AN OSTEObIOGRAPHICAL ANALYSIS OF THE FOSCUE PLANTATION BURIAL VAULT, POLLOCKSVILLE, JONES COUNTY, NORTH CAROLINA

By
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August 2011

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In 2010, an early nineteenth-century vault was excavated on Foscue Plantation in eastern North Carolina as part of an ongoing archaeological research project. According to historical records, three individuals were interred in the vault, Simon Foscue, Sr., Simon Foscue, Jr., and his wife Christiana “Kitty” Rhem Foscue. The lack of research on elite nineteenth-century rural populations in eastern North Carolina meant that remains recovered from the vault could provide valuable information on their life histories beyond historical documents, including health, diet, disease, and burial practices.

Excavation of the vault in fact revealed nine individuals: 1 adult male and 4 adult females, a 3 year (± 12 months) old child, and three preterm fetuses, two of which likely were twins. The estimated age of the fetuses suggests that one of the young females interred may have died eight months pregnant. With the use of historical sources and biological data, three of these individuals have been tentatively identified. The absence of some individuals in the vault could have been the result of later internment in the vault during a period of poor record-keeping or undiscovered records. Initial paleopathology analysis indicates that the childhood and adult health of these individuals is notably better when compared to slave and free landowning individuals in other areas of the Eastern seaboard. Stable carbon and nitrogen isotope analysis provide further insight into rural antebellum diets. The detailed osteobiographies presented in this study, along with the historical documents, provide a renewed picture of a cross-section of a rural plantation-owning family in eighteenth- and nineteenth-century eastern North Carolina.
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POLLOCKSVILLE, JONES COUNTY, NORTH CAROLINA

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Master of Arts, Anthropology

By
Melinda Seeman
August 2011
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CHAPTER 1: INTRODUCTION

Several prominent plantations such as King, Hope, Somerset and Foscue represent eastern North Carolina’s important role in America’s antebellum agricultural industry. These plantations have been the subject of research, both archaeological and historical, to better understand the role each played in shaping coastal North Carolina’s history (Buck 1999; Joyce 1998; Madsen et al. 2002; Penny 2003; Phelps 1980; Seifert 2006). Much of current plantation research has focused on understanding the estate’s spatial layout or the disenfranchised slaves that were the backbone of each plantation. However, little research has focused on understanding the plantation owner’s lives beyond the historical documents recording financial transactions, wills and probate inventories.

In addition, skeletons of eighteenth and early nineteenth century high-status individuals associated with these plantations are the least-studied burials from that time period. Most bioarchaeological studies have focused on the burials of rural poor populations, slaves, and tenant farmers (e.g., South 1979; Rathbun 1987; Little et al. 1992; Bellantoni 1997; Slaughter 2001; Mainfort and Davidson 2006; Matternes and Gillett 2010). Very few historical and biological archaeology projects have focused on understanding the life histories of the elite as represented through their skeletal remains. The Foscue burial vault allows for the investigation of the remains of a known plantation owning family who held a high social and economic status in Craven (Jones) County, North Carolina community.

Although Foscue Plantation is one of the best-documented plantations in North Carolina, excavations have shown that the documents cannot reveal all there is to know
about the plantation. According to the National Historic Register Nomination for Foscue Plantation (Hood 1997), three of the original owners of the plantation were recorded to have been interred in a vault near the original house: Simon Foscue, Sr. (1734-1814), Simon Foscue, Jr. (1780-1830), and his wife Christiana “Kitty” Rhem Foscue (1779-1853). However, excavation of this vault recovered three times the number of people originally thought to be housed in the vault. This discrepancy indicates the incompleteness of the historic record and provides an opportunity to display the importance of historical bioarchaeological investigations. Such investigations can either support, or in the case of this project, correct historic accounts. They also raise additional questions, regarding the historical and social context that resulted in six of these individuals being absent in the family burial records. In addition, through the synthesis of biological and historical data, this project allows for a better understanding of the life histories of elite eastern North Carolina antebellum plantation owners. These “osteobiographies” provide individualized reconstructions of health, disease, and behaviors that would have impacted the skeleton throughout a person’s life.

**Osteobiographies**

One of the primary goals of bioarchaeology is to reconstruct the behaviors and lifestyles of past populations through the study of their skeletal remains within their archaeological and historical context (Pearson and Buikstra 2006: 207; Smith 1991). Whereas bioarchaeologists look for broad patterns in the skeletal data and attempt to define subgroups on a population level, the osteobiographical approach is focused more on creating life histories for a single individual that can later be expanded to make inferences on a population level (Buikstra 2006a). Osteobiographical studies have
concentrated on providing both individual and population histories of past peoples, far beyond what the material remains can articulate. Osteobiographies give a voice to the individual and work well with smaller sample sizes. Constructing osteobiographies for historic burials will add to a more complete understanding of the biocultural history of elite coastal Carolina agricultural families.

Goals and Objectives

This project had several objectives that together will create a strong historic and biological investigation of the Foscue family burial vault. The first goal of this project was to recover the remains in the Foscue family burial vault located in the “vault field” area of the plantation. The next objective was to reconstruct past lifeways through skeletal analyses, which includes paleopathology, demographic assessment, isotope analyses, and bone mineral density scans. Paleopathology will give insight into life histories by displaying past injuries, diseases or activities that may have adversely affected the bone. The isotope analysis will give insight into the diet of the antebellum Foscue family. Bone density scans will augment health analysis of the individuals by analyzing the amount of bone mineral present in the long bones. This will enable us to understand how susceptible historic populations, especially the elite, were to osteoporosis. Using the skeletal and artifact data, detailed osteobiographies of the recovered individuals can be constructed to better understand rural North Carolina elite lifestyles in the early part of the nineteenth-century.
CHAPTER 2: BACKGROUND

Historical Background

Foscue Plantation is located southwest of New Bern in Jones County, North Carolina. It is situated 9.7 miles from Tryon Palace, the former residence for the Governor of North Carolina. The property is surrounded on its eastern border by the Trent River, its northern border runs to Scott Creek and to the west the main house of the property is along US 17 (Figure 1). Foscue Plantation is one of the most well-documented nineteenth-century eastern North Carolina plantations and is an ideal archaeological site for several reasons: the plantation was in use for an extensive period of time, it has remained in the family for eight generations, and there is access to the property with the full cooperation of the current owner and descendant, Jim Foscue, who is an avid supporter of all archaeological endeavors on his land.

The pivotal role that North Carolina played in the production of naval stores in the United States, such as turpentine and tar, is reflected in the state’s nickname of the “Tar Heel State.” Because of the fertile soil found in North Carolina, the state historically been responsible for producing agricultural products such as cotton and tobacco for both local and trade consumption. Foscue Plantation was a leading producer of naval stores and cash crops in the eighteenth and nineteenth centuries, in addition to providing produce for those living in close proximity to the plantation (Outland 2004: 2-3; Seifert 2006). The Foscue Family and the property they owned were important to the economic success of Jones and Craven counties.
In ca. 1625 the first ancestor of the Foscues, Symon Fortesque, immigrated to Virginia from England. The family relocated to Hyde County, North Carolina from Virginia in 1704 and then again to Jones County in 1751, which at that time was still part.
of Craven County (Harriett 1987: 134). The Foscue family has a long history in eastern North Carolina as an elite farming family beginning with the family’s patriarch, Simon Foscue, Sr., who established the original 450-acre plantation in what is now Jones County. Simon Foscue, Sr. passed his legacy through 12 children from three separate marriages. Simon Foscue, Jr. was the first son from his second marriage to Nancy Mitchell (Humphrey 2002; Hood 1997: 8-21) and the heir apparent. After Foscue Sr.’s death in 1814, Simon Foscue, Jr. took over control of the Foscue property and the running of the plantation. Hood (1997) reports that Simon Foscue, Sr., although living at a different plantation at the time of his death, was buried in the burial vault on the property then owned by his son, Simon Foscue, Jr.

I have included two different family trees (Figures 2 and 3) based on data synthesized from Smith-Foscue and Kin (Humphrey 1985), and two Foscue family bibles dating from 1832 and 1870. These genealogical trees serve to clarify the family members discussed in this study. The family trees follow the resulting children and grandchildren from Simon Foscue, Sr.’s second marriage with Nancy Mitchell, because this marriage resulted in the birth of Simon Foscue, Jr., who succeeded his father in Foscue Plantation ownership. Property in this time period was passed down from one male heir to another (Volo and Deennen Volo 2004). Those born of this line are the ones with the most potential to have been buried in the vault. There are conflicting data between the three genealogical sources, Humphrey’s compilation of family trees and the two family bibles, known to exist. The two most drastic differences occur in conflicting information concerning birth dates. In addition, a child of Simon Foscue, Jr.
Figure 2. Family tree according to the Humphrey (1985).
Figure 3. Family tree based on the 1870 and 1832 (*) Foscue family bibles
and Christiana Rehm, Daniel, is mentioned by Humphrey but is not mentioned in either family bible.

There are limitations to the historical research available for this project. Many of the sources rarely discuss individuals beyond everyday purchases or letters between the men discussing business matters. Of the historical sources that do discuss the people, they are either inventories, such as census accounts, or second hand sources, written by family members or hired historians. The lack of consistency between the sources makes the tasks of identifying individuals from the vault more difficult. Perhaps the reason for so many lacunae existing in the genealogical information may be due to the quantity of females in the Foscue family. Their names and stories may have been lost with the passing centuries as a result of historic gender roles and biases (Kennedy 2010).

After inheriting the sizable estate left to him by his father in 1805, Simon Jr. continued to buy land around Jones County, expanding the property to nearly 2,778.5 acres. In addition he constructed the first two-story brick plantation house with a basement in Craven (now Jones) County between 1821-1825, as shown from documented family receipts (Sandbeck 1988; Hood 1997; Seifert 2006: 26-27). In addition to his responsibilities as a plantation owner, Simon Foscue, Jr. also began to participate in public affairs, serving as Justice of the Peace for Jones County in 1813.

Somewhere between his busy public and work life he found time to devote to his private life, marrying Christiana “Kitty” Rehm in 1801 (Hood 1997: 8-21- 8-25). Kitty and Simon, Jr. had seven children together, including their son John
Edward Foscue, who would later inherit the property and continue the family’s agricultural tradition. If the child named Daniel (Humphrey 1985), was actually born they would have had eight children together. However, there are no other family or historic documents that mention this child and his existence as a member of the Foscue family is left undetermined. Simon Foscue, Jr. died on December 10, 1830 followed by his wife Kitty on June 15, 1853. It is reported that they were both buried in the brick burial vault on the property with Simon’s father (Hood 1997). According to the historical record, only three family members, Simon Foscue, Sr., Simon Foscue, Jr., and Kitty Rehm Foscue, were interred within the vault.

Life in the early part of the nineteenth century was difficult, even for elite plantation owners, especially for tenant farmer and enslaved populations. The social and economic status held by elite plantation owners allowed them access to better food resources and medical care than other people during this time period. These advantages have been documented in both the mortuary practices and skeletal remains excavated from the Anglo-American cemetery in Manassas, Virginia, however, this cemetery dates later than the Foscue burial vault (Little et al. 1992). Other bioarchaeological studies of skeletons from this time period have focused on populations of both African American black and European white men, women, children from almshouses, poor tenant farmer, and slave cemeteries from the eastern seaboard (Thomas et al. 1977; Bell 1980; Rathbun 1897; Lanphear 1990; Owsley 1990; Elia and Wesloskey 1991; Steegman 1991; Pfeiffer et al. 1992; Sutter 1995; Slaughter 2001; de le Cova 2011). The
synthesis of these skeletons and historic documents have shed light on early American lifeways in the early part of the nineteenth-century.

In general, medical care in the early part of the nineteenth century was performed at home by women and for those who could afford it by a local doctor (Leciercq 1996, Davidson 2005). Epidemics such as Yellow Fever, Malaria and Cholera were frequent during this time in American history (Volo and Deennen Volo 2004). Death was something dealt with in a somber manner and was not an uncommon occurrence in the early part of the nineteenth-century. In the South men and women were buried according to simple Christian burial practices (Thomas et al. 1977; Bell 1980; Haberstein and Lamers 1981).

Much of the pre-Civil War southern planation economies were dependent on slave and tenant farmer labor for their continued success (Volo and Deennen Volo 2004; Hudson 2011). As a result, the plantation aristocracy were rarely involved in heavy labor activities. The bones of tenant farmers and slaves from the early part of the nineteenth-century display high amounts of non-specific indicators of stress, such as cribra orbitalia, suggesting that they were highly anemic (see Rathbun 1987; Sciulli and Gramly 1989; Slaughter 2001). They also show skeletal pathologies consistent with hard mechanical stress being applied to the bones, regardless of sex. This appeared as heavy degenerative changes in the shoulder and hips and Schmorl’s nodes primarily in the vertebrae of males. In addition many tenant farmers and slaves displayed many broken bones in varied stages of healing.
Dental health in the early nineteenth century was relatively poor, especially for those of lower social and economic standing. Most adults by the age of 40 were missing over a third of their teeth or they suffered from severe tooth decay (Phillips 2001). In general, a high quantity of caries and dental enamel hypoplasias (DEHs) were present in all populations, regardless of socioeconomic standing (Thomas et al. 1977; Rathbun 1987; Sciulli and Gramly 1989; Little et al. 1992; Bellantoni et al. 1997; Saunders et al. 2002). Caries were the result of a combination of the diet being consumed and lack of dental health care. DEHs were the result of childhood development stress. The metabolic stresses that cause DEHs to form include nutritional deficiency, fevers and infectious diseases (Rose and Goodman 1990; Hillson 2008). They are most common during the period of weaning, which historically in lower socioeconomic populations during the antebellum period occurred between 2.5 to 4 years (Lanpher 199-:39). However with the common nature of epidemics in this time period and could also leave their mark on skeletal remains if survived.

Dental caries are more apparent in agricultural peoples, especially those consuming large amounts of sugars and/or carbohydrates and meat (Navia 1994; Lingström et al. 2000; Hillson 2008). Diet in the early nineteenth-century varied due to seasonal availability. Grains, corn, and meats could be stored and lasted much longer than fresh vegetables and fruits, especially during the winter months. Pork was the most common meat consumed in the early part of the nineteenth-century, especially in the South. A variety of vegetables were
consumed in season and often dried and stored to keep over colder months (Volo and Denneen Volo 2004).

Dentistry did not emerge as a true profession until 1840, when the Baltimore College of Dental Surgery opened (Ring 1985). Prior to this date, dental care was either self-performed, or practiced by local blacksmiths or doctors, who often remedied the situation by tooth extraction. Toothbrushes were not a readily available item and those who practiced dental health care at home did so through tooth polishing. Tooth polishing has been observed only at St. Mary’s City colonial site in Maryland. Tooth cleaning, polishing and whitening was done through the use of abrasives to remove tartar from the teeth (Mattick 1994). The remedies used to accomplish this dental cleaning utilized acidic and abrasive ingredients, such as salt, vinegar or tobacco ashes. These various ingredients were rubbed onto the teeth with a cloth, as toothbrushes were not popular until after 1850. This abrasive polishing practice had negative effects on the enamel of the teeth (National Museum of Natural History 2011). Gold fillings were first used in America circa 1800 and became most popular during the Civil War, and were celebrated as the best filling material available at the time (Glenner and Willey 1998).

Women lived within southern patriarchal social systems where gender, race and class shaped their worlds. Plantation-owning men tended to dominate public matters concerning property, court or legal matters, and business. Antebellum women, especially in the South, tended to keep to the private sphere of the household (Fox-Genovese 1988; LeClercq 1996; Davidson 2005). While
the lives of women and children, even those from elite families, have continued to remain less visible within the historic record, they still could have been active contributors to the plantation household. Women, especially plantation mistresses, were responsible for maintaining the household, which included many tasks from overseeing the slaves to picking out china. More importantly women were also responsible for birthing and raising their children (Boswell and McArthur 2006). While women of plantation household were essential in shaping the Antebellum South, the historical data about their roles are limited.

It appears that women’s role as bearers of children increased their chances of dying during young adulthood compared with males. The age range of 20-45 is a life stage generalized by increased mortality for women due to pregnancy-related complications, especially in the nineteenth century. For the mother, pregnancy-related complications included difficulties during labor or subsequent infections after birth (Kennedy 2010). These complications could lead to death of the mother. The infant was equally at risk during the process of labor and the time period just afterwards, and infant mortality was commonplace in the nineteenth-century (Saunders et al. 2002). One in every six infants would never make it to the age of one (Larkin 1988: 75-78). For Caucasians in the early part of the nineteenth-century, one in five children would not survive to reach the age of 21 (Larkin 1988: 75; Bartlett 1994:108). For children who did make it past this precarious time period the next couple years until weaning were fairly safe. Elite plantation owning women had adequate care and resources that allowed
them to extend birth intervals by extending the time for breastfeeding (Kennedy 2010), thus reducing chances of mortality.

**Previous Archaeological Research**

Previous archaeological investigations on the Foscue Plantation site began in 2006 when Craven County Community College (CCCC) initiated a field school for their students on the property. CCCC requested the assistance of the Anthropology department at East Carolina University (ECU) and a cooperative project ensued. The first venture consisted of a shovel-test survey of portions of the planation under the direction of ECU grad student, Laura Seifert. Her initial investigations at Foscue resulted in a management plan for subsequent archaeological research of the site (Seifert 2006). Cooperative field school projects between ECU and CCCC have continued, focusing excavation in the part of the site known as the “vault field” (Hood 1997: 7-3). This sector is named for the brick burial vault located in this area (Figure 4). The field schools have allowed students from the community college a chance to learn excavation methods while giving ECU graduate students the opportunity to gain experience in teaching students in the field and gather data for M.A. thesis projects. CCCC excavations have focused on a structure just north of the deteriorated burial vault, noted on Figure 4 by the dark areas of artifact concentration. The artifacts recovered in these areas of concentration included large amounts of brick (n=99), dark green glass fragments (n=3), and both pearlware and creamware ceramics (n=22) (Seifert 2006: 72). While the focus of subsequent field schools that have continued to excavate in this area have identified the structure found within as
possibly the original plantation house, the deteriorated burial vault itself had been neglected (Figure 5).

Much of the archaeological investigation of Foscue Plantation has focused on understanding the site’s layout and possibilities as an important cultural resource for Jones and Craven counties. Research into Foscue Plantation has
helped identify it as a historically significant site when trying to understand the growth and development of both Craven and Jones counties. The project is focused on documenting the architecture, artifacts and skeletal remains of the vault to provide a picture of an elite family in eastern North Carolina. The goods produced at the plantation contributed in creating a strong community in the early years of Craven County. It was the ownership of a large plantation and participation in public affairs that earned the family notoriety, power, prominence and an elite social and economic status within Craven County.

Figure 5. Deteriorated Foscue burial vault as it appeared at the time of excavation, facing east.
The Development of Bioarchaeology and Osteobiographies

The history and development of physical anthropology can be divided into two phases, which correspond temporally with the transition of paradigms within the discipline. The first phase dating mainly to the eighteenth and nineteenth century was based in the antiquated paradigm of polygenism, or the idea that different races had different evolutionary lineages. During this time period researchers were more concerned with developing typologies to better understand the nature and implications of human variation (Buikstra 2006b; Smith 1993). During the nineteenth century, comprehensive studies of skeletons from archaeological sites were few and far between. Human skeletal remains were placed in inventory lists and the wealth of data they could provide to the archaeological investigation was overlooked. Data from human skeletal remains were rarely incorporated into archaeological reports; instead they were often placed in inventory lists in the appendices of these studies. When skeletons were discussed as part of the research objective in reports only specific elements were analyzed for significance. Early nineteenth-century researchers were typologists and their approach to skeletal analysis was generally descriptive and performed in an attempt to develop a classification system of skulls and skeletal anomalies.

This can be seen in the numerous craniology studies dating to this period (Cook 2006). All of the scientists performing skeletal studies were either physicians or anatomists and were not concerned with the archaeological context of the skulls (Pearson and Buikstra 2006). The most well known of these studies was the 1839 *Crania Americana* written by Samuel G. Morton (Smith 1993). In
his study of various crania, Morton attempted to determine whether racial affinities could be estimated by skull measurements. His study of racial patterning of skulls, ironically discredited the “moundbuilder” myth, proving that those that had constructed the mounds were Native Americans (Cook 2006: 35). Morton’s study was highly influenced by the contemporary thinking and later scholars have looked on his work as scientific racism.

The importance of skeletal data was truly realized as paradigms shifted in the twentieth and twenty-first centuries. Earnest Hooton and Sherwood Washburn greatly impacted physical anthropology in the early to mid-twentieth century. Hooton is considered one of the founding fathers of bioarchaeology. In his 1930 study of Pecos Pueblo he highlighted the importance of understanding how cultures change over time, through the incorporation of skeletal studies with archaeological context (Beck 2006; Pearson and Buikstra 2006). Beginning in the 1950’s Washburn (1952) developed a new biological anthropology paradigm that was more concerned with studying what the skeletons said about a population rather than just developing typologies. Shortly after, Saxe and Binford developed theories that social behavior could be related to mortuary patterning (Saxe 1970; Binford 1971). These new studies led a renewed interest in mortuary studies and to the application of a more biocultural approach to the study of human skeletal remains (Rakita and Buikstra 2005; Smith 1991).

The formal research approach now known as bioarchaeology began fairly recently. In 1977, in the publication of Biocultural Adaptation in Prehistoric America, Buikstra officially coined the term “bioarchaeology” (Blakely, ed. 1977;
Jane Buikstra (1979), who spearheaded the biocultural movement, stressed four biological categories to which skeletal information can contribute. These include biological relationships, cultural funerary behavior, nutrition and pathology, and population demography. The evolution of biological anthropology paradigms aided in the recognition of the importance of analyzing human skeletal data in archaeological context to develop more holistic understandings of past cultures (Pearson and Buikstra 2006: 207; Smith 1991).

Bioarchaeology as an outgrowth of this approach is unique because it combines two subfields of anthropology: archaeology and physical anthropology. Bioarchaeology owes its prominence in the latter half of the 20th century to previous researchers in both archaeology and physical anthropology that recognized the significant stories human remains can tell about past populations when contextually analyzed. This maturation of bioarchaeology and osteobiographies utilizes new methods and techniques to create more holistic anthropological investigations.

During the 1970’s another new approach to the study of skeletal remains also developed, called an osteobiography. The method of constructing osteobiographies follows previous research done by Krogman (1935), who was interested in developing life histories for populations and individuals. Frank Saul (1976) was the first to use the term to describe the analytical methods that can be applied to human remains in order to reconstruct past lives of both the individual and population. Osteobiographical studies represent the advancement in skeletal research methods that goes beyond previous typological thinking.
(Isçan and Kennedy 1989: 8). The osteobiographical approach, like bioarchaeology, is explicitly problem-orientated. The overlying goal of osteobiography is to not only describe the remains but also ask broad individual questions: “Who were they? What can be said about their ways of life?” (Williamson and Pfeiffer 2003:163). The data recovered from individual skeletons can give great insight into the human existence including genetic and familial affinities, subsistence activities, biocultural evolution, disease and epidemic information, population demography and socioeconomic status (Blakely 1977; Goldstein 2006: 376; Rathbun 1986; Robb 2002). Whereas bioarchaeologists look for broad patterns in the skeletal data and attempt to define subgroups on a population level, the osteobiographical approach is focused more on creating life histories for the individual that can later be expanded to make inferences on a population level (Boutin 2011; Buikstra 2006a; Fleming 2009). Osteobiographies work well with smaller samples and provide a voice for the individual within a particular site.

Applying the osteobiographical approach to the Foscue site will give insight into the people far beyond the stories the material remains and structures alone may tell. There are no nameplates or funerary plaques identifying who was housed within the vault. This lack of information facilitates the biggest research question of this project, “who exactly is buried here?” The only evidence available came from family stories, records, and the NRHP nomination documents. Beyond identification of those housed within the vault, the remains can answer questions concerning who exactly the Foscues were in eastern North Carolina.
history. The evidence from their bones can give clues to establishing not only a better understanding of the family, but also a clearer picture of early agricultural lifeways in antebellum America. The bones excavated from the vault will help answer questions concerning health, lifestyle, burial patterns and customs, and historic burial taphonomic processes.

**Developing an Osteobiography**

To construct an osteobiography, the biological profile of an individual is synthesized with contextual archaeological data to produce a more holistic reconstruction of past lifeways. Biological profiles of an individual include information concerning sex, age, stature, ancestry and any pathologies or diseases present on the bones. This information is helpful when attempting to reconstruct a person’s life. It is important to first understand how these biological profiles are developed from skeletal remains.

Humans are sexually dimorphic, meaning that there is considerable variability in the skeletons of males and female. In general, the main sex differences are in robusticity, where males are generally larger (Bass 2005). Sex can only be accurately estimated for adult skeletons (Rathbun 1987). Sex estimation of skeletal remains is most reliably performed by analyzing the os coxae, or pelvis, and cranial morphology. Sex estimation of the os coxae is based on various features; including the pubis, auricular area, ventral arc, the subpubic concavity, ischiopubic ramus ridge, the greater sciatic notch, and the preauricular sulcus (Ubelaker 1978; as modified by Buikstra and Ubelaker 1994). When these features are taken together they can accurately score the pelvis as
male or female. Although not as accurate as the pelvis, the cranium can also be used to determine sex. The results from the cranium can be used to compare the results of the pelvis, if both are present and intact. The features analyzed for sex on the skull include: the nuchal crest, the mastoid process, the supraorbital margin, prominence of glabella, and the mental eminence (chin) (as modified by Buikstra and Ubelaker 1994). These features are scored and together produce an 80% accurate estimate of whether it is male or female (Rathbun 1987). Other elements from the post-cranial skeleton can be used to sex, but are less accurate and are not generally used unless there are no other options. FORDISC software can also be used to estimate sex of an individual based on cranial and post-cranial measurements (Ousley and Jantz 2005).

Age estimation of the skeleton is based on the prognosis of growth and development on various elements, as well as deterioration of the bone. For estimating age at death elements such as teeth, the pelvis, the cranium and long bones can be analyzed. Studies of known skeletal samples showing the morphological changes that occur during the various stages of growth and development in these elements have identified standard ages when these changes are known to occur. Comparing archaeological skeletal data with the standards of growth stages that have been established from these studies can be helpful in determining age (Ubelaker 1978). Subadult remains can be aged without knowing the sex, but adult skeletal degeneration varies due to sex and thus different standards have been established for males and females (Rathbun 1987).
The principal changes that can be observed to estimate the age of adult skeletons include the morphological changes of the pubic symphysis and auricular surface of the pelvis and suture closures of the cranium (Ubelaker 1978; modified by Buikstra and Ubelaker 1994). To estimate age from the morphological changes of the pubic symphysis and the auricular surface the two well-tested methods were used and compared: the Todd and Suchey-Brooks systems (Lovejoy et al. 1985; Buikstra and Ubelaker 1994). Most often an individual’s skeletal age and actual age may not match. Accuracy of aging depends on the elements available, analytical methods, and individual variation in health and other aspects of behavior.

Estimating the living stature of an individual from dry bones is dependent upon the correlation of long bone lengths to body height. Karl Pearson was the first to use mathematical regression equations to publish a series of formulae that can be used to estimate stature. Trotter and Gleser (1952) built upon Pearson’s technique and established the most commonly used and reliable stature estimation tables for American Whites and Blacks. Many of these stature studies derive their formulae from measurements from known skeletal samples. One must use the appropriate formulae when determining stature, because the relationship between long bone lengths and stature varies due to sex and population genetics. Stature can give insight into population adaptations on the genetic level, as well as other non-genetic factors that may affect height, for example, stress, social status, and diet and nutrition (Rathbun 1987). For instance, once the sexual dimorphism within a population is understood, the size
differences between males and female may be a significant indicator of who had
access to resources and to the work capacity of each sex. FORDISC software
uses cranial and post cranial measurements to estimate stature, in addition the
software also displays the height estimation of an individual against other
comparative skeletons dating from the same time period (Ousley and Jantz
2005).

Race is often considered a social construct in anthropology, however it
can be a useful tool in further identifying individual skeletal remains. Assigning
biological race is a difficult task because individuals cannot easily be categorized
into distinct racial categories. Some cranial traits correspond with geographical
origin or ancestry (Sauer 1992). Forensic anthropologists have identified three
main racial estimate groupings that can be successfully identified using
frequency of morphological features and mathematical equations: Asians and
Several cranial morphological features can be used when analyzing to establish
race; cranial sutures, nasal shape, size and form, dentition, the shape of the
palate, the shape of the eye orbits, shape of the mastoid, the shape of the
mandible and mental foramen, and the amount and area of prognathism in the
face (Gill 1998). Metric measurements of the cranium can be used with the
FORDISC software to aid in identifying race based on various racial formulas
(Ousley and Jantz 2005).

Pathologies found on skeletal remains can be indicators of activity, diet
and nutrition. Pathologies are important nonmetric variations that distort normal
bone features. A suite of pathologies can be unique to each person and it allows that specimen to tell its own stories. From these life histories, general inferences can be made about health and lifestyle of the individual and the population.

Patterns of behavior appear on the skeleton in various pathological forms, including osteoarthritis (OA) and fractures (Ubelaker 1978). OA is affected by several factors: including, genetic, mechanical activity, age, hormonal and chemical changes in the body. Osteoarthritis (OA) on the bones at the joints and on the vertebral column are the most common diagnosed skeletal pathologies. The presence of OA has been utilized to infer activity patterns on the skeleton, with various limitations (see Jurmain 1999). Osteoarthritis can be classified into two categories: idiopathic or secondary (Jurmain 1999: 15). Idiopathic means that the OA is present, but there are no direct factors to explain its presence. OA occurring in this form can be localized to a certain joint area, or generalized, affecting more than three joint areas. Secondary OA can be the result of either a traumatic episode, or a congenital, endocrine or calcium disease. OA can be observed on the bone in three different forms: porosity, osteophytes, or eburnation (Jurmain 1999). Osteophytes are bony growths that form on the joint surface or margins or joint and eburnation is when the bone appears to be polished. Because OA is so commonly diagnosed, compounded by the fact that bone only reacts in so many ways to disease (growth or deterioration), there can be problems that occur with pinpointing exact behaviors that cause osteoarthritis. However, recent studies of known collections in addition to ethnographic comparisons with living populations have been helpful to understanding the
appearance OA in certain areas of the body and how these can be connected to certain behavioral activities.

Although not all diseases affect the skeleton, some traces of infections and chronic diseases can be present in the bone. These can include bone infections, tuberculosis, syphilis, tumors, congenital disorders, thyroid diseases and anemia. Osteoporosis, the thinning of bone tissue with the loss of bone density, can be readily identified on skeletal remains. Osteoporosis can result from lack of adequate calcium or vitamin D in the diet, low activity, or the natural process of aging (Marcus and Bouxsein 2008). Diagnosis of osteoporosis can be accomplished through both macroscopic observations of the bone and through the use of bone mineral density scans. Cultural pathologies may also be identified from the skeleton. Some of the most well known examples of these are known are trephination or the artificial deformation of the cranium (Ubelaker 1978: White and Folkens 2005). These cultural pathologies give insight into more than just the health of the individual, but also what medical treatments were practiced within their community.

Poor nutrition and diet can leave their mark on the skeleton, especially on teeth, which are crucial in nutrition and dietary reconstructions of past peoples. Indicators of diet and nutritional stress periods can be seen in the form of Harris lines, dental wear, asymmetry, and hypoplasia. Dental enamel hypoplasias (DEH) are deficiencies in the thickness of the enamel that occur during development from birth to about ten years old during the mineralization of the enamel (Ubelaker 1978). Generally these hypoplasias appear on the enamel
surface as linear striations. Enamel hypoplasias are used as non-specific indicators of stressful periods in an individual’s life. Studies on past populations with DEHs present on the enamel have shown that these lines can be associated with specific developmental ages, which is helpful in identifying when a period of diet or nutritional stress may have occurred. This is done by determining the distance the linear enamel hypoplasia is on the tooth from the cementoenamel junction (Goodman and Rose 1990). Dental abscesses and caries are also good indicators for health of a population and the availability of healthcare. Dental caries are more common in agricultural populations, as opposed to hunter-gather populations that display more dental attrition (White and Folkens 2005). The frequencies of caries apparent in a population may be a result of the types of foodstuffs being consumed. In populations where high carbohydrate diets are the norm (e.g. corn) dental abscesses and caries will be more common.

Recent technological innovations in biochemistry have allowed for the analysis of stable isotopes found within the collagen of bone and teeth to reconstruct prehistoric and historic diets. Isotopes are chemical elements that share the same number of protons and electrons, but differ in neutrons (Larsen 1997: 271). Both childhood and adult diets can be ascertained using stable isotope analysis, specifically carbon and nitrogen. The differences that occur in bone composition of carbon and nitrogen isotopes in human bone reflect the same differences found in the composition of the types of food consumed (DeNiro and Epstein 1978; Schoeninger and DeNiro 1983; Schoeninger 1989; Bocherens et al. 1991). By understanding the composition of the skeletal tissue
of bone the human can be placed back into the food web at a particular trophic level, from which a better understanding can be made about what types of foods they were consuming (i.e. grazers eat plants, carnivores eat grazers, and humans eat both). Bone is constantly reforming itself; as a result the samples of carbon and nitrogen taken from bone and dental dentin will reflect adult diet. By comparing the ratios of stable carbon ($\delta^{12}\text{C}$ and $\delta^{13}\text{C}$) and nitrogen ($\delta^{14}\text{N}$ and $\delta^{15}\text{N}$) isotopes present in the skeleton reconstruction of past diets can be achieved.

Isotope ratios can also be affected during the weaning process or if the individual is suffering from osteoporosis. In this food chain, a nursing infant would be at an even higher level than the mother because they are getting their nutrition from the human (Larsen 1997: 284). Therefore their isotope values, specifically nitrogen, tend to be higher during this time period. After weaning the child’s nitrogen ratios will gradually reduce and match those of surrounding individuals. Studies have proven that the physiology of the bone also has an impact on nitrogen isotope values. White and Armelagos (1997) found that women suffering from osteoporosis had higher $\delta^{15}\text{N}$ values than normal men in the population. Additional factors must be taken into consideration when interpreting the ratio of either carbon or nitrogen isotopes: such as, age of the skeleton, condition of the bone, regional and cultural variations in diet, as well as available foodstuffs.

Stable isotope samples are compared on mass spectrometer equipment and reported according to international standards established by the National Bureau of Standards and the International Atomic Energy Agency. These
standards were put in place in order to normalize the data produced so that it may be comparable between all labs. The mass spectrometer is used to compare the stable isotope ratio in the sample collected with the stable isotope ratio in a standard (Katzenberg 2008:422; France et al. 2007: 274). The reported ratio values are then reported as delta (δ) values in the permil (‰) (Katzenberg 2008: 422). Reported sample isotope ratios use the standard notation:

\[ \delta \text{ in } \% \text{oo} = \left( \frac{R_{\text{sample}} - R_{\text{standard}}}{R_{\text{standard}}} \right) \times 1000 \]

where \( R \) = the ratio of heavier to lighter isotopes. For nitrogen isotopes \( R = ^{15}\text{N}/^{14}\text{N} \) and the standard is atmospheric nitrogen (AIR); for carbon isotopes \( R = ^{13}\text{C}/^{12}\text{C} \) and the standard is the Peedee belemnite carbonate (PDB) (DeNiro and Epstein 1981: 343; Mattey 1997: 160-1; France et al. 2007: 274). The varying isotopic ratio values produced from both carbon and nitrogen bone collagen samples provide identifiable differences between trophic levels within a persons diet. For nitrogen isotopes there is a \( \sim 3.0 \text{--} 4.2\% \text{oo} \) difference between each trophic level in a food chain (DeNiro and Epstein 1981; Schoeninger and DeNiro 1983; France et al. 2007). While carbon isotope values also displays a distinct change between trophic levels, this change is much smaller, only \( \sim 1\% \) (DeNiro and Epstein 1978; France et al. 2007). This smaller change makes it somewhat more difficult to identify subtle variations that may occur in the diet of a certain group.

**Research Hypotheses**

I expect that the osteobiographies presented here will depict a rural elite plantation-owning family whose lives were similar to descriptions found in historic literature describing life in the early part of the nineteenth century. The burial
vault will contain the skeletal remains of the three historically-recorded individuals (Hood 1997). The mortuary practices displayed will be according to historic mortuary norms of simple Christian burials seen in the antebellum South. Because of their high status within the community and the access to a variety of foodstuffs and medical treatment, the skeletal remains will be of healthy individuals who have low levels of non-specific indicators of stress, low instances of childbirth-related deaths and infant mortality, low skeletal indicators of heavy activity-related pathologies, such as osteoarthritis, vertebral osteophytosis, or skeletal trauma from injuries, and healthy T-scores based on the bone mineral density scans. The stable isotope values will depict a family group who was largely consisting of carbohydrates and meats and having little inter-individual dietary variability. In addition, their dental health will be better, but show similar patterning of pathologies, as other contemporary tenant farmer and slave agricultural populations.

These techniques for understanding the human skeleton will be applied in this study to develop detailed osteobiographies of those individuals excavated from the Foscue burial vault. Well-developed biological profiles of each individual will be constructed, and along with excavated material culture remains, will be synthesized with the historic record to develop lifehistories for one of the founding families of Craven and Jones counties.
CHAPTER 3: MATERIALS AND METHODS

The excavation and analysis of both the cultural and skeletal remains recovered from the Foscue family burial vault relied on a combination of physical anthropological, archaeological, and historical methods and data. This holistic approach to the material aided in developing a thorough understanding and identification of those interred within the vault.

**Excavation**

The location of the family vault on the Foscue Plantation grounds has always been remembered by both the Foscue family and nearby residents. As mentioned before, it was at the request of the current landowner and descendant, Jim Foscue, that this project was undertaken. Traditional American historical archaeology excavation techniques were utilized in this project (ECU Procedure Manual 2008). Accurate recording of the excavation was accomplished through the use of feature forms, burial forms, plan maps and photographic images.

Horizontal and vertical controls were used in excavating the vault. These two controls help in developing the sequences that were involved in creation of the vault and what events caused the vault to be in a disturbed state. All dirt excavated from the lowest zones, three and four, were screened through quarter-inch mesh screens. The vault was excavated in thirds to maintain horizontal spatial control of the human remains and provide a “clean” area from which to excavate, minimizing crushing of the skeletal remains. Initially, an exploratory test pit was excavated in the northwestern corner in order to better understand
the stratigraphy of the vault’s interior. In addition to interior excavations, the area immediately surrounding the vault was cleared to better identify the construction of the vault.

All cultural and skeletal artifacts found within the vault were recorded by zone and vault sector and taken back to the ECU’s archaeology laboratory. In the laboratory they were then cleaned by dry brushing. The artifacts and remains were then inventoried, analyzed and conserved, when necessary. Several artifacts were sent to be conserved under the supervision of Susanne Grieve, the director of conservation in ECU’s Maritime Studies Program. At the conclusion of the project the artifacts were returned to the Foscue family.

Comparative historic documents were consulted to aid in the identification of individuals found within the grave. These included two family bibles dating from 1832 and 1870 and a family compiled history entitled *Smiths-Foscues and Kin (1985)* compiled by a relative, Esther Payne Humphrey. Local census records from 1800-1850 were analyzed, along with several local newspaper sources with obituaries and the Foscue family papers at the UNC-Chapel Hill Library.

**Skeletal Materials**

The human skeletal remains used in this study were brittle and friable. The preservation and condition of the bones was inconsistent across the entire skeletal sample. The two oldest adult skeletons were in the most fragile condition, primarily due to their thinner bone cortices than the other remains. The remains of the three younger adults, young child, neonate and two fetal infants
were fairly well preserved. The general color of the bones is a yellow brown with no distinct staining. The bones displayed evidence of heavy root damage, but none had rodent or carnivore damage. Individual 4 had evidence of post-mortem bone damage from a chopping tool, which will be expanded on in the next chapter. The only modifications performed on the bone was the application of polyvinyl acetate (PVA) in an effort to reconstruct some of the skeletal elements and select bone pieces and teeth were drilled and/or crushed in an effort to obtain collagen samples for isotope analysis.

**Osteological Examination**

The skeletal remains were cleaned by dry brushing and inventoried in preparation for skeletal analysis at both ECU’s Bioarchaeology laboratory and at the Smithsonian Institution National Museum of Natural History (NMNH). The analysis of the remains included determining age, sex, stature, race and ancestry, nutrition, aspects of behavior, and pathologies. Data collection of these variables followed protocol outlined in Buikstra and Ubelaker’s (1994) *Standards for Data Collection from Human Skeletal Remains* in addition to Bass (2005), White and Folkens (2005), and Ubelaker (1978). FORDISC 3.1 computer software (Ousley and Jantz 2005) was used for the estimation of stature from the postcranial measurements taken from the remains and estimation of sex and race from cranial and postcranial measurements.

All bones were initially inventoried by field specimen number at the ECU laboratory. The inventory allowed us to establish the initial MNI of nine individuals, including 4 subadults and 5 adults. This count was based on the
initial inventory of the skeletal remains that revealed the presence of nine right femora within the sample.

**Sorting the Individuals**

As noted above, the bones excavated from the Foscue burial vault were entirely commingled and disturbed as shown in Figures 6 and 7. The photograph in Figure 6 depicts an area to the north of the central pillars, and the drawing in Figure 7 shows a continuation of the comingling to the south. Separating the commingled remains into individuals was accomplished in the Smithsonian laboratory under the supervision of Douglas Owsley and Kari Bruwelheide. The first step was to separate each bone by element (e.g. femur, tibia, ulna, os coxa) and side, left or right. The bones were then sorted based on differences in color, density, size, and preliminary age and sex assessment. Individuation of the remains also relied on the morphology of articulations and how well adjacent bones fit together. The bones of males and females are notably sexually dimorphic in this population, and thus most of the bones could be sorted easily by sex. However, the large number of relatively morphologically similar females made distinguishing the skeletal remains these individuals slightly more difficult. The four females could be separated into two groups based on age-related bone porosity and bone color. The two older women had very osteoporotic or osteopenic bones and were a darker color than the two younger women. The two older women were distinguished from each other by the density of their cortical bone and the slightly longer and more gracile bones of Individual 4 vs. Individual 5. The two younger women differed by the amount of wear present
Figure 6. Interior of the vault during excavation showing commingled remains and tree intrusion (photo to the S).
on their bones in addition to visually distinct morphological variation between the two in terms of gracility. Individual 3’s bones were longer and more gracile than Individual 2. The subadult remains were separated by stage of growth and length of bones for the child, fetal and neonate remains. Between the two fetal remains, there was a slight size difference between the long bones and innominate elements present that allowed for differentiation between the two. Individual 7 was slightly larger than Individual 8. In the end, not all of the bones could be associated with the nine individuals, in particular the ribs, hands, and
feet. These bones were assessed for pathologies and other anomalies, but were not considered in creation of the osteobiographies.

**Skeletal Inventory**

Once the individuation process was completed, the elements present in each of the nine individuals were inventoried. This section discusses the quantity, condition, and specific skeletal elements that were able to be associated to each individual. It is from these elements that upon which the skeletal analysis and interpretations were based.

Individual 1 has a nearly complete cranium, missing only part of the left and right palatines and hyoid. The post-cranial elements present include: partial left and right scapulae, complete left and right clavicles, a partial left innominate and a complete right innominate, a complete sacrum, one left rib (3-10), complete left and right patellae, complete left and right talii, a partial left calcaneus and fragmented right calcaneus, and complete left and right humeri, femora, tibiae, and fibulae. The middle ⅔ of the left radius, the proximal ⅔ of the left ulna, and the middle ⅔ of the right ulna are missing. All joint surfaces are complete except for the left acetabulum and the right sacroiliac surface on the innominates. The vertebrae associated with this individual includes a partial 1\textsuperscript{st} cervical vertebra, two partial thoracic (1-9) vertebrae, complete 2\textsuperscript{nd}, 3\textsuperscript{rd}, and 4\textsuperscript{th} lumbar vertebrae, and a partial 5\textsuperscript{th} lumbar vertebra.

Individual 2 had nearly a complete cranium, missing only the left and right palatine and hyoid. Post-cranial elements present include a partial right scapula, a complete right clavicle, complete left and right innominates, a partial sacrum, a
complete right patella, complete left and right talii, a complete right calcaneus, a complete left humerus, and complete left and right radii, ulnae, femora, and fibulae. The proximal ¼ of the left humerus and distal ¼ of the left tibia are missing. All joint surfaces are complete except the distal left radius and proximal left femur. The vertebrae associated with this individual include the 1st and 2nd and three (C3-C6) cervical vertebrae.

Individual 3 has a complete cranium missing only the right palatine and hyoid. Post-cranial elements include partial left and right scapulae and innominares, a partial sacrum, a complete right clavicle, complete left and right talii and calcanei, complete left and right humerii, femora and fibulae and a complete right radius, ulna, and tibia. The distal ¼ of the left radius and proximal ½ of the left ulna and tibia were missing. All of the joint surfaces are complete except for the left sacroiliac portion of the innominate, the left proximal end of the femur, and the right distal end of the tibia. The vertebrae associated with this individual includes all five lumbar vertebrae, which are complete except for a partial 1st lumbar.

The only cranial bone present for Individual 4 is a partial mandible. Post-cranial elements include a fragmented left scapula and partial right scapula, partial left and right innominares and calcanei, a partial sacrum and right patella, and complete left and right femora and tibiae. For the right radius and left ulna only the middle ½ are present. All joint surfaces are complete except for the left sacroiliac portion of the innominate and on both the proximal and distal ends of
the left and right tibia. A partial 5th lumbar vertebra is the only vertebra associated with this individual.

Individual 5 has a mostly complete cranium; the left parietal, temporal and left and right maxilla are partial and the zygomatics, palatines and hyoid are missing. Post-cranial elements associated with this individual include fragmented left and partial right scapulae, partial left and right innominates, talii and calcanei, a partial sacrum, and complete left and right tibias. The distal ⅔ of the right humerus, the proximal ⅓ portion of the left femur, and the proximal ⅔ of the left fibula are missing. All joint surfaces are complete except for the left and right distal femora, the left proximal femur, the left proximal humerus, and both the acetabulum and sacroiliac areas of the left innominate. The vertebrae associate with this individual include: a partial 1st cervical, a complete 2nd cervical, and the 4th and 5th lumbar vertebrae.

The skeletal material from Individual 6 is that of a subadult. The cranial bones for Individual 6 were all partial and the left and right zygomatics and palatines and the mandible and hyoid were missing. The post-cranial bones include complete right and left talii and calcanei, partial right un-fused innominate elements (ilium, ischium and pubis), three fragments of ribs 3-10, a partial sacrum, and a complete right femur, tibia and fibula. The distal ⅔ of the right humerus, the proximal end of the right ulna, and proximal ⅔ of the right radius are missing. All the joint surfaces present are complete except for proximal right ulna, which is missing.
Individuals 7-9 are represented by fetal and neonate bones. Cranial fragments were tentatively associated for Individual 8, but because Individuals 7 and 8 are possibly twins, they could belong to either individual. The ribs present include a left 1st rib, 2 partial left (3-10) ribs and four complete right (3-10) ribs. These fetal ribs could also belong to either Individual 7 or 8. The post-cranial material associated with Individual 7 include a complete right clavicle, complete left and right radii, humerii and femora, and a complete left tibia. The proximal ½ of both the left and right humerii are missing. Post-cranial material for Individual 8 include a complete left clavicle, a partial un-fused ischium of the left innominate, a partial un-fused ilium of the right innominate, complete left and right radii, and complete right humerus, femur, and tibia. Only the middle ⅓ of the left tibia is present. In addition, the distal ⅓ of the right ulna and the proximal ⅓ of the left femur are missing. A partial petrous portion of the right temporal bone is the only cranial material associated with Individual 9. Post-cranial elements for Individual 9 include a partial un-fused ilium of the right innominate, a partial left and right femur and left tibia. The distal ⅓ of the left femur and proximal ⅓ of the right femur and left tibia are missing.

**Bioarchaeological Methods**

Health and quality of life of the individuals was assessed using presence or absence of dental pathologies, degenerative joint disease, vertebral pathologies, and non-specific indicators of stress. Dental health was quantified using the percentage of teeth lost antemortem, and the presence or absence of caries, abscesses and resorption resulting from either periodontal disease or
antemortem tooth loss. The amount and severity of calculus and presence or absence of abscesses and caries was assessed macroscopically. The amount of calculus present on the enamel surface was scored from 1 through 6 based on the Smithsonian’s protocol (see Table 1). The location and severity of occlusal surface abrasion was macroscopically observed and scored on a scale of 1-8, with 8 being the most severe. For any wear-score of 4 or above, the plane of wear is also noted. This system of scoring was performed according to the Smithsonian’s protocol, which is based on numeric codes developed by Smith (1984: 46) (Figure 8 and Table 2).

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<tbody>
<tr>
<td>1</td>
<td>None</td>
</tr>
<tr>
<td>2</td>
<td>Flecks</td>
</tr>
<tr>
<td>3</td>
<td>Moderate</td>
</tr>
<tr>
<td>4</td>
<td>Coalesced</td>
</tr>
<tr>
<td>5</td>
<td>Heavy</td>
</tr>
<tr>
<td>6</td>
<td>3-Dimensional</td>
</tr>
</tbody>
</table>

Table 1. Calculus scoring protocol used for the Foscue remains.
Figure 8. Smith’s (1984) depiction of occlusal dental wear.

<table>
<thead>
<tr>
<th>Score</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Unworn to polished or small facets (no dentin exposure)</td>
</tr>
<tr>
<td>2</td>
<td>Blunting of cusps; may show pinpoint exposures on cusps</td>
</tr>
<tr>
<td>3</td>
<td>Full cusp removal with some dentin exposure</td>
</tr>
<tr>
<td>4</td>
<td>Several large dentin exposures but no coalescence of dentin patches</td>
</tr>
<tr>
<td>5</td>
<td>Two dentinal patches have coalesced</td>
</tr>
<tr>
<td>6</td>
<td>Three or four dentinal patches have coalesced with an island of enamel</td>
</tr>
<tr>
<td>7</td>
<td>Dentin exposure on entire occlusal surface, but with enamel rim retained intact or nearly so</td>
</tr>
<tr>
<td>8</td>
<td>Severe loss of crown height, incomplete enamel rim, crown surface shape similar to root shape</td>
</tr>
</tbody>
</table>

Table 2. Scoring of occlusal dental wear based on Smith (1984).
Degenerative joint disease was assessed by joint regions of the body (Table 3). Each of these regions were subjectively scored on a severity scale from 1-3, with 1 being mild and 3 being severe. This scoring system was used to identify the severity of three primary indicators of osteoarthritis: osteophyte formations, porosity and eburnation present.

<table>
<thead>
<tr>
<th>Region</th>
<th>Elements of that region analyzed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shoulder</td>
<td>Glenoid fossa + proximal humerus</td>
</tr>
<tr>
<td>Elbow</td>
<td>Proximal radius and ulna + distal humerus</td>
</tr>
<tr>
<td>Wrist</td>
<td>Carpals + distal radius and ulna + proximal metacarpals</td>
</tr>
<tr>
<td>Hand</td>
<td>Distal metacarpals+ hand phalanges</td>
</tr>
<tr>
<td>Hip</td>
<td>Acetabulum + proximal femur</td>
</tr>
<tr>
<td>Knee</td>
<td>Distal femur + patella + proximal tibia</td>
</tr>
<tr>
<td>Ankle</td>
<td>Distal tibia + Talus</td>
</tr>
<tr>
<td>Foot</td>
<td>Tarsals + Metatarsals + foot phalanges</td>
</tr>
</tbody>
</table>

Table 3. Joint regions scored.

Vertebral pathologies were assessed by the presence of osteophytes along the vertebral body, which was scored on a subjective scale from 1-3, with 3 being the most severe. Vertebral pathologies including Schmorl’s nodes or spondylysis were noted. Both Schmorl’s nodes, which are pits that occur on the vertebral disc, and spondylysis, which appears as lipping or bony osteophyte growth, are degenerative joint diseases that can appear on the vertebral discs in the synovial joints between the inferior and superior facets.
Finally, non-specific indicators of stress such as the presence of periostitis, cribra orbitalia or porotic hyperostosis, and dental enamel hypoplasias (DEHs) were examined. Each individual’s bones were carefully analyzed to determine the presence or absence of any of these bone defects. If they were present, the bone response of active or healing additionally was noted. The periostitis also was documented by region and severity. DEHs were scored according to the Buikstra and Ubelaker’s (1994) protocol, identifying the type of defect present using a hand-held 10X microscopic lens and measuring its distance from the cemento-enamel junction with sliding calipers to estimate the age that the defect occurred.

**Bone Mineral Density Scans**

In addition to the conventional skeletal analysis discussed above, the NMNH performed bone density scans on the Foscue sample. Bone density scans were performed by a technician and Doug Owsley at the Washington Hospital Center for Breast Health in Washington, DC. Quantification of bone density was done with DEXA (Dual Energy X-Ray Absorptiometry) Scan X-ray equipment. This equipment calculates the mineral density of bone as a T-score, which reflects the severity of osteoporosis present in the bone. The lower the T-score, the higher the chance that an individual’s bone is osteoporotic and is at a greater risk for bone fractures. The equipment was run just as it would have been for a living patient, although some adjustments ensured that the results of the bone density would correct for the lack of soft tissue. To simulate the presence of muscle and skin over the bone, saline water filled bags and a bag of white rice
were placed atop the bone. Because it is impossible to know how much these individuals weighed in real life, average height and weight measurement of historic Caucasian males (65” and 135 lbs.) and females (60” and 100 lbs.) compensated for the missing data. Bone mineral density scores will aid in presenting on a radiographic level how active and well nurtured an individual may have been at the time of their death.

**Isotopic Analysis of Diet**

The results from the carbon ($\delta^{13}$C) and nitrogen ($\delta^{15}$N) isotopes will give insight into the diet that the Foscues consumed by establishing them on a particular trophic level within their regional food web. These food webs are regionally-specific and subjective to the types of plants and animals available for foodstuffs. Stable carbon ($\delta^{13}$C) and nitrogen ($\delta^{15}$N) isotopes are found in bone collagen, which is produced by the protein intake of one’s diet (Bocherens et al. 1991). There are two basic steps to extracting and analyzing stable carbon and nitrogen ratios: the chemical extraction of bone collagen and the analysis of this collagen on stable isotope mass spectrometer. The carbon and nitrogen isotope analyses were performed at the Smithsonian OUSS/MCI Stable Isotope Mass Spectrometry Laboratory under the supervision of Christine France. In this study, collagen was extracted from the Foscue skeletal from the five adult skeletons and the three-year-old child.

Table 4 displays which bone and teeth samples were chosen for each individual. Mechanical preparation for the collagen extraction involved wet drilling a core of bone with ultra-pure water and a Dremel tool. The child’s bone sample
was treated differently because it was too thin to produce a substantial bone core in the same way as the adult samples. Instead, after a fresh thin slice was made to one end of the bone, pieces were broken off with sanitized pliers and collected as the sample for isotope analysis. In addition to the bone samples, collagen from dental dentin from four adult individuals, excluding Individual 4, was extracted for stable isotope analysis.

<table>
<thead>
<tr>
<th>Burial</th>
<th>Age</th>
<th>Sex</th>
<th>Bone Sample</th>
<th>Tooth Sample</th>
</tr>
</thead>
</table>
| Individual 1 | 35-44     | Male  | Left Ulna                         | Left maxillary first premolar (LPM
\(^1\)) and the mandibular right second molar (RM
\(_2\))                     |
| Individual 2 | 25-29     | Female | Left Humerus                      | Right mandibular canine (RC1) and the left mandibular third molar (LM
\(_3\))             |
| Individual 3 | 34-38     | Female | Left Ulna                         | Left maxillary second molar (LM
\(_2\)) and the right maxillary canine (RC
\(_1\))                      |
| Individual 4 | 60+       | Female | Left Femur                        | No tooth sample                                                               |
| Individual 5 | 60+       | Female | Right Femur                       | Right mandibular second premolar (RPM
\(_2\))                               |
| Individual 6 | 3 (± 12 months) | N/A | Right Humerus                     | No tooth sample                                                               |

Table 4. Chart displaying bone and tooth samples chosen for Individuals 1-6 for stable carbon and nitrogen isotope testing.

After completion of the mechanical sample preparation, bone collagen was extracted from the skeletal tissues through chemical processing modified from methods of Longin (1971), DeNiro and Epstein (1978), and Bocherens et al. (1991). Bone core and dentin were weighed and placed into centrifuge tubes and then sonicated in 10mL of ultra-pure water for twenty minutes to remove excess
sediments and labile salts. The water was then poured off and the sample was rinsed five times with ultra-pure water and the water discarded. The sample was left to dry in a 60°C oven overnight. The samples were then soaked in 10mL of 0.6M HCl for twenty-four hours at 4°C to remove structural carbonates. The supernatant was then decanted and discarded. The samples were soaked in additional 10mL aliquots of 0.6M HCl for twenty-four hours increments with daily replacement of the acid until the reaction ceased. Once complete, the samples were rinsed with ultra-pure water five times and dried in an oven overnight at 60°C. The next step was to soak the samples in 15mL of 0.125M NaOH for twenty-four hours at room temperature (22-23°C) to remove humic and fulvic acids. The supernatant was discarded and the samples were rinsed five times in the ultra-pure water. Samples were soaked in 10mL of 0.03M HCl at 95°C overnight to denature the protein. The samples were centrifuged for five minutes and the supernatant freeze dried to produce a purified collagen extract.

The stable isotopes were analyzed using a Thermo Delta V Advantage mass spectrometer in continuous flow mode coupled to a Costech 4010 Elemental Analyzer (EA) via a Thermo Conflo IV. Approximately 0.5mg of collagen extract was weighed and placed into tin capsules. These samples were then introduced to the EA via a Costech Zero Blank Autosampler. All runs include a set of standards for every 10-12 samples. These standards consist of Costech acetanilide and Indiana University Urea #3 to which all samples are linearly corrected. Reproducibility of samples and standards is ≤0.2‰ (1σ) for both δ¹³C and δ¹⁵N.
A diet consisting of either C₃ or C₄ plants or the animals that consumed these plants can be determined by through the analysis of stable carbon isotopes. There is a relationship between diet and isotopic values resulting from testing of the bone collagen (DeNiro and Epstein 1978, 1981; Schoeninger and DeNiro 1983; Bocherens et al. 1991; Ubelaker and Owsley 2003; France et al 2007; Katzenberg 2008). C₃ plants include shrubs, trees and mostly leafy plants, where C₄ plants consist of grasses, maize, millet and sugarcane. The value for C₃ plants range from -20 to -35‰ and C₄ plants range from -9 to -14‰, but can be as high as -6‰. Diets consisting of marine foods can range from -10 to -15‰ (Schoeninger et al. 1983; Ubelaker and Owsley 2003; Katzenberg 2008). Less negative values of δ¹³C represent that an individual was consuming more C₄ plants or animals consuming them and/or incorporating marine life into the diet.

The stable isotope ratios for nitrogen provide additional information about what trophic level of the staple diet. However, it important to emphasize that nitrogen values (δ¹⁵N) are regionally sensitive. For terrestrial environments the δ¹⁵N can range from -10 to +15 ‰, but generally the range is typically from -5 to +10 ‰ (Hauck 1973; Craft et al. 1988; Shearer and Kohl 1989; Nadelhoffer and Fry 1994; Trimble and Macko 1997). For North Carolina the terrestrial baseline δ¹⁵N values range between 0 to 10‰ (Showers and Eisenstein 1990).

The results of applying these various methods of archaeology, osteological examination, bone mineral density scans and bone chemistry analysis will be discussed in the next chapter in further detail. The results of the study of the Foscue burial vault were not as expected and the analysis of the
skeletal remains have directed the focus of this project along various paths concerning mortuary behavior, cultural activities observed from the skeletal remains as well as isotopic diet reconstruction.
CHAPTER 4: RESULTS

In order to clearly present the data that have resulted from the excavation of the Foscue burial vault the information has been organized into three different sections: architectural, material cultural, and biological data. The architectural data concern the structure and form of the vault itself. The artifactual data examine the cultural remains that were recovered from within the vault. The biological data are solely concerned with reporting the findings of the skeletal remains. The biological data reported in this chapter are outlined by Individual and then summarized overall.

Archaeology and Architecture of the Burial Vault

When the vault was first encountered it was covered in pine straw and leaves and surrounded by brick debris, as seen in Figure 5 (from Chapter 2). Two trees had grown into the tomb, one in the southern third and another out of the northwestern wall. Upon removal of the leaves and pine straw, the vault appeared to have collapsed and covered with brick pavement during the twentieth century, discussed below.

The stratigraphy within the vault comprised three distinct zones (Figure 9). Directly underneath the brick cover was Zone 1, a dense clay fill. In the initial excavation this fill layer was split into Zones 1 and 2, however, once the northern third the vault was fully excavated, the stratigraphic profile showed that Zones 1 and 2 were actually the same layer. In order to keep consistency between the excavations of the northern one-third of Zones 3 and 4 remained the same. Directly below this fill layer was Zone 3, a darker layer composed of a mix of clay
and sand and intermingled with brick and plaster rubble. The brick and plaster rubble found in Zone 3 likely derived from the collapse of the vault’s above-ground roof structure. Rather than rebuild the vault, the rubble from the collapsed structure was pushed into the interior and then filled in. The layer with the final designation as Zone 4 was very dark brown sandy silt loam that contained comingled human skeletal remains and coffin hardware.

When the skeletal remains were encountered, the excavation slowed and focused on delineating each skeletal element (following Owsley et al. 1997). The comingling of the remains meant that each element was drawn and its sector within the vault noted. There was also evidence of previous looting of the vault before and after it was filled. The most contemporary evidence for looting was the appearance of a looting hole in the northwestern area of the vault (Figure 10). Judging from the size (10” x 7”) and position of this hole it is highly unlikely that any cultural or skeletal remains were removed from the vault. Early looting of the vault caused postmortem chopping damage found on the right femur of Individual 4 and loss of much of the coffin hardware. Even if the Foscues were practicing simple Christian burials, which were the norm for the period and will be discussed in further detail in the following chapter, it would be expected that a higher concentration of coffin hardware, such as handles, or the inclusion of personal items would have resulted from our excavations. The Foscue family papers give evidence for a custom purchased mahogany coffin for Simon Foscue, Jr., which presumably was adorned with some sort of coffin hardware.
Figure 9. Interior stratigraphy of Foscue burial vault.
The burial vault consists of an underground brick-lined tomb measuring 8.8 ft. east-west by 14 ft. north-south, with a stepped exterior of brick surrounding it on all sides at ground level. Figure 11 depicts the interior of the vault with the six brick pillars and tree root intrusion. The original vault consisted of an underground brick-lined tomb with an associated above-ground brick structure. While the original above-ground structure was destroyed, inferences about the design of the vault can be reconstructed from both the archaeological data and comparisons with contemporary vaults.

The discovery of plaster adhering to the bottom courses of brick and within the tomb fill suggests that it was used to finish the internal walls. In addition, six
plaster covered brick pillars (Figure 12) were identified within the vault. These included: a northwest pillar measuring 1 (l) x 1 (w) x 1.5 (h) ft., a central western pillar (1 x 1 x 1.4 ft.), a southwestern pillar (1 x 1 x 1.5 ft.), a northeast pillar (1 x 1 x 1 ft.), a eastern center pillar (1 x 1 x 1 ft.), and a southeastern pillar (1 x 1 x 1 ft.). The reason why there is a difference in the heights of these pillars (1.5 ft. on the west, 1 ft. on the east) is unknown. They could have possibly been used for roof support or perhaps used as a shelf for the placement of coffins. The lack of research in other contemporary burial vaults makes the comparison of their purpose difficult.

A large metal lock device with two associated doorknobs, inner and outer, were excavated from the northern wall of the vault, along with large door hinges
and numerous clench and machine cut square nails (Figure 13). The presence of these artifacts suggests that the original vault structure had a door on its northern wall. The door was most likely constructed of wood that has since disintegrated.

When the Foscue burial vault’s above-ground structure deteriorated and collapsed, the vault was not rebuilt to its original standards. Instead, the debris was pushed into the interior of the tomb then covered with a thick layer of clay (see Figures 9 and 14). Also pictured is the northwestern brick pillar and exploratory probe an the tree intrusion from the northern wall. Some of displaced bricks were then neatly patterned on top of the vault to seal it (Figure 15).
Figure 13. Lock mechanism (FS #2) (A), knob (FS #2) (B), and door hinges and nails (FS #8) (C)
Figure 14. Depiction the destruction layer (Zone 3) composed of brick and metal debris from the northern third of burial vault.

Figure 15. Later brickwork that was done after the vault was filled, northeast corner.
The other bricks from the above-ground structure were found scattered nearby. While the vault may have been open until its restoration (as suggested by the remains of small fauna within the lowest stratum), it appears the main cause for the comingling of the skeletal remains found within the burial vault is a large, intruding tree (Figure 16). The tree’s roots expanded within the center of the vault’s interior and broke through the brick lined base, moving the bones from their original position, and in some cases, incorporating elements within its root structure. Also notice in this picture the dark area in the northwestern corner of this zone, which is a lens of concentrated destruction rubble.

Figure 16. Excavation of the south ¾ of the vault at the beginning of Zone 3.
Artifactual Data

A small number of artifacts were recovered from the interior of the vault, which were inventoried earlier and shown in Figure 14. These included a large lock mechanism with two knobs, door hinges and hardware, in addition to, coffin hardware, metal nails, two shell buttons, one broken bone button, and faunal remains (Table 5). The coffin hardware includes four iron coffin handles with screws (Figure 17), some with mahogany coffin wood still attached. Several artifacts were sent for conservation including: the coffin handles, the lock with two knobs and various metal and iron artifacts (FS# 2, 8, 20, 27, and 33).

Conservation of the metal objects served to clean and protect them from further oxidation. This was achieved by mechanically and chemically cleaning the objects. Mechanical cleaning was done with the use of brushes and air scribes in an attempt to remove the metal concretions and active corrosion. Chemical cleaning was then performed on the objects by the application of 100% acetone. After cleaning of each artifact was complete, several coats of 10% (aq) tannic acid was applied. Then a protection coat of Renaissance Wax was put on each object. The copper alloy materials, such as the coffin handles, underwent a similar process. After the object was both chemically and mechanically cleaned it was then treated with a coating of 1% Acryloid B-72 in acetone (Grieve 2011: 8-10). Figures 17 and 18 show the nails and coffin hardware before and after the conservation process.
<table>
<thead>
<tr>
<th>FS</th>
<th>Provenience</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Burial Vault N ½ zone 1</td>
<td>Clench Nail</td>
</tr>
<tr>
<td>2</td>
<td>Burial Vault N ½ Zone 2</td>
<td>Lock Mechanism and two knobs</td>
</tr>
<tr>
<td>3</td>
<td>Burial Vault N ½ Zone 2</td>
<td>General Interior</td>
</tr>
<tr>
<td>4</td>
<td>NW corner, burial vault, zone 3</td>
<td>Burned wood</td>
</tr>
<tr>
<td>5</td>
<td>NW corner, burial vault, zone 3</td>
<td>Burned Plaster</td>
</tr>
<tr>
<td>6</td>
<td>NW corner, burial vault, zone 3</td>
<td>Artifacts- Metal</td>
</tr>
<tr>
<td>7</td>
<td>NW corner, burial vault, zone 4</td>
<td>Artifacts</td>
</tr>
<tr>
<td>8</td>
<td>Burial Vault N ½ Zone 3</td>
<td>Artifacts- Metal</td>
</tr>
<tr>
<td>9</td>
<td>Burial Vault N ½ Zone 3</td>
<td>Burned wood</td>
</tr>
<tr>
<td>10</td>
<td>Burial Vault N ½ Zone 4</td>
<td>Artifacts</td>
</tr>
<tr>
<td>11</td>
<td>Burial Vault N ½ Zone 4</td>
<td>Soil Sample</td>
</tr>
<tr>
<td>12</td>
<td>Burial Vault N ½ Zone 4</td>
<td>Bone (Human)</td>
</tr>
<tr>
<td>13</td>
<td>Burial Vault N ½ Zone 4</td>
<td>Floor Plaster Sample</td>
</tr>
<tr>
<td>14</td>
<td>Burial Vault N ½ Zone 4</td>
<td>Teeth (Human)</td>
</tr>
<tr>
<td>15</td>
<td>Burial Vault N ½ Zone 4</td>
<td>Bone (Human)</td>
</tr>
<tr>
<td>16</td>
<td>Burial Vault S ½ zone 1</td>
<td>Artifacts</td>
</tr>
<tr>
<td>17</td>
<td>Burial Vault S ½ Zone 3</td>
<td>Artifacts- 2 bags</td>
</tr>
<tr>
<td>18</td>
<td>Burial Vault S ½ Zone 3</td>
<td>Bone (Human)</td>
</tr>
<tr>
<td>19</td>
<td>Burial Vault S ½ Zone 3</td>
<td>Coffin wood sample-- child's coffin</td>
</tr>
<tr>
<td>20</td>
<td>Burial Vault S ½ Zone 3</td>
<td>Coffin hardware, west of tree trunk</td>
</tr>
<tr>
<td>21</td>
<td>Burial Vault S ½ Zone 4</td>
<td>Artifacts (N 1/2)</td>
</tr>
<tr>
<td>22</td>
<td>Burial Vault S ½ Zone 4</td>
<td>Bone (Human) (N 1/2)</td>
</tr>
<tr>
<td>23</td>
<td>Burial Vault S ½ Zone 4</td>
<td>Artifacts (S 1/2)</td>
</tr>
<tr>
<td>24</td>
<td>Burial Vault S ½ Zone 4</td>
<td>Bone (Human) (S 1/2)</td>
</tr>
<tr>
<td>25</td>
<td>Burial Vault S ½ Zone 4</td>
<td>Curved plaster sample</td>
</tr>
<tr>
<td>26</td>
<td>Burial Vault S ½ Zone 4</td>
<td>Coffin wood sample</td>
</tr>
<tr>
<td>27</td>
<td>Burial Vault S ½ Zone 3</td>
<td>Coffin hardware--child's coffin</td>
</tr>
<tr>
<td>28</td>
<td>Burial Vault S ½ Zone 4</td>
<td>Fauna</td>
</tr>
<tr>
<td>29</td>
<td>Tree Stump Removal</td>
<td>Artifacts- 2 bags</td>
</tr>
<tr>
<td>30</td>
<td>Tree Stump Removal</td>
<td>Coffin hardware and wood</td>
</tr>
<tr>
<td>31</td>
<td>Tree Stump Removal</td>
<td>Bone (Human) child</td>
</tr>
<tr>
<td>32</td>
<td>Tree Stump Removal</td>
<td>Bone (Human)</td>
</tr>
<tr>
<td>33</td>
<td>Tree Stump Removal</td>
<td>Coffin handle and wood) SW corner</td>
</tr>
</tbody>
</table>

Table 5. Listing of artifacts excavated by Field Specimen (FS) number and provenience.
The lock mechanism (FS #2) recovered from the vault measures 7 ¼” wide, 4 ¾” and 1½” deep. Figures 19-21 display the reverse side of the lock before and after treatment. After the mechanical cleaning, a combination of metal and copper alloy treatments were performed on the lock. A 15% (aq) solution of 20°Baume (31.45%) hydrochloric acid diluted in a 50% solution of deionized water was used to treat spots of concretion and then were rinsed with deionized water. The lock was then bathed in 10% (aq) citric acid rinsed again with deionized water. This process of mechanical cleaning and bathing was performed three times. The copper alloy portions of the lock mechanism, the rose, handles and night latch, were polished with Hagerty 100 polish and then were coated with Acraloid B-72. The iron surfaces of the lock were coated several times with a 3% (aq) and 10% (aq) solution of tannic acid, in addition to microcrystalline wax (Powell 2011: 5-6). The Acraloid B-72, tannic acid and wax coatings help to protect surfaces from future corrosion. FS# 8 (Grieve 2011: 25-26). The conservation performed by Susanne Greive and her students helped to better identify certain artifacts found within the burial vault. Through this identification dates could be established for the variety of artifacts recovered. These artifacts were then returned to the family and can be found on display in the current plantation house that was built by Simon Foscue, Jr.
Figure 17. Nails from Foscue Burial Vault before (A) and after (B) metal conservation, FS # 8.
Figure 18. Coffin handle before (A) and after (B) copper alloy conservation, FS# 27.
Figure 19. Obverse side of lock mechanism before (A) and after (B) conservation treatment, FS #2. Photos courtesy Emily Powell.
Figure 20. Detached knob to lock mechanism before (A) and after (B) conservation treatment, FS # 2. Photos courtesy Emily Powell.
Figure 21. Reverse side of lock mechanism before (A) and after (B) conservation treatment, FS # 2. Photos courtesy Emily Powell.
Once the lock was cleaned the interior mechanisms could be identified. It had a latch bolt, dead bolt, and night bolt, all arranged in descending order. This order of bolts was typical for British locks. In addition other diagnostic feature were also intact, including: the rose, the return spring, knobs and back plate (Powell 2011: 35). Figure 22 demonstrates these diagnostic features.

**Biological data**

All of the adult skeletons excavated from the Foscue burial vault displayed morphological skeletal characteristics consistent with those of European descent. These morphological traits include: medium cranial forms with simple cranial sutures, parabolic palatals, a straight nasal profile with narrow nose form,
bilateral chin forms, and rhomboid orbitals (see Gill 1998). Table 6 provides a comprehensive overview of the biological results for the nine individuals identified from the Foscue burial vault.

<table>
<thead>
<tr>
<th>Burial</th>
<th>Age</th>
<th>Sex</th>
<th>Stature</th>
<th>Pathology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual 1</td>
<td>35-44</td>
<td>Male</td>
<td>66.1-71.3&quot;</td>
<td>Arthritis of the elbow, wrist, hips, knees, and ankle, but no evidence for sustained physical activity, osteochondritis dissecans (9mm diam.) on right tibial joint, arthritis on thoracic vertebrae (1-9) inferior and superior articular facets. Evidence of tooth polishing behaviors.</td>
</tr>
<tr>
<td>Individual 2</td>
<td>25-29</td>
<td>Female</td>
<td>62.4-67.6&quot;</td>
<td>No significant pathologies. Highest amount of DEHs and shows evidence for tooth polishing behaviors.</td>
</tr>
<tr>
<td>Individual 3</td>
<td>34-38</td>
<td>Female</td>
<td>61.1-65.9&quot;</td>
<td>Osteophytes on the 1st cervical vertebra, Schmorl's nodes on the 2nd and 4th Lumbar vertebrae, arthritis of the right knee, a healing fracture on the lateral condyle of the proximal right tibia, and periostitis on the middle third of the right tibia. Gold dental filling.</td>
</tr>
<tr>
<td>Individual 4</td>
<td>60+</td>
<td>Female</td>
<td>63.4-68.6&quot;</td>
<td>Suffered from systemic osteoporosis, osteophytes on the L4 and L5 vertebra, a spondylolytic fracture on the L5 vertebrae and arthritis of the knees and hips.</td>
</tr>
<tr>
<td>Individual 5</td>
<td>60+</td>
<td>Female</td>
<td>62.4-68.0&quot;</td>
<td>Arthritis of the hips and knee, osteophytes on L4 and L5 vertebra, osteophytes, eburnation and pitting on the margin of the sacrum, osteophytes on the sacral facets, and suffered from osteoporosis. Antemortem tooth loss of numerous teeth and displays tooth polishing behaviors.</td>
</tr>
<tr>
<td>Individual 6</td>
<td>3 (± 12 months)</td>
<td>Indeterminate</td>
<td>Indeterminate</td>
<td>No significant pathologies, but extremely poor dental health: proximal caries present on the right i1, left m1, right i1, l2, c1, and on the left i1 and c1, occlusal caries present on the right m2, right m1 and m2, and the left m1 and m2 and a buccal cavity on the left m1.</td>
</tr>
<tr>
<td>Individual 7</td>
<td>32 Weeks</td>
<td>Indeterminate</td>
<td>Indeterminate</td>
<td>No significant pathologies.</td>
</tr>
<tr>
<td>Individual 8</td>
<td>31 Weeks</td>
<td>Indeterminate</td>
<td>Indeterminate</td>
<td>No significant pathologies.</td>
</tr>
<tr>
<td>Individual 9</td>
<td>36 Weeks</td>
<td>Indeterminate</td>
<td>Indeterminate</td>
<td>No significant pathologies.</td>
</tr>
</tbody>
</table>

Table 6. Age, sex, stature, and pathologies of the Foscue vault burials.
Individual 1 (31Foscue-ECU-1):

Sex: Male

Age: 35-44

Stature: 66.1 to 71.3” (5’5”-5’9”) (Figure 23)

Figure 23. Stature estimate for Individual 1 (indicated by triangle) based on femur bicondylar length, maximum femur length, and fibula maximum length.

Pathology: The bones show evidence for degenerative joint disease in the form of trace osteoarthritic lipping on the distal and proximal surfaces of the left and right tibiae, the distal end of the right radius, the proximal end of the right ulna, the distal ends of both the left and right femurae, the facets of the sacrum, and the left and right acetabulae of the pelvis. The thoracic vertebrae 1 – 9, making up most of the middle back, also displayed slight lipping in the synovial joint surfaces between the vertebrae. The promonotory of the sacrum had
spondylytic spicules. The right tibial proximal joint surface displayed slight osteochondritis dissecans, measuring 9mm in diameter. The right maxillary sinus has spicular surface irregularities. There is a small distal metaphysis medial side tubercle, or conductor tubercle, on the left femur.

Dental Pathology: This individual has numerous teeth present, including, the maxillary right 2\textsuperscript{nd} incisors, canine, 1\textsuperscript{st} and 2\textsuperscript{nd} premolars, and 1\textsuperscript{st} and 2\textsuperscript{nd} molars, the maxillary left 1\textsuperscript{st} and 2\textsuperscript{nd} premolars and 1\textsuperscript{st} and 3\textsuperscript{rd} molars, the mandibular right 1\textsuperscript{st} and 2\textsuperscript{nd} incisor, canine, 2\textsuperscript{nd} premolar and 1\textsuperscript{st} - 3\textsuperscript{rd} molars, and the mandibular left 1\textsuperscript{st} - 3\textsuperscript{rd} molars. The maxillary left 1\textsuperscript{st} incisor and 2\textsuperscript{nd} molar were the only teeth lost antemortem. This individual had the most severe dental wear of the entire sample. The maxillary occlusal wear scores ranged from 4-6 in a concave-lingual plane, with a lingual slope on the right 2\textsuperscript{nd} incisor and left 3\textsuperscript{rd} molar and concave wear on the right canine. The mandibular occlusal wear scores also ranged from 4-6, with a mixture of concave-buccal wear on the 1\textsuperscript{st} and 2\textsuperscript{nd} right molars and left 1\textsuperscript{st} molar. In addition, flat wear was present on the right 3\textsuperscript{rd} molar, a buccal slope was present on the right 2\textsuperscript{nd} premolar, a distal slope was present on the right 1\textsuperscript{st} incisor, concave-lingual wear was present on the right canine and left 3\textsuperscript{rd} molar, and concave-distal wear was present on the right 2\textsuperscript{nd} incisor and left 2\textsuperscript{nd} molar. There is extensive labial surface abrasion on two incisors that also show evidence of tooth polishing. These two dental pathologies indicate that this individual was practicing a form of tooth cleaning. A linear dental enamel hypoplasia was present on the right mandibular second incisor (I\textsubscript{2}) at 2.70mm from the cementoenamel junction, suggesting that he
suffered from a period of physiological or nutritional stress around 3 years of age. The bone of the left maxillary central incisor and second molar show signs of bone resorption, indicating antemortem loss. Calculus scores for this individual ranged from 1-3, with the heaviest amount present on the posterior portions of the dental arcade, mainly on the molars.

Bone Density: The bone density scan of the proximal end of the left femur resulted in a T-score of -1.1.

Isotope Sample: Isotope samples were taken from the maxillary left first premolar (LPM$^1$), the mandibular right second molar (RM$_2$), and a piece of the left ulna. The bone sample was too poorly preserved and produced imprecise results for both $\delta^{15}$N and $\delta^{13}$C isotopes. The results for both teeth is $\delta^{15}$N is 11.74 ‰ and $\delta^{13}$C is -12.25 ‰.

**Individual 2 (31Foscue-ECU-2):**

Sex: Female

Age: 25-29

Stature: 62.4-67.6” (5’2”- 5’6”) (Figure 24)

Pathology: The only significant pathology apparent on the remains was slight lipping on the dens of the second cervical vertebra, however it was not severe enough to necessitate a severity score.

Dental Pathology: This individual has numerous teeth present, including, the maxillary right 1$^{st}$ and 2$^{nd}$ premolars, the maxillary left 2$^{nd}$ incisor, 1$^{st}$ and 2$^{nd}$ premolars, 1$^{st}$ – 3$^{rd}$ molars, the mandibular right 1$^{st}$ incisor, canine, 1$^{st}$ and 2$^{nd}$ premolars, 1$^{st}$ and 3$^{rd}$ molars, and the mandibular left 1$^{st}$ and 2$^{nd}$ incisors. The
mandibular right 2nd molar was the only tooth lost antemortem. This individual displayed only minimal dental wear, the least of all the adult skeletons, with maxillary and mandibular scores ranging between 1 to 3. There was no significant plane of wear to note. Her teeth also show signs of tooth polishing behavior (Figure 25). All of her anterior teeth show facial surface polishing or sheen, while the posterior teeth do not. Although this individual displayed the least wear, she displayed one of the highest amounts of dental enamel hypoplasias, 24 in all. These hypoplasias suggest that she suffered intermittent periods of nutritional or physiological stress between the ages of 2.5 and 6.5. Calculus scores for this individual ranged from 1-3, with the heaviest amount present on the posterior portion of the dental arcade—right mandibular 2nd premolar and left maxillary 3rd molar and left mandibular 1st molar.
Figure 25. Labial abrasion on central incisor of Individual 2 that has worn away the CEJ. Photo Courtesy the Smithsonian Institution’s Museum of Natural History.

Bone Density: The bone density scan of the proximal end of the right femur resulted in a T-score of -0.8. The bone density scan of the right femur shaft resulted in a T-score of 4.8.

Isotope Sample: Isotope samples were taken from the right mandibular canine (RC) and the left mandibular third molar (LM₃), and a piece of the left humerus at the midshaft. The bone and dental dentin samples chosen for analyses were poorly preserved and when they were processed the results were inaccurate and unable to be used.
**Individual 3 (31Foscue-ECU-3):**

Sex: Female  
Age: 34-38  
Stature: 61.1-65.9” (5’1”-5’5”) (Figure 26)

**Pathology:**
There is mild osteophyte formation, or lipping, on the dens facet of the first cervical vertebra and on the distal articular surface of the right femur. On the proximal joint of the left tibia there is a localized healing antemortem fracture. In addition, the medial posterior surface of the middle third right tibia has an elliptical area of periosteal reaction measuring 24mm by 6mm. Two Schmorl’s depressions are present on the inferior bodies of both the 2nd and 4th lumbar vertebrae.

**Figure 26.** Stature estimate of Individual 3 (indicated by triangle) based on maximum fibula length, maximum humerus length, and maximum radius length.
Dental Pathology: This individual has numerous teeth present, including, the maxillary right 1\textsuperscript{st} incisor, canine, and 3\textsuperscript{rd} molar, the maxillary left 1\textsuperscript{st} incisor, canine, 1\textsuperscript{st} premolar, 1\textsuperscript{st} and 2\textsuperscript{nd} molars, the mandibular right 1\textsuperscript{st} and 2\textsuperscript{nd} premolar, 1\textsuperscript{st} and 2\textsuperscript{nd} molars, the mandibular left 1\textsuperscript{st} premolar and 1\textsuperscript{st} molar. The maxillary right 1\textsuperscript{st} premolar and mandibular left 2\textsuperscript{nd} molar were lost antemortem. Occlusal dental wear for this individual was only mild. Maxillary wear scores were either 2 or 4. The maxillary right canine and 1\textsuperscript{st} incisor and left 1\textsuperscript{st} incisor, canine, 1\textsuperscript{st} premolar, and 1\textsuperscript{st} molar all received a wear score of 4 with a plan of wear occurring on a lingual slope. The mandibular wear scores ranged between 3-5. The left 1\textsuperscript{st} premolar received a wear score of 4 and displayed a linear slope. The right 1\textsuperscript{st} molar revieve a score of 5 and had a buccal-distal plane of wear. The left 1\textsuperscript{st} molar received a score of 6 and had a distal slope. Linear hypoplasias are present on the right maxillary canine (1.05 mm from the CEJ), on the left maxillary second premolar (2.1 mm from the CEJ), the right mandibular canine (1.04 mm CEJ) and second premolar (1.54 mm from the CEJ). These dental enamel hypoplasias suggest that this individual went through one or more periods of nutritional or disease stress between the ages of 5 and 6. This individual also had a gold filling on the occlusal surface of her right second molar (Figure 27). Calculus scores for this individual ranged from 1-4, with the heaviest amount present on the posterior portion of the dental arcade—mainly the molars.

Bone Density: Bone mineral density scans were taken of the proximal end of the right femur and resulted in a T-score of -1.5. A subsequent scan of the shaft of her right femur resulted in a T-score of 3.2.
Figure 27. Images depicting occlusal gold filling in right mandibular 2nd molar of Individual 3. Photos Courtesy the Smithsonian Institution’s Museum of Natural History.

Isotope Samples: Isotope samples were taken from a fragment of the left ulna and the left maxillary second molar (LM²) and the right maxillary canine
(RC'). The bone sample results are 10.47 ‰ for δ¹⁵N and -13.09 ‰ for δ¹³C. δ¹⁵N for the dental dentin from the teeth is 10.31‰ and the δ¹³C is -12.63‰.

Individual 4 (31Foscue- ECU-4):

Sex: Female

Age: 60+

Stature: 63.4- 68.6” (5'3''- 5'7'') (Figure 28)

Pathology: While the bones of this individual were not tested for bone mineral density, they visually displayed generalized osteoporosis, or bone loss, which is evident by the presence of thin cortical bone. The inferior and superior facets of the 5th lumbar vertebra and superior facets of the sacrum displayed moderate osteophyte formation. A spondylolytic fracture also was apparent of the pedicle on the 5th lumbar vertebra. Trace osteophytic lipping was present on the
distal margins of the right and left femora, proximal articular surfaces of the right and left tibia, and the articular surface of the left and right calcaneus. The proximal shaft of the right femur, directly under the femoral head displayed postmortem chopping damage. Which, as previously mentioned, is assumed to be the result of a previous looting event in the vault, based on colorization of the bone and the fracture’s edge.

Dental pathology: This individual has no teeth present. The mandibular right 1\textsuperscript{st} premolar, 1\textsuperscript{st} and 3\textsuperscript{rd} molars were lost antemortem. The skeletal material able to be associated to this individual was limited. As a result only a partial mandible could be identified with Individual 4. At the time of death, there were five tooth sockets that could be identified in the mandibular dental arcade. These include: the right 1\textsuperscript{st} and 2\textsuperscript{nd} premolars, right 1\textsuperscript{st}, 2\textsuperscript{nd}, and 3\textsuperscript{rd} molars. Of these five teeth, three—the right 1\textsuperscript{st} premolar, 1\textsuperscript{st} molar and 3\textsuperscript{rd} molar—were lost antemortem, as the bone shows evidence of resorption. The other two teeth—the right 2\textsuperscript{nd} premolar and 2\textsuperscript{nd} molar—were lost postmortem. The alveolar bone associated with these teeth displayed periapical abscesses with perforation of the cortex and destruction of the bone. The lack of teeth present made scoring dental wear impossible.

Bone Density: Bone mineral density scans were not performed on this individual.

Isotope Sample: No teeth were taken from this individual, but a fragment of the proximal diaphysis of the left femur was collected. The bone samples
proved to be too poorly preserved and produced imprecise results for both $\delta^{15}N$ and $\delta^{13}C$ isotopes.

**Individual 5 (31Foscue-ECU-5):**

Sex: Female

Age: 60 +

Stature: 62.4-68.0” (5’2”- 5’6”’) (Figure 29)

![Graph](image)

*Figure 29. Stature estimate of Individual 5 (indicated by triangle) based on maximum tibia length.*

Pathology: The articular facets on the lower back of this individual, specifically the 4th and 5th lumbar vertebrae and the sacrum, displays severe degeneration. On the 4th and 5th lumbar vertebrae and sacrum, osteophytes and bone polishing, or eburnation, and porosity are present on the inferior and superior articular facets. Slight degenerative joint changes were present on the margins of the acetabulae of the left and right os coxae. Mild osteophytic lipping
is present on the distal joint surface of the left femur and distal surface of the left patella, as well as on the right proximal articulation of the right tibia. The advanced degenerative disease seen in Individual 5 suggests that she is slightly older than Individual 4, assuming that they had similar risks for osteoarthritis.

Dental Pathology: The only teeth present for this individual were the mandibular right canine, 1\textsuperscript{st} and 2\textsuperscript{nd} premolars. This individual has numerous teeth lost antemortem, including, the maxillary right 1\textsuperscript{st} incisor, 1\textsuperscript{st} and 2\textsuperscript{nd} premolars, and 1\textsuperscript{st} molar, the maxillary left canine, 1\textsuperscript{st} and 2\textsuperscript{nd} premolars, the mandibular right 1\textsuperscript{st} incisor and 1\textsuperscript{st} – 3\textsuperscript{rd} molars, the mandibular left 1\textsuperscript{st} and second premolars and 1\textsuperscript{st} – 3\textsuperscript{rd} molars. Occlusal dental wear scores for mandible of this individual ranged between 3 and 5. The right mandibular 2\textsuperscript{nd} premolar was scored with a 4 and displayed a lingual-distal slope. The right mandibular canine received a score of 5 and had a concave plane of wear. Of the 27 identifiable dental sockets, 13 of these display antemortem loss of teeth. These include: the right maxillary 1\textsuperscript{st} incisor, 1\textsuperscript{st} and 2\textsuperscript{nd} premolars and 1\textsuperscript{st} molar, the left maxillary canine and 1\textsuperscript{st} and 2\textsuperscript{nd} premolars, and both the right and left mandibular 1\textsuperscript{st} -3\textsuperscript{rd} molars. The only teeth present and in the socket are the right mandibular canine, 1\textsuperscript{st} and 2\textsuperscript{nd} premolar. The right canine and 1\textsuperscript{st} premolar have exposed cervical root at the cementoenamel junction and their labial surfaces display a sheen as a result of repetitive cleaning, or polishing, of the teeth. Exposure of the dentin has also (Figure 30). If any dental enamel hypoplasias were present in the anterior teeth of this individual, they were obscured by the extensive tooth polishing.
Calculus scores ranged from 2-3 and were only present on the three teeth present, the right mandibular canine, 1\textsuperscript{st} and 2\textsuperscript{nd} premolar.

Bone Density: Bone mineral density scans were not performed on this individual.

Isotope Sample: Isotope samples were taken from the right mandibular second premolar (RPM\textsubscript{2}) and from the diaphysis of the right femur. The bone sample results are 11.03 ‰ for $\delta^{15}$N and -12.67 ‰ for $\delta^{13}$C. For the dental dentin from the tooth the $\delta^{15}$N is 1.75‰ and the $\delta^{13}$C is -12.32‰.

Figure 30. Labial surface abrasion of the right canine and first premolar, polished enamel with loss of facial surface enamel on the canine of Individual 5. Photo Courtesy the Smithsonian Institution’s Museum of Natural History.
Individual 6 (31Foscue-ECU-6):

Sex: Indeterminate

Age: 3 (± 12 months)

Stature: Indeterminate

Pathologies: There were no significant pathologies present on the remains.

Dental Pathology: It was apparent from the teeth present that the child had poor dental health. Several interproximal caries were present on the maxillary right i\textsuperscript{1}, left m\textsuperscript{1}, mandibular right i\textsubscript{1}, i\textsubscript{2}, c\textsubscript{1}, and on the left i\textsubscript{1} and c\textsubscript{1}. Occlusal caries were present on the maxillary right m\textsuperscript{2}, mandibular right m\textsubscript{1} and m\textsubscript{2} and the left m\textsubscript{1} and m\textsubscript{2}. A buccal cavity was present on the mandibular left m\textsubscript{1}. No calculus was present on this individual.

Isotope Sample: No teeth were taken from this individual. For the bone sample a portion of the right humerus at the midshaft was chosen. The bone sample results are 11.65 ‰ for $\delta^{15}$N and -13.62 ‰ for $\delta^{13}$C isotopes.

Individual 7 (31Foscue-ECU-7):

Sex: Indeterminate

Age: ~8 lunar months (32 weeks) in utero.

Stature: Indeterminate

Pathology: No significant pathologies.

Individual 8 (31Foscue-ECU-8):

Sex: Indeterminate

Age: ~8 lunar months (31 weeks) in utero.
Stature: Indeterminate
Pathology: No significant pathologies.

Individual 9 (31Foscue-ECU-9): 
Sex: Indeterminate
Age: ~8 months in utero.
Stature: Indeterminate
Pathology: No significant pathologies.

**Foscue Skeletal and Dental Health**

Table 7 displays the demography of the Foscue burial vault sample. As previously discussed there is one adult male, four adult females, a young child and three neonates. This heavy concentration of females and children will be discussed in further detail in the following chapter. Although the Foscue skeletal sample is small, patterns in bone health can still give insight into life histories.

<table>
<thead>
<tr>
<th>Age in Years</th>
<th>Male</th>
<th>Female</th>
<th>Sub-Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-12 months</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>1-5</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>5-19</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>20-24</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>25-30</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>31-44</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>45-59</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>60+</td>
<td>-</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 7. Distribution of sex and age in the Foscue skeletal sample.

Angel’s (1976) study showed that the largest skeletal change occurring in the United States from colonial to modern times occurred in body stature and
cranial size. Stature is based on long bone measurements and can be seen as a marker of health, because long bone development is influenced by nutritional or disease factors. The change in stature from colonial to modern times is attributed to a combination of genetic intermixing, less infectious diseases, and better nutrition (Angel 1976; Steegman 1991). Stature estimates were produced for all of the Foscue adults of the skeletal sample and the height of the sample falls within expected historic period height standards (Table 8). The average height for a male from colonial to the civil war was 173.4 cm and the average for women was 159.8 cm (Angel 1976: 725). Additional studies of early to mid nineteenth-century almshouse and poor rural populations found average height for males to be 172.6-175.53 cm and from 160.0-165.49 cm for women (Pfeiffer et al 1988: 34; Steegman 1991:264; Bellantoni et al. 1997: 142). The fact that overall the Foscue sample falls within stature norms for the time period shows that they reflect general genetic variation present in the nineteenth-century in the eastern United States in different social classes.

<table>
<thead>
<tr>
<th>Burial</th>
<th>Age</th>
<th>Sex</th>
<th>Stature in inches</th>
<th>Stature in centimeters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35-44</td>
<td>M</td>
<td>66.1-71.3</td>
<td>167.9-181.1</td>
</tr>
<tr>
<td>2</td>
<td>24-29</td>
<td>F</td>
<td>62.4-67.6</td>
<td>158.5-171.7</td>
</tr>
<tr>
<td>3</td>
<td>34-38</td>
<td>F</td>
<td>61.1-65.9</td>
<td>155.2-167.4</td>
</tr>
<tr>
<td>4</td>
<td>60+</td>
<td>F</td>
<td>63.4-68.6</td>
<td>161.0-174.2</td>
</tr>
<tr>
<td>5</td>
<td>60+</td>
<td>F</td>
<td>62.4-68.0</td>
<td>158.5-172.7</td>
</tr>
</tbody>
</table>

Table 8. Stature estimates for individuals 1-5.
Of the four individuals that have skeletal pathologies, all of them displayed at least some form of vertebral pathology. Age-related osteophytes, lipping and/or eburnation were present on the vertebrae of the Foscue sample. In addition Schmorl’s nodes was present on some individuals from this sample (Table 9). Schmorl’s nodes are pathologies that result from indirect trauma from compression injuries to the vertebrae, specifically to the intervertebral disc. Another individual also had spondylolysis, the separation of the neural arch from the vertebral body, of the 5th lumbar vertebra (Lovell 2008; Jurmain 1999). Excluding the youngest adult of this sample, Individual 3, the lower back appears to be most affected in this sample. The patterning of mainly lower back vertebral pathologies seen in the older adults of this sample indicates that these were the result of age-related degeneration.

<table>
<thead>
<tr>
<th>Burial</th>
<th>Age</th>
<th>Sex</th>
<th>Cervical</th>
<th>Thoracic</th>
<th>Lumbar</th>
<th>Sacrum</th>
<th>Schmorl’s Nodes and Spondylolysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35-44</td>
<td>M</td>
<td></td>
<td>T1-9= Mild osteophytes/Margin of facets</td>
<td>Prom= Mild osteophytes/Dorsal Facet= Dorsal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>34-38</td>
<td>F</td>
<td>C1= Mild osteophytes/Margin of facets</td>
<td></td>
<td></td>
<td>Schmorl’s Nodes on L2 and L4 inferior plates</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>60+</td>
<td>F</td>
<td></td>
<td>L4-L5= Moderate Osteophytes/Margin and Surface of Facets</td>
<td>facets= mild osteophytes/dorsal</td>
<td></td>
<td>Spondylolytic fracture present on L-5</td>
</tr>
<tr>
<td>5</td>
<td>60+</td>
<td>F</td>
<td></td>
<td>L4-L5= moderate osteophytes/ margin, moderate porosity/margin and surface, mild eburnation/margin</td>
<td>facets= moderate osteophytes/margin and surface, moderate porosity on margin, mild eburnation/margin</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 9. Vertebral pathologies for individual 1 and 3-5.
Degenerative joint disease (DJD), also known as arthritis, and is one of the most common pathological conditions that can be observed on skeletal remains. The four adult skeletons from the Foscue sample displayed only mild to moderate forms of osteoarthritis (OA) in various joints (Table 10). Osteoarthritis refers to the natural degenerative changes that occur to bones resulting from the process of aging. OA can be the result of repetitive mechanical stress acting on an articular surface and the corresponding cartilage, or from repetitive irritation of the joint or a lack of blood flow to the area (Ubelaker 1978; Jurmain 1999; Lovell 2008). The females of the Foscue sample all exhibit mild OA of the knee, with the two older females showing OA in other joints. Individual 4 has additional mild OA in her foot joints and Individual 5 had moderate OA in her hip. The male of the sample (Individual 1) exhibited mild OA in several joint regions: the elbow, wrist, hip, knee and ankle.

<table>
<thead>
<tr>
<th>Burial</th>
<th>Age</th>
<th>Sex</th>
<th>Shoulder</th>
<th>Elbow</th>
<th>Wrist</th>
<th>Hand</th>
<th>Hip</th>
<th>Knee</th>
<th>Ankle</th>
<th>Foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35-44</td>
<td>M</td>
<td>Mild</td>
<td>Mild</td>
<td>Mild</td>
<td>Mild</td>
<td>Mild</td>
<td>Mild</td>
<td>Mild</td>
<td>Mild</td>
</tr>
<tr>
<td>3</td>
<td>34-38</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mild</td>
</tr>
<tr>
<td>4</td>
<td>60+</td>
<td>F</td>
<td></td>
<td></td>
<td>Mild</td>
<td></td>
<td></td>
<td></td>
<td>Mild</td>
<td>Mild</td>
</tr>
<tr>
<td>5</td>
<td>60+</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Moderate</td>
<td></td>
<td></td>
<td>Mild</td>
</tr>
</tbody>
</table>

Table 10. Degenerative joint disease for individuals 1 and 3-5.

Few non-specific indicators of stress were observed on the Foscue sample, which include dental enamel hypoplasias, periostisis and osteochondritis dissicans (Table 11). The dental enamel hypoplasias will be discussed in this
section as they represent health stresses that affect individuals during development from childhood. Periostitis is the general term for bone infection that affects the membrane that covers the bone, the periosteum (Roberts and Manchester 2005). Osteochondritis dissicans results from the separation of a small piece of subchondral bone from the overlying articular cartilage because the blood supply to this has been cut off (Roberts and Manchester 2005; Lovell 2008). It is a condition mainly seen in adolescents and can be interpreted as an indicator of early onset mechanical stress to an individual’s developing joints.

Of the three adults (Individuals 1-3) having observable teeth all displayed at least one DEH. Individual 1 had only one DEH that correlated with a period of stress occurring at the age of 3. Individual 2 had the most DEHs, 24 in all indicating intermittent stress between the ages of 2.5 to 6.5. Individual 3 had 4 had DEHs present on their teeth, indicating that they experienced periods of stress between the ages of 5 to 6.

<table>
<thead>
<tr>
<th>Burial</th>
<th>Age</th>
<th>Sex</th>
<th>Teeth Present (# of)</th>
<th>DEH (# of)</th>
<th>Age of Stress (.5 increments)</th>
<th>Periostitis (Y/N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35-44</td>
<td>M</td>
<td>20</td>
<td>1</td>
<td>3</td>
<td>N</td>
</tr>
<tr>
<td>2</td>
<td>25-29</td>
<td>F</td>
<td>18</td>
<td>24</td>
<td>2.5-6.5</td>
<td>N</td>
</tr>
<tr>
<td>3</td>
<td>34-38</td>
<td>F</td>
<td>13</td>
<td>4</td>
<td>5-6</td>
<td>Y (location)</td>
</tr>
<tr>
<td>4</td>
<td>60+</td>
<td>F</td>
<td>0</td>
<td>0</td>
<td></td>
<td>N</td>
</tr>
<tr>
<td>5</td>
<td>60+</td>
<td>F</td>
<td>3</td>
<td>0</td>
<td></td>
<td>N</td>
</tr>
</tbody>
</table>

Table 11. Non-specific indicators of stress for individuals 1-5. Individuals 4 had no teeth and individual 5’s teeth were too badly worn away to observe DEH’s.
Periostitis was observed on middle third of the right tibia of Individual 3, possible stemming from a small localized healing trauma to the anterior margin of the tibia. Individual 1 displayed slight osteochondritis dissicans on the proximal joint surface of the right tibia.

The mineral content of the bone is measured and given a T-score between -6 and 3. A lower the T-score indicates the presence of more porous bone. A score of -1.0 is classified as osteopenia and lower than -2.5 is classified as osteoporosis. Bone mineral density scans were performed on Individuals 1, 2 and 3 (Table 12). Individual 1’s scans indicated that he was suffering from osteopenia, or low bone mineral density, with a score of -1.1. Individual 2 had two scans of the bone. The proximal head of the femur resulted in -.8 and the shaft in 4.8. While the shaft score places her in a normal zone for bone mineral density, the proximal head results put her in a dangerously close range of being diagnosed with osteopenia. Individual 3 also had two scans done on her femur. The proximal head of the femur resulted in -1.5 and her shaft resulted in a 3.2. Her shaft is within the normal range of bone mineral density, but the proximal head score indicates that she is suffering from osteopenia. All three individuals, especially 1 and 3, were at a high risk for a broken hip, because their bones were not at a healthy density level. The osteopenic femoral head scores of the two females are countered by a strong, or normal, shaft bone density. This means that these individuals were more at risk of a fracture at the femoral head region, often referred to as a hip fracture, than one that would occur in the shaft of the bone (van der Meulen et al. 2008; Marcus and Bouxsein 2008).
Excluding individual 5, the entire sample only displayed minimal antemortem tooth loss (Table 13). Individual 5 had 16 identifiable teeth lost antemortem. Table 14 displays the presence or absence of bone resorption, abscesses, and caries within the sample. Absorption of the bone due to infection was minimal, only apparent on 2 individuals (1 and 3). The amount of caries and abscesses on the teeth was mild, if at all. Caries are only present on the youngest adults (Individuals 1-3 and 6).

<table>
<thead>
<tr>
<th>Burial</th>
<th>Age</th>
<th>Sex</th>
<th># Teeth Present</th>
<th># Antemortem Loss</th>
<th># Postmortem Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35-44</td>
<td>M</td>
<td>20</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>25-29</td>
<td>F</td>
<td>18</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>34-38</td>
<td>F</td>
<td>13</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>4</td>
<td>60+</td>
<td>F</td>
<td>-</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>60+</td>
<td>F</td>
<td>3</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>3 (± 12 months)</td>
<td>N/A</td>
<td>17</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 13. Number of teeth present. Number of teeth lost ante- and postmortem for individuals 1-6 of the Foscue skeletal sample.
Dental care and medical treatment is apparent on several individuals from sample. The practice of tooth polishing or cleaning displays an effort to upkeep dental health by the Foscues. This behavior is demonstrated by the mild calculus mostly in the posterior dentition on all of the adults and appearance of labial dental abrasion and polishing in Individuals 1, 2, 3, and 5. Individual 3 has a small gold filling on the occlusal surface of her left 2nd molar.

<table>
<thead>
<tr>
<th>Burial</th>
<th>Age</th>
<th>Sex</th>
<th>Abscess (Y/N)</th>
<th>Caries (Y/N)</th>
<th>Resorption (Y/N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35-44</td>
<td>M</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>2</td>
<td>25-29</td>
<td>F</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>3</td>
<td>34-38</td>
<td>F</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>4</td>
<td>60+</td>
<td>F</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>5</td>
<td>60+</td>
<td>F</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>6</td>
<td>3 (± 12 months)</td>
<td>N/A</td>
<td>N</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

Table 14. The presence or absence of dental abscesses, caries, and resorption for individuals 1-6 from the Foscue skeletal sample.

Table 15 displays the individual, type and stable isotope values for both $\delta^{15}N$ and $\delta^{13}C$ resulting from mass spectrometer testing. Both bone and dental dentin was examined for stable carbon and nitrogen isotopes. Figure 31 depicts the results of what would be expected of a family group when comparing the ratio of $\delta^{15}N$ to $\delta^{13}C$ for the entire sample. There is a distinct clustering for both nitrogen and carbon stable isotopes between the Foscue skeletal samples. This clustering of values suggests evidence that those individuals of the Foscue
skeletal sample were sharing a similar diet composed of the same types of plants and animals. The $\delta^{13}C$ values for the sample range between -12.25 to -13.62 ‰ and nitrogen ratios range between 10 to 12‰. One individual at Foscue, the 3 (± 12 month) old Individual 6 had the highest ratio ($\delta^{15}N = 11.65$) of all the bone samples tested. The significance of these values will be further discussed in the following chapter.

Figure 31. Results of the ratio of $\delta^{15}N$ to $\delta^{13}C$ stable isotopes for the Foscue skeletal sample.
Table 15. $\delta^{15}$N and $\delta^{13}$C stable isotope results for the Foscue skeletal sample.

<table>
<thead>
<tr>
<th>Burial</th>
<th>Sample Type</th>
<th>$\delta^{15}$N in ‰</th>
<th>$\delta^{13}$C in ‰</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual 1</td>
<td>Bone</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Poorly Preserved</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual 2</td>
<td>Bone</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Poorly Preserved</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual 3</td>
<td>Bone</td>
<td>10.47</td>
<td>-13.09</td>
</tr>
<tr>
<td>Individual 4</td>
<td>Bone</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Poorly Preserved</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual 5</td>
<td>Bone</td>
<td>11.03</td>
<td>-12.67</td>
</tr>
<tr>
<td>Individual 6</td>
<td>Bone</td>
<td>11.65</td>
<td>-13.62</td>
</tr>
<tr>
<td>Individual 1</td>
<td>Dental Dentin</td>
<td>11.74</td>
<td>-12.25</td>
</tr>
<tr>
<td>Individual 2</td>
<td>Dental Dentin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Poorly Preserved</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual 3</td>
<td>Dental Dentin</td>
<td>10.31</td>
<td>-12.63</td>
</tr>
<tr>
<td>Individual 5</td>
<td>Dental Dentin</td>
<td>11.75</td>
<td>-12.32</td>
</tr>
</tbody>
</table>

The results presented in this chapter for each of the three categories: architecture, artifact, and biological will be further expanded on in the following chapter. The results presented here, specifically the abundance of biological remains, were not as expected. However, these results only allow for additional interpretations of the data and the broader implications they have to the historical context of this vault.
CHAPTER 5: DISCUSSION

Cultural artifacts and skeletal remains together can present a more holistic and complete reconstruction of past life histories. While the cultural and skeletal remains recovered from the Foscue vault represent only a small sample of Southern U.S. rural elite Caucasian plantation owning families, the artifacts and biological data obtained from the skeletal remains can still provide a snapshot of one family during a particular period in North Carolina history. Several topics will be discussed in this study, including historic period mortuary customs, demography, stature, skeletal and dental health, and isotopic evidence for diet. Many of these topics can be compared with other historic cemetery populations.

There is a large lacuna in elite antebellum skeletal studies, which makes directly comparing the Foscue sample with contemporary historic populations difficult. Much of the existing data have come from previous excavations of cemeteries containing poor almshouses, free tenant farmers, or African American slave cemeteries (Angel 1976; Thomas et al 1977; South 1979; Bell 1980; Haberstein and Lamers 1981; Larkin 1988; Rathbun 1987; Sciulli and Gramly 1989; Elia and Wesolowsky; Steegman 1991; Little et al. 1992; Pfeiffer et al. 1992; Bartlett 1994; Bellantoni et al. 1997; Slaughter 2001; Saunders et al. 2002; de la Cova 2011). The type of individuals studied is due mainly to the opportunistic nature of recovery of these skeletons, often the result of cemetery relocation or salvage excavations (Owsley 1990). The individuals recorded in these studies would have different life stressors and behaviors than those of the Foscue family. Under this reasoning, rather than directly comparing the Foscue
sample with equivalent populations, comparison with varying social and economic status populations allows for a more layered and complex understanding of the lifestyle and behaviors of Antebellum Americans from the Eastern seaboard.

**Mortuary Behavior**

In the early part of the nineteenth century, the construction of burial vaults was an investment, but also an expensive and time-consuming endeavor. The vaults were often used for more than one interment. They also functioned as a visible display of wealth for those interred within them. The bricks used in the Foscue burial vault were handmade on the property, representing the self-sufficient and rural lifeway enjoyed by the early Foscue family. In the early to mid-nineteenth century a variety of brick burial vault and mausoleum forms existed in the eastern United States. Popular brick burial vault forms dating from the early nineteenth century included gabled roofs, barrel vaults, and square flat top roofs (see Figures 32, 33 & 34). These different vault forms reflect the varying personal architectural tastes of the nineteenth century (Sandbeck 1988: 440-442; Butchko 1989) and can be seen together in several nearby cemeteries, such as The Cedar Grove Cemetery in New Bern and The Episcopal Cemetery in Elizabeth City. In the Cedar Grove cemetery, which houses many of the prominent citizens of Craven County, the most common brick vault architecture is the gabled roof (Figure 32). These were simple in form and constructed during the first half of the nineteenth century. The rectangular, flat-roofed brick vaults (Figure 33) were common in the first two decades of the nineteenth century, and
Figure 32. Examples of gabled roofed brick burial vaults from Cedar Grove Cemetery, New Bern, NC.
Figure 33. Examples of rectangular, flat roofed brick burial vaults at Cedar Grove Cemetery, New Bern, NC.
Figure 34. Brick barrel vault and elaborate Rhem brick burial vaults from the Cedar Grove Cemetery, New Bern, NC. Both are examples of later nineteenth century more decorative and elaborate vaults.
those constructed at Cedar Grove cemetery date no later than 1811. It was not until the Victorian era that the beautification of death movement took place, resulting in more elaborate mortuary displays (Little et al. 1992). This decorative shift is demonstrated in The Cedar Grove Cemetery by the Rhem stuccoed brick vault and in the barrel-shaped brick barrel vault (Figure 34). These vaults are highly ornate and much larger than other burial vaults in the cemetery. Through the understanding of contemporary and regional burial norms, it is probable that the Foscue burial vault's above-ground structure had a gabled roof and was fairly simple in design, as discussed below.

Unfortunately, because the structure had collapsed and been reconfigured before excavation, there was little remaining to tell the style of brick patterning that may have been used on the above-ground structure. The three most common brick patterns that were used during this time period were simple common bond, English bond, and Flemish bond. These different patterns have to do with variations in the placement of headers and stretchers in the courses, or layers of brick.

A header is the small side of the brick that appears on the wall when laid in a course and a stretcher is the long side appears on the face of a wall. It takes more bricks to make a course of headers than stretchers. Common bond is when the bricks are laid in courses of stretchers with a single course of headers to break up the pattern. The most common sequence of these historically was five courses of stretchers with a sixth course consisting of headers. English bond pattern is made from alternating courses of headers and stretchers. The Flemish
bond pattern was made from the alternating of headers and footers in each course (Charlotte-Mecklenberg HLC n.d.).

Both common and Flemish bond patterning was used in the construction of the 1820’s plantation house at Foscue (Figures 35 and 36). Flemish bond, which used the most bricks, can be seen on the outer front façade of the house and common bond patterning was used for the other walls of the house. The underground brick structure of the vault was constructed using a common bond pattern. There are some bricks left in the rubble that are cut on one end diagonally, suggesting they were cut for a gabled roof. I propose that the vault had a gabled roof and the above-ground structure was constructed entirely of bricks. The type of patterning used on the above-ground structure is pure conjecture. Where the vault reached ground level, a header pattern of bricks was observed. Above these headers the structure could have continued in common bond brick patterning or it could have mirrored the plantation house, having a façade made of a Flemish pattern and the sides common bond with fourth course headers. The Foscue vault demonstrates the difficulty with inferring status from quantity and quality of material objects alone. In this case the historic record and health of the remains must be the indicators for status, not the inclusion of fine items. If this were the case the Foscue vault would by no means be considered elite because the scarcity of artifacts. However, there is a good probability that the vault was looted prior to this excavation during a period of disrepair.

The lack of elaborate artifacts can be the result of two things: either early looters broke into the vault and stole many of the personal artifacts and coffin
Figure 35. Example of common bond brick patterning with fourth course headers found on the sides of the Foscue Plantation house.

Figure 36. Example of Flemish bond brick patterning found on the facade of Foscue Plantation house.
hardware or the Foscues adhered to a simple Christian burial ritual. While there was evidence for a looter's hole in the northwest corner of the vault, the hole did not extend below the rubble layer, where the concentration of artifact and skeletal material was located. There are family and local accounts that the vault was left open and in disrepair at some point in its history. This neglected period in the vault's history could have given the opportunity for looters to enter the vault without much visible disturbance. Some type of looting episode is evidenced by the post mortem damage to the right femur of Individual 4. While the idea of a significant looting episode is a viable option that must be considered, it is more likely that the lack of significant artifacts was the result of the Foscue family following simple Christian burial norms of the time period.

In the early nineteenth-century, death was something that occurred at home regardless of socioeconomic status. Christian burial practices of the period were simple and followed the same ritual processes. Preparation of the body after death was often the responsibility of family members or slaves of the same gender as the deceased. After death the body was washed for purification purposes and then wrapped in a clean white linen or cotton shroud. There was no embalming of the dead in the early to mid nineteenth-century. For the most part coffins were not premade and were often built by a local carpenter or cabinetmaker to order. Coffins in the early part of the century were plain and often hexagonal in shape and served purely utilitarian purposes. It was not until the mid to later half of the nineteenth-century that more elaborate and adorned caskets were in use.
In addition, the body was laid to rest with little, if any, ornamentation or embellishment (Larkin 1988: 98-104; Slaughter 2001: 26). Families such as the Foscues would have laid the dead to rest in a small family cemetery or burial ground, which are commonly seen in eastern North Carolina. Their bodies would have been laid in an east-west orientation, with their head oriented to the west and their feet to the east. This orientation allowed that the dead could rise up to face the rising sun and Jesus in his second coming (Bellantoni et al. 1997: 137; Winchell et al. 1992: 27), and common in Christian burial practices. Identifying the orientation of the burials in the Foscue vault is hindered by the commingled condition of the skeletal remains at the time of excavation.

The lack of artifacts and the trend in death rituals practiced at the times of known deaths of the individuals in the vault helps to support that they would have practiced simplistic burials. The ‘beautification’ and industrialization of death did not occur until much later, during the Victorian Era, or post-Civil War era in American history. This was the result of large quantities of people dying during the Civil War developed a need for an industry to produce extravagant coffins and coffin hardware. This beautification of death was characterized by elaborate handles and ornamental coffin design, prolonged mourning of the dead and an idealization of death (Little et al. 1992: 412; Bell 1990:54). The beautification of death movement increased in popularity during and directly after the Civil War. However, the known death dates for the skeletons interred in the Foscue vault these all occur pre-Civil War era. It is unlikely that elaborate burial trends would have reached the rural Foscue Plantation much before 1860’s.
Of all the artifacts recovered, the most noteworthy was the lock mechanism (FS #2, Figure 20). The lock recovered from the burial vault was identified as a British left-facing rim lock dating 1810-1830 (Streeter 1974; Powell 2011). The origin and date for the lock were based on the organization of the diagnostic elements within the lock. While the lock recovered is slightly larger than the original locks found on the third floor doors, the styles of locks are nearly identical. Taking into consideration the date of the house, which is circa 1823 (Hood 1997; Seifert 2006: 24-5), and the proposed dates for this lock style, it can be surmised that the lock recovered from the vault may have been part of a bulk ordering of locks during the construction of the present plantation house. The identification of the rim lock within the burial vault puts the construction of the vault contemporary with the construction of the house, if not slightly later.

The nails found in the artifact assemblage from the vault are machine-cut nails. This type of nail come into existence in the late 1700’s but is more common on nineteenth-century sites. The hinges excavated from the vault also match the door hinges from the third floor the 1820’s plantation house. In addition there were two metal straps that could have an architectural function. However, these straps are in distorted condition making it difficult to classify their function. The location of the nails, hinges and lock in the northern part of the vault indicate that the door was located along the northern wall.

**Identification of the Skeletons**

The Foscue sample remains a unique glimpse into the lives of a cross-section of three different generations, presuming our identifications stand as
correct (Table 6). With the aid of the National Register Nomination for Foscue Plantation (Hood 1997) and *The History and Genealogy of Jones County, North Carolina* (Harriott 1987), three of these 9 individuals have been tentatively identified. Two of the three supposed individuals mentioned in the National Register Nomination for Foscue Plantation were tentatively identified as in the vault. The biological data for Individual 1, the sole male in the sample, is consistent with Simon Foscue, Jr. The male skeleton in the sample has an estimated age of 35-44, slightly younger than is recorded for Simon Jr., who died at the age of 50 in 1830. In this case the status of Foscue, Jr. must be taken into consideration. As an elite antebellum plantation owner whose family owned many slaves, the likelihood that he performed heavy labor throughout his lifetime would have been very slim. The lack of mechanical stress to his bones may have allowed his bones to maintain a youthful appearance. However, considering the large disparity between the estimated age of Individual 1 and Foscue, Jr.’s age at death, an alternative hypothesis is that this skeleton is possibly not Simon Foscue, Jr. but another Foscue male.

The second individual in the tomb mentioned in the National Register Nomination is Simon Foscue, Jr.’s wife, Christiana “Kitty” Rehm. Kitty died in 1853 at the age of 74. There are two elderly females identified in the Foscue sample, Individuals 4 and 5. Without any definitive pathological conditions or historical mention of injuries sustained by Kitty Rehm in her lifetime, either Individual 4 or 5 could be Kitty Rehm.
A third individual could be tentatively identified from the commingled burial vault. In *The History and Genealogy of Jones County, North Carolina* (Harriett 1987), circumstances leading to the death of Christiana Foscue, daughter of Simon Foscue, Jr. and Kitty Rehm, are detailed. Two facts are mentioned related to Christiana: that she was married to James Hancock and that “mother and baby died together” (Harriett 1987: 135). Christiana Foscue died May 28, 1838 at the age of 26 (Foscue 1870). The biological data for Individual 2, along with the presence of two preterm infants (Individuals 7 and 8), match the written account and identify this skeleton as Christiana Foscue and perhaps her unborn baby[ies].

Those left without tentative identification include Individuals 3, either 4 or 5, 6, and 9. There are no historical accounts mentioning that these women or children were interred in the burial vault. There also are no historical accounts mentioning the young child (Individual 6) or a death of a young child and it is uncertain how this individual is related to the other skeletons in the vault. There is a possibility that one of the elderly females (Individuals 4 or 5) may also be another Foscue woman who has yet to be identified.

**Individual Osteobiographies**

**Individual 1 (31Foscue-ECU-1)**

This individual is the only male from the burial vault and has tentatively been identified as Simon Foscue, Jr., who died at the age of 50. Tooth polishing behaviors were observed on this individual and suggest that good oral hygiene was something of a priority. He displayed mild arthritis in the elbow, wrist, hips,
knees and ankle and on the middle of his back and 1st cervical vertebra. Individual 1’s OA patterning suggests that he was involved in some sort of mechanical or repetitive activity involving these joints, which over time left their mark. However, this activity was not heavy enough to cause more than mild bony lipping on his bones. The presence of osteochondritis dissicans on his right tibia also supports the idea that he was involved in some sort of repetitive activity, especially as an adolescent. This pathology indicates that as an adolescent he was in fact performing some sort of repetitive mechanical labor that affected his knees (Jumain 1999). While he may have been involved in a repetitive activity, there is no evidence for sustained heavy physical activity. Individual 1 lived a fairly inactive life, as implied from his low bone mineral density T-score.

**Individual 2 (31Foscue-ECU-2)**

Individual 2 is the youngest adult female in the sample and had been tentatively identified as Christiana Foscue, daughter of Christiana Rehm and Simon Foscue, Jr. Christiana Foscue died at the age of 26. It is recorded that she and her unborn child passed away together. Drawing from historic details, Individuals 7 and 8, both fetal infants thought to be twins, have been associated with this skeleton. This individual displayed no significant skeletal pathologies, but did show the highest amount of dental enamel hypoplasias, 24 in all. The high quantity of DEHs suggests that in her childhood she experienced significant nutritional or disease stress. Good oral hygiene was also something valued by Individual 2, as there are labial abrasions on her front teeth, indicating she was practicing tooth polishing behaviors. Her low bone mineral density T-scores
diagnosed her as suffering from osteopenia, further supporting a sedentary lifeway led by the Foscue family members.

**Individual 3 (31Foscue-ECU-3)**

Individual 3 is the second youngest female in the sample, with an estimated age of 34-38. This individual’s identity has yet to be determined. There are no historic documents that identify whom she may have been. Considering the young age of this individual, it is hypothesized that the other young neonate in this skeletal sample, Individual 9, may be associated with Individual 3. Her cause of death may have been the result of complications during childbirth or subsequent infections thereafter and may have resulted in the death of the newborn. However, this newborn could have also been another woman’s child and after it died she went on to live a long life. She displayed mild arthritis on her 1\textsuperscript{st} cervical vertebra and on her right knee. Schmorl’s nodes were present on her 2\textsuperscript{nd} and 4\textsuperscript{th} vertebrae. The presence of Schmorl’s nodes displays that she was involved in some sort of activity that caused a compression injury and subsequent disc herniation in her lower back. Several studies of this condition attribute the condition to heavy lifting or mechanical labor on the spine (Angel 1971; Angel et al. 1987; Rathbun 1987). The identification of this pathological condition on the skeleton of Individual 3 is intriguing when her sex, social and economic standing are considered. It is highly doubtful that this individual was doing heavy labor, as the rest of her skeletal data do not suggest this. She also displayed a healing fracture on the lateral condyle of her proximal right tibia and periostitis on the middle part of her right tibia. The healing teacup fracture and
associated periostitis suggests that she may have experienced some sort of mild compression trauma to her right lower leg, however this was not a fatal injury. While she displays mild skeletal pathologies, none indicate she was involved in any heavy physical activity, a fact further supported by her surprisingly low bone mineral density T-scores that diagnose her as suffering from osteopenia. The presence of a gold dental filling from this individual sheds light on dental care in the early part of the nineteenth century and the access that the Foscues had to it considering their rural location.

**Individual 4 (31Foscue-ECU-4)**

This individual is one of two elderly females recovered from the Foscue burial vault. She has been tentatively identified as Christiana “Kitty” Rehm, although there is the possibility that Kitty could also be Individual 5. Osteoarthritis was present on the 4th and 5th lumbar vertebrae and in her hips and knees. There was spondylolytic fracture of pedicle of the 5th lumbar vertebra. While sporadically reported in archaeological samples, the direct activities to cause this pathology are not fully understood. These types of fractures can result from either indirect trauma, a genetic predisposition to this injury, or repeated physical stress (Lovell 2008; Jurmain 1999). It is possible that she may have induced this fracture while performing an activity that overextended her lower back, as her bones show no evidence for sustained physical activity. She suffered from systemic osteoporosis, again indicating that she led a life of inactivity. Individual 4 exceeds the average height expected for women in the early nineteenth-century, which may indicate several things. She may have been related to the
Foscues by marriage and thus genetically dissimilar or perhaps her nutrition and health growing up was less stressful than the rest of the sample.

**Individual 5 (31Foscue-ECU-5)**

This individual is one of two elderly females recovered from the Foscue burial vault. She could possibly be tentatively identified as Chrisitiana “Kitty” Rehm, although there is the possibility that Kitty could also be Individual 4. She suffered from arthritis in the hips, knees and lower back, specifically in her 4th and 5th vertebrae and sacrum. Her arthritis was the most advanced of the entire Foscue sample, ranging from mild to moderate and is not unexpected for and individual, even a sedentary one. The condition of her bones and advanced state of osteoporosis indicate that she is the older of the two elderly females. Of the entire sample she also suffered from the highest amount of antemortem tooth loss. This high amount of tooth loss present in this individual would have caused problems with eating, which may have affected her nutritional intake. Good oral hygiene was also seen as a priority for this individual. Of the three teeth present, all three display labial abrasions consistent with tooth polishing behaviors.

**Individual 6 (31Foscue-ECU-6)**

This individual is a juvenile with an estimated age of 3 years ± 12 months. There are no historic documents mentioning the death of young Foscue child and their burial in the vault. While there were no skeletal pathologies present on the remains of this young child, he/she suffered from extremely poor dental health. There are numerous caries present on nearly all of his/her deciduous dentition. This child was probably just weaned; his/her death could have been the result of
increased risks that are associated with transitional stage. The presence of this individual speaks to the difficulties, even for the elite, of growing up in the early part of the nineteenth-century.

**Individuals 7 (31Foscue-ECU-7) and 8 (31Foscue-ECU-8)**

There are no skeletal pathologies observed on these two individuals. With the close proximity of estimated ages for these fetal infants, 32 weeks for Individual 7 and 31 weeks for Individual 8, it is proposed that they shared the same womb and died together. It is known that Individual 2 died while pregnant and these two individuals have tentatively been associated with her.

**Individual 9 (31Foscue-ECU-9)**

There are no significant skeletal pathologies observed on this neonate. The estimated age of this Individual is 36 weeks, indicating that this child was stillborn or died shortly after birth. With the presence of this individual and an additional younger female, Individual 3, it is possible that these two Individuals can be associated to one another and may have died at the same time from complications during labor. It is also a possibility that this individual in the child of another woman Foscue female who was

The presence of these two fetal infants and one neonate further emphasize the dangers that came with childbearing and high instances of infant mortality in the early part of the nineteenth-century.

**Foscue Plantation Life in the Early Nineteenth-Century**

The skeletal data from the remains of the nine individuals from the Foscue burial vault allow for general statements about health and lifestyle of this rural
elite family from eastern North Carolina. The bone and dental health from the Foscue skeletons from the burial crypt indicate a family who enjoyed an influential life filled with little heavy labor and good health and nutrition. While the diet and some skeletal pathologies are consistent with contemporary lower socioeconomic populations, the lack of skeletal pathologies in this skeletal sample speaks to the Foscue’s privileged lifestyle in the early part of the nineteenth-century.

Overall the Foscue sample displayed minimal skeletal pathologies. The four adults that did show pathologies were the result of the natural processes of aging rather than infection or malnutrition. The pathologies most apparent on these skeletons included vertebral degeneration, degenerative joint disease, and non-specific indicators of stress. This lack of infectious pathological conditions appearing on the bones speaks to their social and economic standing in Eastern North Carolina. In order to remain in good health, they either had to the access to and the financial ability to pay for healthcare or they never got sick to begin with. It could also mean that they died from a disease so quickly that it had no time to cause primary or secondary bone pathologies.

The general bone health of the Foscue family is very different from contemporary tenant farmer and slave populations. The Foscues display almost no non-specific indicators of stress. In addition, based on bone mineral density scans Individuals 1-3 suffered from osteopenia, a lack of significant cortical density due to a sedentary lifestyle. The relatively young age of these individuals, ranging from 25-44 years old, should exclude them from having poor bone
mineral content. There have to be other factors to cause them to be diagnosed with osteopenia. The probability of these wealthy individuals not having access to adequate nutrition is unlikely. The osteopenia was more likely the result of a lifestyle that lacked weight-bearing activities, which is an important factor to maintaining healthy bone mineral density. An explanation for why the Foscues enjoyed a fairly inactive life of little hard labor is best understood through the historic context of the social world in which they lived. The Foscues as owners of a southern agricultural plantation were also owners of numerous slaves. The U.S. Census of Population and Housing from 1800-1830 records that the Foscue family owned as many as 37 slaves at one time. These slaves would have been involved in the upkeep of agricultural fields and house labor.

Dental health provides additional health and lifestyle information about the Foscue skeletal sample. Several significant patterns in dental health emerge that shed light on diet, aesthetic behaviors and dental care that practiced by the elite rural eastern North Carolina family. Where many of the lower status populations in the nineteenth century had poor dental health, overall the dental health of Foscue skeletal sample can be classified as good. Excluding Individual 5, the entire sample only displayed minimal antemortem tooth loss. Individual 5 had 16 identifiable teeth lost antemortem and this can most likely be contributed to processes of aging rather than poor health.

Just as bones develop in a particular way in a person’s lifetime, so do the crowns of teeth. These known stages of permanent crown development aids researchers in identifying ages at which enamel defects occur. These defects
most commonly appear as dental enamel hypoplasias (DEH) and give insight into childhood developmental stress. With the exception of one individual who experienced numerous periods of stress, the dental enamel hypoplasias present on their teeth were more likely the result of weaning stress or illness than the result of poor developmental nutrition that would result in more systemic stress.

The socioeconomic standing of the Foscue family would have allowed them plenty of access to foodstuffs, therefore excluding the possibility that nutritional deficiency was the cause of the DEHs. The appearance of DEHs, especially for Individuals 1 and 3, may have more to do with malnutrition during the weaning process. This data indicates that the Foscue family was weaning their children around the same time as contemporary lower socioeconomic populations, which was previously discussed. If the DEHs present on the Foscue family remains represent weaning stress then they fall into the weaning norms of the early part of the nineteenth-century, with Individual 3 perhaps being weaned slightly later.

The Foscues have both caries and abscesses, but they are only present in low quantities. The appearance of caries on the youngest skeletons of the Foscue sample directly speaks to the diet being consumed, or perhaps a transition in foodstuffs, if in fact the elderly individuals were born before the younger individuals from the vault. A diet higher in meat, carbohydrates and sugars, lacking fresh fruits and vegetables, may have become incorporated deeper in daily diet as food norms changed or as the plantation owners began to
gain a higher socioeconomic status that allowed them to purchase luxury foodstuffs.

The carbon and nitrogen values along with dental pathologies give further insight into the types of diets being consumed on the Foscue Plantation in the early part of the nineteenth-century. $C_4$ plants consisting of grasses, maize, millet and sugarcane. The value for range from -9 to -14‰, but can be as high as -6‰. Diets consisting of marine foods can range from -10 to -15‰ (Schoeninger et al. 1983; Ubelaker and Owsley 2003; Katzenberg 2008). The carbon isotope ratios from the Foscue skeletal sample suggest that they were eating a diet consisting mainly of $C_4$ plants and animals that were consuming the same plants. The Foscue results are very different from previous Early and Late Prehistoric Native American populations, whose carbon ratios are much higher, indicating they were eating more $C_3$ plants and animals. When compared with earlier native populations the Foscues most closely match the mission period Native Americans, who were assimilating to European diet and food norms. (Larsen et al. 2001). While it is also probable that the Foscues may have incorporated small game animals into this diet, such as rabbits or pheasant and the occasional deer, these were not the main food sources for the Foscue family.

For terrestrial environments the $\delta^{15}$N can range from -10 to +15 ‰, but generally the range is typically from -5 to +10 ‰ (Hauck 1973; Craft et al. 1988; Shearer and Kohl 1989; Nadelhoffer and Fry 1994; Trimble and Macko 1997). For North Carolina the terrestrial baseline $\delta^{15}$N values range between 0 to 10‰ (Showers and Eisenstein 1990). Terrestrial nitrogen values do not exceed 10‰.
According to the study performed by Shoeninger and DeNiro (1983) and others, nitrogen values get higher when marine life is consumed (Schoeninger and DeNiro 1983: 631; Ambrose 1993: 87; Ubelaker and Owsley 2003; Katzenberg 2008). The nitrogen values displayed from the Foscue sample indicate that they were incorporating marine life into their diet.

Combining the $\delta^{13}C$ and $\delta^{15}N$ results demonstrates that the Foscues were consuming herbivores that were consuming the same $C_4$ plants upon which they relied. Considering the Foscues were agriculturists, the $C_4$ plant they likely were consuming was corn. In addition, their high economic status would also have allowed them to incorporate sugar to their diet. While wheat and grain may have been a component of their diet, it was not substantial enough to affect the composition of their bone collagen. According to their nitrogen values, the individuals in the Foscue sample were not high enough to suggest that they were consuming carnivores, such as bears or wolves. However, the results do suggest that the Foscues integrated marine resources into their diet, not surprising considering the geographic proximity of the plantation to the Trent River. This is supported by their nitrogen ratios, which range between 10 to 12‰ and the carbon ratios, which range from -12 to -14 ‰.

The isotope results and DEHs apparent on the skeletal remains also give insight into weaning in the early nineteenth-century. Individual 6, the 3 (± 12 months) year old child, had the highest ratio ($\delta^{15}N = 11.65$) of all the bone samples tested. Weaning, or just weaned infants have been shown to have higher nitrogen values than their mothers, indicative of their higher trophic level in
the food web. Carbon isotope values will not be affected by this process and will not differ from their mother’s values (Fuller et al. 2006; Katzenberg 2008). It can be inferred from Individual 6’s δ^{15}N ratio that this child was still receiving some breast milk from its mother at the time of the child’s death. Therefore, this demonstrates that the Foscues wean their children around 3 years of age, however, more samples are needed to prove this supposition. The weaning-related DEHs present on the Foscue remains, along with comparative historic studies (Lanpher 1990) place this age of weaning within the norm for populations dating from the early part of the nineteenth-century.

One would expect with the Foscue diet high in carbohydrates and perhaps more luxury items like sugar, that their dental pathologies would be worse than contemporary lower socioeconomic populations, however this is not the case. A possible explanation for this could be the priority for keeping good dental health among the individuals interred in the Foscue burial vault. There are several indicators in the skeletal sample that the Foscue family had a high regard for dental care. Individual 3 displays evidence of access to dental medical care with her gold filling and Individual’s 1, 2, and 5 show evidence of tooth polishing behavior.

This tooth polishing behavior has rarely been observed on skeletons dating from this time period and is highly noteworthy. The labial abrasions present on the teeth of these individuals indicate that clean teeth and tooth polishing were priorities for both sexes. Along with the cosmetic value of practicing such behaviors, this activity also aided in preventing dental decay in
the anterior dentition. This activity also had detrimental affects on the teeth as well, the wearing away of enamel can leave the dentin exposed and the teeth susceptible to cervical caries. This is best exampled by Individual 5 who polished her teeth so often that she wore away her enamel at the cementoenamel junction, exposing her cervical root.

Individual 3 of the skeletal sample also demonstrates how cavities in the unpolished posterior teeth were handled. Her gold filling is significant because it displays the high economic standing of this individual from Foscue family to afford a precious metallic filling and the availability of restorative dental care in Craven (Jones) County in the early to mid nineteenth-century.

The demography within the Foscue burial vault speaks to the health of women and children during the early to mid nineteenth-century. The heavy concentration of women and children within the vault allows for the discussion topics often neglected in the historic record, such as the health of elite women in the early to mid nineteenth-century. The four women from the vault represent two different age grades, two women in their childbearing years (Individuals 2 and 3) and two in post-menopausal years (Individuals 4 and 5). High infant morality was common for this time period and even the Foscue family’s socioeconomic status did not shield them from losing young children. The presence of preterm infants, neonates, and young women in the Foscue vault supports the dangers of childbearing in the early part of the nineteenth-century.

The skeletons of the two young adult females (Individuals 2 and 3) displayed no pathological conditions that indicate what contributed to their death.
The identification of the fetal Individuals (Individuals 8 and 9) aided in the tentative identification of one of the unknown younger females (Individual 2) as Christiana Foscue, because it was mentioned that she died while pregnant at age 26 (Harriett 1987). With the presence of another younger female (Individual 3) and neonate in the vault, it can be surmised that the deaths of these young women and newborns could have been the result of complications from childbirth. If the women from this sample serve as an example, elite status did not overcome all the risks that came with pregnancy.

Individuals 2, 6, 7, 8, 9, displayed no significant skeletal pathologies. Of all the Individuals excavated, these are the five youngest in the sample. While there are no skeletal indicators to indicate cause of death, Individual 6 represents that even elite plantation owning families, such as the Foscues, were not immune from the difficulties of growing up in this time period.

The bones of the two elderly females in the sample show no pathological conditions other than mild degenerative joint disease and osteopenia. Both of these conditions are the result of aging and degeneration rather than heavy stress. The lack of conditions that leave lesions on the bones indicates the females in this plantation family had several advantages—good medical, familial and financial resources were available to ensure their survival into an advanced age.

Burial norms for the antebellum south were observed in this project. The osteobiographies of those found buried within the Foscue burial vault allow the remains of plantation owners to tell their own tales. While there are some
similarities in the skeletal health between the Foscue family and tenant farmer and slave populations, the similarities are few. The Foscue sample allows one to see the disparities that occurred between social classes in the antebellum Southeastern U.S.
CHAPTER 6: CONCLUSIONS

By applying an osteobiographical method to understanding the small skeletal sample from the Foscue burial vault, this project has shed new light onto the lives of the rural plantation owning families of high social and economic standing in the Southeastern U.S. during the antebellum period. This method has proven successful to establish a better understanding of a family group previously thought to be well-documented. The osteobiographies presented here have allowed for both individual stories and the development of better social, economic and cultural understanding of different lifeways in the antebellum southeastern U.S. The skeletal and material cultural remains from the Foscue vault have provided identification of those interred, date of the vault, assessment of health and disease, and illumination of mortuary practices.

Of the nine individuals identified from the vault, three identified by name. Individual 1, the sole male in the sample, was identified as Simon Foscue, Jr. based on his age-at-death, sex, and documents placing him in the vault. Either Individuals 4 or 5, the two elderly females in the sample, could be his wife Christiana “Kitty” Rehm, again based on a combination of biological and documentary evidence. Individual 2, the youngest adult female, was identified as their daughter Christiana Foscue, who according to documents lost her life in the while pregnant, possibly during childbirth at age 26. Either the two preterm fetuses of similar age (Individuals 7 and 8) or the older neonate (Individual 9) may have been her child[ren] who died with her during birth. As for the other
younger female, Individual 3, her identity and whether or not the older neonate can be associated to her are unknown. There is no reference in the Foscue family papers that discusses the death of a young child matching the time period or biological profile of Individual 6, leaving this individual unidentified. The presence of unidentifiable individuals in the vault is possibly the result of interment during a period of poor-record keeping or the relative invisibility of women or small children in the Foscue family records in particular, and perhaps early to mid nineteenth-century history in general.

When initially constructed, the burial vault was made of brick, mortar and plaster. The above-ground structure of the burial vault presumably was made of brick and would have had a gabled roof. The architecture, masonry and presence of a nineteenth-century rim lock and hinges from the burial vault suggest that it dates to the first half of the nineteenth-century, most likely contemporary with the construction of the currently standing plantation house, completed circa 1824 (Hume 1970; Thomas et al. 1977; Bell 1980; Powell 2011). From the identification of those interred in the vault, the construction of the vault must have been completed by 1830, when Simon Foscue, Jr. passed away. The latest documented interment in the burial vault dates to 1853, Kitty Foscue’s date of death. It is highly unlikely that any individuals were interred after the Civil War, when the family cemetery directly to the south of the currently standing plantation house began to be used by Foscue, Jr.’s son, John Edward Foscue and family.

Mortuary display and behaviors practiced by the Foscue family were consistent with burial customs of the antebellum time period (Thomas et al. 1977;
Bell 1980; Haberstein and Lamers 1981). The lack of artifacts suggests that the Foscues practiced simple Christian burial practices with very little ornamental display. These individuals were interred before the beautification of death movement that took place around and shortly after the Civil War. Considering the amount of time the vault was in disrepair, it is also a possibility that various individuals had the opportunity to remove artifacts and coffin hardware from the vault.

The Foscue skeletal sample allows us to develop a complex and holistic understanding of prominent rural plantation owning residents of the early part of the nineteenth-century in the Southeastern U.S. The osteobiographies presented here allow the skeletons of the early Foscue owners to tell their own stories about their life histories. Burial norms for the time are displayed in both the architecture and mortuary practices used in the Foscue burial vault. The Foscue family, as hypothesized, enjoyed a lifestyle that was fairly sedentary and included access to adequate food sources and medical care. They owned numerous slaves that were used for much of the labor, both in and out of main house. Their remains display no indicators of skeletal trauma, low skeletal indicators for heavy activity-related pathologies, as well as few non-specific indicators of stress. The pathologies that are apparent on some of the remains are mainly the result of mild degenerative joint disease or vertebral pathologies, which are the result of the natural process of aging.

Good dental hygiene was apparent on the Foscue sample, exampled by few dental pathologies and behaviors of tooth polishing. Their dental health for
the Foscue family was, as expected, better than contemporary slave or tenant farmer populations. The Foscue dental health displayed similar patterning of caries, which were the result of diets high in carbohydrates and sugars. The stable isotopes results support this type of diet that was shared within this skeletal sample. Behaviors of tooth polishing and access to dental care were seen throughout the adult skeletons of the samples. Individuals 1, 2, 5 displayed tooth-polishing abrasions on their teeth and Individual 3 had a gold dental filling.

Upon further investigation some of the originally held hypotheses were shown to be incorrect. For this project, the historic record was corrected through the use of archaeological investigation. Nine individuals, not three, were excavated and identified from the Foscue burial vault. Of these nine, only two were recorded to have been interred there, Christiana Rehm and Simon Foscue, Jr. A third individual was also identified, their daughter Christiana Foscue.

Another unexpected result was the low T-scores for the three youngest adult individuals within the Foscue sample. Their bone mineral density T-scores indicated they suffered from osteopenia, which was most likely the result of their sedentary lifestyle. The socioeconomic status of the Foscue women and children did not protect them from the risks and the hazards that came with childbearing and early childhood development. This sample shows the importance of doing studies of the rural elite. It also displays the importance of biological archaeology and how it can clarify America’s historic past.
Future Research at Foscue Plantation

The next step in this project will be the restoration of the Foscue family burial vault by the living descendants. After the vault is reconstructed to historically accurate standards, the re-interment of the Foscue individuals excavated from vault will take place. An interesting future project would be to develop a better understanding of who the familial relationships of the women and children through the use of DNA technology. For example, whether or not Individual 4 and 5 represents Kitty Rehm could be clarified. If DNA was compared between these individuals and the known male Foscue (Individual 1) along with the living descendent (Jim Foscue), and if either of the elderly women showed up not blood related, she could be identified as Kitty Rehm. The same technique may also be used on the children to not only identify how they are related to one another in the vault, but also help to estimate the sex of the juveniles, which may help further identify them. DNA would aid in not only identification but also in understanding of burial patterning behavior. This could be accomplished by determining how each individual in the vault is related to one another and to the current living descendants.

This project has shown the importance of bioarchaeological projects focused on studying the rural elite. There is much to still be known about those elite families that were part of developing the American Southeast. The lives of women and children have consistently been understudied in all socioeconomic classes. This project, and others like it, may give voices to those rural elite families who have remained unstudied because of an overreliance on the historic
record. This project also shows the need for further historical research into the Foscue family history. Further historical research could possibly identify or eliminate possibilities for those left unidentified. The search for documents beyond what is known by the family members could prove to be essential to developing a better understanding of the Foscue family during its establishment in Craven County in the early part of the nineteenth-century. This project shows how the written record may be corrected or supported through the combination of biological and archaeological research.
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