AN OSTEOLOGICAL AND FORENSIC PHOTOGRAPHIC ANALYSIS OF PREHISTORIC MULTIPLE BURIALS IN THE MIDDLE TENNESSEE VALLEY

by

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ABSTRACT

Investigation of mortuary practices provides vital information regarding the lifeways of past peoples. Examining multiple burials from the Pickwick Basin, this thesis assesses if these burials were the product of some particular circumstance or situation, and determines how this changed geographically, temporally, and with burial size. Osteological examination and techniques from forensic photographic analysis were used to determine the reasons behind these multiple burials as well as determine any influential factors that may have been at play. While it was determined that geographic and temporal components did influence burial practices, burial size played a much larger role. Further, violence and ritual were found to impact burial practices in the Pickwick Basin.

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CHAPTER 1

INTRODUCTION

This study seeks to determine and understand the significance and meaning behind the presence and change of multiple burials over time between archaeological sites in the Pickwick Basin, located in parts of Alabama, Mississippi, and Tennessee. Remains from nine archaeological sites housed in the laboratory for Human Osteology at the University of Alabama were examined in order to ascertain if there was any significance behind these burials, and to determine why these individuals were not buried in the more frequently found single graves. Originally excavated in the 1930s and 1940s, many of these burials have been previously examined in varying contexts. However, no one has yet examined the information that can be garnered from multiple burials alone, as this study has attempted to do. This research has resulted in an increased understanding of the prehistoric mortuary practices of Native Americans in the Pickwick Basin, as well as the significance of multiple burials. The current study suggests that burial practices changed over time and across sites to determine if multiple burials play a different role during other times and between geographical areas. This study hypothesizes that these multiple burials would be the result of epidemic or disease, ritual sacrifice, violence (including warfare and raiding parties), trophy taking or ancestor veneration.

All photographs taken during the original excavations were examined using forensic photographic analysis. The photographs, curated by the Alabama Museum of Natural History, were digitized, enlarged, and examined for information that could not be gathered osteologically, such as burial method, position, and the presence of grave goods. Analyzing the burials *in situ*

allows researchers to better understand the mortuary conditions as they were at the time of death, as well as how the individuals within the grave are positioned in relation to one another. Further, the photographic analysis used in this study provides information about the circumstances surrounding the death of a few individuals that osteological analysis would not have been able to ascertain.

Chapter Two provides a brief overview of the circumstances leading to the excavations carried out in the Pickwick Basin, beginning with the Great Depression. It outlines relevant portions of Franklin D. Roosevelt's New Deal, which led to the creation of the Tennessee Valley Authority (TVA). The TVA's mission was to boost the economy of much of the southeastern United States. Damming planned by the TVA project was to inundate several archaeological sites. This chapter outlines the area surveyed by the project, as well as the locations of those sites eventually excavated. This chapter details why those specific sites were chosen and provides a brief description of each including its location, the number and condition of the burials found there, and when the sites were excavated. Chapter Two also provides a brief summary of the initial analysis conducted on the osteological material, including who performed the analysis, what kinds of analyses were performed, and what questions the initial researchers were attempting to answer. In this chapter I outline what I was looking for during the examination process, such as signs of violence, sacrifice, epidemic, and trophy taking or ancestor veneration; the osteological and mortuary correlates of which that were used in this study are outlined here.

Chapter Three details the methods and materials used in this research. This chapter begins with descriptive statistical information regarding how many individuals were examined in total, and how many multiple burial groups were present. Chapter Three next details the examination methods used to determine the age and sex of the individuals. Age was assessed

through many standard methods, using cranial suture closure, morphological characteristics of the pubic symphysis, changing morphology of the auricular surface, bone fusion, dental eruption patterns, and long bone length in juveniles. Sex was assessed on sexually mature individuals, using the pelvic girdle, the skull, and the diameter of the femoral head. This chapter details how to determine the correlates of epidemic, ritual sacrifice, violence, trophy taking, and ancestor veneration. The chapter provides an explanation of the differences between antemortem, perimortem, and postmortem trauma, as well as what these signify to the researcher and how to identify them. It is detailed here how different types of trauma will be used by the researcher to help interpret the significance behind each multiple burial. Chapter Three also discusses the forensic photographic analysis procedure used in this study, and outlines what will be examined using this method: burial position, burial goods, primary or secondary burials, stratigraphic information, and if the burial was standard or diverged from normal practice. This chapter also outlines the correlates of divergent burials. Finally, this chapter discusses what statistical tests were used for this study, summarizes why these tests are the appropriate tests to use, and what the results of these tests tell the researcher.

Chapter Four discusses the results that were gathered from this study. This chapter provides the total demographic information (age and sex) gathered from this sample, as well as that of the individual sites. Burial size, the temporal component, and the geographic component are each discussed in detail. Within each of these larger categories, demographic information, scalping incidents, trauma, "skull only" burials, headless burials, and cremations are discussed. Differences between multiple burial sizes (double, triple, quadruple, or burials of five or more individuals) are discussed, as are temporal differences from the Archaic to the Mississippian, and site to site comparisons. The cremations seen in the sample are discussed and a brief overview of

intentional or accidental cremations is provided. An overview of the forensic photographic analysis is discussed. This chapter provides the total number of photos examined, and compares burial position, burial goods, and primary/secondary burials through time from the Archaic to the Mississippian. Chapter Four also shows how forensic photographic analysis provides information about the remains that could not be seen osteologically, including violent events. Finally, this chapter discusses some particularly notable burials encountered during analysis, including a rich children's burial, several extremely violent burials, and a burial containing only individuals with cranial modification.

Chapter Five begins with a summary of the primary focus of the research, including the research question and the main avenues of research taken. Following this, there is a discussion of the results presented in Chapter Four, interpreting the results of the demographic, temporal, and geographic comparisons, as well as the differences found in the various sizes of multiple burials. Geographic and demographic differences in trauma types and rates are discussed, as well as why some of these differences may be present. It discusses the differences that occur from the Archaic to the Mississippian, particularly trauma (and violent death), burial goods, and burial position. Differences in burial sizes are discussed at length, and included are ideas as to why these differences occur. Of particular interest are the differences seen between large burials (triple, quadruple, and burials of five or more) and small burials (double burials). Chapter Five then presents a summary of these findings, and discusses limitations encountered in the study. It also provides several suggestions of avenues for future research.

CHAPTER 2

BACKGROUND

Unemployment had reached unparalleled heights during the Great Depression. The South, like much of the nation, suffered greatly. Along with the stock market, agriculture declined steadily, and cotton and tobacco sales plummeted. This left much of the region out of work. Franklin Delano Roosevelt, elected in 1932 and tasked with resolving this economic disaster, created a number of relief agencies, including the Federal Emergency Relief Administration (FERA), the Civil Works Administration (CWA), and the Works Progress Administration (WPA). The CWA provided labor to the Tennessee Valley Authority (TVA) for archaeological investigation, which employed over a thousand workers (Lyon 1996:27-30).

Created in 1933, the TVA was a major component of Roosevelt's New Deal. It was formed to develop both the natural and human resources of the Tennessee River Valley physically, economically, and socially. The TVA was formed in an area stricken by extensive and pervasive poverty, including east Tennessee, west North Carolina, northwest Georgia, southwest Virginia, north Alabama, and northeast Mississippi. Families in these areas often earned less than one hundred dollars per year. Further, economic development had been deterred in the region by the frequent flooding and problematic navigations of the Tennessee River. The first step in improving the region economically was to improve the river. To do so, the Army Corps of Engineers and the TVA proposed river management plans which called for large-scale damming. However, this extensive damming would inundate many archaeological sites in the region. Professional and amateur archaeologists alike pressured the TVA to first conduct salvage archaeological projects in order to preserve as much information as possible. (Lyon 1996:37-39).

They made persuasive and passionate arguments, claiming that "not only Tennessee but the entire nation will be the loser unless the data and material remains now threatened with destruction are scientifically recovered and preserved" (Lyon 1996:39). Their impassioned pleas worked, and a large-scale salvage archaeology project began.

From the start, the project intended to focus on prehistoric sites, with little attention to historic sites (Lyon 1996:41). Most of the resources possessed by the Alabama WPA were used on sites that were to be flooded by the Pickwick Landing Dam. This dam, located on the Tennessee River in Hardin County, Tennessee was authorized in November of 1934 and completed in February of 1938. It was the third major dam built by TVA, and was over 7,000 feet long and 113 feet high (Lyon 1996:129). This dam, too, would inundate numerous archaeological sites and required salvage archaeological efforts to preserve all evidence of material culture and to study all prehistoric remains from the region. To accomplish this, an archaeological survey was undertaken of the region under the Social and Economic Research Division of the TVA in conjunction with the University of Alabama's Museum of Natural History. The survey's purpose was twofold: to locate and describe all archaeological sites within the basin and to excavate these sites to preserve information and material remains (Webb and DeJarnette 1942). The archaeological program was formed around the topography of the basin. The Tennessee River Valley is an expansive floodplain, surrounded by steep bluffs. Getting workers to the sites themselves proved to be a challenge; many individuals had to be dropped off as near as they could get to the site, while some sites were simply impossible to reach in the winter due to water and mud (Lyon 1996:129-130).

In 1936, a survey was conducted to locate all archaeological sites within the Pickwick Basin. Each site found was described, classified, and plotted on an aerial map of the region. In

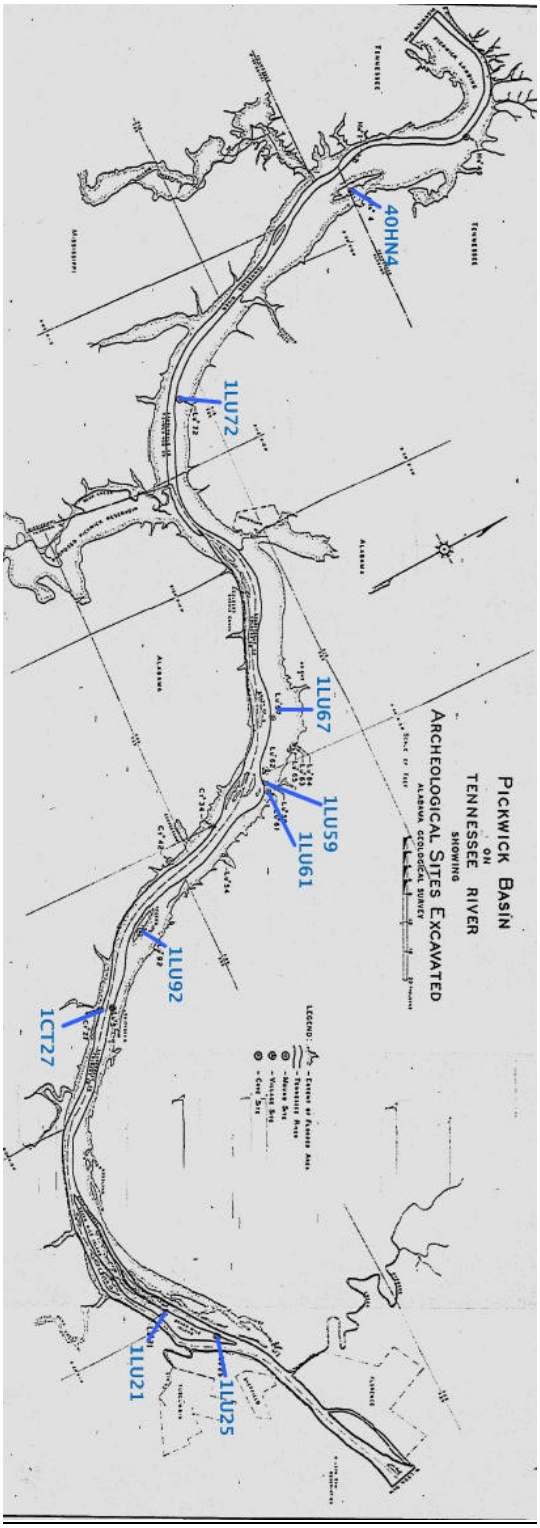
all, 323 sites were recorded: 49 in Hardin County, Tennessee, 40 in Tishomingo County, Mississippi, 116 in Colbert County, Alabama, and 118 in Lauderdale County, Alabama. In May of 1936, supervisors from TVA and laborers from the WPA began the excavation of selected sites. Of the 323 sites, only nineteen were excavated completely or nearly completely: McKelvey Mound (40HN1), Fisher Mound (40HN4), Boyd's Landing (40HN49), Smithsonia Landing (1LU5), Seven Mile Island (1LU21), Perry Site (1LU25), Colbert Creek Mound (1LU54), Bluff Creek Site (1LU59), O'Neal Site (1LU61), Meander Scar (1LU62), Wright Mound No.1 (1LU63), Wright Mound No.2 (1LU64), Wright Village (1LU65), Long Branch Site (1LU67), Union Hollow (1LU72), Koger's Island (1LU92), Mulberry Creek (1CT27), Georgetown Landing (1CT34), and Georgetown Cave (1CT42) (Webb and Dejarnette 1942).

Sites Examined in Study

Of these nineteen sites, only nine were examined for the current project: Fisher Mound, Seven Mile Island, Perry, Bluff Creek, O'Neal, Long Branch, Union Hollow, Koger's Island, and Mulberry Creek (Figure 2.1). These nine were selected for this study because they contained at least one instance of multiple burial, while the other ten sites did not.

Figure 2.1

Map of the Sites Examined in this Study



Fisher Mound, located in Hardin County, Tennessee consists of a Copena burial mound constructed from heavy yellow clay standing eleven feet in height and having a seventy-foot diameter. During excavation, methods were used to retain as much of the skeletal and material remains as possible. In total, 64 burials were excavated, and of these there were only three multiple burial clusters consisting of a total of eight individuals (Webb and DeJarnette 1942).

Seven Mile Island, located on an island in the Tennessee River of the same name, is another mound site. This island is seven miles long and only half a mile wide at its widest point (Webb and DeJarnette 1942). This site was dated to the Mississippian period, and had a truncated pyramidal mound. Underneath the mound was a large village; unfortunately, however, this village could not be excavated due to flooding (Lyon 1996:134) The site had sixteen burials, of which there were only two double burials (Webb and DeJarnette 1942).

The Perry site also is located on Seven Mile Island, and is a shell mound site. Excavation began in the summer of 1938, eventually producing 1,031 burials. Of these numerous burials, there were twenty-seven different multiple burial groups, containing ninety-one different individuals. Because of the good preservation of the skeletal material and the general importance of the site, excavators deemed the site worthy of continued excavation and more extensive study after all other fieldwork in the Pickwick Basin had ended. In doing so, the excavators hoped to increase the number of skeletal remains they had from the site in order to make statistical measures taken from the material all the more valid. Excavations began again in June of 1939 (Webb and Dejarnette 1948). It was found that the later occupancy of the site produced more frequent multiple burials. Multiple burials were so common, in fact, that the excavators said that they were “led to suspect that something more than accidental death of several persons at the

same time would be necessary to account for the frequent and recurrent multiple burials" (Webb and DeJarnette 1948:26).

The Bluff Creek Site is located fourteen miles west of Florence, Alabama, on what was then the bank of the Tennessee River. This site also was composed of a shell mound/midden that had a total depth of around sixteen feet (Webb and DeJarnette 1942). Excavations began in the fall of 1936, but were disrupted in the winter by several "cave-ins" and a major slide toward the end of the project (Lyon 1996:134). Despite the elements, 197 burials were recovered from this site. Within these, there were three multiple burial groups containing a total of nine individuals (Webb and DeJarnette 1942).

The O'Neal Site is also a shell mound site, which was located on what would have been the northern bank of the Tennessee River, some fourteen miles west of Florence. Excavations began here initially in August of 1937 but they had to be halted until January 1938. In general, the site produced very poorly preserved burials. The decay of bone was unusually great, which was likely due to the high water table and the moist lower levels of shell. Sixty-two burials were removed from the site, and of these there were three multiple burials which contained thirteen individuals collectively (Webb and DeJarnette 1942).

The Long Branch Site is a shell mound site that was located in Lauderdale County, Alabama, about fourteen miles west of Florence. It was excavated in the summer of 1936, producing ninety-two burials. Of these, there was one multiple burial containing two individuals, and fifteen burials that were noted for having "extra bones" (Webb and DeJarnette 1942:186-189). Because of this description, these fifteen individuals were included in the study.

The Union Hollow Site is another shell mound and is located five miles north of Waterloo, Alabama. The mound stood only five feet high at the time of excavation, but

excavators noted this low height was the result of erosion due to cultivation. This site was abandoned prematurely due to flooding and cave-ins; however, twenty-one burials were removed from the site, and within these sets of remains there was one multiple burial containing three individuals (Webb and DeJarnette 1942).

The Koger's Island Site is a village and cemetery site located on an island of the same name. The island itself is about two and a half miles long and a mile wide. Koger's Island was excavated during the winter of 1937-1938. The site was made up of two different time components (which were later determined to be Archaic and Mississippian). Archaeologists excavated a portion of the village, and all skeletal remains found were allowed to be washed by the rain, after which they "dried and hardened" (Lyon 1996:135). Some of the skeletal remains were in very good condition, while others only were represented by decayed fragments of bone. Only a small portion of the site was excavated due to time constraints, but from this portion 102 burials were recovered. Of these burials, there were seven multiple burial groups containing thirty-two individuals (Webb and DeJarnette 1942).

Finally, Mulberry Creek, the last site examined in this current study, was a shell mound located on the banks of Mulberry Creek and the Tennessee River. The shell deposit was twenty feet deep and 300 feet long. Excavations began in the summer of 1936, but were disrupted from January of 1937 to that May, due to major flooding (Lyon 1996:133). The Mulberry Creek site contained 134 burials, of which there were five multiple burial groups containing eleven individuals collectively (Webb and DeJarnette 1942).

The human skeletal remains found in the Pickwick Basin were initially analyzed by Marshall Newman and Charles Snow. Newman measured the cranial material while Snow examined the postcranial remains. Earnest A. Hooton also provided his expertise, using

statistical, rather than anthropometric measures, and examined some of the pathological material. G.K. Neumann mediated any problems that arose with metric and morphological techniques. (Lyon 1996:135; Webb and DeJarnette 1942:397-398). The report on the skeletal material indicates that there were four main problems they were considering, many of which considered differences within and between the "Shell Mound" skeletal series and the "Koger's Island" series. The first problem considered the relationship of Mulberry Creek (1CT27) submound skeletons to those of the Shell Mound skeletons. The second considered the relationships of the Shell Mound series skeletons to each other, and whether they were a homogenous or diverse group. They next questioned the relationship between the Koger's Island series from the Perry Site (1LU25) and the series from Koger's Island cemetery (1LU92), to determine whether these were homogeneous populations or not, and how they differed from others in the Shell Mound series. Finally, they dealt with the "unplaced" skeletons, meaning those that could not be placed with any confidence into either the Shell Mound or Koger's Island groups (Webb and DeJarnette 1942:399).

Multiple Burials as Specific Events

While the initial analysis provided much needed information and data on the people of the Pickwick Basin, continued study can reveal even more. The study of human remains can provide information regarding the life and health of an individual as well as that of a population. Skeletal material can reveal much to the archaeologist: past diet, chronic infectious disease, physiological stress (growth disruption), violence or trauma, past lifeways and activities, dental function and tooth use, population history, biological relatedness, and age and sex demographics. The analysis of human remains allows us to assess the overall health, well-being, and general

human condition of people in the past through time (Larsen 2002). Of particular interest to this project were the categories of violence and trauma. As Larsen (2002:128) points out, archaeologists are able to argue for the presence of violence or warfare through many lines of evidence, such as fortifications, defensible sites, settlement patterns, weapons, and iconographic images depicting conflict. However, he goes on to say that these types of evidence merely "identify the *threat* of conflict and not its *outcome* for the individuals involved. Bioarchaeologists are well positioned to study the presence and pattern of injuries deriving from violence" (Larsen 2002:128; emphasis in original). People of the Pickwick Basin were no strangers to violence, and it was likely a threat they often dealt with.

Just as the actual skeletal remains can provide information regarding past peoples, so too can the interments themselves. There are two types of interments, primary or secondary. In primary interments, the individuals within the interment are buried and never moved, being in an extended, flexed, or semi-flexed position. Secondary interments, on the other hand, involve individuals who are exhumed and then reburied at another location at a later date. These bones could be allowed to decompose and then exhumed, gathered and reburied. Bones that are reburied are often jumbled when placed in the new burial pit, and are called a bundle burial. Both primary and secondary burials are found in cases of multiple burials. An individual's interment in a multiple burial, while not uncommon, was far less customary than a person being buried in a singular pit. Multiple burials have been proposed as the outcome of specific events, such as an epidemic or a disease sweeping through a community (Hutchinson and Mitchem 2001:61), ritual sacrifice (Ambrose 2003) trophy taking (Jacobi 2007; Ross-Stallings 2007) or the aftermath of a violent event (Jacobi 2007:314). The correlates of these events can be seen in Figure 2.2 (Figure 2.2).

Figure 2.2

Osteological and Archaeological Correlates of
Violence, Epidemic, Sacrificial Retainers, and Trophy Taking/Veneration

Violent Death	- Bone Fractures
	- Defensive Wounds
	- Body Positioning
	- Points Embedded into Bone
	- Trophy Taking/Veneration
	  - Presence of extra limbs, hands, feet, skulls, or absence of the same
	  - Cut marks on bone
	  - Extra body parts present in mortuary context when the burial pit has not been reused

Epidemic	- Mass Burials - High Proportion of Cremations - Disproportionate Age/Sex Profiles - Specially Constructed Mortuary Facilities (Hutchinson and Mitchem 2001)

Sacrificial Retainers	- Principal individual, no trauma
	- Other individuals, with trauma
	- Body positioning
	- Offerings for principal individual (Gaither 2008)
	- Trophy Taking/Veneration
	  - Presence of extra limbs, hands, feet, skulls, or absence of the same
	  - Cut marks on bone
	  - Extra body parts present in mortuary context when the burial pit has not been reused

Previous Interpretations of Multiple Burials in the Region

The sites examined in this study are no exception, and show evidence of possible ritual sacrifice, violence, and epidemic. "Tick Island" (1La13) in the Wheeler Basin provides an example of a possible ritual sacrifice. A primarily undisturbed burial mound, Tick Island includes twenty-seven burials, of which three were complete bundle burials, six extended or flexed burials, and eighteen were separate skulls. Because Native Americans likely believed that a complete body was needed to reach the afterlife, the eighteen skulls may have represented ritual sacrifices that would have accompanied the complete individuals in the mound to the spirit world (Jacobi 2007:326). An Archaic mass burial at the O'Neal site contained fifteen individuals which could be indicative of an epidemic or raid at that site, due to the large number of juveniles present in the burial; twelve of the fifteen individuals were under fifteen years of age (Lubsen 2004). Mulberry Creek (1Ct27) in the Pickwick Basin revealed a violent episode involving three adult males. Two individuals had projectile points embedded into their vertebrae, while the third had a point in his thoracic cavity (Shields 2003). Bridges, Jacobi, and Powell (2000:36-37) found evidence of violence at the Perry site (1LU25) and the Koger's Island site (1LU92). The Perry site contained multiple individuals with projectile points embedded in the bone, while multiple individuals from Koger's Island displayed evidence of scalping. Bridges (1996) suggests that the individuals displaying evidence of scalping at Koger's Island were likely the victim of raiding or warfare.

There is also evidence for violent episodes displayed in multiple burials at the Law's Site (1MS100) in the Guntersville Basin, which was occupied continually from at least A.D. 1540 up until migrations began in 1686 (Padgett 2007:52). An adult (possibly female) and child were buried together. The female displayed evidence of violent trauma, including perimortem cuts on

the tenth thoracic vertebrae and a tangential cut on the right tenth rib, as well as two trauma points on the right frontal bone (that appear to be depression fractures). In addition to these, there is a triangular shaped defect at the right coronal and sphenoidal sutures, a fracture resulting from this defect, and evidence of scalping. The child was estimated to be nine to twelve months of age at the time of death and did not display trauma. However, because the adult displayed the only evidence of scalping at the site, and the two were not buried in a larger grave, it was concluded that the two were likely victims of a raid (Padgett 2007:330-337). Mary C. Hill (1981), investigating the Gainesville Lake area of the Tennessee-Tombigbee Waterway, also found evidence of violence in multiple burials. At 1Pi61, first occupied during the Early Archaic (Caddell, Woodrick and Hill 1981:35), a young female, an infant, and a subadult were interred in a shallow pit. The female had two projectile points in the right chest region, and the subadult had a single projectile point in the right chest area (Caddell, Woodrick and Hill 1981). At the same site, two adult males and one adult female were found together in a large basin shaped pit. Each male was found with projectile points in their remains (Caddell, Woodrick, and Hill 1981). Excavations carried out at the Perry Site (1Lu25) in the Pickwick Basin revealed four headless adults (Burials 164-167), one of whom was buried face down with a fetus (Burial 224) beneath the pelvis, probably indicating that this individual was pregnant at the time of death. Prone Burials 616 and 617 also showed signs of violence, both having projectile points in their chest cavities (Webb and DeJarnette 1942). Unlike other burial types, prone burials indicate disrespect for the individual who is buried in that manner, which would not be surprising to find in instances of violent death. The only two known dwarves buried at Moundville, for example, were both buried in the prone position (The Science News-Letter 1941:250; Snow 1943:9).

A multiple burial on McKee Island (1Ms32) involving three adult females was found to be missing many of the women's hands. The excavators speculated that this could indicate a trophy removal, as the hands would have been located at the midpoint in the burials, where other bones had survived (Padgett 2007:307-312). In the Guntersville Basin at the Harris Site (1Ms80), several skulls were buried together that could have been trophy skulls, and may have had ceremonial significance. All were decorated with graphite and did not possess a mandible (Webb and Wilder 1951). These skulls could have been a kind of spiritual trophy that could indicate allegiance or sacrifice. Alternately, these skulls could represent acts of veneration, in which the decorated skulls would have been used or incorporated into daily ritual or activities, evoking memories (Jacobi 2007:327-329). In a similar case from Chucalissa in western Tennessee, three burials were found with extra body parts, including lower arms and modified human bone. Burial three seemed to have had its hands removed, and was buried with three extra human skulls; two of which show evidence of scalping, and one was painted with red ochre (Jacobi 2007:330). These skulls could have served a similar purpose as those from the Harris Site.

While there has been some investigation into burials from the Pickwick Basin, no one has examined the information that can be garnered from multiple burials alone, or the significance that these burials would have had. This study analyzes individuals found in multiple burials from nine sites in the Pickwick Basin located in parts of Alabama, Tennessee, and Mississippi to discern the meaning behind and significance of these individuals being interred with others rather than separately in a single burial. Burials will be analyzed to determine if they were the result of disease, sacrifice, violent episodes, trophy taking or ancestor veneration as well as if the reasons behind a multiple burial in this region changes over time, from the Archaic to the Mississippian.

Violence

Violent burials can be differentiated from other burials through evidence of perimortem violence (at or around the time of death) and observations of body positioning in the burial pit. Perimortem violence often can be seen osteologically and indicates a non-peaceful death depending on the location and severity of the wound. Bone fractures, defensive wounds, decapitation, and scalping all can be seen in osteological analysis, and may indicate violent death. Body positioning within the grave, which in the case of burials from the Pickwick Basin was recorded by excavators through photographs and maps, may be examined using forensic photo analysis. This analysis of body positioning can indicate whether the burial was standard for that group or diverged from normal practice. Haglund and Sorg (2002:314) make an important distinction between the two (which they refer to as considerate and non-considerate), saying that standard (or considerate) burials normally contain individuals in correct anatomical position and may have grave goods, while divergent (or non-considerate) burials usually have multiple individuals with trauma, are disarticulated, and normally disposed of in a way not typical for that culture group. In a Barbados slave cemetery, for example, a single female was the only individual buried in the largest artificial mound in the cemetery. She had no grave goods and is the only individual from the site buried in the prone position. Handler (1996) concluded she was likely viewed in a negative manner, possibly as a witch, making her a feared or ostracized person, based on ethnohistoric data. Further, violence can be seen through physical remainders of inflicted violent behavior (i.e., projectile points) that may be embedded into the bone.

As the above examples show, individuals in the prehistoric southeastern United States were familiar with violent events. Warfare in Mississippian times had origins in prehistory, as

evidenced by archaeological data and ethnohistoric accounts. Ambushes, raids, and skirmishes conducted by relatively small groups of people using bows, arrows and war clubs were not uncommon. Ethnohistoric data suggests that such methods were used to gain access to enemy territory and return with minimal losses. Raids were quick, unexpected, and incredibly violent (Dye 2008:102). In fact, the Pickwick Basin in general stands out from the surrounding area as having the most evidence for obvious warfare and raids, due to the large proportion of violence seen in the osteological record (Jacobi 2007:310).

Epidemic

Violence is not the only explanation for mass burials. Evidence of epidemics also may be seen through burial practices. Epidemics are often indicated by a number of factors: mass burials, higher proportions of cremation than normal for that site, specially constructed mortuary facilities, and disproportionate age or sex profiles (Hutchinson and Mitchem 2001). Age distributions may be most helpful, especially if the victims were buried in a separate area or distinguished in some other way in unusual mortuary practices (Milner 1996:202). Ann Axtell Morris and Earl Morris, for example, found what they believed to be clear signs of epidemic in the Basketmaker culture from Tseahatso Cave in Arizona. They found a basket "packed" with four children and on top of them laid fourteen babies and infants. These bodies had no signs of violence, and the burial was thus interpreted as the result of a contagious children's disease (Turner and Turner 1999:45). While the authors do not say this, the large number of infants in this burial could be the result of deaths in multiple communities. It would be unlikely that one group would have so many infants at one time, or that many that died. Further, it has been seen that treating the dead in a group manner is a common practice among small communities when there is a mass disaster or epidemic event. This type of treatment could indicate beliefs about

disease and its victims, or be an energy saving practice (Blakely and Detweiler-Blakely 1989:72). However, despite these correlates, epidemics may be hard to see archaeologically, as rapidly spreading disease usually does not leave markers on bones. Further, atypical mortuary distributions may be due to other factors, such as biological significance, cultural reasons, the result of observational bias, sampling error, preservation or the excavation methods used (Milner 1996:202).

Ritual Sacrifice

Sacrificial retainers are often indicated by the presence of a principal individual, who evidences no trauma, and is associated with offerings. Other individuals around the principal individual, however, do show evidence of trauma and have no offerings associated with them (Gaither 2008). William R. Fowler, Jr., for example, concluded that the burials from Structure E3-7 in Chalchuapa, El Salvador, were likely victims of ritual sacrifice based on similar criteria. Structure E3-7 is a multiple-episode burial mound containing thirty-three individuals in the construction fill. The people who prepared these individuals for burial used the smallest amount of energy possible to prepare the bodies for burial while still adhering to ritual mortuary practice. There was also an absence of grave goods for all but three individuals, indicating low status of those without goods and higher status of those with them. The majority of burials were in the prone position, and the positioning of their hands and feet suggested that they were bound at the time of burial. Because the individuals were positioned in the same way in burial, the author suggests that this is correlated with cause of death or may be the one prescribed for sacrificial victims. All but one of the victims was buried in the construction fill. The single individual that was not had been buried in a shallow, unlined grave cut into the floor, suggesting a higher status

than those in the fill. Finally, all or most of the sacrificial victims were also male, suggesting the possibility of war captives (Fowler, Jr. 1984).

Similarly, William H. Sears (1956:47) concluded that many of the burials at Kolomoki Mounds, located in the southwestern corner of Georgia, were sacrificial retainers. Each mound at Kolomoki contains one burial that is considered the "main burial," which is associated with burial goods and ornaments. All subsequent burials, construction, and artifact deposits are "are oriented horizontally and vertically" with respect to the main burial in the mound. Because of their seeming function and the associated ceremonialism, other burials in the mound are considered "retainer burials." In Mound D, for example, five probable males and two females were interred seemingly simultaneously with the main burial of that mound. These seven individuals were oriented around the main burial, and the five males were buried in the same position as the main individual, semi-flexed. The two females were the only individuals to be identified conclusively as females found in the mound, and were interred adjacent to the main burial. They also were the only individuals who shared the main burial's unusual grave type (in a tomb constructed of a rock slab and logs) (Sears 1956:47). Sears concludes that "individuals whose deaths coincided too closely to those of the main individuals for natural causes of death to be considered" denote "cases of retainer sacrifice and interment" (1956:49).

Trophy Taking and Ancestor Veneration

Acts of trophy taking are, in and of themselves, not considered to be multiple burials in this study. Though these acts do introduce another individual into a grave, they likely imply a different meaning or sentiment than do other burials of complete (or nearly complete) individuals. However, trophy taking was prevalent in the prehistoric southeast, and is therefore

pertinent to this discussion. Trophy taking plays a role in both violent episodes and ritual sacrifice, and will be considered under these two broader causes of multiple burials.

Trophy taking, as defined by Ross-Stallings (2007:339), is "the act of removing human body parts from a living or recently deceased victim or foe, when the body part functions as a souvenir that marks the act of conquering or controlling another human being or human group." Trophy taking may be the result of acts of revenge, proof of a killing, a component of war, ritual, or pure impulse (Ross-Stallings 2007:339). Scalping is often a trophy taking practice, and is also associated with warfare and violent death (Smith 1995). Because it is most often performed at or near the time of death, and because of the Native American belief that to enter the afterlife they need to be complete, it can be interpreted as an insult or curse (Jacobi 2007:312). Trophy taking and veneration are indicated by many of the same correlates, and are therefore often difficult to distinguish between. They are both indicated by the presence of extra arms, hands, legs, feet, skulls, or the absence of the same in a mortuary context where the burial pit has not been reopened or reused, as well as cut marks on the bones (Jacobi 2007). Using the osteological and archaeological correlates outline above, this study will analyze multiple burials from the Pickwick Basin to determine if violence, epidemics, sacrifice, ancestor veneration or trophy taking are the reason behind the multiple burials, or if there is some other factor at work.

CHAPTER 3

MATERIALS AND METHODS

For this study, multiple burials from nine sites in the Pickwick Basin were analyzed to determine the significance behind their interment. The sites examined in this study included Long Branch (1LU67), O'Neal (1LU61), Mulberry Creek (1CT27), Fisher Mound (40HN4), Seven Mile Island (1LU21), Perry Site (1LU25), Bluff Creek (1LU59), Union Hollow (1LU72), and Koger's Island (1LU92). To determine which burials from these sites were part of a multiple interment, several excavation reports and theses were examined, including the original report on the basin, *An Archaeological Survey of the Pickwick Basin in the Adjacent Portions of the States of Alabama, Mississippi, and Tennessee* (Webb and DeJarnette 1942), *The Perry Site, Lu°25* (Webb and DeJarnette 1948), the master's theses of Shields (2003) and Lubsen (2004), as well as the photographs from the original excavations.

In total, 242 individual interments were present within 73 multiple burials at these nine sites. Of these 242, only ten individuals were not present in the Alabama Museum of Natural History collections, reducing the sample size slightly to 232 interments in 70 burial groups. The burials from each site were examined osteologically one at a time, and each burial was analyzed individually and in order of burial number within that site. Each individual set of remains was analyzed to determine the likelihood that the multiple burial was the result of an epidemic, ritual, or violence. These individuals were aged and sexed using appropriate methods in accordance with the bones present due to preservation. Individuals were aged using measures of cranial suture closure (Buikstra and Ubelaker 1994), morphological characteristics of the pubic symphysis (Todd 1920; Brooks and Suchey 1990), the changing morphology of the auricular

surface (Buikstra and Ubelaker 1994), bone fusion (Buikstra and Ubelaker 1994; Schwartz 1995; Schaefer et al 2009), dental eruption patterns (Schour and Massler 1944, Ubelaker 1978), and long bone length in some juvenile individuals (Stewart 1979; Merchant and Ubelaker 1977:67-70; Schaefer et al 2009; Scheuer and Black 2004).

Age Determination

Using standard methods outlined by Buikstra and Ubelaker (1994:32-38), ectocranial suture age was established by examining ten suture sites on the skull and scoring them on a score of zero to three, where zero corresponds to an open suture, one indicates minimal closure, two indicates significant closure, and three is the complete obliteration of the suture. The suture sites scored for this procedure include: the midlambdoid, lambda, obelion, anterior sagittal, bregma, pterion, midcoronal, sphenofrontal, inferior sphenotemporal, and superior sphenotemporal. Of these, the scores of the vault sites (midlambdoid, lambda, obelion, anterior sagittal, bregma, pterion, and midcoronal) were added together, producing a composite score that corresponds to an approximate age rage. The same was done for the lateral anterior sites (pterion, midcoronal, sphenofrontal, inferior spenotemporal, and superior sphenotemporal), yielding another approximate age range. These two approximate age ranges are then used to get an age range for the individual.

Age determination methods following the procedures outlined by Todd (1920:300-314) and Brooks and Suchey (1990:232-233) are concerned with the morphological changes that occur on the face of the pubic symphysis. Younger individuals (beginning at age eighteen) display a rugged symphyseal face characterized by horizontal billowing. As the individual ages, this becomes less defined and beveling of the ventral surface increases. Following this, the face

transforms from a finely grained texture to one of dense bone. In the final phases the bone shows an increase in porosity and displays an overall degenerative nature. The auricular surface, located on the ilium, also displays degenerative changes related to aging. While this surface is more difficult to score than the pubic symphysis, the auricular surface is preserved more often than the pubic symphysis (Lovejoy et al. 1985). This method, based on Lovejoy's work and outlined by Buikstra and Ubelaker (1994:24-32)**.** involves eight phases of morphological age. Similar to the pubic symphysis, younger individuals (beginning at twenty years of age) have a rough, billowy surface marked by transverse organization, a lack of porosity and no retroauricular or apical activity. As the individual gets older, the surface changes from billowing to a coarse granularity. Following this, the granularity gives way to dense bone, followed by an increase in rugged topography on the surface. Finally, the bone begins to show break down and destruction of the subchondral bone. Each phase is described in detail and is accompanied by detailed images in order to correctly assign an approximate age to that individual.

Bone fusion is also a useful measure to determine an individual's age (Buikstra and Ubelaker 1994; Schwarz 1995; Schaefer et al 2009). Fusion of the long bone epiphyses (and in some instances other postcranial areas such as the ribs, phalanges, vertebrae, metacarpals, and metatarsals) was used to determine the age range at death for some individuals. The fusion of each epiphyses occurs within a specific window of time, often just a few years, which allows for a relatively precise age to be determined. However, once fusion has occurred for all bones, this method is no longer useful.

An even more precise, but age limited, method of aging is dental eruption. While the teeth themselves may vary from individual to individual, tooth development, root formation, and dental eruption tend to occur on a general timeline, providing very precise ages for those

individuals. Tooth development is more closely associated with chronological age than other skeletal markers. Further, teeth are recovered most often from archaeological and forensic contexts because enamel is a very hard substance. Durability, combined with their regulated formation and eruption patterns, has led to teeth being the most widely used method for aging subadults (White and Folkens 2005:364). Dental charts, such as the one formulated by Ubelaker (1978) and Schour and Massler (1944), show the development of the dentition beginning in utero (beginning at five months, plus or minus two months) and detail all the dental changes that occur until all the permanent dentition has erupted, tooth enamel has fully formed, tooth cap has erupted and roots have fully formed, which occurs at around twenty-one years of age. These charts were used to determine the age of subadult individuals based on tooth and root formation.

If dentition is not available, long bone diaphyseal length may be used to determine the age of subadults (Scheuer and Black 2004). Using this method, the maximum diaphyseal length (the portion of the bone between the epiphyses) of the complete long bone is measured to provide an age estimation. Though no data have been produced for aging subadults in the Pickwick Basin specifically, the lengths of these individuals were compared to other Native American populations in order to provide a rough estimate of the individual's age (Stewart 1979:136; Merchant and Ubelaker 1977:67-70).

Sex Determination

Sex determination using skeletal remains requires sufficient differentiation among the bones of the sexes, which only occurs after sexual maturity (White and Folkens 2005:385). No reliable methods have yet been devised to determine the sex of subadults, and consequently all subadults in this study were labeled indeterminate. Adult individuals were sexed using the pelvic

girdle (Buikstra and Ubelaker 1994; Schwartz 1995; White and Folkens 2005), skull (Buikstra and Ubelaker 1994; Schwartz 1995), and, on occasion, the diameter of the femoral head. Analysis of the os coxae provides the most reliable indication of sex within the human skeleton. Assessing sex in the pelvic girdle generally looks at the subpubic region, the greater sciatic notch, the preauricular sulcus, and the sacrum. When looking at the subpubic region, the ventral arc, subpubic concavity, and the ischiopubic ramus ridge are scored separately, where a score of one equals female, two is ambiguous, and three is male (Buikstra and Ubelaker 1994:16-17). While not as reliable as the subpubic region, the greater sciatic notch may be used as an indicator of sex. Males tend to have a narrow notch, while females tend to have broader notches. The greater sciatic notch was graded on a scale of one to five, one being female and five being male. Scores of two and four were termed probable female and probable male respectively, and a score of three was ambiguous (Buikstra and Ubelaker 1994:18).

The preauricular sulcus is thought to be more prevalent and defined in females than in males. This was scored on a scale from zero (male) to four (female), zero being an absence of the sulcus, one being a wide and deep sulcus, two being a wide and shallow sulcus, three being defined but narrow, and four being narrow, shallow, smooth, and well defined (Buikstra and Ubelaker 1994:18-19). In males, the distal end of the sacrum tends to have a greater anterior curve, while in females the distal end tends to be more vertically straight. The sacral plateau in males is divided unevenly between the alae (or wings) and the body of the first sacral vertebrae, in a 1/4,1/2,1/4 distribution. In females, this distribution is more even in equal thirds. (Morse et al 1983:92). The female pelvic inlet is wider than that of males, and tends to be oval while males are more heart-shaped (White and Folkens 2005; Morse et al 1983:90).

Skull morphology also may be used to determine sex in adult individuals. Buikstra and Ubelaker (1994:19-21) outline five features that are key for sex determination: the nuchal crest, mastoid process, supraorbital margin, prominence of the glabella, and the mental eminence. Each of these traits were scored on a scale from one to five, one indicating minimal expression and five indicating maximum expression. Minimal expression indicates more gracile and feminine characteristics while maximum expression indicates robust, masculine characteristics. Located on the occipital, the nuchal crest refers to the bony projection that results from the attachments of the nuchal musculature, and could indicate what specific muscles attach in that area. The mastoid process is judged not on length, but its volume as compared to the lengths and widths of the external auditory meatus. A larger mastoid also results from a more robust musculature in that area, which is more typical in males. The supraorbital margin tends to be sharper and thinner in females and thicker, duller, and rounder in males. The prominence of the glabella, and the supraorbital ridge, is concerned with the prominence of the ridge in profile. Again, larger, thicker ridges are associated with males and a more robust musculature. The mental eminence is located on the anterior center portion of the mandible, and is more pronounced in males than females, resulting in males having a squarer jaw than females (Buikstra and Ubelaker 1994).

Other skull characteristics also may be used for sex determination. In males, the root of the zygoma extends beyond the external auditory canal, while in females it does not. Males also have more pronounced temporal muscle lines than females, and male foreheads tend to recede while female foreheads tend to bulge. The gonial angle in males is less than 125˚ while in females the angle is normally more obtuse, with a degree greater than 125 (Morse et al 1983:93). However, the gonial angle should not be used as a sexing measure if any of the mandibular teeth

were lost antemortem, especially molars. The remodeling and reshaping of the jaw in response to tooth loss greatly reduces the accuracy of this sexing measure, altering the overall shape of the jaw (Kemkes-Grottenthaler et al 2002). If any teeth were lost antemortem, or the mandible was not intact, the gonial angle was not measured.

Femoral length and head diameter also are used to determine sex, though for this study only femoral head diameter was used. Stewart (1979:120) measured the greatest diameter of the femoral head using individuals from the Terry Collection, wherein he found the following: definite females had a diameter of 42.5 cm or less, individuals tending toward female had a diameter between 42.5 cm and 43.5 cm, individuals of indeterminate sex range from 43.5 - 46.5 cm, individuals tending toward male ranged from 46.5 cm to 47.5 cm, and definite male individuals had a diameter of 47.5 cm or greater. While Stewart was working with a Caucasian population, others (Dittrick 1979; Dittrick and Suchey 1986, n.d. [as cited in Bass 1987:220-221]) have found that femoral head diameter also works in prehistoric populations. Of all the measures tested (femoral head diameter, mid-shaft width, mid-shaft circumference, and humeral head diameter), the single best indicator was the maximum diameter of the femoral head. In this study, the diameter of the femoral head was taken in centimeters using sliding calipers, which measures the distance between two points with a high degree of accuracy. This measurement was then assigned a designation of female, possible female, ambiguous, possible male, or male according to the chart developed by Stewart. In situations where no other sexing characteristics were available due to poor bone preservation, this was used as the primary mode of sex identification. If the sex of the individual was certain without this measurement, this mode of identification was not used, or simply used as supportive data to the more reliable sexing traits. If

the sex of the individual was tentative, due to ambiguous cranial morphology, for example, then this measure was taken in an attempt to find a more certain final decision.

Skeletal Trauma

Evidence of trauma was noted for both antemortem (before death) and perimortem (at or around the time of death) trauma. Postmortem (after death) trauma was noted but not used in any statistical analysis. Fractures are discontinuities or cracks in skeletal tissue that may or may not have accompanying soft tissue damage. These occur when external forces that are applied directly or indirectly to the bone are greater than the natural strain or elasticity of the skeletal structure. While there are many types of fractures, for the current study all postcranial fractures were classified under the broader general category of "fracture." Fractures that occur antemortem show signs of healing and bone remodeling, while perimortem trauma shows no signs of healing. Remodeling occurs faster in children, and may be influenced by other factors such as vascular supply, which bone was injured, the type of fracture and the nature of the bone. In addition to these biological factors, injured bones that are not immobilized require more time to heal, and any infection may also impede healing time. Individuals with overall good health and nutrition will have the fastest healing time (Aufderheide and Rodriguez-Martin 1998:20-21).

Forearm trauma may be indicative of interpersonal violence. Parry fractures, which are fractures of the ulna with a dislocation of the head of the radius, can and do occur in instances of self-defense. Individuals, perceiving an imminent blow to the head, will defend themselves with their arms, which absorb the blow and fracture. However, these types of fractures may also be due to accident or work related injury (Smith 1996:84-85). Some have suggested that this type of injury in females is indicative of intrapersonal violence, resulting from wife-beatings or lower

status of women in general (Wells 1964:53). Smith, however, in her study of Archaic Period adults from west Tennessee, discovered females were no more prone to these injuries than males. She does admit, though, that because of the frequency of parry fractures, some cases may be the result of intrapersonal violence. However, she goes on to say that female-directed violence may be caused by a number of social circumstances, and that no patterns confirm the female battery hypothesis (Smith 1996:90). Due to the broad range of causes behind forearm trauma to both males and females, antemortem trauma to the forearms was not used as an indicator of violence in this study.

When looking at dry bones, as archaeologists do, definite evidence of healing is the most useful measure for determining antemortem, perimortem, or postmortem fracture. Antemortem wounds require a week to ten days to show enough evidence that healing has begun. Fracturing patterns also differ between green and dry bone. Greenstick and skull fractures in green bone evidence themselves with concentric, radiating or stellate fractures. Depression fractures also occur on green bone due to their retained elasticity (Aufderheide and Rodriguez-Martin 1998:23). Further, fractures that occur when the periosteum and other soft tissues remain intact may have small bone fragments that adhere to the fracture site, helping to distinguish between perimortem and postmortem breaks (Ortner 2003:136). Dry bone postmortem fractures have irregular edges, little beveling, and small portions of the bone that disappear. However, the elasticity of green bone is not lost immediately after death; rather, there is a perimortem period where bones retain elasticity that can range from two weeks before death to two months after death (Aufderheide and Rodriguez-Martin 1998:23). Any breaks that occur during excavation or in subsequent analysis also can be identified easily, as surfaces of bones that have been in

contact with soil for long periods will have a different coloration than those surfaces of the bones that were not (Ortner 2003:136).

Concave indentations to the outer table of the skull are the most common cranial injury found in antiquity. Further, most studies find a preponderance of males with skull fractures on the left side, which likely resulted from a face-to-face encounter with a right-handed adversary (Aufderheide and Rodriguez-Martin 1998:24). Scalping also is seen in antiquity, and was mostly carried out as a means of trophy taking. Removal of the scalp by lithic knives with irregular edges would often incise the periosteum and the cranium's outer table, leaving behind osteological evidence of the event (Aufderheide and Rodriguez-Martin 1998:37). Intentional cranial deformation is seen also in antiquity, and was assessed by examining the cranial remains for abnormally flattened surfaces. These flattened surfaces normally arise from the individual's head being bound to a rigid surface (normally a board) as an infant (Aufderheide and Rodriguez-Martin 1998:35).

Forensic Photographic Analysis

In order to gain as much information as possible about the burials, the original photos taken during excavation were analyzed using forensic photo analysis techniques. Due to the destructive nature of archaeology, the photographs, housed at the Alabama Museum of Natural History on the University of Alabama campus, are valuable resources and have been used previously to provide information to researchers (Jacobi 2007). Though not all the burials have photos associated with them, those that do allow the interments to be analyzed in situ. This permits the researcher to determine burial positioning, associated grave goods, and ascertain if the burial was primary or secondary. In addition, photos can be used to analyze any associated

burials, possibly determine stratigraphic information that may elucidate the sequence of the burials if they were not interred simultaneously, as well as the method of burial (standard or divergent). Divergent burials, which Haglund and Sorg call "non-considerate burials," are made up of "one or more individuals with evidence of trauma and disarticulation usually deposited in a nonstandard and presumably discourteous manner," while standard burials "usually contain one or more complete skeletons in correct anatomical position, and may be associated with grave goods" (Haglund and Sorg 2002:314).

For this research, photo analysis will be most useful in the examination of divergent burials. The positioning of the individuals within the burials can provide evidence for significant events occurring near the time of death, such as torture or death during childbirth. Tortured individuals, indicating violence, may have been bound at the time of burial; while this positioning would be evident in photographic analysis, it would not necessarily be apparent in osteological analysis conducted in a lab or evident in excavation notes. By examining the photographs of the burials, information regarding perimortem conditions can be assessed and any information garnered through osteological analysis can be confirmed (such as evidence of blunt force trauma, which can indicate torture or interpersonal violence). To best examine and preserve these photos, they were digitized and then enlarged to maximize the effectiveness of analysis.

Statistical Analysis

All data was entered into SPSS for statistical analysis. Burials were grouped by site, by burial number assigned during original excavation, by size of the burial, and by multiple burial group number. Multiple burial group numbers were assigned by this researcher for the purpose

of statistical testing. For example, if the first multiple burial contained burials six and seven, both these burials would fall into multiple burial group one.

Each individual was sexed as male, female, or indeterminate. Individuals were assigned by age to four categories: subadult (0-15 years), young adult (16-30 years), middle aged adult (31-50 years), and older adults (51 or more years). The presence of cranial modification was scored on a presence or absence basis. Trauma was assessed in four categories: evidence of post cranial trauma antemortem, evidence of post cranial trauma perimortem, evidence of cranial trauma antemortem, and evidence of cranial trauma perimortem. All types of postcranial trauma, such as fractures and cut marks, were differentiated in analysis but were grouped together under the broad heading of "trauma" (either antemortem or perimortem) for statistical analysis, and were analyzed statistically on a presence or absence basis. Cranial trauma was classified into distinct categories: depression fractures, all other fractures, decapitation, scalping, and trepanation. Cremation of skeletal remains also was seen in the sample, and was scored on a presence/absence basis. When the data allowed, individuals were classified by time into Archaic, Mississippian, or Copena groups. Headless burials were scored on a presence/absence basis as well, though if the body was only represented by a few fragments, rather than labeling it as a headless burial, this was labeled as "missing data" so as to not skew results. Individuals that were only represented by skulls were scored on a presence/absence basis, where presence indicates only a skull is present. Certain health conditions were included in the statistical analysis due to high prevalence in the osteological sample: caries, porotic hyperostosis, periostitis, and osteomyelitis. These were scored on a presence/absence basis. Dental caries on both the crown and the root were counted for this study.

Statistical tests were not limited to the osteological data. Data gathered through forensic photo analysis was compiled and measured in SPSS. Burial photos were examined for any burial goods that may have been associated with the individuals, which was scored on a presence/absence basis. Burial position of the individuals were recorded, and scored as flexed, semi-flexed, sitting, supine, prone, or other. "Other" in this data set refers to any individuals who were reburials or represented by a skull only. Finally, photo data was used to determine if each burial was a primary or secondary interment, and were scored as such in the analysis.

For this data, chi-square tests and t-tests were run to determine any significance within the data. Chi-squares are statistical tests that are used to compare the observed data with data that would be expected according to a specific hypothesis. It looks at the goodness of fit between the observed and the expected outcomes and any variations that may be present. Any deviations from the expected are analyzed to determine if these were the result of random chance or if there is some other significant relationship going on. Chi-squares are always testing the null hypothesis that there is not a significant difference between the observed and expected results (Fisher and Yates 1963).

T-tests also were used to compile all information gathered from both samples into a single statement concerning the probability that they could have been selected from the same populations. The two-sample t-test is used to evaluate any differences in means between two samples from different populations. This test also allows us to estimate the difference between the means of the two populations, including a range of error. The difference taken between the two samples is the best estimate of the difference of the two means (Drennan 2004). These tests also use a null hypothesis that the two population means will be equal to one another. If the null

hypothesis is rejected, the alternative hypothesis that there is some significant difference is not rejected – there is some significant difference between the populations.

Correlation and regression also were used in this study. Pearson's r (or the correlation coefficient) measures how good a fit the best-fit straight line is between two measured variables. The correlation coefficient indicates the direction of the relationship between X and Y as well as the strength of that relationship on a scale from –1 to 1. On this scale, -1 is a perfect negative correlation, 0 indicates no relationship, and 1 is a perfect positive correlation (Drennan 2004:210). Spearman's rank-order correlation (or Spearman's rho) is similar to Pearson's r, but is used on non-normal data. Spearman's rho uses a ranking system to assess the relationship between two variables on the same scale of –1 to 1 used by Pearson's r (Drennan 2004:223-224).

CHAPTER 4

RESULTS

The entire skeletal sample for this study was gathered from nine sites in the Pickwick Basin: Long Branch (1LU67), O'Neal (1LU61), Mulberry Creek (1CT27), Fisher Mound (40HN4), Seven Mile Island (1LU21), Perry Site (1LU25), Bluff Creek (1LU59), Union Hollow (1LU72), and Koger's Island (1LU92). In total, there were (N=232) individuals examined from 70 multiple burial groups. For a complete table of results, see Appendix A.

Demographic Information

For this study, males made up 36.2% (n=84) of the population, females made up 24.1% (n=56), and the remaining 39.7% (n=92) were individuals of indeterminate sex. Individuals placed in the indeterminate category were largely juveniles; however, some adult remains were too fragmentary to be sexed with any certainty and were placed in this category. From the Perry site the multiple burial population studied was 31.4% (n=43) male, 25.6% (n=35) female, and 43.1% (n=59) indeterminate. At the Koger's Island site, the population within multiple burials was heavily comprised of males at 58.8% (n=20), while females accounted for 23.5% (n=8), and those of indeterminate sex were only 17.7% (n=6) of the population. The O'Neal site burials examined in this study were only 5.8% (n=1) male, 5.8% (n=1) female, and 88.2% (n=15) indeterminate. This site's indeterminate count was heavily weighted by one large multiple burial that had within it the highly fragmentary remains of twelve juveniles. Males from the Long Branch site made up 43.75% (n=7) of the population, females accounted for 37.5% (n=6), and

those of indeterminate sex were the remaining 18.75% (n=3). The individuals from Mulberry Creek multiple burials were 54.5% (n=6) male, 18.2% (n=2) female, and 27.3% (n=3) indeterminate. The sample from the Bluff Creek site was composed of 44.44% (n=4) males, 44.44% (n=4) females, and 11.1% (n=1) indeterminate. Union Hollow was 66.66% (n=2) male and 33.33% (n=1) indeterminate. There was only one multiple burial examined from this site, and it contained no female remains. Fisher's mound was the opposite of Union Hollow, made up of 33.33% (n=1) male and 66.66% (n=2) indeterminate. The site had three multiple burials containing eight individuals; however, only three of these eight individuals that were recorded and excavated in the field were present in the University's collections. Thus, the remainders were the only individuals examined in this study, leading to the small number of individuals from this site. All individuals (n=2) examined from Seven Mile Island were juveniles of indeterminate sex.

Individuals were placed into one of five age categories: subadult (0-15 years), young adult (16-30), middle-aged adult (31-50), older adult (51 or older), and adults who were unable to be aged. Adults only were placed in the unaged category if the remains were simply missing or too deteriorated for an age at death to be determined. Subadults made up 32.8% (n=76) of the sample, young adults 15.9% (n=37), middle aged adults 26.3% (n=61), older adults 10.3% (n=24), and unaged adults made up 13.4% (n=31). In total, adults made up 67.2% (n=153) of the sample.

Burial Size

Multiple burials were categorized into four groups: double, triple, quadruple, or five or more. There were 30 double burials containing 51 individuals from this sample. Males accounted for 51% (n=26), females made up 23.5% (n=12), and individuals of indeterminate sex made up

the remaining 25.5% (n=13). There were 18 triple burials examined in this study, which contained 42 individuals; 47.6% (n=20) were male, 23.8% (n=10) were female, and 28.6% (n=12) were indeterminate. There were only five quadruple burials in the sample, containing just seventeen individuals, making it the smallest of the burial categories. Males made up 35.3% (n=6) of the burials, females represented 17.6% (n=3), and 47.1% (n=8) were indeterminate. Males, therefore, appear to be almost two times as likely to be buried in double, triple, and quadruple burials. There were 17 large multiple burials of five or more, containing 122 individuals. Males represented 26.2% (n=32) of the sample, females made up 25.4% (n=31), and 48.4% (n=59) were indeterminate. It should be noted that the large amount of indeterminate individuals within the quadruple and five or more burials were skewed by the presence of very fragmentary individuals with larger group burials.

In total, there were 13 incidents of scalping in the sample (Figure 4.1). Of the total number of scalping incidents found in the remains, 15.4% (n=2) were found in double burials. Triple and quadruple burials each made up 7.7% (n=1) of the incidents of scalping, while burials of five or more contained 69.2% (n=9) of all scalping incidents, well over half. Of all those scalped, 69.2% (n=9) were males and 7.7% (n=4) were females. No individuals labeled "indeterminate" showed evidence of scalping. All individuals showing evidence of scalping were found at either the Perry Site (1LU25) or the Koger's Island site (1LU92). All individuals showing evidence of decapitation (n=3) were found in the same multiple burial of five or more from the Perry Site. One individual, Burial 855, was an older adult female of 55 years or older, while the other two individuals, Burials 855a and 858, were both children of indeterminate sex about five years of age. Only 1.3% (n=3) of the burials displayed perimortem cranial depression fractures (Figure 4.2). One of which was an Archaic period burial, while the remaining two were

from the Mississippian period. In this case, double burials contained two of the perimortem depression fractures, and the other came from a large burial of five or more. Still, burial size was significantly correlated with the broad category of "perimortem cranial trauma" at the .05 level ($\rho = .014$) (Table 4.1). This category included perimortem depression fractures, other fractures, decapitation, scalping, and trepanation (though no incidents of trepanation were found). It is interesting to note, however, that burial size was not significantly correlated with antemortem cranial trauma ($\rho = .483$) (Table 4.2).

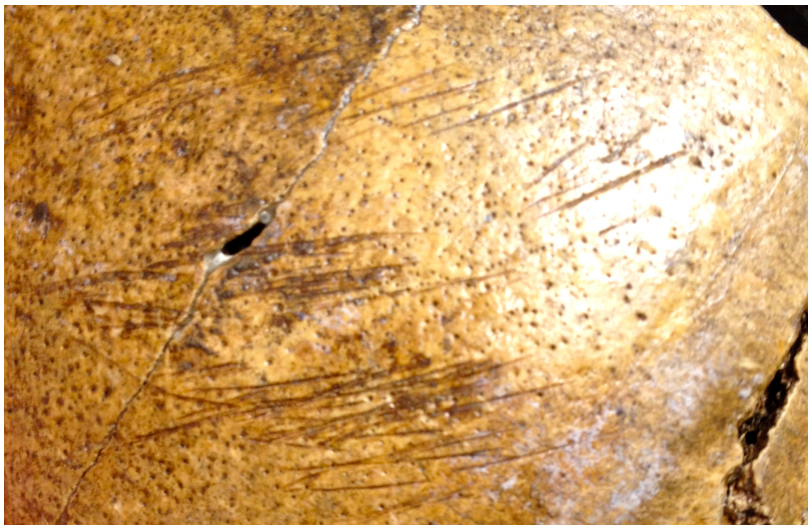


Figure 4.1 Evidence of Scalping Marks from Burial 500, 1LU25

Figure 4.2 Depression Fracture on Frontal Bone of Burial 94, 1LU92

Table 4.1 Significant Correlation of Burial Size and Perimortem Cranial Trauma

			Burial Size	Evidence of Cranial Trauma Perimortem
Spearman's rho	Burial Size	Correlation Coefficient	1.000	.179
		Sig. (2-tailed)	.	.014*
		N	232	187
	Evidence of Cranial Trauma Perimortem	Correlation Coefficient	1.79	1.000
		Sig. (2-tailed)	.014*	.
		N	187	187

*Correlation is significant at the 0.05 level (2-tailed)

Table 4.2 Not Significant Correlation Between Burial Size and Antemortem Cranial Trauma

			Burial Size	Evidence of Cranial Trauma Antemortem
Spearman's rho	Burial Size	Correlation Coefficient	1.000	-.052
		Sig. (2-tailed)	.	.483
		N	232	187
	Evidence of Cranial Trauma Antemortem	Correlation Coefficient	-.052	1.000
		Sig. (2-tailed)	.483	.
		N	187	187

There were 45 instances noted of antemortem postcranial fractures or breaks within the sample (Figure 4.3). Double burials contained 17.8% (n=8) of antemortem postcranial fracture, triple burials contained 24.4% (n=11), quadruple burials had 13.3% (n=6), and burials of five or more had the most instances of antemortem postcranial fractures, containing 44.4% (n=20).

Of burials containing individuals represented by a skull only, 76.5% (n=13) were found in burials of five or more. Double burials contained 17.6% (n=3), and triple burials contained only one (5.9%). There were no "skull only" burials found in quadruple burials. Burials of five or more individuals also contained 53.8% (n=14) of all headless burials. Triple burials contained 26.9% (n=7) of all headless burials, and double burials contained the remaining 19.2% (n=5). Quadruple burials contained no headless individuals. It should be noted, however, that the small number of quadruple burials in the sample is likely influencing these findings.

Figure 4.3 Example of an Antemortem Break on Burial 66 from 1LU92.
The right tibia and fibula have healed together

Cremations

Only 4.3% (n=10) showed signs of cremation in this sample of multiple burials. No differentiation among the level of cremation was made in this study; all instances ranging from smoked bone to calcination of bone were classified as "cremation." All instances of cremation that were present came from the Perry site (n=8), and the O'Neal site (n=2). Both males and females had three individuals that showed evidence of burning, as did four individuals of indeterminate sex. Double burials contained 10% (n=1) of the cremations. Triple and quadruple burials contained no instances of cremation, and burials of five or more contained the large majority of cremations at 90% (n=9). This could indicate ritualistic acts or fires performed

around or on top of the bodies. However, many of these cremations may have been accidental. Amanda Owens (2010:66-67) found that if there was localized intraburial burning, the cremation was likely due to mortuary ritual or an accidental fire. If the fire resulted from mortuary ritual, the localized burning would be at a high temperature, which is indicated by bone calcination. She found that accidental burnings could be shown through a lower temperature fire. If actively tended, these fires would have achieved a higher temperature. She posits that because many of the burials in her study were in association with a shell midden (as are many of the burials in the present study), they may have been close to a nearby fire, possibly ones used for cooking.

Using the criteria outlined by Owens, it is likely that many of the cremations in this study were accidental. From the Perry site, Burial 121c showed evidence of burning on only the distal phalanges and some vertebrae. Burials 498 and 615, from the Perry site, showed localized burning as well. Burial 498 had two calcined phalanges and no other evidence of cremation, and Burial 615 showed evidence of slight burning on a small portion of the ribs. Burials 325b, 326, 327, and 328 from the same multiple burial in the Perry site all displayed localized burning. Burial 325b only showed burning on the occipital, Burial 327 displayed a burnt pelvis, and Burial 328 had evidence of burning on the shaft of the left tibia. Burial 326 (Figure 4.4) displayed the most burning, affecting the right hand, the distal portions of the right and left radii, the distal left ulna, the lumbar vertebrae, the innominate, the proximal end of the right femur as well as the femoral shaft, the left proximal end and shaft of the left femur, and the left patella. Though this individual displays more burnt areas than the others within the burial, these burnt bones are still localized to a relatively small area, ranging from the lumbar vertebrae to the femoral shafts. If the individual had been buried in the extended position, this would account for the hands and distal ulna and radii as well.

Figure 4.4 Accidental and Localized Burning

Accidental and localized burning of the distal right radius, Burial 326, 1LU25 (left); Curved transverse fractures on a long bone fragment, indicative of intentional burning in the flesh, Burial 949, 1LU25 (right)

Burial 949 displayed evidence of burning on all the thoracic vertebrae, the first three lumbar vertebrae, the ilia, the left ischium, the left femoral head, neck, and proximal shaft, which was burnt on the lateral side only. This burial is the only burial in the sample that showed signs of intentional burning. This burial displayed curved transverse fractures on the long bones (Figure 4.4). These fractures occur as a result of bone heating and cracking as the soft tissues and periosteum shrink. When the body is burned in the flesh, the muscles contract and form this fracture pattern (Owens 2010:36; Symes et al 2008:42-43). Two burials from the O'Neal site also showed signs of accidental cremation in this sample, Burial 10 and Burial 14a. Both showed evidence of burning on the cranium only. Burial 10 was burned more intensely, displaying evidence of burning on several cranial fragments, while 14a showed slight evidence of burning on the right parietal and left frontal.

Two individuals from the Perry Site displaying evidence of cremation, Burial 949 and Burial 326, have similar patterning. Both individuals show localized burning on the midsection

and pelvic regions. Because of this patterning, it is possible that this was an act of ritualistic burning. However, as Burial 326 did not show signs of a high temperature fire, accidental cremations from cooking fires cannot be ruled out.

Temporal Component

In total, 34.5% (n=80) of the sample was Archaic, 50.4% (n=117) was Mississippian, 1.3% (n=3) was Copena, and 13.8% (n=32) were of unknown temporal origin. The temporal data were gathered from several sources, including the analysis and notes of Patricia Bridges and William De Vore, the Pickwick Basin Report (1942), and the notes from the original excavations housed at the University of Alabama. Within the sample used for this study, only two sites, the Perry site and the Bluff Creek site had multiple time components. Archaic individuals made up 29.4% (n=35) of the individuals found in multiple burials at the Perry site, while Mississippians accounted for the other 70.6% (n=84) of the multiple burials. Bluff Creek had 33.33% (n=1) Archaic and 66.66% (n=2) Mississippian individuals present in multiple burials. The other individual from the double Archaic burial from the Bluff Creek site was not present in the osteological collections for analysis, leading to a single Archaic individual in a multiple burial from the sample. The burials examined from the Koger's Island and the Seven Mile Island sites are of Mississippian origin. The burials from the O'Neal site, the Long Branch site, and the Mulberry Creek site were found to be Archaic, and the Fisher Mound site was the only site to be described as Copena.

The majority of cremations (n=6) were Mississippian. Only two were from the Archaic period, and none could be attributed to Copena. Two of the cremations had unknown temporal affiliation. Similarly, the majority of individuals (n=10) displaying evidence of scalping were of

Mississippian origin. Only two scalpings could be placed in the Archaic period, and none from the Copena. One individual had an unknown temporal affiliation. All incidents of decapitation (n=3) occurred in the Mississippian period as well. Cranial modification also increased from the Archaic to the Mississippian; 80% (n=12) of cranial modification was Mississippian, while the remaining 20% (n=3) was Archaic. No cranial modification was seen from the Copena sample. While this was not found to be statistically significant, it is clear that the amount of cranial modification seen in this sample increased greatly through time.

Photo Analysis

Photo analysis was used to determine burial position and method of burial, as well as determine the presence of burial goods and whether the burial was primary or secondary. All information in this section was obtained through photographic analysis, and was therefore only applicable to those burials that had photographs present in the archives housed at the Alabama Museum of Natural History. In total, 181 photographs, all taken during the Works Progress Administration excavations, were digitized and analyzed for this study. Unfortunately, no photos were present of any Copena burials, and some of the Archaic and Mississippian burials in the sample had no photographs present. These had to be labeled "missing data."

Photo analysis showed that burial positioning changed with the transition from the Archaic to the Mississippian. The majority (72.5%, n=29) of fully flexed burials came from the Archaic period. Only 27.5% (n=11) fully flexed burials were Mississippian. Conversely, the majority (77.8%, n=42) of semi-flexed burials were Mississippian, and the rest (22.2%, n=12) were Archaic. All eight sitting burials in the sample were from the Archaic period. Of the extended supine burials, 87% (n=20) were Mississippian, and 13% (n=3) were Archaic. There

were only three prone burials seen in the sample, one from the Archaic and two from the Mississippian. Only 5% (n=1) of the reburials, meaning individuals who are exhumed and then reburied at another location at a later date, were Archaic, with the remaining 95% (n=19) being Mississippian. Five burials in the total sample were labeled "other" as they did not specifically fit into any one burial position category. Many of these burials were "divergent" or diverged from the normal burial practice for that culture group. One multiple burial, for example, from the Mulberry Creek site showed three divergently buried individuals who were interred simultaneously and were piled on top of one another (Figure 4.5). Burial 85, a 15-16 year old male, was interred first. Burial 84, a 27-30 year old male, was interred partially on top of Burial 85, covering portions of the lower half of Burial 85. Burial 83, a 40-44 year old male, was interred last and buried in the prone position. Buried facedown, the head and neck of Burial 83 are bent upward at a severe angle, suggesting that the neck and chin of the individual rested against the grave wall while the rest of the body lay horizontally. Both other individuals in the interment also appear to have been resting against the wall of the burial pit, which was not seen in any other burial photographs from this sample. All of the other burials seen in this sample appear to have been interred in a large enough grave that the bodies did not have to lean against the walls of the burial pit. This could suggest that minimal energy was expended in burying these three individuals from the Mulberry Creek site, further marking it as a divergent burial.

Figure 4.5 Burials 83-85 from 1CT27 During Excavation.
Photo courtesy of the Alabama Museum of Natural History at the University of Alabama

Photo analysis also was used to determine if a multiple burial was standard for that culture group or diverged from normal practice. As expected, 71.1% (n=165) were standard multiple burials, while only 7.3% (n=17) were divergent. Because some of the multiple burials had no associated photographs, 21.6% (n=50) fell into the missing data category. Double and quadruple multiple burials contained no divergent burials. Triple burials contained eight individuals who were buried in a divergent manner, while burials of five or more contained nine individuals buried divergently. The relationship between triple multiple burials and burials of five or more with divergent burials was found to be highly significant ($X^2(3)= .002$, $p < .01$) (Table 4.3).

Table 4.3 Chi Square Test Showing a Significant Relationship Between Divergent Multiple Burials and Burial Size

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.548[a]	3	.002*
Likelihood Ratio	17.481	3	.001

Linear-by-Linear Association	.365	1	.546
N of Valid Cases	182		

*Chi-square is significant at the .05 level

It also was expected that standard burials would have more burial goods associated with them than divergent burials. This expectation was supported by the data. Only 17.6% (n=3) of the divergent burials seen in the sample were associated with burial goods, compared with 67.4% (n=97) of standard burials that were associated with burial goods. Of the total number of burial goods seen in the sample, only 3% (n=3) were found with divergent burials, compared with 97% (n=97) seen in association with standard burials. This relationship was significant at the .01 level ($X^2(1)= .000, p < .01$) (Table 4.4). Among Archaic and Mississippian individuals, there was no significant difference in associated burial goods. Of all burials associated with mortuary goods, 41.6% (n=37) were Archaic and 58.4% (n=52) were Mississippian. No Copena burials in the sample had associated burial goods; however, it should be noted that only one double burial (containing Burial 28 and Burial 29 from Fisher Mound) was available for photographic analysis.

Table 4.4 Chi Square Test Showing a Significant Relationship Between Standard/Divergent Burials with Burial Goods

Associated Burial Goods * Standard or Divergent Crosstabulation

			Standard or Divergent		Total
			Standard	Divergent	
Associated Burial Goods	Yes	Count	97	3	100
		%within Standard or Divergent	67.4%	17.6%	62.1%
		Count	47	14	61

	No	%within Standard or Divergent	32.6%	82.4%	37.9%
Total		Count	144	17	161
		%within Standard or Divergent	100.0%	100.0%	100.0%

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.969[a]	1	.000*		
Continuity Correction[b]	13.926	1	.000		
Likelihood Ratio	15.909	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	15.869	1	.000		
N of Valid Cases	161				

*Chi-Square is significant at the 0.01 level

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.44.

b. Computed only for a 2X2 table.

Photo analysis also proved useful for determining that violence was inflicted on individuals found in the multiple burials when it could not be seen through osteological analysis. Burials 616 and 617 from the Perry site did not display osteological signs of violence. However, after viewing the photographs from the excavation, projectile points were seen in the chest cavities of both burials. While these points could have been resting on the chests of these individuals as mortuary goods, it was determined that they were likely the aftermath of a violent event because another individual in the interment, Burial 620, had a projectile point embedded in the spine. This was also clearly seen in the photos, but somewhat difficult to discern osteologically due to the deteriorated nature of the vertebrae.

Notable Burials

Burial 384-386, 1LU25

This was a Mississippian burial containing three subadults (Figure 4.6). Burial 384 is an infant, nine months old (+/- 2 months). This individual had severe osteomyelitis of the tibiae and fibulae. Burial 385 is another infant, around a year old (+/- 3 months). This individual's tibiae also showed signs of osteomyelitis/periostitis, however, due to weathering of the bone it was unclear as to the severity. Burial 386 was an infant as well who was also nine months old (+/- 2 months) at the time of death.

Photo analysis revealed that this burial was rich in burial goods. These three infants were buried with copper, pots, and a great number of beads that were strewn on top of the burial. According to the notes and photographs, this is the only burial in the sample that contained any copper, and one of only three burials to contain beads (or, beads that were visible when the photographs were taken). With no individual over about one year in age at death, this burial displays a disproportionate age profile, one of the correlates of an epidemic. However, this was not considered enough evidence to label this multiple burial as the result of an epidemic. As Hutchinson and Mitchem (2001) outline, epidemics are indicated by many factors, including not only disproportionate age or sex profiles, but also mass burials, high proportions of cremations, and specially constructed mortuary facilities. As this multiple burial contained only one of these archaeological correlates, it is likely that some other factor is at work. Due to the richness and uniqueness of the burial goods, this could possibly be a sacrificial burial. However, the osteological and archaeological correlates outlined by Gaither (2008) necessitate the presence of a principal individual without trauma, other individuals with trauma, offerings for the principal individual, and body positioning for the principal individual that differs from the others within

the burial. While there are many unique offerings, none seem to be given to any specific individual. Though there may be a principal individual, it is not easily discernable here, and therefore not classified as a sacrificial burial in the present study. This burial may be simply indicating a high, ascribed status for these young individuals, who were important enough to be buried with so many precious goods.

Figure 4.6 Rich Triple Burial of Subadult Individuals, Burial 384-386, 1LU25
Photo courtesy of the Alabama Museum of Natural History at The University of Alabama

Burial 83-85, 1CT27

This was an Archaic burial containing three adult males. Burial 83, about 40 years of age, was found with a point in his thoracic cavity. Burial 84, between 27 and 30 years of age, showed evidence of perimortem blunt force trauma on the right parietal. This individual also has a point embedded in two of his thoracic vertebrae. Burial 85, a young adult in his late teens, has a point

embedded in his third and fourth lumbar vertebrae. The angle of the points embedded in Burials 84 and 85, as well as the blow to the head on Burial 84, could possibly indicate torture. The angle (Figure 4.7) could have only been achieved by coming up behind someone and stabbing upwards, or stabbing an individual when they were already on the ground. Further, photo analysis revealed that these three individuals also were buried in a divergent manner. Burial 83 was buried in the prone position, and all three appear to have been tossed into the burial pit (Figure 4.5).

Figure 4.7 Point Embedded in the Third and Fourth Lumbar Vertebrae of Burial 85, 1CT27

Burials 30-34, 1LU92

This is a Mississippian burial containing five individuals. Burial 30 was a young female, around 15 years of age, whose cranium was modified. Burial 31 was an older male in his fifties, who had been cradleboarded as well and showed signs of scalping on the left and right parietals. Burial 32 was an adult male, between the ages of 30 and 50, who displayed two cut marks on the ribs as well as small cuts on the occipital and right parietal. Burial 33 was a male in his early 30s, who was cradleboarded and showed evidence of scalping on the frontal, both parietals, and the occipital (Figure 4.8). Burial 34 was a male in his late 40s, who displayed evidence of scalping

on the frontal and both parietals. The amount of perimortem cranial violence present in this burial indicates that it was likely that the individual was the recipient of inflicted violence, possibly during a raid or full-scale warfare. Though the female shows no evidence of scalping or any other perimortem trauma, it is highly likely that she also suffered a violent end due to her burial within this group.

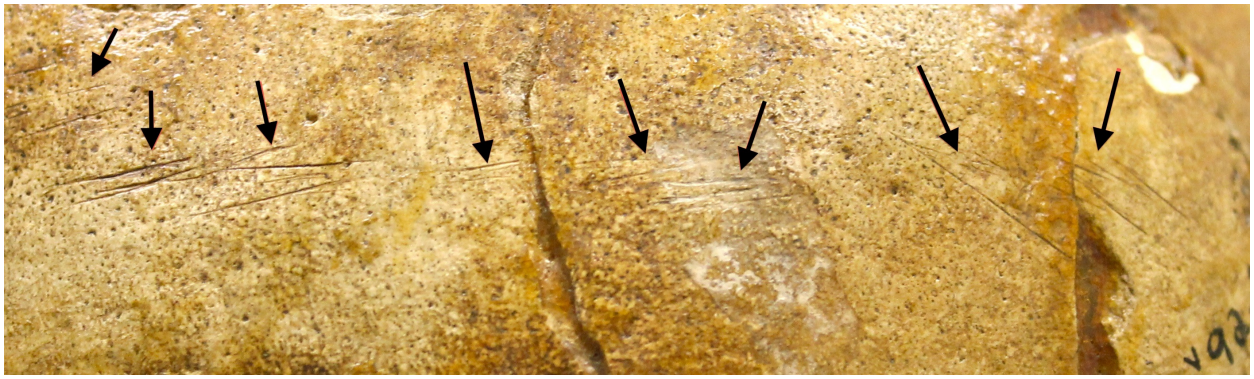


Figure 4.8 Cut Marks Consistent with Scalping, Burial 33 1LU92
Cut marks indicated by black arrows on frontal bone.

Burials 35-39, 1LU92

This is another Mississippian burial that contained five individuals. Burial 35 is a male in his early forties, who showed evidence of scalping on the frontal, both parietals, and left temporal. Burial 36 was a male in his early thirties, who showed signs of scalping on both parietals and the occipital. Burial 37 is an older female, who displays no signs of perimortem violence. Burial 38 was a male in his early forties, who was cradleboarded and showed evidence of scalping on both parietals and the occipital. Burial 39 is a male in his late twenties or early thirties, who shows no evidence of perimortem violence. Similar to Burials 30-34 from the same site (noted above), this burial also was the likely outcome of a violent event. Three of the five individuals within this burial show a form of perimortem violence, and therefore it is likely that the other two individuals in this burial suffered an equally violent end.

Burial 206-209, 1LU25

This is a Mississippian burial of four individuals. Burial 206 was a 21 year old male, who displayed cranial modification (Figure 4.9). Burial 207 was another male of the same age who was also cradle boarded. Burial 208 was an eight year old (+/- 24 months). This individual's cranium was broken up, but in large enough pieces that allowed for a quick reconstruction during osteological examination. This reconstruction showed that this individual was also cradleboarded or had some type of cranial modification. Burial 209 was a subadult as well, about three or four years old. Unfortunately, there were only four cranial fragments available for study for this individual, and it is unknown if he or she also had cranial modification. This is the only burial encountered in the study where all individuals (with cranial material available for study) showed evidence of cranial modification.

Figure 4.9 Cranial Modification of Burial 206 from 1LU25.

CHAPTER 5

DISCUSSION

Primary Focus

The primary focus of this study was the analysis of multiple burials in the Pickwick Basin to determine their significance. Was there any reason why individuals chose to bury others in a multiple burial, rather than the more commonly found single interment? It was hypothesized that these burials would be the result of violence, epidemic, or sacrificial practice. In total, 232 individuals from 70 multiple burial groups from nine archaeological sites within the Pickwick Basin were examined for this study. Each individual set of skeletal remains was subject to an osteological examination, as well as forensic photographic analysis when photographs were available. Geographic and temporal components were also of interest from the beginning of this project. Sites were compared to each other within the basin as well as through time to determine if the practice of the multiple burials changed in significance geographically or temporally. During the data analysis phase, a new factor emerged as a prominent focus of the research. The number of individuals in the grave, or burial size, seemed to have a greater impact on the significance of the multiple burials more than any other factor. After noticing this, burial size became a central focus of the study, and along with the geographic and temporal components, helped determine the path for analysis of the results.

Site to Site Comparison

Most of the perimortem violence in the sample comes from only a few of the sites. Individuals from the Perry site had two depression fractures, two other cranial fractures, six incidents of scalping, and three incidents of decapitation. Individuals from the Koger's Island site had one depression fracture and seven incidents of scalping, and Mulberry Creek site had one individual with a cranial fracture. None of the other sites had any signs of perimortem cranial trauma. As noted above, most of the perimortem cranial trauma, and consequently violent deaths, were found present at two sites: Perry and Koger's Island. While some of the sites had perimortem postcranial trauma, which could represent intentionally inflicted violence, in this study these instances were not considered to be direct evidence of violence as these injuries could have been sustained accidentally. However, if there was physical evidence embedded in the bone (i.e., points) without signs of healing, then those were considered violent deaths, such as those at Mulberry Creek. Sites with individuals represented by a skull only also were found only at three sites: Perry, O'Neal, and Fisher Mound. Sites with individuals who were headless were found at five sites: Perry, Koger's Island, O'Neal, Long Branch, and Bluff Creek. Cremations were only present at the Perry site and the O'Neal site.

However, it should be noted that there was a large difference in size between the sites. The Perry site contained the most individuals in multiple burials examined in this study (n=137). However, this is not surprising as it was also the largest of the nine sites by far; containing 1031 individual excavated skeletal remains. The Koger's Island site contained the second largest number of individuals buried within a multiple burial (n=34); however, this site was much smaller, with only 102 individuals excavated total. Of the 62 individuals excavated from the

O'Neal site, only 17 individuals were placed in multiple burials. There were 92 individuals excavated from the Long Branch site, but only 16 of those were found in multiple burials. From the Mulberry Creek site, 134 individuals were excavated; but only 11 of those individuals were from multiple burials. The Bluff Creek site contained 197 excavated burials, with only nine individuals interred in multiple burials. Fisher Mound site had a total of 64 burials that were excavated, however, only three individuals were from multiple burials. Similarly, the Union Hollow site only had three individuals from multiple burials out of its 21 excavated burials. Seven Mile Island site had the smallest amount of individuals in multiple burials; only two individuals of 16 total excavated individuals were interred in a multiple burial. This large difference in size could account for the Perry site and the Koger's Island site having the most perimortem cranial trauma seen in the sample.

Temporal Comparisons

This research tried to determine if types of violence changed or became more or less prevalent through time. Some postcranial perimortem violence was evident in the Archaic. One multiple burial from the Mulberry Creek site (containing burials 83-85) displayed the only "other cranial fracture" seen in the Archaic sample, as well as physical remainders of violence. Burial 83 had a point in the thoracic cavity, Burial 84 had a point embedded in the thoracic area of the spine, and Burial 85 had a point embedded in lumbar area of the spine. Another Archaic multiple burial from the Perry site (containing burials 607, 615-620) displayed evidence of perimortem postcranial violence. Burials 616 and 617 had points within the chest cavity, and Burial 620 had a point embedded in the spine. Though not completely absent in the Archaic, the Mississippian overall contained more incidents of perimortem cranial trauma, and consequently, violent death.

The Archaic only had one depression fracture, one other cranial fracture, two incidents of scalping, and no instances of decapitation within the sample. The individuals from the Mississippian, on the other hand, had two depression fractures, two other cranial fractures, ten incidents of scalping, and three decapitations. However, here it should be noted that the majority (n=7) of the scalping incidents came from two large multiple burials from the Koger's Island site. Further, all three incidents of decapitation came from the same multiple burial from the Perry site. These burials could be skewing the sample somewhat. Copena burials showed no perimortem cranial trauma whatsoever; however, there are only three individuals within the sample that fall into this category.

Burial goods were not significantly correlated with any time period ($\alpha = .05$, $\rho=.982$), nor were individuals who were represented in burial by a skull only ($\alpha = .05$, $\rho=.778$). Cranial modification increased greatly from the Archaic to the Mississippian. Only three Archaic individuals were seen with some sort of cranial modification, and twelve were seen from the Mississippian. None were seen from the Copena.

Burial Size

This category proved to be the most interesting way to divide the burials. Most markers of violence, correlates of ritual practice, cremations, divergent burials and burial goods tended to be associated to the burials that contained five or more individuals: 64.7% (n=11) of cranial modifications, 76.5% (n=13) of burials represented by a skull only, 53.8% (n=14) of headless burials, 47% (n=47) of all burial goods, 69.2% (n=9) of all incidence of scalping, 100% (n=3) of decapitations, 61.5% (n=8) of perimortem postcranial trauma, 90% (n=9) of cremations and 52.9% (n=9) of all divergent burials. As noted in the results, burial size was significantly

correlated with the broad category of "perimortem cranial trauma" at the .05 level ($\rho = .014$). However, it was not significantly correlated with antemortem cranial trauma ($\rho = .483$). This seems to suggest that large multiple burials of five or more individuals are likely the product of violent episodes while smaller multiple burials most likely are not. As shown above, much of the perimortem cranial violence is seen in the larger burials, however, antemortem cranial trauma is not. This suggests that individuals who met a violent end due to a raiding event or warfare were likely buried together in a large burial pit, perhaps to save time and energy as well as provide those individuals with a proper burial. As Milner (1991:590) suggests, deaths that occur from a single or few massacres would likely result in an expedient mass interment, especially if those burying the victims were fearful of another attack. There is evidence of burying victims of warfare or raid in mass graves ethnohistorically. The Crow Creek site, located in south-central South Dakota, contains the remains of at least 486 individuals in two massive deposits; 90% of these remains displayed evidence of scalping and violent death (Wiley and Emerson 1993:265-266).

The majority (53.8%, n=14) of headless individuals from the sample used in this study also were seen in burials of five or more. Burials that were badly deteriorated, and had no cranial bones except teeth were not considered headless burials. This is because teeth are composed of harder materials (enamel, dentin) than the other bones in the body, and remain long after the other bones of the body have decomposed. Similarly, the majority (76.5%, n=13) of individuals represented in burial by a skull only were found in large burials of five or more individuals. Three were found in double burials (17.6%) and only one was found in a triple burial (5.9%). Headless individuals and individuals represented in burial by a skull only could be representative of ritualistic behavior such as ancestor veneration, or be the remnants of trophy taking practices

in warfare or by raiding parties. Consequently, the presence of large burials of five or more individuals was determined to be of a different nature than smaller burial sizes.

Looking at the raw data suggests that double burials may have a different meaning or significance to them than do all larger burials. While grouping triple, quadruple, and burials of five or more together and comparing them to double burials did not produce significant results, it is likely there is still some difference in mortuary behavior happening here. Of the 22 total incidents of perimortem cranial trauma, only four came from double burials. There were 30 double burials containing 51 individuals, meaning only 7.8% of this population showed signs of perimortem cranial trauma. In contrast, there were only 18 triple burials, with only 42 individuals available for examination. Four of these individuals had some sort of perimortem cranial trauma, meaning 22% of triple burials showed signs of perimortem cranial trauma compared to the 7.8% seen in double burials. This is a very large jump, percentage-wise, and suggests that some factor is at work. I believe the reason that grouping together triple, quadruple, and five or more burials did not produce significant results when compared to double burials is likely due to the small sample size of the quadruple burials. There were only five quadruple burials in the sample, containing 17 individuals available for analysis, only one of whom had any sort of perimortem cranial trauma. This small sample size could have possibly skewed the data.

Further, of burials where standard or divergent burial practices could be ascertained through photographic analysis (n=182), all of the divergent burials (meaning any burial that diverged from normal cultural burial practices) also occur in only triple burials or burials of five or more. Again, the lack of divergent burials in quadruple burials is likely due to the small number of quadruple burials. However, the absence of divergent burials in double interments is likely due to some other cause, such as the smaller amount of violent death seen in double

burials. Of the 40 known standard or divergent double burials, all were buried in a standard manner.

The large numbers of cremations occur more frequently in the large burials of five or more. However, most of these cremations appear to be accidental, as determined by lower fire temperatures and localized burning. The only cremation that appears to be on purpose, Burial 949 from 1LU25, was from a double burial. Due to the apparent accidental nature of the majority of cremations within the sample, it does not seem as though burial size played a role in the likelihood that individuals would be cremated.

Sex of Individual

There were slightly more males (n=84) than females (n=56) in the sample. The same number of males and females (n=3) showed signs of cremation; sex does not seem to have influenced cremation practices. As discussed above, however, the cremations appear to be accidental, so to understand if sex does play a role in Archaic and Mississippian burial practices, future studies would be needed that examine intentional cremations.

Sex did not make a significant difference in the presence of perimortem cranial trauma ($X^2(8)= .103$). Male individuals exhibited in total two depression fractures, two "other cranial fractures", and nine incidents of scalping. In comparison, females displayed evidence on the skull of one depression fracture, four incidents of scalping, and one decapitation. Males could have sustained these injuries during warfare or raids. While females were not likely participating in warfare, they could have been victims of raiding parties, sustaining similar injuries. Similarly, sex had no effect on the likelihood that an individual would be buried headless; ten males and six females were buried as headless individuals. Individuals represented in burial by a skull only

were most often difficult to sex with certainty. Of the seventeen "skull only" burials, only one was definitely identified as male and one identified as definitely female. Sex appears to have not played a role in "skull only" burials either; however, as most were ambiguous, more study on this subject is needed to determine if sex actually plays a role in skull only burials. However, sex does seem to play a role cranial modification. While not significant ($X^2(2)= .234$), over half (n=10) of those individuals with cranial modification were male. Only three were female, and four were juveniles of indeterminate sex.

Summary

Multiple burials are not rare in the archaeological record of the prehistoric Southeastern United States, but they are much less common than single interments. The goal of this study was to determine if there was any specific meaning or significance behind them, and try to ascertain why individuals would be placed in a multiple burial rather than a single grave. Several possible factors were considered in this study that could have resulted in multiple burials: violence, ritualistic practices, and a widespread disease or epidemic. This study found no evidence that disease or an epidemic was the reason for any multiple burials in the sample. This was expected to be the hardest to assess, as disease often moves too quickly to leave marks on the bones. Evidence of an epidemic must be evaluated by its non-osteological correlates in burial practice: mass burial, high proportion of cremation (intentional), disproportionate age or sex profiles, and specially constructed mortuary facilities (Hutchinson and Mitchem 2001). However, none of the burials in this sample showed enough evidence to be classified as the result of an epidemic.

Violence and ritualistic practices, however, do seem to be the cause of many of these multiple burials, particularly those larger burials of five or more individuals. Perimortem cranial

trauma was used to determine violent death. Depression fractures, other cranial fractures, decapitation, and scalping were all seen within the sample. These injuries showed no signs of healing and were not likely to be the result of accidental injury. The only postcranial perimortem traumas that were considered evidence of violent death were those that left physical remainders embedded within the bones themselves (i.e., projectile points). Though postcranial perimortem trauma without physical remainders could have been the result of a violent encounter, these injuries also could have been sustained accidentally and were therefore not considered conclusive evidence of violent death in this study.

Within the entire sample of multiple burials there were 26 headless individuals and 17 individuals represented in a burial by a skull only. These individuals were most likely the recipients of inflicted violence and/or ritual practice. Ancestor veneration and trophy taking were common practice, and it is often difficult to distinguish between the two. Both are classified through the presence of extra limbs, hands, feet, skulls when the burial pit has not been reused, or the absence of the same, as well as cut marks on the bone. Because of this, at present, these multiple burials have been attributed to either violent death or ritual practice, but attempts have not been made to distinguish between the two. That is for future work.

There seems to be a difference in mortuary behavior present with double burials as opposed to triple burials and larger. No individuals in a double burial were buried in a divergent manner, and the presence of violent death in double burials is quite small compared to triple burials and burials of five or more. Though quadruple burials have even less evidence of perimortem cranial trauma than double burials, this is likely due to the small sample size. Large burials of five or more contain the most perimortem cranial trauma, cremations, headless individuals, and “skull only” burials. Large burials of five or more individuals, and likely even

triple and quadruple burials, appear to be the product of violent episodes or ritual practice far more often than do double burials.

This research was limited in some aspects by the disparities in burial size frequency. Double burials and burials of five or more were the most frequently seen, with triple burials being slightly less frequent and quadruple burials being rather scarce. However, this could also lend support to the idea that the real difference seen in burial size is between double burials and any burial larger than that type of interment. Double burials may be more frequent than others because they carried a different significance or served some other purpose, such as kin burials, while larger burials were often reserved for a ritual practice or for victims of warfare or raids. Unfortunately, time constraints did not allow me to conduct research on the biological relatedness of individuals within the same burial, but this would be a fruitful area to examine for further research. To further broaden our knowledge on the subject, comparative analysis on multiple burials across a wider geographic area would be incredibly useful. Further studies comparing multiple burials to single burials may also yield interesting and productive results.

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Appendix A

Table A.1 Burial Data Categorized by Site*

	Perimortem Depression Fracture	Scalping	Other Cranial Fracture	Decapitation
Site				
1LU25	2	6	2	3
1LU92	1	7	0	0
1LU61	0	0	0	0
1LU67	0	0	0	0
1CT27	0	0	1	0
1LU59	0	0	0	0
1LU72	0	0	0	0
40HN4	0	0	0	0
1LU21	0	0	0	0

	Cremation	Cranial Modification	Buried with Mortuary Goods	Headless Burial	Skull Only Burial
Site					
1LU25	8	11	47	20	9
1LU92	0	5	26	1	0
1LU61	2	0	16	2	6
1LU67	0	0	4	2	0
1CT27	0	0	5	0	0
1LU59	0	0	--	1	0
1LU72	0	1	0	0	0
40HN4	0	0	0	0	2
1LU21	0	0	2	0	0

	Standard Burials	Divergent Burials	Archaic Individuals	Mississippian Individuals	Copena Individuals
Site					
1LU25	96	11	35	84	0
1LU92	34	0	0	29	0
1LU61	17	0	17	0	0
1LU67	8	0	16	0	0
1CT27	8	3	11	0	0
1LU59	--	--	1	2	0
1LU72	0	3	--	--	--
40HN4	--	--	0	0	3
1LU21	2	0	0	2	0

	Age				
	0-15 years	16-30 years	31-50 years	51+ years	Un-aged Adults
Site					
1LU25	46	23	31	16	18
1LU92	6	3	19	4	2
1LU61	13	1	0	0	3
1LU67	3	3	4	3	3
1CT27	2	4	3	0	2
1LU59	1	3	3	1	1
1LU72	1	0	1	0	1
40HN4	2	0	0	0	1
1LU21	2	0	0	0	0

	Double Burials	Triple Burials	Quadruple Burials	Burials of 5 or More	Sex		
					Male	Female	Indeterminate
Site							
1LU25	13	6	4	10	43	35	59
1LU92	3	1	0	4	20	8	6
1LU61	0	1	0	1	1	1	15
1LU67**	12	3	0	0	7	6	3
1CT27	4	1	0	0	6	2	3
1LU59	1	1	0	1	4	4	1
1LU72	0	1	0	0	2	0	1
40HN4	1	1	0	0	1	0	2
1LU21	1	0	0	0	0	0	2

* All data in these tables represents individuals available for analysis in the lab at the time of the study. Some individuals were incomplete; as such, not all individuals in the study could be evaluated in all categories.

**1LU67 - This site contained one “double burial” while all the rest were described in the literature as a burial containing “extra bones.” The numbers here reflect the MNI for each burial.

-- Unknown