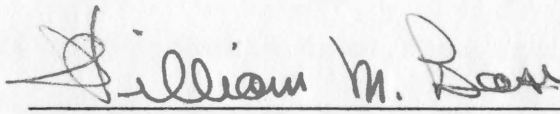
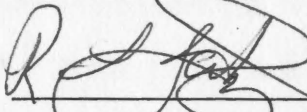


To the Graduate Council:

I am submitting herewith a thesis written by Mary Cassandra Hill entitled "The Alabama River Phase: A Biological Synthesis and Interpretation." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Anthropology.


Dr. William M. Bass, Major Professor

We have read this thesis
and recommend its acceptance:


Charles W. Jaul

Accepted for the Council:


Vice Chancellor
Graduate Studies and Research

THE ALABAMA RIVER PHASE:
A BIOLOGICAL SYNTHESIS AND INTERPRETATION

A Thesis
Presented for the
Master of Arts
Degree
The University of Tennessee, Knoxville

Mary Cassandra Hill
March 1979

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ABSTRACT

Until recently, very little attention has been paid to the protohistoric time period in the state of Alabama. Perhaps this is because it is not as "artifactually" interesting as the preceding Woodland and Mississippian periods. The only unusual artifacts found from this time period are mortuary vessels, burial urns, which are not found in preceding occupations.

This protohistoric time period, known as the Alabama River phase, is very important, however, in the reconstruction of the total prehistoric cultural development. It was during this time that one of the most elaborate, affluent social structures, the Southeastern Ceremonial Complex, declined and met its ultimate demise.

It is the purpose of this thesis to present data obtained from the analysis of several Alabama River phase sites in anticipation of elucidating some of the problems and hypotheses posed by archaeologists concerning the aftermath of the Mississippian decline.

A total of 88 burials was analyzed from four sites with known Alabama River phase components. Pertinent data was recorded for each individual concerning age at death, sex, and pathologies and anomalies. Site 1WX1 had a Mississippian component underlying the Alabama River phase component.

The burials from both of these components were analyzed and compared for similarities and differences.

In addition to the data obtained from the four Alabama River phase sites, comparative data recently obtained from the skeletal material excavated for the Tennessee-Tombigbee Waterway has been added. This additional data is from two sites, 1PI33 and 1GR2, considered to belong to the middle to late Mississippian time period. A total of 56 individuals, 23 from site 1PI33 and 33 from site 1GR2, represents the comparative populations, with emphasis being placed on pathological diagnoses.

It was concluded that contrary to the popular consensus that the basic Mississippian subsistence pattern of riverine hoe agriculture heavily supplemented by hunting and gathering continued through the Protohistoric period to the Historic period, a change in subsistence may have occurred during the Protohistoric period which resulted in extreme nutritional stress for the indigenous groups occupying Alabama during that time period. Several hypotheses are offered as explanations for this nutritional stress.

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CHAPTER I

INTRODUCTION

One of the most outstanding prehistoric cultural developments in North America occurred between A.D. 700 and A.D. 1500. Commonly known as the Mature Mississippian, and locally known in Alabama as the Moundville phase, this stage of cultural development is defined by archaeologists by several principal culture indicators including shell-tempered pottery, wattle and daub houses, truncated pyramidal mounds, large scale palisaded settlements, and riverine agriculture (Sheldon, 1974; McKenzie, 1966). These settlements are also typified by highly complex economic and social organizations, known as chiefdoms. The "Southern Cult" religious complex, characterized by highly stylized motifs and artifacts, rare and exotic trade goods, large specialized religious super-structures and an elaborate burial complex, also reached its summit in development during this time period (McKenzie, 1966; Sheldon, 1974).

"Sometime between A.D. 1450 and 1550, a series of unknown events and processes brought an end to the cultural florescence at Moundville, leaving in their wake a number of relatively impoverished cultural groups. The time span of these events is the so-called "Mississippian Decline," a concept easily recognized in the loss or

degeneration of numerous archaeological traits, but poorly understood as to its precise timing and fundamental causes" (Sheldon, 1974:9).

In historic records it can be noted that unusual cultural manifestations often occur at the time of decadence or decline of highly sophisticated cultures. The practice of urn burial in the Southeast is apparently one such occurrence. This type of mortuary practice is confined temporally to the Protohistoric period, A.D. 1540 - 1715, (Sheldon, 1974) with the initial development in the decline or terminal part of the mature Mississippian period (Moundville phase) (Sheldon, 1974).

Around the turn of the nineteenth century, Clarence B. Moore did extensive archaeological investigations in the Southeast. Among his copious notes on artifacts found in this region are numerous notations and descriptions of the occurrence of burial urns (Moore, 1899, 1901), and in 1904 he published an article devoted entirely to the distribution of urn burials in the United States (Moore, 1904).

Once called the Burial Urn Culture, the Alabama River phase is characterized by several principal culture indicators, the most outstanding of which is inhumation in large clay urns. These urns are most commonly globular in shape and range in size from ten to twenty inches in diameter, being tempered with grit and shell (Brannon, 1938;

DeJarnette, 1952; Sheldon, 1974). These urns are usually covered with other earthenware vessels, bowls, or the broken bottoms of bowls, and in some instances they appear to have perhaps been covered with animal skins (Brannon, 1938; Sheldon, 1974). "The burial urns are usually decorated only on the upper part and on the narrow, slightly constricted necks of the wide-mouthed vessels. The most common form of decoration consists of a series of palisades approximately parallel to one another, formed by strips of clay. These may be attached to the vessel throughout their entire length, or only at their ends. However, in no case are they strong enough to form utilitarian handles. When the urns occasionally do have stronger, utilitarian handles, they usually only have four" (Brannon, 1938: 233). Other common decorations were punctuations and incised designs (Moore, 1899; DeJarnette, 1952; Sheldon, 1974).

Disposition within the urns themselves is also quite variable, although it appears that most urns contained the remains of children or infants, in which case the remains appear to have been articulated (i.e., primary burial). Adults were secondarily interred in urns, either as single or multiple individuals. More rarely, the urns contain cremations (Brannon, 1938).

Often the urn depositions were covered with twigs, plastered with mud, and finally covered with more twigs which were then burned, producing a hard clay covering for

the entire deposit. This capping technique was also used for the final mortuary preparation of another rather unique form of interment during this same time period (see discussion of site 1TU49 burial data). This particular interment involved placing the individual in an upright seated position with the legs crossed (similar to the "lotus" position in yoga) and the hands placed in the lap.

The fully extended and flexed primary burials and secondary bundle burials frequently seen also during this time period appear to have been a retention of those forms of mortuary treatment from the previous Mississippian period.

Very few, if any, burial goods were deposited with urn burials. This could be reflective of the paucity of such artifacts in the people's everyday existences as a result of the decline of the elaborate ceremonial complex (i.e., Southeastern Ceremonial Complex) associated with the mature Mississippian period. For more detailed information concerning the archaeological assemblages for the Alabama River phase see Sheldon, 1974.

There are many questions surrounding the transition from the mature Mississippian culture (i.e., Moundville phase) to the protohistoric Alabama River phase. Only recently, with the works of Cottier (1968) and Sheldon (1974), have any major attempts been made to propose answers to the questions concerning this transition.

Alabama River phase sites are widely dispersed within the state of Alabama, with extensive concentrations being located along three major waterways: the Black Warrior River, the Mobile River, and the Alabama River, after which this phase has been named (see Figure 1).

Alabama River phase sites have been excavated since the 1920's, with the focal point of the excavations being devoted to the recovery of cultural remains. Very little, if any, attention has been directed toward the analysis of the accompanying osteological remains and the incorporation of such analyses into the archaeological reports. No doubt, this is partially due to the fact that earlier aims of archaeological research were focused on the simple extraction of cultural material and partially due to the lack of personnel who were trained in the proper field and laboratory techniques for extensive burial analysis.

In the past, any osteological analyses which were made were included as little more than data "check lists" which were inserted as appendices at the ends of reports. The recent redefinition of the goals of archaeological field excavations recognizes that inclusion of physical analyses and cultural theory are of necessity in the ultimate understanding and solution of the problems represented by prehistoric data.

One of the purposes of this paper, therefore, is to present data obtained from the skeletal remains of selected

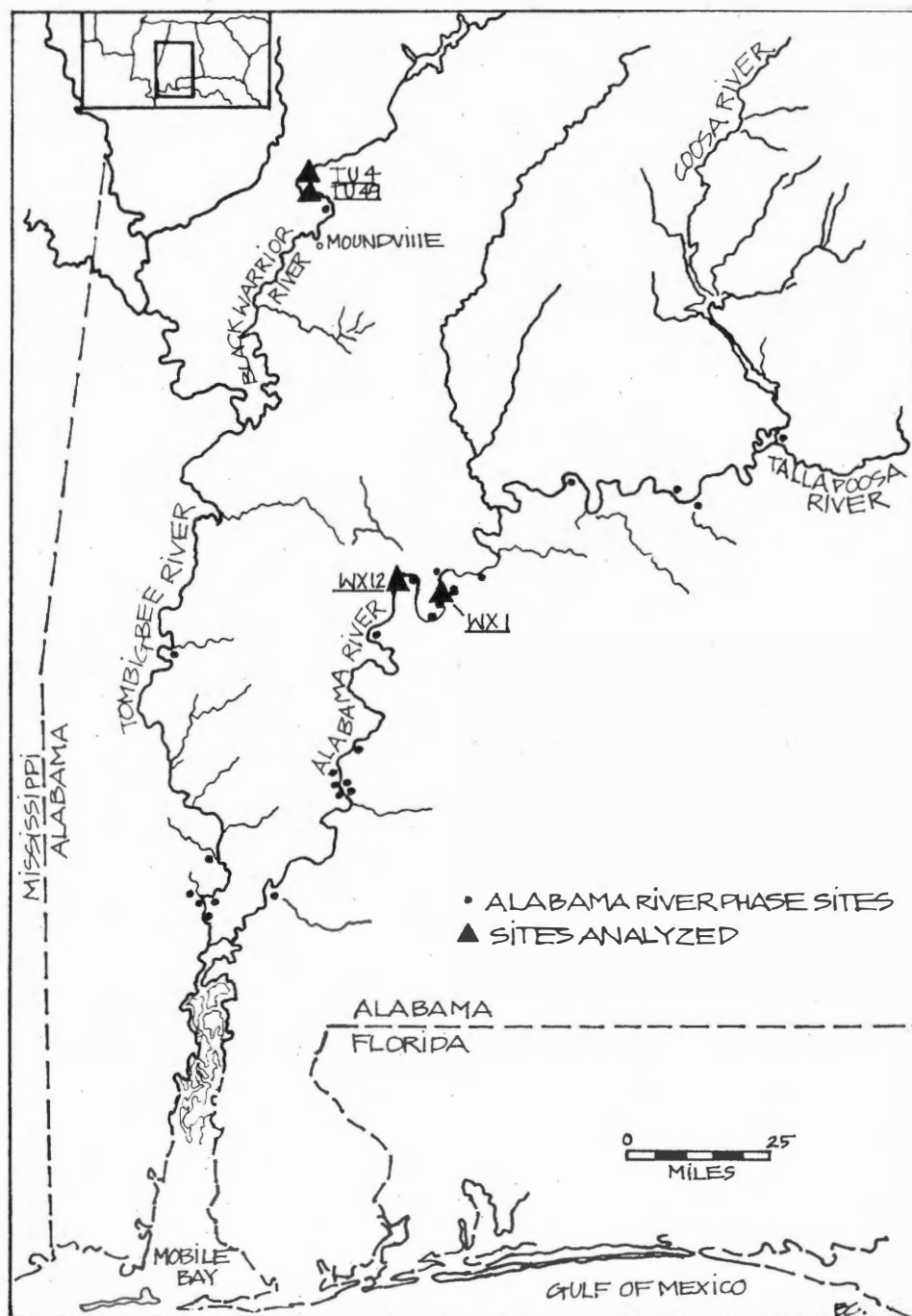


Figure 1

Map of the state of Alabama showing the locations of Alabama River phase sites and the sites for this particular study.

sites which would be pertinent to the possible solution of a major problem confronting archaeologists in the Southeast (particularly in Alabama), i.e., the transition of the Moundville phase into the protohistoric Alabama River phase.

Sheldon (1974:74) feels that the basic subsistence pattern for the Alabama River phase was one of riverine agriculture and settlement heavily supplemented by hunting and gathering. This assumption is based primarily on artifactual assemblages. In his dissertation, Sheldon says, "Inferable from the archaeological assemblage and various ancillary data are a basic dependence upon riverine hoe agriculture of the traditional Southeastern cultigens, a strong supplementation by hunting and gathering of various natural food resources on the Piedmont slopes and river valleys and an extended small scale settlement pattern in the river valleys of the Coastal Plain" (Sheldon, 1974, 119).

The adaptive success of any population can often be determined through the analysis of those biological remodelings which occur in response to certain pathologies, anomalies, or trauma. Food getting or processing behavior may also be indicated through pathological responses.

The principal focus of this research is to test Sheldon's statement concerning the overall subsistence pattern of the Alabama River phase by conducting extensive skeletal analyses which include the differential diagnoses of pathologies and anomalies.

CHAPTER II

MATERIALS AND METHODS

Materials

Protohistoric sites with known Alabama River phase components are abundant within the state of Alabama (Figure 1). Because it would be impossible to analyze all of the skeletal material from these sites, samples were taken from two of the three major areas, i.e., Black Warrior and Alabama Rivers. The selection of these sites was based primarily on the amount and availability of material that was excavated. Preservation and completeness of the skeletal material were also deciding factors.

Four sites were selected for this particular study, with a total of 88 burials being analyzed. The sites selected were 1WX12 (represented by one burial), 1WX1 (represented by 40 burials), 1TU4 (represented by 19 burials), and 1TU49 (represented by 28 burials). Sites 1WX12 and 1WX1 are located on the Alabama River, and sites 1TU4 and 1TU49 are located along the Black Warrior River (see Figure 1). The burials analyzed from site 1WX1, the Liddell Site, were from two separate components: Mississippian and Alabama River phases. The burials from the other sites are all considered to be Alabama River phase. Although more burials were excavated from these sites, they

were not available for study because of loss; however, whenever possible, the original field data concerning these missing burials has been included in the Burials Appendix section and in the summary and conclusions.

Sites 1WX1 and 1WX12 were excavated by the University of Alabama under the direction of David L. DeJarnette. These sites were part of a salvage program, the Miller's Ferry Lock and Dam, and have been described by Cottier, 1968 and Sheldon, 1974. Site 1TU4 was originally test excavated by the Alabama Museum of Natural History in 1932, however, the burials analyzed in this particular study were excavated by Cailup B. Curren from 1976 through 1978. Site 1TU49 was partially excavated by David L. DeJarnette in 1958 and 1959, and later partially excavated by Jerome J. Nielsen in 1975 for the University of Alabama.

The burials excavated from these sites are now stored at Mound State Monument, Moundville, Alabama and were generously made available to the author by David L. DeJarnette and Jerome J. Nielsen.

Methods

Before the skeletal material could be completely analyzed it was necessary to do the basic cleaning, cataloging and reconstruction necessary in the curation of any archaeological material. Once this was completed the basic analyses of skeletal material were applied to the burials from the four selected sites. These basic

analyses included the determinations of sex, age at death, and pathologies and anomalies of each individual. Determinations were often difficult because many skeletons were incomplete.

The selection of those criteria or standards which are known to produce the most accurate assessments of individuals' age, sex, and pathologies and anomalies is of critical importance in the analysis of prehistoric skeletal material.

Determination of Sex. Those standardized means of visual and statistical determination of the sex of a particular individual which have produced the most accurate results are based on developmental changes in the bone which occur after the individual has reached puberty. Numerous attempts have been made in determining the sex of prepubescent individuals with only moderate success (Boucher, 1967). Consequently, no attempt was made to estimate the sex of prepubescent skeletons represented in this particular study.

The determination of sex and its related problems has been discussed at length by numerous authors. Summaries of these studies are presented in Bass, 1971 and Krogman, 1973.

The overall morphology of the pelvis is recognized by most physical anthropologists as being the most sexually distinctive criterion upon which to base an assessment.

Generally, the female pelvis is broader than that of the male. The female pelvis is specifically characterized by a wide sciatic notch, smaller acetabulum, elevated preauricular sulcus (sacro-iliac articulation), long pubis, wide subpubic angle, small triangular obturator foramen, and it is more gracile in overall appearance (Bass, 1971; Krogman, 1973). Stewart (1957, 1970) and Houghton (1974) feel that the presence of parturition pits along the pubic symphysis and sacro-iliac articular surfaces are also indicative of female pelves.

Other general post-cranial morphology which might be indicative of sex includes a tendency toward robusticity and rugosity in males, with the muscle attachments being more pronounced and the diameters of the heads of the femur and humerus being larger in males (Bass, 1971; Krogman, 1973). Also, the presence of septal apertures (supra-condyloid foramen) may be indicative of females (Hrdlicka, 1932; Bass, 1971).

The gross morphologies of the cranium and mandible are second in the line of descent of important sexing criteria. Sexual dimorphism is usually evidenced by a more rugged, robust cranium in males. Specifically, the male cranium usually has a more prominent supra-orbital ridge, blunt orbital borders, larger teeth, larger palate, more pronounced muscle attachments on the frontal and occipital bones, large rounded mastoid processes, and

larger frontal sinuses (Bass, 1971; Krogman, 1973). The male mandible is characterized by larger teeth and a squared mental eminence (chin) (Bass, 1971; Krogman, 1973).

Cranial measurements have been proven to be quite accurate in the discrimination between males and females (Giles and Elliot, 1963; Giles, 1964, 1970). When the cranial material was complete enough, these discriminant functions were used to check the visual sexing assessment. Because of the often fragmented and poorly preserved nature of most of the material analyzed in this study, visual assessment of gross morphological features was the principal means of determining the sex of the individuals.

Determination of Age. There are two primary problems associated with determinations of age at death. The standards used are based on data obtained from American Caucasians; and consequently the validity of the application of these standards to prehistoric American Indians is often questioned. This is unfortunately unavoidable.

Another criticism is that chronological age often varies from biological (skeletal) age for any given population. However, this is not actually a problem for mortuary samples because chronological age cannot be known, and therefore, the populations are reduced to the same level of comparison. In other words, prehistoric populations are all compared on the basis of skeletal development and maturation.

Aging can generally be divided into two processes: maturation and degeneration. Included among those criteria in the assessment of maturation are the appearance and union of primary centers of ossification, dental eruption sequences, diaphyseal length of long bones, and the stages of epiphyseal union. Dental eruption sequences have been shown to be among the most accurate of aging criteria for subadult skeletal material. The dental maturation chart prepared by Schour and Massler (1941, 1944) was found to be the most useful in this particular study. When teeth were not available, the diaphyseal length standards published by Johnston (1962) were used. Because of the temporal and geographical discrepancies between the Indian Knoll series and the Alabama River phase sites of this study, Johnston's standards were used with caution as a last resort. Occasionally it was possible to refer to the developmental sequences observed by Greulich and Pyle (1959) for the bones of the hand and wrist. The summaries of various researches concerning the appearance and union of ossification centers and epiphyseal union provided by Bass (1971) and Krogman (1973) were often referenced, as was the extensive research on epiphyseal union by McKern and Stewart (1957).

Those criteria included under the subdivision of degeneration in the assessment of age at death are cranial suture closure, changes in texture and density of bones,

accentuation of muscle attachments, changes in the symphyseal face of the os pubis, and degenerative pathologies (i.e., osteophytosis, osteoarthritis, etc.). Todd and Lyon (1924, 1925) first described the sequences of endocranial suture closure as being indicative of the age of an individual. More recently Krogman (1973), who has summarized their work, cautions that this method of age assessment is quite variable and should not be relied upon too heavily. In the absence of other more accurate age criteria, endocranial suture closure was referenced. Changes in the texture and density of bones is indicative of senile osteoporosis. These changes are also seen as a consequence of prolonged illness and should only be used as age determining criteria in conjunction with other age indicators. Bone remodeling occurs in response to stress or tension due to the required locomotion or movement of everyday life and activities. As one ages, then, the lines of muscle attachments, particularly on the long bones, become more pronounced. Probably the most accurate means of visual assessment in the determination of the age of adults is the observation of the changes which occur on the symphyseal face of the os pubis. Todd (1920, 1921) initially defined ten phases of age-related changes from 18 to 50+ years. Because this system tends to overestimate age, McKern and Stewart (1957) re-defined the phases which are considered to be quite accurate for males up to age 40.

For females, however, the changes in the symphyseal face occur at different times (ages) than for males, because of distortion occurring during parturition. Gilbert and McKern (1973), after completing a study similar to that of McKern and Stewart, proposed standards for the assessment of age of the female os pubis. Because of the fragmented nature of the skeletal material from the Alabama River phase sites, the assessment of age from changes in the pubic symphysis was virtually impossible. Certain pathologies and anomalies which occur as a normal consequence of degeneration can often be indicative of general adult age assessments (i.e., young adult, mature adult, senile adult). Included in these degenerative pathologies are osteophytosis, osteoarthritis, ossification of costal cartilage, pacchionian pits, etc.

Determination of Stature. The scope of this particular study does not include the computation of estimated stature of each adult, however, whenever possible, long bone measurements were taken and have been included in the Burials Appendix section in order that such measurements can be used by other researchers in the future.

Bone Pathology. The determination of a differential diagnosis of pathology for each individual in this series of Alabama River phase sites is the primary focal point of this author's research. The adaptive success of any population can often be determined through the analysis of

those biological remodelings which occur in response to certain pathologies, anomalies, or trauma. Often inferences concerning cultural behavior can be made by examining each individual and then constructing a descriptive model for the entire population in terms of adaptive behavior. The physical disability of an individual could result in an altering of behavior of his fellow inhabitants in order to compensate for that person's nonproductivity. Food getting or processing behavior may also be indicated through pathological responses. In the diagnosis of paleopathology, several general categories are considered: trauma, arthritis, inflammation of bone, neoplasms, anomalies, dental pathology, and specific diseases (such as tuberculosis or treponema) (see Morse, 1969). A differential diagnosis was made for each skeleton in the Alabama River series whenever possible by visual and roentgenographic examination. It is hoped that the diagnosis of pathologies of the skeletal material in this study will perhaps aid in the elucidation of the general subsistence pattern of the Alabama River phase.

CHAPTER III

THE SITES

Those sites which were selected for study are located along two major river systems in Alabama. Sites 1WX1 and 1WX12 are located along the Alabama River and sites 1TU4 and 1TU49 are located on the Black Warrior River (Figure 1, page 6). Principal factors in the selection of these particular sites were the control of excavation, accompanying archaeological records, and systematic storage of the material.

The Black Warrior River Sites

The Moody Slough Site, 1TU4. 1TU4 is presently one of the northernmost Alabama River phase sites. Located ten miles below Tuscaloosa just south of the junction of Moody Slough and the Black Warrior River, the site is indicated by fragments of pottery and other debris covering an area of approximately 320 feet by 565 feet on a cultivated terrace of a fine sandy loam (Sheldon, 1974:140).

The site was originally test excavated in 1932 by the Alabama Museum of Natural History, however, very little is actually known about the extent of these excavations other than two covered urn burials were found containing infants (Sheldon, 1974:140). The skeletal material contained in these urns is no longer available for study because of loss; however, in 1976, the author accompanied Cailup B. Curren to the site in order to excavate two

individuals contained in a single bundle burial which was eroding from the side of the river bank. Mr. Curren was conducting a survey of the known prehistoric sites in Tuscaloosa County, Alabama, at the time of his discovery of the burial. Subsequent examination of the pottery sherds contained in this burial placed it temporally in the Alabama River phase. Fifteen more burials have been excavated since 1977.

The Foster's Ferry Site, 1TU49. Located on the Warrior River eight miles southwest of Tuscaloosa and approximately twelve miles downstream from 1TU4, 1TU49 occupies a low linear levee on the second river terrace between the river banks and the flooded low ground of Moody Swamp which is two miles to the east (Sheldon, 1974:141). The primary concentration of cultural debris covered an area of approximately 225 by 600 feet (Sheldon, 1974:141). The site was originally surveyed in 1933, however, it was not excavated until 1958 and 1959 by David L. DeJarnette for the University of Alabama. DeJarnette excavated several test pits in the major area of surface concentrations which revealed a midden deposit of ten to twelve inches in depth (Sheldon, 1974:142). Three distinct components were identified through the classification of pottery sherds: Late Woodland, Moundville phase, and Alabama River phase, which comprised the largest occupation (Sheldon, 1974:142). DeJarnette's excavations revealed six burials, the remains of which are presently stored at Mound State Monument.

Midden debris from DeJarnette's excavations included river mussel shells, pottery, animal bones, corn cobs and kernels, acorns, hickory nuts, walnuts, daub fragments, and seventeen post molds with no discernable pattern (Sheldon, 1974:144-145).

In 1975 the owner of the site contacted Mound State Monument notifying them of a water line which was to cross the known area of prehistoric occupation. A crew of volunteers under the direction of Jerome Nielsen excavated that portion of the site to be destroyed by the water line. These excavations revealed 5 burials, all considered to be Alabama River phase. Also encountered were eleven post molds, pottery sherds, and daub fragments. This material has also subsequently been stored at Mound State Monument.

The Alabama River Sites

The Liddell Site, 1WX1. 1WX1 is located between the Alabama River and Pine Barren Creek on the immediate western edge of the third river terrace near the left bank of the river (Sheldon, 1974:168). That component attributed to Alabama River phase occupation covers approximately 31 acres (Bozeman, 1963:1). The site was excavated by Tandy Bozeman in 1961 and later by John Cottier in 1964 and 1966 for the University of Alabama. Cottier (1968:137, 140) recognized at least five distinct occupations, the final and most extensive of which was attributed to the Alabama phase. A total of 44 individual interments was uncovered

by Cottier and Bozeman, 30 of which are considered to be Alabama River phase and 10 considered to be Mississippian on the basis of associated artifacts (Sheldon, 1974:170).

Three distinct clusters of burials were recognized. The other burials were scattered throughout the site with no apparent patterning (Cottier, 1968; Sheldon, 1974). There were very few associated grave goods.

Over seventy features were revealed by the excavations. However, even though several post molds were scattered throughout the site, no structural pattern was discernable (Sheldon, 1974:170).

Floral and faunal remains from the site included charred corn cobs, acorns, hickory nuts, walnuts, box turtle, river mussels, fish scales, and large amounts of reptile, fish, bird, and mammal bones (Sheldon, 1974:170).

Because of the extensive amounts of cultural debris, post molds, refuse pits, wide range of floral and faunal remains, and numerous burials, Sheldon (1974:174) feels that the Liddell Site, 1WX1, was probably a permanently occupied settlement during the Alabama River phase.

The Goat Pasture Site, 1WX12. The area in which this site is located is approximately three and a half river miles below Canton Bend and one mile above the Alabama State Highway 28 bridge (Sheldon, 1974:178), and is a one and a half square mile area of low, white sandy ridges on the left bank of the Alabama River (Sheldon, 1974:178).

The site itself is located on one of the flat topped ridges on the northeastern edge of this area, locally called "Sand Island," approximately 300 yards from the bank of the river (Sheldon, 1974:178-179).

In 1965 Sheldon excavated the site for the University of Alabama. The four major trenches and four test pits which were excavated totaled approximately 2075 square feet (Sheldon, 1974:179). The majority of cultural debris was contained within the first eight inches, and subsequent analysis indicated the presence of three distinct occupations of the site (Sheldon, 1974:179). The final and largest occupation has been attributed to the Alabama River phase (Sheldon, 1974:180).

All thirty-one of the cultural features have been assigned to the Protohistoric occupation of the site. These features include twelve post molds scattered throughout the excavated area in no discernable pattern, five clay lined circular refuse pits containing animal bone fragments, river mussels, charcoal, quartz chips and pottery sherds, six additional refuse pits (without the clay lining), five associated features which appear to represent the remains of a small structure, and four burials (Sheldon, 1974:180-181).

Three of the burials were in pottery urns and one was extended. "The burials lay at a considerable distance from each other and there was no evidence of the special burial

areas found at several of the other Protohistoric sites" (Sheldon, 1974:181).

In his summary of this site, Sheldon (1974:182) says that 1WX12 could possibly have been a small hamlet or village during the Protohistoric period. He further states that, "The loose moderately fertile soils of 'Sand Island' would have provided more than adequate agricultural land for a settlement of this size. The substantial midden deposit and the remains of one, possibly two structures and/or four burials, further suggest that habitation of the site was on a permanent or near so basis. The presence of glass trade beads indicates that the inhabitants were in some form of contact with either the French at Mobile or the English traders in extreme eastern Alabama" (Sheldon, 1974:182-183).

CHAPTER IV

THE BURIALS

The Goat Pasture Site, 1WX12

There are two major occupation levels at this site, the largest of which is represented by a typical Alabama River phase assemblage as defined by Sheldon (1974).

Four burials were excavated at this site, one extended and three in pottery urns. According to the field notes (see Cottier, 1968), these burials were not in any apparently designated burial area, but rather randomly distributed over the site. Of these four burials only one, Burial #2, was available for study because of misplacement. The results of the analysis of this burial are in the Burials Appendix section.

According to the notes taken on the burials, Burials 1, 2 and 3 were all infants placed singly in urns while still in the fleshed state, as indicated by the fact that the skeletons were all in anatomical order.

Burial 4 was a child approximately seven to eleven years of age which was placed in a small pit so that the knees were drawn up and resting against the sides of the pit. "In direct association with the upper chest, mandible, and skull was a small circular pendant flanked by two shell pins. Nineteen European blue and white glass trade

beads and one aboriginal shell bead were found close to the pendant and pins and were probably on the same string" (Sheldon, 1974:182). Sheldon (1974:183) goes on to say that the presence of these trade beads is indicative of some form of contact either with the French at Mobile or the English in extreme eastern Alabama. (See Table 1.)

Table 1. Burial data from site 1WX12.

Burial #	Burial Type	Age	Sex	Pathology
1	primary, urn	infant	?	-
2	primary, urn	infant	?	-
3	primary, urn	infant	?	-
4	primary, semi-flexed	7-11 years	?	-

The burial which was analyzed was extremely fragmented and the bones themselves did not evidence any pathology. Obviously these four children are not representative of the total population of the site. The site was probably a temporary village, i.e., one which was occupied on a seasonal basis, and as such would not necessarily include burials of adults. The fact that four children were buried while the site was temporarily occupied might possibly be indicative of high infant mortality and lower life expectancy for the population. If this site was only

seasonally occupied, one might expect to find the adult burials at the permanent village site. All of the site was test excavated.

The Liddell Site, 1WX1 (Table 2)

Excavations were conducted at the Liddell Site in 1961 by Tandy Bozeman and in 1964 and 1966 by John Cottier, under the direction of David L. DeJarnette for the University of Alabama. These excavations revealed a total of 44 interments, 30 (containing 33 individuals) of which are considered to be Alabama River phase and 10 attributed to a Mississippian occupation (Sheldon, 1974: 170). The excavations conducted by Cottier were part of a salvage project for Miller's Ferry Lock and Dam.

A minimum of 33 individuals were interred in 30 burials in the Alabama River phase component at this site. Two other burials, #17 and #26, were recorded for this component, but no data concerning these two was available other than that they were urn burials. The nine adults can be subdivided into several categories: one male of indeterminable age, two females of indeterminable age, two young females 15-18 years of age, two older females 40-60 years of age, and two adults of indeterminable age and sex. There are seventeen infants in the 0-3 year category and there are seven children in the 4-10 year category. One could then say that 24 individuals, or 73%, died by the age of 10 years and 26 individuals, or 79%, of the population analyzed

Table 2. Burial data from site 1WX1.

Burial #	Burial Type	Age	Sex	Pathology
1	Al. Riv. Ph., urn, single, secondary	adult	female	-
2	Al. Riv. Ph., urn, multiple, primary	infants	-	osteoporosis & porotic hyperostosis
3	Al. Riv. Ph., urn, single, primary	2.0-2.5 yrs.	-	systemic infection
4	Al. Riv. Ph., urn multiple, primary	infants	-	porotic hyperostosis
5	Al. Riv. Ph., urn, sec. & primary, multiple	adults, infant	female? male?	hydrocephaly? & systemic infection
6	Al. Riv. Ph., flexed, single, primary	3-4 yrs.	-	systemic infection
7	Al. Riv. Ph., urn, primary, multiple	45+5 yrs.	female	degenerative arthritis & osteomyelitis
8	Al. Riv. Ph., urn, primary, multiple	2.5-3.5 yrs.	-	hydrocephaly ?
9	Al. Riv. Ph., urn, single, primary	4.5-5.5 yrs.	-	trauma

Table 2 (continued)

Burial #	Burial type	Age	Sex	Pathology
10	Al. Riv. Ph., urn, multiple, secondary	3 yrs.	-	-
11	Al. Riv. Ph., urn, multiple, secondary	8 yrs. ?	-	-
12	Al. Riv Ph., flexed primary, single	47-64 yrs.	female	degenerative arthritis, localized infection, osteochondrytic cysts
13	Al. Riv. Ph., urn, primary, single	child	-	-
14	Al. Riv. Ph., urn, primary, single	newborn	-	-
15	Al. Riv. Ph.?, primary	8-9 yrs.	-	-
16	Al. Riv. Ph., primary, semi-flexed, single	8-10 yrs.	-	-
17	Al. Riv. Ph., urn	-	-	-
18	* Miss., bundle	65-81 yrs.,	female	degenerative arthritis
19	multiple, secondary	adult, fetal	male	-
20			-	

Table 2 (continued)

Burial #	Burial Type	Age	Sex	Pathology
21	Al. Riv. Ph., urn, primary, single	newborn	-	-
22	Al. Riv. Ph., flexed, primary, multiple	16-18 yrs.	female	systemic infection
23	Al. Riv. Ph., flexed, primary, multiple	fetal	-	-
24	Al. Riv. Ph., urn, single, primary	infant	-	-
25	Al. Riv. Ph., urn, primary, single	infant	-	-
26	Al. Riv. Ph., urn	-	-	-
27	Al. Riv. Ph., urn, single, primary	6-9 mos.	-	nonlipid histiocytosis or eosinophilic granuloma
28	Al. Riv. Ph., urn, single, primary	infant	-	-
29	Al. Riv. Ph., urn, single, primary	infant	-	-
30	* Miss., extended, primary, multiple	2 yrs.	-	-

Table 2 (continued)

Burial #	Burial Type	Age	Sex	Pathology
31	* Miss., extended, primary, multiple	14-19 yrs.	female	circulatory defect
32	* Miss., extended, primary, multiple	1.5-2.5 yrs.	-	-
33	* Miss., extended, primary, multiple	8-9 yrs.	-	systemic infection
34	* Miss., extended, single, primary	6-8 yrs.	-	osteomyelitis
35	* Miss., semi-flexed, single, primary	4.5-5.5 yrs.	-	-
36	Al. Riv. Ph., flexed, multiple, primary	fetal newborn	-	-
37	Al. Riv. Ph., secondary	31+ yrs.	-	degenerative arthritis
38	Al. Riv. Ph., extended, primary, single	15-16 yrs.	female	spina bifida occulta
40	* Miss., flexed, single, primary	31+ yrs.	male	degenerative arthritis & systemic infection
42	Al. Riv. Ph., -	adult	-	-

died before the age of 20. Pathological data were obtained from 30 of the individuals. Systemic infections, periodontal disease, hydrocephaly, and porotic hyperostosis are the prevalent pathologies for the younger individuals and degenerative arthritis appears to be the most prevalent pathology for the older individuals.

Ten individuals were interred in the ten burials (denoted by astericks in Table 2) representative of the Mississippian occupation on this site. There were two adult males (one aged 31+ years and one of indeterminable age), two females (one aged 14-19 years and one aged 65-81 years), three children in the 4-10 year category and three infants in the 0-3 year category. If these are representative of the total population, 60% died before the age of 10 years and 70% died before the age of 20 years. Systemic infections were the most prevalent pathology for the younger individuals representing the Mississippian occupation and degenerative arthritis was the most prevalent pathology for the older individuals.

There was no evidence of porotic hyperostosis in the individuals representing the mature Mississippian occupation, however, two of the infants, 6.7% of the population analyzed from the Alabama River phase, evidence porotic hyperostosis. According to El-Najjar (1976) and El-Najjar, et al. (1976), porotic hyperostosis is more likely to be evidenced during the earlier years of growth and development.

The Moody Slough Site, 1TU4 (Table 3)

Very little information is available concerning this site. Located on the Black Warrior River approximately ten miles below Tuscaloosa, it is presently the northernmost site of known Alabama River phase occupation. In 1932 the site was test excavated by the Alabama Museum of Natural History. According to the records kept of this excavation, two infant burials in covered urns were encountered, however, the osteological material is no longer available for direct examination because of loss of the material.

In his recent survey (1976) of sites in Tuscaloosa County, Cailup B. Curren visited the Moody Slough Site and noted what appeared to be a burial eroding from the river bank. He, Betsy Cain, and I returned to the site and excavated this burial. The notes on this undertaking, as well as the artifactual material, have been stored at Mound State Monument. These burials have been given the letter designations of "a" and "b."

In subsequent seasonal field excavations from 1977 to 1978 Curren has excavated 15 additional burials, designated with letters "c" through "p" (there were four individuals in burial "m, n, o").

The burials from the 1932 excavations have been given the letter designations of "q" and "r."

Seventeen of the nineteen individuals were analyzed. Of these seventeen, ten, or 58.8%, evidenced porotic

Table 3. Burial data from site 1TU4.

Burial #	Burial type	Age	Sex	Pathology
a	secondary, bundle	17-19 yrs.	Female	porotic hyperostosis
b	secondary, bundle	15.5-16.5 yrs.	Female	porotic hyperostosis
c	primary, semi-flexed	older adult	Female	-
d,e,f	secondary, multiple, urns	adults, child	F,M,?	porotic hyperostosis
g	primary, urn	9 mos.	?	-
h,i	primary	.5-1.5, 10±2 yrs.	?	porotic hyperostosis
j	primary, semi-flexed	50+ yrs.	Male	degenerative pathologies
k	cremation	infant	?	-
l	primary, semi-flexed	32±2 yrs.	Male	porotic hyperostosis
m,n,o	secondary, bundle, multiple	adults, adol., child	M,F	porotic hyperostosis
p	secondary, single, bundle	50+ yrs.	Female	porotic hyperostosis
q	primary, urn	infant	?	-
r	primary, urn	infant	?	-

hyperostosis. Individuals "a" and "b" were young adult females and evidenced extreme cases of this pathology (El-Najjar, 1978). According to El-Najjar, et al (1976), evidence of porotic hyperostosis can often be obliterated if the diet is stabilized in the later stages of growth and development. That all of the adults except one (individual "j") evidenced this pathology even into senile adulthood would then be evidence of years of chronic suffering from nutritional stress. Because there is no evidence of other pathologies (such as trauma or infection) which might result in nutritional stress, one could view the subsistence pattern with suspicion as the causative factor. Individuals "l" and "p" evidence a combination of pathologies including those consequential with old age degeneration which complicates their diagnoses.

There were seven individuals in the 0-10 year category, two adolescents, three young adult females, three older adult females, and four older adult males. Twelve individuals, or 63.16% of the population, died before the age of 20 years. However, it appears that if one could survive to the age of 20, then survivorship into middle age was probable.

To date, this site is the most recent in time of all the Alabama River phase sites, and is definitely a European contact site (Curren, 1978).

The Foster's Ferry - Baker Site, 1TU49 (Table 4)

This site is located eight miles southwest of Tuscaloosa and approximately twelve miles downstream from the Moody Slough Site, 1TU4. The original survey of the site was made in 1933 but the first excavation was not made until 1958 by David L. DeJarnette for the University of Alabama. Three distinct occupation levels could be determined from these excavations: Late Woodland, Moundville phase, and Alabama River phase. The following burial information is taken from Sheldon (1974:145-146). This will be followed by the author's burial data. The original notes were not available for study.

Eleven individuals were uncovered at the site by DeJarnette in six distinct interment lots, all of which originated within the second six inch level, although no discernable pit outlines were detected (Sheldon, 1974:145). Burials 1, 2 and 3, and Feature 1 seemed to form a distinct cluster, however, this does not necessarily indicate that they were all interred simultaneously, but perhaps that this particular area was favored for interment (Sheldon, 1974:145).

"Burial 1

This was a covered urn burial containing partial remains of four individuals. The urn itself was a large Alabama River Plain globular jar with strap handles covered by an inverted Foster Filmed Incised wide rimmed bowl with guilloche design. Contained with the urn were four complete sets of limb bones and three adult skulls.

Table 4. Burial data from site 1TU49, 1958-1959 excavations.

Burial #	Burial type	Age	Sex	Pathology
1	secondary, multiple, urn	adult,ado- lescent, child, infant	male & female	porotic hyperostosis
2	secondary, single, urn	adult	-	-
3	secondary, single urn	adult	-	-
4	primary, semi-flexed	-	-	-
5	primary, extended	adult	-	-
6	secondary, multiple, urn	senile adult, male & adult, child female		-

Burial 2

Burial 2 was an uncovered Alabama River Plain globular jar containing the limb bones and skull of a single adult individual. A sandstone discoidal and a small shell-tempered wide rimmed bowl were also found in the urn. This bowl is unusual in that it was covered completely with a cream slip, which on the interior base was then covered by a red pigment with stripes and "U" shaped elements of the same color extending up to the interior lip.

Burial 3

Located less than eight inches from Burial 1 and less than twelve inches from Burial 2 was Burial 3, another urn burial. It was composed of an Alabama River Plain globular jar covered by a shattered Foster Filmed Incised wide rimmed bowl. Found in the urn were limb bones of a single individual but no skull.

Burial 4

Burial 4 was a partially flexed burial. No other information was available.

Burial 5

No information is available on this interment, other than it was an extended adult.

Burial 6

This was another urn burial consisting of an Alabama River Plain globular jar surmounted by a Foster Filmed Incised wide rimmed bowl. In the urn were the partial sets of limb bones and skulls of three individuals. After the individual bones were placed in the urn, it was filled to the rim with charred corn cobs and fragments of wood charcoal."

(Sheldon, 1974:145-146)

All of these burials are considered to be assignable to the Alabama River phase.

During September, 1975, a portion of the site of 1TU49 was excavated by the University of Alabama under the direction of Jerry Nielsen. This was done in order to salvage that part of the site which was to be destroyed by a pipeline. This author was present during the first part of the excavation with the remainder of the burial excavations being done by Dr. Kenneth R. Turner. (See Table 5 for burial data from site 1TU49, 1975 excavations.)

Although it is difficult to determine how many individuals were present because of the accidental mixing of the skeletal material from the 1958-1959 excavations at the Fosters' Ferry Site, a total estimate of a possible minimum of 28 individuals appears to be represented by the skeletal material excavated in 1958, 1959, and 1975.

Because of the accidental mixing of the skeletal material from the earlier excavations, it is difficult to give actual percentages for the burials excavated during 1958 and 1959. However, all age categories seem to be represented, as well as both males and females. One child from this group had porotic hyperostosis. When one adds the data obtained from the analyses of the burials excavated in 1975, it appears that this population had more individuals who lived past the age of 32 years than did other populations.

Table 5. Burial data from site 1TU49, 1975 excavations.

Burial #	Burial type	Age	Sex	Pathology
1	primary, flexed	8-10 years	?	-
2	primary, semi-flexed	32-35 years	male?	-
3	primary, extended	45+ years	male	-
4	secondary, bundle	32-35 years	female	-

The Comparative Mississippian Sites

Recent excavations for the Tennessee-Tombigbee Waterway have recovered 56 burials from two sites, 1PI33 and 1GR2, which are considered to date from the middle to late Mississippian time period (Jenkins, 1978). Specific descriptive data concerning these excavations will appear in a series of volumes to be published in the near future. However, the following data were obtained by this author after completing extensive analyses of the skeletal material.

Site 1PI33 was a multi-component site, the excavation of which resulted in 23 burials assigned to the middle Mississippian period, 8 burials assigned to the late Woodland period, and 4 burials of indeterminate time period. Of the 23 middle Mississippian individuals, two showed slight evidence of possible porotic hyperostosis. However, these two individuals, aged 4-5 years and 1.5-2.5 years, also had other pathologies which should be considered in the diagnoses. Individual #14, aged 4-5 years, evidences rickets as well as cribra orbitalia; and individual #31, aged 1.5-2.5 years, evidences a generalized infection in the oral cavity and cribra parietalis, all of which are indicative of nutritional stress. These two individuals represent 8.7% of the Mississippian population at this site.

Site 1GR2 was also a multi-component site with one individual assigned to the middle Woodland time period and 33 individuals assigned to the late Mississippian time period. Of these 33, three individuals, or 9.09% of the population, evidence porotic hyperostosis. The ages of these individuals are as follows: adult male aged 30+ years, young adult aged 18-25 years of indeterminate sex, and child aged 3.5-4.5 years. None of the other members of the population evidenced nutritional stress.

CHAPTER V

DISCUSSION

The data obtained from the analyses of the skeletal material from these four Alabama River phase sites and the Mississippian sites contribute a great deal to the elucidation of culture process during that particular time period.

Other than the change in social organization, one of the more obvious changes in cultural behavior is that of mortuary treatment or preparation. A mortuary innovation for the Alabama River phase is that of inhumation in large pottery urns. Vessels of this size are not seen in the preceding Mississippian phase, although accompanying vessels are quite common with Mississippian burials. These accompanying vessels often contained food, and perhaps this, then, is the link or relationship to the urns seen later with Alabama River phase burials. The urns themselves often evidence seered or smudged exterior surfaces, the result of being placed over a fire (Sheldon, 1974). If the urns were used as large cooking pots, then one could possibly postulate that the people of the Alabama River phase were recombining some of the mortuary practices of the Mississippian phase. The presence of the fully extended and flexed primary burials and secondary bundle

burials frequently seen also on Alabama River phase sites appear to have been a retention of those forms of mortuary treatment from the previous Mississippian period.

As early as 1938 Brannon had noted a preference for depositing infants and children in urns. This is substantiated by the burial data from site 1WX1. In these instances, the dead were primary inhumations.

It was not an uncommon practice during historic times for the dead to be gathered together after a certain period of time and buried in one mass ossuary (see Ubelaker, 1974). Scaffolding or dessication pits were often used as the initial mortuary procedures in preparation for final secondary interment. Moore's and Brannon's observations of the mass interments of these urns filled to the brim with bones and charred remains would certainly indicate that this was also the case during the Alabama River phase (Moore, 1899; Brannon, 1938). The mass interments at site 1TU49 also lend credence to this hypothesis.

The analysis of the skeletal material for this study produced no evidence of any social rank or status indicated by preferential mortuary treatment.

Although the urns are often decorated with incised or punctated designs, very few accompanying artifacts were deposited with urn burials. This is possibly reflective of the paucity of such artifacts as a result of the decline

of the elaborate Southeastern Ceremonial Complex of the Mississippian period.

It is postulated that there was a subsistence change from the riverine hoe agriculture heavily supplemented by hunting and gathering during the Mississippian period, to a heavy dependence of riverine hoe agriculture, particularly maize production, during the Alabama River phase.

Sheldon (1974:74) feels that the basic subsistence pattern for the Alabama River phase was one of riverine agriculture and settlement heavily supplemented by hunting and gathering, which would imply a continuance of the Mississippian subsistence pattern through the Alabama River phase to the Historic period. The analysis of the osteological remains from several Alabama River phase sites indicates, however, that there may have been a change in the subsistence pattern concurrent with the metamorphosis of the Moundville phase to the Alabama River phase. This suggestion of a slight change in the subsistence pattern is made on the basis of the presence of certain pathologies of the bone which are considered to be indicative of nutritional stress. These pathologies are collectively known as porotic hyperostosis.

Porotic hyperostosis is a descriptive term for abnormal bone changes in the skull which appear as spongy or sievelike porosity (Angel, 1967; El-Najjar and Robertson, 1976; El-Najjar, 1976; El-Najjar, et al., 1976). Because

bone is limited in its ability to respond to external and internal stimuli (unlike soft tissues which show change in color, etc.), "porotic hyperostosis" has been used to describe the physiological changes resultant from congenital hemolytic anemia such as thalassemia or sickle-cell anemia (Angel, 1966, 1967), rickets (Williams, 1929), calcium deficiency (Todd, cited by Williams, 1929) and iron deficiency anemia (El-Najjar, 1976; El-Najjar and Robertson, 1976; El-Najjar, et al., 1976; Steinbock, 1976). Porotic hyperostosis is characterized by the thinning and often complete destruction of the outer table of the cranial vault, caused by pressure atrophy produced by hypertrophy of the hematopoietic diploe between the inner and outer tables (Steinbock, 1976:214). Steinbock goes on to say that the sieve-like or coral appearance of the affected area is due to the complete destruction of the outer table and exposure of the hypertrophied cancellous bone or diploe, and that the skull vault in the affected area is thicker than normal due to the hypertrophied bone which protrudes to a slight or moderate degree over the normal external contour of the skull (Steinbock, 1976:214-215).

The most probable cause of porotic hyperostosis in these Alabama River sites is iron deficiency anemia, because the congenital hemolytic anemias were not present in prehistoric New World populations. This particular

anemia is caused by inadequate dietary iron content, inability to absorb iron from the intestine, excessive losses of iron from the body, disturbances of iron metabolism by infection or other mechanisms, or dietary factors such as chronic deficiencies of amino acids and minerals necessary for bone formation (Steinbock, 1976:231). Of these, inadequate iron content, inability to absorb iron from the intestine, and disturbances of iron metabolism by infection or other mechanisms are the most probable causes for porotic hyperostosis seen in these Alabama River phase inhabitants.

Recently, in a series of articles (El-Najjar, 1976; El-Najjar and Robertson, 1976; El-Najjar, et al., 1976) it has been substantially demonstrated that porotic hyperostosis resultant from iron deficiency anemia in prehistoric populations was probably directly related to an almost total dependence on maize agriculture and the processing techniques of maize. These studies were conducted on skeletal samples from seven distinct geographic localities which fell into two major subsistence patterns: maize-dependent and non-maize dependent. Porotic hyperostosis was found to be significantly higher among children and adults in the maize-dependent groups (see El-Najjar, 1976).

Nutritional stress is usually the result of multiple stimuli. The presence of numerous systemic infections, most commonly attributed to microorganism infection,

probably further complicated the nutritional stress evidenced by the people at these Alabama River phase sites. Microorganism infection is one of the most common consequences of a more sedentary subsistence and settlement pattern. The accumulation of wastes and garbage coupled with common use of cooking vessels, particularly unglazed pottery, resulted in high microorganism infection rates of prehistoric groups (Brothwell, 1967:63).

Although periodontal disease and plaque formation are more prevalent in Mongoloid populations (Patton, 1977), they are also indicative of excess carbohydrate intakes and soft foods, such as bread or mush. Again, these pathologies, coupled with extreme dental attrition which can be attributed to food processing techniques such as the grinding of corn with a stone mano (see Burial #6, site 1WX1), could be related to a dependence on maize agriculture.

The presence of large amounts of charred corn cobs (particularly sites 1TU4 and 1TU49) further evidences carbohydrate intake.

This does not say, however, that animal foods were not ingested as well. But in the absence of sufficient quantities of these foods, along with microorganisms which would inhibit proper assimilation, porotic hyperostosis becomes prevalent.

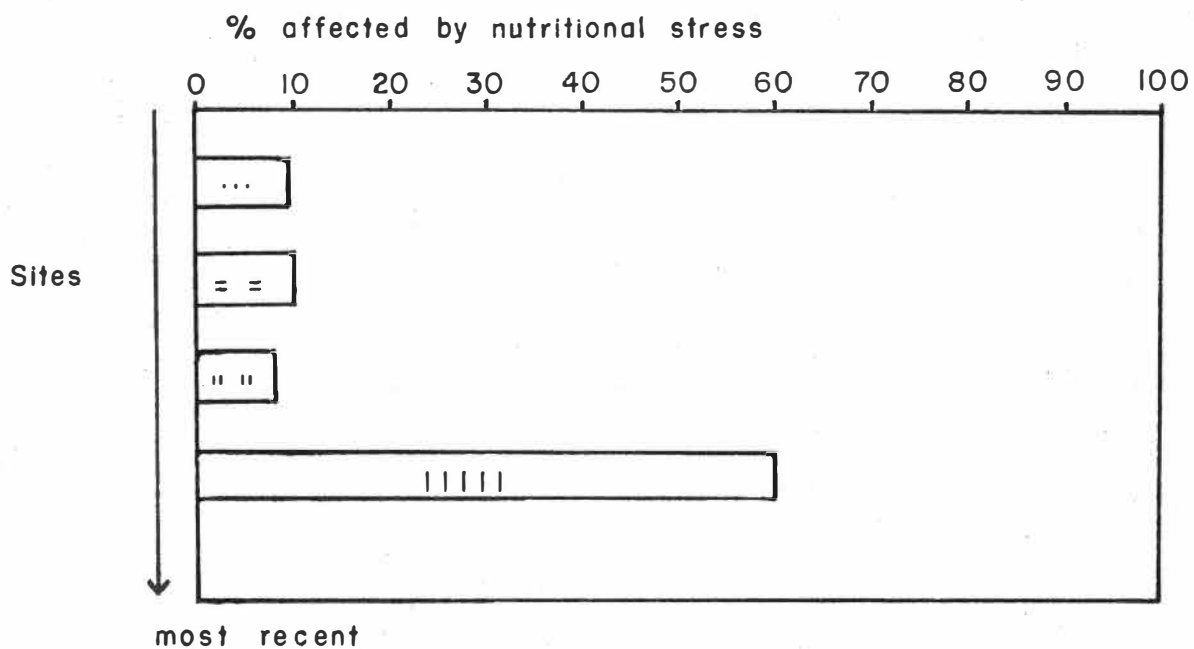
Priestly (1928:215) quotes the Sauz reports as saying that the Indians' agricultural lands "are so scant that as

soon as an ear of corn is gathered they immediately plant again at the foot of the selfsame stalk. Even with all this they have for their principal food bitter acorns, shoots of canes, and roots, wherewith they pass and sustain their lives." If this account is accurate, it is certainly indicative of nutritional stress.

Obviously, the burials excavated at these sites are not representative of the total village populations. What, for instance, could possibly explain the almost total absence of males from site 1WX1 during the Alabama River phase occupation? One explanation could be that males were differentially interred on another part of the site which was missed by the excavations' test units. Another explanation could be that the male population was devastated by one of the three Spanish expeditions (i.e., DeSoto, Luna, or Pardo) during the sixteenth century. If the latter was indeed the case, then one could postulate a direct relationship between the lack of males (those trained in hunting techniques) and the evidence of porotic hyperostosis related to maize-dependent horticulture (usually a female activity). These Spanish expeditions could also be blamed for the nutritional stress of the general aboriginal populace simply by the fact that they either traded for or took the food surplus from the Indian groups which they encountered. This is purely speculative at this point.

Figure 2 is a bar graph representing the percentages of the populations affected by nutritional stress. Sites 1WX12, 1WX1, and 1TU49 have been combined because a time sequence has not yet been established. Site 1TU4 is the most recent. A chi square test was used to test the significance of these frequencies of occurrence. It was found that only site 1TU4 is significantly different from the other sites. This frequency is significant at the .001 level for three degrees of freedom.

The presence of the rare congenital anomalies and pathologies such as bifurcated roots of central and lateral incisors and canines and hydrocephaly (see Figure 3) is evidence of small, isolated populations. Alexandersen (1963) says that the bifurcated roots are a rare trait seen only in homogeneous populations. Only one individual was recorded with this anomaly from the entire Pecos Pueblo population (Nelson, 1938).



... | PI33
 == | GR2
 " " | WX12, | WX1, | TU49
 combined
 ||| | TU4

Figure 2

Percentages of the populations affected by porotic hyperostosis.

Figure 3

Unidentified burial from site 1WX1 showing hydrocephaly.

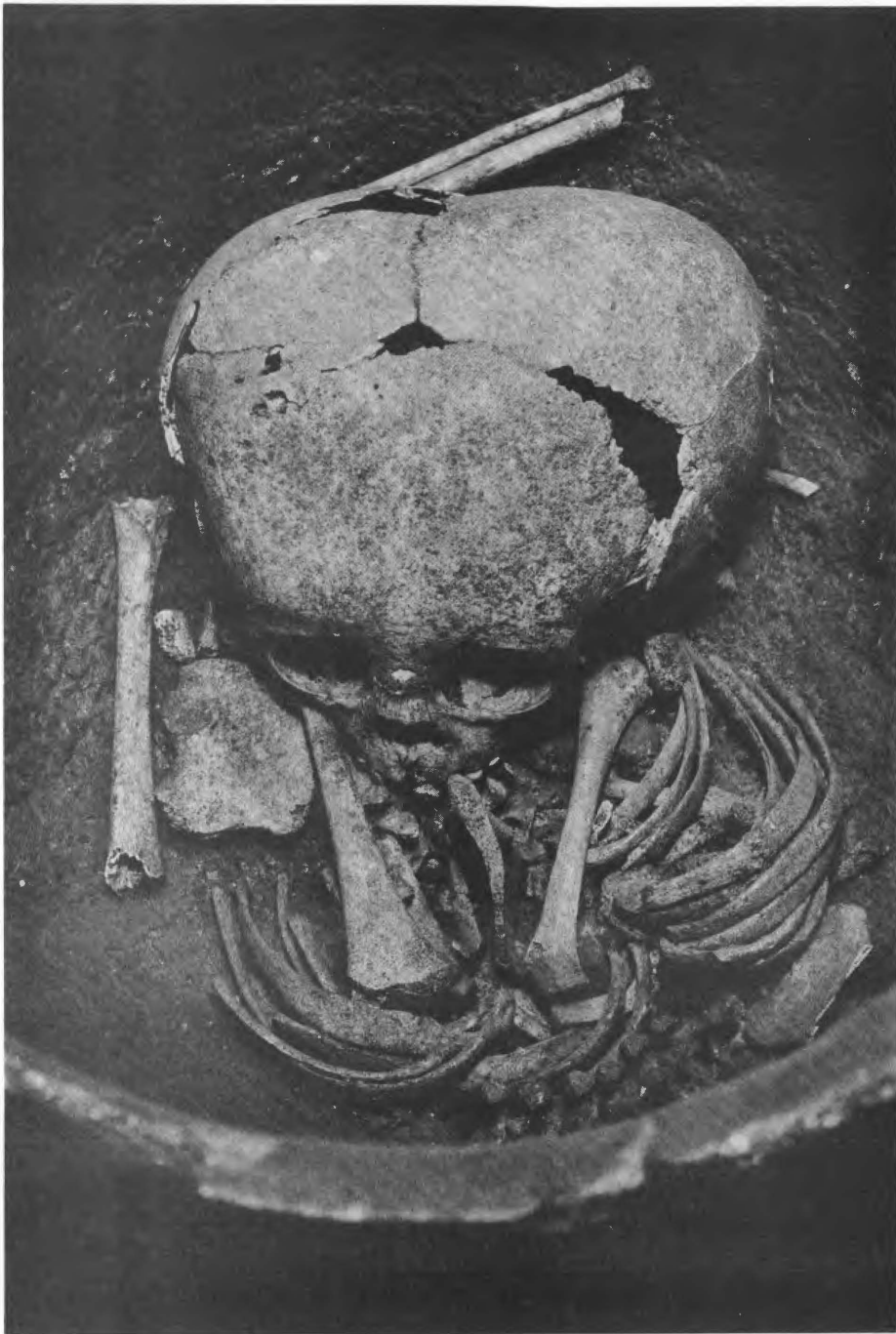


Figure #3

CHAPTER VI

SUMMARY AND CONCLUSIONS

In order to attempt to more completely understand the reasons for the decline of the Mississippian subsistence and settlement patterns, and the resultant consequences thereof, it is necessary to examine every possible source of information. The mortuary remains of the prehistoric groups representative of that time period would be one such source of information. Through the analysis of those biological remodelings which occur in response to environmental influences, the physical anthropologist is often able to determine the adaptive success of a population.

Very little attention has been paid to the proto-historic time period in Alabama, until recently. Sheldon (1974) has made a major attempt to examine the cultural artifacts and to make statements concerning the overall subsistence and settlement patterns of this time period. A continuation of the subsistence pattern established during the Mississippian period was postulated.

However, the analyses of the osteological remains from the four Alabama River phase sites and the two Mississippian sites plus the Mississippian component at site 1WX1 do not completely support this hypothesis.

It is suggested by the author that the basic Mississippian subsistence pattern of riverine hoe agriculture supplemented by hunting and gathering may have continued, but with increasing dependence on a particular food source, i.e., maize, through time. This suggestion is made on the basis of an increase in pathologies of the bone which are indicative of nutritional stress.

The Protohistoric period (Alabama River phase) was apparently one of great social structural turmoil and re-adaptation. The indigenous groups apparently divided into small bands or villages, with little communication (genetic communication) among these groups. Their subsistence re-adaptation is evidenced by extreme nutritional stress in some areas which can probably be equally attributed to the general lack of or inability to obtain available foodstuffs, as well as the effects of the first European contacts. The almost complete abandonment of the ideologies of the preceding Moundville phase is evidenced by the drastic change in mortuary patterning.

The information in this thesis is site specific. It cannot be emphasized too strongly that more archaeological field work is necessary before this time period can be completely understood.

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APPENDIX

APPENDIX

ANALYSIS OF BURIALS

1WX12 Burial #2:

Age: newborn
Sex: indeterminable

The skeleton is that of a newborn infant which is extremely fragmented, but is in a good state of preservation. Those bones which are present are the ribs, vertebrae, long bones, cranial fragments, hands, and feet. There were no obvious pathologies on the bones. No teeth are present, therefore, the age is an estimation based on size and development of primary centers of ossification.

1WX1, The Liddell Site:

Burial #1:

Age: adult, middle aged
Sex: female

This secondary interment was contained in a pottery urn excavated by Tandy Bozeman. Those bones which are present are cranial fragments, rib fragments, indeterminate bone fragments, three human teeth, and two animal teeth. The human teeth exhibit extreme dental attrition.

Burial #2:

This covered urn excavated by Tandy Bozeman contained two primary infant burials. It was associated with Burial #4.

Burial #2a:

Age: newborn
Sex: indeterminable

The cranial bones exhibit a generalized osteoporosis. Those long bone measurements which could be taken are:

max. length left tibia.....67mm
max. length left humerus....65.5 mm
max. length right humerus...65mm
max.length left ulna.....62mm
max.length right ulna.....62mm
max. length ? fibula.....63.5mm

Burial #2b:

Age: 0.0-0.5 years
Sex: indeterminable

This skeleton exhibits pronounced swelling of the tibiae, extreme osteoporosis, porotic lesions on the cranium of a lytic/blastoc nature, and a small, rounded, porous, lytic lesion approximately one inch in diameter on the occipital in the area of opisthocranium. There is a generalized osteoporosis of the entire skeleton with periosteal swelling of the long bones, particularly the tibiae, probably indicative of malnutrition as described by Angel (1967: 378-389), which he calls porotic hyperostosis. The following long bone measurements were taken:

max. length right femur.....93mm
max. length right humerus...77mm
max. length left humerus....76mm
max. length left radius.....64mm

Burial #3:

Age: 2.0-2.5 years (Schour and Massler, 1941)
Sex: indeterminable

Excavated by Tandy Bozeman, this urn contained the complete remains of one infant; however, there are two left ischia, indicating two individuals. Those bones which are present are cranial fragments, long bones, vertebrae, innominates, and two teeth (maxillary central and lateral incisors). The vertebral segments are separate, innominate components are separate, and the occipital components are separate. There is slight fusiform swelling evidenced on the fibulae, ulnae, and radius, indicating a possible generalized systemic infection. The maximum length of the left radius is 85 mm.

Burial #4:

This covered urn excavated by Tandy Bozeman contained the remains of two children.

Burial #4a:

Age: 2.5-3.5 years (Schour and Massler, 1941)

Sex: indeterminable

This skeleton exhibits an unusual bifurcated root formation of the deciduous maxillary central incisors and mandibular canines (see Figure 4). There is a noticeable amount of attrition on the left mandibular central incisor with corresponding attrition on the left maxillary central incisor. Circular lytic/blastoid lesions are exhibited on a few of the cranial fragments; the cells in the diploe are arranged in a radiating, "sunburst" pattern and there are numerous tiny blastoid spicules on the endocranial surface of the lesion. There is only slight ectocranial evidence of this. There is also a radiating lytic/blastoid lesion on the medial surface, in the center of both ilia, however, this is not quite as distinct on the ilia as it is on the cranium nor is it in a complete circular pattern. The possible diagnosis is porotic hyperostosis. Those long bone measurements which could be taken are:

max. length left femur.....165mm
max. length right tibia....137mm
max. length left ulna.....110mm
max. length ? fibula.....135mm

Burial #4b:

Age: 1.5-2.5 years

Sex: indeterminable

Those bones which are present are left and right scapulae, right femur, left and right ilia, right ischium, and left pubis. There were no pathologies observable. The maximum length of the right femur is 132 mm.

Burial #5:

This urn, excavated by John Cottier, contained at least two adults and one infant.

Burial #5a:

Age: 2 years (Schour and Massler, 1941)

Sex: indeterminable

Figure 4

Burial #4a, site 1WX1, showing bifurcated root formation of deciduous central incisors and canines.



Figure #4

The skeleton is complete and was probably a primary interment. Although incomplete, the cranium has the globular appearance of a hydrocephalic, however, this infant has assymetrical synostosis of the left half of the coronal suture which might explain the globular appearance of the skull. There appears to have been some type of blood-borne infection as exhibited by extreme osteoporosis at the elbows and knees. Both fibulae exhibit lytic lesions which have completely destroyed the proximal ends. Also, the vertebral column exhibits osteoporosis. This generalized pathology could possibly have been the result of microorganism infection.

Burial #5 b and c:

Age: adult
Sex: female?

Age: adult
Sex: male?

Those bones which are present are all bones of the hands and feet, three patellae (two gracile, left and right; one robust, left), one first cervical vertebra, portion of a hyoid, two maxillary central incisors, one mandibular central incisor, and two maxillary molars.

One individual is a great deal smaller than the other with more gracile features, possibly indicative of a male and female.

The mandibular central incisor, two maxillary molars, and one of the maxillary central incisors exhibit extensive attrition (considered as one individual). One of the molars has a carious lesion on the occlusal surface and three carious lesions along the cemento-enamel juncture: a large one on the buccal surface, a small one on the mesial surface, and a medium one on the distal surface following along the juncture to the buccal surface. The other maxillary molar has several pinpoint carious lesions on the occlusal surface and one large carious lesion on the buccal surface of the root which has eroded into the pulp cavity and extends around to the mesial surface of the root where there is another small carious lesion along the cemento-enamel juncture. There is an opening at the root tip possibly indicative of an abscess. There is an enamel pearl on the distal surface of the root.

The other maxillary central incisor exhibits shoveling.

According to the original field notes, one of the feet was in anatomical order indicating a partially fleshed state at the time of interment.

Burial #6:

Age: 3-4 years (Schour and Massler, 1941)

Sex: indeterminable

This was a primary interment of a child approximately 3-4 years of age, which was placed in a small, deep pit in a tightly flexed, seated position with the arms folded in the chest region. There is a fusiform swelling of the left humerus, however, because of the fragmentary condition of the bones, very little else could be ascertained.

There was a stone mano in association with the burial.

Burial #7:

Age: 45 $\pm$ 5 years (Krogman, 1973)

Sex: female (Bass, 1971; Krogman, 1973)

Burials #7 and #8 were together in a rather elaborate interment which apparently involved placing Burial #7 in a seated position with the legs crossed and the hands placed in the lap, then placing Burial #8 in the lap of #7, which was then slumped over and covered with an inverted urn, and finally the entire interment was filled with earth and capped with moist clay. Both burials were primary interments. European glass trade beads were found in the chest region of Burial #7.

The skull of Burial #7 has smooth, blunt orbital borders, heavy malars, large teeth, large mastoids, squared mandible, and slight supra-orbital torus. However, the post-cranial defining characteristics are a wide sciatic notch, parturition pits, triangular-shaped obturator foramen, and well-defined muscle attachments. All epiphyses, including the medial epiphyses of the clavicles, are completely united. The manubrium and body of the sternum are separate. The basilar suture is closed, and the coronal suture is closed in parts 1 and 2 endocranially and ectocranially. The sagittal suture is closed except at lambda, and the lambdoid suture is open. The third molars have not erupted, however, they appear to be congenitally absent.

The skull exhibits obvious fronto-occipital deformation.

Cranially there is pathological evidence of periodontal disease, antemortem loss of left and right mandibular first premolars and right mandibular second premolar and maxillary first premolar, with subsequent alveolar resorption, heavy dental attrition, and post-mortem loss of maxillary left central incisor and right lateral incisor and left canine. This individual also had a deviated nasal septum.

Postcranially there is pathological evidence of generalized osteophytic deposits characteristic of degenerative arthritis associated with old age, ossified costal cartilage on the ribs, light bone density, and a small drainage sinus surrounded by blastic reactive bone is present on the distal metaphyseal area of the left fibula located just slightly superior to the articular surface. There are also six sacral vertebrae, and a septal aperture on the right humerus.

Because of cranial deformation and poor reconstruction, cranial measurements were not made. However, the following mandibular measurements were taken:

symphysis height.....	33mm
diameter bigonial.....	112mm
diameter bicondylar.....	128mm
height ascending ramus...	59mm (right ramus)
corpal length, go-gn.....	91mm (right side)

These long bone measurements were also taken:

max. length left fibula....	35.4cm
max. length right fibula...	35.0cm
max. length left femur.....	41.9cm,
head diameter.....	41.5mm
max. length right femur....	41.5cm,
head diameter.....	41.5mm
max. length left radius....	24.4cm
max. length right humerus..	30.7cm,
head diameter.....	40.0mm
max. length left humerus...	30.5cm,
head diameter.....	39.5mm
max. length left tibia.....	36.5cm,
min. length.....	35.4cm
max. length right tibia....	36.2cm,
min. length.....	35.15cm
max. length left ulna.....	26.6cm
max. length right ulna.....	26.5cm

Burial #8:

Age: 2.5-3.5 years (Schour and Massler, 1941)

Sex: indeterminable

Found in the lap of burial #7, this tightly flexed primary burial appears to be that of a 2.5-3.5 year old infant. It appears to have been a probable hydrocephalic, although absolute pathological diagnosis is difficult to ascertain because of warping of the cranial vault.

Those long bone measurements which were taken are:

max. length left femur.....164mm

max. length right femur.....163mm

max. length left tibia.....135mm

max. length right tibia.....134mm

max. length ? fibula.....129mm

Burial #9:

Age: 4.5-5.5 years (Schour and Massler, 1941)

Sex: indeterminable

This was a single primary interment in an urn with no covering vessel.

The six year molars are just beginning to erupt. There are healed fractures of the sternal ends of four ribs. Because of the fragmented condition of the burial very little else could be ascertained.

Burial #10 and #11:

Age: 8 years (Schour and Massler, 1941)

Sex: indeterminable

These two individuals were contained in a single covered urn. They appear to have been secondarily interred.

There are only five cranial fragments and a molar tooth present. Those portions of the skulls which are present are: right parietal fragment, occipital fragment, right temporal, and two basilar portions of occipitals, and a mandibular permanent molar. On the basis of the molar's root development, one individual appears to have been approximately 8 years old. The lateral portions forming the occipital condyles are in final stages of fusion to both basilar portions of the occipitals.

Burial #12:

Age: 47-64 years (Krogman, 1973)

Sex: female

This primary inhumation of a senile adult female was placed in a large pit in an upright seated position with the legs crossed and the hands placed in the lap. During the course of refilling the pit or decomposition, the individual had slumped to the right side. There were no associated grave goods.

Those identifying characteristics of the cranial and postcranial skeletal remains are blunt orbital borders, small pointed mastoids, occipital bun, slight supra-orbital torus, smooth rounded cranial vault, smooth gracile chin, slight parietal bossing, wide sciatic notch, and large septal apertures. The third molars have erupted, the basilar suture is closed, the coronal suture is closed endocranially and ectocranially, the sagittal suture is closed endocranially and ectocranially, and the lambdoid suture is closed endocranially. The muscle attachments are well defined on the long bones, and the first and second sacral vertebrae are in final stages of fusion.

Cranially there is evidence of extreme dental attrition, antemortem loss of left and right mandibular first, second, and third molars with subsequent alveolar resorption, and extreme abscessing of the mandibular right first and second premolars and the left canine and first premolar. The maxillary teeth exhibit similar attrition and abscessing, and the inferior internal borders of the orbits in the areas of the maxillary sinuses and lacrimals is corroded probably due to infection caused by the numerous abscesses of the maxillary teeth. There is also evidence of slight frontal deformation, and a deviated nasal septum.

Postcranially there is pathological evidence of generalized osteophytic deposits characteristic of degenerative arthritis and erosion of the acetabular sockets (particularly the right side) which can probably be attributed to arthritis. The proximal epiphyses of the fibulae are deformed, and there is a small rounded lytic cyst located just medial to the glenoid cavity on the dorsal surface of the right scapula. The costal cartilage on the ribs is ossified. There is evidence of ankylosing spondylolysthesis of the fifth lumbar vertebra and a compression fracture of the eleventh thoracic vertebra (Buckley, 1976). Senile

age changes are evidenced in the hands and feet with slight exostoses on some of the digits, associated with degenerative arthritis. There is also an osteochondritic cyst present on the proximal epiphysis of the proximal phalanx of the first digit of the foot (Buckley, 1976)(see Figure 5).

Burial #13:

This was a primary urn interment of a child which had been intruded upon by the digging of a refuse pit; consequently the remains were fragmented and scattered. The skeletal material from this burial was not available for study.

Burial #14

Age: infant (newborn)
Sex: indeterminable

The complete skeletal remains of a newborn infant were primarily interred in this urn which was disturbed by plowing. There were no burial associations.

There were no evident pathologies on the skeletal material itself, and those measurements which could be taken are as follows:

max. length left femur.....76mm
max. length right femur....75.5mm
max. length left tibia.....69mm
max. length right tibia....69mm
max. length ? fibula.....65mm
max. length ? fibula.....65mm
max. length ? ulna.....63.5mm
max. length ? humerus.....66.5mm

The teeth are just beginning to calcify.

Burial #15:

Age: 8-9 years (Schour and Massler, 1941)
Sex: indeterminable

Burial #15 is listed in the original field notes as being a dog burial. However, the remains of a human mandible and maxilla were found in a bag labeled "LWX1, Burial #15."

There are no obvious pathologies. The second permanent molars are only beginning to erupt through the alveolar bone, and the permanent maxillary canines

Figure 5

Burial #12, site 1WX1, showing an osteochondrytic cyst on the proximal epiphysis of the proximal phalanx of the first digit of the foot.



Figure #5

have not erupted. The root formation of the permanent maxillary central incisors is incomplete and the deciduous canines and first molars are still present.

Whether this belongs to the Alabama River phase component or not is questionable.

Burial #16:

Age: 8-10 years (Bass, 1971; Schour and Massler, 1941)

Sex: indeterminate

This primary semi-flexed burial was found in a pit intrusive from the plow zone. No direct burial associations were present, but the artifacts in the pit fill are Alabama River phase.

The cranium was soaked in alvar, including the soil surrounding the cranium, resulting in a hardened mass with which it was impossible to cope. Those postcranial remains which were present are long bone fragments, ribs, vertebrae, scapula, clavicles, phalanges of the hand, and sternum.

The sternal fragments are separate and the neural arches of the vertebrae are in final stages of fusion to the vertebral centra.

There were no obvious pathologies.

Long bone measurements are:

max. length right ulna.....165mm

max. length right fibula....208.5mm

Burial #17:

There is no information concerning this burial in the original field notes except that it was an urn. There also was no skeletal material available for study.

Burials #18, #19, and #20:

This was a secondary bundle burial containing two adults and a fetal skeletal which has been attributed to the Mississippian component on the basis of associated artifacts.

There are an adult cranium, two adult mandibles, adult postcranial skeletal material, and a fetal skeleton present. One of the mandibles articulates with the cranium. This cranium and matching mandible appear to be those of a senile adult female which exhibit sharp orbital borders, no supra-orbital torus, small pointed mastoids, smooth gracile zygomatics, and smooth chin. There was a pronounced fronto-occipital

deformation; however, the following cranial measurements were taken:

Maximum length.....	160mm
Maximum breadth.....	155mm
Basion-Bregma.....	142mm
Endobasion-Nasion.....	108mm
Minimum Frontal Breadth.....	96mm
Nasal Height.....	49mm
Right Orbital Height.....	37mm
Right Orbital Breadth.....	41mm
Symphysis Height.....	30mm
Diameter Bigonial.....	97mm
Diameter Bicondylar.....	120mm
Height Ascending Ramus.....	56mm
Corpal Length, go-gn.....	87mm

The age of this individual is considered to be 65-81 years, based on the following criteria: the sagittal suture is completely closed and obliterated endocranially and ectocranially (35 years); the sphenofrontal suture is completely closed and obliterated (64 years); the coronal suture is completely closed and obliterated in all three sections endocranially and ectocranially (41 years); the lambdoid suture is closed in all three sections (47 years); the sphenoparietal suture is closed (65 years); and the mastooccipital suture is closed (81 years) (Krogman, 1973: 81).

There were no cranial pathologies observed except those associated with the teeth, which exhibit extreme attrition. There appears to be a congenital absence of the third molars. The mandibular central incisors and right lateral incisor appear to have been lost antemortemly with subsequent alveolar resorption, and there is an apparent abscess of the right lateral incisor. The mandibular right second molar was also abscessed, but lost postmortemly. There is no plaque or periodontal disease exhibited. This individual also had a slight underbite possibly attributable to cranial deformation.

Postcranially this older adult female exhibits pathological bone changes concurrent with old age, i.e., arthritic osteophytosis on the vertebral centra, arthritic exostoses on the right first metatarsal, ossification of the costal cartilage, and the right talus and calcaneus exhibit extensive degenerative exostoses to such a degree that they are almost fused together.

Long bone measurements for this individual are:
max. length left femur....43.5cm,
head diameter.....40.0mm

max. length right femur...42.5cm,
 head diameter.....40.0mm
 max. length left humerus..30.0cm,
 head diameter.....39.5mm
 max. length right humerus.33.0cm,
 head diameter.....39.0mm
 max. length left radius...23.2cm
 max. length left ulna.....24.9cm

The second individual is considered to be an adult male. The mandible, although smooth and with a pointed chin, is more massive than the other. No measurements could be taken because the condyles and gonial angles are missing. Those teeth which are present exhibit a marked amount of attrition. There is no evidence of periodontal disease. The right first molar is present, but abscessed and the central incisors are missing postmortemly. The lateral incisors are congenitally absent. The left first, second, and third molars are abscessed and missing antemortemly, with subsequent alveolar resorption; also, the alveolar bone has the characteristic bone spicules indicative of localized infection. It is difficult to determine whether the right third molar is congenitally absent or was lost antemortemly and resorbed, although the latter is probably the case. A portion of the root of the left third molar is present and there is a great deal of plaque on the left canine and left first and second premolars. There are two mental foramina on the right side, one above the other.

Those long bones which could be measured for the second individual are:

max. length left femur.....46.0cm,
 head diameter.....45.0mm
 max. length left ulna.....24.9cm
 max. length right ulna.....25.0cm
 max. length right humerus.....39.0cm,
 head diameter.....44.0mm
 max. length left radius.....23.5cm

Burial #21:

Age: newborn, 0.0-0.5 years
 Sex: indeterminable

This was a primary burial of a newborn infant, placed on its right side and then covered with an inverted urn. The burial had been disturbed by plowing but the bones themselves were in anatomical order. Only the postcranial skeleton is present.

There were no observable pathologies. Those long bone measurements which could be taken are:
max. length right tibia.....55mm
max. length left tibia.....56mm

Burial #22:

Age: 16-18 years
Sex: female

Burial #22 was a primary interment of a young adult female, with the fetal skeleton of Burial #23 in the pelvic area. The body was apparently placed in an upright seated position at the time of inhumation, but had slumped over during the process of pit refill and decomposition.

Those cranial and postcranial identifying characteristics exhibited on the skeleton are small pointed mastoid processes, sharp orbital borders, thin zygomatic processes, smooth broad zygomatics, smooth cranial vault, gracile mandible, and wide sciatic notch. The facial region exhibits a slight nasal sill and alveolar prognathism. The cranium exhibits pronounced fronto-occipital deformation. This individual also had two, small, smooth, conical-shaped supernumerary teeth located posteriorly to the maxillary central incisors (see Figure 6), several enamel pearls, periodontal disease, and the teeth appear to have been crowded and maloccluded.

There is an obvious fracture calus of the distal portion of the left fibula with possible subsequent infection as evidenced by periosteal reaction. There is also a rounded lytic lesion with sharp borders surrounded by elevated periosteal reactive bone, located in the center of the lateral aspect of the left calcaneus, which possibly corresponds to the infected fibula. This pathology could possibly have produced a systemic infection which resulted in the abortion of the fetus and ultimate death of the individual.

The following measurements were taken:

Long Bone Measurements:

max. length left femur.....	43.1cm,
head diameter.....	42mm
max. length right femur.....	42.5cm,
head diameter.....	41.5mm
max. length left humerus.....	29.5cm,
head diameter.....	41.5mm
max. length right humerus.....	29.9cm,
head diameter.....	41.5mm

Figure 6

Burial #22, site 1WX1, showing supernumerary teeth posterior to maxillary central incisors.

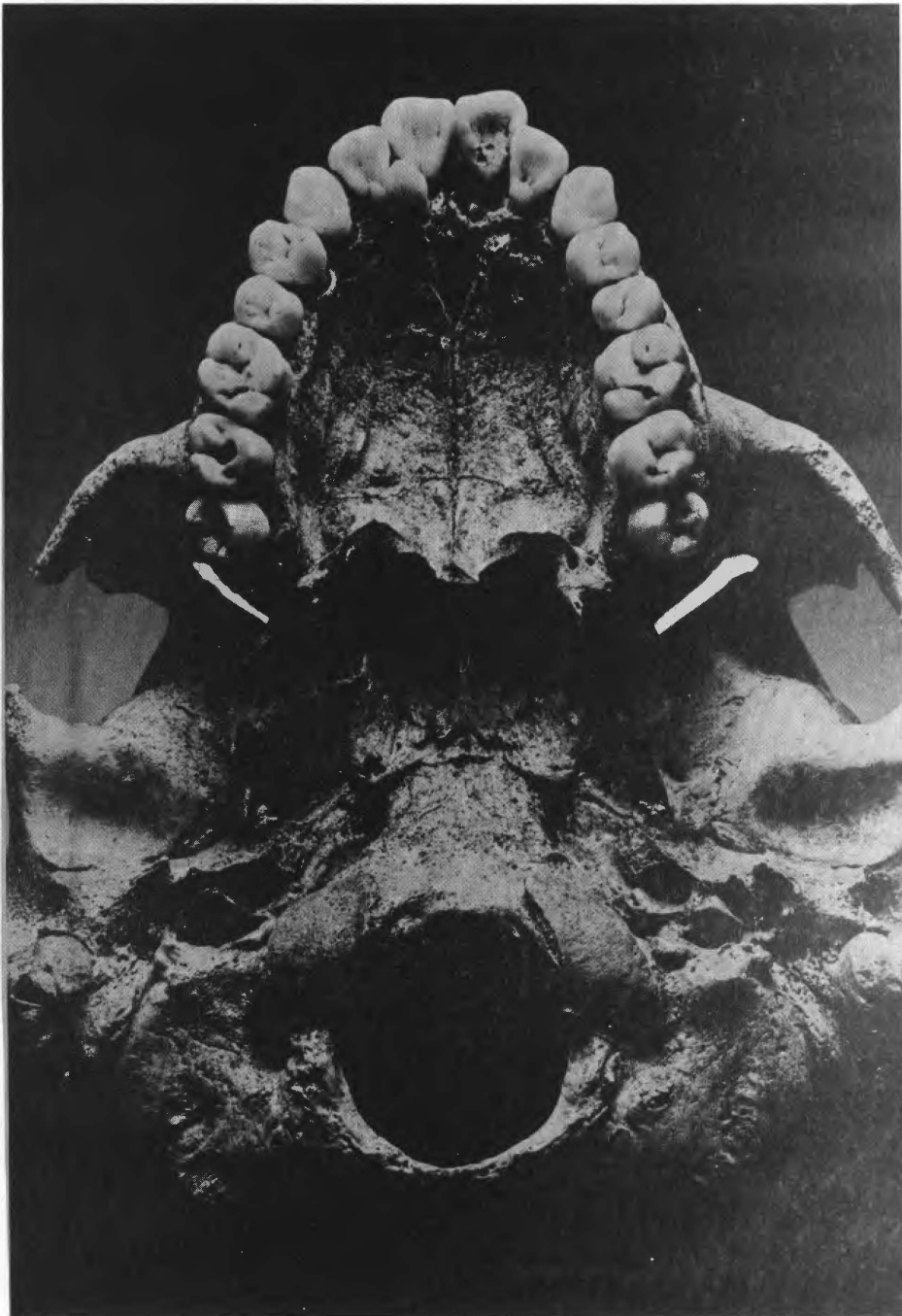


Figure 6

max. length left radius.....	23.8cm
max. length left tibia.....	36.2cm,
min. length.....	35.0cm
max. length right tibia.....	35.7cm,
min. length.....	34.7cm
max. length left ulna.....	25.5cm
max. length left fibula.....	34.7cm (pathological)
max. length right fibula.....	33.7cm

Cranial Measurements:

max. length.....	140mm
max. breadth.....	155mm
basion-bregma.....	135mm
endobasion-nasion.....	91mm
endobasion-alveolar point.....	95mm
min. frontal breadth.....	90mm
bizygomatic breadth.....	125mm
nasal height.....	47mm
nasal breadth.....	22mm
left orbital height.....	33mm
left orbital breadth.....	40mm

Mandibular Measurements:

symphysis height.....	35mm
diameter bigonial.....	93mm
diameter bicondylar.....	111mm
height ascending ramus.....	53mm
corpal length, go-gn.....	85mm

Burial #23:

Age: fetal
Sex: indeterminable

Burial #23 is the Complete, well preserved, but fragmented skeletal remains of a fetus found in the pelvic area of Burial #22. There are no obvious pathologies.

Burial #24:

Age: infant
Sex: indeterminable

Burial #24 was an infant contained in an urn, according to the original field notes. There were no associated grave goods. The skeletal material was not available for study.

Burial #25:

Age: 0.0-0.5 years (Schour and Massler, 1941)
Sex: indeterminable

This primary infant interment was deposited in an urn. There were no associated artifacts.

The skeleton is complete and in a good state of preservation. There were no obvious pathologies. The following long bone measurements were taken:

max. length right radius.....	52mm
max. length left radius.....	52mm
max. length right ulna.....	60mm
max. length left ulna.....	60mm
max. length right humerus.....	64mm
max. length left humerus.....	63mm
max. length right tibia.....	65mm
max. length right femur.....	76mm

Burial #26:

There is no available data on this burial other than the fact that it was in an urn. The skeletal material was not available for study.

Burial #27:

Age: 6-9 months (Schour and Massler, 1941)
Sex: indeterminable

This was a single primary interment of an infant in an urn. There were no associated artifacts.

The skeleton is complete and in a good state of preservation. The skull exhibits small, porous, osteolytic lesions characterized by small "punched-out" lesions with well-defined margins and no evidence of osteoblastic activity. One area is large and porous with numerous pinpoint perforations in the outer table. There are also numerous striations in the outer table. Examination of the x-ray indicates that this pathology is confined to the skull with no osteoporosis exhibited in any of the other flat bones or long bones. The possible differential diagnosis includes nonlipid histiocytosis (Letterer-Siwe disease), eosinophilic granuloma, Hand-Schüller-Christian syndrome (see Richter, 1966; Bennett, 1966).

Those long bone measurements which could be taken are:

max. length right humerus.....	73mm
max. length left femur.....	90mm

max. length left ulna.....68mm
max. length right ulna.....67mm
max. length right tibia.....77mm
max. length ? fibula.....69.5mm

Burial #28:

Age: infant
Sex: indeterminable

According to the original field notes, this was a single primary infant inhumation in an urn, although the skeletal material was not available for examination.

Burial #29:

Age: 0.0-0.5 years
Sex: indeterminable

Although this burial was disturbed by plowing, it appears to have been a single primary interment in an urn.

The skeleton is complete and is in a good state of preservation. There were no apparent pathologies on the bones themselves. The following long bone measurements were taken:

max. length right humerus.....67mm
max. length left humerus.....67mm
max. length right ulna.....63.5mm
max. length left ulna.....63mm
max. length right radius.....54mm
max. length left radius.....54mm
max. length right femur.....78mm
max. length left femur.....78mm
max. length right tibia.....67mm
max. length right fibula.....65mm

Burial #30:

Age: 2 years (Schour and Massler, 1941)
Sex: indeterminable

This burial has been attributed to the Mississippian component. It was a primary interment placed in an extended position next to Burial #31 so that the right arm extended over the left leg of Burial #31. The left arm was flexed across the chest. There was no evidence of a pit outline, nor were there any associated artifacts.

There were no evident pathologies; but the maxillary first molars have an unusual extra cusp which is formed on the buccal surface. There is also evidence of the previously mentioned unusual attrition pattern on the left mandibular central incisor (see Burial #4a).

Burial #31:

Age: 14-19 years (Bass, 1971; Krogman, 1973).
Sex: female

Located just to the right of Burial #30, this burial was also a primary extended interment. Both burials have been assigned to the Mississippian component.

The skeleton is complete and has these identifying characteristics: small rounded mastoids, small smooth cranial vault, pronounced temporal lines on the frontal bone, sharp orbital borders, smooth mandible with squared mental eminence, small teeth, slender gracile zygomatics, large septal apertures on both humeri, wide sciatic notches, and very small patallae.

There is an extensive amount of attrition on the teeth, particularly on the molars, with numerous pinpoint carious lesions on the occlusal surfaces.

Obvious cranial pathologies include five endocranial parietal pits and numerous small porous pits resembling cribra in the area of lambda.

The head of the right radius is very wide and flattened in appearance, with the neck being very slender. The distal end of the left radius is flattened anterior-posteriorly and there is an elongated, elevated platform of blastic bone on the medial aspect of the distal metaphysis.

The following long bone measurements were taken:
max. length right femur.....42.5cm,
head diameter.....43.5mm

Burial #32:

Age: 1.5-2.5 years (Schour and Massler, 1941)
Sex: indeterminable

Also assigned to the Mississippian component is this primary extended inhumation of a child, placed face down in the pubic area of Burial #33. There was no discernable pit outline, nor were there any associated artifacts.

There were no obvious pathologies on the skeleton itself, however, the left mandibular central and

lateral incisors exhibit the same attrition pattern as that of Burial #30. The maxillary central and lateral incisors have a bifurcated root formation.

Burial #33:

Age: 8-9 years (Schour and Massler, 1941)

Sex: indeterminable

This individual was interred in a primary extended position on its back, with Burial #32 being placed on top of it, face down, in the pelvic region. This has also been assigned to the Mississippian component. Both skeletons are complete, but fragmented, and the cranial remains have been soaked in alvar.

The only obvious pathology for Burial #33 is a slight periosteal swelling on the left tibia.

Burial #34:

Age: 6-8 years (Schour and Massler, 1941)

Sex: indeterminable

This Mississippian burial of a child was a primary extended inhumation with the arms folded across the chest and the head slumped forward. The lower right leg was missing, but because of the fragmented condition it is difficult to ascertain the reason for its being missing. There was no discernable pit outline, and no associated artifacts were found. There was an extra mandible fragment next to the left foot.

There was pathological evidence of periostitis of the left tibia, and a small drainage sinus on the left fibula.

These long bone measurements were taken:

max. length right femur.....	243mm
max. length right humerus.....	174.5mm
max. length right radius.....	123mm
max. length right ulna.....	140.5mm

Burial #35:

Age: 4.5-5.5 years (Schour and Massler, 1941)

Sex: indeterminable

This Mississippian burial of a child was a primary semi-flexed interment, placed on the right side with the arms slightly flexed.

There were no obvious pathologies on the bones themselves.

The occlusal surfaces of the maxillary and mandibular central and lateral incisors exhibit moderate attrition, and the maxillary canines show a slight amount of attrition.

The following long bone measurements were taken:

max. length left tibia.....159mm

max. length right tibia.....159mm

max. length right femur.....195mm

Burials #30, #31, #32, #33, #34, and #35 appear to form a distinct cluster.

Burial #36:

According to the original field notes and drawings, Burial #36 was a burial of a dog which was intrusive into Burial #37. However, on an inventory form, also from the original field notes, the word "dog" has been marked through and replaced by the word "baby." The bag labeled "Burial #36, 1WX1" contains the complete remains of two infants.

Burial #36a:

Age: fetal

Sex: indeterminable

There were no obvious pathologies. Only two long bone measurements could be taken:

max. length left femur.....63mm

max. length right femur.....63mm

Burial #36b:

Age: 0.0-0.5 years (Schour and Massler, 1941)

Sex: indeterminable

There were also no obvious pathologies on this skeleton. The following long bone measurements were taken:

max. length left femur.....73mm

max. length right femur.....74mm

max. length right tibia.....66mm

max. length left radius.....52mm

max. length ? fibula.....63mm

These two infants were apparently primarily interred in a small round pit, with no associated artifacts.

Burial #37:

Age: adult, 31+ years (Bass, 1971; Krogman, 1973)

Sex: indeterminable

The remains of an older adult were apparently secondarily interred in a small round pit which was intruded upon by Burial #36. The osteological material of Burial #37 is extremely fragmented and in a poor state of preservation. Only postcranial remains are represented: left clavicle, right patella, two left ribs, right calcaneus, right and left carpals, one metacarpal, and the phalanges of the hand and foot.

There are osteophytic deposits on the phalanges of the foot, the patella, and the lateral epiphysis of the clavicle, indicative of degenerative arthritis.

The medial epiphysis of the clavicle is completely fused.

There was one shell bead found with this burial.

Both Burials #36 and #37 have been attributed to the Alabama River phase component.

Burial #38:

Age: 15-16 years (McKern and Stewart, 1957)

Sex: female

This was possibly a primary extended inhumation. The burial had been disturbed, and only fragmented vertebral and innominate osteological material remained. These were in anatomical order, though there was no evidence of a pit outline. This burial has been attributed to the Alabama River phase.

There is pathological evidence of spina bifida occulta and the "lumbarization" of the first sacral vertebra.

Burial #40:

Age: adult, 31+ years (Bass, 1971; Krogman, 1973)

Sex: male

This Mississippian primary inhumation of an adult male was placed in a flexed position with the hands next to the skull in a north/south orientation. The pit itself was rather deep compared to the other Mississippian burials. A bone pin and a cluster of three projectile points were found in association.

The osteological material is complete, except for the skull which was stolen from the site by "pothunters."

There is pathological evidence of extreme periostitis exhibited on all of the long bones, characterized by an elevated periosteum and thickening of the cortices with subsequent decrease of medullary space. The tibiae have a flattened (anterior-posterior) appearance, known as platycnemia, which was once considered to be associated with anemia but now is considered to be a consequence of extensive stress (Cassidy, 1978) (see Figure 7).

There actually appear to be two different pathologies present: degenerative arthritis (vertebral osteophytosis and Kienbach's disease, otherwise known as osteonecrosis of the lunate which apparently was predisposing to degenerative joint disease of the radial-carpal joint (Buckley, 1976) (Figure 8). There is a corresponding lytic lesion on the lunar aspect of the left radius, and a systemic infection involving the ribs, sternum and long bones, characterized by extreme periostitis with subsequent thickening of the cortices of the long bones and loss of medullary space (see Figure 6, page 79).

A final, separate pathology from the other two is a fracture calus of a fibula on the distal metaphysis.

The following long bone measurements were taken:

max. length left humerus.....	31.7cm,
head diameter.....	43mm
max. length left ulna.....	26.7cm
max. length right ulna.....	26.7cm
left femoral head diameter.....	44.5mm
right humeral head diameter.....	43.5mm

Burial #42:

Age: adult

Sex: indeterminable

This burial has been tentatively assigned to the Alabama River phase. It consists of only five adult rib fragments with no obvious pathology. There was no other data available concerning this burial.

1TU4, the Moody Slough Site:

Burials "a" and "b"

Figure 7

Burial #40, site 1WX1, showing extreme periostitis
and platycnemia of the tibia.



Figure #7

Figure 8

Burial #40, site 1WX1, showing Kienbach's disease
(osteonecrosis of the lunate).

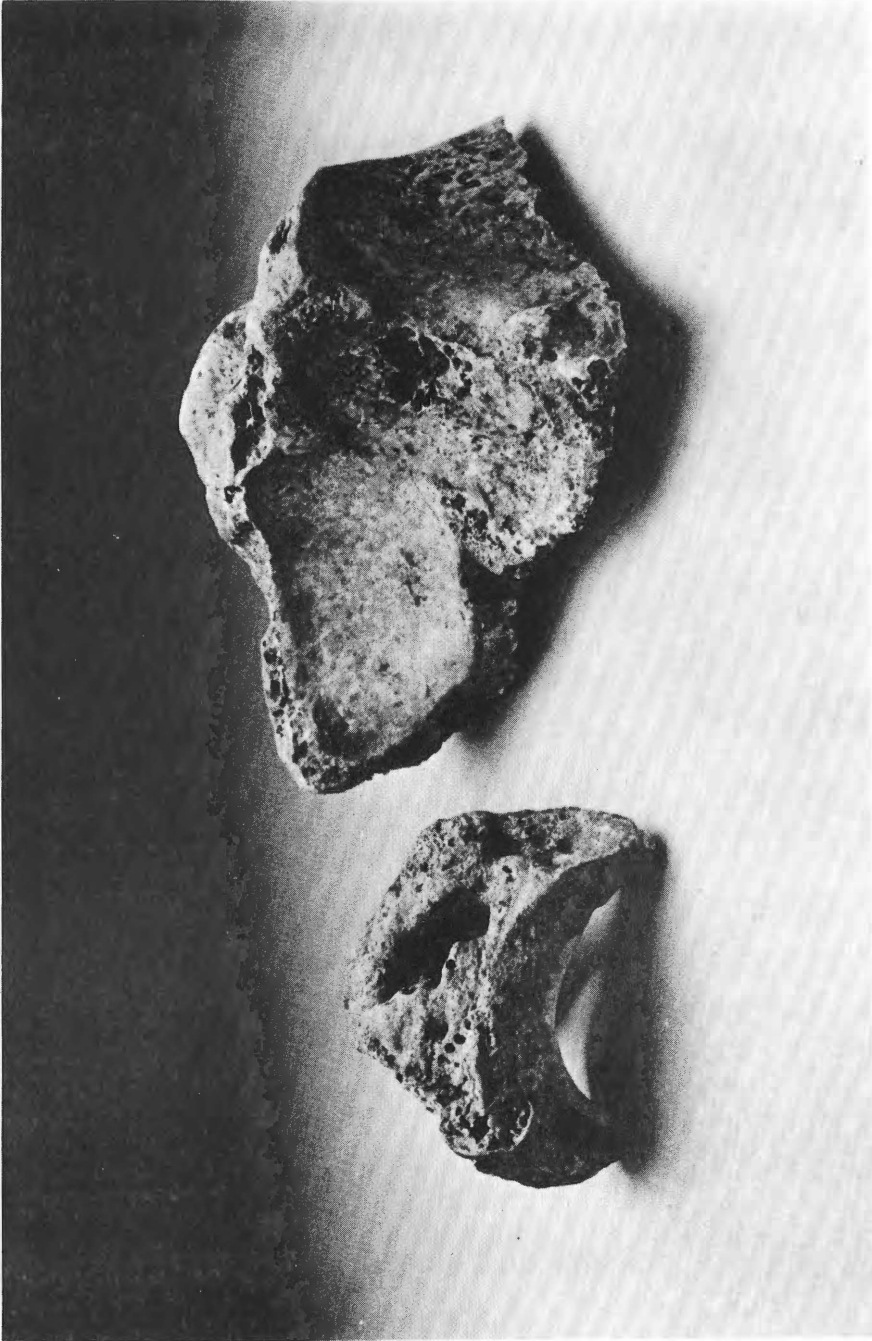


Figure 8

This was a bundle burial of two individuals with fragments of Alabama River Phase Plain pottery in direct association. There were two distinct bundles consisting of skulls placed on top of long bones, placed side-by-side to one another in the same pit.

Burial "a":

Age: 17.0-19.0 years (McKern and Stewart, 1957)

Sex: female (Bass, 1971; Krogman, 1973)

The distal epiphyses of the fibula, tibia, and metacarpals are in final stages of fusion, as well as the proximal epiphyses of the proximal phalanges of the hands. The first, second, and third cervical vertebrae were present directly under the skull in anatomical order at the time of excavation, indicating a partially fleshed state of the skull at the time of interment. The third molars have not quite erupted into the occlusal plane.

There are four round lytic lesions on the endocranial surface of the occipital in the area of the internal occipital crest. The right parietal appears to have a small area of blastic activity. There is an extreme crowding of the teeth and evidence of periodontal disease. The possible diagnosis is porotic hyperostosis (see Angel, 1967; El-Najjar, 1976; El-Najjar, et al., 1976).

Burial "b":

Age: 15.5-16.5 years (Bass, 1971; Krogman, 1973)

Sex: female (Bass, 1971; Krogman, 1973)

The skull exhibits small, gracile features: small mastoids, no supra-orbital torus, smooth gracile chin. There is a septal aperture on the right humerus. The third molars have not yet erupted in the maxilla, and in the mandible they have erupted but are not in the occlusal plane. The distal and proximal epiphyses have not yet united to the long bones.

There are two large, oval lytic/blastic lesions on the parietals (one on each parietal). In cross section these lesions have a "hair-on-end" appearance (see Figure 9). A small lytic lesion is present on the lateral aspect of the distal end of the left humerus. Cribra orbitalia are also evident. There is evidence of extreme crowding and malocclusion of the teeth, with heavy plaque deposits. The probable diagnosis is porotic hyperostosis.

Figure 9

Burial "b," site 1TU4, showing extreme porotic hyperostosis.



Figure 9

There are multiple sub-orbital foramina on the left side of the maxilla.

Those measurements which could be taken on the long bones are as follows:

max. length of left femur.....36.5cm
max. length of right femur.....36.2cm
max. length of right humerus..25.6cm
max. length of right tibia....31.4cm

Burial "c":

Age: older adult
Sex: female

This burial was represented only by the articulated remains of the legs (minus the feet) and the left acetabulum. The legs were in a flexed position, lying on the left side. The rest of the burial had eroded into the river. It appears that the burial was a primary, semi-flexed interment. No urn was present. The long bones were gracile, with thin cortices. The left femoral head diameter was 42 mm. No pathologies were observed.

Burials "d", "e", "f":

Age: two adults and a child
Sex: male and female

This was apparently a secondary urn interment contained in vessels #2 and #5. Cranial and post-cranial fragments of two adults and a child are present. The male cranium and mandible and long bones are very robust in appearance. The following measurements were taken:

left femoral head diameter.....49mm
right femoral head diameter.....49mm
left humeral head diameter.....50mm
right humeral diameter.....51.5mm
max. length left humerus.....33cm

Pathologies for the male skeleton include pronounced swelling of the anterior crests of the tibiae, porotic hyperostosis, and extreme attrition, caries, and periodontal disease. An age estimate of 45± 5 years was made on the basis of cranial suture closure.

The female skeleton is very gracile. The following measurements were taken:

right femoral head diameter.....39mm

The age of the female is estimated to be approximately 30 ± 5 years.

The age of the child is estimated to be approximately 2-4 years.

The skeletal material for the female and child is too fragmented to ascertain definite ages or pathologies.

Burial "g":

Age: infant, approx. 9 months (Schour and Massler, 1941)
Sex: indeterminable

This was a primary interment. The skeletal material is extremely fragmented and in a fair state of preservation. No pathologies were noted. The skeleton was contained in urn #4.

Burial "h" and "i":

Age: infant (.5 to 1.5 years) and child (10±2 years)
Sex: indeterminable

These were primary interments of infants found at the knees of burial "j." The skeletal material is complete, extremely fragmented, and in a fair state of preservation. The infant exhibits porotic hyperostosis and the child has an enamel pearl on a molar.

Burial "j":

Age: adult, 50+ years
Sex: male

This was a primary interment, semi-flexed, facing south on an E/W axis with the head to the east. The skeleton was complete, semi-fragmented, and in a good state of preservation. The most notable physical characteristics of the skeletal material are that the medial epiphyses of the clavicles are fused; the long bone epiphyses are fused; there are small hands and patellae, narrow sciatic notches, no elevation of the preauricular sulcus, complete fusion of the cranial sutures, large mastoids, pronounced occipital torus, pronounced supra-orbital torus, and blunt orbital borders. Pathologies and anomalies include platycnemia and medial-lateral bowing of the tibiae, vertebral osteophytosis in the lumbar region, pacchionian pits on the endocranial surface, moderate to extreme attrition of the teeth, abscessing and antemortem loss of the right mandibular second and third molars and

left first and third molars, periodontal disease, and a "rocker" mandible. Those long bone measurements which could be taken are:

max. length left radius.....23.8cm
max. length right radius.....24cm
right humeral head diameter.....44mm
left humeral head diameter.....45.5mm
max. length left femur.....43.4cm
left femoral head diameter.....45mm
right femoral head diameter.....45mm

The cranial measurements which could be taken are:

max. length of cranium.....184mm
max. breadth of cranium.....133mm

There was an extra humerus with this burial.

Burial "k":

Age: infant
Sex: indeterminable

This was a cremation of an infant with urn ceramics and a miniature "urn." No bone was available for analysis.

Burial "l":

Age: adult, 35±2 years
Sex: male ?

This primary interment was in a semi-flexed position with the head to the SE, facing South. Burial urn ceramics were with the interment. The skeletal material is fragmented and in a good/fair state of preservation. The physical characteristics of the cranial and post-cranial skeleton are narrow sciatic notch, slightly elevated preauricular sulcus, thin long bone cortices, medial epiphyses of clavicles are fused and the articular surfaces are pitted, thin gracile long bones, pronounced linea aspera, extremely pronounced supra-orbital torus, large blunt mastoids, blunt orbital borders, pronounced occipital torus. The cranial sutures are open. Pathologies and anomalies include separate sternal components, healed fracture calus of distal metaphysis of left clavicle, platycnemia of tibiae, medial-lateral bowing of tibiae, slight periostitis of medial posterior aspect of left tibia, compression fractures of second, third, and fourth lumbar vertebral centra, cribra parietalis,

moderate attrition, medium plaque deposits, extreme maxillary abscesses of right third molar, first premolar, and canine and left first molar and second molar, apparent antemortem loss of maxillary central incisors with subsequent alveolar resorption, extreme abscessing involving every mandibular tooth except the left second molar, and extremely convoluted lambdoid suture with numerous wormian bones. The teeth exhibit a black vegetable stain. Those long bone measurements which could be taken are:

max. length right humerus.....30.9cm,
head diameter.....44.5mm
max. length left humerus.....30.8cm,
head diameter.....43mm
max. length right ulna.....26.6cm
max. length right radius.....24.6cm
max. length right femur.....42.5cm,
head diameter.....44mm
max. length right fibula.....35.5cm
max. length right tibia.....37.2cm,
min. length.....36.5cm
max. length left femur.....43cm,
head diameter.....44mm

Burials "m", "n", and "o":

Age: adult (45±5 yrs.), young adult (15-16 yrs.),
adolescent (10.5-12 yrs.), and child (7-8 yrs.)
Sex: male and female (adults)

These were secondary bundle burials in the same pit on a N/S axis, with numerous associated artifacts such as shell gorgets and ear spools and urn ceramics. The ear spools indicate a partially fleshed state at the time of interment. The skeletal material is fragmented and in a fair/good state of preservation. However, the skeletons were mixed and difficult to analyze. Four sets of femora were present. All four individuals exhibit porotic hyperostosis, moderate attrition and pinpoint carious lesions, and porous vertebral centra. Ages were estimated on the basis of epiphyseal closure, cranial suture closure, and dental maturation.

Burial "p":

Age: adult 50+ years
Sex: female

This was a bundle burial with an inverted vessel over the skull. The skeleton is complete, semi-fragmented,

and in an excellent state of preservation. Physical characteristics include small gracile long bones, medium-sized septal apertures on both humeri, small patellae, pronounced linea aspera, 90° angles of femoral necks, small hands and feet, medial epiphyses of clavicles are fused, wide sciatic notches, elevated preauricular sulci, "female" sacral curvature, gracile cranium and mandible, and the cranial sutures are fused. Pathologies and anomalies include osteophytic deposits on olecranon processes, medial-lateral bowing of tibiae, fusiform swelling in mid-diaphysis region of left tibia (probably a healed "green stick" fracture calus), bulbous calcium deposits on molar roots, separate sternal components, "hourglass"-shaped vertebral centra, osteophytosis in lumbar region, parturition pits along preauricular sulci (sacro-iliac articular surfaces), moderate to extreme attrition, antemortem abscess and loss of mandibular first molars and second molars with subsequent alveolar resorption, mandibular third molars appear to have been present but abscessed and clinging only to the gingival tissues, porotic hyperostosis, and cribra orbitalia. The cranium exhibits occipital deformation. Long bone measurements include:

max. length left humerus.....	28.6cm,
head diameter.....	38mm
max. length right radius.....	22cm
max. length left radius.....	21.5cm
max. length left tibia.....	33.7cm,
min. length.....	32.5cm
max. length left femur.....	40.3cm,
head diameter.....	41mm
max. length right femur.....	40.2cm,
head diameter.....	40mm

Mandibular measurements are:

symphysis height.....	35mm
left corpal length.....	87mm
left ascending ramus height.....	55mm
bigonial diameter.....	96mm
bicondylar diameter.....	121mm

Cranial measurements are:

max. length.....	162mm
max. breadth.....	153mm
min. frontal breadth.....	97mm
basion-bregma height.....	142mm

Burials "q" and "r":

Ages: infants
Sex: indeterminable

These were the two urns containing the remains of infants which were excavated in 1932. No skeletal material was available for study.

1TU49, The Fosters' Ferry - Baker Site

Burial 1:

The first box of material analyzed was labeled "1TU49, Burial Urn #1, F. #1." It contained cranial fragments in a good state of preservation. A minimum of three individuals (three frontal bones) is represented here. The skulls might have been in a partially-fleshed state at the time of their interment because there are also first and second cervical vertebrae present. The ages of these individuals was ascertained by tooth eruption. One adolescent's 12 year molars have erupted and have a slight amount of attrition, but the third molars have not erupted, therefore, this individual is estimated to be approximately 15.0-17.0 years of age (Schour and Massler, 1941). The second is a child approximately 6 years of age (Schour and Massler, 1941). A third child appears to be approximately 11.0-12.0 years old (Schour and Massler, 1941).

There are three basilar portions of occipitals present. One appears to have the basilar suture completely closed; one basilar suture is in partial stages of closure; the third is fragmented so that the basilar suture area is missing. These indicate at least one individual 21 years of age or older and another approaching that age (McKern and Stewart, 1957).

Another box of cranial material was labeled "Burial Urn #1, Skulls 1-2-3-4." In this box there were four mandibles and one complete skull to which one of the mandibles articulates. Three of the mandibles appear to be adults and one is approximately 17.0-18.0 years of age (Schour and Massler, 1941).

That skull which is entire is believed to be that of a female. The mandible is smooth, but wide. It has blunt orbital borders and a slight supra-orbital torus. It also has a slight external occipital

protuberance, small, rounded mastoid processes, and slight temporal lines on the frontal bone. The cranial vault is smooth and gracile (slightly elongated). The teeth show moderate attrition with numerous tiny pin-point caries on the occlusal surfaces. The maxillary lateral incisors are "barreled" and the left maxillary incisor has a small separate cusp formed on the lingual surface. There is also evidence of periodontal disease. There are several parastomian pits present endocranially. Those measurements which could be taken on the mandible are as follows:

symphysis height..... 38mm
bigonial diameter.....105mm
bicondylar diameter.....125mm
height ascending ramus..... 58mm
corpal length go-gn..... 87mm

Substituting these measurements into the equation of Giles (1964) for sex discrimination in mandibles, resulted in a score of 290.97, therefore indicating a female.

The second mandible analyzed appears to be that of an adult male with the following mandibular measurements:

symphysis height..... 32mm
bigonial diameter.....114mm
bicondylar diameter.....137mm
height ascending ramus..... 64mm
corpal length go-gn..... 90mm

The third mandible displays the "rocker" effect described by Houghton (1977) and Snow (1974) which is most unusual for this population. The assessment is that of an adult female. The mandibular measurements for this were:

symphysis height..... 30mm
bigonial diameter..... 97mm
bicondylar diameter.....124mm
height ascending ramus..... 58mm
corpal length go-gn..... 86mm

The fourth mandible could not be measured but is considered to be female.

There is a maxilla included in this material which does not appear to articulate to any of the mandibles. This appears to be aged 18.0-19.0 years (Schour and Massler, 1941).

The label on the third box of material which was analyzed read as follows: "These skeletal remains found outside of and surrounding Burial Urn #1 Feature #1 trench TU49." This box contained long bones and a patella, all apparently from one individual, which are in a good state of preservation. The bones are heavy in density and the muscle attachments are well defined. The pertinent data for this material are

as follows.

The skeleton is that of an adult male. The right fibula, right ulna and right patella are also present. The left femoral head has a "mushroom" appearance, with the neck being virtually indistinguishable. The diagnosis for this is probably traumatic arthritis, since there is no evidence of arthritis on any of the other bones. There are small septal apertures present on both humeri. Those measurements which could be taken are:

max. length left femur.....	41.6cm
max. length right femur.....	42.6cm
max. length left humerus.....	31.3cm
max. length right humerus.....	31.3cm
max. length right tibia.....	35.7cm,
min. length.....	34.8cm
max. length left tibia.....	35.3cm,
min. length.....	34.4cm
max. length left fibula.....	34.0cm
max. length left radius.....	23.5cm
left femoral head diameter.....	(deformed)
right femoral head diameter.....	46.0mm
left humeral head diameter.....	44.5mm
right humeral head diameter.....	45.0mm

The following material was contained in a box labeled "Burial Urn #1," which contained several small bags which were not labeled and four which were labeled. The bag designation numbers were assigned by the author as the material was being analyzed.

Bag #1: labeled "TU49, Feature #1 or #2"

This contains subadult long bone fragments in a poor state of preservation. All of the epiphyses are separate from the diaphyses, except for an ulna which has the proximal epiphysis fused to the diaphysis. Judging from the size of the ulna, as compared to the other bones, it probably does not belong to this particular individual represented by the other bone fragments.

Bag #2 contains small miscellaneous fragments and teeth representing an infant, a child (3-4 years), and an adolescent (15 years) (Schour and Massler, 1941).

Bag #3 contains five bone fragments representing three individuals: infant, child (3-4 years), child (11-15 years) (McKern and Stewart, 1957) (Bass, 1971). This bag was labeled "TU49 June 1958."

Bag #4 contains miscellaneous long bone fragments representing: infant, child (3-4 years), child

(10-12 years) (McKern and Stewart, 1957) (Bass, 1971). There was also a great deal of animal bones and teeth and pottery fragments included with this material.

Another box was labeled "1TU49, Burial Urn #1." It contained both cranial and postcranial remains of at least three individuals: an adult male, adult female, and an adolescent (10-12 years) (Schour and Massler, 1941) (Krogman, 1973).

The cranial bones in this box exhibit a thickening of the diploe, with the "hair-on-end" appearance which is characteristic of porotic hyperostosis, however, the outer table is eroded away by weathering, leaving the diagnosis uncertain.

One adult individual apparently had multiple osteocondrytic cysts in his/her hands.

Another large box of material was encountered labeled "1TU49, Burial #1". Essentially, the remains in this box are as follows: two children (4-6 years, and 10-12 years), an adolescent (14-16 years) and two adults (female, 20 years; and male, 23+ years) (McKern and Stewart, 1957) (Bass, 1971).

A small box labeled "1TU49, Feature #1 & 2, Burial #1" was found containing a skull without the mandible. The skull is that of a male adult, aged approximately 38-42 years (Krogman, 1973). There were several parietal foramina on the endocranial surface, and three wormian bones in the lambdoid suture. The teeth exhibited moderate dental attrition. The outstanding cranial features were a pronounced supra-orbital torus, pronounced temporal lines on the frontal bone, blunt orbital borders, wide heavy malars, large blunt mastoids, pronounced external occipital protuberance, and wide rounded palate. Examination of endocranial suture closure revealed that the sagittal suture was closed in parts 1, 2, 3, 4, and the lambdoid suture was closed in parts 1 and 2 (Krogman, 1973).

Those cranial measurements which could be obtained are:

max. length.....	173mm
max. breadth.....	140mm
basion-bregma.....	(absent)
endobasion-nasion.....	(absent)
endobasion-alveolar point.....	(absent)
min. frontal breadth.....	93mm
bizygomatic breadth.....	150mm
nasion-alveolar point.....	68mm
nasal height.....	53.3mm
nasal breadth.....	31mm

left orbital height.....32.5mm
left orbital breadth.....42.5mm
biorbital breadth.....103mm

Obviously all of this material is not assignable to Burial Urn #1, according to the original field notes recorded in Sheldon (1974). The probable cause for the mixing of the skeletal material is that these excavations were conducted as field schools and it is virtually impossible to oversee each student during the process of removal and storage of material. This is an excellent example of the true value of keeping accurate field notes and records.

Burial 3:

Labeled "1TU49, Feature #1, Burial Urn #3, Trench 4," this is represented by one small bag containing five bone fragments: cranium, mandible, ulna, and two animal bone fragments. This appears to be a probable adult.

Burial 6:

There were six bags of material contained in the box labeled "1TU49, Burial Urn #6." The following bag numbers were assigned by the author during the course of analysis.

Bag #1 contains long bones and a right clavicle. Those bones which were present were three right ulnae, one left ulna, one right radius, one left radius, two right humeri, two left humeri, three left tibiae, one right fibula, one left femur, one right femur, and one right clavicle. The two femora, the clavicle, and one left tibia appear to belong to the same individual, an adult senile female. The bones are very light in weight and brittle in texture. The cortices are extremely thin and traversed by fine trabeculae. There are no pronounced muscle attachments evident.

The proximal epiphysis of one of the right humeri is in final stages of fusion. Its diameter is 49 mm. The diameter of the other right humeral head is 46 mm. On this basis, the assessment of these two individuals is that of adult males in

both cases, with one being approximately 21-23 years of age, and the other being 24+ years of age (McKern and Stewart, 1957).

Bag #2 contains fragments of long bones and innominates. Those bones which are present are one left ulna, one left radius, one fibula, one right femur, one left femur, one right tibia, and one left innominate, one right innominate, one left humerus, one right humerus, one right tibia, one right radius, one left rib which appear to belong to a single individual.

The femora are very large and heavy with well defined muscle attachments. The right femoral head diameter is 49 mm. It is felt that this represents a male (Krogman, 1973).

Those bones felt to belong to the single individual mentioned above appear to be those of an older female. There are medium-sized septal apertures present on both humeri. The bones are very small, thin, and gracile. The innominates have wide sciatic notches. A few of these bones have scortched or charred areas on their outer surfaces, indicating that this individual was cremated before interment. Charred cane is also present.

Bag #3 contains cranial and mandibular fragments of at least three individuals, possibly four. Two of these individuals are represented by complete mandibles, a third is represented by two large mandibular molars, and the fourth is represented by a single small deciduous mandibular molar which has not completed its root formation.

The two mandibles are small, gracile, and have small teeth. One of these mandibles appears to belong to the older female mentioned above. It also has the appearance of being seered by fire on its outer surfaces, with the edges actually being slightly charred. This mandible exhibits senile age changes. The third molars have errupted and the root formation is complete, however, these have been lost postmortemly. It exhibits very little dental attrition. The second mandible also appears to be female, and it evidences periodontal disease.

There is a green stain on a parietal fragment resembling that made by copper.

Those mandibular measurements which could be obtained are as follows:

Mandible #1:

symphysis height.....28mm (approximate)
diameter bigonial.....99mm
corpal length, go-gn.....84mm

Mandible #2:

symphysis height.....32mm (approximate)
diameter bigonial.....110mm
height right ascending
 ramus.....56mm
right corpal length, go-gn.92mm

Bag #4 contains the extremely fragmented remains of a child. Those bones which are present are mandible, rib, long bone fragments, two cranial fragments, and several teeth. Based on the crown and root formation (Schour and Massler, 1941), this child was 6-7 years of age.

Bag #5 contains numerous small bone fragments representing both cranial and postcranial material, as well as several animal bone fragments, pottery sherds, and charred cane. Permanent and deciduous teeth are present.

Bag #6 contains large bone fragments representing both cranial and postcranial material. There is also a great deal of animal bone, pottery fragments, daub, and charred cane present.

In summary, there appear to be two adult females, two adult males, and a child represented by this material. One of the females was extremely small and gracile, and was apparently partially cremated before interment.

1TU49, the 1975 Excavations

Burial #1:

This burial was that of a child, which was complete but extremely fragmented and in a very poor state of preservation. The age is estimated to be approximately 8-10 years (Schour and Massler, 1941). The cranium exhibits an extremely convoluted lambdoid suture and part of the sagittal suture in the area of lambda.

The inhumation was of a primary type, with the body being placed in a sitting position with the legs

crossed and the hands being placed in the lap. The body had apparently slumped slightly downward during the course of decomposition so that the facial region was resting on the chest. Examination of the pit fill revealed that the burial had been filled with earth, topped with sticks, and then capped with moist clay which was then covered with more sticks and fired, forming a hard clay cap over the entire burial.

Burial #2:

The skeleton is that of an adult, aged 32-35 years (Krogman, 1973) but of unknown sex, which was complete but extremely fragmented and in a very poor state of preservation. The teeth exhibit extreme dental attrition. The sagittal suture is fused in parts 1, 2, 3, and 4. The muscle attachments are very well defined on the long bones, indicating a possible male.

The inhumation was of a primary type, being placed in a semi-flexed position so that the knees were bent.

Burial #3:

This is an adult male, aged approximately 45+ years (Bass, 1971; Krogman, 1973). The skeleton is complete but extremely fragmented and in a very poor state of preservation. Those outstanding skeletal characteristics which are exhibited in the osteological material are heavy bone density, narrow sciatic notch, blunted orbital borders, well defined temporal lines on the frontal bone, large mastoids, pronounced supra-orbital torus, and very wide mandible (bicondylarly and bigonially). The teeth exhibit extreme dental attrition, and the mandible evidences senile age changes, with loss of the left and right first molars, second molars, third molars, second premolars, and subsequent alveolar resorption.

The right femoral head diameter is 45.5 mm.

The inhumation was of a primary type with the body being fully extended and the head turned to the left side, facing southwest.

Burial #4:

This is a single skull of an adult female aged approximately 32-35 years (Bass, 1971; Krogman, 1973). The cranial vault is smooth and gracile, with sharp orbital borders, small mastoids, and slight temporal

lines on the frontal bone. The basilar suture is closed, and the teeth exhibit heavy dental attrition and a supernumerary maxillary second premolar.

The inhumation was of a secondary type.

Burial #5:

This is a secondary bundle burial of long bones which appear to be those of an adult female. There are large septal apertures on both humeri. The bones are thin and gracile in appearance. The measurements which could be taken are:

right femoral head diameter.....40.5mm

left femoral head diameter.....40.0mm

It is felt that Burials #4 and #5 are the same individual, although they were slightly separated spacially.

There was no discernable pit outline for any of the burials except Burial #1. Burials 2, 3, 4, and 5 appear to form a distinct cluster as if they had been interred simultaneously. They were positioned angularly in a southeast/northwest orientation.

VITA

Mary Cassandra Hill was born in Tuscaloosa, Alabama on June 1, 1951. She attended elementary school and high school in Moundville, Alabama and graduated from Hale County High School in 1968. The following June she entered the University of Alabama, and in May, 1972 she received a Bachelor of Arts degree in English, with a minor in French. In September, 1973, she entered a graduate program in anthropology at the University of Tennessee in Knoxville.

After completing a year of thesis research in Alabama, during which she received a diploma from Druid City Hospital as a surgical technician, she accepted a teaching position as instructor in physical anthropology at Wake Forest University in Winston-Salem, North Carolina in September, 1976. The following year she held the position of Coordinator of Education for the Museum of Man at Wake Forest University. She was a guest lecturer in paleopathology for the University of Alabama School of Nursing in July, 1978. She is presently conducting research on the skeletal material excavated for the Gainesville section of the Tennessee-Tombigbee Waterway by the University of Alabama.

She received her Master of Arts degree from the University of Tennessee in March, 1979.

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