the subadult skeletal remains, sex was determined for adults only, based on criteria from cranial and pelvic morphology, as well as general robusticity of long bones.

Os Coxae Morphology

The pelvis is the most useful region of the skeleton for determining sex, due to the fact that the female pelvis is adapted for the birth of large-brained infants as well as bipedal locomotion (Steele and Bramblett 1988). Females have a wider pelvic basin and more flared ilia than males (Krogman and Iscan 1986, White 1991). The methods developed by Phenice (1969) for determining sex from the subpubic morphology are among the most accurate. There are three aspects of the pubis that are highly indicative of the sex of the individual. Phenice (1969) developed the method of evaluating these aspects and found 95% accuracy in determining the sex of an individual based on the shapes of three features, including the ventral arc, subpubic angle and the ischiopubic ramus. In females, the ventral arc is an elevated bone ridge extending across the ventral surface of the pubis. It usually is absent in males. The angle inferior to the pubis, or the subpubic angle, is more concave in females and more convex in males, when seen from the dorsal view. The third trait consists of a ridge present on the medial aspect of the ischiopubic ramus in many females which is absent in most males (Phenice 1969, White 1991).

Other pelvic traits useful in determining sex include the sciatic notch, which is wider in females and narrower in males (Krogman and Iscan 1986, Steele and Bramblett 1988), a raised sacroiliac articulation in most females, and a preauricular sulcus in most females. Overall, male pelves are more robust, with more pronounced muscle markings. The obturator foramen is larger and more oval in males, smaller and more triangular in females. The acetabulum is larger in males, to accommodate a larger femoral head (White 1991).

Cranial Morphology

The skull is the second best region of the skeleton to use to determine sex (Krogman and Iscan 1986; Steele and Bramblett 1988; White 1991). Significant cranial features can be divided into three areas: the face, the mandible and the vault. Facial traits include larger supraorbital tori in males, sharper supraorbital margins in females, larger and deeper palates in males and larger teeth in males (Ascadi and Nemeskeri 1970). The mandible exhibits a bilobate, square chin in many males whereas in most females the chin is more angular and single-lobed. The mandibular rami are broader and more vertical in males, narrower and more angled in females. The male mandible often exhibits gonial eversion (Steele and Bramblett 1988), and marked muscle attachments. The last area, the vault, often exhibits parietal and frontal bossing in females, and larger mastoid processes and external occipital protuberance in males (White 1991).

Skeletal Robusticity

Other postcranial, non-pelvic traits can be used for determining sex, but are most useful when combined with cranial or pelvic morphology. Males usually are larger and

more heavily muscled than females, so their bones are more robust, with more obvious muscle markings, than in females. Males are, on average, taller than females (White 1991).

DIET AND HEALTH EVALUATION

In order to test hypostheses about the biological consequences of social hierarchy and stratification, each individual was evaluated for several non-specific indicators of biological stress. This information is used to make comparisons about general health and diet patterns between groups of individuals determined by social categories. For bioarchaeological studies, growth disruptions are most useful when there is more than one indication or more than one incident of growth disruption (Larsen 1997, Goodman and Rose 1990). In this way a single episode of severe illness unrelated to nutrition will be less likely to skew the picture. For this reason, the pattern of stress indicators is more important than are individual cases. Each individual was scored for the presence or absence and severity of linear enamel hypoplasia, porotic hyperostosis, and cribra orbitalia. Stature and caries prevalence were also evaluated where possible for information on potential differences in diet between groups.

Linear Enamel Hypoplasia

Linear enamel hypoplasia is a "deficiency in enamel thickness due to a disruption of ameloblast activity" (Goodman and Rose 1990). It appears as a visible line or pit in the enamel of a tooth formed during a slowing or cessation of normal tooth formation. The slowing or cessation is most frequently due to a severe episode of stress caused by illness or malnutrition, although in rare cases, localized trauma and hereditary defects may also cause

hypoplasias (Goodman and Rose 1991). The enamel malformation lasts for the duration of the stress and then normal enamel deposition resumes (Larsen 1997, Goodman and Rose 1990). These lines can only by produced while the teeth are still forming, so linear enamel hypoplasias represents stressful periods during an individual's childhood. Thus, even adult teeth can illuminate patterns of pathology during childhood.

Linear enamel defects visible to the naked eye were recorded for maxillary and mandibular canines. These teeth are more likely to exhibit visible enamel defects than other teeth, although incisors and premolars also often exhibit hypoplasias. It is unknown at this time why canines show visible defects most often, but it could be due to a variety of factors such as tooth formational process, weaning stress at the time of canine formation, greater susceptibility of he canines, or other metabolic factors (Condon and Rose 1992, Goodman and Armelagos 1985, Hutchinson and Larsen 1988, Larsen 1997).

For the purposes of this study, all examples of linear enamel hypoplasia were recorded, but the data was then converted into a present/absent scale to facilitate statistical testing of pathology and other archaeological criteria.

Cribra Orbitalia and Porotic Hyperostosis

Porotic hyperostosis and cribra orbitalia are two pathological conditions of skeleton that are often used as non-specific indicators of health and nutrition in a population. The term porotic hyperostosis was introduced by Angel (1966) to describe skeletal lesions affecting the outer table of the cranium, particularly the parietals and occipital. These lesions may also affect the roof areas of the eye orbits, a condition called cribra orbitalia. The lesions represent the expansion of the diploic space of the cranial vault (Angel 1966, Larsen

1977), and are characterized radiographically by "hair-on-end" perpendicular orientation of the cranial diploe and macroscopically by the thinning of the outer table of the canial vault, with porosity (Angel 1966, Stuart-Macadam 1989). The etiology of these two conditions appears to be similar, but debate about the potential causes and timing continues (Larsen 1997). Active, unhealed lesions are usually only seen in children under the age of five, while most adult manifestations indicate healing and remodeling of the lesions, leading most researchers to interpret these lesions as childhood episodes of anemia (Stuart-Macadam 1989, Larsen 1997).

Both porotic hyperostosis and cribra orbitalia are often interpreted as indications of iron-deficiency anemia, and the expansion of the diploic space is seen as an attempt by the body to increase red blood cell-producing bone marrow. Recent scanning electron microscopy studies indicate that there are several other potential causes of similar skeletal lesions, such as rickets, scurvy, and infections (Schultz 1993, Ortner 1992). Nevertheless, in a population which relied heavily on maize agriculture for subsistence, it is likely that many of the manifestations are due to childhood episodes of iron-deficiency anemia. Maize contains phytates, which interferes with iron absorption, making the individual consuming maize more susceptible to iron-deficiency, even if iron-rich foods are being consumed at the same time (Baynes and Bothwell 1990). Other, non-dietary potential factors in iron-deficiency include chronic diarrhea, parasitic infection, low birth weight, and blood loss and hemorrhage (Stuart-Macadam 1989).

The cranial vaults and upper eye orbits of each individual were scored for the presence and severity or absence of each of these conditions, and then collapsed into

present/absent criteria to facilitate statistical analysis. Presence of these lesions are used as an possible indication of childhood episodes of anemia, and generally as indicators of non-specific stress during development.

Anterior Tibia Periosteal Reactions

Periostitis, or periosteal reactions of the bone are lesions that reflect non-specific infections of the outer layer, or periosteum, of the bone (Ortner and Puschar 1985). The tibia is the bone most commonly affected by periostitis, perhaps because the bone on the tibia is covered by less soft tissue than other skeletal elements, providing a cooler environment for the infectious agents (Steinbock 1976). Prevalences of infectious lesions can be compared between groups as an indication of general biological stress. The most likely cause of periostitis of the anterior tibia at Town Creek is treponematosis, given this disease's prevalence in the Southeast (Bogdan and Weaver 1992; Hutchinson 1993; Powell 1988,1990, 1992). However, because some remains were fragmentary, a differential diagnosis could not be completed for many of the individuals, and the more encompassing condition of periostitis of the anterior tibia is used instead. Other possible causes of periostitis on the anterior tibia include infection and trauma. Obvious cases of osteomyelitis were excluded. All individuals were scored for the presence or absence of periostitis of the anterior tibia. Individuals were counted as positive for the characteristic if at least one tibia showed moderate to severe periostitis. Therefore, burials were only scored absent if the majority of the anterior of both tibiae were present and free of periostitis. Only one tibia had to be present to score individuals as positive for this trait. Given this methodology, it is possible that the prevalence of periosteal lesions is overestimated in the population.

Stature

Stature is a useful indication of dissimilar diet in populations. Differences in diet and illness during infancy, childhood and adolescence among subgroups in the same population can result in differences in adult stature. Recent studies have shown that nutritional supplementation in children from the same areas leads to taller average adult stature attained (May et al. 1993). Stature is especially useful when comparing intra-population differences in a relatively homogenous group because it will reflect these nutritional differences. Because stature can be estimated from skeletal remains, it is a valuable tool for seeking differences in perceived subgroups. Controlling for age, sex, and population affiliation, average stature will be greater for a high-status group compared to a lower-status group, provided the high-status groups had better nutrition and health during growth (Bogin 1988). Stature was determined for each adult where possible by measuring the maximum length of complete tibiae and femora using an osteometric board as described in White (1991). Stature estimates based on these maximum lengths were then obtained from the chart provided in Krogman and Iscan (1986), which was modified from Genoves (1967, Tables 12 and 13).

Dental Carious Lesions

Dental caries is a disease process in which localized demineralization of dental hard tissues is caused by bacterial fermentation of carbohydrates, especially sugar, from the diet (Larsen 1997). The lesions produced by dental caries are easily observed in teeth from archaeological context. The frequency of carious lesions in individuals and populations is related to the diet and abrasiveness of foods consumed. Turner (1979) determined that

average frequencies of carious lesions in agriculturalists are greater than average frequencies for hunter-gatherers. Dental caries prevalence increase through time in the Eastern Woodlands with increased reliance on maize (Larsen 1997; Larsen et al. 1991; Milner 1984). Maize is high in carbohydrates that contribute to carious lesion formation (Hardings et al. 1965; Larsen 1997).

Maize was a significant source of food for the people living at Town Creek, comprising the most common plant food found at the site (Trinkley, in Coe 1995). Trinkley's analysis was from a selected sample of plant remains, and not all were from food midden contexts. Also, flotation was not used routinely during excavation at Town Creek, and Trinkely's analysis was of botanical remains collected by hand from excavation or screening. However, maize was very common at the site and likely to have been an important food resource. For this study, the relationship between diet and status can be approached through analysis of individual caries prevalence.

Previous studies have found that caries prevalences are sometimes higher in females than in males in agricultural groups, perhaps due to the ready access to maize by women processing the grain, and sex-based differences in food consumption (Larsen 1997; Larsen et al. 1991; Milner 1984; Seidel 1995). Status-based differences in caries prevalence have also been investigated. In the Southeast, elite access to more animal protein may result in lower caries frequencies in adult higher-status individuals than in the lower-status adults. Powell (1991a, 1991b), however, did not find any patterned differences in caries frequencies between sexes or status groups in the Moundville collection.

Caries frequencies were calculated for the Town Creek population to test for status-based and sex-based differences. Caries size and location was recorded for each tooth. A

caries rate was calculated for each individual by dividing the number of affected teeth by the number of scoreable teeth. Caries rates for spatial clusters were calculated by dividing by the number of teeth with at least one carious lesion by the number of observable teeth.

INDIVIDUAL CHARACTERISTICS

In addition to the age, sex, health and diet characteristics of each individual, information about trauma and intentional cranial deformation was collected to provide further behavioral and cultural data. The patterns detected based on these criteria can be particularly informative about avenues to status that are available to different people.

Artificial Cranial Deformation

Many Mississippian groups practiced intentional cranial deformation, usually of the fronto-occipital type (Buikstra and Ubelaker 1994). The meaning of this modification is unknown, and the distribution of individuals with and without deformation in Mississippian cemeteries and burial areas is not often considered by mortuary archaeologists. Fronto-occipital deformation (Buikstra and Ubelaker 1994; Neumann 1942) is common in the Town Creek burials. Because ground pressure can warp the cranium, deliberate cultural modification was distinguished from post-mortem deformation due to ground pressure by the pattern of deformation. Intentional cranial deformation is indicated by a flattened and highly sloped frontal bone and an upright and flattened occipital bone (Buikstra and Ubelaker 1994). Subadult crania are more susceptible to ground warping due to the thinness of the bone. Therefore subadults were not scored for cranial deformation unless most of the cranium was present, and no evidence of ground warping was present.

Several individuals exhibited slight flattening of the occipital, which may or may not have been intentional. Because there were only a few of these individuals and it is unclear if occipital flattening is intentional or a byproduct of sleeping habits or cradle-boarding, these individuals were not included in the analysis by artificial cranial deformation. All other individuals were coded as having fronto-occipital deformation, having no cranial deformation, or undetermined. Fewer than half of the individuals could be scored for this attribute.

Skeletal Trauma

As was discussed in the previous chapter, skeletal trauma can be useful in reconstructing behavior patterns of culturally-defined groups within a population. Injury to the skeleton during life produces certain characteristic features, including indications of healing and remodeling like the formation of a bony callus (Krogman and Iscan 1986; White 1999). Perimortem injuries can be difficult to distinguish from postmortem bone breakage due to the lack of remodeling in each, but it is very important to be sure that postmortem damage is not interpreted as perimortem injury (e.g., Milner et al. 2000). Each individual was examined for indications of premortem injuries which affected the skeleton. Information about skeletal trauma can be used to make inferences about behavior patterns between cultural sub-groups, including gender categories. Indications and patterns of interpersonal violence and violent death are useful in reconstructing the lifeways and stresses a group experienced (Larsen 1997; Lambert 1994, 1997; Walker 1989). Skeletal indications of trauma can be divided into accidental injury and intentional injury or interpersonal violence (Larsen 1997) based on the pattern and context of the injuries and injured.

THE ARCHAEOLOGICAL CONTEXT

In order to provide the archaeological context of each individual, the archaeological records and field notes were organized in a database to develop a comprehensive profile of each individual, including burial position, pit type, location (both within the site as a whole, and in relation to other burials around the individual), orientation, and the artifacts included in the burial. This chapter also contains information about intrasite chronology at Town Creek.

Information about the burial context was collected from the burial notes, sketches, and photographs. Over the decades of field work at Town Creek, data collection methods changed somewhat, and the amount of information for each burial varies greatly from only vague spatial dimensions to complete forms with sketches, photographs, and copious notes. All of the artifacts associated with the burials were examined and reported as part of the Research Laboratories of Archaeology NAGPRA Inventory. A significant part of this research has been the organization of the burial notes data into a standardized database. This database is reproduced in Appendix A.

Location

The location of each burial was recorded both by the grid coordinates and by the burial cluster of which it was a member, if any. Burials from outside structures were coded separately as "loners." Spatial clusters were identified and labeled as mentioned in the previous chapter.

Type

Each burial was scored as either an oval pit, a shaft and chamber pit, or an urn burial. Shaft and chamber pits are a common burial facility for the Historic and prehistoric Siouan people who inhabited the Piedmont, and at least two and maybe more burials at Town Creek are clearly Historic, evidenced by the presence of glass beads in the burials. Therefore, the small number of other shaft and chamber burials have been labeled as probably Historic as well, and excluded from the analysis. Most burials at Town Creek are in oval, bell-shaped, or sub-rectangular pits. A note was made in the database when burial records indicated special treatment, such as bark-lined, stone-lined, or stepped-edge pits. Although this information is considered when present, it was not systematically collected during excavation, and few individuals are recorded as having these features, therefore, firm conclusions about the meaning of these special treatments cannot be made.

Position

Four positions are represented in the burial population: semi-flexed with the body lying on the back with the arms crossed on the torso and the legs drawn up to one side, flexed with the body lying on its side, extended, and disarticulated and bundled. Burials of infants in urns often could not be scored for position, and are coded separately. Flexed burials were also scored for the side on which the body is lying.

Orientation

The compass orientation of the major axis of each burial was recorded, and the direction the head was facing scored. Because many of the burials were placed in the floors

of circular houses, and follow the outlines of these houses, a pattern to the orientation of the head was not obvious.

Artifacts

Artifacts in each burial have been recorded, then divided into classes based on the material (bone, shell, ceramic, copper, stone), the type of artifact, and location of the artifact within the burial. Several burials at Town Creek contained artifacts linked to the Southeastern Ceremonial Complex (Galloway 1989). These artifacts and their context are described in a separate section in Chapter 5, along with possible ranges within which these artifacts are dated.

INTRASITE CHRONOLOGY

Intrasite chronology has proved to be the most elusive and frustrating aspect of this analysis. It is important for a mortuary analysis to have some confidence in the intrasite chronology of the burials. It is necessary to ascertain which burials and clusters are contemporaneous; otherwise, it is difficult to determine whether differences between burials are due to change through time, or contemporaneous status or rank differences. Burials which are significantly older or younger than the main group should be analyzed separately from the main group.

Fluoride Dating

Fluoride (F) dating was attempted to create an intrasite chronology at Town Creek. Fluoride dating yields a relative chronology by testing the amounts of Fluoride present in

bone. Fluoride dating has been used for over a century to help create relative dates for material from the same area. It was instrumental in exposing the Piltdown hoax (Weiner et al 1950), and has been used at several archaeological sites in the United States as well (Ezzo 1992; Haddy and Hanson 1982; Schurr 1989,).

After death and burial, one of the taphonomic changes that occur is the exchange of fluoride ions (F^-) with hydroxide ions in the bone mineral. The fluoride ions become incorporated into the hydroxyapatite crystal, forming fluroapatite (Hagen 1973; Neumann and Neumann 1958). The fluoride content of bone increases over time because fluoroapatite has a higher molecular stability than hydroxyapatite (Ezzo 1992; Schurr 1989). Thus, the more fluoride that is present in archaeological bone, the older it is, compared with other bones at the site. Fluoride incorporation is affected by several variables, including soil pH, temperature, and fluoride content in the soil and ground water (Ezzo 1992; Hagen 1973).

Haddy and Hanson (1982) attempted to use F dating and Nitrogen dating on Missippian human skeletal remains from Moundville to help assign the burials to the three major time periods known at the time, Moundville I (AD 1100-1250), Moundville II (AD 1250-1400), and Moundville III (AD 1400-1550) based on pottery seriation (Steponaitis 1978). They employed proton inelastic scattering to measure the amounts of flouride in the samples. They found that the Nitrogen and Fluoride dating yielded similar results in the limited sample of burials (n=19). The results for the F dating conformed to the ceramic seriation in 13 of the 17 burials that also contained ceramics. They concluded that the wide range of F values obtained indicate "an excellent sensitivity of the methods to the time span over which these burials took place" (Haddy and Hanson 1982:43)

Shurr (1989) analyzed 38 burials from the Angel site in Indiana, again to establish a relative chronology of these burials. Schurr used a different method to measure the Fluoride present in the samples; ion selective electrode. He chose five pairs of burials of known chronology (based on stratigraphic position) to test the usefulness of the method at the site. The Fluoride dating results conformed to expectations in this trial (Schurr 1989: Table 1). Schurr then analyzed 28 more burials from the site. A wide range of Fluoride values was found at Angel, like at Moundville. The Fluoride values of many of the burials clustered around a mean, suggesting that the area from which the burials were excavated was in use as a cemetery for a relatively brief time (Schurr 1989:269). The technique of testing the methods with pairs of burials of known age increased the author's confidence in the results obtained.

Ezzo (1992) attempted to refine the adult burial chronology at Grasshopper Pueblo in Arizona using Fluoride dating. Ezzo used the same methods of analysis as Schurr; ion selective electrode. Ezzo also tested the method at Grasshopper Pueblo with burials known to be early and late, which clearly separated with the Fluoride dating. He analyzed 141 burials from 4 areas at the site. In his discussion, Ezzo brings up another possible source of misleading results; depth of burial. He concludes in agreement with Schurr (1989) and Haddy and Hanson (1982) that Fluoride dating can be a useful technique for establishing relative chronology of burials at a site.

Because F dating is relatively inexpensive, and requires little bone (approximately 0.2 grams of cortical bone), the technique was used to attempt to establish the relative placement of burials at Town Creek. Nine animal (mostly deer) bone samples were sent to Schurr's laboratory at Notre Dame University for initial testing. Bones were chosen from what was

believed to be contexts early and late in the occupation of the site. Two samples were taken from features underneath the mound, one sample associated with an Irene phase burial urn, and five from Cluster 7, the largest burial group. Three tests were run for each sample. The results of this round of Fluoride testing (using ion selective electrode) indicated two subsets in the data, presented in Table 4-1. Unfortunately, these results did not correlate with assumed early and late burials. Samples from Cluster 7 appear in both groupings, as do the samples from the premound features.

The assumptions made about early and late burials may have been in error. Because the intrasite chronology was in doubt, the assumption that Cluster 7 was later in time than the pre-mound features was unwarranted. It is likely, given that four of the five palisades predate the building of the mound, that the mound was constructed late in the occupation of the site. Based on these ambiguous findings, a very limited trial on human skeletal remains was conducted with burials that were known to be early and late.

With guidance from R.P. Stephen Davis and H. Trawick Ward, four pairs of burials of well-estimated chronological position were chosen. Two burials from beneath the mound (Burials 2-006 and 2-041) were compared with two from the floor of the first structure built on the top of the mound (Burials 2-059 and 2-061). Two burials with glass trade beads (Burials 3-051 and 3-052) , and two burials from the village with clearly prehistoric artifacts (a copper axe, 4 shell earpins, and 2 copper-covered wooden ear spools) (Burials 3-037 and 3-050) were also compared. If the method worked, each member of a pair would be similar to the other (intra-group similarity), and there would be significant differences between the mound burials and the village burials, especially with the historic burials. Unfortunately, the two definite historic burials are sub-adults (4-5 years, and 9-15 months age-at-death). Adults

Table 4-1. Results of fluoride dating for nine animal bone samples, divided into subsets based on F%.

Accession No.	Specimen No.	Context	Description	%F	Subset
34	b121	Fea. 21	Subsoil under mound, near Structure B	.0619	2
34	b218	Fea. 22	Firepit from pre-mound earthlodge	.0204	1
34	b466	Fea. 20	Premound feature	.0290	1
700	b3831	Bu. 68a	Irene phase ceramics	.0161	1
1040	b1325	Bu. 102-107	Cluster 7- Irene phase ceramics	.0603	2
1040	b1341	Bu. 110	Cluster 7	.0286	1
1040	b1347	Bu. 112	Cluster 7	.0692	2
1040	b1371	Bu. 121	Cluster 7	.0174	1
1040	b1385	Bu. 125	Cluster 7	.0123	1

Table 4-2. Results of fluoride dating for eight human bone samples.

Burial No.	Age	Sex	Artifacts	Cluster	%F	Expected subgroup	Actual subgroup
2-006	40+	M	Turkey bone skin scratcher, shell beads	2	.125	1	3
2-041	25-30	F	Shell ornament	Earthlodge	.105	1	2
2-059	21+	M?	None	Town House 1	.051	2	1
2-061	25-35	F?	None	Town House 1	.119	2	2
3-037	30-40	F	Four shell earpins, copper-covered wooden earspool	12	.050	3	1
3-050	35±6	M	Copper axe, shell beads	13	.360	3	4
3-051	4-5	?	Glass beads	Historic	.148	4	4
3-052	1year±3 months	?	Glass beads	Historic	.134	4	3

are preferred for this type of analysis because the bones of sub-adults are more porous and absorb more F from the soil and groundwater. Burials 3-051 and 3-052 are the only burials that contained clearly European artifacts, however.

The results are presented in Table 4-2. Again, three tests were run from each burial to check for consistency, and the means compared. No significant differences were found between the groups (ANOVA F= 2.028, Sig. = 0.142). Schurr also ran a comparison between the adults and juveniles, again with no significant differences (ANOVA F=0.018, Sig.= 0.896). When the juveniles are excluded from the groups, there are still no significant differences between groups (ANOVA F=2.297, Sig. = 0.135). Clearly, there was no point in further pursuing F dating at Town Creek. The pairwise comparisons demonstrated that the method will not yield results of any value. The lack of significant results may be due in part to the low Fluoride values obtained in all the samples (Schurr, personal communication). It seems likely that there are low amounts of Fluoride in the soil and groundwater in the vicinity of Town Creek. The amounts of Fluoride in the bone were low, making small amounts of variation more significant than they actually were, and creating greater within-group than between-group variability.

Southeastern Ceremonial Complex Artifacts

An attempt was made to determine the temporal placement of burials containing artifacts commonly referred to as Southeastern Ceremonial Complex (SECC) artifacts (Galloway 1989). While some of these artifacts could be placed temporally, there were so few SECC artifacts at Town Creek that it did not provide an adequate intrasite chronology for the rest of the burials or clusters. A further complication and obstruction to interpretation

is that the spatial clusters of burials were in use for an unknown amount of time. Therefore, even if a SECC artifact is present in a burial in a particular cluster, it may not help date the cluster as a whole.

Spatial Dimensions of the Site

Clusters of burials that are wholly or partially underneath the mound are clearly earlier in the occupation of the site than those in the mound itself. Artifact inclusions, burial position, orientation, and other aspects of the mortuary context are compared between these two areas. However, there are only five individuals interred in the mound, and the skeletal remains of these individuals are in very poor condition. The very small sample size and poor preservation makes comparison of the biological data virtually impossible.

One other area of the site shows clear stratification that can be used to partition at least some of the burials. The area within the interior palisade along the river has a circular structure that was clearly earlier than the rectangular structure that overlays it. Each structure contained burials that can be tenatively assigned to either the earlier, round structure, or the later, rectangular one. Again, the number of burials that can be partitioned with this stratigraphic technique is low.

DATA CODING AND ANALYSIS

Visual, as well as statistical, means of searching for patterns in the data were employed. Diagrams of many of the burial clusters were produced to facilitate this process. Spatial relationships were explored through the creation of a schematic of the site. Each

burial was plotted onto the schematic map, coded by age and sex. The distribution of certain artifacts was also plotted on this schematic.

Statistical analysis. In addition to graphical exploratory data analysis techniques, statistical association and clustering was performed. Body position and interment type variables were coded. The presence or absence of each variable was coded for each individual. Only individuals with complete data were included in this analysis (n=142). Cluster analysis (polythetic-agglomerative clustering) was used to elucidate associations between multiple mortuary features and to identify categories of burials. This algorithm divides the population into more and more homogenous subpopulations based on maximized or minimized variables. The results can be presented diagrammatically as a dendrogram illustrating the coalescence of subgroups into ever larger clusters. Archaeologists studying other Mississippian sites have had success with this clustering method in the past (e.g. Goldstein 1980, Hatch 1976, O'Shea 1984, Peebles 1974, Schurr 1992).

At Town Creek, cluster analysis proved to be unprofitable. Too many variables led to a complex dendrogram of "spaghetti" that did not elucidate meaningful relationships between groups of individuals. Further cluster analyses were performed with fewer variables, including only those for the trunk position, and whether or not the arms, legs, and hips were flexed. The results obtained from this clustering were more useful, but ultimately, the most useful way to group the burials was by trunk position (back, right, left, prone, or sitting), along with separate groups for the urn burials, and individuals who were disarticulated or bundled. Note was also made of individuals positioned on their backs with their legs extended. There is a great deal of variability in the arm position, but it does not fall into any apparent pattern.

Chi-square and Fischer's exact tests were used to identify statistically significant associations between pairs of mortuary features at a confidence level of α=.05. The results of the statistical tests are presented in Chapter 5.

SUMMARY

This chapter describes the methodology best suited for testing the hypotheses and expectations developed in the last chapter. The development of a biological and archaeological context profile for each individual is an integral initial step for this analysis. Accordingly, each individual was evaluated for skeletal indications of age and sex. Next, I gathered data on non-specific indicators of health and diet from each skeleton that was preserved enough to evaluate. Mandibular and maxillary canines were examined for linear enamel hypoplasia. Cranial vaults and eyeorbit roof areas were scored for cribra orbitalia and porotic hyperostosis. Next, I examined the periosteal surface of each tibia, particularly the anterior crest region, for indications of periosteal reaction, a non-specific sign of infection. Stature was estimated for each individual who had intact femora and tibiae. Each tooth was evaluated for dental carious lesions. Finally, information about skeletal trauma and artificial cranial deformation completed the biological profile.

Following the completion of the biological profile, I recorded data about the location, type, position, orientation and artifacts in each burial. I described the difficulties of establishing an intrasite chronology for Town Creek, including the use of Fluoride dating and stratigraphical means. Unfortunately, the persistent lack of an intrasite chronology does limit some of the interpretations of the mortuary program and social organization at Town Creek.

CHAPTER 5

RESULTS OF THE ANALYSIS

This chapter presents the results of the biological and archaeological analyses described above. The results are broken into sections concerning age at death patterns, burial position, cranial deformation, artifacts included in burials, orientation, and health and nutrition. They are further subdivided where appropriate into results by age, sex, and status. Statistical testing results are provided where appropriate. First, I provide information about the criteria I used to organize the presentation of the data to facilitate pattern recognition and hypothesis testing.

Age Groups

Each individual was assigned to an age group based on their estimated age at death. Table 5-1 describes the age range for each age group. Age groups are based on an estimate of the important cultural stages of life, but are necessarily arbitrary. They are used as a tool for determining the age groups considered meaningful for the culture and to look for patterns in the data. It may be that there are too many age groups here, but it is easier to lump the data after analysis than further separate it. Age at death could not be estimated for some individuals beyond determining if the individual was an adult or a subadult based on size of the remains. These individuals are not included in parts of the analysis that are dependent on

age at death, but are included in evaluating differences between adults and subadults, and in totals.

Table 5-1. Age groups and age ranges.

Abbreviation	Age group	Age range
NB	Newborn	Birth to 9 months
I	Infant	9 months to 18 months
C	Child	18 months to 5 years
J	Juvenile	5 years to 12 years
AD	Adolescent	12 years to 18 years
YA	Young Adult	18 years to 25 years
A	Adult	25 years to 35 years
MA	Mature Adult	35 years to 40 years
OA	Older Adult	40+ years

Sex Categories

Sex was determined for adults only. Each adult was assigned a sex category of Male, Male?, Undetermined, Female?, or Female. For the results presented below, individuals of Undetermined sex were dropped from the analysis by sex, but included in results concerning adults and subadults. Male and Male? were lumped together, as were Female and Female?.

Status Determination

Status results are initially based on the simplest determination of status: whether or not the individual had any artifacts buried with him or her. In some cases, particular artifacts are used as markers of status, but in order to increase sample size for meaningful comparisons, all the data for health and nutrition comparisons are based solely on artifact

presence or absence. A description of the potentially highest elite segment is provided with the discussion of artifacts.

AGE PATTERNS IN THE BURIAL ASSEMBLAGE

Age at death

Table 5-2 depicts the number of individuals in each age group. The largest number of individuals died while they were adults (25-35 years old). This table also contains the same data presented as percentages rather than raw numbers, again showing a pattern of relatively high newborn and child mortality, followed by a decline in mortality until young adulthood, with a subsequent peak of death at adulthood, a decline in mature adults, and lastly another rise in the oldest age group, older adults. This pattern does not fit well with the expected pattern of mortality in a natural fertility, preindustrial agricultural population (Weiss 1977). The expected curve would show a high rate of mortality at the newborn and infant age ranges, a steady decline to young adulthood, and a slow rise to the peak of mortality at mature and older adulthood.

The difficulty with using this type of mortality curve is that it is based on cumulative aggregates representing multiple generations, so cannot be compared directly with life tables based on biological populations (Larsen 1997; Cadien et al. 1974). Additionally, the samples may not even be representative of all the individuals in the population over time. Some individuals may have been buried outside the limits of excavation; others could have died away from the village. To further complicate matters, recent work suggests that large numbers of subadults in a population may be more reflective of fertility and not increased infant mortality (Buikstra et al. 1986; Larsen 1997).

At Town Creek, the excavated burials cannot be treated as if they are representative of the average life expectancy, fertility, mortality, or any other measure for the simple fact that only a portion of the burials known to be present at the site have been excavated. Inclusion of individual in clusters of burials is clearly biased by status and descent groups or other culturally meaningful subgroups. The skeletal remains of young children are particularly subject to under-representation due to the fragility of the bones, and their greater sensitivity to post-depositional changes, such as soil acidity. It is likely that subadults are underrepresented in most excavated burial assemblages.

The biases inherent in the sample at Town Creek are best exemplified by looking at the ages at death by burial cluster. Specifically, the fact that 23 of the 60 burials of subadults (39%) are found in Cluster 7, the largest cluster at the site, to the northeast of the mound (see Figure 2-2). Fifteen of the 35 infants and newborns, or 43%, are found in Cluster 7. It seems plausible that an unknown number of subadult remains are missing from this assemblage, particularly if the hypothesis that the clusters represent the dead of particular kin groups. It is unlikely that no children died in the group that produced Clusters 10 and 20, for example. It is possible that the group that produced the burial assemblage in Clusters 1 and 7 had higher fertility, and thus a higher ratio of adults to subadults (Buikstra et al. 1986; Larsen 1997). However, it is equally plausible that the higher numbers of subadults in these clusters is due to their longer-term use. Cluster 7 appears to have been rebuilt in the same location multiple times, and may have received burials for several generations (discussed in detail in Chapter 6).

For the reasons outlined above, it seems unwarranted to attempt to create a demography of the excavated burials at Town Creek. There are simply too many unknown

cultural, preservation, temporal, and excavation-based biases at play. In the future, if better temporal control can be achieved, some of the confounding factors may be resolved to the point where hypotheses about mortality and fertility patterns may be made. For now, it is still helpful to look at patterns in the age at death by sex and status, but the lack of temporal control and other limitations to interpretation should be kept in mind.

Table 5-2. Number and percent of individuals in each age group. See Table 5-1 for age ranges and abbreviations.

Age Group	N	% of all aged individuals
NB	22	11
I	13	7
C	25	13
J	20	10
AD	10	5
YA	7	4
A	44	22
MA	20	10
OA	36	18
Total	197	100

Age at Death by Sex

Male and female ages at death are compared in Figure 5-1 as percentages of all sexed adults. Females in this population were more likely to die younger than males at the adolescent, young adult and adult age ranges. This is plausible, due to the higher rate of death in females due to the biological stress placed on the body during menstruation, pregnancy, and lactation. Male mortality surpasses female between adult and mature

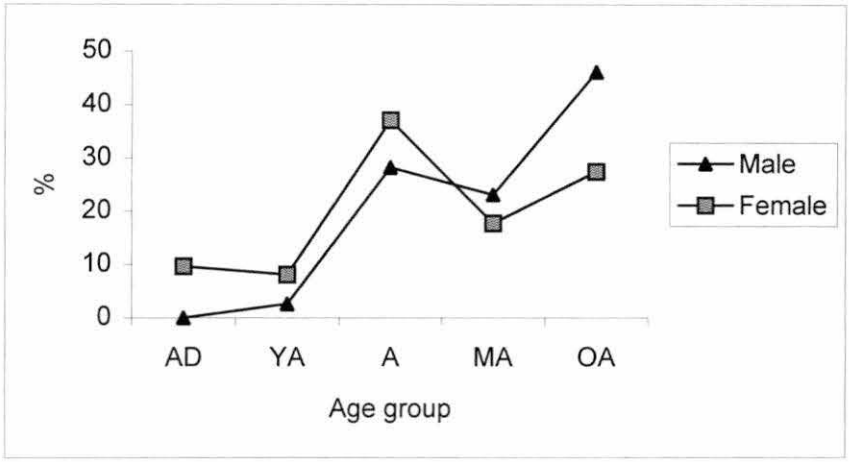

Figure 5-1. Percent of individuals in each age group by sex. See Table 5-1 for age group abbreviations.

adulthood, or around age 35. More males live longer to die at older ages than females, especially in the older adult age group. In fact, the peak of male deaths is over age 40, while it is between ages 25-35 for females.

BURIAL POSITION

Individuals at Town Creek were placed in a variety of positions. Table 5-3 presents the numbers of individuals in each position, broken down by age and sex. There are five types of burials: those on their backs, those on their side, those that are disarticulated, those prone, and children in urns. Fifty-five percent of the burials on their side were on the right side. Forty-two percent were on their backs, shoulders squared. Thirteen of these were fully extended; the rest had their legs drawn up to one side or the other with no apparent pattern to the position of the legs or arms. Of the extended burials, six are female, five are male, and two are children. Two of the females, one of the males, and one of the children had artifacts with them. Extended burials are found in many areas of the site, including pre-mound Cluster 1 and within the interior palisade, and Clusters 7 and 18 (Figure 5-2). All the artifacts found with extended burials are "shiny"; either copper or conch shell, except one child which in addition to conch shell, had perforated pebble beads. Only one, an adult male, has copper. Four individuals were in bundles, the other disarticulated individuals are fragments or isolated bones commingled with other burials, probably from disturbed burials.

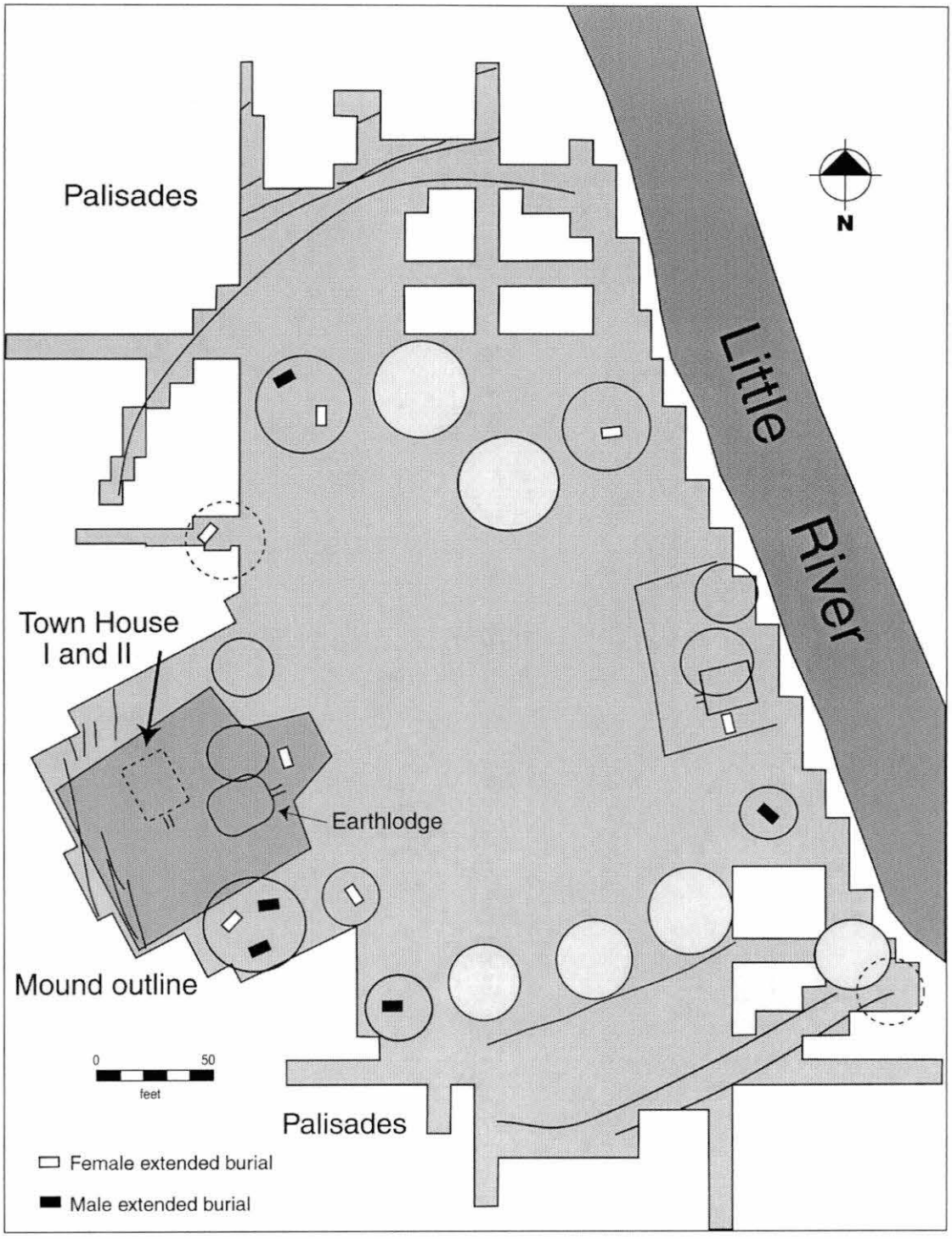

Figure 5-2. Schematic map of the location of extended adult male and female burials. This type of burial is uncommon at Town Creek.

Table 5-3. Burial position by age and sex.

	Back	Right Side	Left Side	Prone	Disarticulated	Vertical	Urn	Total
Male	22	10	9	1	2	0	0	44
Female	34	15	7	1	7	2	0	66
Subadult	21	10	8	1	2	0	13	55
Unknown sex adult	5	8	12	2	5	0	0	32
Totals	82	43	36	5	16	2	13	197
Percent	41.2	21.8	18.3	2.5	8.1	1	6.6	

Unknown position- 58

Age

Figure 5-3 presents burial position by age as a percent of all adults and all subadults. No adults were buried in urns, while 22% of the subadults were in urns (Figure 5-4). One subadult and four adults were prone, the rarest burial position. A larger percentage of adults than subadults were disarticulated. Similar proportions of adults and subadults were buried on their side or back, slightly more on their back for both age groups.

Sex

Figure 5-5 presents the percentages of males and females in each position. A slightly larger percentage of females, 53%, were buried on their back than males (50%). Both males and females were more likely to be buried on their back than in any other position. All four individuals that were definitely bundled were adult females. Two bundles were interred in Town House 2; the other two bundles predate the building of the mound. One premound bundle was interred in Cluster 1 and one was outside the earthlodge. A single deposition of at least four disarticulated individuals was excavated from north of the plaza area. There are at least two juveniles and two adults in this burial. Sex could not be determined for any of them. The bones do not appear to have been bundled before deposition, but all were skeletonized and disarticulated. Females were more likely to be disarticulated than males, with 11% of females disarticulated compared with 4.5% of males.

Status

Figure 5-6 shows the percent of individuals in each position that had artifacts buried with them. By far, subadults in urns have the highest percentage of individuals with artifacts

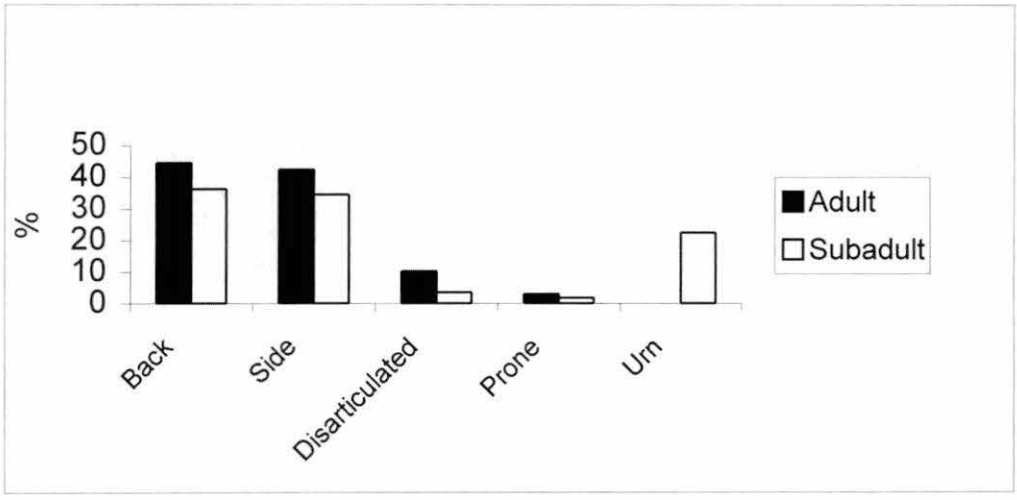

Figure 5-3. Burial position by age, expressed as a percent of all adults and all subadults with known burial position.

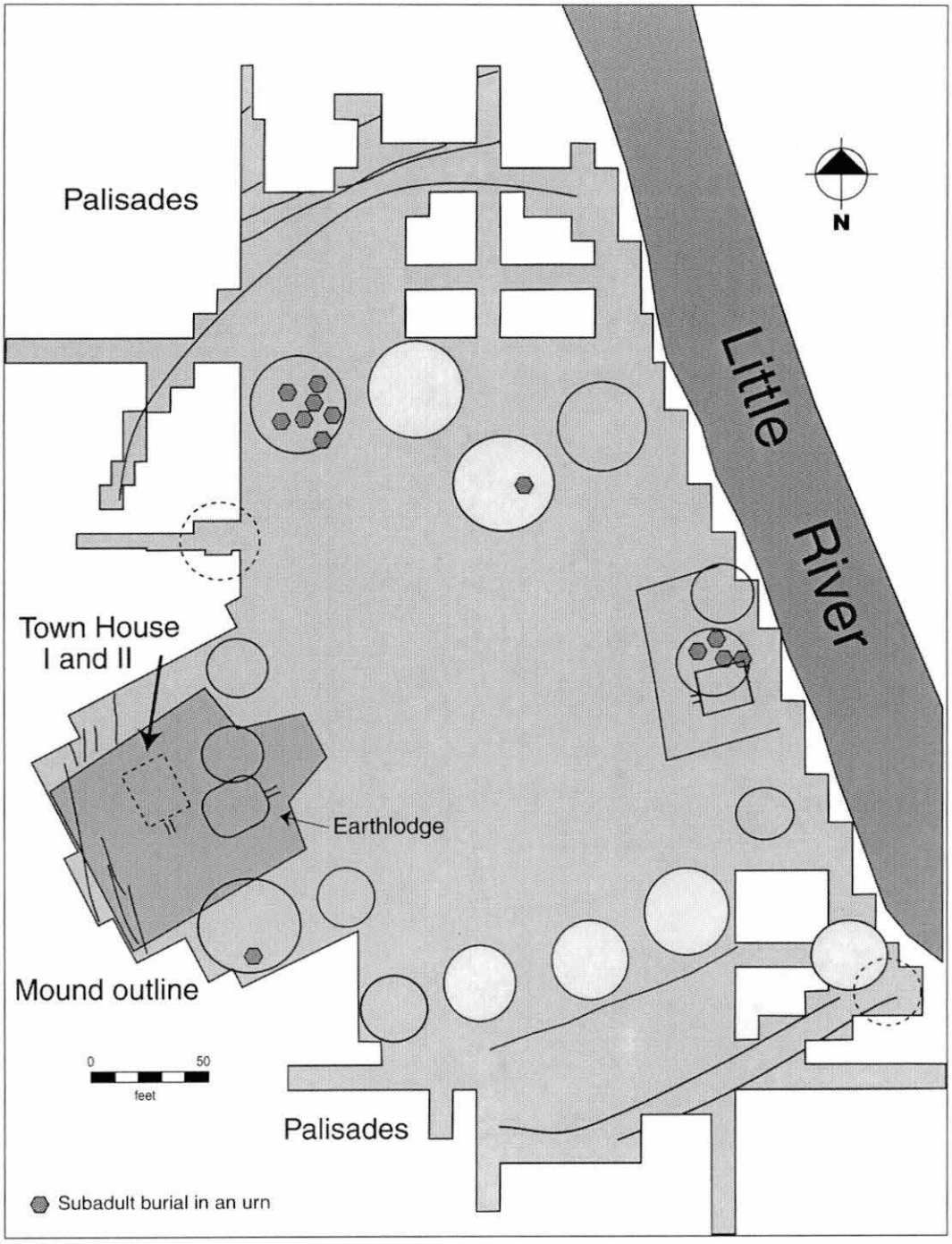

Figure 5-4. Schematic map of the location of urn burials. Twenty-two percent of the subadults at Town Creek were buried in urns. All but two of the thirteen subadults in urns were under the age of one year old at death. The remaining two were approximately 4 years old at death.

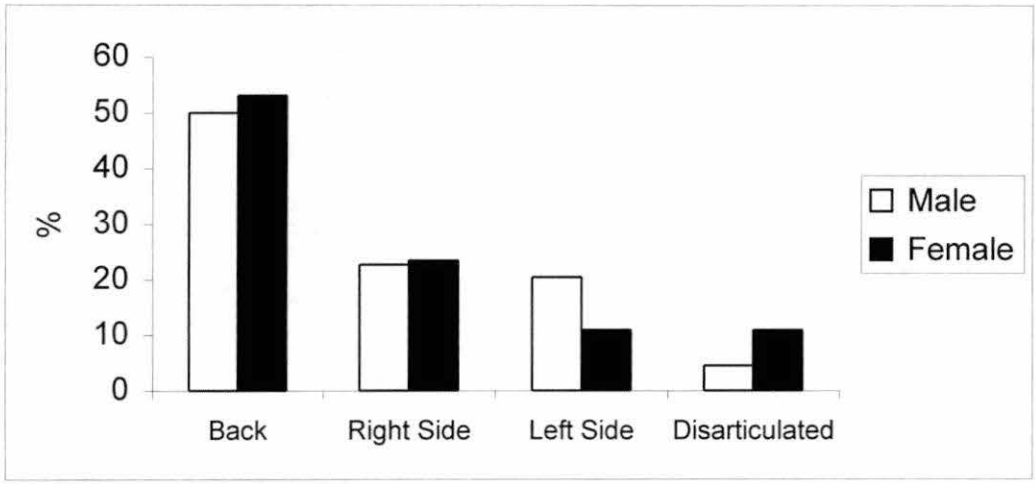

Figure 5-5. Percent of adults in selected burial positions by sex.

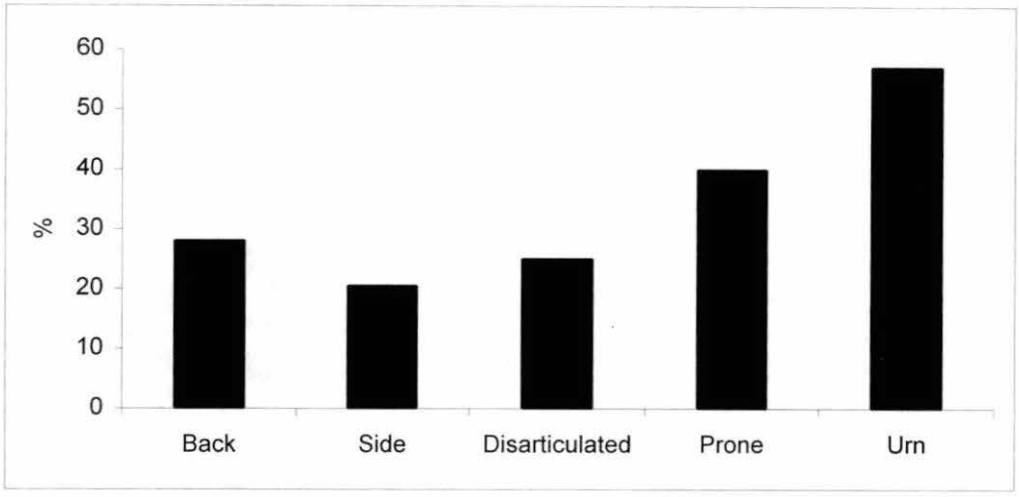

Figure 5-6. Percent of individuals with artifacts by burial position.

(eight out of 14, or 57.2%). The least common burial position, prone, has a high percentage of individuals with artifacts, but the percentage is most likely misleading in this case because the 40% is a result of two out of five prone burials containing artifacts. The sample size is too small to warrant firm conclusions. Somewhat more individuals interred on their backs had artifacts (28%, or 23 out of 82) than disarticulated or individuals buried on their side (20.5%, 16 of 78, and 25% or 4 of 16, respectively).

ORIENTATION

The orientation of the long axis of each burial pit was established, and the direction the head was pointed along that axis was recorded for each individual (Table 5-4).

Table 5-4. Orientation of the head.

	Male	**Female**	**Adult**	**% Adult**	**Subadult**	**% Subadult**	**Total**	**Percent Total**
North	10	13	26	19.5	6	6.8	32	14.5
Northeast	7	7	16	12	12	13.6	28	12.7
East	10	11	22	16.5	3	3.4	25	11.3
Southeast	3	3	8	6.0	3	3.4	11	5.0
South	5	8	14	10.5	6	6.8	20	9.0
Southwest	2	2	6	4.5	6	6.8	12	5.4
West	5	6	12	9.0	3	3.4	15	6.8
Northwest	2	5	8	6.0	7	8.0	15	6.8
Unknown	0	0	21	15.8	42	54.5	63	28.5
Totals	44	55	133		88		221	

Age

Fifty-four percent (64/112) of adults with known orientation are oriented to the north, northeast, or east. Forty-six percent (21/46) of subadults are oriented the same. North and northeast orientation puts the body in line (roughly) with the Little River. The cardinal points are represented more often than the in-between points, other than northeast. Sixty-six percent (74/112) of adults and 58.7% (27/46) of subadults are oriented towards the cardinal points. Subadults show more variation in orientation, but the mode is northeast. The mode for adults is for the head to be oriented towards the north.

Individuals interred on their backs showed an even stronger bias for north, northeast and east: 64% (50/78) were pointed in these directions. People on their right and left sides were similar in their orientations: 41% (16/39) of those on the right and 42.8% (15/35) of those on the left were in those directions. A higher percentage of right and left side interments were oriented to the cardinal directions: 59% (23/39) and 57% (16/35), respectively.

Sex

Males in general have a strong north, northeast, and east orientation: 61.4% (27/44). Females are slightly less likely to be oriented in those directions: 56.4% (31/55).

CRANIAL DEFORMATION

Many individuals at Town Creek exhibit intentional cranial deformation, almost always fronto-occipital (Table 5-5). Of the 79 individuals who could be evaluated for cranial

deformation, 60, or 76% had deformation of the fronto-occipital (FO) type. Individuals with occipital flattening were not included in this part of the analysis because it is unknown if the flattening is the result of deliberate artificial deformation, or other, inadvertent developmental processes such as cradle-boarding, or sleeping position. The small numbers of individuals without deformation is a problem for statistical hypothesis testing, particularly when poor preservation makes observation of particular indicators of health and nutrition impossible. However, general patterns can be seen in the data, and the differences indicated by these patterns are of particular interest in examining potential inter-regional interactions.

Table 5-5 Cranial Deformation

Category	N	Fronto-Occipital deformation	%	No cranial deformation	%
Unknown sex adults	15	7	46.7	8	53.3
Males	21	15	71.4	6	28.6
Females	40	33	82.5	7	17.5
Subadults	12	9	75.0	3	25.0
Total	76	55	72.4	21	27.6

Age

Three out of the 12 (25%) subadults that could be evaluated did not display cranial deformation. There are too few individuals to evaluate health and nutrition differences between these subadults. Only one subadult without deformation had any artifacts interred with him or her. This infant was buried wearing a garment with over 1650 marginella shell beads sewn onto it in Cluster 7. The burial is in a group with two other individuals, a newborn and an older adult female, who were also buried with marginella shell beads. These

three individuals are the only ones at Town Creek to be interred with marginella shell beads. Interestingly, the older adult female did have deformation.

Sixteen of the 67 adults who could be scored (23.8%) did not have cranial deformation. Three of the 16 (18.75) had artifacts interred with them, well below the average for the site.

Sex

Adult females without cranial deformation (n=6) have higher rates of linear enamel hypoplasia, tibia periostitis, cribra orbitalia and porotic hyperostosis, and lower caries rates when compared with females with deformation (n=34) (Table 5-6). None of the pairwise comparisons are statistically significant (p=.05), but the consistent result indicates a patterned difference in health and diet between these two groups whereby the females without deformation have poorer health and nutrition than the females with deformation. Males display a different pattern than females (see Table 5-7). The caries rate for males with deformation is slightly higher than those without deformation, but not as dramatic as the caries rate difference between the two groups of females. The rest of the health traits are mixed. Linear enamel hypoplasia rates are higher for males with deformation, but tibia periostitis and porotic hyperostosis rates are the same or very similar. Cribra orbitalia rates are much lower in males with deformation. This mixed pattern is more difficult to interpret because the small sample sizes may lead to skewed results. Males with and without deformation probably had similar health and nutrition.

Table 5-6 Health and nutrition data comparison for females by artificial cranial deformation.

	FO Deformation			No cranial deformation		
Pathology	N*	Present**	%	N*	Present**	%
Dental caries	502	218	43.4	110	27	24.5
Linear enamel hypoplasia	18	10	55.6	5	4	80
Anterior tibia periostitis	28	7	26.9	3	2	66.7
Cribra orbitalia	27	3	11.1	6	3	50
Porotic hyperostosis	31	6	19.4	4	2	50

*N for dental caries refers to the number of teeth that could be evaluated for caries. For all other traits, N refers to the number of individuals that could be evaluated.
** The values for this category refer to the number of individuals who display the trait, except for dental caries, where the number refers to the number of teeth with at least one caries.

Table 5-7 Health and nutrition data comparison for males by artificial cranial deformation.

	FO Deformation			No cranial deformation		
Category	N*	Present**	%	N*	Present**	%
Dental caries	188	79	42.0	175	59	33.7
Linear enamel hypoplasia	4	1	25.0	3	0	0.0
Anterior tibia periostitis	15	5	33.3	6	2	33.3
Cribra orbitalia	14	3	21.4	6	3	50.0
Porotic hyperostosis	16	4	25.0	7	2	28.6

*N for dental caries refers to the number of teeth that could be evaluated for caries. For all other traits, N refers to the number of individuals that could be evaluated.
** The values for this category refer to the number of individuals who display the trait, except for dental caries, where the number refers to the number of teeth with at least one caries.

Status

Nine of the 34 females (26.5%) with deformation had at least one artifact buried with them, while only one out of the six females (16.7%) without deformation had any artifacts buried with her. The artifact buried with this female were two olivella shell beads on a necklace. No other individual at Town Creek had olivella shell beads with him or her.

Only one male out of the seven (14.3%) without deformation had any artifacts in the burial, while only two of the 17 (11.8%) males with deformation had artifacts. This means there was little difference between the proportion of males with artifacts in each group, but both groups are much less likely to have artifact inclusions than females, either with or without deformation. The one male in the non-deformed group was unique in several ways. First, he had the only copper axe, or copper tool or any type. Second, he was buried in an extended position, and is in a high status Cluster 14 along the riverbank. Of the other six, four were buried in Cluster 7, the largest cluster at the site, and the other two were buried in Cluster 18, across the plaza from Cluster 7.

Males and females without cranial deformation do not appear in the same burial clusters, except Cluster 14, which had one male and one female (3-050 and 3-042), each the only ones of their sex with burial inclusions, each with a unique mortuary item, the olivella beads with the female, and the copper axe with the male. The male is in an extended position, and in line with other burials forming a circle within the structure. The female is an adolescent, and falls slightly outside the circle, but was probably within the structure.

The spatial patterning of individuals without deformation does not appear to be random (Figure 5-7). Seven of the 19 (36.8%) individuals who were not buried inside structures were non-deformed, including two of the subadults. Four males without

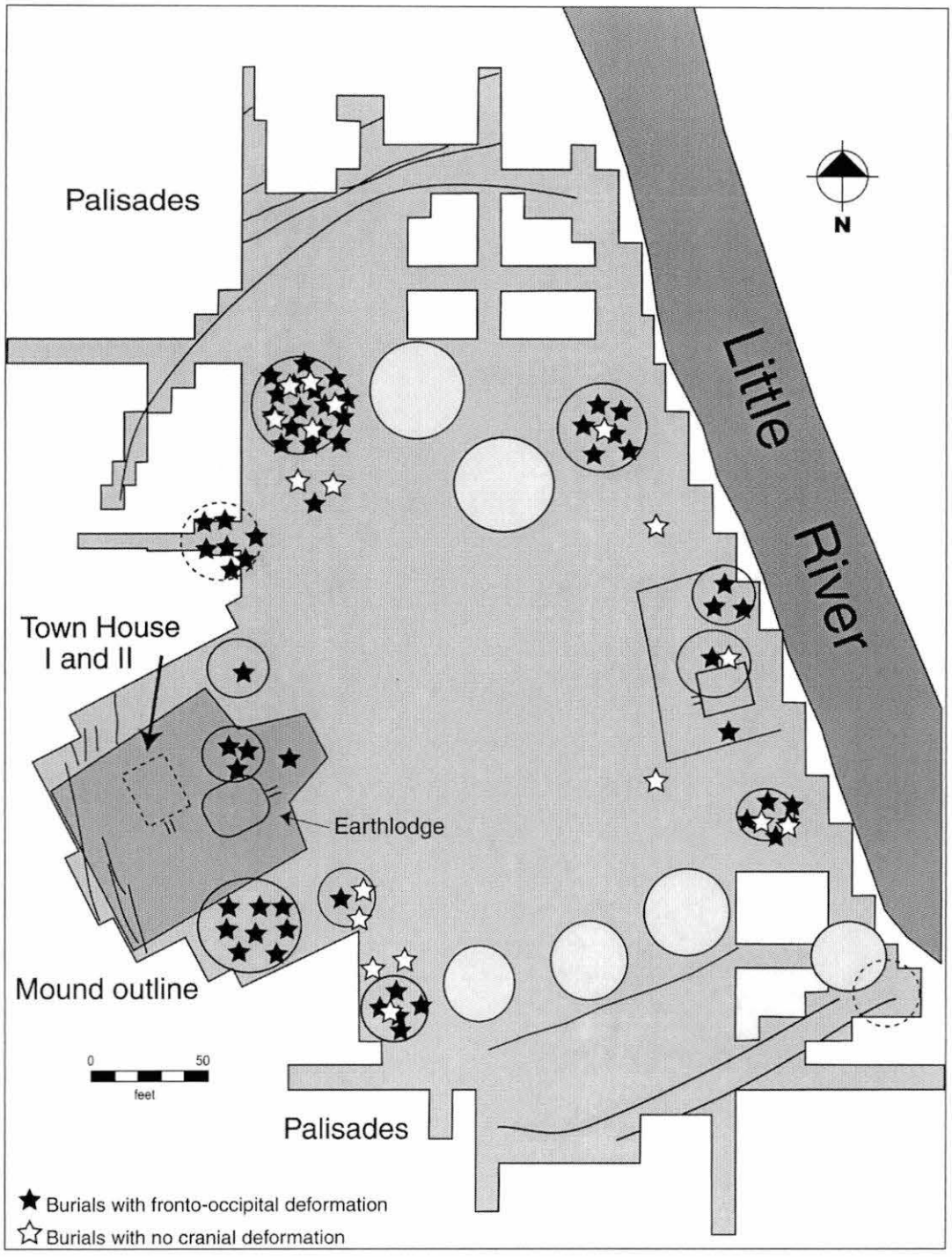

Figure 5-7. Schematic map of the location of individuals with and without artificial cranial deformation. Males and females without cranial deformation do not appear in the same cluster except for cluster 14, to the south of the walled enclosure along the river.

deformation were buried in Cluster 7, and one infant. Two females were buried in Cluster 2 near the mound. One unknown sex adult was buried in each of Clusters 18 and 10; one female was buried in Cluster 12. One male and one female were buried in Cluster 14, the only cluster that contained both males and females without deformation.

GRAVE GOODS

The presence or absence of any artifacts can be used as a rough indicator of status. An unfortunate reality of this type of analysis is that it is quite likely that perishable grave goods such as feathers, garments, foods, flowers, and other biodegradable grave offerings were placed in the burial with the individual, but are archaeologically invisible. Therefore, any analysis of the distribution and patterning of non-perishable grave goods is likely to under-represent the individuals with grave goods, creating an artificial dichotomy. However, it is still possible to draw conclusions about the distribution and patterning of certain artifacts, and more tentative conclusions about grave goods in general. In this section, burials are first divided into two groups. Those with artifacts are considered higher status than those without. Experimentally, I removed those individuals with very few artifact associations (such as a single bead) but found that those few individuals did not appear to change the results of the analyses described below. In order to avoid potentially biased decisions concerning which and how many artifacts are necessary to categorize an individual as high status, I decided to include all individuals with artifacts in the same category. Overall, 23.75% of all individuals at Town Creek had at least one non-perishable artifact in the burial. After discussing this rough estimate of status, a description of the distribution of selected artifacts is presented, and finally, each burial cluster is considered separately.

Table 5-8. List of all burials containing artifacts.

Burial	Age Range	Age	Sex	Cluster	Artifacts
2-002a	NB	NB	Y	1	22 large columella barrel shell beads (1 string)
2-006	40+	OA	M	3	76 columella segment shell beads double strand around neck, 6 turkey bone scratchers near right elbow
2-007	30+	A	F	4	shell beads (not on burial form, but indicated in scale drawing)
2-013	25-35	A	F	1	1 triangular CSPP by raised left hand
2-033	21+	A1	U	2	2 triangular CSPP lay .3' to the left of the skull, tips pointed NE,
2-034	30-40	MA	M	2	1 columella cylinder/barrel conch shell bead near cervical verts
2-035	?	I	Y	2	6 shell bead casts in soil in urn
2-038	30+	MA	F?	5	copper object near right ear, stains only. Green stain also on ribs, L temporal/parietal/occipital near asterion
2-043	3mos+/-2	NB	Y	E	14 columella barrel shell beads by skull and thoracic region- 1 strand
2-044	4+/-1	C	Y	4	58 columella segment shell beads around neck and R side, 22 columella barrel/cylinder shell beads at L wrist, 2 perforated pebble beads at L arm, 17 columella barrel/cylinder shell beads at R ankle, and 1 columella barrel/cylinder shell bead at L ankle
2-046	2y+/-8m	I	Y	4	6 flat, 2-holed diamond shaped shell pendants beneath skull
2-047	40+	OA	U	5	fragments of beaten copper, possibly an ornament on back of L shoulder
2-048	35+	MA	F	TH2	conch columella shell hair pin at south end of burial
2-059	21+	A1	M?	TH1	2 "rattles"- piles of "rattle stones" (1 by head, one by pelvis), 2 mica sheets- "buttons" or gorgets lying by middle of back, 2 CSPPs by feet, 10 large columella segment shell beads around forearms, 9 small columella barrel beads, 1 red ochre lump by feet
2-060		A1	U	TH1	1 "rattle" near forehead, 3 pieces of mica near the back of the neck

3-005	18+/-3	YA	F	11	4 nested conical perforated shell gorgets at L side of skull, quartz pebbles (gourd rattle?) next to knees
3-006	30+	A	U	12	1 pottery disc
3-007	18mos+/- 6	NB	Y	11	7 columella shell barrel/cylinder beads around neck
3-019	35+/-5	MA	M	12	10 columella segment shell beads, 2 columella segment shell beads, one at each wrist
3-020	?	A1	M	12	mica fragment near shoulder, 1 "elbow" burnished clay pipe in front of skull, quartzite pebbles from rattle above skull, 4 cspp above skull, shell beads near skull, 1 raccoon skull near skull, I columella segment shell beads
3-023	18-25	YA	F?	12	10 columella segment shell beads around L elbow, 10 columella segment shell beads at R wrist, Mica frags on lumbar vertebrae
3-024	?	I	Y	12	12 large columella segment shell beads, necklace?, 18 large columella sgement shell beads in bottom of urn
3-025	4+/-1	C	Y	12	8 small columella cylinder/barrel shell beads necklace
3-033	25+	A1	F?	12	2 stone ear discs
3-036	1.5+/-6m	I	Y	13	2 Copper-covered wooden ear spools, 2 wooden rattles with stone pellets, 2 perforated pottery discs
3-037	25-35	A	F	13	4 shell earpins in L ear, 1 copper-covered wooden ear spool in R ear, 98 columella segment shell beads around both wrists, R ankle, neck
3-042	15-17	AD	F	14	2 large olivella shell beads
3-043	20-30	A	F	14	engraved circular shell gorget with excised triangles and incised circles at neck, string of 23 columella barrel shell beads around neck, 1 shell disc near verts
3-050	35+/-6	MA	M	14	1 copper axe l ilium, 20 cut shell columella segment beads at neck
3-051	4-5y	C	Y	HIST	24 glass trade beads, 2 cut shell disk beads
3-052	1y+/-3m	NB	Y	HIST	24 glass trade beads, 1 perforated copper gorget, 31 cut shell disk beads
3-057	25-35	A	M	20	1 "elbow" clay pipe by jaw, 1 quartzite scraper by L elbow, green stain on temporals, necklace of 1 copper bead, 1 shell beads and 1 copper pendant by neck, split cane matting

3-058	?	J	Y	20	1 tubular copper bead near skeleton
3-065	20-30	A	U	0	6 columella segment shell beads by neck
3-068a	?	I	Y	9	Engraved circular shell gorget with excised triangles, 9 columella segment shell beads
3-070	40+	A	F?	10	1 large pecked celt blank
3-075	12+	A	U	9	Rectangular greenstone hammerstone at L heel
3-084	25+/-4	A	U	0	29 columella segment shell beads at neck
3-086	37+/-6	MA	F	7	1 bone awl
3-088	2y+/-8m	C	Y	7	String of 154 columella segment shell beads at neck
3-092	50+/-10	OA	M	7	1 copper gorget at neck
3-094	2.5y+/-10m	C	Y	7	40 columella segment shell beads at mandible, 33 columella segment shell beads at pelvis- garment
3-097	NB	NB	Y	7	31 small tubular shell beads
3-100	12	J	Y	7	71 large columella barrel shell beads at neck, 37 columella segment shell beads at ankles,7 columella segment shell beads at neck
3-108a	8+/-2	J	Y	7	1 sand-tempered, simple stamped (herringbone) jar and 1 small corn cob impressed bowl
3-111	1.5+/-6m	I	Y	7	2 small conch shell gorgets, 17 shell beads necklace, 266 faceted shell beads ("like early trade beads") on garment
3-117	35-45	MA	F	7	2 plain shell gorgets by L arm
3-119	35+/-5	MA	F	7	15 large columella barrel/cylinder shell beads at neck, 25 columella segment shell beads
3-120	2y+/-8m	C	Y	7	15 large columella segment shell beads at neck, 1 rhyolite chipped celt, 3 columella segment shell beads
3-121	9m+/-3m	NB	Y	7	132 large columella segment shell beads at neck
3-122	2y+/-8m	C	Y	7	84 columella barrel shell beads at neck and ankles
3-123	40+/-5	OA	F	7	2 marginella shell beads
3-124	6m+/-3m	NB	Y	7	20 marginella shell beads, 1 columella segment shell beads, 1 bone bead
3-124a	1y+/-6m	I	Y	7	1657 marginella shell beads- probably on a garment, 92 clay beads 317 columella segment shell beads

3-135	>30	MA	M	18	1 obtuse angle stone pipe, 1 steatite tubular stone pipe, 1 carved steatite amulet (human face) by waist
3-138	12+/-2.5	J	Y	6	1 elbow form clay pipe near legs, 32 columnella segment shell beads at neck
3-147	45+	OA	F	18	Dan river style small pot (jar), textile impressed, local paste

Age

The burials of subadults are more likely to contain artifacts than adults. Figure 5-8 breaks down artifact presence by age category. Six of the 23 (26%) newborns and two of the seven (29) young adults have artifacts. Both have a slightly higher than average (24%) percentage of artifacts. Infants and mature adults have far above average percentages of individuals with artifacts. Seven of 13 infants (54%) and ten of 20 mature adult burials contained at least one artifact. Adolescents and older adults have a far below average percentage of individuals with artifacts. Only one of ten adolescents (10%), and two out of 36 mature adults (6%) had any artifacts. Juveniles and children have a slightly lower than average percentage. Nine of 14 juveniles (21%) and six of 25 children (24%) had artifacts interred with them.

Children in urns have columella shell beads if they have any artifacts (7/13 or 54%). Only one infant in an urn has any artifact other than columella shell beads. Burial 3-124 has marginella shell beads and one bone bead. Burial 3-124 is unusual also in that it is with only two other burials at the site that contained marginella shell beads; all three are in same vicinity in Cluster 7. Twenty subadults had artifacts (32.8%). Of these, 19 had conch shell artifacts, only three (15% of those with artifacts, 5% of all subadults) had anything other than conch shell beads or gorgets.

Sex

Figure 5-9 shows the percent of males and females in each age group with artifacts. The pattern for females is different from that of males at younger ages, but parallels males

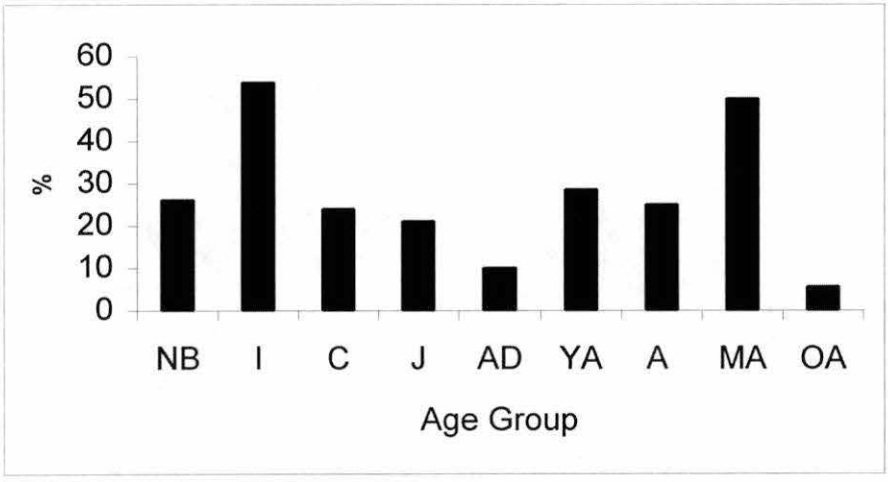

Figure 5-8. Age and artifact presence, expressed as the percent of individuals in each age group buried with at least one artifact. For age group abbreviations, see Table 5-1.

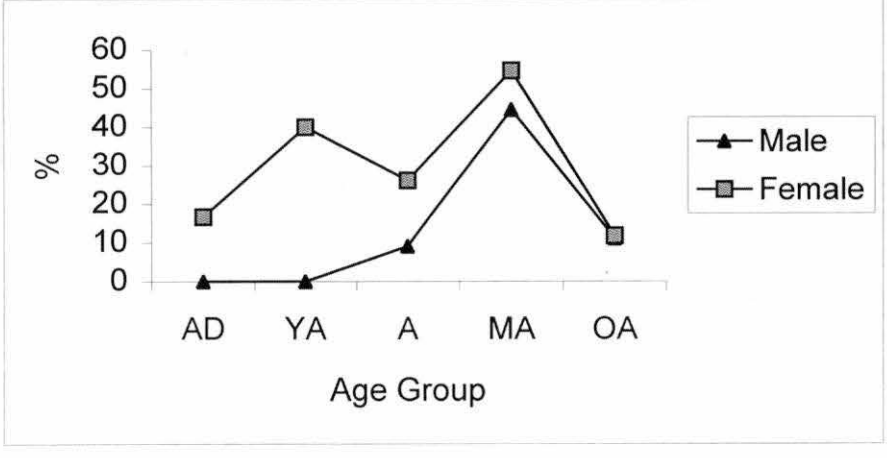

Figure 5-9. Percent of adults buried with at least one artifact by age group and sex. For age group abbreviations, see Table 5-1.

for the mature adult and older adult age categories. The percentages and numbers for each age and sex category are presented in Table 5-9. The sample sizes for adolescents and young adults are particularly low, and are therefore not as reliable as the three older age groups. For both males and females artifact percentage peaks at the mature adult age group. 44% of mature adult males and 55% of mature adult females were buried with artifacts. Older adults have the lowest percentages of artifacts for both males and females: 11% for males and 12% for females. Females have higher percentages of individuals with artifacts than males in all age groups, with an overall percentage of 27% for females, compared with 18% for males.

Table 5-9. Sexed adults with artifacts.

Age	Male	Female	Males with artifacts	Females with artifacts	Percent of males with artifacts	Percent of females with artifacts
AD	0	6	0	1	0.0	16.6
YA	1	5	0	2	0.0	40.0
A	11	23	1	6	9.1	26.1
MA	9	11	4	6	44.4	54.5
OA	18	17	2	2	11.1	11.8
Totals	39	62	7	17	17.9	27.4

Spatial Distribution of Selected Artifacts

The distribution of several types of artifacts is particularly illustrative of the differences between males and females, adults and subadults, and high and lower status individuals. These include copper artifacts, conch columella shell beads and gorgets, mica sheets, wooden rattles, and clay and stone pipes. The age, sex, and spatial distribution of each of these artifact types are discussed below.

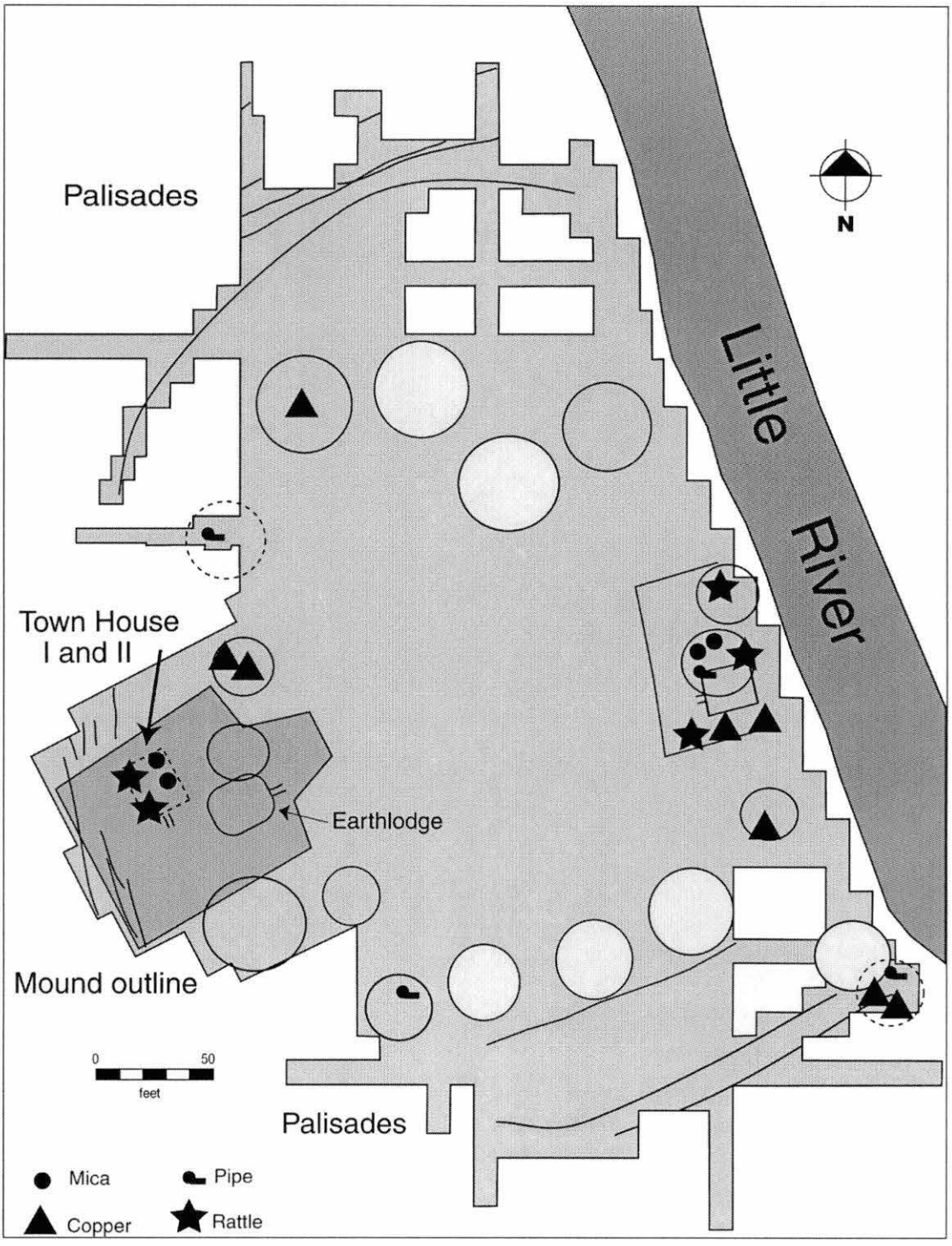

Figure 5-10. Schematic map of the location of selected burials goods: copper and mica artifacts, rattles, and stone and clay pipes. Mica and rattles appear only with burials in the mound and in the walled enclosure along the river. Copper and pipes are more widely distributed.

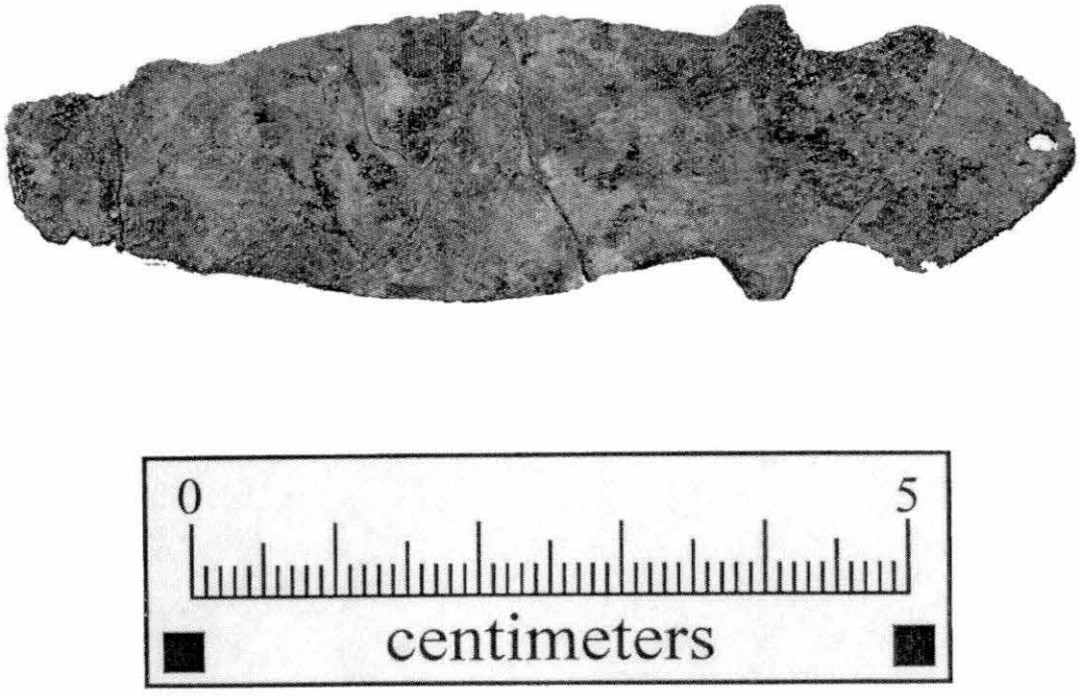

Figure 5-11. This copper ornament or pendant was found in Cluster 20 on cane matting by the neck of burial 3-057, an adult male aged 25-35 years at death.

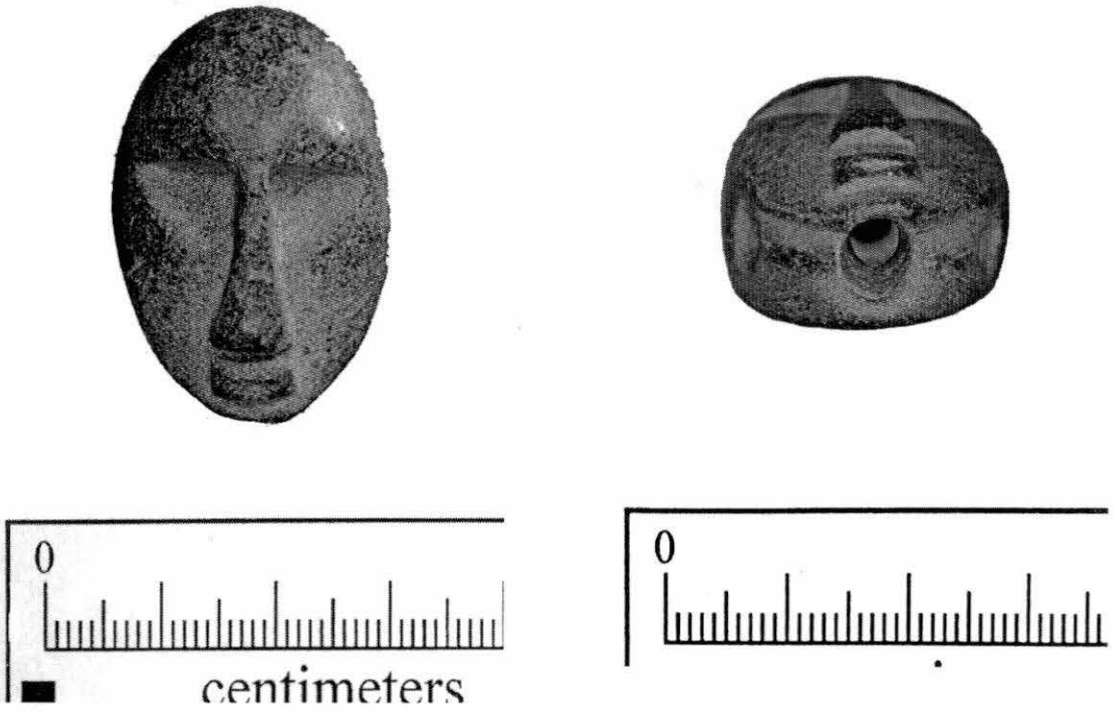

Figure 5-12. Carved steatite "amulet" in the form of a human face, with holes drilled in the bottom, sides, and top. The back is hollow. This artifact was found in Cluster 18 by the waist of burial 3-135, a mature adult male (over 30 years old at death.

Copper

Eight individuals had copper objects with them (Figure 5-10). The three males with copper had a gorget, a "pendant," (see Figure 5-11) and an axe. The two females had copper ear ornaments. Only two subadults had copper, 3-036, an infant associated with extended burial 3-037 (2 copper-covered wooden ear spools), and a juvenile with a copper bead. No males had ear ornaments; no females or infants had tools or necklaces. Copper is found in several locations at the site. Burials containing artifacts were placed within the interior palisade across from the mound, in Cluster 7 to the north (right) of the mound, underneath the mound, and in a cluster to the south (left) of the mound.

Mica

Only adults are interred with mica sheets. Mica is only located in two places in the site (Figure 5-10). Mica appears in the mound in two of the three burials associated with Town House 1, and directly across from the mound in Cluster 12 along the riverbank. Three of the four adults with mica also have "rattles" with them.

Rattles

Four individuals had "rattles" made of carved wood, perhaps covered with copper in one instance. The presence of a rattle was inferred from the discrete piles of small rocks in several cases in which the wooden rattle had disintegrated. This inference is somewhat suspect, but the pattern of distribution of these inferred rattles is consistent with the distribution of other artifacts such as mica, lending more confidence to the interpretation of these piles as rattles. Rattles appear only in the mound or across from the mound in the

burials of three adults and one infant (3-036) (Figure 5-10). The infant was interred in Cluster 13, and is associated with extended burial 3-037.

Pipes

Four individuals had stone or clay pipes with them (Figure 5-10). Three had clay pipes. One, a mature adult male, had both clay and stone pipes. No spatial pattern is evident in the distribution of these artifacts, other than the fact that they are widely scattered. Of the four individuals with pipes, three are adult males and one is a juvenile. The three adult males with pipes all also each had a unique, presumably high status items with them. Burial 3-020 also had mica, conch shell beads, a rattle, and a raccoon skull. Burial 3-057 had a copper "pendant", a quartzite scraper, and a copper bead. Burial 3-135 had both a stone and a clay pipe, as well as a steatite amulet of a human face (see Figure 5-12). All three were flexed, with two interred on their left side and one on their right side. The juvenile was also flexed, on the left side, and had conch shell beads.

Marine shell

Shell grave goods are ubiquitous at the site (Figure 5-13). Almost 70% of the individuals who had any artifacts with them at all had conch shell columella beads. Forty-six percent of the burials with artifacts contained only shell artifacts. Figure 5-13 demonstrates that Cluster 7 is unusual in the high number of individuals with shell (n=16). Ten of these 16, or 63%, had only shell beads.

Five individuals had shell gorgets with them (the most complete is shown in Figure 5-14). Of these five, three were with women, one was a child, and the other with an unknown

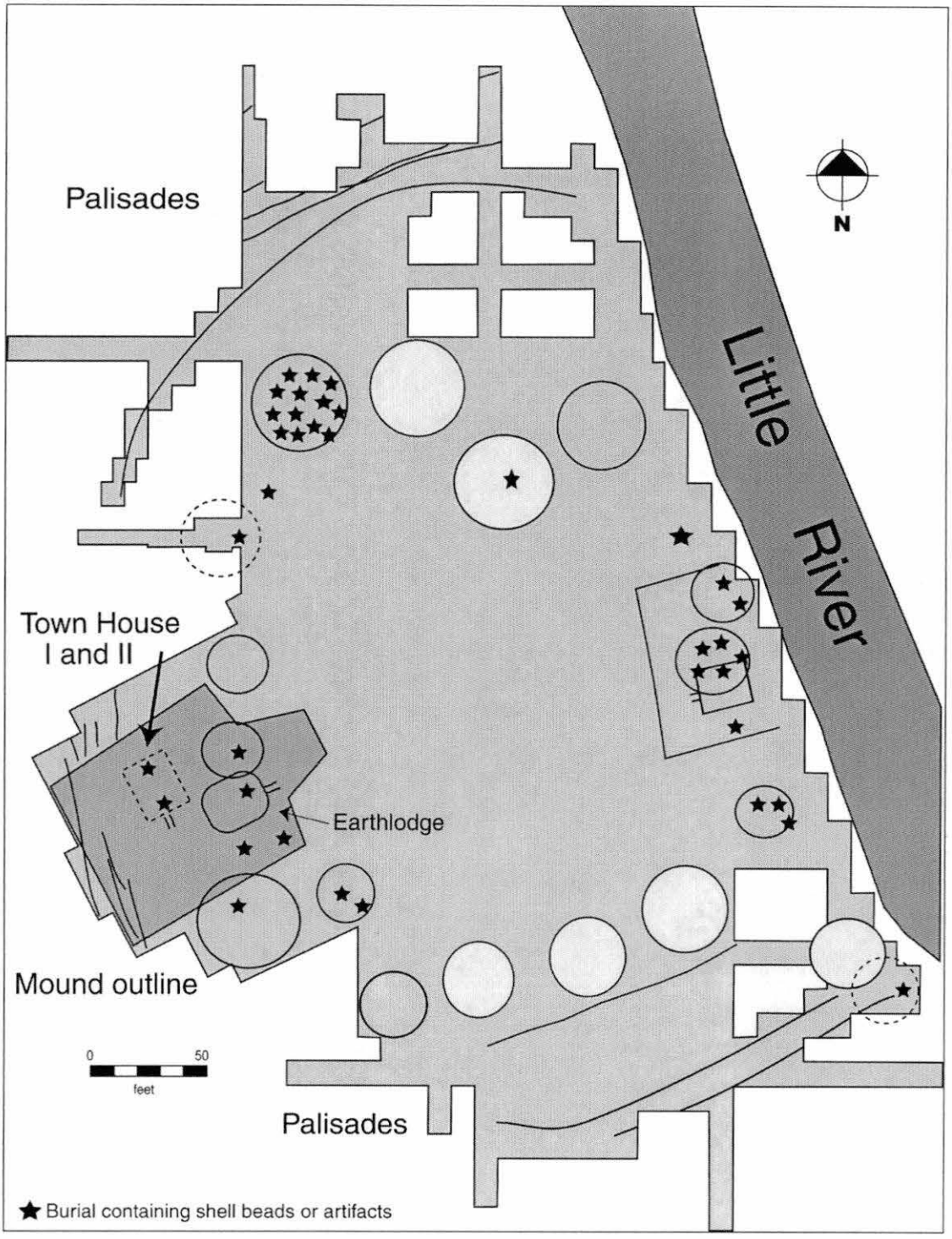

Figure 5-13. Schematic map of the location of burials containing shell beads or artifacts. Shell is the most common type of artifact found in burials at Town Creek.

Figure 5-14. Engraved circular conch shell gorget with excised triangles and two incised concentric circles in center. This artifact was found in Cluster 14 with burial 3-043, an adult female aged 20-30 years at death.

age and sex individual. Two of the individuals with gorgets were in Cluster 7. The other three were in clusters along the river, across from the mound.

Three individuals had marginella shell beads interred with them. All three of these individuals are buried very close to one another in Cluster 7. These three include an adult female, an infant in an urn, and a child. (Burials 3-123, 3-124, and 3-124a). Two infants and one child were interred wearing garments decorated with shell beads. All three were in Cluster 7. Two of the three garments were decorated with columella shell beads, and one with over 1650 marginella shell beads. The rest of the shell beads interred with individuals appear to have been worn as strings in necklaces, anklets, or bracelets.

High Status Grave Goods

Although the presence of any grave good may indicate status, certain burials have large numbers of artifacts, or artifacts made of rare, non-local material that set them apart and distinguish them as higher status than others with artifacts. Forty-six percent of the individuals with artifacts had only shell beads or artifacts with them. While marine shell is non-local, it appears to have been widely available. Copper, mica, and rattles, on the other hand, have a more restricted distribution, described above. Stone and clay pipes are very rare at the site, as are conch shell gorgets. Together, these five artifact types (conch gorgets, mica sheets, copper artifacts, stone and clay pipes, and rattles) are considered here to represent membership in the highest elite stratum. These artifacts are present in the burials of seventeen individuals. Nine of these individuals are found in just two places: the mound and the area within the inner palisade along the riverbank. Mica and rattles appear in five burials, found only in the burials in the mound and along the riverbank. Distribution of these rare

artifacts conforms well to expectations about the location of elite burials, and supports the link between the mound and the area inside the inner palisade as elite areas.

Burial Clusters

The number of individuals in each cluster of burials varies, but there is a natural break in the numbers at about ten. Seven clusters have eight or fewer individuals, while eight have ten or more individuals. Clusters in the village with more than ten individuals are analyzed here because the larger sample size presents patterns that are more robust. In other words, the clusters with very small numbers of burials are harder to interpret because small differences take on greater significance than may be warranted. In this section, a brief description of the average number of individuals with artifacts, and the number of artifact types is provided for each burial cluster with more than ten individuals, plus the burials in or near public structures. The proportion of individuals in each cluster with and without artificial cranial deformation is also included in this description. Finally, each cluster report includes a description or table of the artifact types found in these selected clusters.

The burials in clusters in or near public buildings are also included in this analysis because these individuals exhibit special treatment that may be related to status, and therefore are important to this discussion. Table 5-10 presents the number of individuals, the number of individuals with artifacts, the percentage of individuals with artifacts, and a summary of the number of artifact types (NAT), and the NAT divided by the MNI for the clusters. Indicators of health and nutrition are evaluated for large clusters below in the section that describes the bioarchaeological data.

Table 5-10 Artifacts in selected clusters of burials

Cluster	N	Number of individuals with artifacts	Percentage of individuals with artifacts	NAT	NAT/N
0	32	2	6.3	1	3.1
1	29	2	6.9	2	6.9
2	11	3	27.3	2	18.2
6	19	1	5.3	2	10.5
7	47	16	34.0	13	27.6
12	21	7	33.3	9	42.9
18	16	2	12.5	3	18.8
Town House 1	3	2	66.7	6	200.0
Town House 2	2	1	50.0	1	50.0
Earthlodge	3	1	33.3	1	33.3

Group 0

This set of burials is called Group 0 because it is not a spatial cluster, but rather the burials that do not fall within a structure and are not associated with a public structure, like Clusters 3 and 13. These burials are in groups of no more than three individuals. Several of the burials contain multiple, disarticulated individuals. Only 6% or 2 of the 32 individuals in this group have artifacts. Each of the two has only a single string of conch columella shell beads, so the NAT is only one for this group. Two of the three subadults without cranial deformation (67%) and five of the 16 adults (31%) without deformation are part of Group 0. Overall, seven of the nine individuals who could be evaluated (78%) did not have cranial deformation.

Cluster 1

Cluster 1 is partially under the mound; therefore, the individuals interred there probably died before the construction of the mound, earlier in the occupation of the site. All of the individuals who could be scored had cranial deformation. Only two individuals out of the 29 had artifacts (7%). One adult female had a triangular projectile point interred by her raised left hand, and one newborn had a string of conch columella barrel beads interred in the burial urn with him or her. Burial urns are not counted as grave goods, and the NAT for this cluster is two.

Cluster 2

Cluster 2 contains 11 individuals. Two of the three (67%) which could be evaluated did not have cranial deformation. Three individuals (27%) had grave goods. One adult of

unknown sex had two triangular projectile points interred near the left side of his or her head, a mature adult male had one conch columella barrel bead near the back of his neck, and an infant in an urn had at least six shell beads (only casts of the shell remained). The NAT for Cluster 2 is two.

Cluster 3

Cluster 3 contains three burials, two older adult males, and one adult female, located near the earth lodge. These burials are arranged in a diagonal line running southeast to northwest outside the southern wall of the earthlodge. Two of the burials are wholly or partially under the embankment for the earthlodge. Coe (1995) determined that these three burials predate the construction of the earthlodge. The burials do not seem to be associated with a particular structure. The female and one of the males had no artifacts. The second male burial contained a double strand of 76 conch columella shell beads and a unique artifact that Coe (1995:238-239) interprets as a "bone scratcher." This artifact consists of six sharpened turkey long bone segments arranged beside each other such that the sharpened edges are aligned in a row. Similar artifacts have been found at the Mulberry site in South Carolina, containing from six to ten sharpened splinters (Ferguson 1974). Originally described as "bone-combs," both Ferguson (1974) and Coe (1995) attribute these artifacts to bloodletting rituals. Coe (1995:239-240) cites Mooney's (1890) account of a pre-ballgame ritual scratching that took place among the late ninteenth-century Cherokee in Western North Carolina, in which the bone comb is referred to as a "kanuga." The kanuga is described as being made of turkey bone, with seven sharpened splinters of leg bones affixed to a frame made of turkey quill (Mooney 1890). The ritual of bloodletting, referred to as the "ordeal of

scratching" (Mooney 1890), involved scratching the arms, chest, and back of young men before participation in the game. The young men, after treating the bleeding scratches with herbs, plunged into water to rinse before dressing for the game (Culin 1907).

None of these three individuals could be evaluated for cranial deformation. The percentage of individuals with artifacts is 33.3%, and the NAT is two.

Cluster 6

Cluster 6 contained at least 19 individuals, but the entire cluster may not have been excavated. The cluster is located on the edge of excavations and the area around it has not been excavated. Only one individual (5%) had any artifacts. This individual, a juvenile, had an elbow-form clay pipe and a string of conch columella segment beads interred with him or her. All of the individuals who could be evaluated had cranial deformation. The NAT for Cluster 6 is two.

Cluster 7

This cluster is the largest at the site, containing 47 individuals. Sixteen of these individuals (34%) had artifacts interred with them, one of the highest percentages at the site. The number of artifact types is also impressive. Thirteen types of grave goods are found in this cluster. These are listed in Table 5-11. The NAT for Cluster 7 is 13. Five of the 22 individuals (23%) who could be evaluated had no cranial deformation.

Cluster 7 is unusual in several respects. First, it has the largest number of individuals interred in it. The structure associated with this group appears to have been rebuilt in the same place several times. Many of the later burials disturbed earlier ones as the skeletonized

remains of earlier burials were pushed aside to make room for new burials. There is also a discrete group of three individuals, an older adult female, a newborn, and an infant which are the only burials at the site to contain marginella shell beads with them. The female and the newborn have low numbers of the beads, but the infant was interred wearing a garment to which over 1657 marginella shell beads had been sewed. Additionally, the only bone tool, copper gorget, ceramic jar, corncob impressed bowl, and clay beads found in burials are found in Cluster 7.

Table 5-11. Artifact Types in Cluster 7

Artifact Types in Cluster 7
Conch columella segment beads
Conch columella barrel beads
Garment decorated with shell beads (conch or marginella)
Marginella shell beads
Copper gorget
Bone awl
Small conch columella barrel beads
Sand-tempered, simple stamped (herringbone) jar
Small corn cob impressed bowl
Small conch shell gorgets
Bone bead
Clay beads
Rhyolite chipped celt

Cluster 12

Twenty-one individuals were interred in Cluster 12. Cluster 12 overlaps with an earlier circular structure and a later rectangular structure. The majority of the burials appear to be associated with the earlier, circular structure, and follow the outline of that dwelling. However, two burials are clearly outside this structure, and six burials are in the area where the two structures overlap. Mica appears in a burial in this overlap area, but is also is in a

burial clearly associated with the earlier structure. This could indicate that the burials in the overlap area are associated with the circular structure. There is no way to differentiate them at this time with any confidence; therefore, all are considered part of Cluster 12, and not a specific structure. At this time, I think it is likely that most of the burials are associated with the earlier round house, because all three of the other rectangular structures at the site (the earthlodge and two townhouses) had no more than three burials in them. The round structures tend to have larger numbers of burials in them. Table 5-12 presents a list of the nine artifact types associated with this cluster. The two burials that could be evaluated for cranial deformation were evenly divided.

Table 5-12 Artifact Types in Cluster 12.

Artifact Types in Cluster 12
Pottery disc
Conch columella segment shell beads
Mica fragments
Projectile points
"elbow" form burnished clay pipe
Rattle
Raccoon skull
Conch columella barrel shell beads
Stone ear discs

Cluster 13

Cluster 13 consists of a loose grouping of burials located between the southern edge of the interior palisade and the southern wall of the rectangular structure along the riverbank. The relationship between the burials, the palisade, and the structure is unknown, but none overlap the others. Two of the burials appear to be associated with one another more

strongly than the other three. These two burials consist of an adult female (3-037) and an infant (3-036). Both of these burials contain similar artifacts, and are positioned close together. The other three burials include an older adult male, an adolescent, and an individual of unknown age and sex. None of these three burials contained any artifacts, nor could they be evaluated for cranial deformation.

Burials 3-036 and 3-037 contained a number of rare, exotic artifacts. The infant was buried with two copper-covered wooden ear spools, two wooden rattles with stone pellets, and two perforated pottery discs. The adult female had four shell earpins in her left ear, one copper-covered wooden ear spool in her right ear, and 98 conch columella segment shell beads around both wrists, her right ankle and neck. The adult female had fronto-occipital deformation. The percentage of individuals with artifacts for this group is 40%, and the NAT is five.

Cluster 18

Cluster 18 is near what Coe referred to as the "Yadkin Hearth," a feature containing fire-cracked rock, stone chips, animal bones, pottery fragments, and dark fill. Coe interpreted this as a large ring of overlapping hearths associated with an earlier, Yadkin period, occupation of the site (1995:90). Coe considered some of the burials in the vicinity to be part of a Pee Dee mortuary, but others that were flexed on their sides to be later, Siouan period burials (1995:90). The main evidence Coe cites for the interpretation of the burials as Siouan and therefore not Pee Dee appears to be the presence of a Dan River pot in a burial with an adult female, stone pipes in a burial with an adult male, and the fact that some of the burials are flexed on their sides. Because Dan River ceramics overlap with Pee Dee ceramics

temporally, and because there are other flexed burials at the site, I do not consider these burials to be later, intrusive Siouan burials. There are several clearly Historic burials at another part of the site which contain Historic period artifacts like glass beads, and are interred in shaft and chamber burial pits. The evidence Coe (1995) cites is not compelling. A final bit of evidence is that five of the six of the individuals who could be scored display fronto-occipital cranial deformation, clearly a Pee Dee trait.

Cluster 18 contains 16 individuals, but only two (12.5%) burials contain any artifacts. These artifacts are the carved stone pipes and the Dan River pot mentioned above, a NAT of three. One of the six individuals (16.67%) who could be scored did not have cranial deformation.

Public Buildings

The first townhouse built atop the mound, like the earthlodge covered by the mound, and the second townhouse, all contain small numbers of burials. Given the less common architecture and the special location of all of these structures, and the rectangular structure along the riverbank, it is likely that these structures were centers for public ritual and may have been the dwellings of the elite. Therefore, people interred within these structures are thought to be elite or religious specialists. The fourth probable public building, the only other rectangular, trenched-entrance structure at the site, also contained burials, but it is unknown which burials are associated with it, and which are associated with the earlier, round structure which it overlaps. Therefore, those burials cannot be considered here.

Town House 1

Town House 1 contained two burials, and a third burial was found at the same level to the south of the structure. One burial, an adult probable female (2-061), is located directly to the north of the central hearth in a rectangular pit that had a posthole in each corner. Some type of light structure seems to be deliberately associated with this burial. No artifacts were associated with her, however. The second burial (2-059) is located directly to the west of the hearth. The edges of this burial are not as distinct, so it is unknown if there were postholes at the corners. This individual, an adult probable male, was interred in a flexed position with a large number and variety of grave goods, including two "rattles" inferred from the piles of "rattle stones" by the head and pelvis, two mica sheets or gorgets lying by middle of back, two projectile points by the feet, ten large columella segment shell beads around his forearms, nine small columella barrel beads, and a red ochre lump by his feet. The third individual (2-060) is an adult of unknown sex. This individual was buried outside the double-walled structure to the south, near the trenched entrance. There are at least two postholes in the eastern corners of the rectangular pit. The other edge of the pit is indistinct. This individual was interred with one "rattle" near the forehead, and three pieces of mica near the back of the neck.

All three individuals were in poor condition, and cranial deformation could not be scored for any of them. The NAT for the three is six, and the percentage of individuals with artifacts is 66.67%.

Town House 2

The second structure built on the mound contained two individuals. Both are adult females and both were interred as disarticulated bundles. One (2-048) was interred within

the burned debris of the second townhouse. The other (2-049) was buried outside the structure to the south, close to the trenched entrance, in a very similar location to burial 3-060. Burial 3-048 was interred with a conch shell hairpin. As above, the burials were in too poor condition to determine cranial deformation.

Earthlodge

Three subadults were interred in the northeast corner of the earthlodge, close to that corner's large support post. All three were newborns. One burial contained a string of 14 conch columella barrel beads while the other two contained no artifacts. These burials could not be evaluated for cranial deformation.

HEALTH AND NUTRITION

In this section, I describe the results of seven measures of individual health and nutrition by the age, sex, and status of the individuals who could be evaluated for these criteria. I also describe health and nutrition for the large clusters described above.

Dental caries

Dental caries comparisons produced some of the most robust statistical inferences and patterned difference between individuals by age, sex, and status due to the large sample sizes available. All teeth for each comparison were added together, and percentages of carious teeth were obtained for each group. Additionally, the percentage of individuals with caries was also computed in some instances.

Age

Adults have a higher caries rate than subadults, both by percent of teeth and of individuals with at least one carious tooth, as expected with this age-dependent pathological condition. Nearly 90% of the adults (89%) and 37% of the subadults had at least one carious lesion. Thirty-seven percent of adult teeth were carious, while only ten percent of subadult teeth were carious (Table 5-13).

Table 5-13. Carious lesion data for whole site.

Category	Scoreable individuals	Scoreable teeth	Teeth with at least one carious lesion	Individuals with at least one carious tooth	Percent carious teeth	Percent of individuals affected
Male	33	534	181	27	33.9	81.8
Female	44	712	294	42	41.3	95.5
Adults	83	1368	512	74	37.4	89.1
Subadult	54	728	73	21	10.0	38.9
Total	147	2253	636	105	28.2	71.4

Sex

Males have a lower percentage of both carious teeth and individuals with caries compared with females. Eighty-two of males had at least one carious lesion, compared to 96% of females. For males, 34% of their teeth were carious, while 41% of females' teeth were carious. This result is also expected. There is a trend for females in agricultural societies to have a higher caries rate (Larsen 1997). Females have both the highest numbers

of individuals with at least one carious tooth, and the highest overall caries rate, compared to males.

Status

There are differences between males and females, adults and subadults by status as well. Because the numbers of individuals is smaller, only percentages of carious teeth are presented. Table 5-14 presents the data for caries rates by status.

The difference between individuals with and without artifacts is negligible when the whole population is compared. 28.7% of the teeth of individuals with artifacts were carious, compared with a 28.6% rate for the teeth of individuals without artifacts. However, there are several significant differences between males, females, and subadults by status.

The caries rate for adults with artifacts is 34.6%, and slightly higher at 38.6% for adults without artifacts (Table 5-17). Subadults with artifacts actually have a higher caries rate, 18% compared to 5% for subadults without artifacts, a statistically significant difference (chi square, df=1, p=.0009) (Table 5-16). The largest difference in caries rate by age or sex is between males with artifacts and males without artifacts (Table 5-18). The caries rate for males with artifacts is 19%, lower than any other group of adults. The rate for males without artifacts, 37.6% is still lower than the rate for either females with artifacts (47%) or those without artifacts (38%). The difference between males by status approaches statistical significance (chi square, df=1, p=.00619). While many of the comparisons by status reveal that those individuals with artifacts had lower caries rates than those without artifacts, females show the opposite pattern.

Table 5-14. Carious lesion data for individuals with artifacts.

	Scoreable teeth		Teeth with caries		Percent carious teeth	
Category	With artifacts	Without artifacts	With artifacts	Without artifacts	With artifacts	Without artifacts
Male	111	444	21	167	18.9	37.6
Female	209	649	98	247	46.8	38.1
Adults	376	1119	130	432	34.6	38.6
Subadult	110	172	20	8	18.2	4.7
Total	549	1667	158	478	28.7	28.6

Table 5-15. Injury description by individual, cranial injuries first.

Burial	Cluster	**Age**	**Sex**	**Element and injury**
2-026	1	Older adult	Male	Healed depression fracture on the left side of the frontal.
3-050	2	Mature Adult	Male	Healed mandible body injury on the left side, possible fracture with subsequent infection.
3-084	0	Adult	Undet.	Healed depression fracture on the frontal.
3-146	18	Older adult	Male	Healed depression fracture on the right side of the frontal.
2-004	1	Older adult	Male	Healed injury of the left proximal ulna-probable fracture.
2-025	1	Older adult	Female?	Partially healed fracture of the distal right tibia shaft.
2-029	1	Older adult	Female?	Healed fracture of the left distal tibia shaft.
2-034	2	Mature adult	Male	Severe fracture of the right proximal ulna with subsequent infection and arthritis resulting in fusion of the right proximal radius and ulna. Elbow was probably non-functional. Infection was still active at time of death.
3-019	12	Mature adult	Male	Healed fracture of the right femur proximal shaft.

3-042	14	Adolescent	Female?	Healed fractured middle and distal phalanges of the foot- one toe.
3-046	14	Older adult	Male	Healed fracture of the left superior facet of the 1st lumbar vertebra, partly healed severe deltoid muscle pull on the left humerus.
3-047	14	Adolescent	Undet.	Healed lesion on left femur on the proximal diaphysis. Possible incomplete fracture.
3-125	7	Older adult	Male	Green schist chipped stone projectile point embedded in the lamina of the 5th thoracic vertebra, protrudes into neural arch. Probable cause of death, no indications of healing.

Skeletal Trauma

Several individuals at Town Creek displayed skeletal indications of trauma or injury. Table 5-15 lists the individuals and their injury.

Age

Two adolescents display postcranial injuries, while ten of the 13 individuals with traumatic injuries lived to be over 30 years old at death. Overall, this is 5.6% of the subadults that could be scored for trauma. The other 11 individuals with trauma comprise 16.2 % of the individuals who could be scored. A statistical comparison of adults and subadults with trauma reveals that the difference by age is not significant (Fishers test, p=.27).

Sex

It is of note that of the four individuals with cranial injuries, three are male, and one is of undetermined sex. More males than females display postcranial injuries as well. A total of eight of the 13 (61.5%) individuals with injuries are male, while only three (23%) are female. Overall, 30% of the males had skeletal trauma, compared to only 7% of the females, a statistically significant difference (Fishers test, p=.039). Both individuals with forearm trauma are male, but these injuries are not typical of "parry" fractures, or fractures resulting from using the forearm to protect the face from a blow. The cranial and forearm injuries do not coincide on the same individuals either, making it less likely that these two types of injuries result from the same cause of interpersonal violence (Larsen 1997). Both forearm injuries may be due to trauma to the elbow. Both individuals with tibia fractures are female. The individual with the embedded projectile point is male.

Table 5-16. Individuals with skeletal trauma by age and sex.

Category	N Scoreable	N with Trauma	% with trauma
Male	27	8	29.6
Female	42	3	7.1
Adult	74	12	16.2
Subadult	18	1	5.6
Total	92	13	14.1

Status

Males with artifacts had a much higher percentage of trauma (60%, 3 out of 5) than males without artifacts (23%, 5 of 22) (Table 5-17). This difference is statistically significant (Fishers test, p=.016). Females with artifacts were also more likely to have trauma (8%, 1 out of 12) than those without artifacts (7, 2 out of 30), but in both cases the percentages are very low, and much lower than the males. Generally, adults with artifacts are more likely to have trauma (26%, 5 out of 19) than adults without artifacts (12.7%, 7 out of 55). No subadults with artifacts displayed trauma, 11% of those without artifacts (1 out of 9) had trauma. There appears to be a consistent association between trauma and status, as measured by artifact presence, although the difference is not statistically significant, due to the small sample sizes. The trend is apparent, however.

Table 5-17. Skeletal trauma and status.

	Scoreable Individuals		Individuals with Trauma		Percent Trauma	
Category	With artifacts	Without artifacts	With artifacts	Without artifacts	With artifacts	Without artifacts
Male	5	22	3	5	60.0	22.7
Female	12	30	1	2	8.3	6.7
Adults	19	55	5	7	26.3	12.7
Subadults	9	9	0	1	0.0	11.1
Total	45	116	9	15	20.0	12.9

Linear Enamel Hypoplasia

Age

Individuals who died as subadults are nearly twice as likely to have linear enamel hypoplasia as adults (see Table 5-18). 36% (21 of 39) of adults had at least one canine with a hypoplastic line, compared to 77% (20 of 26) subadults (Table 5-20). Because only subadult teeth that were completely formed were considered, age should not have a significant effect on this trait. This difference is statistically significant (chi square, p=.059).

Sex

Females have a percentage of linear enamel hypoplasia (63%, 17 of 27) more than three times as high as that of males (20%, 2 of 10). This result is also statistically significant (Fishers test df=1, p=.02), even though the number of males with linear enamel hypoplasia is very low (Table 5-21).

Table 5-18. Linear enamel hypoplasia by age and sex

Caetgory	N scoreable individuals	N individuals with at least one hypoplastic line	% individuals with LEH
Male	10	2	20
Female	27	17	62.9
Adults	39	21	36.3
Subadult	26	20	76.9
Total	65	41	63.1

Table 5-19. Linear enamel hypoplasia by status.

	Scoreable individuals		Individuals with LEH		**Percent LEH**	
Category	With artifacts	Without artifacts	With artifacts	Without artifacts	With artifacts	Without artifacts
Male	2	8	1	1	50.0	12.5
Female	6	25	3	17	50.0	68.0
Adults	9	33	5	18	55.6	54.5
Subadult	3	6	0	5	0.0	83.3
Total	13	54	6	38	46.2	70.3

Status

The pattern of linear enamel hypoplasia and status is different for males and females. Males with artifacts have a higher percentage of linear enamel hypoplasia (50%, or 1 of 2) than males without artifacts (12.5%, or 1 of 8) (Table 5-19). Conversely, females with artifacts have a lower percentage of linear enamel hypoplasia (50% or 3 of 6) than those without artifacts (68%, or 17 of 25) (Table 5-23). None of the three subadults with artifacts that could be evaluated for hypoplasia had any hypoplastic lines, while five of the six subadults without artifacts (83%) had at least one line. None of the differences in linear enamel hypoplasia rates by status are statistically significant ($p<.05$).

Anterior Tibia Periostitis

Age

Subadults (28%, or 7 of 25) have a much lower percentage of periostitis than adults do (36%, or 29 of 80) (Table 5-19). Over a third of the adults who could be scored for periostitis of the tibia were affected, a high percentage.

Sex

Anterior tibia periostitis affected a greater percentage of adult females than adult males, with 40.5% (17 of 42)of the females who could be scored showing signs of healed or active periostitis. Only 34% (11 of 32) of the males who could be scored showed periostitis.

Status

None of the five scoreable subadults with artifacts showed signs of periostitis, while two of the eight without artifacts had periostitis (25%) (Table 5-21). These samples are too small for statistical comparisons. For both males and females, a higher percentage of those with artifacts are affected by periostitis than those without artifacts. 28% (8 of 29) of males without artifacts had periostitis, compared with 80% (4 of 5) of males with artifacts. Females with artifacts had a periostitis rate of 40% (6 of 15) while 35.5% of females without artifacts had periostitis. In the case of males, the percentage of individuals with artifacts with periostitis is more than twice that of males without artifacts, and even though the sample size is very small the results are statistically significantly different (Fishers test, p=.042).

The pattern of individuals with artifacts having a higher percentage of periostitis than those without holds true for all comparisons, lending more confidence to the categories with very small sample sizes, but only the difference between males is statistically significant.

Table 5-20. Anterior tibia periostitis by age and sex.

Category	N Scoreable Individuals	N individuals with periostitis	% individuals with periostitis
Male	32	11	34.4
Female	42	17	40.5
Adults	80	29	36.3
Subadults	25	7	28
Total	105	36	34.3

Table 5-21. Anterior tibia periostitis by status.

	Scoreable individuals		Individuals with periostitis		Percent periostitis	
Category	With artifacts	Without artifacts	With artifacts	Without artifacts	With artifacts	Without artifacts
Male	5	29	4	8	80.0	27.6
Female	15	31	6	11	40.0	35.5
Adults	22	62	10	18	45.5	29.0
Subadult	5	8	0	2	0.0	25.0
Total	27	70	10	20	37.0	28.6

Cribra Orbitalia

Age

Subadults demonstrate a higher rate of cribra orbitalia than adults do. Eleven of the 57 scoreable adults (19%) had active or healed lesions, while six of the 22 (27%) of the subadults had lesions. This difference is not statistically significant ($p<.05$) (Table 5-22).

Sex

Males exhibit higher cribra orbitalia rates than females. Twenty-three percent (5 of 22) males had cribra orbitalia lesions, while 16% (5 of 31) females displayed the lesions. This difference is also not statistically significant ($p<.05$).

Status

The numbers of individuals with artifacts that could be scored for cribra orbitalia are very low (Table 5-23). Adults with artifacts have higher rates of cribra orbitalia (36%, or 5 of 14) than those without artifacts (17% or 8 of 47), and the result approaches statistical significance (Fishers test, $p>.13$). Subadults show the opposite pattern. Subadults without artifacts had half the cribra orbitalia rate (30% or 3 of 10) of those with artifacts (17% or 1 of 6).

The numbers of males and females with artifacts is very low. However, the differences between females with artifacts (50% or 4 of 8) and those without artifacts (14.8% or 4 of 27) are statistically significant (Fishers, $p=.059$). Overall, individuals with artifacts

were more often affected by cribra orbitalia (30% or 6 of 20) than those without artifacts (19.3% or 11 of 57).

Table 5-22. Cribra orbitalia by age and sex.

Category	N Scoreable Individuals	N individuals with cribra orbitalia	% individuals with cribra orbitalia
Male	22	5	22.7
Female	31	5	16.1
Adults	57	11	19.3
Subadults	22	6	27.3
Total	79	17	21.5

Table 5-23. Cribra orbitalia by status.

	Scoreable individuals		Individuals with cribra orbitalia		Percent cribra orbitalia	
Category	With artifacts	Without artifacts	With artifacts	Without artifacts	With artifacts	Without artifacts
Male	5	19	1	5	20	26.3
Female	8	27	4	4	50	14.8
Adults	14	47	5	8	35.7	17.0
Subadult	6	10	1	3	16.7	30.0
Total	20	57	6	11	30.0	19.3

Porotic Hyperostosis

Age

The percentage of adults and subadults affected by porotic hyperostosis is similar (Table 5-24). 15 of 62 adults (24%) had porotic lesions, while 26% (5 of 19) subadults had the lesions.

Sex

The percentage of males and females affected by porotic hyperostosis is also similar, with females having a slightly higher rate. 20% of males (5 of 25) had porotic hyperostosis, while 23.5% of females (34 of 78) had the lesions.

Status

None of the three subadults with artifacts who could be scored were affected by porotic hyperostosis (Table 5-25). For adults, the percentage of individuals affected by porotic hyperostosis was virtually the same, regardless of status (27% with artifacts and 26% of those without artifacts). None of the five males with artifacts who could be scored were affected. Females with artifacts had a higher percentage of porotic hyperostosis (33%, or 3 of 9) than those without artifacts (25%, or 7 of 28). Overall, individuals with artifacts had a lower percentage of porotic hyperostosis (22%) than those without artifacts (27%). None of the comparisons approaches statistical significance.

Table 5-24. Porotic hyperostosis by age and sex

Category	N Scoreable Individuals	N individuals with porotic hyperostosis	% individuals with porotic hyperostosis
Male	25	5	20.0
Female	78	34	23.5
Adults	62	15	24.2
Subadults	19	5	26.3
Total	81	20	24.7

Table 5-20. Porotic hyperostosis by status.

	Scoreable individuals		Individuals with porotic hyperostosis		Percent porotic hyperostosis	
Category	With artifacts	Without artifacts	With artifacts	Without artifacts	With artifacts	Without artifacts
Male	5	21	0	6	0.0	28.6
Female	9	28	3	7	33.3	25.0
Adults	15	50	4	13	26.7	26.0
Subadult	3	9	0	3	0.0	33.3
Total	18	59	4	16	22.2	27.1

Stature

Stature was estimated for each individual where possible from maximum femur length. Table 5-26 presents the data for average lengths, stature, and standard deviations for males and females.

Sex

Male and female average femur length and stature estimation is shown in Table 5-27. Males are, on average, 9.45 cm taller than females, a statistically significant difference (Students t-test). Figure 5-15 shows the boxplot of the values for males and females.

Status

Average stature for males with and without artifacts was very similar, as it was for females (see Table 5-28). Figure 5-16 shows that the midspread of males with artifacts is restricted compared with those without artifacts, although the means are not significantly different. Males with artifacts were somewhat shorter than the male average (Figure 5-17), while those without artifacts were slightly taller. Females show the opposite pattern. Figure 5-18 shows the boxplot comparing the stature of females with and without artifacts. The range for females with artifacts is much wider than that for males. Figure 5-19 shows that females without artifacts were shorter than average while those with artifacts were slightly taller than average.

Table 5-26. Stature by sex.

	Male	Female
Average Femur length (cm)	45.96	42.87
Average Stature	170.24	160.79
Average Standard Deviation for Stature	5.16	5.85

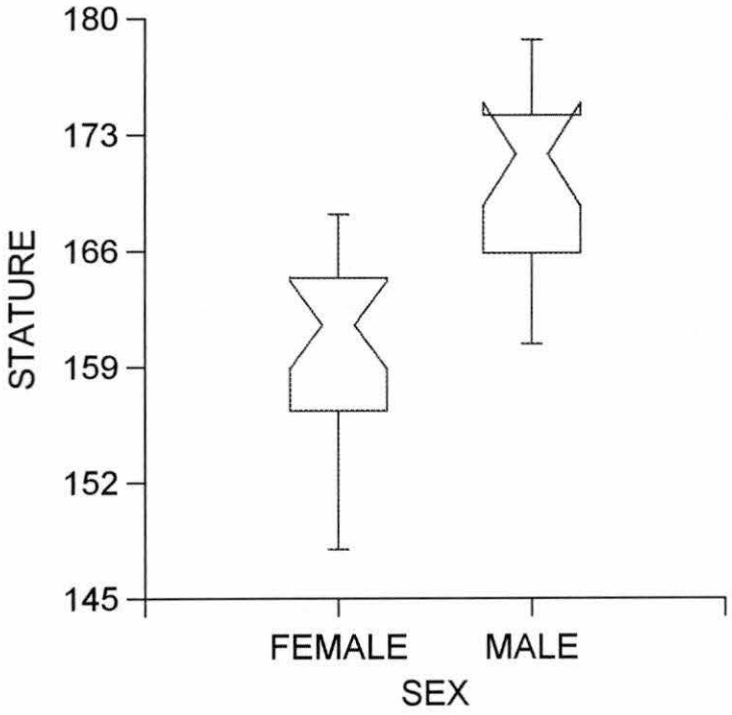

Figure 5-15. Boxplot of female and male stature.

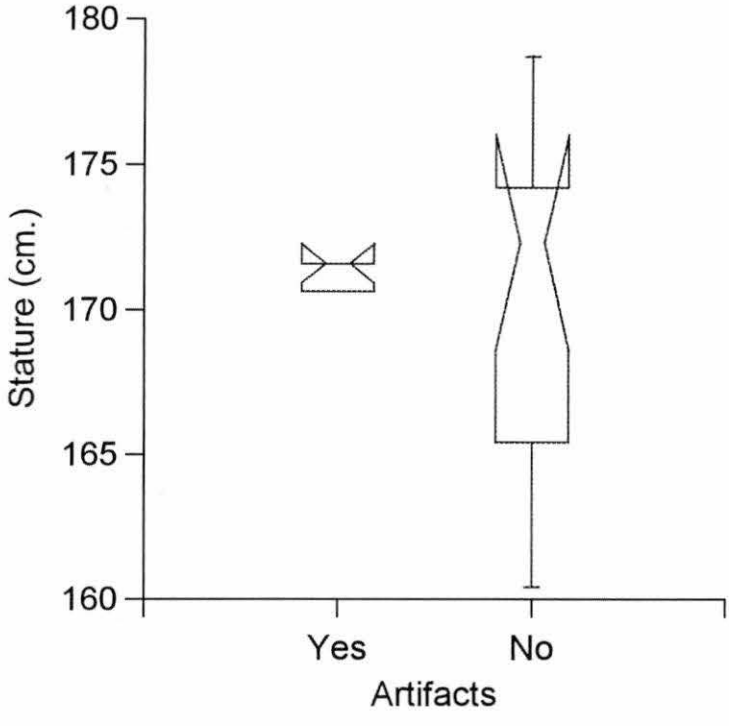

Figure 5-16. Boxplot of male stature by status.

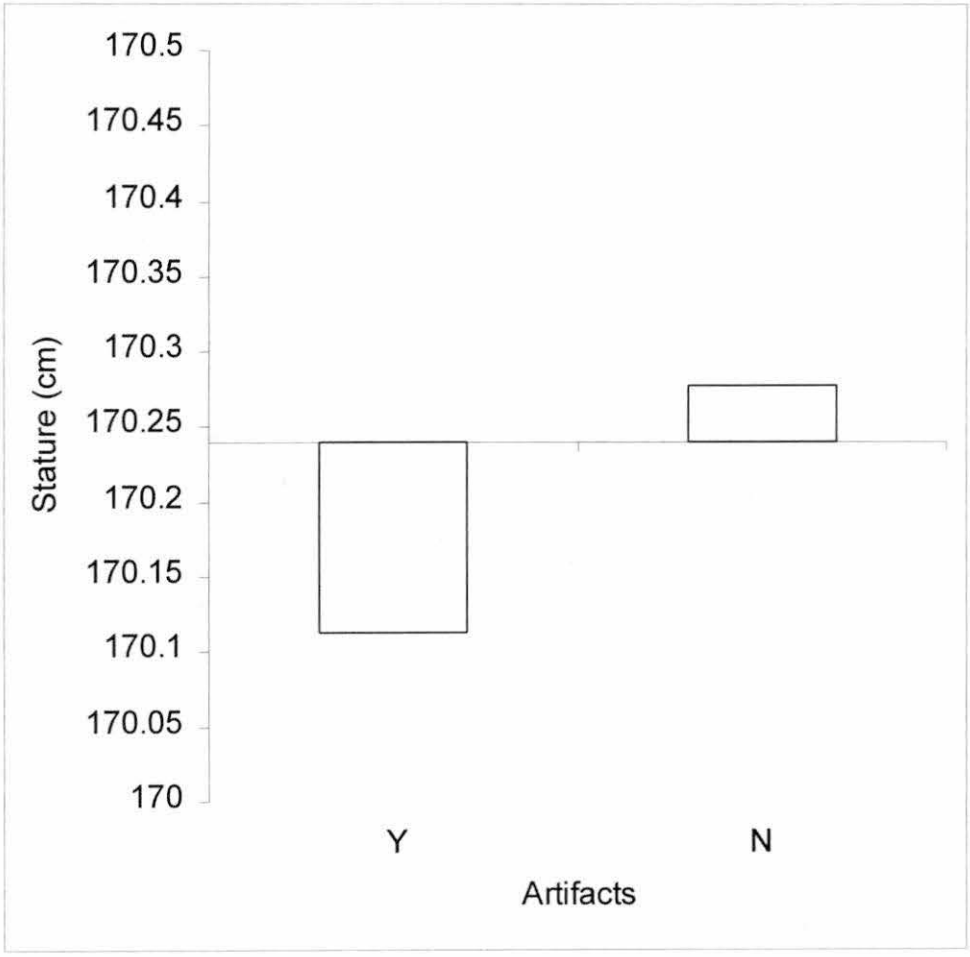

Figure 5-17. Male stature by status, compared with average male stature. "Y" refers to males buried with at least one artifact, while "N" refers to males with no artifacts. The X axis crosses the Y axis at average male stature (170.24).

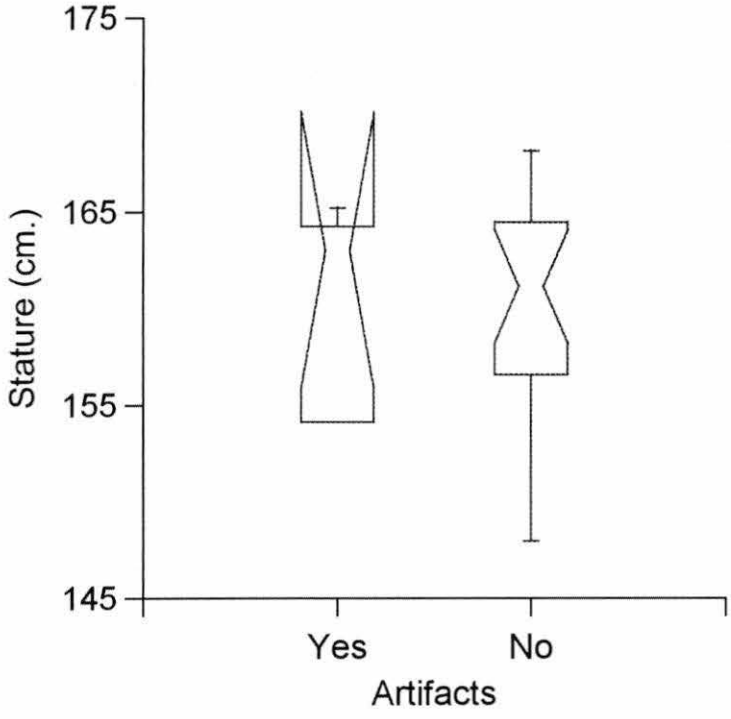

Figure 5-18. Boxplot of female stature by status.

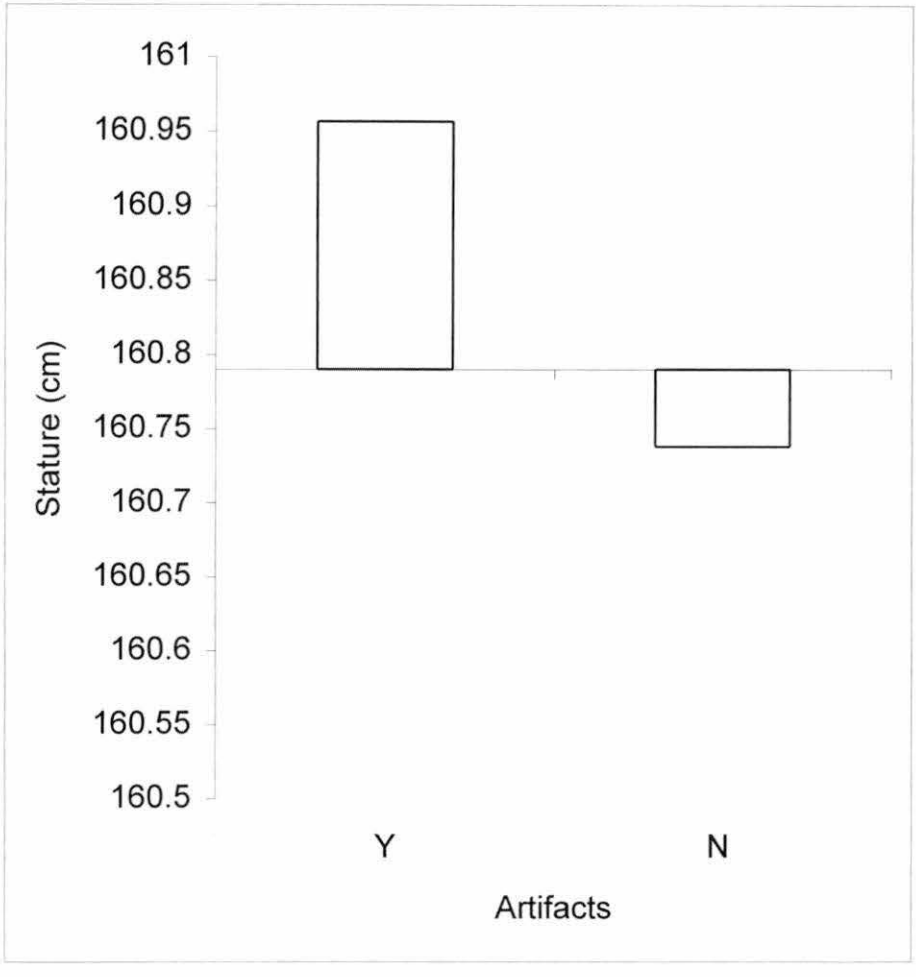

Figure 5-19. Female stature by status, compared with average female stature. "Y" refers to females buried with at least one artifact, while "N" refers to females with no artifacts. The X axis crosses the Y axis at average female stature (160.79).

Table 5-27. Stature by sex and status.

	Males	Females
Stature of individuals with artifacts	170.11	160.96
Stature of individuals without artifacts	170.28	160.74

Table 5-28. Stature by cranial deformation.

	Males	Females
Stature of individuals with fronto-occipital deformation	170.11	163.23
Stature of individual without cranial deformation	170.52	155.67

Cranial Deformation

The association between stature and cranial deformation is stronger for females than with males. Table 5-28 shows the large difference in average femur length for females by cranial deformation. Females without cranial deformation are an average of 7.56 cm shorter than those with fronto-occipital deformation. Figure 5-20 shows the difference between females by cranial deformation, and that females with deformation are taller than the average for females. The boxplot in Figure 5-20 shows the difference between stature by cranial deformation is statistically significant.. Figure 5-21 presents the average stature data for males, showing a much slighter difference between male stature by cranial deformation. The boxplot in Figure 5-22 confirms that the difference is not statistically significant.

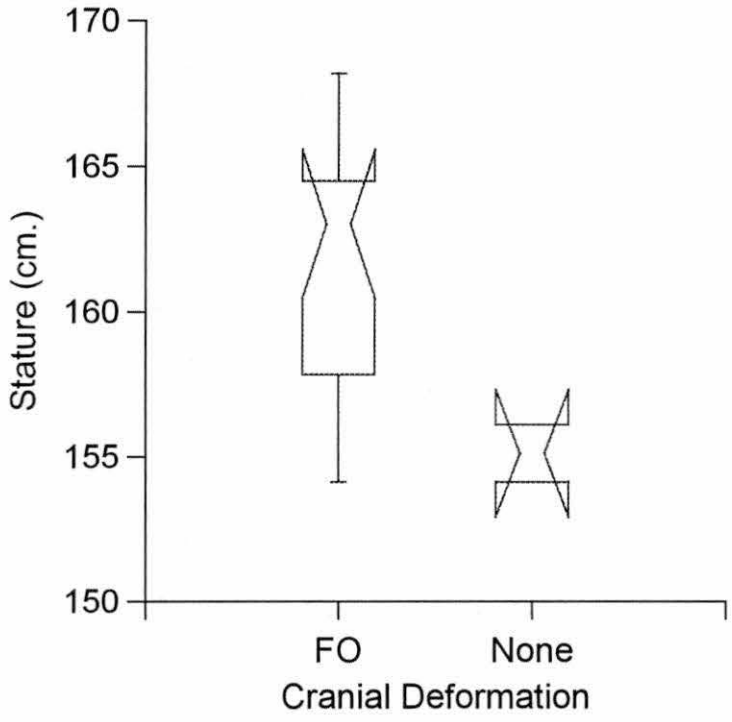

Figure 5-20. Boxplot of female stature by cranial deformation.

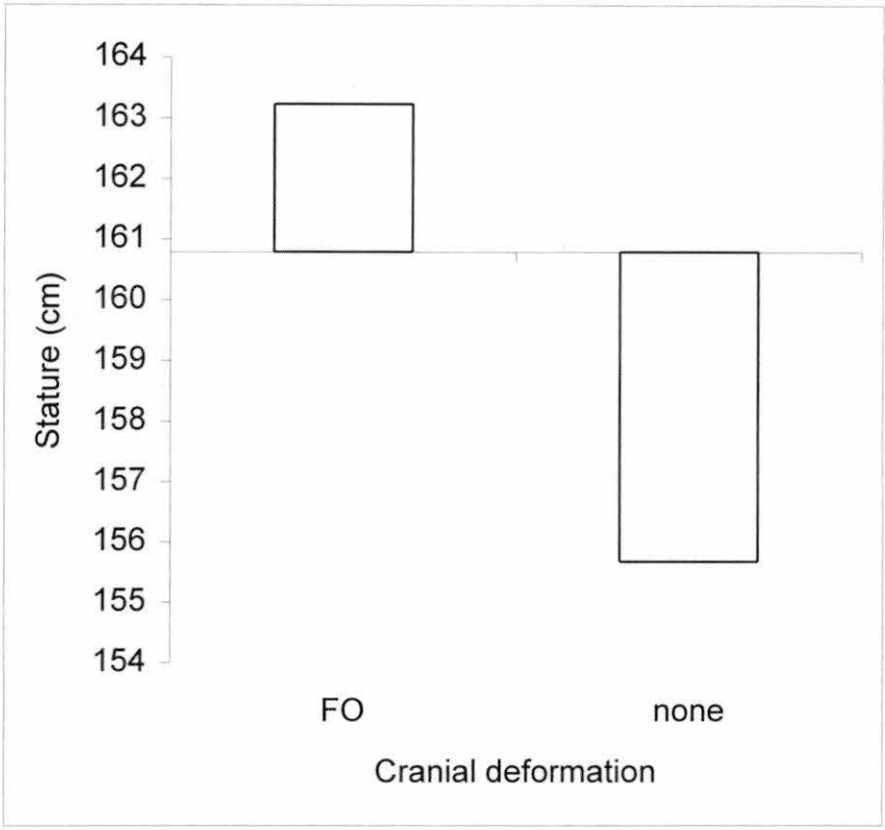

Figure 5-21. Female stature by cranial deformation, compared to average female stature. The X axis crosses the Y axis at the average male stature (160.79 cm.). "FO" refers to the average stature for females with fronto-occipital deformation, while "none" refers to females without cranial deformation.

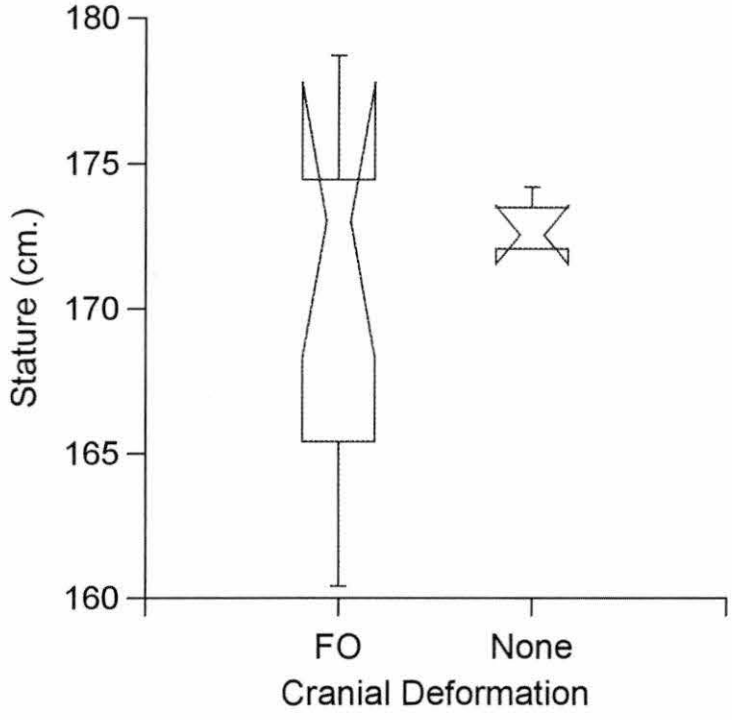

Figure 5-22. Boxplot of male stature by cranial deformation.

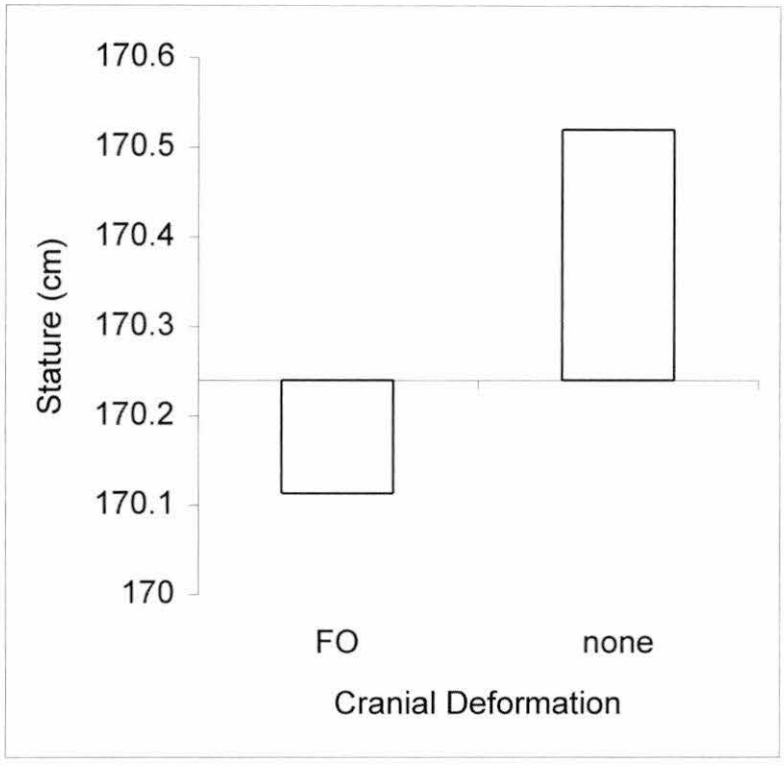

Figure 5-23. Male stature by cranial deformation, compared to average male stature. The X axis crosses the Y axis at the average male stature (170.24 cm.). "FO" refers to the average stature for males with fronto-occipital deformation, while "none" refers to males without cranial deformation.

HEALTH AND NUTRITION BY BURIAL CLUSTER

Due to the lack of an intrasite chronology, health and nutrition comparisons through time are not possible. The only temporal comparison possible would be between the burials in the mound and those that predate the mound by virtue of being underneath it. However, the five burials in the mound are in too poor condition to allow this comparison. The larger clusters of burials, however, do allow for comparison, and demonstrate the variation present within the sample. The results of this analysis must be interpreted with caution, however, because it is likely that some of the largest clusters, such at Clusters 6 and 7, were used over a long period of time, while others may have been in use for only a single generation. The comparison can be useful in understanding possible status differences that created these spatial clusters.

The small sample size and poor preservation of the burials in the townhouses, the earthlodge, and the burials outside public buildings (Clusters 3 and 13) preclude them from use in this part of the analysis. Therefore, this comparison will be based on Group 0 and Clusters 1, 2, 3, 6, 7, 12, and 18. These clusters show definite differences in the percentage of individuals with artifacts (Figure 5-24) and the number of artifacts types (NAT) divided by the number of individuals in the cluster (Figure 5-25). It is unknown at this time whether these differences are related to status or temporal differences, or both. The results should be interpreted in a number of ways, which will be discussed in Chapter 6. Results for each cluster for carious lesion rates, linear enamel hypoplasias, and artificial cranial deformation are shown below.

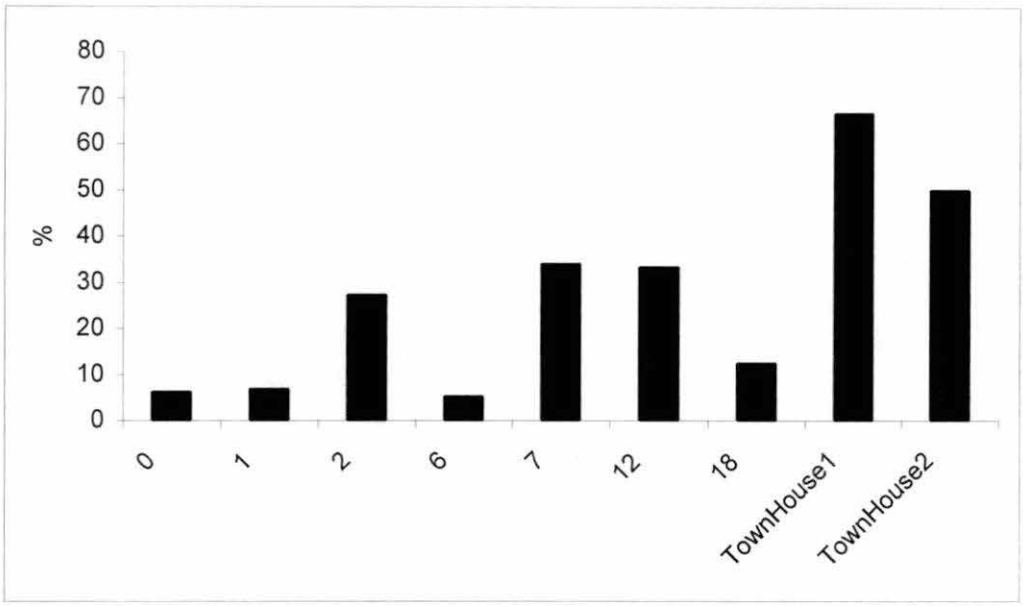

Figure 5-24. Percent of individuals with artifacts by selected cluster.

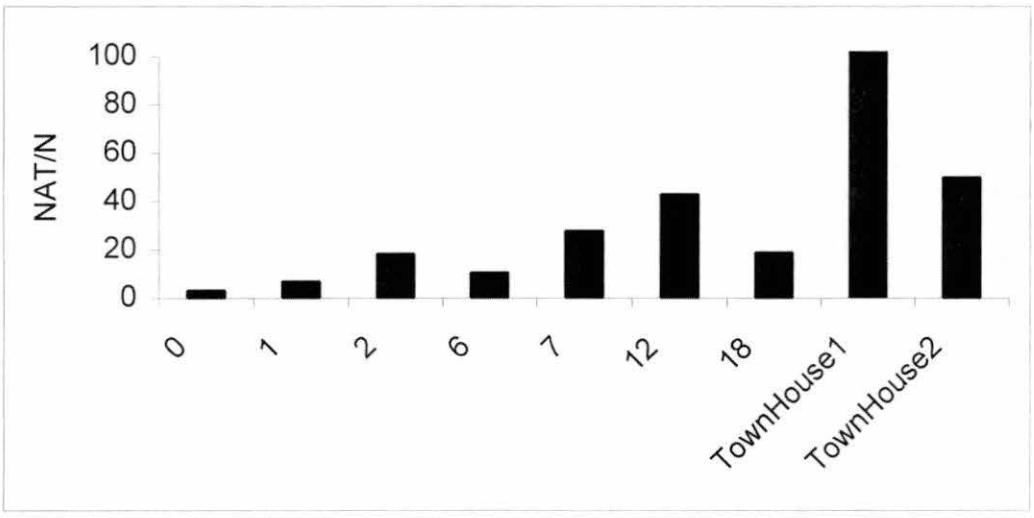

Figure 5-25. Number of artifact types divided by N for selected clusters.

Health and Nutrition for Large Clusters

Table 5-29 presents the results for the biological indicators by cluster. Unfortunately, most of the large clusters of burials do not contain large enough (n>5 individuals) samples of scoreable individuals for anterior tibia periostitis, cribra orbitalia, or porotic hyperostosis. Only caries rates and linear enamel hypoplasia rates are considered here. These dental health data present an indication of diet and childhood health or illness.

Table 5-29. Health and nutrition data for large clusters

Cluster	N	% Caries	% LEH	% Tibia periostitis	% Cribra orbitalia	% Porotic Hyperostosis
0	32	21.6	77.8	20.0	20.0	40.0
1	29	27.8	70.0	28.6	0.0	25.0
2	11	19.7	100.0	0.0	33.3	0.0
6	19	33.9	42.9	0.0	16.7	28.6
7	47	31.4	45.5	33.3	15.4	16.7
12	21	8.9	75.0	50.0	0.0	0.0
18	16	14.6	100.0	33.3	25.0	20.0

Caries Rates for Selected Clusters

Caries rates by cluster shows that most of the clusters have below average (28.2%) caries rates. Clusters 12 and 18 are markedly lower, while Cluster 2 is about eight percent lower. Clusters 6 and 7 have higher than average caries rates, at 33.9% and 31.4%, respectively.

Linear Enamel Hypoplasia for Selected Clusters

Interestingly, the opposite pattern appears for linear enamel hypoplasia rates. Clusters 6 and 7 have a much lower than average (63%) percentage of individuals with at least one hypoplastic line. Clusters 2 and 18 have higher than average percentages.

Cranial Deformation for Selected Burial Clusters

The presence or absence of artificial cranial deformation, while not an indicator of health or nutritional stress, also yields useful information for comparisons by clusters. Table 5-30 and Figure 5-26 show that two of the Clusters, 1 and 6, do not contain any individuals without cranial deformation. Clusters 7 and 18 have below average (24%) percentages of individuals without deformation, while Group 0 and Clusters 2, and 12 have higher than average percentages. Group 0, at 78%, has more than three times the average percentage.

Table 5-30. Cranial deformation for large clusters

Cluster	Scoreable Individuals	FO	None	% None
0	9	2	7	77.78
1	8	8	0	0.00
2	3	1	2	66.67
6	7	7	0	0.00
7	22	17	5	22.73
12	2	1	1	50.00
18	6	5	1	16.67

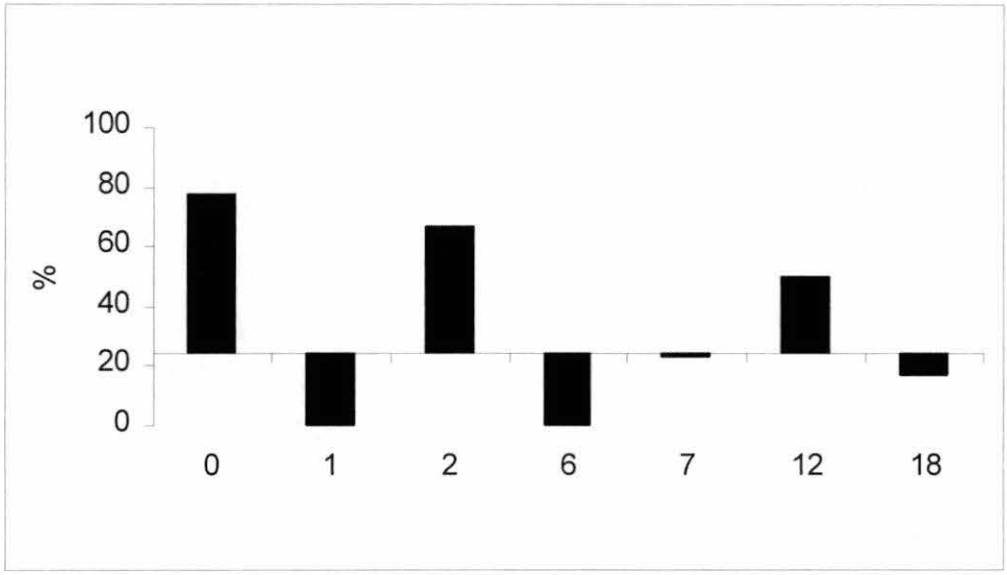

Figure 5-26. Percent of individuals with no cranial deformation for large clusters, compared with site average.

HEALTH AND NUTRITION OF BURIALS IN ELITE AND NON-ELITE CONTEXTS

Artifact distribution and site architecture both support the idea that the mound and the area along the riverbank in the inner palisade contain the burials of the highest level of the elite. It would be interesting to determine if the indicators of health and nutrition showed that these individuals were in better health, with fewer dental caries and taller stature. Unfortunately, the burials in the mound are in very poor condition. Compounding the problem, the burials within the inner palisade include those probably associated with at least one earlier round structure. It is impossible to tell at this point which burials are those of the elite and which may be associated with the earlier structure, other than looking solely at the few individuals with the elite grave goods. In other words, although some of the burials in the inner palisaded area are likely to be elite, an unknown number of potentially non-elite burials are also present. Lumping all the individuals together and ignoring this possibility of an important temporal and status difference within the group is pointless. Therefore, unless the burials can be sorted, the differences between these highest elite and the rest of the individuals at the site cannot be accomplished.

SUMMARY

This chapter includes the results of the archaeological and bioarchaeological analyses which have been chosen to evaluate indications of social ranking at Town Creek, and to estimate the biological impact of social ranking on the people. First, the archaeological

context information is provided. The most common burial position was on the back, with the legs drawn up to one side in a modified semi-flexed position. Only young children are buried in urns. Most burial pit are oriented so that the individual's head points to the north, northeast, or east, which puts the body parallel to the river.

Next, I turned to individual characteristics, including cranial deformation. Most individuals at Town Creek who could be evaluated for cranial deformation displayed fronto-occipital deformation. Individuals without deformation are found throughout the site, but several of the pre-mound clusters and a cluster close to the mound do not have any individuals without cranial deformation, suggesting a possible temporal difference in cranial deformation practices. Individuals without cranial deformation tend to display more indications of biological stress than those with deformation, especially females without deformation.

Males had higher rates of skeletal trauma than females and subadults, but overall, few individuals showed signs of trauma. Females display more indicators of biological stress than males, and fewer reached old age, suggesting that females experienced more, or more severe stress episodes during their lives. Subadults also had higher rates of stress, suggesting that individuals who died as children were subjected to repeated or sustained higher levels of ill health or poor nutrition or both.

Individuals with artifacts usually displayed fewer indicators of poor health or malnutrition. Females with artifacts, compared to females without artifacts, have a strong pattern of better health and nutrition and taller stature. The pattern for males with and without artifacts is not as strong, in other words, males show little health and diet variation by artifact presence.

I compared several health and nutrition factors by cluster, but found that the results do not show a consistent pattern. No cluster shows markedly better or worse health and nutrition, with the exception of Group 0. Individuals in Group 0 were more likely to have no cranial deformation, and poorer health and nutrition. Due to the strong possibility that there are temporal differences within each cluster, these results are not surprising. I deemed it fruitless to attempt to compare groups by elite and non-elite context for the same reasons of probable temporal change confusing the results.

CHAPTER 6

INTERPRETATIONS, DISCUSSION, AND CONCLUSIONS

In this chapter, I discuss and interpret the implications of the results presented above. The discussion is arranged by evaluation of the hypotheses set forth in the introduction. The hypotheses are presented in order with the exception of the first one. Hypothesis 1 concerns the presence of discernable ranking at Town Creek. Because this is a general statement while the rest concern specific aspects of social ranking, it is best evaluated last after the other hypotheses are considered.

The main concern of this study is whether a social hierarchy was organized by people at Town Creek, and if so, how this organization impacted the population. These individuals were not passive, but actors who through their daily lives and practices negotiated and represented themselves. One way in which social position was portrayed and acted was through the medium of mortuary ritual. Other ways of concern here include the way people ordered the places they lived and the public spaces they created and maintained. Finally, access to food and other resources impacted the health and nutrition of individuals as members of groups who made diet choices from those available to them. People also chose to practice cranial deformation on their children's crania, or not, possibly according to criteria of group membership or status. The social life and organization of any group is incredibly rich and nuanced. Archaeologists and bioarchaeologists are only able to approach

the social systems of past populations because the choices people make in their daily lives leave patterns in the archaeological record that can be interpreted.

HYPOTHESIS TESTING

Hypothesis 2: Gender was an important organizing element for mortuary ritual because it was important in ordering daily life and social relationships.

Gender can be difficult to reconstruct in past populations because it is based on more than age and sex. During life, gender is constructed through a sexual division of labor and sex-role plans which "help men and women orient themselves as male and female to each other, and to the growing boys and girls whose behavior they must shape to the commonly accepted mold" (Sanday 181:3). Gender roles cannot be assumed to fall along biological lines of age and sex, but these biological criteria can be used to construct models of the "accepted mold" in each culture. It is important to keep in mind, however, that archaeologists begin with the biological and physical skeletal remains to reconstruct social and cultural identities (Driscoll et al. 2001).

Sullivan's (2001) model of the gendered avenues to political power and prestige at Toqua predicted and supported the idea that males and females each had their own trajectories towards political influence. Males gained status at younger ages through involvement in warfare, and were more often interred in the mound and public spaces. Females and children were also interred in the mound, implying an inherited element to leadership status. Some females also achieved status through the domestic sphere, however, and were accorded elaborate burials in the households that were the basis of their power and

influence. Rodning (1996, 1999, 2001) also found a similar pattern at a Cherokee townsite in western North Carolina.

These studies are important because they highlight the fact that mound burials are not the only ones indicative of political power and influence, and also that males and females had different roles and opportunities in life that shaped the way they were presented in death. Finally, these studies are from an area that probably influenced culture at Town Creek through trade or other social interactions.

Eastman's (2001) study of the gendered dimensions of life courses and mortuary practices among the late prehistoric Siouan communities in North Carolina and southern Virginia is also important to consider because of the probable indigenous origin of and northern Piedmont influence on Pee Dee culture. Eastman found that artifacts appeared in male and female burials with equal frequency, but different artifacts had gendered distributions. Over half of the burials (56%) had sex-specific mortuary goods that were mutually exclusive (Eastman 2001).

These models of gender in mortuary practices can be compared with the patterns found at Town Creek. The expectations based on this hypothesis are first presented, and then the results that do not fit the expectations are discussed. Finally, the overall results are compared with the models of Siouan, Cherokee, and eastern Tennessee cultures.

Table 6-1. Sex-specific artifacts at Town Creek.

Gender: **Type**	**Count**
Male:	
Copper gorget	1 adult
Stone and clay pipes	3 adults, 1 subadult
Stone face effigy/amulet	1 adult
Raccoon skull	1 adult
Turkey bone scratcher	1 adult
Copper ornament	1 adult
Scraper	1 adult
Female:	
Marginella shell beads	1 adult, 2 subadults
Conch shell hairpin	1 adult
Stone ear discs	1 adult
Bone awl	1 adult
Plain conch shell gorgets	2 adults, 1 subadult
Engraved conch shell gorgets	1 adult, 1 subadult
Copper-covered wooden earspools	1 adult, 1 subadult
Chipped celt blank	1 adult
Olivella shell beads	1 adult
Ceramic vessels	1 adult, 1 subadult

Gender at Town Creek

Sex-Specific Artifact Types

Sex-specific artifacts are found in the burials at Town Creek. Table 6-1 presents a list of these artifacts by sex, and the number of individuals who had these artifacts interred with them. Unfortunately, for the purposes of reconstructing gendered dimensions of mortuary practices, these items are not particularly informative. This is because nearly every sex-specific artifact type only appears with a single individual. Thus, it is difficult to know if these items are symbolic of gender or of characteristics peculiar to the individual. The only

artifacts that are present in several graves and only appear with one sex are pipes with males and plain shell gorgets with females. Both of these types of artifacts also appear with a subadult, but both are not present in a subadult burial. This provides a weak echo of Eastman's (2001) findings. If each of the other items is symbolic of gender and not individual traits, then there may be a strong representation of gender in the mortuary practices at Town Creek. If I group several types of artifacts together, they do segregate by biological sex. For example, if I group hair and ear ornaments together, three females and one subadult who have these artifacts, and no males. Raw material for artifacts does not appear to be used to symbolize gender as copper, shell, mica, bone, and stone appear with both males and females. The only exception to this is with shell artifacts. Males have exclusively conch columella shell artifacts while two females have olivella and marginella shell beads. These two females do not have conch shell artifacts in addition to the other shell beads.

Conch columella shell beads and artifacts are common at the site. Forty-six percent of the individuals with artifacts had *only* conch shell artifacts. Conch shell artifacts are more common in subadult burials than adult, with 17.86% of subadults having only conch shell artifacts while only 5.77% of adults had only conch shell artifacts. This difference is statistically significant (Fisher's, p=.07).

Gendered Spatial Dimensions of Elite Burials at Town Creek

Sullivan (2001), Rodning (1996, 1999, 2001), and others (Anderson 1994, Hatch 1974, Peebles 1974) have found that male burials are more frequent in mounds and public spaces than female and subadult burials. This pattern does not obtain at Town Creek. Unlike

other mounds, Town Creek has no subadult burials and more female than male burials in the mound. Three of the five individuals in the mound are female, one is male, and one is of indeterminate sex. This finding does not meet the expectation set forth with Hypothesis 2 that more male than female burials should be found in the mound. Another expectation was that males should occupy the highest most visible status positions in the mortuary practices at Town Creek. Again, this pattern is not found. In addition to there being more females than males in the mound, the most elaborate burial outside the mound setting is an adult female (3-037) buried between the rectangular structure near the river and the surrounding inner palisade. This burial is of a female in an extended position in a large, stepped edge rectangular pit, and was covered with logs forming the roof of the burial chamber prior to filling the pit with dirt. This female had four shell ear pins in her left ear, one copper-covered wooden ear spool in her right ear, and 98 columella segment shell beads in strands around both wrists, her right ankle, and her neck. One of the most elaborate male burials was interred in the mound/earthlodge area before the construction of either public building, and may not be comparable to other burials at the site because it is earlier. However, it is unknown whether this burial (2-005) is contemporaneous with the elaborate female burial across the plaza described above.

Trauma and Gender

Males are expected to have more skeletal trauma than females, particularly trauma that may be related to interpersonal, not accidental injury. This analysis shows that three males and no females had cranial injuries. The three females with postcranial injuries all had experienced trauma to the lower limbs, including two tibia fractures and one toe fracture.

Powell (1992) predicted that female trauma would be related primarily to daily activities and not warfare. The females at Town Creek probably fit this model. Male injuries were primarily to the upper body and head, and include frontal depression fractures, a mandibular fracture, proximal ulna fractures, a deltoid muscle pull, and a lumbar vertebra fracture. The one incidence of lower limb trauma in a male was a proximal femur fracture. Finally, one male exhibited an embedded projectile point in his fifth thoracic vertebra that was probably the cause of death for the individual.

The patterns of trauma do support the expectation that males and females had different activities. The male activities could have included something that involved some form of interpersonal conflict such as warfare or a physically strenuous game. I do not believe that the evidence of trauma supports Coe's idea that the Pee Dee were in constant conflict with their neighbors. The numbers of individuals with trauma is low overall, and the only positive evidence of an individual who was killed by a projectile weapon was a male who had at least one projectile point embedded in his upper thoracic vertebrae, possibly another in his eye orbit, and another in his shoulder. The projectile points were small and triangular.

Males with artifacts were far more likely to have experienced skeletal trauma than males without artifacts. Sixty percent of the males with artifacts had trauma while only 22.7 percent of those without artifacts had trauma. Another way of looking at this finding is that males may have gained status through the activities that led to the pattern of trauma they display. Both females with and without artifacts have very low percentages of trauma (see Table 5-15).

Indications of Avenues to Status by Age and Sex

Another expectation of Hypothesis 2 was that male burials should contain markers of status at younger ages than females because of their avenue to achieved status at younger ages through participation in warfare activities. This pattern obtained at Toqua (Sullivan 2001). This expectation was also not met. Young males are relatively rare at the site, with only one identifiably male individual under the age of 30. A comparison of percentage of individuals with artifacts in the adult age category shows that only one of the eleven (9%) adult males had any artifact interred with him, while six of the 23 (26%) adult females had artifacts. The one male with artifacts had an "elbow" clay pipe by his jaw, a quartzite scraper by his left elbow, green stain on temporals, possibly indicating the presence of a copper hair or ear ornament, a necklace of one copper bead, one shell bead and a copper pendant by his neck. The burial was lined with split cane matting. This individual was not buried in a public location, however, but was interred in Cluster 20, outside the main ring of structures containing burials. There is no evidence that younger males had avenues to prestige and power at younger ages than females, in fact, the opposite is true, if artifacts actually are status indicators. At every age category, females are more likely to have been interred with artifacts than males.

Another way to evaluate the impact of age and sex on status is to determine if indications of status increase with age for males or females or both. Recently, archaeologists have become concerned with the "double standard" in archaeological interpretation where rich male burials seen as leaders, but equally prominent female burials are interpreted as the wife or wives of the leader, or even sacrificial victims (Sullivan 2001, Nelson 1997:133). At Toqua Sullivan (2001) found that female interment in the mound decreased with age, with

none over age 40 in the mound, a pattern which could suggest that women lost prestige with age. She suggests that the meaning of burial in the mound was different for men and women.

The results of this analysis show that at Town Creek, the percentage of individuals with artifacts (used here as a rough measure of status) peaks at the mature adult category for males and females, then *decreases* for older adults for both sexes. Plotting the percentage of individuals with at least one grave good by age groups, Sullivan (2001:119) found a pattern similar to that at Town Creek. The percentage of individuals with at least one funerary offering increases with age and peaks at the 30-35 and 35-39 age group for females, and at the 35-39 age group for males. Both sexes show a marked decline in artifact presence after age 40. The older females with artifacts at Toqua are all buried in the village setting, and tend to have more artifacts and artifact types than the older males in the either mound or village. Sullivan (2001) suggests instead that at least two gendered spheres, public and domestic, existed at Toqua.

Based on the pattern of decreasing numbers of artifacts with increasing age after adulthood, the relatively young age of the individuals in the mound, and individuals with grave goods along the river, it appears that only individuals who died while they were actively practicing and maintaining their public roles were entitled to interment in the mound, and to be buried with prestige goods. In other words, only those that died while "in office" were accorded elaborate burial in restricted areas. It is likely that leaders who died fairly young created more social upheaval and disruption that was mitigated through elaborate or special mortuary treatment. Burial of a leader in a public building or area serves a dual (at least) function of reinforcing and recreating the power structure when the new leader participates in the funeral, thus reintegrating the society. As Parker Pearson (1999:32)

asserts, "funerals are political events at which the status of the deceased as well as that of the mourners is actively negotiated and reevaluated." When the transition from Leader A to Leader B was accomplished without the death of Leader A, the later death of (former) Leader B was not as problematic, and may not have required as complex or intricate a burial ritual.

Summary of the Findings of Testing Hypothesis 2

Hypothesis 2 contained predictions about gender as an organizing principle of the mortuary practices at Town Creek. My findings indicate that gender does appear to have had an important role in organizing leadership, power and status at Town Creek, but not in the ways it was expected to. Males are *not* more common in public settings. Males do *not* appear to have had avenues that led to earlier achieved status than females. In every case and every circumstance evaluated here, the evidence points to female leadership, and female power relationships as important organizing principles of both private and public spaces. No consistent pattern of a male-dominated gender hierarchy exists, but a female-dominated hierarchy is supported.

Sex-specific artifacts may be present, but these artifacts may also be symbolic of personal, non-gender-related aspects of an individual's identity. The exception appears to be pipes and plain shell gorgets, which are associated exclusively with more than one male and female, respectively. Another expectation that did fit the model was that males with artifacts were far more likely to have trauma than those without, indicating that the activities that lead to the trauma may also have enhanced male status. Finally, the expectation that indications of status would increase with age as both males and females gained prestige through the various avenues available and culturally appropriate to their genders was not met. Status

indications, both the percentages of individuals with artifacts, and positioning in public spaces, reach a peak with mature adults and show a marked decline with older age.

Hypothesis 3: Matrilineal descent and kinship were important organizing principles for the mortuary ritual.

As described in the previous chapters, human burials in the village are clustered into distinct areas. Many of the larger clusters of burials are arranged in circular patterns that appear to correspond to the outlines of a circular structure. This is more clearly illustrated by Figure2-7, a drawing based on a reconstruction of the structure from the photographic mosaic of Cluster 16 along the southern edge of the plaza by Roy Dickens (Dickens n.d.). This illustration also shows that this structure was rebuilt, probably two or three times, in the same location. The density of postholes around several of the other larger clusters suggests that, as at the King site in Georgia, larger groups of burials in the floors of houses may be associated with houses that are rebuilt multiple times in the same location (Hally and Kelly 1998).

The above information can be put together in an attempt to find an "architectural grammar" of the site (Lewis and Stout 1998, Lewis et al. 1998). As Lewis et al. (1998:4) note, "just as language is imposed order on selected sounds, the grammar of human constructions and appropriations is ordered by design intents, functional limits, and contexts." Part of the grammar of a site organization is related to organizing principles such as gender and kinship. In the above discussion of Hypothesis 2, the gendering of public spaces was considered, and the pattern found at Cherokee sites and Toqua did not obtain at Town Creek. Nonetheless, gender was an important element that ordered mortuary ritual and

social organization at Town Creek. In this section, I discuss the evidence for the importance of kinship as another principle that ordered life and politics at Town Creek.

Burial Clusters in the Village

The placement of burials at the site allows certain interpretations of the social and political organizations at Town Creek. Situating a burial in the floor of a structure creates a material and cognitive link between the deceased, the location, and those who inter him or her there. In Mississippian societies, burials are often placed in the floors of domestic structures. As Rodning (2001: 100) notes, "symbolic meanings become embedded in the spaces and places where men, women and children live their lives." If the earlier structures at Town Creek became linked in the minds of the inhabitants with the founding families or corporate groups, then burials within the structure may reinforce the position of these families within the community. Individuals could reinforce their relationship by placing relatives in the floor of the original houses. Continued use of these structures would be vital to maintain that linkage, and reify the important position of the founding lineage(s). This may explain the large number of burials within the floor of Cluster 7. It may be that the burials represent members of the same household or lineage that had spread out beyond its original dwelling to other nearby houses. The members of this lineage continued to place their deceased in the original house, emphasizing their connection to their progenitors.

Hally and Kelly (1998:60) suggest that at the King site, certain structures "were destroyed and rebuilt most often as a result of the death of a significant household member, perhaps the genealogically senior member and household head" but were not able to identify that person. They further suggest that in-place rebuilding of structures represents the

"physical expression of an ideological emphasis on household identity and continuity through time, " and "households would have had a strong interest in their own identity, perpetuation, and existence through time" (Hally and Kelly 1998:61).

One way that households may have reinforced their identity is through slight differences in mortuary ritual that set each apart. Evidence of this would include artifacts or artifact types that only appear in one cluster. This analysis has shown that this prediction is supported, albeit weakly. Cluster 7 is the only cluster in which marginella shell beads are located in burials. Marginella shell beads are easier to produce than conch columella shell beads. However, although two of the three individuals with marginella shell have low numbers of the beads, one burial, an infant, was interred wearing a garment to which over 1650 marginella shell beads had been affixed. The elaborateness of this garment belies an interpretation that use of marginella shell equates with lower status, I believe.

The distribution of urn burials also presents supporting evidence for differences in mortuary ritual by cluster. Urns appear in only five clusters although subadults of the appropriate age (less than 4.5 years old at death) appear in 11 clusters. This pattern could indicate that some kin groups buried certain children in urns while others did not. The pattern could also be due to temporal or status differences, however.

A number of artifacts appear with only one individual, as described above. This could indicate differences in mortuary ritual by kin group, but could also symbolize personal or gender identity, or temporal differences.

Summary of Testing Hypothesis 3

Cluster 7 provides the best support for the interpretation that burials were placed in the floors of houses as a means of reinforcing kin group identity. This cluster may represent the longest-lived, largest, or most powerful kin group at Town Creek. In the future, an analysis of dental and cranial metric and non-metric traits would help answer the question of whether this cluster contains individuals who are closely related to one another.

Hypothesis 4: Fronto-occipital deformation indicates Pee Dee group membership and distinguishes them from neighboring groups.

Artificial cranial deformation may have served as a symbol of corporate membership, or identity, or it may have been a marker of status. It is something that parents do to their children at a young age and so does not represent a decision made by the individual. Not every individual at Town Creek displayed artificial cranial deformation. Because the majority of individuals at Town Creek had FO deformation, most parents performed the necessary binding or other mechanical means of producing the desired effect. The question of why some adults and children do not have deformation is more important than why most do.

Gender and Cranial Deformation

There are consistent differences between those with deformation and those without that help address this question. Because of the potentially different reasons males and females did not have deformation, I will examine each separately.

Females

Only 17.5% of the females did not have cranial deformation. The females without artificial cranial deformation had generally poorer skeletal health, and more indications of childhood health or nutritional deficiencies than the other females. They had lower rates of dental caries, however. They also were less likely to have any artifacts buried with them.

The pattern suggests two possible interpretations. First, it may indicate that the females without cranial deformation came from a different area in the region where people did not routinely practice cranial deformation, perhaps marrying into Town Creek society as adults, or coming with other adults as children. This would account for the apparently slightly different diet and childhood health these females experienced. Alternatively, if these females are indigenous to Town Creek, a social factor such as lower status could account for the lifelong health and nutrition and mortuary differences. None of the six females without deformation can be classified as high status based on artifacts, but spatially two of the females are buried in Clusters 12 and 14, along the river with high status burials.

Females with cranial deformation are the most likely to have artifacts, and 90% of the females with artifacts have cranial deformation. If artifact presence is an indicator of status, then higher status in females is largely dependent on having FO deformation, far more than males. Only 66% of males with artifacts have FO deformation.

The inclusion of a Dan River pot in a burial with a female with cranial deformation is interesting in that it further supports a connection between the Pee Dee and other cultures on the Piedmont. Interestingly, a Pee Dee complicated stamped vessel was found with two Dan River pots in a burial in Rockingham County. (Ward and Davis 1999:107).

The only female without deformation buried with any artifacts had two Olivella shell beads (probably a necklace) in the burial. This is the only example of Olivella shell in a burial at Town Creek.

Males

The pattern for males is different. There is a slight difference in health and nutrition between males with and without deformation, but the pattern is mixed, and all of the differences are slight. With no clear directional pattern to the data, it becomes more likely that the differences are due to sampling error or individual differences, and not a patterned inequality. Males in general are less likely to have artifacts interred with them than females, and this is particularly true of males compared with females with FO deformation. However, it is of note that while only 10% of the females with artifacts do not have deformation, 33% of the males with artifacts are non-deformed, suggesting that avenues to high status are more open to males without deformation than females.

The pattern of differences by gender and cranial deformation supports the hypothesis that males married into this matrilineal society from another group in the region and gained or brought higher status as a result of this successful alliance. The females without deformation may have come to Town Creek with their brothers or other male relatives. Nearly twice as many males without deformation as females are interred at Town Creek. If these women also married into the group, this may help explain the presence of children at Town Creek without cranial deformation: perhaps the mothers of these children did not deform their heads in the characteristic Pee Dee fashion because it was not a tradition they grew up with. In a matrilineal society, the mother may have had more control of what

happened to her children than their father, presumably Pee Dee, did. A potential problem with this explanation is that females and subadults without deformation do not appear in the same clusters.

Cranial deformation and regional interaction

Table 6-2 presents the mean stature for males and females from two Piedmont sites that are roughly contemporaneous with Town Creek, the Shannon and Wall sites. This table also includes mean stature for individuals at Town Creek with and without cranial deformation. Susan Homes Hogue studied Piedmont Siouan sites from pre-, proto-, and early historic sites, examining changes in health through time, as well as the biological relationships between the groups as part of her study of mortuary practices. The Wall site is located in present-day Hillsborough, North Carolina on the banks of the Eno River and dates to the Late Prehistoric period (Hogue 1988). The Shannon site is a Late Prehistoric (AD 1450-1525) site on the Roanoke River in Virginia. Individuals at these sites did not exhibit fronto-occipital deformation that is common at Town Creek. Some individuals displayed slight occipital flattening (Lambert 2001).

Table 6-2 Stature Comparison between Town Creek and Piedmont Siouans

Site	Males	Females
	Mean Stature	Mean Stature
Shannon[1]	168.66	156.31
Wall[1]	173.406	No data
Town Creek All	171.16	162.10
Town Creek with cranial deformation	171.03	164.54
Town Creek without cranial deformation	171.44	156.99

[1] adapted from Hogue 1988, p. 65, table 7

Mean stature for males with and without cranial deformation are very similar at Town Creek. The mean for males at Town Creek falls between the means for Wall and Shannon males. Females with and without cranial deformation at Town Creek show large differences in mean stature. The mean stature for females at Town Creek is taller than that of the Shannon site. No females could be evaluated for stature at Wall. The fact that the mean stature for females without cranial deformation is very similar to the mean stature of females at Shannon is consistent with the above hypothesis that the women at Town Creek without cranial deformation may have come to Town Creek as adults. Mean stature neither supports nor rejects the hypothesis about the potential movement of males between groups.

People without cranial deformation have a higher percentage of skeletal trauma (4/16, or 25%) than people with fronto-occipital deformation (6/44, or 13.6%). This difference is not statistically significantly different, but lends further support to the idea that cranial deformation is an indication of a cultural and perhaps behavioral difference within this group.

Summary of Testing Hypothesis 4

Overall, the evidence does tend to support the hypothesis that individuals without cranial deformation are individuals who did not grow up with the Pee Dee. Less certain is the interpretation that these individuals married into the Pee Dee. The evidence is consistent with this interpretation, however, and I believe it fits the facts better than an explanation based on status differences within the Pee Dee.

Hypothesis 5: Elite individuals at Town Creek had better health and nutrition because of their social position.

The evidence discussed in this section is all designed to meet the overall goal of understanding the biological impact of social ranking on the lives of men, women and children. The evidence discussed above, and summarized later in this chapter, support the contention that there was social ranking at Town Creek Answering the question of what this ranking meant for the health and diet of individuals is an important goal of this study.

Health and Nutrition by Status

How to interpret skeletal manifestations of biological stress has been the subject of debate in biological anthropology in the last decade. In what is referred to as the "osteological paradox," Wood et al. (1992) argue that skeletal series contain 'hidden heterogeneity." This means that within each group there are individuals who experienced different morbidity that are skeletally indistinguishable from one another. Individuals who experience morbidity may die quickly before skeletal manifestations of the illness result. Alternatively, they may survive with the morbidity long enough to show skeletal signs of the illness. Lastly, a skeletal series will include individuals who did not experience morbidity but died for other reasons. The first and last group will be indistinguishable from one another. Wood et al. (1992) argue that caution must be exercised when interpreting the meaning of patterns of skeletal lesions, because the individuals with lesions may actually have been healthier or more culturally or biologically advantaged than those who display no lesions (Larsen 1997). The best way to deal with this potential problem in interpretation is to incorporate more than one indicator of stress, and couple the observations with information

about age-at-death (Goodman 1993). In addition, it is important to consider the burial context of each individual to incorporate potentially advantageous conditions such as higher status.

Summary of Indicators of Health and Nutrition

Chapter 5 presents the results of the analysis of health and nutrition in exhaustive detail. Here I provide a brief summary of these findings, followed by a discussion and interpretation of their meaning.

Females at Town Creek have higher caries rates and higher linear enamel hypoplasia, tibia periostitis, and porotic hyperostosis incidence than males. Subadults have fewer caries than adults do, as is expected in this age-dependent disease. Subadults have higher incidences of linear enamel hypoplasia, cribra orbitalia and porotic hyperostosis than adults, indicating that individuals who died as children were subject to repeated high levels of biological stress, leading to an early death. These children may not show signs of tibia periostitis in high levels because this indicator of non-specific infection is unlikely to appear in young children due to the high bone remodeling rate experienced during skeletal growth.

Females in this population were more affected by biological stress than males, possibly due to the high nutritional and caloric demands of pregnancy and lactation. The higher prevalence of linear enamel hypoplasia in females is interesting. It may indicate that females were more susceptible to illness due to malnutrition as children. Conversely, it may indicate that females were sufficiently buffered against stress such that they survived illness and/or malnutrition better than boys, which could help explain the disparity in the numbers of

adult males and females. However, a cultural explanation, or chance and the selective bias of the areas excavated are more likely to be the case.

The inference from the osteological paradox that the women were actually healthier than the males and better surviving stress is not supported due to the fact that women died at younger ages than males. The lower rates of cribra orbitalia in women compared with men are unexpected. Cribra orbitalia and porotic hyperostosis can be due, among other things, to iron-deficiency anemia, a condition more common in females due to iron loss during menstruation. It is possible that the small sample sizes have led to skewed results.

Higher status individuals have a slightly higher percentage of trauma (1/6 or 16.7%) than non-elite (13/92 or 14.1%), but the number of high status individuals who could be assessed for skeletal trauma is very low. The pattern is stronger when individuals with artifacts are compared to those without artifacts as a gross measure of status. Five out of 26 individuals with artifacts had trauma (19.2%) as opposed to eight out of 66 (13.8%) of those without artifacts. This relationship is also not statistically significant, but fits with the expected pattern.

Discussion

The results of the analysis of health and nutrition by status are revealing. There is little support for the idea that individuals who appear to be high status based on artifact inclusions and location within the site were significantly advantaged biologically. This result is not unexpected. Powell (1988, 1992) found that the archaeologically identified elite at Moundville were not significantly different biologically than the non-elite. She reasoned that the elite may have been overnourished, based on ethnohistorical models, but that this

overprovisioning of the elite did not come at the expense of basic nutritional adequacy for the rest of the population.

The finding that the elite were not better nourished at the expense of the non-elite has important ramifications for the interpretation of social organization. An element of political power and prestige is the degree of control the elite have over resources including food. Bioarchaeological analyses support the contention by some archaeologists that the role of the elite did not entail exclusive access to and redistribution of vital food resources (e.g., Earle 1977, 1991). Ideas about exactly what was controlled by chiefly elite in Mississippian communities have changed over time, but the idea of control has not (Welch 1996). It is likely that the elite controlled and manipulated ritual and the distribution and display of prestige goods, including items symbolizing esoteric knowledge and access to trade networks (e.g. Blitz 1993, Cobb 1989, Helms 1979, Knight 1981, 1990, Muller 1984, Pauketat 1994, Smith 1990, Welch 1991).

Hypothesis 1: Because Town Creek is a South Appalachian Mississippian ceremonial center, evidence of social ranking should be discernable in the mortuary program.

I have chosen to discuss the first hypothesis last because the results of the tests of the rest of the hypotheses bear directly on the evaluation of Hypothesis 1. There does appear to be social ranking at Town Creek, along gender and age lines, and probably by kin group as well. There is a social hierararchy, represented by the mound and inner palisaded areas. The individuals interred within these spaces display many indications that they were the elite segment of the society. One interesting finding, already introduced, is that women apparently played an important leadership role for the group.

One of the interesting patterns that does not quite fit the model of hierarchically arranged social status is the high percentage of individuals with artifacts in Cluster 7. Cluster 7 is unusual in a number of ways. It has the highest number of individuals buried within it, it contains several unique mortuary items, it has high numbers of males without deformation. However, the tables presented at the end of Chapter 5 comparing the large clusters by the ratio NAT/N clearly shows Cluster 7 is not like the proposed elite areas of the mound and the inner palisaded area. Cluster 7 has a high percentage of individuals with artifacts, and a large number of artifacts types, but it also has a high number of individuals. When the NAT/N equation is evaluated, it shows that Cluster 7 is not as unusual as it first appears.

The simplest explanation is that Cluster 7 was the one most often rebuilt. Perhaps it was the first residence of a particularly successful family who maintained the structure and continued to place burials within it. It is also possible that the function of this structure changed over time from primarily a residence to a mortuary facility. Further research of associated features is warranted to test these ideas.

The two other areas both are marked off by physical means-- the mound is elevated, and the area along the river is, at least at some point in the occupation of the site, walled off from view. Both are therefore out of view with potentially limited access. As Lewis et al. (1998:3) state, "all societies assign meaning to spaces that denote, connote, or secure privacy; that segment activities." Rectangular structures only appear in these contexts. The rest of the identified structures are round. Mica and rattles only appear with individuals interred in these two areas.

There are only five individuals interred in the mound, three with the first townhouse, and two with the second. Of these, three are female, one is male, and the other is an adult of

unknown sex. All five are relatively young: none are over 45. This is part of a general pattern at Town Creek where the number and type of artifacts interred with individuals decreases with increasing adult age after a peak at the age of 30-35. This pattern stands in contrast to the age-at-death distribution of both males and females. If status and access to and manipulation of prestige goods increased with age, this was not demonstrated by including these goods in the grave furniture.

The second townhouse contained only two individuals, both adult females. Both also were bundle burials, fully skeletonized and disarticulated before interment in the mound. At least one of them appears to have been interred in the burned debris of the second townhouse. No further building took place on the mound summit other than covering the burned townhouse with more soil. It seems likely that these remains were curated until the appropriate time to inter them, perhaps at the time the site was abandoned, or at least at abandonment of the mound. Neither contained mica nor rattles, which are found only with individuals associated with the first townhouse.

The rise and fall of Mississippian chiefdoms is mirrored in mound construction in that construction activity at administrative centers "began when a chiefdom was founded and it ceased when a chiefdom ceased to exist as a political entity" (Hally 1996:93). The structures atop the mound served as residences for the chief, storage sites for the bones of former chiefs, and temples. Among the Natchez, the chief was said to communicate with the Sun from his mound summit residence. The skeletal remains of former chiefs would serve as symbols of chiefly lineage, and reinforce the legitimacy of the current leader (Hally 1996:94). Stages of mound building may correspond with either fertility and renewal

(Knight 1986, 1989), or with the succession of a new chief upon the death or overthrow of a chief (Hally 1996).

The burials across from the mound along the river include males, females and children. The women interred along the river are also young, none older than about 40, with 6 under the age of 30. The men for whom age can be estimated are slightly older, with an average age of about 35-40. Looking at just the burials that fall within the screened area, there are 12 subadults, five males, 10 females, and six unknown sex adults. The children have only shell beads, except the burial with copper-covered wooden earspools, and a rattle. One of the males had only shell beads, while the other had mica, rattles, a raccoon skull, four projectile points, and shell beads. Four of the 10 females had artifacts, all of which were "prestige goods" or items of limited distribution (e.g. stone ear discs, copper covered wooden earspools, rattles and mica, as well as shell beads). Clearly here, as in the mound, there are more women than men, and the artifacts with the women are indicative of higher status and more political or social power, or both.

The areas along the river and the mound itself represent segregated areas where the elite were interred in a manner that reinforced their position in the society. There can be no doubt that women were important leaders and held political and social power and influence. Elaborate male and female burials along the river suggest that more than one avenue or portrayal of prestige existed. Men and women both held important positions. Certain roles seem to be restricted to men, as evidenced by the male burials containing ritual apparatus such as pipes, rattles, an animal skull, and the only representation of a human at the site, the face "amulet" or decoration. Perhaps the ritual sphere was divided into male and female

roles, with women controlling domestic ritual including burials, while males directed public rituals such as renewal, the Green Corn Ceremony, and other cosmological events.

If the rattles are indicative of a religious role of the individuals they are interred with, this suggests that the mound and interior palisaded space were sacred spaces, reserved at least at one point for the interment of individuals with this role.

If access to mica was limited in time, then it is possible that the Cluster 13 dates to the same period as the first Town House on top of the mound. That means that the interior palisade and square structure within it were constructed after the mound was in place, because these structures intrude on the circular structure of Cluster 13. The association between mica and rattles and the mound and opposite the mound also seems related to the role of the individuals in the group. One of the burials with mica and rattles also had the only animal skull associated with a burial- a raccoon skull. Unfortunately, the skeletal remains of this individual are missing, but the excavation notes list the individual as an adult male.

The common Mississippian trend from more public decision-making (represented by the earth-embanked lodge) towards more hierarchical decision-making by the elites, (represented by the mound) is seen at Town Creek (Rudolph 1984, Larson 1994). It is difficult to say where the screened area fits in the political development of hierarchy at the site. The biggest obstacle to interpretation at this point is that I cannot say for sure whether or not the mound and screened area were in use at the same time. Attempts at fluoride dating have been unsuccessful in seriating burials at Town Creek, and only two burials at the site contained ceramic vessels, making ceramic seriation difficult. If both areas were in use at the same time, then perhaps the screened area along the river represented the living area of an

elite clan, and the actual leaders, who were drawn from this group, were interred in the mound—a combination of both achieved and ascribed status for leaders.

CONCLUSIONS

This analysis has examined patterns in the mortuary program at Town Creek, a South Appalachian mound and village on the Piedmont of North Carolina. Data collected though mortuary archaeology and bioarchaeology methods were combined to create a picture of social organization and community health in the population interred at Town Creek.

The burials at Town Creek form a spatially organized representation of the social status hierarchy negotiated in this population. In this matrilineal society, women held power in the domestic sphere, as well as power in the political life of the group. This is evidenced by the household clusters of burials, as opposed to the burials in the mound itself. An analysis of the biology of the individuals at Town Creek indicates that women, while potentially powerful in several spheres, were also subject to stresses similar to women in other agricultural groups in the Southeast, such as higher rates of non-specific pathological indications of stress like linear enamel hypoplasia, cribra orbitalia, and inflammatory responses of the anterior tibia.

Men at Town Creek had avenues to power and prestige that may not have been open to women, resulting in males without cranial deformation occupying much higher social positions than women without cranial deformation. Males were more likely to experience traumatic injuries during their lifetimes than women were. Men may have served as religious specialists in ways that women did not, indicated by several male burials with an animal

skull, a ritual skin-scraper, and a carved stone amulet. Men in general displayed fewer indications of biological stress than women, and had less variability in markers of skeletal and dental health and nutrition.

This study is a first step towards integrating an important site into recent literature about political and social change and development in the region. It represents the first reporting on the entire human population from Town Creek. Previous analyses examined severely limited samples of the burials at the site, and were of limited value for understanding the health and diet of the community. It is hoped that this research will spur other archaeologists and bioarchaeologists to incorporate and integrate Town Creek into regional studies.

Contributions of the Research

This study has relied on a thorough integration of bioarchaeological and mortuary archaeology data, methods, and theory. Previous studies of Mississippian mortuary contexts typically rely primarily on one or the other of these perspectives. Blending these perspectives has been particularly useful in elucidating the patterns discussed in this analysis. The methods used have been specifically applied to avoid gender bias in the collection of the skeletal data.

The model for data collection and interpretation developed here should prove useful in illuminating complex patterns in the mortuary program at other sites as well. A close examination of the interrelationships of health, nutrition, spatial dimensions, and artifact distributions within other large sites such as Irene, Etowah, and even Moundville and Cahokia would yield interesting results. Incorporation of cranial deformation data is still

uncommon, but potentially important in understanding regional interactions in other sites on the fringe of the Mississippian world, or even to examine possible resistance to Mississippian expansion.

Future Research

Intrasite chronology

One of the most frustrating elements of this analysis has been the inability to pin down any type of intrasite chronology of the burials and buildings. As others begin to study Town Creek, perhaps a method for producing such a chronology will be developed, such as ceramic seriation and a better understanding of the stratigraphy at the site. Of course, radiocarbon dating may help, but without a compelling reason to destroy human bone, this line of enquiry is rightly closed.

If an intrasite chronology can be refined, it will allow us to examine the growth of the site, and perhaps understand why the people at Town Creek and other Pee Dee sites actively developed characteristic Mississippian architecture and their pattern of cranial deformation, as well as ceramic motifs and adornment. Because Coe's model of invasion does not appear to fit the available data, another explanation of the development of the site must be produced. The question of how and why local people adopted Mississippian ways is of interest throughout the Southeast, and perhaps research at Town Creek can add to this line of thought.

Gender and ritual

In the future, the data generated here could be used to more closely examine the differing roles of men and women in ritual activities. Lambert (2001) has contributed a fascinating study of a particular skeletal trait, auditory exostoses, combined with ethnohistoric information about ritual bathing practices to create a rich interpretation of these bathing rituals by gender at Town Creek and other South Appalachian Mississippian sites. This type of combination of biological and cultural information is one particularly exciting and fruitful direction for future bioarchaeological analyses.

Preliminary studies of biological distance at Town Creek show potential for future research as well. As discussed above, rituals performed in structures is more in the private sector, and may be more subject to a sort of "ritual drift" or change through time in different directions, due to the lack of oversight of the whole group. Therefore, some of the differences between clusters may be due to different traditions that develop in the different groups. If these were competing kin groups, emphasis may have been put on these differences, accelerating the pace of divergence from common rituals. Biological distance studies may be able to determine whether these burial clusters are formed of related individuals, and may help us understand marriage patterns and alliances within Town Creek individuals as well as within the region.

The household sphere is often under the control of women, and according to early European explorers in the area, this seems to have been the case in the Southeast at the time of contact. Because women were reinforcing and creating their importance in the society, I expect ritual within households to be under the control of women, and emphasize their role. The burials of children, as extensions of the position and role of their mothers, may contain

similar themes and motifs as the burials of women. Female children might be especially linked to women's positions and roles.

It is my hope that future researchers will bring different but complementary methods and questions to bear on this unique collection so that it can be fruitfully compared with the rich archaeological and bioarchaeological studies that take place in the Southeastern United States.

APPENDIX A

Database of excavated individuals

Burial	Age Range	Age	Sex	Cranial Def.	Location	Position	Side	Head	Orient.	Type	Artifacts	Cluster
2-001a	35-45	MA	F	FO	2R14.5	SF	R	E	E-W	Pit, double	N	1
2-001b	25-35	A	F	FO	2R14.5	F	B	E	E-W	Pit, double	N	1
2-002a	NB	NB	Y	?	-4R4	URN	-	-	-	URN	Y	1
2-002b	ADULT	A1	M?	?	80R30	?	?	?	?	?	N	5
2-003	20-35	A	F?	?	17.5R35.5	SF	B	NW	NW-SE	oval pit	N	3
2-004	40+	OA	M	?	19.5R31	F	R	W	E-W	oval pit	N	3
2-005	ADULT	A1	F	?	-2.7R19.6	F	B	E	E-W	oval pit	N	1
2-006	40+	OA	M	?	23R23.5	SF	B	SW	NE-SW	oval pit	Y	3
2-007	30+	A	F	FO	58R44	bundle	-	-	-	bundle	Y	4
2-008	35+/-5	OA	F?	FO	-10R20	F	R	S	N-S	oval pit	N	5
2-009	?	U	U	?	85R45	?	?	?	NE-SW	oval pit	N	5
2-010	3-6 mos	NB	Y	?	43R28	?	?	?	NE-SW	oval pit	N	E
2-011	9+/-3 mos	NB	Y	?	37.5R36.7	F	?	?	?	round pit	N	0
2-012a	9+/-1	J	Y	?	-7.8R31.7	F	B	NW	N-S	oval pit	N	1
2-012b	9mos-1Y	NB	Y	?	-7.8R31.7	?	?	?	N-S	oval pit	N	1
2-013	25-35	A	F	?	-6.7R6.7 A	SF	B	N	N-S	oval pit	Y	1
2-014a	30+	A	F	?	-19R2 A	SF	B	N	N-S	oval pit	N	1
2-014b	16+/-2	YA	F?	?	-16.2R2.8 A	SF	B	N	?	oval pit	N	1
2-014c	3mos+/-2	NB	Y	?	-16.2R2.8 A	?	?	?	?	Extra indiv	N	1
2-015	30-40	MA	F	?	-13R2.5A	SF	B	N	N-S	oval pit	N	1
2-016	40+	OA	M	?	-16.5L4A	SF	B	N	N-S	oval pit	N	1
2-017	30+	A	M?	?	-14L7.5	F	L	S	NW-SE	oval pit	N	1
2-018	?	U	U	?	-13R18.5	?	?	?	?	oval pit	N	1
2-019	?	U	U	?	-20.5R12	?	?	?	?	oval pit	N	1
2-020	adult	A1	M	?	-13.5R12	E	B	E	E-W	rectangular	N	1
2-021	40+	OA	M	?	-23.3L12.7	SF	B+R	NE	NE-SW	oval pit	N	1
2-022	18+	A1	U	?	-10R10	F	R	?	NW-SE	oval pit	N	1
2-023	40+	OA	F	FO	-10R10	SF	B	W	E-W	oval pit	N	1
2-024	40+	OA	M	FO	-10R20	SF	B	NE	NE-SW	oval pit	N	1
2-025	40+	OA	F?	FO	-10R20	SF	B	E	E-W	oval pit	N	1
2-026	40+	OA	M	FO	-20R20	F	R	NE	NE-SW	oval pit	N	1
2-027	35+/-8	A	M?	FO	-10R20	F	L	ESE	ENE-WSW	oval pit	N	1
2-028	30+	A	F?	?	-10R20	-	-	-	-	Secondary	N	1
2-029	40+	OA	F?	FO	-10R20	SF	L	NNE	NNE-WSW	oval pit	N	1

2-029a	25-35	A	U	?	w/b.30	-	-	-	-	extra individual	N	1
2-030	30-40	A	F?	?	dbl. Burial	bundle	-	-	-	bundled with b. 29	N	1
2-031	6+/-2	C	Y	?	-10R20	F	R	W	E-W	Dbl	N	1
2-032	30+	A	M?	?	-10R30	E	B	E	E-W	oval pit	N	1
2-033	21+	A1	U	?	-20R50	SF	B	NE	NE-SW	oval pit	Y	2
2-034	30-40	MA	M	?	-30R50	F	R	SSE	SSE-NNW	oval pit	Y	2
2-035	?	I	Y	?	-20R50	URN	-	-	-	URN	Y	2
2-036	30-40	MA	F	FO	40R60	E	B	N	N-S	Rec.Pit	N	0
2-037	adult	A1	U	?	90R50	F?	B and R	NW	ESE-WNW	oval pit	N	5
2-038	30+	MA	F?	?	80R60	SF	B	NW	ESE-WNW	oval pit	Y	5
2-039	6mos+/-3m	NB	Y	?	80R40	SF	B	NW	ESE-WNW	oval pit	N	5
2-040	6+/-2	C	Y	?	90R70	?	?	N	N-S	oval pit	N	0
2-041	25-30	A	F	FO	40R40	F	R	E	E-W	oval pit	N	4
2-042	1m	NB	Y	?	40R30	F	R	NW	ESE-WNW	oval pit	N	E
2-043	3mos+/-2	NB	Y	?	40R30	SF	B	S	N-S	oval pit	Y	E
2-044	4+/-1	C	Y	?	50R40	E	B	N	N-S	Rec.Pit	Y	4
2-045	30-40	MA	F	FO	50R40	SF	B	S	N-S	oval pit	N	4
2-046	2y+/-8m	I	Y	?	50R40	F	B	NE	SW-NE	oval pit	Y	4
2-047	40+	OA	U	?	80R40	F	B or Stomach?	N	N-S	oval pit	Y	5
2-048	35+	MA	F	?	45.1L8.1	bundle	-	-	N-S	bundle, oval pit	Y	TH2
2-049	35-45	MA	F?	?	30.9L10.15	bundle	-	-	no pit evident	bundle	N	TH2
2-050	?	U	U	?	50R70	?	?	?	?	no pit outline	N	0
2-051	?	U	U	?	?	F?	?	?	?	no pit outline	N	5
2-052	13+/- 2.5	AD	F	?	-19.5R56	F	L	NW	NW-SE	oval pit	N	2
2-053	40+	OA	F	None	-18R52.5	SF-Jitterbug	B	NW	NW-SE	oval pit	N	2

2-053a	1mo	NB	Y	?	-18R52.5	?	?	?	NW-SE	oval pit	N	2
2-054	40+	OA	M	?	-18R52.5	F	L	NW	NW-SE	oval pit	N	2
2-055	26+/-7	A	F	FO	-23R53	E	B	N	N-S	Rec pit	N	2
2-056	6+/-2	C	Y	?	-21R39	?	?	NE	NE-SW	oval pit	N	2
2-057	19+/-3	AD	F	None	-12R52	SF	B	NE	NE-SW	oval pit	N	2
2-058	adult	A1	U	?	-28R44	?	?	?	NE-SW	oval pit	N	2
2-059	21+	A1	M?	?	56.6L58	F	R	E	N-S	oval pit	Y	TH1
2-060		A1	U	?	Sq 20 and 30	F	L	E	E-W	oval pit	Y	TH1
2-061	25-35	A	F?	?	Sq 60	F	R	N	E-W	oval pit	N	TH1
3-001a	18-25	YA	F	?	0R20	SF	B	E	E-W	oval pit	N	11
3-002a	?	A1	U	?	?	?	L	SE	NW-SE	oval pit	N	11
3-003a	?	I	Y	?	-10R10	?	?	NW	NW-SE	oval pit	N	11
3-004a	2-6 Y	C	Y	?	0R10	?	?	NW	NW-SE	oval pit	N	11
3-005	18+/-3	YA	F	FO	-10R10	SF or F? look at photo	B	NE	NE-SW	oval pit	Y	11
3-006	30+	A	U	?	-20R10	SF	B	E	E-W	oval pit	Y	12
3-007	18mos+/- 6	NB	Y	?	-10R10	SF?	B	SE	NW-SE	round pit	Y	11
3-008	35-40	MA	M	FO	-10R20	F	R	S	N-S	oval pit	N	11
3-009	20-30	A	U	?	-19.5R18.3	F	R	SE	NW-SE	oval pit	N	12
3-010	25+/-5	A	F	FO	0R10	SF	B	S	NW-SE	oval pit	N	11
3-011	35+/-5	MA	F?	?	40L20	SF	B	ENE	ENE-WSW	oval pit	N	0
3-012	25+/-5	A	F	None	-20??	F	L	E	NE-SW	oval pit	N	12
3-012a	18-25	YA	U	?	-20??	?	?	?	?	?	N	12
3-013	5+/-16 mos	C	Y	?	-20??	?	?	NE	NNE-WSW	oval pit	N	12
3-014	30+	OA	F?	?	13.5L8.9	SF	B	E	E-W	oval pit	N	0
3-015	9m+/- 3	NB	Y	?	-17R16.1	URN	-	-	-	URN, killed	N	12
3-016	?	I	Y	?	-20.3R14.2	URN	-	-	-	URN, killed	N	12
3-017	30+/-5	A	M	?	-28.7L5.3	SF or F? look at photo	L and back?	N	N-S	oval pit	N	12
3-018	16+/-3	AD	F?	?	-26.7L5.1	F	R	S	N-S	oval pit	N	12
3-019	35+/-5	MA	M	FO	-22.1L4.9	SF	B	NE	NE-SW	oval pit	Y	12
3-020	?	A1	M	?	-24L0.2	F	L	NE	NE-SW	oval pit	Y	12
3-021	7+/-2	J	Y	?	-23.15R7.5	F or SF?	B	NW	E-W	oval pit	Y	12
3-022	35+	OA	F?	?	-29.8R7.5	F	B	W	E-W	oval pit	N	12
3-023	18-25	YA	F?	?	-37.3R4.15	SF	B	SE	SE-NW	oval pit	Y	12

3-024	?	I	Y	?	-35.3R2.65	URN	-	-	-	URN, killed	Y	12
3-025	4+/-1	C	Y	?	-25.6R4.9	URN	-	-	-	URN, killed	Y	12
3-026	20-30	A	F	None	24.6I14.7	F?	B	N	N-S	oval pit	N	0
3-027	ADULT	A1	U	?	18.1L15.8	F	R	WSW	WSW-ENE	oval pit	N	0
3-028	30-40	MA	M	?	20.7L21.5	F	L	E	E-W	oval pit	N	0
3-029	adult	A1	M	?	-35.5L.4	?	?	NW	NW-SE	oval pit	N	12
3-030	25-35	A	F?	?	-34R12	SF	B	S	N-S	oval pit	N	12
3-031	7.5+/-2	J	Y	?	-26R17	F	R	S	N-S	oval pit	N	12
3-032	?	U	U	?	-25R11	?	?	?	N-S	oval pit	N	12
3-033	25+	A1	F?	?	?	SF	B	W	E-W	oval pit	Y	12
3-034	?	U	U	?	?	?	B	W	E-W	oval pit	N	0
3-035	?	U	U	?	?	?	?	?	?	?	N	0
3-036	1.5+/-6m	I	Y	?	-50R10	?	?	?	?	oval pit	Y	13
3-037	25-35	A	F	FO	-53.6R8.6	E	B	N	N-S	oval pit	Y	13
3-038	18-30	YA	F?	?	-41.6R8.6	F-vertical in pit	?	NE	NE-SW	oval pit	N	12
3-039	35+	OA	M?	?	-58.7R17	F-vertical in pit	?	NE	E-W	round pit	N	13
3-040	14+/-2.5	AD	Y	?	-52R17.5	SF	B	S	N-S	oval pit	N	13
3-041	?	U	U	?	-57.8R17.5	F?	?	S	NW-SE	oval pit	N	13
3-042	15-17	AD	F	None	?	F	R	SE	NW-SE	oval pit	Y	14
3-043	20-30	A	F	FO	-84.5R17.5	SF	B	SW	NW-SE	oval pit	Y	14
3-044	35+/-5	OA	F	None	-92R27	F	L	NE	NE-SW	shaft and chamber	N	HIST
3-045	15-19	AD	F?	FO	-90.7R27.7	SF		NNE	NNE-WSW	oval pit	N	14
3-046	40-50	OA	M	FO	?	F	R	SSW	NNE-SSW	oval pit	N	14
3-047	14-18	AD	Y	?	?	F	R	SSW	NNE-SSW	oval pit	N	14
3-048	40-60	OA	M	FO	?	SF	B	NW	NW-SE	oval pit	N	14
3-049	40+/-5	OA	F	FO	?	F	R	?	?	oval pit	N	14
3-050	35+/-6	MA	M	None	-90.8R19	E	B	SE	NW-SE	oval pit	Y	14
3-051	4-5y	C	Y	None	-97R13.3	F	L	NE	NE-SW	shaft and chamber	Y	HIST
3-052	1y+/-3m	NB	Y	?	-98.8R16.3	SF	B	NE	NE-SW	shaft and chamber	Y	HIST
3-053	42+/-7	OA	F	?	?	SF	B	S	N-S	round	N	14

3-054	5+/-2	C	Y	?	?	F	L	ENE	ENE-WSW	round	N	14
3-055	?	U	U	?	-166.5R66.5	F	L	SW	NE-SW	shaft and chamber	N	HIST
3-056	?	U	U	?		F	L	E	E-W	oval pit	N	20
3-057	25-35	A	M	?	-151.5R70.5	F	R	E	E-W	oval pit	Y	20
3-058	?	J	Y	?	-155.8R72.2	F	R	E	E-W	oval pit	Y	20
3-059	25+/-5	A	M?	?	-167R75.5	SF	B	NE	NE-SW	oval pit	N	20
3-060	20-30	A	U	?	-169.5R73.5	F	R	NE	NNE-WSW	oval pit	N	20
3-061	20-30	A	F	?	28.5L198.25	F	R	N	N-S	oval pit	N	6
3-062a	8+/-2	J	Y	?	40.25L196.5	?	?	?	?	?	N	0
3-062b	9+/-2	J	Y	?	40.25L196.5	?	?	?	?	?	N	0
3-062c	25-35	A	U	?	40.25L196.5	?	?	?	?	?	N	0
3-062d	adult	A1	U	?	40.25L196.5	?	?	?	?	?	N	0
3-063	adult	A1	F?	?	26.5L199.25	?	?	?	N-S	oval pit	N	6
3-064		A1	U	?	-156.75R56	F	R	ESE	ESE-WNW	oval pit	N	20
3-065	20-30	A	U	?	112.3L41.3	Bund. Or F	?	S	N-S	oval pit	Y	0
3-065a	1y+/-4m	I	Y	?	112.3L41.3	?	?	?	?	oval pit	N	0
3-065b	6+/-2	C	Y	?	112.3L41.3	?	?	?	?	oval pit	N	0
3-066	adult	A1	M?	FO	96L37	SF	B	E	NE-SW	oval pit	N	10
3-067	25-40	A	F?	FO	94.3L33	SF	B		E-W	oval pit	N	10
3-068	30+	A	F	FO	91.8L31.4	E	B		E-W	oval pit	N	10
3-068a	?	I	Y	?	80L30	URN	?	?	?	URN	Y	9
3-069	25-35	A	F	FO	94L23.5	F	L	SE	NW-SE	oval pit	N	10
3-070	40+	A	F?	FO	93L23.3	F	R	NW	NW-SE	oval pit	Y	10
3-071	adult	A1	U	None	85.5L26	F	R	SW	NE-SW	oval pit	N	10
3-072	41+/-10	OA	M	FO	81.2L21.2	F	L	NE	NE-SW	oval pit	N	10
3-073	12+/-2	AD	Y	?	?	?	?	?	NW-SE	oval pit	N	0
3-074	?	U	U	?	?	?	?	?	NW-SE	oval pit	N	0
3-075	12+	A	U	?	86L40	F?	?	?	N-S	oval pit	Y	9
3-076	10+/-2.5	J	Y	None	47L139	F	L	S	N-S	round	N	0
3-077	11+/-2.5	J	Y	?	-63L22	F	R	SW	NW-SE	oval pit	N	0
3-078	11+/-2.5	J	Y	?	-64L25	F	R	SE	NW-SE	oval pit	N	0
3-079	16+/-3	AD	Y	None	-73.5L26.3	F	R	N	NE-SW	oval pit	N	0
3-080	2y+/-8m	C	Y	FO	20.7L182.8	SF	B	N	NE-SW	oval pit	N	0
3-081	8+/-2	J	Y	?	47.5L187.5	F	L	W	NW-SE	oval pit	N	0
3-082	6+/-2	J	Y	?	47L182.5	F	R	NE	NE-SW	oval pit	N	0

3-083	42+/-5	OA	F	None	48L29	F	R	N	NNE-SSW	oval pit	N	0
3-1062	adult	A1	U	?	w/67	?	?	?	?	oval pit	N	10
3-084	25+/-4	A	U	None	56L156.7	F	L	W	E-W	oval pit	Y	0
3-085	child	C	Y	?	61L153.85	F	L	E	E-W	oval pit	N	0
3-086	37+/-6	MA	F	?	65L173.3	SF?	?	SE	NW-SE	oval pit	Y	7
3-087	37+/-5	MA	M	FO	60.8L173.9	SF	B	E	E-W	oval pit	N	7
3-087a	adult	A1	U	?	?	?	?	?	?	oval pit	N	7
3-088	2y+/-8m	C	Y	FO	64.7L185.2	F	R	E	E-W	oval pit	Y	7
3-089	42+/-5	OA	M	FO	67.7L188.6	F	L	S	N-S	oval pit	N	7
3-090	18+	A1	M	?	93.4L185.2	E	B	NE	NE-SW	oval pit	N	7
3-091	6m+/-3m	NB	Y	?	82.65L160.25	Jitterbug	B	W	E-W	oval pit	N	7
3-092	50+/-10	OA	M	FO	75L165.9	F	L	W	NE-SW	oval pit	Y	7
3-093	0-6mos	NB	Y	?	76.17L161.8	E	B	NE	NE-SW	oval pit	N	7
3-094	2.5y+/-10m	C	Y	?	78.2L162.7	SF	B	SW	NE-SW	oval pit	Y	7
3-095	26+/-5	A	F	FO	91.5L166.7	SF	B	N	N-S	oval pit	N	7
3-096	47+/-5	OA	F	FO	90L167	F	L	N	NW-SE	oval pit	N	7
3-097	NB	NB	Y	?	91.75L168.5	URN	-	-	-	URN	Y	7
3-098	3m+/-2m	NB	Y	?	93.8L168.7	URN	-	-	-	URN	N	7
3-099	40+	OA	M	None	80L181.2	F	R	NW	NW-SE	oval pit	N	7
3-100	12	J	Y	?	82.3L180.5	F	L	S	NW-SE	oval pit	Y	7
3-101	40+/-5	OA	F	FO	80L180	F	R	S	NW-SE	oval pit	N	7
3-102a	4.5+/-1	C	Y	?	88.5L177.2	URN	-	-	-	URN	N	7
3-103	?	I	Y	?	90L177.5	URN	-	-	-	URN	N	7
3-104	1y+/-4m	I	Y	?	90.3L175.5	SF	B	N	N-S	oval pit	N	7
3-105	20+/-3	YA	M	FO	85.7L175	F or SF	R	N	E-W	oval pit	N	7
3-106	27+/-6	A	M	FO	87.5L175	Jitterbug	R	E	E-W	oval pit	N	7
3-107	20+/-3	A	M	?	90.5L174.5	SF	B	N	N-S	oval pit	N	7
3-108a	8+/-2	J	Y	FO	84L185.75	F	L	E	E-W	oval pit	Y	7
3-109	4+/-1	C	Y	?	91.2L166	F or SF	B	NW	NW-SE	oval pit	N	7
3-109a	2m+/-2m	NB	Y	?	91.2L166	?	?	?	?	?	N	7
3-110	40+/-5	MA	M	None	88.5L166.5	SF	B	W	E-W	oval pit	N	7
3-111	1.5+/-6m	I	Y	FO	84.5L163.75	SF	B	SE	N-S	oval pit	Y	7
3-112	11+/-2.5	J	Y	FO	83L163	F	L	SW	NW-SE	oval pit	N	7
3-112a	3m+/-2m	NB	Y	?	83L163	?	?	?	?	?	N	7
3-113	3m+/-2m	NB	Y	?	84L173	URN	-	-	-	URN	N	7
3-114	37+/-5	MA	M	None	84L167.5	F	L	S	N-S	oval pit	N	7
3-115	40+/-5	OA	M	FO	85.5L167.8	F	R	S	N-S	oval pit	N	7
3-116	22+/-4	A	M?	?	83.6L168.5	?	?	?	?	oval pit	N	7

3-117	35-45	MA	F	FO	82.8L169.5	E	B	S	N-S	oval pit	Y	7
3-118a	2.5+/-10m	C	Y	?	82L170	?	?	?	?	?	N	7
3-118b	2y+/-8m	C	Y	?	82L170	?	?	?	?	?	N	7
3-118c	6m+/-3m	NB	Y	?	82L170	?	?	?	?	?	N	7
3-118d	NB	NB	Y	?	82L170	?	?	?	?	?	N	7
3-119	35+/-5	MA	F	FO	80.5L166.5	SF	B	SW	NE-SW	oval pit	Y	7
3-120	2y+/-8m	C	Y	FO	78.5L166	SF	B	NE	N-S	oval pit	Y	7
3-121	9m+/-3m	NB	Y	?	82.8L173.5	URN	-	-	-	URN	Y	7
3-122	2y+/-8m	C	Y	?	81.1L173.8	F	B			oval pit	Y	7
3-123	40+/-5	OA	F	FO	79L174	F	R	E	E-W	oval pit	Y	7
3-124	6m+/-3m	NB	Y	?	79L174	URN	-	-	-	URN	Y	7
3-124a	1y+/-6m	I	Y	None	78.5L172.5	?	?	?	?	?	Y	7
3-125	35+/-5	OA	M	None	74L170	SF	B	W	NE-SW	oval pit	N	7
3-125a	?	U	U	?	?	SF	L	E	E-W	pit	N	16
3-126	13+/-3	J	Y	?	-172.6L116.7	SF	B	E	N-S	oval pit	N	18
3-127	4+/-1	C	Y	FO	-177.6L114.2	F?	?	?	N-S	oval pit	N	18
3-128	>18	A1	M?	?	-161L121	SF	B	N	N-S	oval pit	N	18
3-129a	13+/-3	J	Y	?	26.5L203	F	R	WE	E-W	?	N	6
3-129b	>21	A1	M	?	26.5L203	?	?	?	?	?	N	6
3-130a	27+/-6	A	F	FO	24.1L211.5	SF	B	W	E-W	oval pit	N	6
3-131	>21	A1	F	FO	25.9L213.8	F	L	N	N-S	oval pit	N	6
3-131a	2y+/-8m	C	Y	?	25.9L213.8	?	?	?	?	?	N	6
3-132	21+	A1	F	FO	23.7L211.2	F	L	E	E-W	oval pit	N	6
3-133	>18	A	U	None	-173.5L119.1	F	L	N	N-S	round	N	18
3-134	10+/-3	J	Y	?	-163.7L121.4	?	?	?	E-W	oval pit	N	18
3-135	>30	MA	M	?	-165.9L123	F	L	E	E-W	oval pit	Y	18
3-136	13+/-2.5	J	Y	?	-165L124.75	F?	R?	?	?	oval pit	N	18
3-137	42+/-5	OA	F	FO	29L209.5	Secondary	-	-	-	oval pit	N	6
3-138	12+/-2.5	J	Y	?	32.6L207.3	F	L	N	N-S	oval pit	Y	6
3-139	?	U	U	?	27.6L212.2	F	L	NE	NE-SW	oval pit	N	6
3-140	18+	A1	U	?	27.5L216.2	?	L	N	N-S	oval pit	N	6
3-141	17+/-2	AD	F?	FO	29.2L213.5	E	B	SW	NE-SW	oval pit	N	6
3-142	45+/-7	OA	F	FO	31.75L211	F	R	W	E-W	oval pit	N	6
3-142a	4.5+/-1	C	Y	FO	31.7L211	?	?	?	?	oval pit	N	6
3-143	>30	A	M	?	30L209.65	SF	B	N	N-S	oval pit	N	6
3-144	2y+/-8m	C	Y	?	29.8L209.15	F	L	SW	NE-SW	oval pit	N	6
3-145	>21	A1	F?	?	29.8L216	?	?	?	N-S	oval pit	N	6
3-146	45+	OA	M	FO	-170L130.5	E	B	E	E-W	oval pit	N	18
3-146a	3+/-1	C	Y	FO	-170L120	?	?	?	?	oval pit	N	18

3-147	45+	OA	F	FO	-180L130	F	R	N	N-S	oval pit	Y	18
3-148a	4+/-1	C	Y	?	-180L130	?	?	?	?	oval pit	N	18
3-148b	>30	A	U	?	-180L130	?	?	?	?	oval pit	N	18
3-149	>21	A1	M	FO	-174.6L129	SF	B	E	E-W	oval pit	N	18
3-150	?	U	U	?	-168L135.6	F	L	NE	NE-SW	oval pit	N	18
3-151	6+/-2	J	Y	?	-179L137.2	F	R	NE	NE-SW	oval pit	N	18
3-152	>18	A1	M?	?	-164.25L131	F	R	W	E-W	oval pit	N	18
3-153	30+/-5	A	M	None	-151.25L138.25	SF	B	N	N-S	oval pit	N	0
3-155		OA	M	None	-146.35L153.5	F	R	S	N-S	oval pit	N	0
3-130b	18m+/-6m	I	Y	?	?	?	?	?	?	pit	N	6
3-125b	?	U	U	?	?	F	L	S	N-S	pit	N	0

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