Notebook - July-August 1973

South Carolina Institute of Archaeology and Anthropology--University of South Carolina

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INTRODUCTION

Archeologists and physical anthropologists have coordinated their research efforts toward an understanding of the biological population in its cultural setting for many decades. This coordination has taken many forms depending upon the interests and concerns of the physical anthropologist and of the archeologist. Some of these efforts are typological analyses of the skeletal material (Neumann 1952); others are biological tables attached to archeological reports; and others are fully coordinated research such as that done by William Bass in the Plains area (Bass, Evans and Jantz 1971).

It is the latter approach that is attempted in this report on the skeletal material from the Scott's Lake Bluff Site (38CR35). The physical anthropology studies are centered around the examination of the relationships between the biological and the cultural development of the population. We have attempted to employ studies of non-metric, discontinuous, and genetic traits along with the cultural forms of treatment of people at death, and the life patterns of these people (Armelagos 1968; Binford 1971; Finnegam 1973; Sublett 1972). The study of this relationship calls for an examination and analysis of such features as form and location of burial, relationship of sex and age at time of death, body preparation, articulation, number of individuals per burial, orientation, position and inclusions if any (Sprague 1968). Binford (1971) stresses the importance of attempting to confer the
"organizational properties" of the cultural system under study through the analysis of burial practices as parts of a system with variables affecting them. It is in these areas that we have concentrated our efforts in the analysis of the Scott's Lake Bluff Site (38CR35).

The Mississippian culture period has been divided into four geographical areas—Middle Mississippian, Caddoan, Plaquemine, and South Appalachian (Griffin 1952; Ferguson 1971). The population under analysis from Scott's Lake Bluff is associated with the South Appalachian Province. Other contemporary sites in this area will be discussed in this report for comparison. These sites include: Irene Mound (Caldwell and McCann 1941), Peachtree Mound (Setzler and Jennings 1941), Hiwassee Island (Dallas component) (Lewis and Kneberg 1946), Mulberry Mound (Kelly n.d.), Kolomoki (Sears 1956), and Charles Towne (South 1971). Mention should be made that although the Dallas component of the Hiwassee Island Site is used for comparison, it is located on the northwestern extremity of the South Appalachian Province. All of the sites mentioned are ceremonial centers and, with the exception of Charles Towne, have truncated platform mounds on the site.

The Scott's Lake Bluff burials were excavated during the summer of 1973 under the direction of Dr. Leland Ferguson. Dr. Ferguson at this time was excavating a Revolutionary War site, Fort Watson (Scott's Lake Site, 38CR1), which had been constructed atop a South Appalachian Mississippian temple mound. The Scott's Lake Bluff Site (38CR35) was located along a bluff of Lake Marion one-half mile due south of Fort Watson and was reported by Mr. Denne who owned the property. Both sites are located along the northeast shore of Lake Marion in Clarendon County, South Carolina. This artificial lake was formed in 1948 when the Santee River was dammed. Scott's Lake, an oxbow cut-off of the Santee River, was inundated by the flooding of Lake Marion (Fig. 1).

The burials excavated represent a small sample (twenty-five individual inhumations), however, the burial practices and other cultural data revealed through excavation and analysis have provided new material for comparison with South Appalachian Mississippian culture and people known from sites elsewhere.

**BURIAL DESCRIPTION**

All of the bone material excavated shared the same properties of preservation—extreme flaking and fragmentation, with the tendency to crumble at touch. Some decalcification and leaching had occurred, causing the bones to warp and splinter. Soil pressure and acidity also contributed to the deformation and poor condition of the bone material. The burial fill consisted of sand, a medium which is generally good for preservation. This, however, was found to be detrimental to the Scott's Lake Bluff material due to the porosity of the fill, and the acidic leaching and water action in the area.
FIGURE 1. Scott’s Lake Area, Clarendon County, South Carolina.
FIGURE 2. Scott's Lake Bluff Site.
All eighteen excavated burials were situated along a bluff face. A concentration consisting of Burials #2, #4, #7 - 16, and two cremations (Fig. 2) provided important stratigraphic information, therefore this concentration is the central focus of this study.

Burial #1 was located 65 feet northeast of the concentration. Burial #5 was 10 feet directly north and had washed out of the face of the bluff. Burial #3 was located two feet southwest of the concentration, and #6 was 10 feet southwest (Fig. 2). Only the lower portion of the #6 inhumation was present, with the upper portion having been separated from the bluff due to erosion caused by wave action.

Preliminary examination of the burial locations within the concentration led to the construction of a temporal chart designating early (Group I) to late (Group III) burials (Table 1). All other burials were treated as separate entities as there was no apparent association with the concentration. The sequence is constructed of three groupings:

- Group III. Burials 2, 4, and one cremation (Fig. 3; Fig. 4a)
- Group II. Burials 9, 10, 11, 12, 13, 15, 16, and one cremation (Fig. 4b; Fig. 5)
- Group I. Burials 7, 8, and 14 (Fig. 4b; Fig. 5)

The sexing and aging of the material was based on endocranial suture closure, general sexual dimorphic traits, tooth eruption, epiphyseal closures, and measurements from fragmentary long bones (Krogman 1962; Brothwell 1965; Steel and McKern 1969; Bass 1971). Aging was kept in general terminology of old adult (35+ years), adult (26-34 years), young adult (18-25 years), and adolescent (13-17 years). Burial classification terms used follow those described by Sprague (1968).

Group I is the earliest in the sequence of burials, consisting of three simple primary burials1 with three inhumations2. The three individuals were flexed. Two burials (7 and 14) had grave goods. Burial #7 was an adult of undetermined sex with a polished celt in association. Burial #14 was adult female with 10 shell beads each roughly 3-6 mm. in diameter in association.

Group II intruded into the fill of the burials of Group I (Fig. 5). This large pit consisted of a total of 14 inhumations in eight compound secondary burials (seven bundle burials and one cremation). Two complicated stamped urns and plain cover bowls, all belonging to the Chicora Ware Group (South 1973) were located directly above Burial #16. Eight

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1Burial is defined as "...the process (es) by which a group abandons the physical remains of a deceased member to the elements," (Sprague 1968).

2Inhumation is the individual deposited.
<table>
<thead>
<tr>
<th>Sequence</th>
<th>Burial Type</th>
<th>Individuals</th>
<th>Sex</th>
<th>Age</th>
<th>Artifacts</th>
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<tr>
<td>2</td>
<td>Flexed</td>
<td>1</td>
<td>M</td>
<td>A</td>
<td>6 projectiles, celt, mineral stones</td>
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<td>Group III Feature 1</td>
<td>Flexed</td>
<td>1+</td>
<td>*</td>
<td>*</td>
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<tr>
<td>9</td>
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<td>A,A</td>
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<td>M,*</td>
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<td>Bundle</td>
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<td><em>,</em></td>
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<td>M,M</td>
<td>OA,A,YA</td>
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<td>16</td>
<td>Bundle</td>
<td>1</td>
<td>*</td>
<td>Adol</td>
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<tr>
<td>Feature 2 Cremation</td>
<td>1+</td>
<td>*</td>
<td>Adol</td>
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<td>*</td>
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<td>A</td>
<td>shell beads</td>
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<td>Flexed</td>
<td>1</td>
<td>F</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Flexed</td>
<td>1</td>
<td>M</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Outside of burial concentration</td>
<td>Flexed</td>
<td>1</td>
<td>F</td>
<td>OA</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Flexed</td>
<td>1</td>
<td>M</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>*</td>
<td>1</td>
<td>M</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Flexed</td>
<td>1</td>
<td>*</td>
<td>A</td>
<td></td>
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</tbody>
</table>

Key: * = undetermined  
+ = or more  
OA = Old adult, 35+ years  
A = Adult, 26-34 years  
YA = Young adult, 18-25 years  
Adol= Adolescent, 13-17 years
FIGURE 3. Group III Burials
FIGURE 4a. Burials 4 and 2, Group III

FIGURE 4b. Groups I and II Burials
FIGURE 5. Groups I and II Burials
small rounded pebbles were associated with Burial #12, possibly representing the remains of a rattle from which the outer organic covering had decayed (David Anderson, personal communication). Associated with Burial #11 was one shell bead. At the base of the pit, one post hole was located, but could not be associated with a structure.

Of the fourteen inhumations in this group, six were determined to be male and eight were undetermined. Three of the undetermined were posited to be male. The long bone measurements were used to calculate height, and the general robusticity of the bones and pronounced muscle attachment areas placed them in the male range for those statures already determined. Of the fourteen inhumations, two were old adult, six were adult, one was a young adult, and one an adolescent. The cremation contained portions of one individual between 15-18 years of age. Animal bone was distinguishable from the human material in the cremation, but specific generic classification could not be made with the exception of a few bird bones and turtle shell fragments.

Group III consisted of two simple primary burials and one compound secondary burial (cremation), with a total of three inhumations definitely represented. The cremation may have contained more than one individual. Burial #4, the later of the two primary burials, intruded into the fill of Burial #2. Both inhumations were adults in flexed position. The individual in Burial #2 was of undetermined sex, as was the individual of the cremation. The individual in Burial #4 was female. Animal bone, again, was included in the cremation, but classification as to type of animal could not be made. Burial #2 contained grave goods; six projectile points that were variants of the triangular Caraway type, and one small polished celt that appeared to have been used. European ceramic sherds were located throughout the upper levels of the fill of Burial #4.

The remaining burials (#1, #3, #5, and #6), all simple primary deposits, were analyzed separately. Burial #1 contained one adult female inhumation in flexed position. Burial #3 contained two inhumations, one old adult female and one adult male. The female was in flexed position; the position of the male inhumation could not be determined. European ceramic sherds were located in the fill of Burial #3. Burial #5 contained one adult male inhumation, position undetermined. Burial #6 contained one adult inhumation, sex undetermined. The upper portion of the body had been washed out of the bluff, but the lower portion was in a flexed position. This burial also contained European ceramic sherds in the fill.

The most striking observation made about the concentration of burials concerned the sex of the individuals. Of the total number of burials excavated within this area, both females and males were included in the simple primary deposits in flexed positions, while only males were included in the compound secondary deposits. This also applied to the site as a whole. There were twenty inhumations within the concentration area. Of these, eleven were males, two were females and seven were undetermined. With the exception of one (a cremation), all individuals were adults.
Artifacts within the burial concentration area, other than specific grave goods previously mentioned, were limited. Assorted pottery sherds, flint, and chert chips, recovered from the fill of all of the burials ranged in date from Woodland to Historic times. This sporadic occurrence indicates that the majority of artifacts were unintentionally included in the fill and were not purposefully placed with the burials. There were, however, definitely associated grave goods in each group of burials. Two of the three burials in Group I contained grave goods, and one burial in Group III contained grave goods. Group II appears to have been a single burial (or deposit) with a total of fourteen inhumations in several bundled groups and one cremation. The two urns and two cover bowls were located atop Burial #16, but could have been associated with the pit as a whole.

The intrusion of Group II into Group I revealed an interesting pattern. With the intrusion, the fill of the three burials of Group I was disturbed. It appears that previous knowledge of burials in the area is evident, supporting, along with the representation of artifacts from prehistoric to historic times, that the "cemetery" was used continually over an extended period of time. The later burials (#1, #3, #5, #6) would also support this in that they were deposited in the area of, but not immediately on, the concentration. Also apparent is the change in preference of burial type within the three groups (simple to compound to simple), with more time being consumed in depositing the individuals of Group II.

Another fact deserves mention at this time. In each of the bundle burials, even those with two or more inhumations, there existed only one cranium. Taking into consideration that deterioration rates would be the same for all of the burials, with exception of diseased or infant skeletons, it does not seem likely that within the concentration area certain crania deteriorated more quickly than others. It appears that a selection process was used, or possibly in the transportation of or in the secondary preparations of the remains, the crania were either lost or kept for other purposes.

PATHOLOGIES, DEFORMATION AND ANOMALIES

Due to the extreme erosion of the bone material, observations were difficult to make regarding cultural phenomena, non-metric traits and disease. Some of these traits, however, were clearly observable.

Bone pathologies: The most common occurrence of pathology was swelling due to trauma as described by Brothwell and Sandison (1967: 599-605). One individual in Burial #13 exhibited swelling on the lateral portion of the left fibula diaphysis. Burial #11 exhibited swelling on the anterior distal portion of the diaphyses of two left femora, as well as on the anterior crest of the right tibia (Fig. 6 d, e).

Burial #8 exhibited acute stages of osteitis or yaws, with porous striations occurring on the distal ends of the femora and the tibiae (Fig. 6 a-c). Small finger-tip depressions were present on the proximal
FIGURE 6: a-c: Burial #8, osteitis demonstrated on the femora, tibiae, and cranium. d-e: Burial #11, traumatic swelling on the femora and tibia.
ends of the tibiae, directly below the articulatory surface. Porous bone growth was also located on the parietals and frontal of the calvarium.

Burial #1 had a lesion located on the occipital, directly below the external occipital protuberance (Fig. 7a). The lesion is 9.5 mm. in length and 6.5 mm. in breadth at the widest point. It does not appear to have completely penetrated the cranium.

Anomalies and Deformation: The most evident anomalies were the occurrence of sagittal and lambdoidal wormian bones. In other studies it had been found that these usually occurred with occipital or lambdoidal flattening (Neuman 1942). Burial #14 exhibited lambdoidal wormian bones (Fig. 7b) but a true case for cranial deformation could not be made due to the poor preservation of material as well as the absence of the total calvarium. One inhumation in Burial #11 (Fig. 9a) demonstrated occipital flattening, as did the inhumation from Burial #4. Accompanying the deformation in Burial #11 were not only wormian bones, but also an epiteric bone located directly posterior to the right mastoid process along the temporo-lambdoidal suture (Fig. 9a,b). A fold had also occurred on the posterior squamosal portion of the left temporal and appears to be due to the deformation.

Dental Pathologies: Peridontal disease was evident in three individuals in the concentration area. Reabsorption and alveolar abscessing occurred in conjunction with this in the molar area. In Burial #9, one individual showed ante-mortem loss of the right mandibular pre-molar 2, and molars 103, with reabsorption. The second inhumation within Burial #9 demonstrated ante-mortem loss of the left mandibular second molar, with reabsorption also taking place (Fig. 8d). Alveolar recessing was evident with the left pre-molar 2 and molar 1 of this individual. One inhumation in Burial #11 demonstrates ante-mortem loss of the three left mandibular molars, with reabsorption just beginning to appear.

Caries did not occur in high frequency or to extreme degrees. In Group I, the inhumation in Burial #4 showed caries in the second and third left mandibular molars.

Even with a small sample size, it is possible to make some comparisons within the population. Periodontal disease and alveolar recessing occurred together only in Group II of the sequence. No caries were evident within this group. Within the concentration area as a whole, only adult males exhibited periodontal disease. The females demonstrated no dental pathologies.

TOOTH ANALYSIS

Teeth were examined and rated for wear patterns according to a scale devised by Frick (n.d. - Appendix II), and were measured for buccal-lingual and mesial-distal distance (Bass 1971). Comparisons of both size and wear patterns were then made between the Scott's Lake Bluff population and that of the Mulberry Mound population (Carter and Chickering n.d.).
FIGURE 7: a: Burial #1, lesion located below the external occipital protuberance. b: Burial #14, lambdoidal wormian bones.
FIGURE 8: a: Burial #12, left maxilla -- Group II. b: Burial #4, left mandible -- Group III. c: Burial #8, mandible -- Group I. d: Burial #13, mandible -- Group II.
FIGURE 9: a: Burial #11, occipital flattening; notice fold occurring on posterior squamosal portion of left tempora. b: Burial #11, with epiteric bone.
When comparison was made among the three groups from Scott's Lake Bluff there were no significant differences established regarding size measurements. However, tooth wear patterns did reveal substantially less tooth wear in Group II when compared to Groups I and III (Table 2; Fig. 8 a–c). Significantly less wear of Group II was also evident when the Scott's Lake Bluff material was compared to that of Mulberry Mound. All members of Group II that were aged were determined to be adults and old adults, and the comparison was made with other individuals of adult age.

Attrition often has been characterized as a pathology, but recent studies indicate the frequent occurrence of dental attrition among North American Indian populations. Cultural causes that could contribute to attrition include: dietary functions, food texture, preparation of food or the lack of it, and the eating habits of the population (Molner 1972).

Moodie (1929) suggests carbohydrates, grass seeds, acorns, or maize as sources of increased wear on the occlusal surfaces of the teeth. Since major food items of the Mississippian groups included these resources, their role must be considered in the interpretation of tooth wear. Moodie (1929) also notes other considerations, such as the use of grinding stones, and hot sand or ashes in food preparation that could cause dental attrition. Recent studies show that while principle foods can be soft and unabrasive, supplemental foods are often abrasive (Oppenheimer 1966). The less wear among Group II inhumations might well be attributed to dietary differences, with a diet consisting of less abrasive foods such as meats, and soft vegetable products.
TABLE 2

TOOTH WEAR COMPARISON

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<td>M2 (R) 8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M1 (L) 9</td>
<td>PM1(R) 4A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M2 (L) 7A</td>
<td>PM2(R) 4A</td>
<td></td>
</tr>
<tr>
<td>Group I</td>
<td>M3(R) 8</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>M3(R) 8</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M1(L) 9</td>
<td>None</td>
<td></td>
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<tr>
<td></td>
<td>M2(L) 8A</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M3(R) 8</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>

* Rated according to Frick (n.d.). - See Appendix II.
METRIC DATA

The collection of metric data was limited by the extreme decomposition and fragmented condition of the bone material. Maximum long bone length was calculated using Steel and McKern's (1969) technique for estimating long bone length from measurable fragments (Table 3). Approximate measurements had been made in the field, but discrepancies were noticed between the field measurements and those taken in the laboratory. The differences between these two measurements were found and a mean calculated, resulting in a constant of \( \pm 2.2 \) cm. for the discrepancies. This was then added to those approximate measurements for which none could be made in the laboratory. Stature was then calculated utilizing the formula for Mesoamerican populations derived by Genoves (1967).

Three different formulas were used following Steele and McKern for maximum long bone length: male, female, and undetermined. The left femur was used in most cases whenever present; otherwise the right femur was used. In cases where more than one segment was measurable, all possible measurements were taken and an average calculated for maximum length. In cases where there were individuals whose sex was undetermined, stature was employed as a determinant for sexing (along with the general robusticity of the bones and the pronounced muscle attachment areas), as long as the stature fell within two standard deviations of the range for each sex for the Scott's Lake Bluff population. This process resulted in the identification of three inhumations in Burials #2, #10, and #13 as male, thus increasing the number of known males within the concentration area from eight to eleven and decreasing the unknown from ten to seven.

Range and mean of stature for each sex was calculated for all burials. The female stature ranged from 155.16 cm. to 157.23 cm. with the mean being 156.19 cm. or 5'1.2". The male stature ranged from 165.14 cm. to 180.51 cm. with the mean being 168.90 cm. or 5'5.4" (Table 3).

DISCUSSION AND CONCLUSION

After reviewing all of the data gathered from the population of the Scott's Lake Bluff Site, comparisons were made with other populations of the same geographical province (Irene, Peachtree, Hiwassee, Mulberry, Kolomoki, Charles Towne). Problems arising in the comparative analysis included obstacles such as limited studies on the comparative material and extremely eroded bone material. For the Scott's Lake Bluff Site sample, comparative data were limited to stature estimates, pathologies and anomalies, and demographic patterns. Ethnohistorical sources were also used in the analysis of burial form and location. Non-metric traits were extremely difficult to assess due to the decomposition of the bone material.

Stature estimates among the population from the Scott's Lake Bluff Site were compared to those made for Irene, Hiwassee and Mulberry using the two-tailed t-test (Appendix III). Among the males, no significant
TABLE 3

STATURE ESTIMATION

<table>
<thead>
<tr>
<th>Sex</th>
<th>Burial Number</th>
<th>Maximum Length</th>
<th>Stature*</th>
<th>Height</th>
</tr>
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<tbody>
<tr>
<td>Males</td>
<td>2</td>
<td>44.19</td>
<td>166.25</td>
<td>5'4.5&quot;</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>50.50</td>
<td>180.51</td>
<td>5'9.2&quot;</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>44.52</td>
<td>166.99</td>
<td>5'4.8&quot;</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>44.99</td>
<td>168.06</td>
<td>5'5.1&quot;</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>45.75</td>
<td>169.77</td>
<td>5'5.7&quot;</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>44.05</td>
<td>165.93</td>
<td>5'4.4&quot;</td>
</tr>
<tr>
<td></td>
<td>Range</td>
<td>165.14 - 180.51</td>
<td>Mean 168.90 (5'5.4&quot;)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>168.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>4</td>
<td>41.50</td>
<td>157.23</td>
<td>5'1.6&quot;</td>
</tr>
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<td></td>
<td>14</td>
<td>40.70</td>
<td>155.16</td>
<td>5'0.9&quot;</td>
</tr>
<tr>
<td></td>
<td>Range</td>
<td>155.16 - 157.23</td>
<td>Mean 156.19 (5'1.2&quot;)</td>
<td></td>
</tr>
</tbody>
</table>

*Based on Genoves (1967) formula for estimation of stature using the maximum length of the femur and the tibia for Mesoamerican populations.
variation was observed. However, the females of the Mulberry population appeared to be slightly taller with a mean of 161.47 cm., compared to a mean of 156.19 cm. for those at Scott's Lake Bluff.

Anomalies and pathologies were infrequent, with the major anomalies being sagittal and lambdoidal wormian bones, and pathologies occurring in only three individuals within the concentration area (Burials #8, #11, and #13), and one individual outside of the area (Burial #1). The most frequent pathology was traumatic swelling. One individual (Burial #8) displayed osteitis on the tibia, femur and parietal and frontal bones. Dental caries were infrequent, but alveolar recessing occurred on all male individuals of old adult age throughout the sample population. This finding remains consistent with the results of the dental analysis of the Mulberry Mound population (Carter and Chickering n.d.). The Irene Mound population was reported to exhibit extreme tooth wear; however, few caries were found to exist (Hulse 1941). Hiwassee demonstrated a high frequency of caries, periodontal disease, and abscesses (Lewis and Kneberg 1946). Peachtree demonstrated few caries but showed a high occurrence of ante-mortem molar loss with reabsorption (Setzler and Jennings 1941).

Cranial deformations were difficult to assess due to post-mortem warping from soil pressure. There were definite cases of occipital flattening — Burials #4 and #11. In the preliminary analysis, the Mulberry Mound population displayed only a small number of cranial deformations (Carter and Chickering n.d.). Hiwassee Island contained individuals demonstrating cranial deformation, with frontal deformation as opposed to the occipital flattening observed in both the Mulberry and Scott's Lake Bluff populations. The Peachtree Site inhumations demonstrated equal occurrences of both occipital flattening and frontal deformations. The small sample size and soil conditions may contribute to the few cases of deformations observed at Scott's Lake Bluff. Whatever the reason, it does not appear to be the norm of the burials excavated at Scott's Lake Bluff.

Burials were flexed, bundled, or crematory deposits; all common modes in the South Appalachian Province. The individuals buried at Scott's Lake Bluff were oriented facing various directions. This was unlike the situation at Kolomoki and Charles Towne. At Kolomoki (Sears 1956), all inhumations were facing east, while at Charles Towne it has been suggested that the burials of two moieties were represented, with the moieties aligned with the solstices (South 1971).

The Scott's Lake Bluff burials were not always articulated. The females of the population were invariably articulated, but males occurred in both bundled and articulated burials. The total number of individuals within the concentration area was 20, with eleven males, two females and seven undetermined. Group II presented an interesting pattern within itself, with nine males, no females and five undetermined. The buried population within the concentration area as a whole contained a large ratio of males to females.
It appears that only male individuals were included in the bundled burials. It would appear that the bundled inhumations were afforded special treatment in that greater and longer post-mortem care was taken with these individuals. Lawson, a traveler in the Carolinas during the early eighteenth century, recounted the burial practices of Coastal Plain Indians involving the use of a scaffold on which the deceased were placed until deterioration took place, in order that the bones could be cleaned of flesh (Harriss 1952). Bones were then kept in boxes and oiled periodically. For those individuals of royalty and wealth, there was a "magnificent cabin" to house ancestral bones. In the event of a migration or shift to a new area, the bones of these individuals were carefully taken up and moved with the population (Harriss 1952).

Muskhogean groups also practiced the method of scaffolding the deceased (Williams 1930). Bartram (Harper 1967) described the same process and identified the use of bone houses. Once these houses were full, a ceremony was held, involving the burial and/or cremation of all of the stored bones in a central pit. At times, a mound was constructed over the burial area. Muskhogean groups also scaffolded individuals who died away from home if the company was not pursued by an enemy. Logs were placed over the scaffold securing the corpse to prevent wild animals from taking the body. After enough time had passed for deterioration to take place, the company would return for the bones to carry them back to their village for burial (Williams 1930). This was also practiced by Algonquian groups further north (Bushnell 1920). Bushnell, in describing various methods of burial for the eastern groups, also states that cremation and scaffolding served as a means of reducing the remains to a less difficult carrying package, specifically when individuals died away from home. He also identifies urns as functioning as containers in which to carry these remains (Bushnell 1920).

Much the same pattern would follow in the preparation for a bundle burial, whereby the bones were cleaned after a period of time to allow the flesh to deteriorate. It appears that this method was practiced only for certain males interred at the Scott's Lake Bluff Site, although some inhumations of this type burial were sexually undetermined. Group II was afforded a more detailed treatment of burial practice, with time taken to clean the bones of flesh and hold them for a "mass" burial.

It is not certain whether the burials at Scott's Lake Bluff were directly associated with a mortuary structure or located on a mound. One post hole was found, but could not be associated with a specific structure due to the limited extent of excavation. The area did yield artifacts dating from Woodland to Historic time signifying occupancy for an extended period of time. The pottery from both Scott's Lake Bluff and Scott's Lake Mound Site were of the same ware-group—Chicora. This and the close proximity of the two areas indicates that the two sites were probably associated with one another. The cemetery area itself was evidently known of by the residing population as it appears that the same general area was a focal point for subsequent burials.
The cultural developments within the South Appalachian Mississippian Province are considered to be the results of both migration and diffusion. Three provinces were described by early explorers based on political affiliations: the Chicora (along the Santee River and north), the Cusabo (between the Santee and Savannah Rivers), and the Guale (along the Savannah River and south) (Ferguson 1972). The Guale and Cusabo were both believed to have been Muskogean speaking people, while the Chicora were believed to be Siouan. Archeological evidence demonstrates that there was much migration and exchange among the various groups living within the South Appalachian Province, making it virtually impossible to associate sites with specific tribal groups in the southeast. This especially holds true for the area of Chicora ceramics (Ferguson 1972). The Scott's Lake Bluff population, located within the Chicoran Province, was probably interred there sometime between 1200 A.D.—1600 A.D. (Ferguson, personal communication). During this time, the movement of various groups of people and the meeting of different groups with each other caused unstable relationships among the various peoples occupying the Coastal Plain.

It has been the intent of the authors to establish a reconstruction of a time past when written records were not kept. The means employed for the reconstruction have been through available archeological data, ethnohistorical sources, and by a comparison with other complexes already analyzed. However, the single most important contribution has been the biological matter. As fragmentary as the bone material was, it nevertheless yielded data that may be useful in future similar studies.
APPENDIX I

BONE INVENTORY

Burial #1

Cranium

Vault: left parietal in portions; small segment of right parietal; temporal (right) in sections

Face: lacks portions of left maxillary and both zygomatics; nasal septum included

Base: complete

Mandible: complete except for left ascending ramus

Teeth: All teeth present with the exception of the maxillary incisors, left canine and left premolar, and the mandibular right canine

Shoulder Girdle

Scapulae: spine portions of both right and left; acromion process portion and five fragments of wings

Clavicles: right shaft portion and fragments of left

Vertebrae

Cervical: first, second, and third cervical vertebrae are represented by nearly complete centrums and foramina

Pelvis

Innominates: left and right acetabulum fragments; sciatic notch (side undetermined)

Ribs

None

Upper Limbs

Humeri: both left and right are represented by small fragments with the right humerus represented by the diaphysis

Hands

None

Lower Limbs

Femora: left femur nearly complete (shaft portion of lateral side is missing)

Tibiae: right represented by diaphysis and medial malleolus portion of the distal articulatory end; left is represented by diaphysis fragment and medial malleolus portion of the distal articulatory end

Feet

Metatarsals: two fragments of diaphysis

Burial #2

Cranium

Vault: fragmentary portions of occipital and temporal (sides unidentified)

Shoulder Girdle

None

Vertebrae:

Lumbar: fragmentary portions of four vertebrae consisting of centrums and spinal portions
Ribs
None

Pelvis
Innominate: fragmentary portions of both right and left ilium fragments

Upper Limbs
Humeri: fragments of both left and right diaphyses present
Radii: fragmentary portion of left diaphysis
Ulnae: fragmentary portion of left diaphysis

Hands
None

Lower Limbs
Femora: the diaphyses of both right and left are present; right also includes head and neck portions of proximal articulatory end
Tibiae: both sides represented by diaphyses fragments
Fibulae: right represented by diaphysis fragment and distal portion of articulatory end; left represented by diaphysis fragment

Feet
None

Burial #3

Cranium
Vault: left lower portion of left parietal; left temporal represented by mastoid process, external auditory meatus, petrous portion and the beginning of the zygomatic arch; right temporal represented by petrous portion and external auditory meatus
Face: small maxillary fragments with sinus cavities; alveolar portion with molar; right nasal with lacrimal
Mandible: left mandible present but missing condyle of ascending ramus
Teeth: maxillary M1 and two premolars present; mandibular molars 1 and 2 present

Shoulder Girdle
Scapulae: lower spine portion present (side undetermined)
Clavicles: left fragment of diaphysis

Vertebrae
Sacrum: sacrum fragment

Pelvis
Innominate: right represented by pubic and acetabulum fragments; left innominate represented by most of innominate with fragmentary acetabulum; pubic symphysis present (side undetermined)

Ribs
None

Upper Limbs
None

Hands
None
Lower Limbs
Femora: right represented by complete bone with exception of anterior diaphysis portion and distal end; left represented by diaphysis fragment with proximal articulatory end
Tibiae: right represented by anterior portion of shaft with portion of distal end and medial malleolus
Fibulae: left represented by diaphysis fragments
Patellae: left lateral articulatory surface present

Feet
Tali: right represented by articulatory surface for distal end of tibia
Cuboid: left represented
Naviculars: left represented

Burial #4

Craniun
Vault: left and right parietals are represented in fragmentary portions; left temporal is represented by petrous portion, mastoid process and beginning of zygomatic arch; sphenoid is represented by greater wing; right temporal is represented by petrous portion; right frontal section, including right supra-orbital ridge is present
Face: left zygomatic represented by fragments; maxillary left alveolar portion present
Base: nearly complete, lacks lower portion below the external occipital protuberance; wormian present
Mandible: left represented by gonial angle portion of ascending ramus, condylar and coronoid process fragments
Teeth: maxillary first molar, premolars and canine present; mandibular molars are present in fragmentary condition

Shoulder Girdle
Scapulae: left spinal fragment

Vertebrae
Cervical: represented by second cervical and fragments

Pelvis
Innominates: right and left present in fragmentary condition

Ribs
None

Upper Limbs
Humeri: right and left represented by diaphyses fragments
Radii: right represented in fragmentary condition
Ulnae: right represented in fragmentary condition

Hands
None

Lower Limbs
Femora: left and right represented by diaphyses fragments
Tibiae: right and left represented by diaphyses
Fibulae: represented by diaphyses fragments (sides undetermined)

Feet
None
Burial #5

Cranium
Vault: parietal fragments present (sides unidentified); left temporal represented by squamosal portion and petrous portion
Face: right alveolar portion of maxilla
Base: fragmented occipital; includes most of lower portion and all of upper portion; wormians are present separately
Mandible: right represented by horizontal ramus and chin
Teeth: mandibular molars (two) and one crown, premolars (two) and one incisor
Shoulder Girdle
None
Vertebrae
None
Pelvis
None
Ribs
One fragment
Upper Limbs
Ulnae: proximal end (undetermined side)
Radii: right diaphysis fragment
Hands
None
Lower Limbs
Femora: left distal portion of diaphysis with proximal articular end present
Feet
Phalanges: one fragment of diaphysis

Burial #6

Cranium
Vault: parietal fragments (side unidentified); left temporal represented by petrous portion with external auditory meatus and temporomandibular joint
Teeth: molar crown present
Shoulder Girdle
None
Vertebrae
None
Pelvis
None
Ribs
None
Upper and Lower Limbs
Represented by various long bone fragments
Hands and Feet
None
Burial #7

Cranium
- Vault: left parietal present; frontal represented by right fragment and coronal suture fragment; sphenoid represented by left greater wings; left temporal represented by squamosal portion and mastoid process
- Face: maxillary sinus cavities represented in fragments; alveolar portion present; nasal and vomers present
- Base: occipital complete with foramen magnum
- Mandible: left side of mandible with gonial angle and ascending ramus

Shoulder Girdle
- None

Vertebrae
- Cervical: first and second complete vertebrae, others represented by fragments

Pelvis
- None

Ribs
- None

Upper Limbs
- None

Hands
- None

Lower Limbs
- Femora: left represented by diaphysis with the proximal end represented by head fragment and neck
- Fibulae: diaphyses fragments (sides undetermined)

Burial #8

Cranium
- Vault: left and right parietals present in fragmentary condition; frontal is represented by most of bone with both supra-orbital ridges; left temporal represented by petrous portion and squamous portion; right temporal represented by petrous and mastoid portions; sphenoids represented by left lesser wings
- Face: maxilla represented by right alveolar and zygomatic portions, palatal portion; left maxilla alveolar fragments also present
- Base: occipital represented by nearly complete right side, and fragmentary left, lambdoidal suture present with two wormian bones
- Mandible: left represented by horizontal and ascending ramus; right represented by horizontal ramus and chin
- Teeth: maxillary right premolars and left first and second molars and premolar (second) present; mandibular molars (six) and four incisors, and three premolars present

Shoulder Girdle
- None
Vertebrae
Cervical: represented by one fragment (centrum)
Thoracic: represented by six fragments
Lumbar: represented by seven fragments

Pelvis
Innominate: left represented by portion of acetabulum and sacro-iliac joint facet

Ribs
None

Upper Limbs
Humeri: right represented by diaphysis portion; proximal articulatory end fragments present

Hands
None

Lower Limbs
Femora: right represented by diaphysis portion with proximal articulatory end; left represented by diaphysis fragments
Tibiae: right represented by diaphysis fragments; left represented by diaphysis fragments and distal articulatory end
Fibulae: right and left represented by diaphysis fragments

Feet
Tali: right represented by articulatory surface for distal end of tibia

Burial #9

Cranium
Vault: fragmented left and right parietals, occipital connected to left frontal with orbital ridge, and portion of right frontal. Left squamous portion of temporal is present with petrous portion. Right petrous portion also included. Sphenoid left lesser wing fragment, with assorted sphenoid fragments and parietal fragments.

Face: left zygomatic is present; right maxilla portion including eye orbit

Base: one complete mandible, missing portions of both condyles, and still retaining 3 right molars, 2nd molar on left lost antemortem. Another mandible is present with the left horizontal ramus and ascending ramus missing. PM2, M1 and M2 of right lost antemortem, with reabsorption taking place. A left gonial angle and fragmented ascending ramus is also present. Section of mandible containing PM1 and PM2 are present, but side unidentified at present. Three incisor fragments and 2 mandibular molars.

Ribs
fragmented portions

Pelvis
Left innominate--complete pubic area and ischium area (missing lesser sciatic notch). Portion of ilium present with cut-off starting at the beginning of the anterior posterior iliac spine. The acetabulum is complete, as well as the obturator foramen. Portion of the sciatic notch present. Right innominate represented by sciatic notch, sacro-iliac articular surface section and portion of the acetabulum. All is of the ilium section. Fragment of obturator foramen and acetabulum of left is present.
Upper Limbs
Humeri: entire right humerus, missing portion of distal end
Ulnae: the proximal end and most of shaft of the left ulna is present. There is another shaft fragment present, but side is unidentified.
Radii: shaft portion with radial tuberosity and radial distal tip of right

Shoulder Girdle
Scapulae: right fragment; section with the beginnings of coracoid and acromion stems, also has portion of glenoid cavity
Clavicles: most of left clavicle present with tip of flattened end missing and completely missing the sternal articulation portion. Right clavicle represented by shaft portion.

Vertebrae
Cervical: first cervical present; other portions are fragmented and number undetermined
Thoracic: fragmented
Lumbar: fragmented
Sacro: left portion with articular surface for lumbar vertebrae, promontory surface, and sacro-iliac articular surface. Another fragment reveals a split between section--possible incomplete ossification.

Lower Limbs
Femora: proximal end and shaft portions of left femur, and shaft portions of unidentified side.
Tibiae: two right tibiae—one with all of a shaft and portion of proximal end and the other with shaft and distal end portions. One left tibia with upper portion of shaft and proximal end. Various long bone fragments.
Feet: one calcaneus—right—nearly complete; four tali—very fragmentary, two right and two left; one phalange; one cuboid.

Unidentified: thirteen (13) assorted fragments

Burial #10

Craniun
Vault: temporal fragment with mastoid process (right) temporal fragment with petrous portion attached parietal fragment with sagittal suture occipital portion— incomplete one wormian bone—separate frontal—eye orbit section, internal various other parietal and vault fragments
Face: maxilla—alveolar portion fragment; zygomatic—none
Mandible: right ascending ramus; left horizontal ramus, gonial angle, and ascending ramus with coronoid process. No teeth intact.

Teeth: one mandibular molar; 2 incisors, 2 premolars.
Shoulder Girdle
acromion process fragment
Vertebrae
None
Ribs
Fragment of articulatory end of either the first or second rib
Pelvis
None

Upper Limbs
Humeri: right diaphysis, left diaphysis, left intertubercular groove with part of greater tubercle
Ulnae: right proximal end with most of diaphysis and distal end of diaphysis; left proximal end (fragmented) with small portion of diaphysis.
Radii: right diaphysis with radial tubercle; left diaphysis

Hands
Metacarpal: one fragment

Lower Limbs
Femora: left diaphysis fragments with beginnings of neck portion; right diaphysis fragments with beginnings of neck portion; left diaphysis portion; right diaphysis portion; neck fragments.
Tibae: right diaphysis portion with nutrient foramen; left diaphysis portion; flattened diaphysis - side unidentified.
Fibulae: one possible diaphysis fragment

Feet
None

Various other unidentified bone fragments are present

Burial #11

Cranium
Vault: all of the right parietal and temporal bones, with beginnings of the zygomatic process; left parietal, fragmented; all of the above has been reconstructed. Left petrous portion of the temporal is present. Two wormian bones are present in the sagittal suture at the lambdoidal intersection.
Face: frontal portion containing right supra-orbital ridge (glued to above sections); alveolar portion of maxilla fragment with M1 and PM2 intact.
Base: the occipital is nearly complete, missing section around foramen magnum. Basilar suture fragment present.
Mandible: left horizontal ramus present, and one fragment of coronoid process. Also, left coronoid process and mandibular notch fragment.

Teeth: six molars - unattached

Assorted parietal and sphenoid fragments present

Shoulder Girdle
Scapulae: none
Clavicle: right clavicle, a nearly complete representation by diaphysis portion. Left clavicle is represented by sternal articulatory end.

Vertabrae
Thoracic: one fragmented
Lumbar: one fragmented
Unidentified fragments

Ribs
First left: articulatory end (with vertebrae) possible
Second rib;
21 assorted rib body fragments
Pelvis: none

Upper Limbs
Humeri: left and right diaphysis portions present
Radii: left and right represented by diaphysis portions and radial tubercles
Ulnae: left and right represented by diaphyses portions; left proximal end present

Lower Limbs
Femora: right femur represented by the upper portion of diaphysis; lesser trochanter and beginnings of neck and head portion (articulatory ends) are also present. Left femur represented by most of the diaphysis with portions of proximal end distal ends (medial epicondyle).
Tibae: right diaphysis portion
Patellae: most of left patella is present, with right represented by fragment

Hands
Metacarpal: proximal end of one
Carpal: one fragment
Phalanges: four nearly complete

Feet
Calcaneus: fragment, side unidentified
Tali: one right complete and one left fragment
Matatarsal: one distal end
Phalanges: four fragments
33 unidentifiable long bone fragments present
34 unidentifiable bone fragments present

Burial #12

Cranium
Vault: parietal fragments both left and right. Right squamous portion. Temporal fragments, petrous portions left and right. Mastoid process, left, and zygomatic process, left.
Face: maxilla fragments - alveolar portion, left with three molars intact. One maxilla fragment, left with lacrimal attached, one left zygomatic.
Base: occipital fragments-two with lambdoidal suture also nuchal lines
Mandible: none
Teeth: 3 maxillary molars intact
11 molar fragments, 6 incisors, 7 premolars
Other various unidentifiable skull fragments present

Shoulder Girdle
None

Vertebrae: 3 fragments unidentified; one sacrum fragment
Ribs: two fragments of lower ribs
Pelvis: one pelvic fragment, two ilium portions (glued)

Upper Limbs
Humeri: left and right diaphyses and other assorted diaphyses fragments

Hands
Phalanges: 7 diaphyses
Metacarpals: 4 diaphyses fragments with 1 distal end and one proximal end
Lower Limbs
Femora: diaphyses left and right (glued); one other diaphysis, side undetermined
Tibiae: one left diaphysis; 2 right diaphyses
Fibulae: one right diaphysis
Feet: one phalange
Other unidentified bones present

Burial #13

Cranium
Face: maxilla fragment—alveolar portion with 2 molars and 1 premolar intact. One maxilla fragment—alveolar portion
Base: occipital—nearly complete
Mandible: 2 mandible fragments with 2 incisors intact in each. One right coracoid process.
Teeth: 2 incisors, 5 premolars

Shoulder Girdle
Clavicle: 1 right
Vertebrae: 1 cervical fragment; 9 thoracic fragments with facets; 1 centrum fragment
16 vertebrae fragments unidentified
Ribs: 2 right with head, neck, and tubercle. 10 rib fragments

Pelvis
Innominate: 17 fragments

Upper Limbs
Humeri: 1 right diaphysis (glued); 1 left diaphysis (glued); 1 head fragment; 1 left diaphysis
Radii: 2 right diaphyses
Ulnae: 1 left diaphysis; 1 right diaphysis

Hands
Phalanges: 3

Lower Limbs
Femora: 2 femur left diaphyses; 1 femur left diaphysis and part of the distal portion; 1 femur partial diaphysis; 1 femur head fragment
Tibiae: 3 right diaphyses; 2 left diaphyses, one with portion of proximal end
Fibulae: diaphyses fragments
Feet
Tarsals: 1 right talus; 1 tarsal fragment
Metatarsals: 2 present
Phalanges: 1 present
Various other long bone fragments
Various other unidentified bone fragments

137
Burial #14

Cranium

Vault: left parietal and portion of right parietal. Left frontal and portion of the right frontal. Left temporal with petrous portion. Right temporal with petrous portion of sphenoid-right lesser wings.

Face: maxilla fragments of the alveolar region with 4 teeth fragments intact

Base: occipital nearly complete and attached to other portions of the skull. 2 other basalar fragments.

Mandible: right gonial angle with portion of ascending ramus with one molar intact. Left horizontal ramus with 3 molars intact. 2 premolar fragments, and 1 incisor fragment.

Various other unidentified skull fragments

Teeth: (besides aforementioned) 2 mandibular molars and 1 premolar fragment

Shoulder Girdle

Scapulae: acromion process

Clavicles: none

Vertebrae

Cervical: second nearly complete. 6 others somewhat fragmentary.

Thoracic: 3 nearly complete.

Lumbar: none

Ribs: 5 fragments, 2 with heads and necks.

Pelvis

None

Upper limbs

Humeri: 24 diaphyses fragments

Hands: 2 phalanges, one 3rd one is complete.

Lower Limbs


Various other unidentified fragments.

Burial #15

Cranium

Vault: parietal fragments both left and right, some with squamosal suture. Other suture lines present on various specimens. Temporal fragments having left zygomatic process and squamosal. 1 right mastoid process. Left and right petrous portions. Frontal fragments. 1 frontal crest. 1 sphenoid fragment with lesser wing.

Face: maxilla fragments; 1 alveolar portion 1 lateral eye orbit ridge. 2 zygomatic fragments, left and right.

Base: occipital parts. 1 EOP.

Mandible: fragments, 1 of horizontal ramus.

Various other skull fragments unidentified.

Teeth: 2 mandibular premolars. 1 maxillary molar.

Shoulder Girdle

Scapulae: none

Clavicle: none

Vertebrae: 2 fragments

Ribs: 4 shaft fragments
Pelvis
   Innominate: partial ilium with sciatic notch. 1 acetabulum fragment.

Upper Limbs
   Humeri: partial diaphysis
   Hands: none

Lower Limbs
   Femora: Distal end fragment. Left proximal end and diaphysis. Right diaphysis.
   Tibiae: right diaphysis; left diaphysis
   Fibulae: left diaphysis
   Various other unidentified bone fragments

Burial #16

Cranium
   Face: maxilla fragment - alveolar portion.
   Base: Occipital - nearly complete with EOP.
   Mandible: One condyle fragmentary. One fragment of ascending ramus.
   Teeth: 1 premolar
   Vertebrae: 2 fragments

Pelvis
   Innominate: 2 fragments with facets
   Various other bone fragments unidentified
APPENDIX II

TOOTH WEAR PATTERNS

1. No wear
2. Slight wear, polishing, cusps or edge worn slightly
3. Dentine exposed in points, edge flattened A. Cusps worn
4. Dentine exposed in spaces, flattening A. cusps worn
5. 1 cusp worn down or edge flattened A. to dentine
6. 2 cusps worn down A. to expose dentine
7. 3 cusps worn down A. to expose dentine
8. 4 or 5 cusps worn down A. to expose dentine
9. Broad exposure of dentine with much wear
10. Complete dentine exposure
11. Dentine exposed and tooth worn to root
12. Slope to ____ side
APPENDIX III

T-TEST CHART

(Tests whether or not the difference between two sample means is significant.)

<table>
<thead>
<tr>
<th>Scott's Lake Bluff v. Irene Mound</th>
<th>Male = .708</th>
<th>Female = .314</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scott's Lake Bluff v. Mulberry Mound</td>
<td>Male = .620</td>
<td>Female = .208</td>
</tr>
</tbody>
</table>

Significance level = 1.41

* The Hiwassee population was measured in feet and inches as opposed to centimeters employed in measurements of the other populations, thus a T-test was not run on the Hiwassee populations; however, when the feet and inches component were compared to the Scott's Lake Bluff population no appreciable differences were observed.

* Although the cross comparison of males and the females of the Scott's Lake Bluff and the Irene Mound populations show no appreciable differences, what is significant is the fact that the females of the Mulberry Mound population were somewhat taller than either the females of Scott's Lake Bluff and the Irene Mound populations.
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