

## AN ISOLATED HUMAN SKELETON FROM SOUTHERN OHIO<sup>1</sup>

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*Abstract.* During the recent construction of the Ross County Regional Water System in Southern Ohio, the skeletal remains of a prehistoric American Indian were recovered. The isolated burial remains represent the skeleton of a male, between 40 and 45 years of age. The discovery circumstances prevent accurate determination of the date of deposition. An extensive examination of the skeletal remains suggests the occurrence of several pathological lesions among which are: a healed fracture of the left clavicle, osteoarthritis of the joint surfaces of the long bones and vertebrae, periostitis of the lower limbs, cribra orbitalia, and an advanced case of Leggs-Calve-Perthes Disease.

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The articulated human skeleton which is reported in this study, was recovered during excavation for the Ross County Regional Water System 5.1 miles (8.2 km) north of Chillicothe, Ohio during the summer of 1975. The location of the site is shown in figure 1.

The skeleton was encountered during backhoe trenching for a watermain which was extended east from the water filtration plant of the Ross County Regional Water System. The watermain was laid in mixed sands and gravels at a depth of 12 feet below the present land surface. The remains were first observed by Mr. William (Sonny) Willis of Chillicothe. Because of the depth at which the skeleton was encountered (4 m) and the unconsolidated nature of the sands and gravels overlying the burial, no attempt was made to excavate the entire burial. Only those bones which could be recovered with the backhoe were saved. Subsequent to the excavation, the skeletal remains were given to Mr. Alva McGraw of Chillicothe for examination. Mr. McGraw delivered the remains to the present authors.

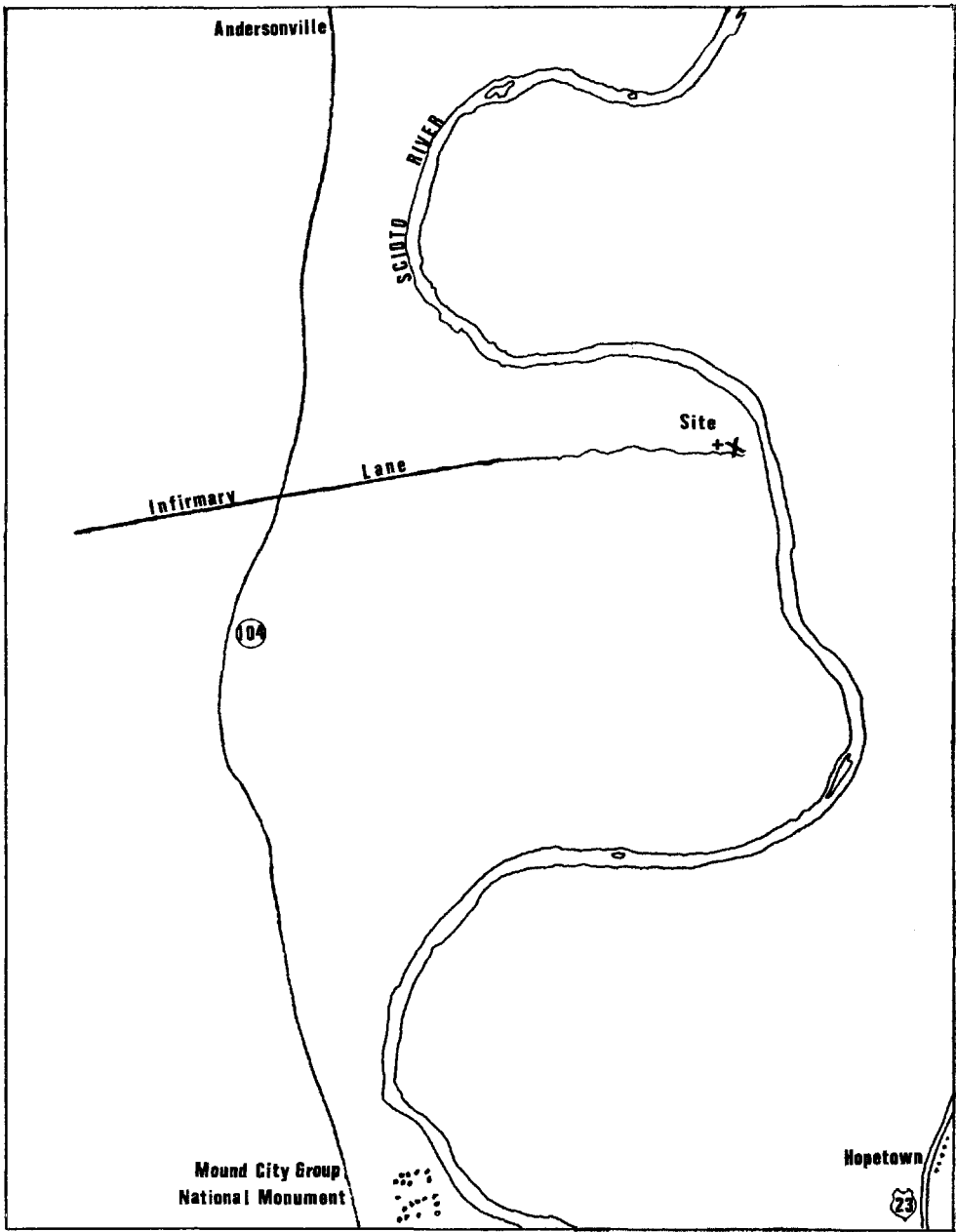
The burial site is located in Union Township, Ross County, Ohio, on the west side of the Scioto River. The site is 5.1 miles (8.2 km) north of Chillicothe and 1.8 miles (2.9 km) south of Anderson-

ville, Ohio, along State Route 104, and is properly located 700 meters east of the termination of Infirmary Road, 1.4 miles (2.5 km) east of the junction of Infirmary Road and State Route 104, and 100 meters west of the Scioto River. The site is situated on a low rise on the flood plain of the Scioto River at an elevation between 624 and 626 feet. The coordinates of the site are 39°24'34" North Latitude and 82°59'10" West Longitude (USGS Kingston, Ohio, 7½' Quad-angle).

Accurate cultural-chronological placement of the human skeleton has not been possible for several reasons. First, the excavation was devoid of grave associations or the grave associations were not recovered as a result of the crude excavation technique. Second, samples suitable for radiocarbon dating (other than the human bone itself) were not recovered. Lastly, the placement of the pipeline and the filling in of the excavation immediately after discovery prevented *in situ* examination by the authors and reduced the available geochronological information.

The human skeleton which is considered in this report represents a primary deposition. The articulating surfaces of the long bones (including the styloid process of the ulna, the styloid process of the fibula, and the trochlear notch of the ulna) display no edge wear or erosion of the lamellar bone, which is characteristic

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Chillicothe (Junc. U.S. 50) 3.1 mi.

FIGURE 1. Map location of burial site.

of bones which have been subjected to movement by fluvial processes. The small bone spurs, which are characteristic of osteoarthritis (e.g. the left humerus and radius and the right radius and ulna) and of osteophytosis (e.g. the second cervicle and forth lumbar vertebra), were intact and undamaged. The superior margins of the orbits, the mastoid process, and the occipital condyles displayed no erosion. In summary, all of the normal indicators of fluvial redeposition were lacking and we concluded that the human skeleton represents a primary deposition either as a purposeful human burial or as an accidental inclusion within the sand and gravel deposit.

The circumstances surrounding the discovery and recovery of the skeletal remains did not permit us to determine if the deposition was accidental or purposeful. Because the skeleton was discovered during backhoe excavation, no attempt was made to determine the presence or absence of a grave outline, and no grave goods were recovered. The absence of grave goods may have been the result of the backhoe excavation. The depth at which the skeleton was recovered and the physiographic setting of the site locality argue for accidental inclusion within the sand and gravel deposit.

Although it is impossible to determine the mode of skeletal deposition (except to exclude the possibility of fluvial redeposition), it has been possible to provide an estimation of the earliest possible date at which the deposition could have occurred. The find location is situated north of the Cuba moraine, within the glaciated portion of Ross County. The Cuba moraine forms the terminal Late Wisconsin moraine of the Scioto Lobe and has been radiocarbon dated between 18,000 and 20,000 B.P. Deposition by either human activity or accidental intrusion could not have occurred until the ice sheet of the Scioto Lobe had retreated past the find location. The site lies south of the Reeseville moraine, which has been dated *ca.* 15,000 B.P. (Goldthwait, 1965). Clearly, the earliest date at which deposition could have occurred is between 18,000 and 15,000 B.P. It would be tempting to conclude that this human skeleton dates from more than

15,000 years ago. However, this estimation represents *only* the earliest possible date at which deposition could have occurred. An exact determination of when deposition occurred is impossible.

We have examined the possibility that the skeleton represents that of an Anglo-European individual, perhaps from the Ross County Home for the Aged which has operated near the find locality for many years. The skeletal evidence considered below strongly indicates that the individual is of an American Aboriginal population. The depth of the discovery (12 feet below the present land surface level), the lack of coffin fragments, and the lack of a clearly marked grave outline (characteristic of historic burials within the past 200 years) strongly argues against the possibility of a purposeful burial from within the historic period.

#### MATERIALS AND METHODS

The skeleton was badly destroyed as a result of the excavation and, as a result, only partially recoverable. Those osteological segments which were recovered were in excellent state of preservation and include the following:

*Cranium:* The recovered cranial material consist of a calvarium and portions of the face. The calvarium included the posterior two-thirds of the left and right parietals with the adjoining temporals and mastoid complexes. The occipital was present and intact. The face was badly damaged but includes the left and right orbits with partial zygomatics. The mandible, less dentition, was also present. The maxilla was not recovered, however, two teeth were included with the burial remains. One tooth is a central incisor and the other is a lateral incisor.

<i>Postcranial Skeleton:</i>	<i>Location</i>
Clavicle	Left and right
Humerus	Left
Ulna	Right
Radius	Left and right
Ribs	Left, first and fifth
Pelvis	Right (Partial Ilium, acetabulum, with Pubis and Ischium)
	Left (Partial Ilium, acetabulum, with Pubis and Ischium)
Sacrum	
Femur	Left, proximal one-third
	Right, proximal and distal one-third
Tibia	Left
Fibula	Left, distal one-third
	Right, distal one-third
Calcaneus	Right
Vertebrae	Cervical, second and fifth
	Lumbar, fourth

Brothwell (1965) suggested that in an analysis of palaeopathology the following categories of pathological lesions can usually be identified: developmental anomalies, infectious diseases, degenerative conditions, trauma, tumors, nutritional deficiencies, and those of unknown origin. Employing these categories in our analysis we were able to diagnose infectious diseases (osteitis and periostitis), degenerative conditions (osteoarthritis, osteoporotic pitting of the parietals, and osteophytosis), trauma (fractures), nutritional deficiencies (cribra orbitalia), and those of unknown origin (Leggs-Calves-Perthes Disease).

The techniques of diagnosis in palaeopathology were outlined by Roney (1966) and include macroscopic examination, microscopic and histological analysis, and the use of X-rays. In our analysis, we have relied upon macroscopic examination using a lighted magnifying observing glass to examine each of the bones. Observations of the external periosteal surface were made to identify the gross external appearance of each lesion. In those cases where macroscopic examination yielded doubtful data, radiographs were taken and the negatives were analyzed.

The sex of the skeleton was determined on the basis of several criteria which include: the angle and index measurements of the sciatic notch (Gustov, 1972); the diameters of both the femoral head and neck (VanGerven, 1972); the indices of Hanna and Washburn (Hanna and Washburn, 1953); and the multivariate statistical techniques of Giles (Giles, 1970).

The age determination was based upon: the degenerative changes which have occurred in the face of the pubic symphysis (Todd, 1921; McKern and Stewart, 1957); and the stages of closure for both the endocranial and ectocranial sutures (Todd and Lyon, 1924; 1924).

The skeletal remains were tentatively identified as those of an Amerindian. This determination was based upon several criteria: the depth at which the burial occurred; the correspondence between statural estimates for the study specimen and statural estimates for Amerindians from the Anderson site of Southern Ohio; the correspondence between size and shape characteristics of the cranium of the study specimen to the Iswanid type of Neuman (1952); the presence of the Inca bone; the moderate degree of pre-mortem artificial cranial deformation (fronto-lambdoid); and the central maxillary incisor being shovel-shaped. Although these traits are not absolute indicators of the Amerindian origin of the study specimen, their simultaneous occurrence in one individual is strongly suggestive of an Amerindian affiliation.

#### RESULTS AND DISCUSSION

The skeleton is that of a male with a skeletal age between 40 and 45 years. On the basis of the condition of the pubic symphysis, approximate age of 42 years is not unreasonable. The stature of the

individual was reconstructed on the basis of the regression equations of Trotter (1970) and stature was calculated on the basis of humerus, radius, ulna, and tibia lengths. From the results tabulated below the average stature estimate based on all four approximations was  $169.59 \pm 4.19$  centimeters.

#### *Stature Estimates Based on Longbones*

	<i>Estimated Stature</i>
Humerus	$168.95 \pm 4.25$ cms
Radius	$169.08 \pm 4.60$ cms
Ulna	$170.10 \pm 4.66$ cms
Tibia	$170.35 \pm 3.27$ cms

The analysis of pathological lesions focuses upon both the cranial and post-cranial skeleton. Macroscopic examination and X-ray analysis demonstrated the presence of several categories of pathologies. On the facial region, the initial stage of cribra orbitalia is present on the superior surface of both the left and right orbital walls. Cribra orbitalia refers to a lesion which usually occurs on the superior aspects of the orbits. The lesion may be expressed unilaterally or bilaterally. In its less severe manifestations, the lesion appears as a series of porous openings ("pin holes") in the roof of the orbit. In its most severe manifestations, cribra orbitalia is expressed as an expanded mass of cribrous bone giving it a "honeycomb-like" appearance. The lesion is brought about by an expansion of the diploic space and a corresponding thinning of the outer table.

Several factors have been suggested to account for the etiology of cribra orbitalia. Brothwell (1965) sees it as a discrete genetic trait and Morse (1969) suggests that the lesion may be due to the pressure of an enlarged lacrimal gland. Recent investigations have supported the suggestion that the lesion is a result of a hereditary hemolytic anemia (Angel, 1964) or a response to some type of a nutritional disorder (Moseley, 1966; Nathan and Hass, 1966).

In the lower facial region the mandible is present but, none of the dentition was recovered (fig. 2). Root sockets for the central incisors, lateral incisors and canines were present, indicating that at the time of death, the anterior dentition



FIGURE 2. Mandible showing premortem loss of posterior dentition with alveolar resorption.

was present in the oral cavity. On both the left and right quadrants, the premolars and molars are missing and the root sockets are completely resorbed. This suggests that the posterior dentition had been lost long before death occurred. Considering that the posterior dentition is employed in crushing and grinding foodstuffs and that the American aboriginal diet contained a large amount of vegetable materials, it can be suggested that this individual must have been at a disadvantage with respect to the mastication of nutritional resources. This disadvantage may account for the appearance of the initial stage of *cribra orbitalia*.

An examination of the alveolar bone demonstrated that this individual did not suffer from mandibular dental abscesses, which are very common in most American Indian skeletal populations. The two maxillary teeth exhibited heavy attrition, especially on the lateral incisor which had a large cervical cavity on its lingual aspect. Both incisors showed the shovel-

ing phenomena which was especially prominent in the median incisor.

On the calvarium, both parietals and the occipital were characterized by a degenerative condition referred to as osteoporotic pitting, which is age related and is the result of a decrease in activity of osteoblasts while osteoclastic activity remains constant resulting in a thinning of the external table of the crania. Bilateral accessory ossicles are located at the lambdoid suture. Berry and Berry (1967) suggested that accessory ossicles were discrete epigenetic traits which can serve as genetic populational markers.

On the postcranial skeleton the left clavicle (fig. 3) exhibited a well healed fracture with callous formation. On both the left and right medial articular facets there was light arthritic lipping. The left humerus and radius were intact and displayed a mild case of osteoarthritis as evidenced by slight pitting and lipping of the proximal and distal articular facets. The right radius and ulna exhibited heavy

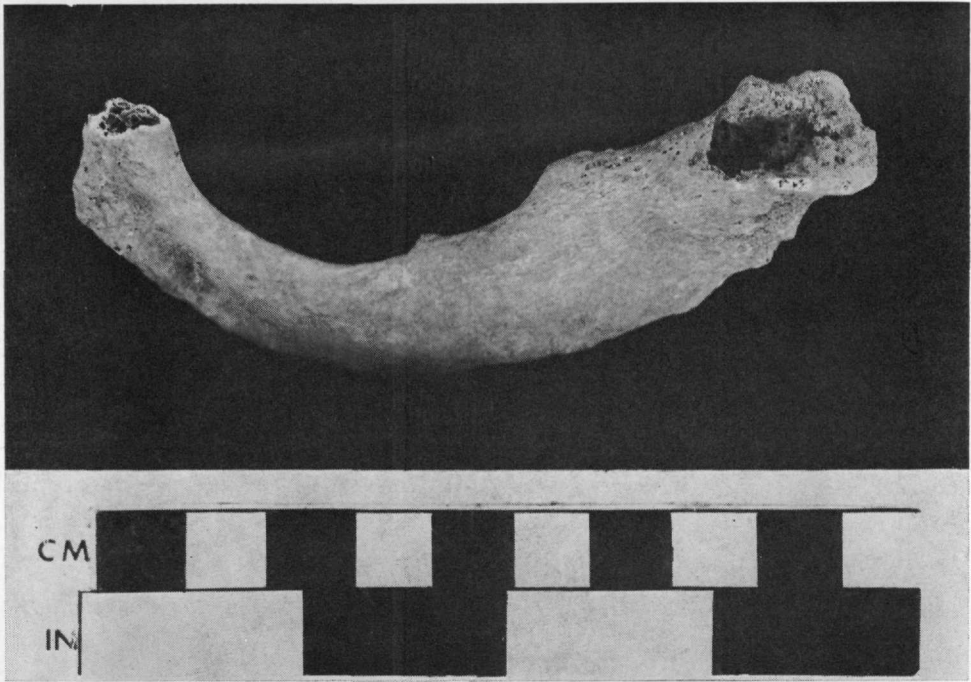


FIGURE 3. Left clavicle with healed fracture.



FIGURE 4. Arthritic lipping and pitting of the proximal end of the ulna.

osteoarthritis (figure 4). The articular surfaces (both proximal and distal) are well pitted and heavy osteoarthritic lipping appears around the joint margins. On the right ulna, the olecranon process displays a moderate amount of eburnation, which is a process whereby the articular surface undergoes a degenerative process of condensation and hardening until the surface becomes polished like ivory. Eburnation is an extreme osteological response to osteoarthritis.

On the medial articular facet of the first left rib there is a healed infection and regeneration is extensive suggesting that the lesion occurred long before death. The fifth left rib has a well healed fracture with some callous formation.

The right innominate has a periosteal infection on the ischium. The lesion displays some regeneration; however, regeneration is incomplete suggesting that the lesion was not healed at the time of

death. Mild osteoarthritic lipping occurs on the external margins of the acetabulum. Similar lipping and mild pitting are found on the right femoral head.

The left innominate and femur exhibit severe degeneration and provide a good illustration of Leggs-Calves-Perthes Disease (osteochondrosis of the epiphysis of the head of the femur, see figure 5). The disorder is due to interference with the blood supply to the femoral head and causes severe degeneration of the femoral head. The femoral head is enlarged, heavily pitted and exhibits a large area of eburnation. Corresponding pitting and eburnation are located on the left acetabulum. In such an advanced state the disorder is severely debilitating and can seriously limit locomotor ability.

The sacrum appears normal except for moderate torsion to the left. The torsion is probably due to biomechanical pres-



FIGURE 5. Leggs-Calves-Perthes Disease of left femoral head.

tures exerted on the left femur and innominate by the Leggs-Calves-Perthes Disease.

The left tibia is intact and exhibits mild periostitis on the medial and lateral surfaces of the shaft. Two small exostoses are located along the popliteal line. Mild osteoarthritic lipping appears around the marginal surfaces of both the proximal and distal articular surfaces. Both the left and right fibula display mild to moderate periostitis along the shaft surface with somewhat heavier expression on the distal one-third.

In the vertebral column, the fifth cervical exhibited moderate osteoarthritic degeneration of the body, with mild osteophytosis around the body margin. Likewise, the fourth lumbar shows degeneration of the body and a somewhat more advanced stage of osteophytosis. Small osteophytes had developed along both the superior and inferior vertebral margins.

Considering the level of medical technology of the North American prehistoric populations, it is highly improbable that much could have been done to correct any of these disorders, or to alleviate any of the pain which they could generate. Although none of the lesions identified on this skeleton can be directly associated with the cause of death, all of them operating on the biological system of this North American native could have significantly lowered his general state of health and, consequently, contributed to his death.

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