

**APPENDIX VII**

**WOODVILLE GRAVE SITE, ANALYSIS OF HUMAN SKELETAL REMAINS**

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## **Analysis of Human Skeletal Remains Woodville Grave Site**

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This report represents the results of the analysis of the human skeletal remains from the historic burials at the Woodville Grave Site (7NC-E-98A) located south of the Woodville Farm Site (7NC-E-98) in New Castle County, Delaware. The goals of this analysis were to obtain whatever information it was possible to recover from these skeletons with respect to such factors as age at death, sex, mortuary treatment, population affinity, stature and evidence of pathological conditions such as disease, dental decay and loss, nutritional deficiencies or traumatic injury. The sample consisted of human skeletal material from 13 graves as well as human bone from "unknown context". The skeletons will be referred to in this report by the field number of each grave. The skeletal material from the numbered graves is described below and the material from unknown context is listed in an Appendix 1.

### **METHODOLOGY**

Skeletal material from the Woodville Grave Site was brought to the Laboratory of Biological Anthropology at the University of Delaware directly from the field, in many cases still covered with soil matrix. All material was cleaned using soft brushes and dental instruments. When possible, reconstruction of broken bones was accomplished using Duco Cement. In order to determine which skeletal elements were present, and to check for duplication of parts, each skeleton was inventoried.

The following section describes the individual burials separately. For each one, an inventory of skeletal parts present and their condition of preservation is given, followed by an assessment of bony pathology, sex, age at death, population affinity and stature (height) during life. When possible, sex was determined using criteria established by Phenice (1969) for the medial portion of the pubic bone with secondary confirmation from other areas of the pelvis such as the sciatic notch, and preauricular region and finally, from other skeletal elements such as the cranium and long bones. Age of juvenile individuals was estimated from dental eruption, **epiphyseal** fusion and **diaphyseal** length and for adults from relative dental **attrition** (tooth wear), endocranial suture closure and presence of degenerative changes such as **arthritis**. The **pubic symphysis** (the most accurate indicator of age in adults) was not sufficiently well preserved in any of the individuals from this site to use for estimating age. Measurements were made using sliding dial calipers, spreading calipers, a flexible tape and a bone board following standard procedures outlined in Howells (1973), Bass (1987) and Buikstra and Ubelaker (1994).

Dental wear was scored using a system described by Smith (1984). Descriptions of skeletal **pathology** were made following terminology defined by Mann and Murphy (1990) and **dental caries** identified visually following Koritzer (1977). Population affinity was made following Bass (1987) who summarized morphological features which have been found to be useful in distinguishing between populations and following Giles and Elliot (1962) who provide **discriminant functions** for determining population affinity based on cranial metrics. This metric assessment was possible for only one individual (the one in Grave 3) but morphological evidence from the other individuals, when present, was consistent with the results from that individual, suggesting that all individuals were from a single population.

Where possible stature for each individual was estimated based on as many long bones as were sufficiently preserved to allow measurement. It is well known that the relationship of long bone length to stature shows population variation in humans. Because it is likely based on the archaeological and historic context as well as the osteological evidence, that all individuals in this sample were of European ancestry, stature was estimated using sex-appropriate regressions derived from American White populations and provided in Trotter (1970) and Bennett (1987). Estimates of stature based on all available long bones for each individual are given in Table 1. With one exception, estimates of stature based on different bones from the same individual were within the standard errors given for the estimates.

Tables 2-6 also provide cranial, **postcranial** and dental measurements, and tooth wear scores for each individual. Definitions of technical terms which appear in bold face (the first time they are used) can be found in the Glossary and a diagram showing the names of all skeletal elements is included in the Appendices 2 and 3.

## **DESCRIPTIONS OF INDIVIDUAL SKELETONS**

### **Grave 1**

#### **Skeletal Inventory and Condition**

Most of this skeleton was preserved and in good condition. Exceptions to this are that the ribs were not recovered and the pelvis was deteriorated and broken. The cranial vault (Figures 1 and 2) is well preserved though the face is broken off and the maxilla and mandible are only preserved in fragmentary condition (Figure 3). Several ear ossicles were preserved (Figure 4)

The vertebral column is represented by eight portions of vertebrae, from the lumbar and thoracic regions (Figure 5). No cervical or upper thoracic vertebrae were preserved. The vertebrae which are preserved are in fair condition with much of the outer table of bone flaked off. No ribs were present.

The superior portion of the sacrum (including the first sacral vertebra) was preserved, but the remaining portion of the sacrum was very fragmentary. The innominates are both present, though only the ilium of the right side and the ilium and portion of the ischium of the left side are preserved (Figure 6). The area along the iliac crest is broken off and poorly preserved.

Both femora were preserved, though the cortical bone on the distal ends was somewhat damaged (Figure 7). Both patellae are preserved, though (especially the right one) in poor condition. The tibiae are preserved, though in both cases the proximal ends are in very fragmentary conditions. The right fibula is represented only by fragments and the left is in poor condition, with only the distal half present. Both feet are represented by tali, calcanei, naviculars, cuboids and fragments of metatarsals and phalanges.

Clavicles and scapulae are all present, but in fairly fragmentary condition. The only portions of joint surfaces on these bones which are preserved are portions of the glenoid fossae. Humeri are in good condition with damage only to the proximal and distal ends. Radii and ulnae are all present, though only the shafts are in good condition -- the articular ends are damaged in most cases. Both hands are represented by a number (but not all) of the carpals, metacarpals and phalanges.

## General Description and Pathology

### Cranium

The skull has relatively strong temporal lines anteriorly and a moderately developed supraorbital torus, especially centrally over the glabellar region (Figure 1). The mastoid process which is preserved (the right) is fairly small and the parietals have some bossing (this may be exaggerated by the fact that the occipital is broken off and there may have been some post-mortem distortion in the shape of the cranial vault. There is an external protuberance at inion.

The maxilla, as far as it preserved (the anterior portion, in front of the approximate position of the third molars) is completely edentulous and was so for a considerable time before death. While the alveolus shows traces of the tooth sockets, these are almost completely resorbed (Figure 3). The area of prominence of the supra-orbitals show some mild pitting of the bone but there is no evidence of cribra orbitalia (Figure 1). There is very slight pitting on the occipital, just above the foramen magnum, but not in the region of inion. The right temporomandibular joint has what appears to be an arthritic facet anterior to the fossa, just below the root of the zygomatic arch. The facet shows signs of pitting and bone degeneration. The left temporomandibular joint may have had a similar but much milder condition, but that may be postmortem damage to the outer bony surface.

The mandibular teeth had also largely been lost antemortem, though probably after the maxillary teeth. The mandible shows signs of resorption following the loss of the teeth, but some teeth (such as the right and left second incisors and probably canines) were present at the time of death and were recovered during excavation. One of the central incisors was lost well before that time. On the right side (where it is possible to see the alveolar surface) there had clearly been some antemortem loss of cheek teeth (though probably not all of them, and not as far before the time of death as in the maxilla).

### Postcranial Remains

The vertebrae which are present all show signs of arthritic lipping on the margins of the articular surfaces of the bodies (Figure 5). Three of thoracic vertebrae which are present are fused together between the articular processes, but not between the vertebral bodies. All articular surfaces of the vertebral bodies which are well enough preserved to be examined are pitted and show evidence of osteoporosis.

Like the lumbar portion of the vertebral column, the sacrum shows arthritic lipping on the margins of the superior articular surface as well as pitting and some osteophytic development on the superior articular surface of the sacrum. Where it is possible to tell, there seems to be similar pitting on the iliac surface of the sacro-iliac joint. The innominates show arthritic lipping of the margins of the acetabulum as well as some osteophytic development along the portion of the iliac crest which is preserved. The acetabula are large and fairly deep. The sciatic notch is moderately wide, but extremely asymmetrical in shape.

The femora are large and fairly robust (Figure 7). On both sides there are surface osteophytes at the fovea capitis (Figure 8). The left patella shows slight arthritic marginal lipping on the posterior joint surface. There is slight marginal lipping on the distal joint surfaces of the tibiae (proximal surfaces are not preserved) but no evidence of periostitis or other pathologies. The feet show evidence of extreme arthritic lipping the margins of the joints on both sides especially in the navicular and cuboids.

The scapulae have very mild arthritic lipping on the margins of the glenoid fossae, but it is impossible to determine the presence or absence of other pathologies on them or on the clavicles. The humeri have slight evidence of arthritic lipping on the proximal surface of the right (the left is too poorly preserved to be evaluated). The distal ends and shafts are free of pathology. The olecranon fossae are unperforated. No pathology is visible on the radii or ulnae but their condition is poor. The carpals, metacarpals and phalanges have some traces of marginal arthritic lipping on the articular surfaces.

### Sex

The portions of the innominate which are used to evaluate features of the pubis which are indicative of sex (Phenice, 1969) are not preserved and therefore cannot be evaluated. However, the large acetabula and asymmetrical sciatic notches suggest that this individual was male. The protuberance at inion and large superciliary arches are consistent with this.

### Age

This individual was well into adulthood as evidenced by the arthritis, osteoporosis and antemortem dental loss. However the cranial sutures are visible, and not obliterated both internally and externally. Age at death was probably in the 50s or older.

### Stature

Using a formula for white males, the stature of this individual calculated from the femur length is 172 cm (5' 7.7")

### Population Affinity

There is a sharp nasal margin or sill (no gutter) at the bottom of the nasal aperture. This is suggestive of a European population affinity.

## **Grave 2**

### Skeletal Inventory and Condition

Although portions of the entire skeleton are preserved from this individual, the bone is in only fair condition with quite a bit of fragmentary bone and essentially none which are unbroken.

The cranium is represented by all bones though only the left parietal is unbroken and much of the cranial bone is quite fragmentary.

The vertebral column, ribs and sacrum are poorly preserved. The first three cervical vertebrae are present in good condition, but otherwise, only fragments of vertebral bodies (of unidentifiable, lower vertebrae) and other smaller fragments are present.

Portions of both innominates are present, though the right is more complete than the left. The right one preserves a portion of the ilium including part of the acetabulum and sacro-iliac articulation. The left includes a smaller portion of the same region, but none of the sacro-iliac articulation.

Both femora are poorly preserved, though in both cases the head of the femur is present. A portion of the left patella is preserved in poor condition. The left tibia and fibula are well preserved, but on the right side, both bones are very fragmentary. Similarly, most of the bones of the left foot (except the phalanges) are present and in good condition, while those of the right are represented only by four extremely fragmentary pieces of tarsals.

The scapulae are represented only by fragments and the clavicles not at all. The humeri are represented only by shaft and head fragments and the more distal portions of the arms, including the hands are represented only by fragments.

## General Description and Pathology

### Cranium

The cranium is small and gracile. The bone of the cranial vault is very thin. Browridges are extremely light, mastoids are small and muscle markings such as the temporal lines are very faint. There is no external protuberance at inion. An unfused metopic suture extends the along the whole length of the frontal (see Figure 9). There is no evidence of pitting or other lesions on the cranial vault. The occipital condyles show extremely slight evidence of marginal lipping on the edges but in general this appears to be the skull of a fairly young adult.

The mandible had only three posterior teeth present in the jaw at the time of death. Others had been lost well before the time of death since there has been considerable alveolar resorption in the molar and premolar regions of the mandible so that the mandibular corpus is quite thinned. The anterior teeth were present at the time of death and were quite heavily worn. Both lower third molars were present in the mandible with cusps worn, but not through to the dentin (see Figure 10). The upper molars which remain were extremely heavily worn and have both occlusal and interproximal carious lesions. The left lower second molar has an extremely large carious lesion in which the entire mesial surface and most of the inside of the crown of the tooth was decayed. In addition, there is a large expanded apex of the root. Overall, this individual had considerable dental pathology. The left temporomandibular joint exhibits arthritic lipping anteriorly.

### Postcranial Remains

The cervical vertebrae exhibit marginal arthritic lipping. The bodies of the more inferior vertebrae show pitting on the articular facets and moderate osteoporosis and osteoarthritis (see Figure 11).

The pelvic morphology which is preserved is not complete enough to allow assessment of the features Phenice (1969) described as being good sex indicators. Overall, the innominates are small and gracile. A portion of the right sciatic notch is present and suggests that the sciatic notch would have been fairly wide and symmetrical.

The femora are also small and lightly built. There is a slight degree of osteophytic development at the fovea capitis on the head of the femur. Epiphyses appear to be completely fused. Joint surfaces which are preserved show no evidence of arthritis. The left foot which preserves most of the joints of the foot shows no obvious evidence of arthritis.

## Sex

There is no doubt that this individual is female. This is based on the small size and gracile structure of the cranium, mandible and postcranial skeleton. The innominate, while fragmentary is small and appears to have a wide sciatic notch.

## Age

The age of this individual at first appeared to be problematic. The cranial bones are unfused and there is an unfused metopic suture. Although the metopic suture usually closes before adulthood, it does sometimes fail to fuse. Cranial suture closure is a less reliable indicator of age than other methods and since all other indicators on the skeleton suggest that this individual was at least middle aged, more weight is given here to those indicators<sup>1</sup>.

The third mandibular molars are fully erupted and have considerable tooth wear, indicating that this individual was fully adult. In addition, the extreme antemortem tooth loss and heavy wear on the anterior teeth suggests that she was at least middle-aged, probably at least in the 40s.

The presence of slight arthritis on the cervical vertebrae and osteoporosis on the more inferior vertebrae supports an age estimation of middle-aged.

## Stature

Using a formula for white females, the stature of this individual calculated from the tibia length is 162 cm (5' 3.7").

## Population Affinity

The preservation of this skeleton makes it impossible to determine population affinity.

## **Grave 3**

### Skeletal Inventory and Condition

The condition of this skeleton is good to excellent. The cranium and mandible are almost entirely intact, with only minimal damage to the zygomatic arches, a portion of the face, and parts of the mandible.

The atlas and portions of the axis are preserved as well as portions of the lower thoracic and upper lumbar, or just upper lumbar vertebrae. The superior portion of the sacrum (including S1 and 2) is preserved.

The innominates are both present, though no portions of the anterior part of the pelvis is preserved. The left is in slightly better condition than the right.

Both femora are present in very good, though not perfect, condition. A fragmentary right patella is present. Both tibiae and fibulae are present, though most of the spongy areas of the articular ends are somewhat deteriorated making it impossible to take an accurate measurement of maximum length. The

left foot is represented by the calcaneus, talus, fragment of cuboid, portions of all metatarsals and two fragments of phalanges. The right foot is more fragmentary with no complete bones and fragments of five tarsals and five metatarsals.

Scapulas and clavicles are present but in fragmentary condition. Both humeri are present with some damage to both the proximal and distal ends in both cases. Radii and ulnae are all present, again with some damage to the some of the ends. Both hands are represented, the right by seven carpals as well as ten metacarpal and phalangeal fragments and the left by the hamate and eighteen metacarpals and phalanges or fragments of those.

## General Description and Pathology

### Cranium

This skull is very gracile and small (Figures 12 and 13), with almost no supraorbital development at all, the mastoids are very small and the cranial vault bone is very thin. The mandible is also small and gracile. There is a roughened region in the right glenoid fossa, and extremely slight pits in the roofs of the orbits, but no other signs of pitting, or pathologies.

The metopic suture is present and unfused for the full length of the frontal (Figure 12). Other cranial sutures are also open, in some cases with no signs of fusion (for example in the lambdoidal suture) but the speno-occipital synchondrosis is fused and obliterated.

Six upper teeth (right C, M<sup>2</sup> and M<sup>3</sup> and left I<sup>2</sup>, C and M<sup>1</sup>) are present (Figure 14). The other incisors were probably present at the time of death, but all other teeth seem to have been lost before the individual died. On the alveolus, in the area of the premolars and missing molars the bone is resorbed suggesting that the teeth were lost well before the time of death. The crown of the upper left first molar is quite decayed and there is an interproximal carious lesion on the distal surface of the upper right second molar. The anterior teeth are somewhat worn, but healthy. On the mandible, all postcanine teeth on the left and all teeth posterior to the first premolar on the right were lost well before the time of death. The mandible is extremely resorbed and thin (Figure 15). The mandibular teeth which are present (all of those which were there at the time of death) are worn, and there is evidence of interproximal carious lesions around the cemento-enamel junction on all but the right incisors. The right second premolar has a large carious lesion on the mesial portion of the crown.

### Postcranial Remains

The cervical vertebrae that are present (C1 and a portion of C2) have slight marginal lipping on the joint surfaces. The lower vertebrae have osteophytic development on the margins of the superior and inferior articular surfaces as well as pitting, indicative of osteoporosis on the articular faces. In addition, the lumbar vertebrae have marginal lipping on the articular facets (Figure 16).

The innominates are small and gracile. The sciatic notches are extremely wide, open and symmetrical. The acetabula are small and have slight marginal lipping, evidence of osteoarthritis. There is no evidence of a preauricular sulcus in either innominate. The sacrum is very wide. The superior articular surface as well as the sacral sides of the sacro-iliac articulation show pitting, evidence of osteoporosis.

The femora are gracile but quite long. The linea aspera is very light. For those joint surfaces which it is possible to evaluate, there is slight marginal lipping. Similarly, the tibiae and fibulae are gracile, but quite long. The distal articular surface of the left tibia shows slight evidence of marginal lipping. There is also marginal arthritic lipping on the articular surfaces of the tarsals.

Very slight marginal lipping is visible on the glenoid fossa of the left scapula. The humeri are long and gracile with extremely light muscle markings and unperforated olecranon fossae. The radii and ulnae follow the pattern of the other long bones in being long but very gracile and light. There is slight arthritic lipping on the margins of the joint surfaces which are preserved.

### Sex

This individual is certainly female. The cranium is very small with almost no supraorbital development, small mastoids, no external protuberance at inion and light muscle markings. The Giles and Elliot discriminant function based on cranial metrics classifies it as female (see Appendix 4). The sciatic notch is wide and the postcranial skeleton is gracile.

### Age

This individual is similar to those from graves 1 and 2, in being of middle age or slightly older. The moderately heavy tooth wear and considerable antemortem tooth loss as well as the presence of evidence for arthritis and osteoporosis suggest that she was certainly at least middle-aged at the time of death.

### Stature

Using a formula for white females, the stature of this individual calculated from femur length is 168 cm (5' 6.2").

### Population Affinity

This individual is almost certainly of European origin. The skull has a nasal sill (i.e., no nasal guttering, the face is fairly orthognathic (flat) and the zygomatics are retreating. In addition, the Giles and Elliot (1962) discriminant functions for cranial metrics classify it as "white" using both the "black/white" and the "white/indian" discriminant functions. (See appendix).

## **Grave 4**

### Skeletal Inventory and Condition

This grave had been cut into by some previous excavation and only the bones of the lower limb remained at the time of this excavation.

The femora were represented by only the shafts of the bones, in fair condition, with only the distal articular end of the right present in fragmentary condition. Neither proximal end was preserved. Both patellae were preserved in extremely fragmentary condition. The right tibia shaft was present in fair condition and the left in very poor condition. The right fibula and small fragments of the left were present, again in poor condition. Portions of both feet were preserved, but in extremely poor condition.

## General Description and Pathology

### Postcranial Remains

The long bones, especially the femur were thick, robust and probably long. The poor condition and limited preservation of the skeleton precludes most observation, but on the bones which are present, the only visible pathology is very slight marginal lipping on some of the articular surfaces of the tarsals.

### Sex

Based on the size of the long bones, this individual was probably male.

### Age

All epiphyses are fused and obliterated so this individual is certainly fully adult. The presence of a limited degree of arthritis suggests that the individual had begun middle age.

## **Grave 5**

### Skeletal Inventory and Condition

This skeleton was represented by only a few very small unidentifiable fragments of bone.

## **Grave 6**

### Skeletal Inventory and Condition

This skeleton is represented by only small fragments of the lower limbs, including the distal femora, tibial and fibular fragments and some foot fragments.

## General Description and Pathology

### Postcranial Remains

No pathology is visible on the bone preserved here.

### Sex

Because of the extremely poor preservation, it is impossible to determine the sex of this specimen.

### Age

The distal femoral epiphysis is not fused to the diaphysis, suggesting that this individual was sub-adult. Based on its size and on the fact that this epiphysis fuses late in adolescence, the estimate of age for this individual is early adolescence.

## Grave 7

No bone is present from this grave.

## Grave 8

### Skeletal Condition and Inventory

This skeleton is preserved only from the pelvis down.

Both innominate bones are present, though the superior pubic ramus is preserved only on the right side and its condition is poor. Both femora are complete and in good condition. Both patellae are present in fair condition. The tibiae and fibulae from both sides are preserved in good condition. The right foot is represented by all the tarsals in good condition, four metatarsals and one phalangeal fragment. The left foot is represented by all the tarsals in fair condition, four metatarsals and four other fragments.

There is also a sacrum (labelled U12-2) which may be associated with this material. The sacrum seems to fit the left innominate at the sacro-iliac articulation. A left ulna (U 12-1) and left radius (S12) also may be associated with this individual.

### General Description and Pathology

#### Postcranial Remains

The epiphyses of the iliac crests are completely fused to the ilia, but the line of fusion is still faintly visible. The acetabula are small, the sciatic notches very wide and the pubis long. No preauricular sulci are present on either side. There is a very slight degree of marginal lipping around the edges of the acetabulum but no other pathology. The sacrum (which, as mentioned above, may be associated with this skeleton) has moderate to extreme osteophytic development around the entire margin of the superior articular surface. It is fairly wide.

The femora are fairly gracile and short. The right femur has a bit of arthritic lipping on the superior margin of the anterior portion of the distal articular surface. The tibiae and fibulae are also fairly gracile and small. No pathology is evident on these lower limb bones. The foot bones have a small amount of mild marginal lipping.

The possibly associated radius and ulna are light, gracile and short. The radius has slight marginal lipping of the distal articular surface.

#### Sex

Based on the shape of the sciatic notch, the size of the acetabulum and the length of the pubis, this individual is female. The bones of the lower limb are gracile and small and the possibly associated other bones (including the wide sacrum and small radius and ulna) are consistent with this diagnosis.

#### Age

This individual was fully adult at the time of death. If the sacrum is associated with the other bones, as it seems to be, the individual would have been in late middle age (at least 50 years old).

## Stature

Based on the many long bones that were well preserved (6) and using formulae for White females, this individual was about 161 cm (5' 3.2") tall. Measurements of most of the long bones produced estimates of stature with overlapping standard errors. However, the right tibia was considerably longer than the left (9 mm) and produced an estimate that was somewhat greater than the others. This could have been the result of a healed injury or other pathology which was no longer visible on the bone.

## **Grave 9**

No bone is present from this grave.

## **Grave 10**

### Skeletal Inventory and Condition

The skull is essentially present (even including an ear ossicle), but in quite fragmentary condition. Many of the cranial bones (such as the frontal and maxilla) appear to be deformed from side to side so that they appear to be narrower than they would have during life.

The vertebral column is represented by fragments of about ten vertebrae from different parts of the column. Fragmentary innominates are preserved from both sides of the skeleton (the right is more complete, but still preserves only a portion of the ilium and a small portion of the ischium). Both femora are preserved. The shafts are in good condition, but the proximal and distal ends, though present are in poor condition. Very small fragments of both patellae are present. Both tibiae and fragments of both fibulae are present. The right foot is represented by fragments of three tarsals and two metatarsals and the left foot by a fragment of calcaneus, another tarsal fragments and three fragments of metatarsals.

The upper limb is more fragmentary than the lower limb. Portions of both scapulae and clavicles are present but they are quite fragmentary. The humeri are both represented by fragmentary shafts and the right ulna and radius are present in extremely fragmentary condition.

Some hair was recovered during excavation in association with this skeleton. It is not clear whether it belongs to the individual whose skeletal remains are present.

### General Description and Pathology

#### Cranium

The cranium is quite light and gracile. There is very light supraorbital development. There is a roughened area in the area of nuchal muscle attachments but no real external protuberance at inion. The mastoids are small. There seems to be no nasal suture (or it is fused) on the midline between the two nasal bones. There is some slight evidence of cribra orbitalia, especially on the left side, but the condition of the bone makes observation of this quite difficult (Figure 17).

The maxillary teeth that were present in the jaw at the time of death are virtually all preserved (Figure 18). This includes all except the right M<sup>1</sup> and M<sup>2</sup> and the left M<sup>1</sup>. These teeth were lost sometime before death, but the surface of the alveolus has not smoothed over as it would have if the

individual had lived longer. The teeth that were present at the time of death exhibit some carious lesions interproximally. It is difficult to be certain because the enamel surface is somewhat broken, but there appear to have been such lesions on both the central incisors (mesially at the cemento-enamel junction) and on the right M<sup>2</sup> and left M<sup>3</sup>. The mandible is in quite poor condition, but it is clear that the right M<sub>1</sub> was lost well in advance of death. The mandibular teeth are in very fragmentary condition, but there is no obvious evidence for pathology among them.

### Postcranial Remains

The vertebrae have considerable pitting on the articular surfaces of the bodies and marginal osteophytes throughout the column (Figure 19).

The innominates are extremely small overall, with small acetabula. The sciatic notch appears to have been quite wide. The acetabula has moderate arthritic lipping around the margin.

The femora are very gracile and small. The linea aspera is almost indistinct with no real ridge. There is some osteophytic development at the fovea capitis. The tibiae and fibulae are also small and gracile. The tibial articular surfaces are quite complete and show no evidence of osteoarthritis.

The clavicles, scapulae and humeri are small and gracile.

### Sex

Based on the small size of the overall skeleton, the gracile nature of the skull and long bones and the small innominates with wide sciatic notches, it is clear that this individual is female.

### Age

Based on the antemortem dental loss and the arthritic lipping of the acetabula, this individual was in late middle age.

### **Grave 11**

### Skeletal Inventory and Condition

This individual was represented by a complete skull, which, partly due to the fact that it is a juvenile, was in fragmentary condition. Most of the individual bones are present and complete (including ear ossicles).

Fragments of long bones from the right leg are present in very poor condition. No other bones were preserved from the postcranial skeleton.

### General Description and Pathology

#### Cranium

For the most part, the cranial sutures are entirely unfused. The metopic suture, on the frontal is closed. The frontal has no browridge development. There is mild pitting in the roofs of the orbits, possibly early cribra orbitalia (Figure 20). Other bones of the conium are gracile, as expected in a juvenile and show only possible traces of pitting (on the parietals and occipital) but no other evidence of pathology (Figure 20).

The deciduous dentition was completely erupted at the time of death. The first deciduous molars are still slightly open at the apex of the root and the second deciduous molars are quite open with the tip of the root almost, but not fully formed. The first permanent molars (some still in the crypt, but others are loose, having fallen out of the fragmentary jaw) have the crown completely formed and the beginning of root formation. Using the standards provided by Ubelaker (1978), this individual is approximately 3 or 4 years old. The upper incisors are worn so that there is a line of dentin exposure and two of them have what may be carious lesions in the crowns (it is difficult to distinguish them from post-mortem damage in this case).

### Sex

It is not possible to determine sex from these remains.

### Age

(See above). This individual was approximately 3 or 4 years old at the time of death.

## **Grave 12**

### Skeletal Inventory and Condition

The condition of bone in this skeleton was quite good, but the cranium has been crushed into many pieces. Portions of most of the skull are present (including the ear ossicles), including the anterior portion of the mandible, but not the maxilla.

The vertebral column is represented only by fragments. Portions of both innominates, but not the sacrum are represented in only fair condition. Both femora are preserved, though neither is complete. The patellae, tibiae and fibulae are all represented, but in quite fragmentary condition. The feet are represented by fragments, mostly of tarsals and metatarsals.

Scapulae and clavicles are represented only by fragmentary material. Both humeri are present, but neither is complete enough for a length measurement. Both ulnae and radii are represented and one of the ulnae (right) is virtually complete. The hands are represented by fragmentary carpals, metacarpals and phalanges.

### General Description and Pathology

#### Cranium

The cranial bones are very thick, compared to other individuals from this site. In addition, compared to other specimens, the frontal has more supraorbital development, the mastoids are bigger, muscle markings are stronger. All cranial sutures are fused and obliterated both endocranially and on the outer surface of the skull. There is very slight pitting on the anterior surface of the frontals and in the roofs of the orbits, suggesting early cribra orbitalia. The glenoid fossae are shallow and show no signs of arthritis.

The portion of the mandible which is preserved (anteriorly from the middle portion of the molar region on the right to the premolar region on the left) was completely or almost completely edentulous at the time of death (Figure 21). Except in the right canine region the alveolar process has resorbed with only slight pitting remaining. The socket for the right lower canine is still present but the canine had apparently been lost antemortem because resorption had already begun. The mandible is quite thinned.

## Postcranial Remains

The fragmentary innominates are large, with what seem to be large acetabula (they are broken and impossible to measure). The sciatic notches are also broken, but appear to have been of moderate width (consistent with a diagnosis of either male or female). The left acetabulum shows moderate marginal lipping and osteophytic development, suggesting the presence of osteoarthritis (Figure 22).

The femora are large and robust, with well developed linea aspera. The heads of the femora have some marginal lipping, consistent with the evidence of osteoarthritis of the hip, cited above. The fragmentary bones of the lower portion of the leg are similarly large and robust. In contrast to the thick bones of the cranium, the long bones have thin shaft walls. The foot shows some evidence of marginal lipping, but the condition of the bones makes it difficult to assess the severity.

The scapulae and clavicles are in very poor condition, but the glenoid fossa of the left scapula shows moderate arthritic lipping on the posterior margin. The humeri have heavy muscle markings but, like the femora, thin shafts. Both olecranon fossae are perforated. The ulnae have evidence of arthritis in the form of moderate lipping in the ulnar notches. Joint surfaces of the carpals also exhibit marginal lipping.

## Sex

Based on the robusticity, size and thickness of the cranial vault, and morphology of the innominates, there is no doubt that this individual was male.

## Age

Based on the closed cranial sutures, antemortem tooth loss and presence of osteoarthritis, this individual is somewhat older than those described here as "middle-aged".

## **Grave 13**

### Skeletal Inventory and Condition

This individual was represented by only some of the bones of the skull (the occipital, frontals, temporal, sphenoid, mandible) and a few vertebral centers of ossification.

### General Description and Pathology

#### Cranium

The bones of the skull are separate in this very young infant. None of the cranial sutures had closed. Some crowns of deciduous teeth were present, including a portion of the deciduous upper central incisors and several deciduous molars. The molars have a completed crown, but no evidence of root formation. No evidence of pathology is visible on the very fragmentary bones.

#### Sex

It is not possible to determine the sex of this individual.

#### Teeth

The stage of dental development and eruption suggests that the individual was close to birth or a few months old at the time of death.

## **SUMMARY**

The sample from the Woodville Grave Site includes skeletal remains of eleven individuals from numbered graves (two graves contained no preserved bone) as well as an undetermined number of other individuals from unprovenienced contexts. Table 7 provides summary information about the individuals for these 13 graves. Of the eleven individuals from numbered graves, 3 are male, 4 are female and 4 are undetermined (either because of the condition of the bone or the age of the individual represented). The ages at death of these individuals ranged from newborn through old age, with most individuals (7) being in middle-age or older. There are three juveniles represented: one newborn, one 3-4 year old and one early adolescent.

The size of the skeletal sample from the Woodville Grave Site is too small for population reconstruction of demographic parameters or population-wide estimates of health status. Nevertheless it is worth noting that the pathology present in this sample consisted mostly of age-related degenerative changes such as osteoarthritis and antemortem tooth loss. All of the adults individuals who had dental remains preserved had some degree of antemortem tooth loss ranging from moderate to very extreme and many of the teeth which did remain in the jaws at the time of death were carious. Although this sample does not permit quantification of the caries rate, it is clear that dental decay and ultimately dental loss, was the norm for individuals in this population. This suggests a diet, heavily dependent on carbohydrate foods. Three individuals exhibited slight cribra orbitalia which is generally indicative of nutritional deficiency such as anemia.

## **GLOSSARY**

alveolus -- The portion of the maxilla or mandible into which the teeth fit.

antemortem -- Occurring before death.

arthritis (osteoarthritis) -- Degenerative joint disease; remodelled changes in the skeleton which most frequently come about as the result of destruction of weight-bearing joints.

attrition -- Occlusal tooth wear.

cemento-enamel junction -- The line at the base of the crown of a tooth, between the enamel of the crown and the cementum of the root.

cribra orbitalia -- Porosity in the upper surfaces of the orbits which may be related to anemia or other deficiency

deciduous dentition -- The primary dentition which are shed as the permanent dentition erupts ("milk teeth").

dental caries -- Lesions on the enamel surface of teeth which are the result of decay.

dentin -- The main tissue of the tooth which surrounds the pulp cavity and is covered with enamel.

diaphysis -- The mid-portion of a long bone (shaft) which is one of the primary centers of ossification.

discriminant function -- A linear equation that assigns an unknown case to one of a number of categories (such as sex or population).

enamel -- The hard substance that covers the dentin and forms the outer surface of a tooth crown.

enamel hypoplasia -- Lines of disrupted development in the enamel surface of teeth.

enthesophytes -- Ossified projections or spurs at the points of ligamentous and tendinous attachment.

epiphysis -- One of the ends of a long bone which is one of the secondary centers of ossification.

interproximal -- Between the teeth.

occlusal -- The biting surface of the tooth that contacts the teeth from the opposing jaw.

osteophytes -- Growths on the surfaces of bones associated with degenerative joint disease (osteoarthritis) or trauma.

osteoporosis -- Bone loss, usually associated with aging.

parturition scars -- Modifications of the surface of the bony pelvis (on the dorsal surface of the pubic symphysis or the preauricular region of the ilium) which may be the result of pregnancy and/or childbirth.

pathology -- The study of disease.

porotic hyperostosis -- Porosity in the outer surface and thickening of the bony table of the cranium which may be related to anemia or other nutritional deficiency.

postcranial -- That portion of the human skeleton below the skull.

pubic symphysis -- The joint at the front of the pelvis where the two innominate bones articulate at the midline.

resorption -- The process of bone destruction.

scoliosis -- Lateral curvature of the spine.

spheno-occipital synchondrosis -- The articulation between the sphenoid and occipital bones at the base of the skull.

spondylosis deformans -- A degenerative spine disease in which there are osteophytes bridging between the vertebral discs. It is found most often in elderly individuals and more commonly in males than in females.

suture -- A interlocking joint between two cranial bones.

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## **APPENDIX 1**

The following list itemizes the bone from "context unknown". Although much if not all of this material could come from the graves described above, the associations are not known. Material is grouped together under its field number.

### **Rd 406 Buried**

- 3 pieces of metal
- 1 fragment of thoracic vertebra including the arch
- 1 proximal hand phalanx
- 1 anterior maxillary tooth
- 5 unidentifiable bone fragments

### **406 #1**

- 1 basilar portion of an occiput of an infant.

### **406 #2**

- 1 first metacarpal

### **406 #3**

- 1 rib fragment

### **406 #4**

- 1 femoral head with some osteophytic deposits

### **406 #5**

- 1 right ulna, deformed (bent at an angle at midshaft) by post-depositional forces. The articular surface of the ulnar notch has marginal lipping.

### **406 #6**

- 1 right hamate
- 1 metacarpal

### **406 #7**

- 1 first hand phalanx

406 #8

- 1 adult right humerus
- 1 adult right radius

The humerus is complete (see table of long bone measurements) and has a perforated olecranon fossa. Muscle markings on both bones are light. There are marginal ridges on the distal articular surface of the radius.

406 #9

- 1 unidentifiable fragment

406 #10

- 1 right second metacarpal

406 #11

- 1 right third metacarpal

406 #13

- 1 sacral fragment (with extreme osteophytic deposition on the superior articular surface)
- 1 proximal phalanx of a thumb
- 1 metacarpal
- 1 middle phalanx of a finger

D-3

- 1 tibia shaft

U1

- 1 juvenile humerus diaphysis, 226 mm long.

U3

- 1 proximal right femur in poor condition

U4

- unidentifiable long bone shaft fragment

U8

fragments of cranial bone, including a small frontal, mostly from the right side. The bone has moderate pitting in the supraorbital region and slight pitting in the roof of the orbit.

1 humerus shaft, including most of the distal end (this is a very robust humerus with strong muscle markings)

1 small (but adult) right talus

1 unidentifiable long bone shaft fragment

3 fragments of cranial bone

6 other small unidentifiable fragments

U9

3 vertebral fragments, including 1 vertebral body with considerable marginal osteophytic development

1 fragment of an acromial process of the scapula, probably from the left side

1 ulnar shaft fragment

4 rib fragments

1 parietal fragment

16 other unidentifiable fragments

U13

1 proximal right humerus in good condition. The bone is very large and extremely robust.

No number but labelled "This ulna may be associated with Grave 10"

1 right proximal ulna. This bone has marginal lipping in the articular surfaces of the ulnar notch.

A skull found "in slumped soil of bluff"

This is a complete skull. The face is broken off of the cranial vault but the condition of the bone itself is excellent. There has been some plastic deformation to the bone, so that even if reconstructed, it is unclear that accurate cranial measurements could be taken.

The cranium is extremely large, robust and ruggedly built. The supraorbitals are the largest seen in this sample, the temporal lines are marked, mastoids are big and there is an external protuberance at inion. The bones of the cranial vault are thick. There is no doubt that this individual is male.

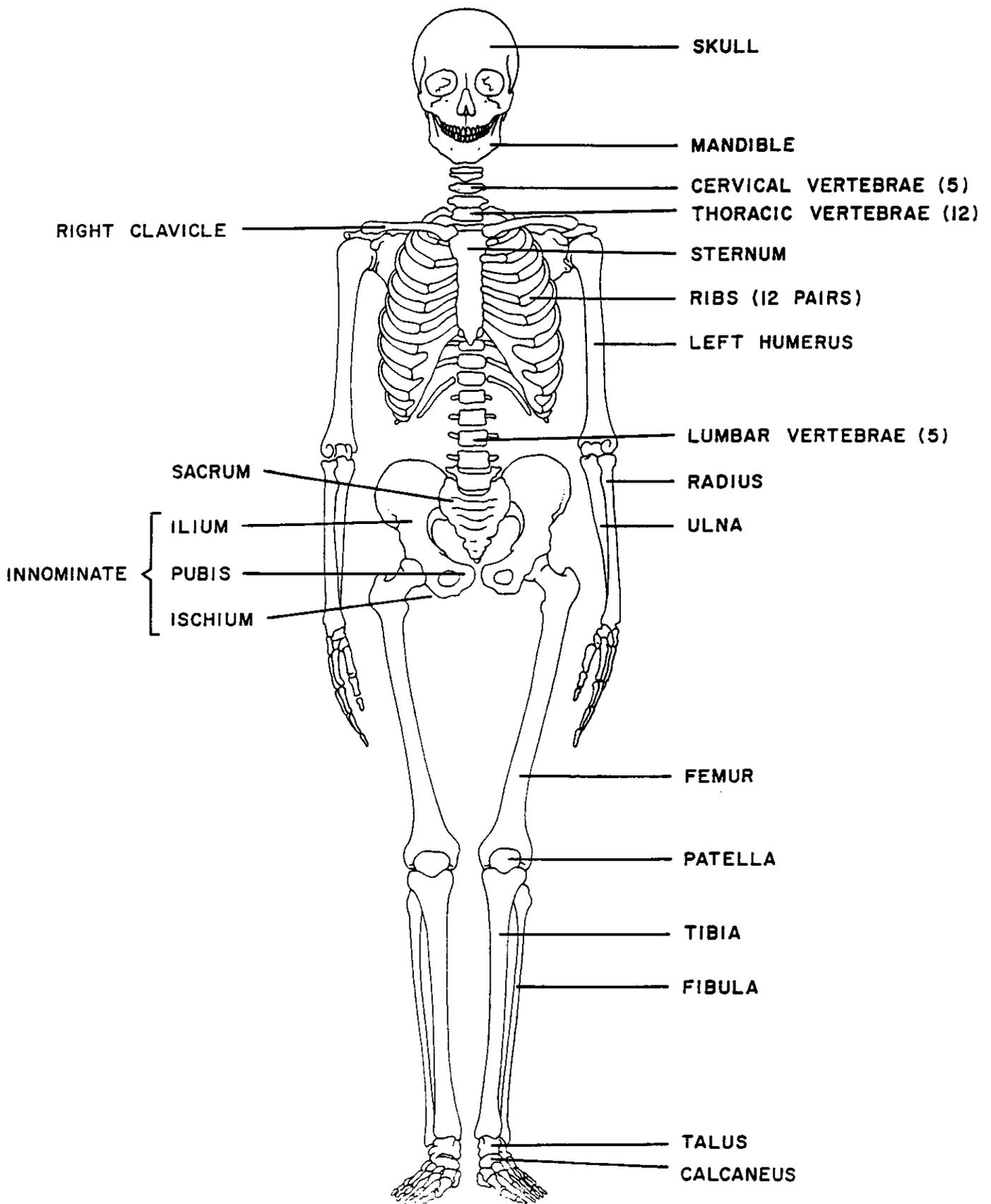
The cranial sutures are fused both externally and endocranially. The maxilla was completely edentulous at the time of death with considerable resorption of the alveolus. Both of these indicators suggest that the individual was advanced in age at the time of death. The outer bony surface of the occipital condyles are abraded so it is not possible to evaluate them for signs of arthritis, but the glenoid fossa is roughened and there are signs of arthritis at that joint.

On the occipital bone, just superior to inion, there is an area of pitted bone. It is possible that this is due to post-mortem damage, but it is also possible that it represents pathological pitting on the occiput. The rons over the medial portions of the browridges also show pitting, but there is no cribra orbitalia.

There is a sharp angle at nasion and a distinct nasal sill at the bottom of the nasal aperture. The face is fairly flat and unprognathic.

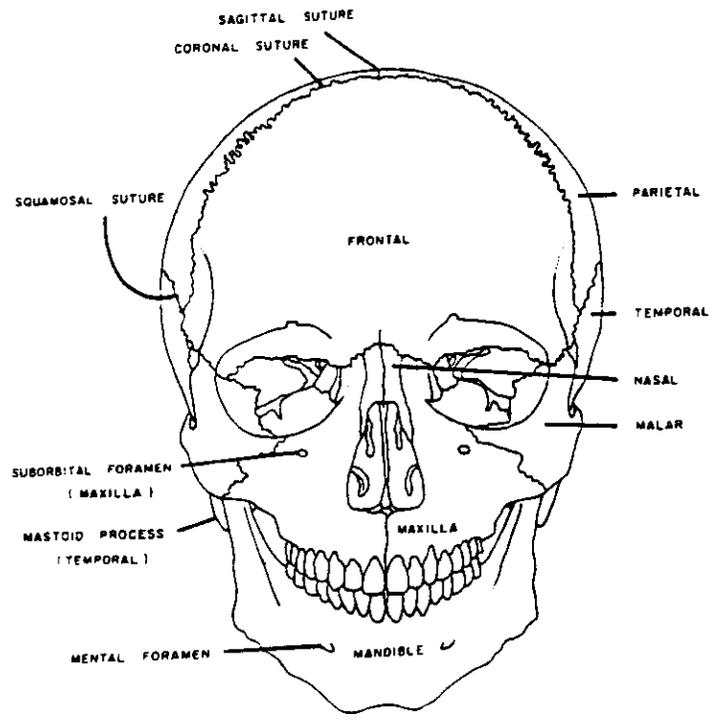
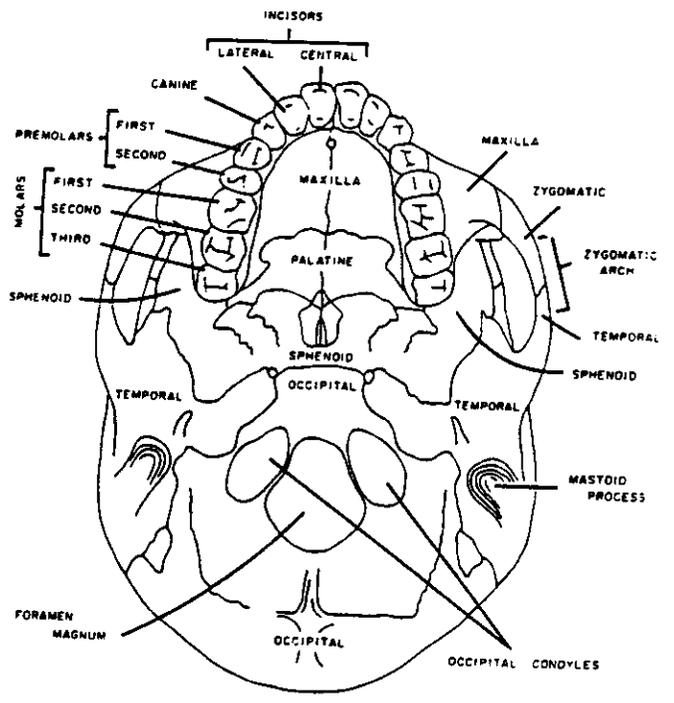
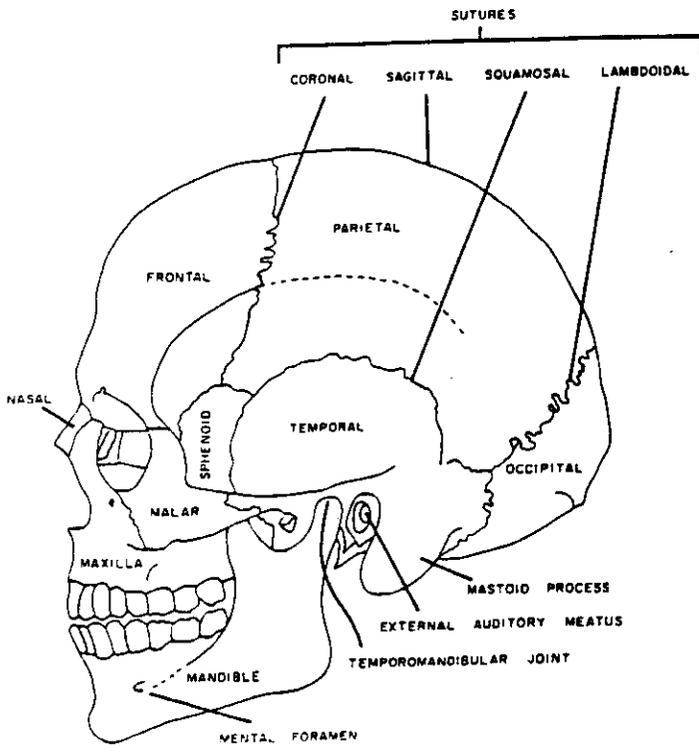
## **APPENDIX 2**

### **The Principal Bones of the Human Skeleton (from Ubelaker, 1978)**



### **APPENDIX 3**

**Bones and Principal Features of the Human Skull  
in Frontal, Lateral and Inferior View  
(from Ubelaker, 1978)**



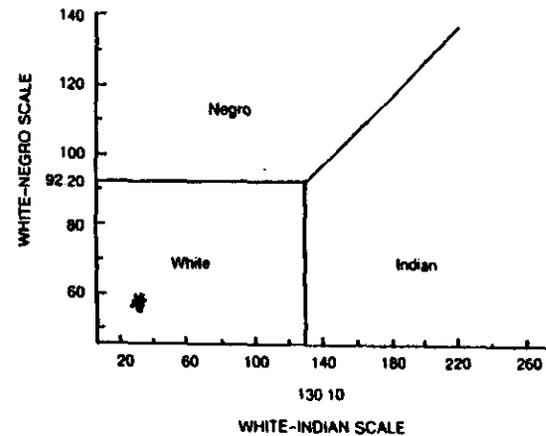
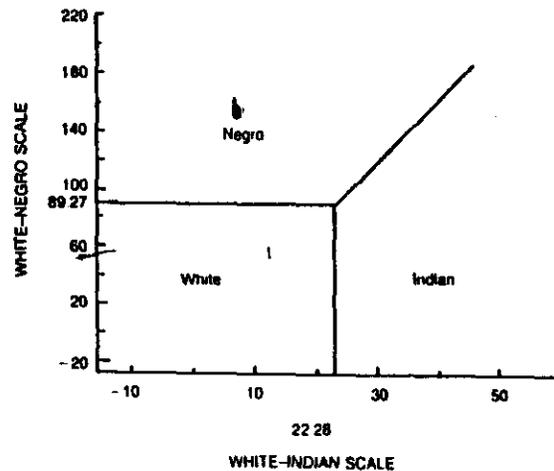
## **APPENDIX 4**

**Basis for identification of population affiliation for the individual from Grave 3.**

Specimen: Woodville Grave 3 Date: October 12, 1994 Measured by: KR Rosenberg

MEASUREMENT	MALE		FEMALE		SEX Female
	WHT/NEG	WHT/IND	WHT/NEG	WHT/IND	
*1. Basion-Prosthion Ht. <u>79</u> x	+3.06 = _____	+0.10 = _____	+1.74 = <u>137.5</u>	+3.05 = <u>240.9</u>	1. <u>79</u> x -1.00 = <u>-79</u>
*2. Glabello-Occip. Ln. <u>163</u> x	+1.60 = _____	-0.25 = _____	+1.28 = <u>208.6</u>	-1.04 = <u>-169.5</u>	2. <u>163</u> x +1.16 = <u>189.1</u>
3. Maximum Width <u>125</u> x	-1.90 = _____	-1.56 = _____	-1.18 = <u>-147.5</u>	-5.41 = <u>-676.2</u>	5. <u>95.9</u> x +1.66 = <u>159.2</u>
4. Basion-Bregma Ht. <u>123</u> x	-1.79 = _____	+0.73 = _____	-0.14 = <u>-17.2</u>	+4.29 = <u>527.7</u>	6. <u>109</u> x +3.98 = <u>433.8</u>
*5. Basion-Nasion Ht. <u>95.9</u> x	-4.41 = _____	-0.29 = _____	-2.34 = <u>-224.4</u>	-4.02 = <u>-385.5</u>	7. <u>58</u> x +1.54 = <u>89.3</u>
(estimated) *6. Max Diam. Bi-zyg. <u>(109)</u> x	-0.10 = _____	+1.75 = _____	+0.38 = <u>41.4</u>	+5.62 = <u>612.6</u>	TOTAL = <u>792.4</u>
*7. Prosth.-Nasion Ht. <u>58</u> x	+2.59 = _____	-0.16 = _____	-0.01 = <u>-0.58</u>	-1.00 = <u>-58</u>	MALE _____ +
8. Nasal Width <u>24.8</u> x	+10.56 = _____	-0.84 = _____	+2.45 = <u>55.4</u>	-2.19 = <u>-54.3</u>	FEMALE <u>792.4</u> -
TOTALS			= <u>53.2</u>	= <u>37.7</u>	891.12

\*These measurements are used for calculating sex.



Giles and Elliot (1962) worksheet for race identification from cranial measurements.

Table 1

Long bone Measurements (mm) used in  
stature reconstruction<sup>2</sup>

Grave	Dimension	side	Measurement	Stature Estimate (cm)
1	femur length	left	466	172.3 +/- 3.27
	humerus length	left	328	171.7 +/- 4.05
	humerus length	right	326	
2	tibia length	left	346	161.9 +/- 3.66
3	femur length	left	462	168.2 +/- 3.72
	humerus length	left	339	171.9 +/- 4.45
8	femur length	left	428	160.6 +/- 3.72
	femur length	right	434	
	tibia length	left	367	169.3 +/- 3.66
	tibia length	right	376	
	ulna <sup>3</sup> length	left	246	162.8 +/- 4.30
	radius <sup>4</sup> length	left	228	163.0 +/- 4.24
	femur + tibia	average	802	164.7 +/- 3.55
10	femur length	right	385	149.2 +/- 3.72
	tibia length	left	317	153.6 +/- 3.66
	tibia length	right	318	
	femur + tibia	average	702	150.8 +/- 3.55
12	ulna length	right	249	166.2 +/- 4.32
406 #8 <sup>5</sup>	humerus length	right	314	163.5 +/- 4.45

<sup>2</sup>. Stature estimates were made for each long bone which was well enough preserved to allow measurement of maximum length. If both the left and right side were present from a single individual, the average of the two sides was used. All stature estimates were done using regression equations derived from samples of European origin and of the sex to correspond to sex assignment given in the text.

<sup>3</sup>. This bone is U-12-1 and is probably associated with grave 8.

<sup>4</sup>. This bone is S 12 is probably associated with Grave 8.

<sup>5</sup>. Unprovenienced material. Regression used to estimate stature was for this individual was one derived from White Females.

Table 2

Cranial Measurements from Better Preserved Adult Individuals

Measurement	Grave 1	Grave 2	Grave 3
Maximum length			163
Nasion-occipital length	172		161
Basion-prosthion length			90
Prosthion-opisthion			125
Prosthion-basion			79
Opisthion-nasospinale			112
Basion-nasospinale			75
Basion-bregma			123
Nasion-bregma (arc)	120	117	108
Nasion-bregma (chord)	105.6	99.3	95.9
Bregma-lambda (arc)	130	118	124
Bregma-lambda (chord)	116.5	102.8	110.1
Lambda-opisthion (arch)			105
Lambda-opisthion (chord)			90.5
Lamba-inion (arc)			60
Lambda-inion (chord)			58.7
Inion-opisthion (arc)			44
Inion-opisthion (chord)			43.3
Bregma-inion (arc)			188
Bregma-inion (chord)			139.8
Bregma-opisthion (arc)			228
Bregma-opisthion (chord)			141
Lambda-basion (chord)			108.7

Nasion-lambda (arc)	250		228
Nasion-lambda (chord)	172		160
Max. cranial breadth	134		125
Max. frontal breadth	111		109
Bifrontal breadth		95.4	89.4
Minimum cranial breadth	94		
Bistephanic breadth	102		108.1
Bizygomatic breadth			(109)
Biauricular breadth			106
Biasterionic breadth			99
Nasion-prosthion			58.0
Orbit height			30.2
Orbit breadth			34.0
Nasal aperture breadth			24.8
Nasal aperture height			46.4
Mastoid height	(25.8)	22.7	19.7
Mastoid width	13.1	10.5	10.3
Length of occipital condyle		22.3	
Width of occipital condyle		10.7	
Ascending ramus height of mandible to coronoid process		50.5	
Ascending ramus height of mandible to condyle		46.6	

Table 3

Postcranial Measurements for Adult  
Skeletal Material from Woodville Site  
Lower Limb Dimensions

	1l	1r	2l	3l	3r	8l	8r	10l	10r
Fem1	49.5	49.5		40.3	41.8	41.8			
2	47.4	47.8		38.1	40.6	40.7			
3	35.1	36.4				29.9			
4	27.5	27.5				20.8			
5	466			462		428	434		385
6	462	462		459		425	428		
7	31.5	31.8		24.6		26.9	27.1		23.6
8	32.7	30.5		24.8		25.7	25.4		23.4
9	99	99		78		80	83		76
10	32.0	29.8		24.2		27.9	26.9		
11	36.0	34.4		31.2		30.5	29.7		
12	104	100		86		92	91		
Tib1			346			367	376	317	318
2						26.5	26.2	21.9	22.6
3						19.5	20.2	18.9	19.3
4						73	72	65	68
5						30.6	31.7	26.8	25.6
6						23.3	23.9	22.2	22.0
7						84	86	78	78
Inn1	56.5	53.8		43.9	46.3	46.4	48.3		
2	51.0	55.2		49.8	50.6	47.3	49.9		

Note: Measurement definitions are as follows.

- Fem 1: Femoral head diameter, vertical
- 2: Femoral head diameter, horizontal
- 3: Femur neck diameter, vertical
- 4: Femur neck diameter, horizontal

- 5: Maximum femur length
- 6: Bicondylar femur length
- 7: Femur midshaft diameter, anterior-posterior
- 8: Femur midshaft diameter, medial-lateral
- 9: Femur midshaft circumference
- 10: Femur subtrochanteric diameter, anterior-posterior
- 11: Femur subtrochanteric diameter, medial-lateral
- 12: Femur subtrochanteric circumference

- Tib 1: Tibia maximum length
- 2: Tibia midshaft diameter, anterior-posterior
- 3: Tibia midshaft diameter, medial-lateral
- 4: Tibia midshaft circumference
- 5: Tibia diameter at nutrient foramen, anterior-posterior
- 6: Tibia diameter at nutrient foramen, medial-lateral
- 7: Tibia circumference at nutrient foramen

- Inn 1: Acetabular height
- 2: Acetabular diameter

Table 4  
Upper Limb Dimensions

	1l	1r	3l	8l*	12r	406 #8
Hum1	328	326	339			
2	22.8	24.7	16.5			
3	20.2	20.7	13.7			
3	67	73	50			
Uln1				246	249	314
2					16.2	16.9
3					11.2	19.8
4					47	61
Rad1				228		
2				14.6		
3				9.7		
4				38		

\* This ulna (U-12-1) and radius (S12) are probably (but not certainly) associated with the individual from Grave 8.

Note: Measurement definitions are as follows.

Hum 1: Humerus maximum length  
 2: Humerus midshaft diameter, maximum  
 3: Humerus midshaft diameter, minimum  
 4: Humerus midshaft circumference

Uln 1: Ulna maximum length  
 2: Ulna midshaft diameter, maximum  
 3: Ulna midshaft diameter, minimum  
 4: Ulna midshaft circumference

Rad 1: Radius maximum length  
 2: Radius midshaft diameter, maximum  
 3: Radius midshaft diameter, minimum  
 4: Radius midshaft circumference

Table 5

Dental Measurements  
(mesial-distal, buccal-lingual diameters in mm)

Tooth	Grave 2 (left)	Grave 2 (right)	Grave 3 (left)	Grave 3 (right)
I <sub>1</sub>	5.2 5.4	4.8 5.9	5.0 5.5	4.3 5.7
I <sub>2</sub>	5.4 6.2	5.3 5.8	5.7 5.7	5.4 5.8
C	6.1 7.7	6.3 7.8		6.7 6.6
P <sub>3</sub>		6.7 7.8	6.9 7.5	6.8 7.4
P <sub>4</sub>				
M <sub>1</sub>				
M <sub>2</sub>	9.9 9.6			
M <sub>3</sub>	9.1 8.7	9.9 8.7		
I <sup>1</sup>				
I <sup>2</sup>				
C			6.5 7.6	
P <sup>3</sup>				
P <sup>4</sup>				
M <sup>1</sup>				
M <sup>2</sup>				8.3 10.1
M <sup>3</sup>				9.2 10.1

Table 6

Dental Wear Scores (after Smith 1984)

Tooth	Grave 2 (left)	Grave 2 (right)	Grave 3 (left)	Grave 3 (right)
I <sub>1</sub>	4	4	3	3
I <sub>2</sub>	4	4	3	3
C	4	5	2	2
P <sub>3</sub>		4	3	2
P <sub>4</sub>				1
M <sub>1</sub>				
M <sub>2</sub>	3			
M <sub>3</sub>	3	3		
I <sup>1</sup>				
I <sup>2</sup>				
C			2	2
P <sup>3</sup>				
P <sup>4</sup>				
M <sup>1</sup>			decayed	
M <sup>2</sup>				2-3
M <sup>3</sup>				2

Table 7

Summary Table  
Skeletal Material from Woodville Graves

Grave	Condition	Age	Sex	Pathology
1	good	50s+	male	extreme osteoarthritis (TMJ and post-cranially), antemortem tooth loss
2	fair	40s+	female	slight osteoarthritis (TMJ and post-cranially), antemortem tooth loss, dental caries
3	excellent	40s+	female	slight osteoarthritis (TMJ and post-cranially), antemortem tooth loss, dental caries
4	poor	middle age	male	slight osteoarthritis
5	fragmentary			
6	fragmentary	e.adolescent		
7	no bone			
8	fair (from pelvis down)	late middle age	female	slight osteoarthritis (post-cranially)
9	no bone			
10	good	50s+	female	slight osteoarthritis, cribra orbitalia, antemortem tooth loss, dental caries

11	fair	3-4 years		mild cribra orbitalia, dental caries
12	good	advanced age (60s+)	male	mild cribra orbitalia, moderate osteoarthritis, antemortem tooth loss
13	poor	birth-6 months		