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Osteology of a Burial Vessel from the Late Prehistoric/Early Contact Period Pine Harbor Site (9MC64)

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Research Question

In this paper I will use Osteological analysis and compare the Pine Harbor site to other Mississippian sites in order to ascertain what factors about Pine Harbor burial patterns are unique and what they can tell us about the culture of the people who lived in the Mississippian world.

Introduction

Analyzing mortuary practices for the purpose of putting them into an anthropological framework is a way of telling the story of a society and its culture. From these practices, anthropologists are able to construct an understanding of traditions that can be linked to other cultures within a similar regional and temporal context. Mortuary analysis includes using burial contents and the ways the bodies have been prepared for their journey into the afterlife. However, social status of individuals is difficult to assess because the factors that indicate status in life do not always show in funerary items. Further clues from the remains themselves and the ways in which they are interred are required. Osteological analysis to assess age, sex, health, and post mortem damage helps add depth to exhumed remains by using biotic details to inform the abiotic history. This research is inspired by the distinctive cultural mortuary patterns and the many different ways humans throughout history have prepared and interred the dead.

The site I examine, Pine Harbor (9MC64), is a Late Prehistoric to Early Contact period archaeological site on the Georgia coast near Sapelo Sound, sixty miles south of Savannah. Several vessel burials were excavated by Fred Cook during salvage operations at the site from

1978 to 1980 in order to excavate a Native American burial mound. However, the vessels and their contents were not formally analyzed using modern methods of physical anthropology. I will be analyzing one of the vessel's contents in order to add much needed information to the osteological record of southeastern Native American sites and shed light on burial demographics and practices of its native occupants. It will reintroduce the topic of urns and other vessel burials as well as add basic information about cremation practices for this region during the protohistoric time period. Then, I will discuss the possible explanations of human behavior and status as they relate to Mississippian culture.

I begin the literature review with a brief discussion of the theoretical approach to examining archaeological data. This will be the basis of my analysis of the mortuary vessel's contents that is the subject of this paper. In the same section I will also discuss the emergence of the Mississippian period and certain beliefs as they pertain to mortuary practices. The second section will contain information about some of the well-known vessel burial sites, common themes that are associated with the vessels, and current hypotheses about them. The third section will be a description about the diet and health of the peoples of this time period. This information will help situate the discussion on the health of the individuals for the sample used. Then, Methods and Materials will discuss: different types of burials, Cook's notes pertaining to the burial and vessel at Pine Harbor, how data was collected, and the theory behind osteological analysis. The Results states what the data and observations found on the remains. Finally, the Discussion and Conclusion links the information from the Literature Review to the data. I talk about trends discussed and what they might say about the vessel and its contents. This paper does

not exhaust the discussion on this topic, rather, it is a much needed addition to an area of mortuary practices that garners little attention.

Literature Review

The Mississippian Southeast

Mortuary practices and rites have always been a curiosity to archaeologists since the beginning of the discipline. Material culture, social relations, cultural ideals, and the human body represent an intersection of archaeological interests. Early works by anthropologists tried to find links between practices and customs, all in an attempt to make sense of human behavior. Many of our contemporary ideas about culture and mortuary practices were formulated after archaeology's split from "old archaeology" to "new archaeology". From New Archaeology (coined first by Joseph Caldwell in 1959) came the general consensus that the ultimate goals of American Archaeology were to define the processes which condition human behavior through lifeways that were constructed by methodical, cultural chronologies (Thomas & Larsen 1979:135). While the lifeways of many peoples can be constructed by material goods, Hutchinson and Aragon (2002) state that archaeologists should consider multistage ritual processes for burial practices. Any burials included in a space may only represent a "temporary stage of postmortem arrangement" (Hutchinson and Aragon 2002:28-30). These arrangements might be due to stages of processing and not necessarily terminal layouts in terms to symbolism. While burials are generally interpreted to signify the status of the deceased, pre-state societies;

“emphasized kinship and community relationships so they might more accurately represent the desires of the bereaved” (Hutchinson and Aragon 2002:28-30).

The Mississippian period emerged around 1000 A.C.E. and lasted to about 1500 A.C.E (Cobb 2003:63). It was roughly divided into Early, Middle, and Late subperiods (Hally 1994:163) and is characterized as largely made up of chiefdoms that formed one of the most complex societies that has existed in North America (King 2014). Taking place across scattered societies within river valley settings in the eastern woodlands, Mississippian culture exhibited a broad diversity of different backgrounds that came together, and eventually their cultures spread; connecting through a network of communication and exchange. While the details of each of the separate chiefdoms that developed are still unclear, they emerged through similar developmental pathways into comparable cultures (Smith 1990). This relatedness has led archaeologists to assume that perhaps the many different groups came from a core source and spread outward (Caldwell 1958).

The most important of all the rites of passage for the Southeastern Indians was the transition from life to death (Hudson 1976:327). While many of the mortuary rites differed from place to place and at different times, several beliefs and practices were general and durable: the belief that some of a person, the “Spirit”, lived on after death; the living had to show their respect of the deceased and observe their wishes; and some individuals were given more ceremony at death than others (Hudson 1976:327) were all common in the Mississippian Southeast. These beliefs led Southeastern peoples to a great concern about what happened to the body after death. For instance, it was very disgraceful to have one’s body dismembered or left to be devoured by

animals (Hudson 1976:328). Great care went into the preparation of the body for the afterlife. Abundant evidence of this has come from archaeologists uncovering offerings and effigies of the Southeastern mortuary complex from large Mississippian sites (Cobb 2003).

Elaborate burials associated with Mississippian sites have served as sources of inspiration about the structure of these complex societies (Cobb 2003:72). Many of the case studies reported on from different sites have fashioned a processual link between burial treatment and social intricacy (Cobb 2003:72). In other words, the kinds of goods a person is buried with gives clues to how complex the social aspect of a culture is. The deep connections the individuals might have had to the deceased shows how richly their rituals and traditions are. Abundance and quality of burial goods equating with status still guides Mississippian mortuary research to this day (Cobb 2003:72) and the lack of these goods is also often telling.

The Irene phase occupied the time frame 1000 to 1350 A.C.E (Hally 1994:163). Sites that are associated with this phase through architecture, goods, and artistic motifs are limited mainly to the narrow coastal zones of barrier islands, tidal marshes, and adjacent mainland (Hally 1994:163). They range in size from a few hundred square meters to sixty hectares. Due to their rarity, little excavation has been conducted of large Irene sites in Georgia (Hally 1994:164). Some archaeologists believe that during this phase many of the settlements were not occupied for long, offering a look into shifting population demographics (Hally 1994:1964). The Lamar phase (1350 to 1600 A.C.E.) is limited to primarily the lower Piedmont and Coastal Plain of South Carolina and eastern Georgia (Hally 1994:164). It closely resembles the mortuary practices seen during the Irene phase (Williams & Shapiro 1990; Hally 1994). Urn-burials tended to be rare, but

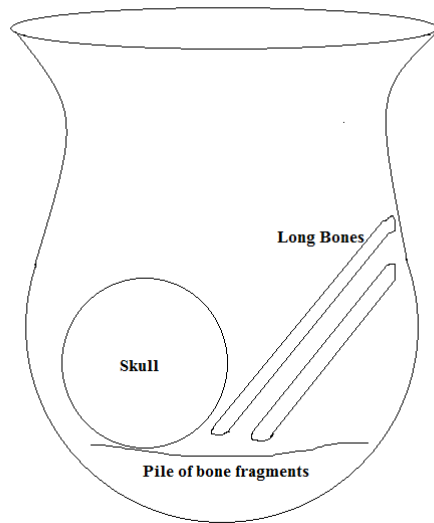
the Irene and Lamar phase represent the height of urn-burials that were adapted from the late Woodland period (Hally 1994:164).



Urn/Vessel-Burials during the Mississippian Period

Urn-burials, the custom of burying the dead in earthenware vessels (Figure 1), is a practice that is widely distributed throughout the world (Brannon 1938:228). Before European

Figure 1



contact, Indians living in certain regions along rivers and the coasts in Alabama, Georgia, Florida, and North Carolina practiced a form of interring their dead with in Urns. Several of these sites were originally excavated and recorded by C. B. Moore in the early 1900s, but have not really been revisited or extensively analyzed since (Hutchinson and Larsen 1988; Moore 1904).

Records by Clarence B. Moore (1904) tell of his trek across the southeast to find evidence of urn-burials and their contents (see Table 1: Urn-burial sites excavated by C. B. Moore). His curiosity took him across the Southeast to Georgia, Florida, and Alabama (see map for general site locations). Moore (1904) postulated that the use of clay vessels was possibly due to the greater use of pottery in everyday life in the south. He spent time at many burial sites in the late 1800s and early 1900s documenting cases where he encountered urn-burials and what was contained within. While in Georgia, five sites excavated by C. B Moore had clay vessels with skeletal remains inside: St. Catherine's Island, Ossabaw Island, Creighton Island, Sapelo

Island, and Altamaha River. At St. Catherine's Island (1896), few vessels had been found and most of them contained adults with only one containing infant remains. Ossabaw Island (1896) was similar to St. Catherine's Island except there was more than one urn that contained uncremated infant remains of one or more infants per urn. The main difference at Ossabaw Island can be seen with the adults interred in vessels. All of the adult remains were cremated and many were found with several adults per vessel (Moore, 1904). At Creighton Island (1896) several vessels were found containing the uncremated remains of one infant per vessel. Sapelo Island (1897) exhibits a case where roughly the same amount of the vessels found contain as many uncremated adult remains as infants and all of the vessels that interred infants held one per urn while many of the vessels that interred adults held more than one set of skeletal remains. This is the only site that had any kind of sex determination; one adult female. The Altamaha River (1898) site interred more than one vessel with uncremated remains of one infant per; this is the only documented vessel that was not closed at the mouth. There were no records found of these sites being revisited later in the 1900s.

Table 1: Urn-burial sites excavated by C. B. Moore

Location	Site	Site #	Number of Vessels	Cremated/Uncremated	# of remains in vessel	Age Group	Sex	Special instance	Initial Excavation	Revisited
Georgia	St. Catherine's Island	n/a	1	uncremated	1	infant	n/a		1896	No record found
			>1	uncremated	>1 - 1	adult	n/a			
	Ossabaw Island	n/a	>1	uncremated	>1 - 1	infant	n/a		1896	No record found
			>1	cremated	>1 - 1	adult	n/a			
	Creighton Island	n/a	6	uncremated	1	infant	n/a	capped with inverted vessels	1896	No record found
	Sapelo Island	9Mc23	>1	uncremated	>1 - 1	adult	n/a		1897	No record found
			>1	uncremated	1	infant	n/a			
	Altamaha River	n/a	1	uncremated	1	adult	female			
			>1	uncremated	1	infant	n/a	vessel not closed	1897	No record found
Florida										
	Ochlockonee Bay	n/a	1	uncremated	1	adolescent	n/a	only one found	1898	No record found
Alabama										
	Little River	1Mn227	2	uncremated	1	infant	n/a		1904	1980s
	Matthew's Landing	1Wx77	1	uncremated	>1	Infant	n/a		1904-1905	1980s
	Durant Bend	1Ds1	>1	uncremated	1	infant	n/a		1905	1970s;1980s
			2	uncremated	1	adult	n/a	without skull		
			1	uncremated	2	adult and adolescent	n/a	skulls on top of vessel		
	Moundville, Mound 1	1M17	2	uncremated	1	infant	n/a		1905	No record found

C. B. Moore's excavations in Florida (1898) only took him to one place that interred a human skeletal remains in an urn; Ochlockonee. Ochlockonee yielded one urn with the uncremated remains of one infant with no record of sex determination. There were also no records found of this site being later revisited in the 1900s.

In Alabama, urn-burials were found at four sites: Little River, Mathew's Landing, Durant Bend, and Moundville Mound I. At Little River (1904), two urns were found that contained the uncremated bones of one infant in each vessel. Mathew's Landing (1904-1905) had one vessel containing the uncremated skeletal remains of more than one infant found inside of the urn. The Durant Bend (1905) site excavated interred many vessel burials: several of the vessels contained the uncremated remains of one infant inside, two of them contained the uncremated remains of one adult per without the skulls, and one of the vessels contained two uncremated skeletons with one adult and one juvenile with their skulls on top of the vessel. Moundville's Mound I (1905) excavation yielded two urns with the uncremated remains of infants inside of them. All of these vessels were closed with bowls placed on top to cover the mouth of the urn (Moore, 1904). However, there are no records of the sex of the individuals inside any of the vessels. These sites are really the only ones that were revisited and excavated again later in the 1900s, but they did not yield any more urn-burials.

In the 20th century, a few more sites were excavated in Georgia by other archaeologists: the Lamar village (9B12) in Bibb County, the Contentment Mound site (9MC32), and Pine Harbor (9MC64) – both in McIntosh County (Georgia's Natural, Archaeological, and Historic Resources GIS, or GNAHRGIS 2015). Not much is documented about the contents of the urns at

these sites, but they have been inventoried with the other materials during excavations. Of these three, Pine Harbor offers the greatest detail of the vessels themselves.

Few urn-burials have been noted in detail from the Lamar Village (Walthall 1980:272) and there is little information about the number or contents of them. Most of the excavations were done from the 1930s to 1940s by Gordon Willey, Jesse Jennings, and Charles Fairbanks; then again at the end of the 1990s by Mark Williams. The Contentment Mound, a few miles north of the Norman Mound (9MC59) in McIntosh County, Georgia (GNAHRGIS 2015), had originally been excavated by C. B. Moore, but he had not found any urn-burials during his excavation. At least seven of the forty-five burials excavated here were documented as cremations interred in pottery vessels. They contained at least one individual of unknown age and sex. No other information is available for the vessel contents of the Contentment Mound site (Cook, 1980). At Pine Harbor, Cook estimated that the fifteen pottery vessel burials that were found there were intrusive mortuary complexes to the late Irene Phase and exhibit Southern Cult motifs (Cook, 1980). According to Cook's (1980) field notes, the presence of Savannah and Irene ceramic complexes in the premound topsoil led him to conclude that the entire Pine Harbor mound dates to the Late Prehistoric to Early Contact period and, more specifically, late Mississippian Irene Phase, dating to the sixteenth century. Several burial vessels, log tombs, and human remains were recovered from this site. The cremains for this research were found in one of several vessels, labeled Vessel F. Cook (1980) proposes that vessels may have become more prominent due to the increased number of deaths during early European contact and that these alternative mortuary practices could have arisen to "alleviate pressure on the mortuary system".

Alabama is said to be the hallmark of vessel burials during the Protohistoric period (Hill 1996). The most common type of urn found in Alabama ranges from ten to twenty inches in diameter, the larger being most used, and is globular in shape (Brannon 1938). Smaller vessels are sometimes used as well. The urns are typically covered with another earthenware bowl of superior workmanship or the broken bottom from another bowl. An example of this was found at 1Lo85, Pintlala. There are also instances where skins were tied over the mouth of the urn. It also appeared that these urns were placed in a pit specifically made to hold them. Yet, no uniform method of placing the urns in the pits was found, as they can occur singly or in groups (Brannon 1938:230). Brannon (1937) notes that the motifs on the urns may have had ritualistic significance associated with the burial ceremony itself. While these sites are highly damaged (due to flooding, plowing, etc.) none of the urns were found in a mound. At all of the contemporary sites studied in Alabama, urn-burials are found associated with other forms of interment (Brannon 1938:229).

At Taskigi (1Ee8), in Elmore County, Alabama, evidence shows that the burial urns were placed on top of an older non-urn burial, showing that burial pits were reused and built upon (Brannon 1938:231). Three-fourths of the urn-burials found at Taskigi held the remains of infants and children exhibiting primary burials in that the entire body was placed in the urn shortly after death (Brannon 1938). There were frequent instances where the urn-burials contained full and partial cremations of only human remains (Brannon 1938:232). Brannon (1938) suggests that even though this may indicate that cremation was practiced, the same conditions could have been caused placing hot ashes in the urns at the time of the burial and might not be intentional. In no

case were there stone artifacts placed in the urns, and if there were artifacts, they tended to be small effigies of animals that accompanied the remains of children (Brannon 1938:232).

Some archaeologists suggested that clay vessels were a substitute for other types of boxes or baskets and that the more rare pottery urns survived while the others could not have (Coe 1995:277). Coe (1995) disagrees. He argues that the urns at Town Creek and the Pee Dee complex in North Carolina were not reburials and that this tradition was already well established. These urns underwent a complex ritual that would not have been used on a substitute. These urns were one way in which the adults and parents could assert the infant's status during its short lifespan (Coe 1995:277).

“The records of the early digging in and around Town Creek Mound in North Carolina are rare, just as rare as the documentation of its existence” (Coe 1995:6). The site (31MG2) was initially excavated by Robert L. Steele in the 1880s, but was later excavated in 1926 by Morris R. Mitchell. An account from the son of the landowners, Lloyd Frutchey, Jr., tells about how frequently skeletal bone fragments would appear from burial urns that would turn up randomly (Coe 1995:6). In 1938 four pottery urns “made for infants” were found away from the initial mound that belonged to the Siouans (Coe 1995:85,180). In 1961 that number grew to twenty-one Pee Dee culture urn-burials all containing infants in them (Coe 1995:269). One of the unique things about Town Creek is that all of the urn-burials here contained only infants while the sites in Alabama and Georgia had contained some adults (Coe 1995:276). Also, in this case, the mortuary vessels at Town Creek were made strictly for the purpose of ceremony and burial when the need arose and show no sign of domestic use (Coe 1995:276).

Coe (1995) notes that once the urn and cover was made the pit was dug in one of the mortuaries and placed there about two feet from ground surface. Then, the first step in the ritual was carried out by knocking a hole in the bottom of the vessel with a rock (known as “killing”). This practice was believed to allow the spirit of the infant, whose body was soon to be received, to be released. The rock was then left at the bottom of the urn (Coe 1995:276). The second step in the ritual was to prepare the infant for interment. It was then wrapped in skins and cloth and ceremonially prepared, then placed at the bottom of the urn. The third step was for the mother (biological or social) to place an offering on the infant’s body – shown in ten of the 21 urns found at Town Creek. Finally, the third step was to seal the mouth of the vessel with a bowl and fill the grave with soil (Coe 1995:276).

The use of Urn-burials usually contained the primary remains of infants and children, some with the secondary remains of adults, and could include primary and secondary cremations (Hutchinson and Aragon 2002; Hill 1996; Hally 1994). The urns at Town Creek Indian Mound contained the remains of twenty-one infants, but no adults, nor did the vessels show any signs of prior domestic use (Hutchinson and Aragon 2002). While the infants in the urns were not reburials they might have been in a multistage process that could have been reserved space for them (Coe, J 1995; Hutchinson & Aragon 2002). Hutchinson and Aragon (2002) theorize that cremation might have connections with priests and special roles and that infants and children were mainly primary burials because they never attained a “mature essence” that could be taken to the afterlife through ritual.

Even though a great many excavations have taken place along the Georgia Coast, the lack of analysis has diminished the data that has been collected. We still, to this day, know very little about demography, health, and morphology of the populations that lived here and even less about sociocultural implications of grave goods. Status rankings remain to be investigated in depth (Thomas & Larsen 1979:12).

Diet and Health

For thousands of years before the appearance of food production around 10,000 years ago all people were hunter and gatherers. Agriculture made it possible for larger populations to exist and ultimately revolutionized human society (Schurr and Powell 2004). Contrary to this romantic ideal is the fact that the adoption of agriculture involved a “general decline in oral and general health” (Larsen 1995). The evidence for this decline can be found on the skeletal and dental growth patterns of remains and indicates that the shift to food production led to significant and widespread biological changes in human populations (Larsen 1994). What cost did this ultimately have on the diet and health of the peoples of the Mississippian period? One way to analyze this is looking at weaning foods (Schurr and Powell 2004) and what impact they had on a growing population as time went on (Bridges 1989).

A modified general model based off of one that Alan H. Goodman implements is used to examine the broader effects of stress in skeletal populations (Goodman and Armelagos 1989). First, examining environmental constraints of a people gives clues into how limited resources of

a people can lead to culturally induced stressors through diet. The physiological disruptions from these stressors and how they lead to skeletal stress indicators depends on the host's resistance factors. Collectively, these dynamics will potentially impact an individual and a population through decreased health - among other aspects (Goodman and Armelagos 1989:226). This section will mainly focus on the effects of diet during the weaning years because this is the time that is the most susceptible to the effects of inadequate nutrition (Goodman and Armelagos 1989:227). The net effects on a culture that experiences a decline in health to subadults can "severely hinder ability to maintain resources and flexibility to meet future challenges" (Goodman and Armelagos 1989:227).

The subsistence economy of the Mississippian Indians was mostly obtained in three major ways: cultivation, gathering, and hunting (Walthall 1980:190). Maize agriculture played a significant role from the last couple centuries of the precontact period and continued to do so through the early contact period (Hutchinson and Larsen 1988). The transition from mostly hunting and gathering to one that incorporated maize-agriculture marked a time of decreased general health in regards to growth and development (Cook 1980; Hutchinson and Larsen 1988). It was induced by a less nutritious diet and the introductions of new diseases by Europeans: smallpox, measles, cholera, and diphtheria to name a few (Cook 1980; Hutchinson and Larsen 1988). In some cases sociopolitical factors on the taxation of food and labor conscriptions also increased stressors that native peoples faced (Hutchinson and Larsen 1988).

Table 2: Percentage of Individuals Affected by Hypoplasia During the Precontact/Contact Period of			
		Contact	Precontact
All Teeth		74%	95%
Mandibular			
	L1	79%	67%
	L2	75%	49%
	C	89%	95%
	M1	15%	40%
Maxillary			
	L1	97%	79%
	L2	92%	81%
	C	83%	85%
	M1	25%	51%
*Adapted from Figure 2 of Dale Hutchinson and Clark S. Larsen (1988)			

An odontological case study compared two Coastal Georgia sites: a precontact site at St. Catherine's Island and Pine Harbor. Dale Hutchinson and Clark S. Larsen (1988) analyzed incisors and canines from 72 individuals from the St. Catherine's Island site and 44 individuals from Pine Harbor. In Table 2, it is shown that there was a higher number of individuals from St. Catherine's Island were affected by Enamel Hypoplasia during the contact period. The Precontact St. Catherine's Island site and Pine Harbor numbers resemble each other except in a few points. This small difference could be accounted for by the larger sample size being used and tested from St. Catherine's Island. Table 3, from the same study, expands on this by comparing precontact and contact remains only from St. Catherine's Island showing that there is almost a fifty-percent increase of enamel hypoplasia markers after contact. This data reveals that Pine

Harbor shows a diet that resembles that of precontact St. Catherine's Island.

Table 3: Sample size of Tooth Types from Coastal Georgia Dentitions								
Sites	Mandible				Maxilla			
	L1	L2	C	M1	L1	L2	C	M1
Precontact St. Catherines	15	22	32	39	24	25	33	38
Contact St. Catherines	44	43	64	47	37	36	63	47
Pine Harbor	22	21	31	20	32	18	41	29
Total	81	86	127	106	93	79	137	114
*Sample teeth were taken from the left side dentition of each individual. If the left tooth was missing, it was substituted with the right. *This table is adapted from Table 2 from Dale Hutchinson and Clark S. Larsen (1988)								

This study incorporated an analysis of Enamel Hypoplasia and how it is used to assess episodic metabolic stress in skeletal remains. Enamel Hypoplasia is a defect of enamel thickness that appears as “furrows or pits” that form on the surface when “the normal process of tooth growth is hindered” (Nelson and Ash 2010: 22). These enamel deficits arise during the secretory phase of tooth development and are signs of metabolic and nutritional disruption (Hutchinson and Larsen 1988).

When maize was initially adopted, it was included as an addition to the preexisting group of native crops and treated as just another starchy seed (Bridges et al, 2000:231,232). During the Mississippian period the production of maize intensified (Bridges et al, 2000:232). Many groups would boil the kernels in boiling water or process them with alkali treatments to make it soft and easier to chew (Bridges et al, 2000:232). However, maize's use along the coasts of the southeastern Mississippian period was less pronounced than it was inland (Schurr 1998). For instance, on the Georgia coast, diets were typically made up of fish and crustaceans (Schurr 198) and the use of maize was seasonal (Keene 2004).

At the Grove's Creek (09CH71) site, on Skidaway Island, Georgia, Deborah Keene (2004) conducted a study evaluating coastal subsistence and settlement strategies. The purpose of her study was to reevaluate the site to see what kinds of agricultural plants were being grown and if the site was utilized as a permanent settlement or for only part of the year. These two details can inform about a culture's dietary habits and to see if oral stressors can be explained by a seasonal, rather than a chronic, deficit in nutrition.

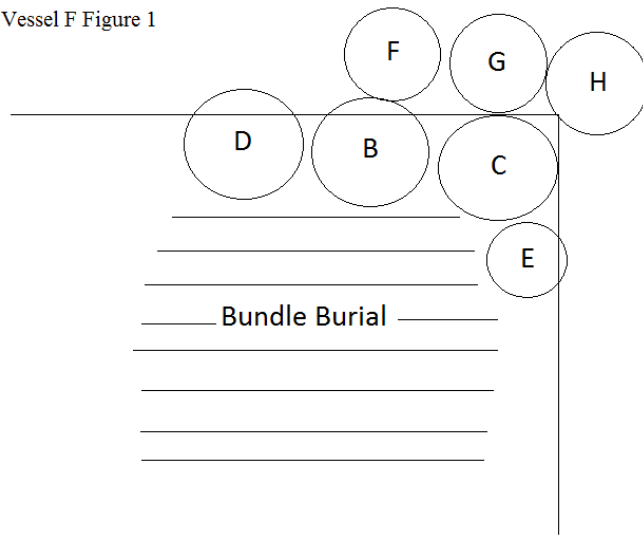
The paleoethnobotanical samples of Grove Creek contained a large variety of taxa. About thirty of these were from edible plants. Many nuts, seeds, fruits, crops, and miscellaneous plants were analyzed. Of these varieties, the second highest edible plant remains was corn (*Zea mays*) which was harvested in June and consumed during midsummer to early autumn, peaking during late summer (Keene 2004). This showed evidence that the Native Americans that inhabited Grove Creek grew maize during certain months of the year and stored it to be used at a later time (Keene 2004). This study presented factors that the village was occupied year-round, when it was previously thought to have only been occupied during certain seasons (Keene 2004). What is unclear from the study is whether or not corn was a major part of the diet during the last months of summer. Keene notes that there might have been a shift of agricultural lands during the Irene period to Ossabaw Island which contributes to the evidence of seasonal settlement patterns (Keene 2004). This shows that maize use and possible consumption was not particularly used all the time and that it might have had a certain use (Keene 2004). Using oral and skeletal health patterns correlate with a general decline in health as the use of corn increased (Larsen 1995), but it also correlates to increased European contact (Cook 1980).

Humans have traditionally focused their subsistence on “long-term reliable and energetically efficient resources” that inevitably lead to a cultural change; given basic ecological conditions (Schutkowski 2006:103). Weaning behaviors are one of these changes. Many methods of weaning behavior have been explored in past populations: demographic profiles, non-specific osteological indicators of stress, bone chemistry studies, and stable nitrogen-isotopes (Schurr 1998). Many of these studies (Schurr 1998; Bridges Et Al. 2000; Hutchinson and Larsen 1988) looked to study estimated weaning ages that children underwent in Native American prehistoric and protohistoric populations. The outcomes of these studies all had one thing in common: there was an increased use of maize as a nutritional offset for weaning.

Methods and Materials

There were a number of ways burials were prepared that vary from culture to culture: (1) Bundle burials, a secondary burial practice which range from entire bodies in wrapping to processed portions of the bodies wrapped in cloth. (2) Cremations, the use of high-temperature burning to reduce remains to ashes. (3) Flexed burials, where the body is placed in a semi-fetal position with the knees drawn up against the chest and hands near the chin. Cook notes that the burial practices seen at Pine Harbor were a modified continuation of a Savannah II pattern of flexed burials. They were found to be the most common at the site, with cremated remains being more frequent than bundle burials, but less frequent than flexed burials. Bundle burials and burials of uncremated human remains were infrequent (Cook 1980).

Vessel F Figure 1



Vessel F (Vessel F Figure 1) was found behind other burial vessels (B-H) near a bundle burial in the southwest portion of a feature. Most of the vessels that were collected at Pine Harbor were used for cooking until the crew happened upon one that stood out as being astonishing. Cook was able to identify

eleven different decorative motifs that provided him evidence of having come into contact with an incised vessel as a “broader cultural manifestation of the Southern Cult” from the Irene Phase (Cook & Snow 1984:2). Fifteen vessels in total were recovered from the Pine Harbor site that exhibited similar decorative motifs. Several of the vessels that contained cremated bone within them also had uncremated bone on top of them. When the excavation crew had excavated the burial pit they also came upon a bundle burial on top that had fallen onto the vessels below it. There exists the potential for fragments of bone from the over-laden burial mound to be incorporated into the contents of Vessel F. Without there being a way of identifying the foreign materials, the data in this analysis will assume all remains in Vessel F are the original contents unless proven otherwise.

Minimum Number of Individuals (MNI) accounts for each possible individual as a unit. The principle is essentially a logic game. If there is a left and a right clavicle, Minimum Number of Individuals is one. If there are two right clavicles, then the MNI is two. If there are 3 pelvic

fragments, two being the same fragment on the same side of a male pubic bone and the third happens to be female, then the MNI is three, and so forth. The MNI not only tells us how many individuals there might be, but can also give some ideas to how the remains were handled after being cremated. Secondary burial, the act of processing remains and then moving them, could mean that parts from previous cremations could be mixed in with the more recent ones.

Age, sex, and apparent health are a little trickier to assess from cremains. The level of damage to the bones can often hide and/or erase traditional markers that could indicate any of these factors. Carbon dating could possibly tell how old the cremains are, but not the age of the individual before death. Bones that are easily identifiable in their normal state can be unrecognizable afterwards, even if they had not been completely destroyed. Age assessments become less accurate because the maturation rate decreases as the age of the subject increases (Blakely and Walker 1968).

A partial reconstruction of the sagittal suture and teeth analysis are able to give some evidence as to the possible age of one of the individuals using suture fusion analysis. Sutures tend to continuously fuse throughout a person's lifetime and a general age range can be indicated by how fused the cranial sutures are. Other possible age indicators were observed from teeth development. While possible evidence of age is still able to be assessed, techniques for finding the sex of the individuals are unlikely for these remains. Possible health was assessed using indicators on the teeth looking for patterns of diet and nutrition.

Post-mortem damage includes, but not limited to, animals that have scavenged the remains after they have cooled. Gnawing is typical of rodents to sharpen their teeth and

carnivores tend to leave puncture holes from their canines when there is meat on the bone. Due to this, there may be bones that have been carried off by animals that were not found in the vessel. Type of fuel, the amount of fuel used, collapse of the cremation pile, humidity, heat, human interference as well as many other factors could be involved that would affect the physical state and appearance of these remains.

The cremated remains being used for this research have not been completely damaged by the cremation process. This fact has made it easier for most of remains that are intact, albeit highly fragmented, to be generally identified and sorted into categories. Some partial reconstruction was also able to be done. Osteological analysis includes gathering data on distinguishing human from animal bone, the minimum number of individuals represented, as well as details of age, sex, apparent health of the individual(s) interred, and post-mortem damage. All of these factors are used as a comparative basis with other Mississippian sites in order to establish similarities and differences in order to inform about what kind of individual(s) were placed inside this vessel.

Soon after being excavated in the 1970s, the contents inside of Vessel F underwent its first analysis where fragments were sorted into three categories: cranial, postcranial, and unidentified. The cranial and postcranial categories were then broken down into subcategories: mandible fragments, teeth that included broken roots and crowns, and large unidentified postcranial fragments. There were numerous inconsistencies with the sorting and labeling and all of it had to be reanalyzed.

First, the identified bone was assessed to see if they were identified correctly. Second, anything in the unidentified category was reevaluated fragment by fragment to see if anything could be identified that has not been already. All of the fragments were separated into two elements: Human Bone and Nonhuman Bone. The Nonhuman section could be separated into UID (unidentified) Animal, Shell, and Charcoal. Human Bone was further broken down into UID Human Bone and ID (identified) Human Bone. No further breakdown of the UID Human Bone was necessary, but ID Human Bone could be broken down into: Cranial and Post Cranial. Cranial fragments were further separated into UID Cranial and ID Cranial. ID Cranial categories are as follows: Frontal, Parietal (further separated into UID parietal left and right sides), Temporal, Occipital, Maxilla, and Mandible. After all of the cranial categories were finished the postcranial fragments could be separated: Scapula, Vertebrae, Costal, Pelvis, Sacrum, Ends of Long Bones, Femur, Fibular, Patella, Wrist (further separated into left lunate and left capitate), and Phalanges. The teeth were separated out from the cranial bone into its own section. They were further broken down into: ID Teeth, UID Siding, and UID Fragments. The ID Teeth were separated into LI², LC₁, RP₄, RP⁴, RM²₂, and RM₂. UID Siding was separated into Premolar and Molar.

All of the fragments were counted pertaining to their corresponding category (with the exceptions of UID Human, UID Teeth Fragments, and the Nonhuman elements), then placed into a container and weighed with a digital scale. The container used to hold the fragments during weighing was weighed separately and zeroed-out for accuracy. After all of the fragments were separated and could be identified, cranial reconstruction was attempted to help find the Minimal

Number of Individual. Then, using current physical anthropological analysis, clues to the age, sex, and apparent health were examined.

Results

Table 4 shows that vessel F contents comprised a total of 4993.2g of material. Total Human Bone and Teeth (4936.8g) far out-weighed the Nonhuman (56.7g) elements. UID Human Bone (3066.1g) outweighed ID Human bone (1812.5g) and Cranial fragments (426, 1427.0g) were more numerous and weighed more than the Post Cranial fragments (184, 385.5g). Of the Cranial fragments there were less ID Cranial fragments (212) than UID Cranial fragments (214), but weighed more at 1011.1g with UID Cranial Fragments weighing 415.9g. ID Cranial fragments consisted of: 45 frontal fragments weighing 230.3g, 43 Parietal fragments weighing 229.4g, 28 temporal fragments weighing 75.0g, 62 occipital fragments weighing 374.2g, 7 maxilla fragments weighing 14.7g, and 27 mandible fragments weighing 87.5g. The parietal fragments consisted of: 27 UID parietal fragments weighing 106.7g, 8 right parietal fragments weighing 68.3g, and 8 left parietal fragments weighing 54.4g.

The Post-cranial fragments consisted of: 4 scapula fragments weighing 19.2g, 24 vertebrae weighing 32.5g, 42 costal fragments weighing 76.4g, 24 pelvic fragments weighing 114.8g, 6 sacrum fragments weighing 24.3g, 65 end of long bone fragments weighing 95.0g, 1 femur fragment weighing 7.5g, 1 fibular fragment weighing 5.3g, 1 patella fragment weighing 0.9g, 2 carpel fragments weighing 1.9g, and 14 phalangeal fragments weighing 7.7g. The

Nonhuman elements contained 32.9g of UID Animal bone fragments, 21.9g of shell, and 1.9g of charcoal.

Table 4: Vessel F Contents					
				Number of Fragments	Weight in Grams
Human Bone					4878.6
UID Human					3066.1
ID Human				610	1812.5
	Cranial			426	1427.0
		UID Cranial		214	415.9
		ID Cranial		212	1011.1
			Frontal	45	230.3
			Parietal	43	229.4
			UID Parietal	27	106.7
			Right	8	68.3
			Left	8	54.4
			Temporal	28	75.0
			Occipital	62	374.2
			Maxilla	7	14.7
			Mandible	27	87.5
	Post-Cranial			184	385.5
			Scapula	4	19.2
			Vertebrae	24	32.5
			Costal	42	76.4
			Pelvic	24	114.8
			Sacrum	6	24.3
			Ends of Long Bones	65	95.0
			Femur	1	7.5
			Fibula	1	5.3
			Patella (Right)	1	0.9
			Carpels	2	1.9
			Left Lunate	1	1.0
			Left Capitate	1	0.9
			Phalanges	14	7.7
Nonhuman					56.7
UID Animal					32.9
Shell					21.9
Charcoal					1.9
Total Human Bone and Teeth					4936.8
Total Weight of Vessel F Contents					4993.2

Table 5 shows that UID Teeth Fragments (37.8g) weighed more than ID Teeth (3.9g) and UID Siding (16.5g). ID Teeth consisted of: 1 LI₂ weighing 0.5g, 1 LC₁ weighing 0.7g, 1 RP₄ weighing 0.5g, 1 RP₄ weighing 0.5g, 1 RM₂ weighing 0.9g, and 1 RM₂ weighing 0.8g. UID Siding consisted of: 14 premolars weighing 8.0g and 9 molars weighing 8.5g. The Total weight came to 58.2g.

Table 5: Vessel F Contents						
					Number of Fragments	Weight in Grams
Teeth					29	20.4
ID Teeth					6	3.9
		Left Maxillary Incisor	LI ₂		1	0.5
		Left Mandibular Canine	LC ₁		1	0.7
		Right Mandibular Premolar	RP ₄		1	0.5
		Right Maxillary Premolar	RP ₄		1	0.5
		Right Maxillary Molar	RM ₂		1	0.9
		Right Mandibular Molar	RM ₂		1	0.8
UID Siding					23	16.5
			Premolar		14	8.0
			Molar		9	8.5
UID Teeth Fragments.						37.8
Total						58.2

No artifacts were found within the vessel. The vessel's contents did contain non-human bone fragments, shell, and charcoal. The cranial fragments are relatively the same size with small variation in thickness, heavily burned, and indicators of siding have been greatly diminished. Only a small percentage of these fragments could be partially reconstructed showing portions of frontal bone, left and right portions of parietal bones at the sagittal suture, and portions of occipital bone. Some maxillary fragments, petrous fragments of the temporal bone, and sphenoid fragments, many of which are endocranial, have also been identified. Partial reconstructions of

mandible fragments have yielded two right halves and a medial portion of a third all exhibiting their own set of mental spines. They are of slightly different sizes, density, and coloration. Postcranial fragments exhibit the same patterns as the cranial fragments had with each other; they are relatively the same size with small variation. Fragments of identified postcranial bone include: vertebrae (with the inclusion of an odontoid process from an axis), costal, pelvic, a right patella, carpels (a left lunate and left capitate), phalanges, and a few long bones (a femur and a left fibula fragments).

Two of the identified permanent molars exhibit the beginning of juvenile root formation. A left maxillary incisor has been identified with the root having been broken off. On the lingual (inner) side of the left maxillary incisor a shovel-shape is present- indicating Asian or Native American descent. Horizontal lines, or banding, appear on the labial (outer) side of the left maxillary incisor showing signs of liner enamel hypoplasia. No pathological lesions have been observed. In some places there appears to be more charring on the inner sides, rather than the outer sides, but in some parts the opposite occurs. Generally the charring appears to be evenly distributed throughout the remains. All but two teeth have been charred (RP₄, RP⁴) and all are broken at the root. While most of the teeth show extensive burning and breaking, several appear to be very worn down as well, making them difficult to identify but are evidence of excessive use that could come with old age. Evidential markings on the bones that point to exposure to animals is not observed, nor does there seem to be any other damages besides the cremation process.

Discussion and Conclusions

A few things can be said about C. B. Moore's discoveries: his notes were mostly qualitative with little quantitative data, little to no preservation was done to the vessels or the remains, and he assumed cultural homogeneity. Much of his excavation on urn-burials is frequently cited among contemporary southeastern archaeologists due to the relatively few number of excavations, and publications, that have been done on the subject. His contributing hypothesis, the predominance of clay vessels in the use of urn-making in the southeast, might not be far from the truth. We know that a great importance was placed upon how the body was preserved and interred after death. It would not be unreasonable to assume that the Native American Indians had observed the fast degradation of organic matter in the southeast and sought to preserve the dead from the very environment around them. Clay offers better protection than wood or basket urns.

The importance of Pine Harbor lies with the burial vessels and their contents found there because of their rarity on the Georgia coast. It is evident that the Native American population that lived at this site had utilized pottery as a form of interring the dead. Not only did they place skeletal remains in these vessels, but they cremated some beforehand. This could be evidence for Cook's hypothesis that cremations are one sign of European contact; that cremations are possibly due to the increased spread of diseases as a means to contain the illness. This possible use as a method of quarantining the infected body may have been part of a ritual burial, specifically for those who died under certain circumstances, so that their spirits could be released by the vessel that contained them. However, whether or not this specific cremation was a response to the

increase of diseases after European contact is unknown as there are no indicators on the bones to signify illness was the reason for death; as it would have been easily burnt away. If the status of the individuals had more to do with them being interred in the vessels, instead of a primary or secondary burial, then it would have been more likely that they had been buried with some kind of mortuary goods (gift from parent or an effigy) like so many other Mississippian burials have shown. However, this is also not the case as there are no artifacts associated with this vessel other than the urn itself.

Many of the bone fragments had been burnt away, leaving behind incomplete human skeletons. There are four possible ways the persons in Vessel F could have been cremated: 1. They were cremated at different times in the same burning pit; 2. They were cremated at different times in different burning pits; 3. They were cremated at the same time in the same burning pit; 4. They were cremated at the same time in different burning pits. As a whole, the remains seem to have been burnt evenly at around the same temperatures due to the mostly uniform charring. This observation leads me to conclude that the best answer is that they were burnt at the same time and in the same pit. This information is useful as it gives clues to possible connections the interred might have had in life: same mode and time of death, like ritual sacrifice or presence of illness, or even possibly kinship. For this sample to have been cremated and placed within the vessel was rare given that the previous sites mentioned in the Urn/Vessel-Burial section of the literature review almost always consisted of uncremated skeletons of infants and adults - the only exception being of an adult at Ossabaw excavated by C. B. Moore.

The banding on the adult left maxillary incisor shows evidence of possible linear enamel hypoplasia. When considering the literature review, several factors could be a contributing factor for the banding observed, none of which necessarily overlap: 1. Increased use of maize into the general diet as time progresses. 2. Weaning infants with maize – which is really a subset of the causes of increased maize use/consumption, but for the purpose of this research, it will be its own category. 3. Seasonal agricultural shifts that can inform us about dietary patterns and subsistence. 4. Introduction of new diseases by Europeans (which also may have been the cause of the increased cremations that are found on the Georgia coast).

Due to the presence of three mandibles, exhibiting their own set of mental spines, it is possible to say that at least three people had been placed in Vessel F after cremation had occurred. This data complements the confirmation of juvenile and adult teeth, which shows that the vessel contained a minimum of one adult and one child. This mix of age groups in the same vessel is unusual as none of the current vessel-burials has contained children and adults together except for only one from Durant Bend recorded by C. B. Moore. The most common element for vessel-burials in the southeast has appeared to be the presence of infant remains. This was the case with Alabama as three-fourths of the remains were infants, as well as the sites described by C. B. Moore, Hally, and Coe, where urn-burials were found. None of the infants were placed with adults in the same vessel. This sample from Pine Harbor does not follow this trend. If there is an infant in this vessel among the juvenile and adult cremains then the remnants have not been able to be identified. Vessel F might be the exception though and it would be premature to state

that this is the case for all of Pine Harbor. More analysis would need to be done on the contents of the rest of the urns found there.

This sample from Pine Harbor does resemble those found in Alabama where the urns were observed among other incised types of burials. Vessel F was excavated among a pile of other urns very close to a bundle burial which gives the impression of a ritual. Like the Taskigi, the burials that were interred on top of the urns shows that the site was reused and built upon afterwards. Even though the Pine Harbor site was mostly determined to be an Irene phase protohistoric burial site, it would be interesting to see if the urns are from a different phase than the overall site. This sample's vessel contains the remains of bodies that have been partially cremated like many of the ones found at Taskigi as well. Unlike the Alabama urns though, the Pine Harbor urn mouths were not covered with bowls nor did they have stretched animal skins tied to seal them.

The most significant hindrance to researching urn/vessel-burials in the Southeast is the relatively few analytical works that have been done on them and their contents. There are large periods of time between mentions of urn-burials in the publications wherever they are found and they are usually only mentioned as a side note that is part of the larger discussion on mortuary practices on types of interment - or simply not mentioned at all. There does not seem to be any mention in the literature about the different age groups occupying the same vessel either. Certainly the small sample size of data is a contributing aspect, but this is not as much of a factor when it comes to the contents themselves being analyzed for more than the very basic information. More osteological analysis should take place other than the few instances that

occurred at the beginning of the 20th century. Pine Harbor is a good start, but if the rest of the vessel-burials yield different results than Vessel F, then this would give a clearer picture as to the commonality of cremations and age groups interred here. It would also show if there are any instances of artifacts buried inside the vessels with the remains. Or, perhaps the urns themselves are simply not enough to go on and instead the answer is more complex and cannot be assessed by the archaeology at all. There are still many questions about them that simply cannot be answered in this paper because they lead to more questions, like most research. This analysis has merely scratched the surface and hopefully will be a good lead-in for others in the future studying urn/vessel-burials of the Mississippian Southeast.

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