Bioarchaeological Reports on Human Skeletal Remains from Iowa and Other Proveniences

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Research Papers

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Osteological Methods

The osteological analyses follow the guidelines developed by the Paleopathology Association (PA) (Buikstra and Ubelaker 1994). Complete, partial, and commingled remains are inventoried in the Office of the State Archaeologist Bioarchaeology Program's osteodatabase, which utilizes the Access database developed by staff at the Maxwell Museum of Anthropology. Cranial metrics are collected utilizing methods in Moore-Jansen et al. (1994). Cranial nonmetric observations are recorded based on definitions in Finnegan (1972), El-Najjar and McWilliams (1978), and Hauser and De Stefano (1989), using coding provided in the osteodatabase. Postcranial metrics are taken following Moore-Jansen et al. (1994). Postcranial nonmetric traits are scored using the definitions in Finnegan (1978) and Saunders (1978).

Sex is estimated based on morphological characteristics of the cranium (Acsadi and Nemeskeri 1970) and os coxae (Buikstra and Ubelaker 1994; Milner 1992; Phenice 1969), as well as sexually dimorphic postcranial metrics defined in Bass (1995) and Steele (1976). Age estimates are based on one or more of the following methods: relative dental attrition (for broad age ranges); dental development (AlQahtani et al. 2010); cranial suture closure (Buikstra and Ubelaker 1994); palatal suture closure (Mann et al. 1991); changes in sternal rib ends (Isçan and Loth 1986); changes in the face of the pubic symphysis (Suchey and Katz 1986; Brooks and Suchey 1990); changes in the auricular surface of the os coxa (Lovejoy et al. 1985; Meindl and Lovejoy 1989); skeletal maturation (Cunningham et al. 2016; White et al. 2012); skeletal epiphyseal closure (Cunningham et al. 2016; Schaefer et al. 2009); subadult diaphyseal length and ilium breadth (Cunningham et al. 2016; Schaefer et al. 2009; Ubelaker 1989); the presence or absence of age-related osteological changes (White et al. 2012); and comparison with confidently-aged subadult remains in the OSA comparative collection.

Biological affinity is evaluated through examination of nonmetric cranial and dental characteristics (Byers 2008; Edgar 2015; Irish 2105; White et al. 2012). When possible, analysis of metric data using FORDISC 3.1 (Jantz and Ousley 2005) provides estimations of both biological affinity and sex.

Dental remains are inventoried, and dental pathologies are recorded according to the system in Buikstra and Ubelaker (1994). Dental attrition is scored using the coding method developed by Scott (1979) and Smith (1984). Dental metrics are taken using the guidelines and landmarks defined by Hillson et al. (2005), Mayhall (1992), and Moorees (1957). Dental morphology is scored using the Arizona State University Dental Anthropology System (Edgar 2017; Turner et al. 1991). Enamel hypoplastic defects are measured using the procedures outlined by Goodman and Rose (1990) and Goodman (1991).

Descriptions and interpretations of pathological conditions utilize Buikstra (2019), Ortner (2003), and Mann and Murphy (1990), as well as sources specified in individual reports. Stature is estimated using long bone length formulae developed by Trotter (1970) for non-Native American remains. Prehistoric Native American stature is estimated using Auerbach and Ruff (2010) for lower limb bones and Sciulli and Hetland (2007) for upper limb bones or combinations of elements. When applicable, stature is reconstructed for complete remains following Raxter et al. (2006). Some descriptions of cranial deformation utilize categories defined by Neumann (1942). For commingled remains, the Minimum Number of Individuals is calculated by landmark coding using the procedures outlined in Mack et al. (2016).

Osteological References

Acsádi, Gyorgy and Janos Nemeskéri
1970 History of Human Life Span and Mortality. Akadémiai Kiadó, Budapest.

AlQahtani, Sakher J., Mark P. Hector, and Helen M. Liversidge
2010 Brief Communication: The London Atlas of Human Tooth Development and Eruption. *American Journal of Physical Anthropology* 142:481–490.

Auerbach, Benjamin M. and Christopher B. Ruff
2010 Stature Estimation Formulae for Indigenous North American Populations. *American Journal of Physical Anthropology* 141:190–207.

Bass, William M.
1995 *Human Osteology: A Laboratory and Field Manual*. 4th ed. Special Publication No. 2. The Missouri Archaeological Society, Columbia.

Brooks, Sheilagh T. and Judy M. Suchey
1990 Skeletal Age Determination Based on the Os Pubis: A Comparison of the Acsadi-Nemeskeri and Suchey-Brooks Methods. *Human Evolution* 5:227–238.

Buikstra, Jane E., editor
2019 *Ortner's Identification of Pathological Conditions in Human Skeletal Remains*, Third Edition. Academic Press, London.

Buikstra, Jane E. and Douglas H. Ubelaker
1994 *Standards for Data Collection from Human Skeletal Remains*. Arkansas Archeological Survey Research Series No. 44, Fayetteville.

Byers, Steven, N.
2008 *Introduction to Forensic Anthropology*. 3rd edition, Pearson Education, Inc., Boston, Massachusetts.

Cunningham, Craig, Louise Scheuer, and Sue Black
2016 *Developmental Juvenile Osteology*. Academic Press, London.

Edgar, Heather J.H.
2015 Dental Morphological Estimation of Ancestry in Forensic Context. In *Biological Affinity in Forensic Identification of Human Skeletal Remains: Beyond Black and White*, edited by Gregory E. Berg and Sabrina C. Ta'ala, pp. 191-207. CRC Press, Boca Raton, Florida.
2017 *Dental Morphology for Anthropology: An Illustrated Manual.* Routledge, New York.

El-Najjar, Mahmoud Y. and K. Richard McWilliams
1978 *Forensic Anthropology*. Charles C. Thomas, Springfield, Illinois.

Finnegan, Michael
1972 Population Definition on the Northwest Coast by Analysis of Discrete Character Variation. Ph.D. dissertation. University of Colorado.

Finnegan, Michael
1978 Non-metric Variation of the Infracranial Skeleton. *Journal of Anatomy* 125:23–37.

Goodman, Alan H.
1991 Stress, Adaptation, and Enamel Developmental Defects. In *Human Paleopathology: Current Syntheses and Future Options*, edited by D.J. Ortner and A.C. Aufderheide, pp. 280–287. Smithsonian Institution Press, Washington, D.C.

Goodman, Alan H. and Jerome C. Rose

1990 Assessment of Systemic Physiological Perturbations From Dental Enamel Hypoplasias and Associated Histological Structures. *Yearbook of Physical Anthropology* 33:59–110.

Hauser, Gertrud and Gain Franco De Stefano
1989 Epigenetic Variants of the Human Skull. Schweizerburt, Stuttgart.

Hillson, Simon, Charles FitzGerald, and Helen Flinn
2005 Alternative Dental Measurements: Proposals and Relationships with Other Measurements. *American Journal of Physical Anthropology* 126:413–426.

Irish, Joel D.
2015 Dental Nonmetric Variation around the World: Using Key Traits in Populations to Estimate Ancestry in Individuals. In *Biological Affinity in Forensic Identification of Human Skeletal Remains: Beyond Black and White*, edited by Gregory E. Berg and Sabrina C. Ta'ala, pp. 165-190. CRC Press, Boca Raton, Florida.

Işcan, Mehmet Y. and Susan R. Loth
1986 Estimation of Age and Determination of Sex from the Sternal Rib. In *Forensic Osteology: Advances in the Identification of Human Remains,* edited by Kathy Reichs, pp. 68–89. Charles C. Thomas, Springfield, Illinois.

Jantz, Richard and Steve Ousley
2005 FORDISC 3.1 Personal Computer Forensic Discriminant Functions.

Lewis, M.E.
2004 Endocranial Lesions in Non-adult Skeletons: Understanding their Aetiology. *International Journal of Osteoarchaeology* 14:82–97.

Lovejoy, C. Owen, Richard S. Meindl, T. R. Pryzbeck, and Robert P. Mensforth
1985 Chronological Metamorphosis of the Auricular Surface of the Ilium: A New Method for the Determination of Adult Skeletal Age at Death. *American Journal of Physical Anthropology* 68:15–28.

Mack, Jennifer E., Anna J. Waterman, Ana-Monica Racila, Joseph A. Artz, and Katina T. Lillios
2016 Applying Zooarchaeological Methods to Interpret Mortuary Behavior and Taphonomy in Commingled Burials: The Case Study of the Late Neolithic Site of Bolores, Portugal. *International Journal of Osteoarchaeology* 26:524–536.

Mann, Robert W. and David R. Hunt
2005 *Photographic Regional Atlas of Bone Disease*. 2nd edition. Charles C. Thomas, Springfield, Illinois.

Mann, Robert W., Richard L. Jantz, William M. Bass, and Patrick S. Willey
1991 Maxillary Suture Obliteration: A Visual Method for Estimating Skeletal Age. *Journal of Forensic Sciences* 36: 781–791.

Mayhall, John T.
1992 Techniques for the Study of Dental Morphology. In *Skeletal Biology of Past Peoples: Research Methods,* edited by Shelley Saunders and M. A. Katzenberg, pp. 59–78. Wiley-Liss, New York.

Meindl, Richard S. and C. Owen Lovejoy
1985 Ectocranial Suture Closure: A Revised Method for the Determination of Skeletal Age at Death and Blind Tests of Its Accuracy. *American Journal of Physical Anthropology* 68:57–66.

1989 Age Changed in the Pelvis: Implications for Paleodemography. In *Age Markers in the Human Skeleton,* edited by Mehmet Y. Işcan, pp. 137–168. Charles C. Thomas, Springfield, Illinois.

Milner, George R.
1992 Determination of Skeletal Age and Sex: A Manual Prepared for the Dickson Mounds Reburial Team. Manuscript on file, Dickson Mounds Museum, Lewiston, Illinois.

Moore-Jansen, Peer H., Stephen D. Ousley, and Richard L. Jantz
1994 *Data Collection Procedures for Forensic Skeletal Material*. Report of Investigations No. 48, Department of Anthropology, The University of Tennessee, Knoxville.

Moorees, Coenraad F. A.
1957 The Aleut Dentition: A Correlative Study of Dental Characteristics in an Eskimoid People. Harvard University Press, Cambridge, Massachusetts.

Neumann, Georg K.
1942 Types of Artificial Cranial Deformation in the Eastern United States. *American Antiquity* 7:306–310.

Ortner, Donald J.
2003 Identification of Pathological Conditions in Human Skeletal Remains. Academic Press, San Diego, California.

Phenice, Terrell W.
1969 A Newly Developed Visual Method of Sexing the Os Pubis. *American Journal of Physical Anthropology* 30:297–302.

Raxter, Michelle H., Benjamin M. Auerbach, and Christopher B. Ruff
2006 Revision of the Fully Technique for Estimating Statures. *American Journal of Physical Anthropology* 130:374–384.

Saunders, Shelley
1978 *The Development and Distribution of Discontinuous Morphological Variation of the Human Infracranial Skeleton.* National Museum of Man Mercury Series, Archaeological Survey of Canada, Paper No. 81. National Museums of Canada, Ottawa.

Schaefer, Maureen, Sue Black, and Louise Scheuer
2009 *Juvenile Osteology: A Laboratory and Field Manual*. Academic Press, San Diego, California.

Sciulli, Paul W. and Brenda M. Hetland
2007 Stature Estimation for Prehistoric Ohio Valley Native American Populations Based on Revisions of the Fully Technique. *Archaeology of Eastern North America* 35:105–113.

Scott, Eugenie C.
1979 Dental Wear Scoring Technique. *American Journal of Physical Anthropology* 51:213–218.

Smith, B. Holly
1984 Patterns of Molar Wear in Hunter-Gatherers and Agriculturalists. *American Journal of Physical Anthropology* 63:39–56.

Steele, D. Gentry
1976 The Estimation of Sex on the Basis of the Talus and Calcaneus. *American Journal of Physical Anthropology* 45:581–588.

Suchey, Judy Meyers and Darryl Katz
1986 *Skeletal Age Standards Derived from an Extensive Multiracial Sample of Modern Americans*. Instructional materials accompanying male pubic symphyseal models of the Suchey-Brooks system. Distributed by France Casting, Fort Collins, Colorado. Copy on file, Office of the State Archaeologist, University of Iowa, Iowa City.
Trotter, Mildred
1970 Estimation of Stature from Intact Long Limb Bones. In *Personal Identification in Mass Disasters*, edited by T.D. Stewart, pp. 71–83. Smithsonian Institution, Washington, D.C.
Turner, Christy G. II
1971 Three-rooted mandibular first permanent molars and the question of American Indian origins. *American Journal of Physical Anthropology* 34:229–242.
Turner, Christy G. II, Christian R. Nichol, and G. Richard Scott
1991 Scoring Procedures for Key Morphological Traits of the Permanent Dentition: The Arizona State University Dental Anthropology System. In *Advances in Dental Anthropology*, edited by Marc A. Kelley and Clark Spencer Larsen. Wiley-Liss, New York.
Ubelaker, Douglas H.
1989 Human Skeletal Remains: Excavation, Analysis, Interpretation. 2nd ed. Taraxacum, Washington, D.C.
Warwick, Roger and Peter L. Williams (editors)
1973 *Gray's Anatomy*. 35th British edition. W.B. Saunders, Philadelphia.
White, Tim D., Michael T. Black, and Pieter A. Folkens
2012 *Human Osteology*. 3rd ed. Academic Press, San Diego.

Human Remains from an Unknown Provenience, Possibly Wapello County, Iowa

Samantha Murphy

At an unknown time and unknown location likely in Wapello County, Iowa human remains representing at least nine individuals were excavated, possibly from a burial mound. The remains were then stored for an unknown amount of time at a private citizens property before being transferred to the Office of the State Archaeologist (OSA) Bioarchaeology Program in 2021. The remains represent two distinct adults, one older adult male and one older adult female, three adults of unknown age and sex, and four juveniles, including one 1–3-year-old, two 6-7 year olds, and one child a little over seven years old.

Introduction

In 2021 the OSA was contacted about human remains identified by a private citizen at her father in law's residence. The remains had been stored in an attic and storage shed for an unknown period of time, sometime after June 24, 1970, as that was the date on the newspaper padding the remains. The human remains were transferred with the individuals in BP 3619 (UI OSA 2021a) who were known to originate from Peru. The provenience of the individuals reported here (BP3623) (UI OSA 2021b) is unknown; the only location data given was the daughter in law's " vague memory that the remains came from mounds that were going to be destroyed on a farm in Langwood, Iowa and when the farmer was asked to preserve the mounds, he refused unless he was compensated for the lost property". When searching for Langwood the only result is a 4-H educational center in Wapello County, Iowa. Transferred with the remains were an assortment of six artifacts. It is unknown if these artifacts were excavated with the remains or from another location. The artifacts are typical of pre-contact Iowa.

Osteological Analysis

All of the remains show evidence of a prior burial context through heavy dirt adherence to the remains and staining. The remains are dry and brittle with the cortical layer easily flaking off suggesting an ancient context. Based on the description from the donor that the remains were likely excavated from a mound context and the condition of the remains, the individuals are likely of ancient Native American ancestry.

INDIVIDUAL 1

Individual 1 is represented by a partial cranium and mandible. The maxilla, frontal, occipital and parietal bones were refit from the commingled remains. The left temporal and sphenoid are absent. Individual 1 is an adult however the large portion of missing sutures make refining age difficult. The sutures that are visible are completely fused. Cranial measurements (See Table 1) are possibly not as accurate, due to overlap when refitting.

In the maxilla and mandible most of the teeth are present and in occlusion (See Table 2 for Dental Inventory, Table 3 for Dental Metrics). The right third molar, right second premolar, left first incisor, and left second molar of the maxilla are unobservable with no evidence of resorption indicating postmortem loss. The area of alveolar bone that would contain the left third molar has been damaged and is no longer

observable, so it is not possible to determine if the tooth was present at the time of death. In the mandible the right incisors, canine, and premolars have been lost postmortem. All observable teeth show a high amount of wear with the molars nearly worn flat and significant dentin exposure on the incisors, premolars, and canines. The high amount of wear suggests an older adult who is of Native ancestry who was consuming food processed with ground stone technology. No caries, calculus or other dental pathologies were observed. A moderate mandibular torus is present.

Based on the sexually dimorphic characteristics present the individual is likely female. The glabella, supra orbital margins, and one observable mastoid process are fairly small and gracile. The mental eminence on the mandible is slightly more robust than expected but still falls within the typical range of female. Based on suture closure and dental wear the individual is a middle to older adult. Dental wear also indicates the individual is of Native American ancestry. The condition of bone cortex and presence of commingled individuals support communal interment in a burial mound.

INDIVIDUAL 2

Individual 2 is represented by a partial mandible. The mandible is missing the right ramus and condyle due to postmortem damage. The mandible cannot be associated with any of the commingled craniofacial fragments described below suggesting a different individual.

Only six teeth are present and in occlusion and one of the teeth, the right first premolar, consists of only the root visible in the socket due to postmortem breakage and loss of the crown (See Table 4 for Dental Inventory, Table 5 for Dental Metrics). On the left side of the mandible the first molar and premolars are present; the first premolar, and first and second molars are present on the right. All of the teeth show high amounts of wear and dentin exposure. The molars have uneven wear with more advanced wear on their buccal halves. The left second and third molars, and right third molar were lost premortem. The alveolus surrounding the location of the right third molar is fully resorbed. The left second and third molars were likely lost due to an abscess well before death as it exhibits evidence of healing; there are no remnants of the molars' sockets in the alveolus, just an oval shaped lesion approximately 3mm deep with smooth mostly dense margins and very little porosity. All other teeth were lost postmortem and are not present. Individual 2 presents notable dental pathologies. The left first molar and right second molar have caries on their distal interproximal surfaces and all teeth present show a slight amount of alveolar recession (See Table 6 for Dental Pathology).

Based on the projecting mental eminence and the general robustness of the mandible Individual 2 is likely a male (See Table 7 for Cranial Metrics). Based on the high amount of dental wear and tooth loss he is an older adult. The mandible is covered in a light layer of dirt suggesting a previous burial context. The previous burial context and high amount of dental wear suggests ancient Native American ancestry.

ADULT COMMINGLED

The rest of the adult human remains are classified as commingled. There are no identifiable individuals due to the unknown excavation context and method and then the mixture of the human remains in storage. In total there are 101 commingled adult fragments (See Table 8 for Adult Commingled Remains). The total minimum number of individuals from the adult commingled remains is three.

From the crania there are 37 fragments, a majority of which are from the cranial vault. There are three portions of nearly complete frontal bones. The frontal bones were one indicator of MNI. In addition to the frontal bones there are 11 pieces of fragmented parietal, two occipital fragments, two left and two right temporals, and 11 maxillary and facial bones, two of which contain portions of the alveolar process. There are six pieces of mandible broken into one right condyle, one left condyle, one left vertical ramus and three body portions. There is no dentition associated with the adult commingled remains.

The remainder of the commingled axial skeleton aside from the crania are as follows. There are five fragments of ribs present. There are two right and three left. Three of the ribs are just portions of shaft with minimal curvature. The other two fragments are a portion of the tubercle and angle with just a small portion of the tubercle present. There is one small fragment of manubrium consisting of the most superior portion. There is also one small fragment of scapula identifiable by the glenoid fossa and part of the scapular spine.

The rest of the commingled remains are from the appendicular skeleton, primarily long bones. There are seven os coxae fragments to assist in determining MNI. There is one nearly complete pair of left and right os coxae. They are assumed to come from the same individual based on similar size, age, and condition. The paired os coxae represent a possible female based on the width of the greater sciatic notch and the preauricular sulcus. Both sides are missing the pubis and portions of the ischial ramus. There are two other fragments of right sided ox coxae, one portion of pubis from a middle-aged adult female and a portion of iliac crest and greater sciatic notch also from an adult female. There are also three other small unsideable fragments of os coxae: one superior portion of the iliac crest, one fragment of acetabulum consisting of just the curvature and no surrounding bone, and one shallow greater sciatic notch possibly from a male individual. The shallow greater sciatic notch only presents cortical bone on one side with the other side being damaged postmortem. The other portion of the appendicular skeleton not represented by long bones are phalanges and one calcaneus. There are three complete middle hand phalanges, and three complete middle foot phalanges present.

There are eight total humerus fragments, including one complete right humerus, one right distal humerus that includes the olecranon fossa and epicondyles, and one midshaft portion including the neck. Identifiable portions of left humeri are one nearly complete humerus missing the head and neck and one distal portion of the midshaft. There are three fragments of humerus that could not be sided, two humeral heads that did not refit to any of the other fragments, and one small portion of midshaft with no identifying features. There are two complete radii, one left and one right, that are likely from the same individual based on size, age indicators, and condition. Both have slight lipping around the radial head suggesting an older individual. The right radius had a metal pin inserted into the tuberosity at some point prior to arriving at the OSA, likely as an attempt at rearticulation. The metal pin has started to rust suggesting it has been in place a significant amount of time. The final upper limb bones are two complete left ulnae, one with a metal pin similar to the one seen in the right radius, inserted below the ulnar notch. This was likely an attempt at rearticulation but does not mean that the radius above pairs with this ulna. There are two incomplete fragments of right ulnae, one ulnar head and one from midshaft. There are also two incomplete fragments of left ulnae, one head and a portion of midshaft. None of the fragmented ulnar portions appear to pair up or refit with each other based on size or breakage patterns. In addition to the identifiable upper limbs there are 14 fragments of upper limb long bones, mostly midshaft, that could not be identified.

The femora present were also a determining factor in the MNI. There are two nearly complete left and right femora which are a possible pair based on similar size, age indicators, and condition. However, due to the postmortem damage this cannot be confirmed. There are also two left sided midshafts and one right sided midshaft. It is possible that some of these midshafts pair together but due to postmortem damage it is not possible to confirm. The tibiae were only represented by fragmented midshafts, two left and two right, and it could not be determined if any paired. The four fibula fragments are almost all midshafts and missing distinguishing siding features. The exception is the fifth fibular fragment which represents a small portion of the left lateral malleolus.

JUVENILE COMMINGLED

All of the juvenile remains represented in this burial project are classified as commingled as individuals could not be identified. The MNI for the juveniles was calculated to be four based on duplication of elements and indicators of four different age ranges. In total there are 43 commingled juvenile elements (See Table 9 for Juvenile Commingled Remains); a majority of the fragments are from crania. Three frontal bones, one occipital, one basi-occipital, one left zygomatic and 16 parietal fragments are present. Dimensions of the zygomatic indicate an infant or toddler over 40 weeks old is represented. A small left portion of mandible with deciduous first and second molars in occlusion is also present. The left permanent lateral incisor is visible in its crypt and was exposed by postmortem breakage, and the underside of the crypt for one of the permanent left premolars is visible where the inferior surface of the mandibular body has been broken away postmortem. The presence of partially preserved root sockets for the left first permanent molar indicates it was also in occlusion and was lost postmortem. Based on this dental development, one the juveniles is between six and seven years old. A basilar part of the occipital also falls roughly within this age range; it is unfused to the pars lateralis indicating an age range of three to six years, and its dimensions indicate the individual was well over four.

The rest of the juvenile commingled axial skeleton fragments include vertebral fragments. There is also one left clavicle present. Three vertebrae are represented by one thoracic vertebral body, one lumbar vertebral body, and one fairly complete cervical vertebra (3-6) with full fusion of the neural arches to the vertebral body. Complete fusion of the cervical vertebra, excluding the annular rings, indicates an age of over four years old. The other two vertebral bodies have no fusion of the neural arches and are from a younger individual, likely a toddler.

The appendicular skeleton fragments are primarily from long bones. There are also one calcaneus, one small portion of an ilium, and one partial ischium. The ilium fragment is an anterior portion of the iliac crest. A single left humerus missing its proximal third is present; the distal end is completely unfused. A single right partial ulna is present, with only the head and ulnar notch absent. The only lower limbs represented in the juvenile assemblage are three femur fragments. The first is a right partial femur represented by the neck, greater and lesser trochanter, and partial midshaft. A second right partial femur of similar size is represented by the neck and partial midshaft. The third is a left partial femur represented by the neck and partial midshaft and is significantly larger than the right femora, indicating a slightly older child over 7 years old. In addition to the identifiable remains there are six indeterminate long bone fragments.

From what could be observed of bone dimensions and developmental stages, at least four juveniles are represented by these commingled remains: one 1-3 year-old, two 6-7 year olds, and one child a little over 7 years old.

POSSIBLE FUNERARY OBJECTS

When the human remains were transferred to the OSA, five artifacts and one naturally occurring concretion that was possibly utilized were included. There was no documentation of whether the artifacts were found with the remains or had been collected separately. The artifacts include two pieces of corded ware pottery, both from the rim of the vessels, with one piece having a black glazing applied. There is a black chert hand axe showing significant polishing along the blade edge suggesting a high amount of use over time. There are two flaked lithic tools: an expedient tool or a biface in the early stage of production made of grey chert (some of the cortex is still present and the edges show some evidence of use and retouching), and a utilized flake of brown chert that shows some use wear on the edges. The final possible funerary object is a naturally occurring concretion with a natural hole in the center. It is possible that the concretion was worn as a pendant, however microscopic analysis did not identify any wear that would be present if a string was pulled tight. There are also two faunal elements intermixed with the human re-

mains; it is unclear if these were purposeful interments with the individuals or the result of bioturbation.

Summary

At least nine individuals were transferred to the OSA after being excavated from an unknown location in Iowa, possibly in Wapello County, at an unknown time. The remains of the individuals were stored on the private property of the donor's father-in-law since their excavation/collection. All elements represent five adults and four juveniles. Two adults are identifiable individuals: one female represented by a partial skull and one male represented by a partial mandible. Of the remaining commingled adult remains an MNI of three was calculated and based off analysis of the ox coxae two of the individuals are likely female. An MNI of four was calculated for the juvenile commingled remains based on identifiable age ranges represented. Two of the individuals were aged six to seven years old, one is a little over seven, and one is an infant to a toddler (1-3 years old). All of the individuals are of ancient Native American ancestry based on previous burial context and condition of the remains. While the remains arrived to the OSA with artifacts it is unclear if these artifacts are associated funerary objects or from different locations.

References Cited

University of Iowa, Office of the State Archaeologist (UI, OSA)
2021a Burial Project 3619. On file, Office of the State Archaeologist, University of Iowa, Iowa City.
University of Iowa, Office of the State Archaeologist (UI, OSA)
2021b Burial Project 3623. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Cranial Metrics (mm), BP 3623 Individual 1	
Cranial metric	
Upper facial height	66
Minimum frontal breadth	96
Upper facial breadth	100
Nasal height	49
Nasal breadth	30
Orbital breadth L	40
Orbital breadth R	40
Orbital height L	36
Orbital height R	33
Biorbital breadth	110
Interorbital breadth	20
Chin height	20
Mandibular height L	28
Mandibular height R	28
Maximum ramus breadth R	29
Ramus height R	63
Mandibular length	70
Mandibular angle	96

Table 2. Dental Inventory BP 3623 Individual 1						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MAXILLA:						
RM3	5		0	0	0	0
RM2	2		4	4	4	4
RM1	2		4	4	4	4
RP2	5	9				
RP1	2	3				
RC	2	4				
RI2	2	3				
RI1	2	2				
LM3	3		0	0	0	0
LM2	5		0	0	0	0
LM1	2		4	4	4	4
LP2	2	3				
LP1	2	3				
LC	2	4				
LI2	2	3				
LI1	5	9				
MANDIBLE:						
LM3	2		1	1	1	1
LM2	2		2	2	2	2
LM1	2		3	3	4	3
LP2	2	3				
LP1	2	3				
LC	2	3				
LI2	2	3				
LI1	2	3				
RM3	2		2	2	2	2
RM2	2		4	4	4	4
RM1	2		4	4	4	4
RP2	5	9				
RP1	5	9				
RC	5	9				
RI2	2	3				
RI1	2	3				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 4. Dental Inventory BP 3623 Individual 2

Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MANDIBLE:						
LM3	4		0	0	0	0
LM2	4		0	0	0	0
LM1	2		7	6	5	7
LP2	2	3				
LP1	2	4				
LC	5	9				
LI2	5	9				
LI1	5	9				
RM3	4		0	0	0	0
RM2	2		6	5	5	6
RM1	2		7	0	0	7
RP2	5	9				
RP1	7	9				
RC	5	9				
RI2	5	9				
RI1	5	9				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 5. Dental Metrics (mm) BP 3623 Individual 2				
Tooth	**Mesiodistal**	**Buccolingual**	**CEJ mesiodistal**	**CEJ buccolingual**
MANDIBLE:				
LM1	10.0	11.0		
LP2	6.0	8.0		
LP1	5.0	7.0		

Table 6. Dental Pathologies BP 3623 Individual 2					
Tooth	**Calculus:**		**Caries:**		**Abscess:**
	Presence	**Location**	**Number**	**Type**	**Type**
MANDIBLE:					
LM1			1	Interproximal	
RM2			1	Interproximal	

Table 7. Cranial Metrics (mm), BP 3623 Individual 2	
Cranial metric	
Chin height	26
Mandibular height L	23
Mandibular height R	22
Bigonial width	91
Minimum ramus breadth L	28
Maximum ramus breadth L	33
Ramus height L	60
Mandibular length	70
Mandibular angle	100

Table 8. Adult Commingled Remains BP 3623					
Element	**Number of Fragments/ Specimens**	**MNE Left**	**MNE Right**	**MNE Midline**	**MNE Unsided**
Cranium/mandible	37	4	3	22	8
Sternum	1				1
Ribs 2-12	5	3	2		
Scapula	1	1			
Humerus	8	2	3		3
Radius	2	1	1		
Ulna	5	3	2		
Hand phalanges	3				3
Os coxa	7	1	3		3
Femur	5	3	2		
Tibia	4	2	2		
Fibula	5	1			4
Calcaneus	2				2
Foot phalanges	3				3
Long bone fragments	14				14

Table 9. Juvenile Commingled Remains BP 3623						
Element	**Number of Fragments/ Specimens**	**MNE Left**	**MNE Right**	**MNE Midline**	**MNE Unsided**	**Age Range**
Cranium/ mandible	22	1		16	5	3-6 (possible infant included)
Mandibular teeth	2	2				6--9
Thoracic vertebrae	1				1	5--6
Lumbar vertebrae	1				1	no younger than 6
Unidentified vertebrae	2				2	1 arch fragment 6+, 1 body fragment possibly infant
Clavicle	1	1				3--6
Humerus	1	1				6--9
Ulna	1		1			6--9
Os coxa	1	1				6--9
Femur	3	1	2			2 aged 6-7, one older than 7
Calcaneus	2				2	
Long bone fragments	6				6	

Human Remains from an Unknown Provenience

Samantha Murphy and Jennifer Mack

Human remains of mixed African American and Native American ancestry were transferred from the University of Northern Iowa (UNI) to the Office of the State Archaeologist (OSA). The individual is a young adult female with unknown original provenience as the original collector did not provide the information. The individual originated from a burial context and is not of ancient antiquity, but is not of medico-legal significance.

Introduction

In January of 2022 a student at UNI brought these human remains to her forensic anthropology professor Dr. Tyler O'Brien. The remains had been given to her grandmother by Charles J. "Butch" Pascavage (1942-2006) and had been stored in her grandmother's home for decades. It is unclear where Mr. Pascavage acquired the remains as he lived and worked in various locations around the United States before settling in Montana.

Upon receiving the remains Dr. O'Brien performed cranial analysis and determined that the individual was a young adult female, of African American ancestry with strong potential for Native American admixture. Dr. O'Brien assessed that the individual was probably once a part of an anatomical or teaching collection before Mr. Pascavage acquired it. Using FORDISC analysis Native American ancestry was confirmed and upon this confirmation the remains were transferred to the OSA in March of 2022.

Osteological Analysis

A single individual is represented by a nearly complete cranium with only a portion of the right zygomatic, and nasal conchae missing. Damage to the right zygomatic occurred postmortem, likely from excavation and transport. The entire crania including the teeth are covered in a lacquer-like substance leaving a brown colored stain. Within the stain are the remnants of identification labels or tape, all of varying widths and sizes, with three across the frontal bone, one on the left parietal, and one on the left temporal. There is handwriting on the posterior portion of the left parietal bone that appears to say "*An Negro*". The labels, writing, lacquer, and condition of the bone suggest that the individual was in an anatomical collection at some point but there are no other modifications typical of education and anatomical collections. It is unclear if the individual underwent these modifications before or after Mr. Pascavage acquired them. When using a hand microscope dirt and other sediments can still be seen to be trapped in the sutures and along the teeth suggesting a previous burial context prior to modifications.

All of the maxillary dentition is present and in occlusion, however the right incisors have been damaged postmortem. There is chipping to the occlusal surface of the right first incisor and almost the entire right second incisor has been broken off so some dental morphology analysis and measurements could be done on the right first incisor, but none could be done on the second. The dental inventory is recorded in Table 1 and dental metrics are in Table 2. The teeth show minimal to no dental wear which not only suggests that the individual was a young adult, but that they were consuming food that was machine processed or at least not processed by stone tools. No pathologies or injuries were observed on the individual.

Upon the remains arriving to the OSA Jennifer Mack performed her own analysis and confirmed Dr. O'Brien's findings. The individual is a female, based on gracile sexually dimorphic craniofacial features.

Based on the extreme lack of dental wear but complete third molar development the individual is a young adult likely between 20 and 30 years old. All of the sutures show complete closure except for the bregmatic suture which is open with some postmortem separation between the frontal and parietal bones. All the visible sutures show no evidence of obliteration. Mack also performed FORDISC analysis which resulted in a 0.774 posterior probability with a 74.2% cross validation for Native American female when compared against all female ancestries in the database and 0.990 posterior probability with an 88% cross validation for Native American female when compared against Native American, European, and African American females. Cranial metrics are recorded in Table 3. Native American ancestry is strongly supported by shovel shaped incisors visible on the right first and both left incisors. There are several facial features that could suggest African American ancestry including slight alveolar prognathism, absence of a nasal sill, and a short wide nasal aperture. The combination of these facial features with the FORDISC results supports an individual of mixed African American and Native American ancestry.

Based on dentition the individual is not of ancient antiquity as more dental wear is more typical of modern populations. Given anatomical preparation the individual is not of medico-legal significance; the Iowa Department of Public Health's date range of concern is generally 30-50 years ago. This is supported by the evidence of a previous burial context as in the past some anatomical collections were sourced from cemeteries.

Summary

Human remains represented by a nearly complete cranium from an unknown provenience were transferred to the OSA from UNI in March of 2022. The individual represented is a young adult female of mixed African and Native American ancestry. The individual was likely excavated from their original burial and then was used in an anatomical collection based on the modifications observed. The individual is not from ancient context but is also not a modern individual of medico-legal significance as defined by the Iowa Department of Public Health. As the individual does present Native American ancestry the individual is subject to reburial under NAGPRA.

References Cited

University of Iowa, Office of the State Archaeologist (UI, OSA)
2022 Burial Project 3667. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Dental Inventory BP 3667						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MAXILLA:						
RM3	2		1	1	1	1
RM2	2		1	1	1	1
RM1	2		2	2	2	2
RP2	2	2				
RP1	2	1				
RC	2	1				
RI2	7	9				
RI1	7	1				
LM3	2		1	1	1	1
LM2	2		1	1	1	1
LM1	2		2	2	2	2
LP2	2	1				
LP1	2	1				
LC	2	1				
LI2	2	1				
LI1	2	1				
MANDIBLE:						
LM3	9		0	0	0	0
LM2	9		0	0	0	0
LM1	9		0	0	0	0
LP2	9	9				
LP1	9	9				
LC	9	9				
LI2	9	9				
LI1	9	9				
RM3	9		0	0	0	0
RM2	9		0	0	0	0
RM1	9		0	0	0	0
RP2	9	9				
RP1	9	9				
RC	9	9				
RI2	9	9				
RI1	9	9				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 2. Dental Metrics (mm) BP 3667

Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
MAXILLA:				
RM3	7.0	9.0		
RM2	9.0	11.0		
RM1	11.0	11.0		
RP2	6.0	8.0		
RP1	5.0	6.0		
RC	6.0	7.0		
LM3	6.0	10.0		
LM2	9.0	10.0		
LM1	11.0	11.0		
LP2	6.0	9.0		
LP1	6.0	8.0		
LC	8.0	6.0		
LI2	6.0	4.0		
LI1	8.0	4.0		

Table 3. Cranial Metrics (mm), BP 3667	
Cranial metric	
Maximum cranial length	175
Maximum cranial breadth	133
Bizygomatic diameter	125
Basion-bregma height	130
Cranial base length	97
Basion-prosthion length	97
Maxillo-Alveolar breadth	60
Maxillo-Alveolar length	51
Biauricular breadth	122
Upper facial height	66
Minimum frontal breadth	85
Upper facial breadth	85
Nasal height	48
Nasal breadth	24
Orbital breadth L	32
Orbital breadth R	33
Orbital height L	31
Orbital height R	31
Biorbital breadth	91
Interorbital breadth	21
Frontal chord	100
Parietal chord	110
Occipital chord	90
Foramen magnum length	33
Foramen magnum breadth	30
Mastoid length L	25
Mastoid length R	27

Human Remains from Blood Run National Historic Landmark

Samantha Murphy

Human remains representing two individuals were collected from Blood Run National Historic Landmark site 13LO2 at an unknown time. The remains were collected by a Darrell Frerichs and later transferred to the OSA collections where the remains were identified. The remains represent an adult and one juvenile aged between 8 and 11.

Introduction

Blood Run National Historic Landmark, in Lyon County, Iowa (Figure 1), and its Oneota mound and village site, 13LO2, have been previously documented by the OSA and other archaeologists. It has also been frequented by many private collectors over the years; several Bioarchaeology Program reports document human remains originating from Blood Run (Lillie and Mack 2014; Mack 2019; Mack et al. 2017; Noldner 2019; Schermer 1984, 2004, 2015; Schermer et al. 1998). The human remains documented here were identified among artifacts donated by collector Darrell Frerichs and transferred to the Bioarchaeology Lab in July of 2023 (UI OSA 2024). It is unclear when the remains were originally collected, and their original provenience was not documented.

Osteological Analysis

The human remains represent two individuals, one adult and one juvenile. The adult individual is represented by a midsection of a right ulna (Table 1). The juvenile is represented by a partial left mandible fragment (Table 2). The only three teeth that are observable are the deciduous left second molar, the permanent left first molar, and the permanent left second molar. All other teeth of the observable left mandibular dental arcade were lost postmortem. The permanent second molar can only be partially viewed in its crypt and has not yet fully developed. Based on the present dentition the juvenile is aged between 8 and 11 years old. All of the damage and breaks observed on the fragments occurred postmortem. Flaking and bleaching of cortical bone on the lateral surface indicates exposure to the elements for some time; the medial body cortex is better preserved with brown staining indicating further that the element was a surface find with the lateral surface facing up. The ulna fragment is uniformly stained dark brown on all surfaces. There were no observed pathologies.

Due to the remains being collected from Blood Run they are affiliated with the archaeologically defined Oneota cultural time period.

Summary

Human remains representing a juvenile aged 8 to 11 years old and an adult individual of unknown age and sex were transferred to the OSA in the Darrell Frerichs artifact collection in July 2023. The individuals are of ancient Native American ancestry due to their original provenience at Blood Run National Historic Landmark, a known Oneota site, and their preservation is consistent with originating from a burial environment.

References Cited

Lillie, Robin M., and Jennifer E. Mack

2014 Human Skeletal Remains and Burial-Related Artifacts from the Amy Harvey Collection: 13AM60, 13LO2, 13WD7, 13WD8, 13HB0g, Northeast Iowa, 23BO1, and Unprovenienced Remains. In Reports on Burial Projects Osteology and Archaeology, edited by Robin M. Lillie, and Shirley J. Schermer, pp. 231–283. Research Papers Vol. 38, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

Mack, Jennifer E.

2019 Human Remains Collected from Blood Run National Historic Landmark (13LO2), Lyon County, Iowa, in the Nineteenth and Twentieth Centuries. In Bioarchaeological Reports on Human Skeletal Remains from Iowa and Other Proveniences, edited by Jennifer E. Mack, and Lara K. Noldner, pp. 11–16. Research Papers Vol. 44, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

Mack, Jennifer E., Robin M. Lillie, and Lily J. Doershuk

2017 Human Remains from the Blood Run Site (13LO2), Found in the Amy Harvey Collection and in the Luther College Archaeological Laboratory Collection. In Bioarchaeological Reports on Human Skeletal Remains from Iowa and other Proveniences, edited by Jennifer E. Mack, and Lara K. Noldner, pp. 17–22. Research Papers Vol. 42, No. 2. Office of the State Archaeologist, University of Iowa, Iowa City.

Noldner, Lara K.

2019 Human Remains Recovered from Eroding Landform at Blood Run National Historic Landmark (13LO2), Lyon County, Iowa. In Bioarchaeological Reports on Human Skeletal Remains from Iowa and Other Proveniences, edited by Jennifer E. Mack, and Lara K. Noldner, pp. 17–18. Research Papers Vol. 44, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

Schermer, Shirley J.

1984 Human Skeletal Remains from 13LO2, the Blood Run National Historic Landmark 1984–1986. In Miscellaneous Reports on Iowa Archaeology, by University of Iowa Office of the State Archaeologist, pp. 61–81. Research Papers Vol. 12, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

2004 Human Skeletal Remains from Four Blood Run National Historic Landmark Collections, 13LO2, Lyon County, Iowa. In Reports on Iowa Burial Projects: Osteology and Archaeology, edited by Shirley J. Schermer and Robin M. Lillie, pp.63-126. Research Papers Vol. 29, No. 2. Office of the State Archaeologist, University of Iowa, Iowa City.

2015 13LO2, Blood Run National Historic Landmark Site, Lyon County, Iowa. In Bioarchaeology of the Charles R. Keyes Collection, edited by Robin M. Lillie, and Lara K. Noldner, pp. 417–431. Research Papers Vol. 39, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

Schermer, Shirley J., Linda Forman, Robin M. Lillie, Jill Robinson, and Larry J. Zimmerman

1998 NAGPRA Inventory and Consultation: Human Remains and Funerary Objects in the Charles R. Keyes Collection. Research Papers Vol. 23, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist (UI, OSA)

2024 Burial Project 3812. On file, Office of the State Archaeologist, University of Iowa, Iowa City

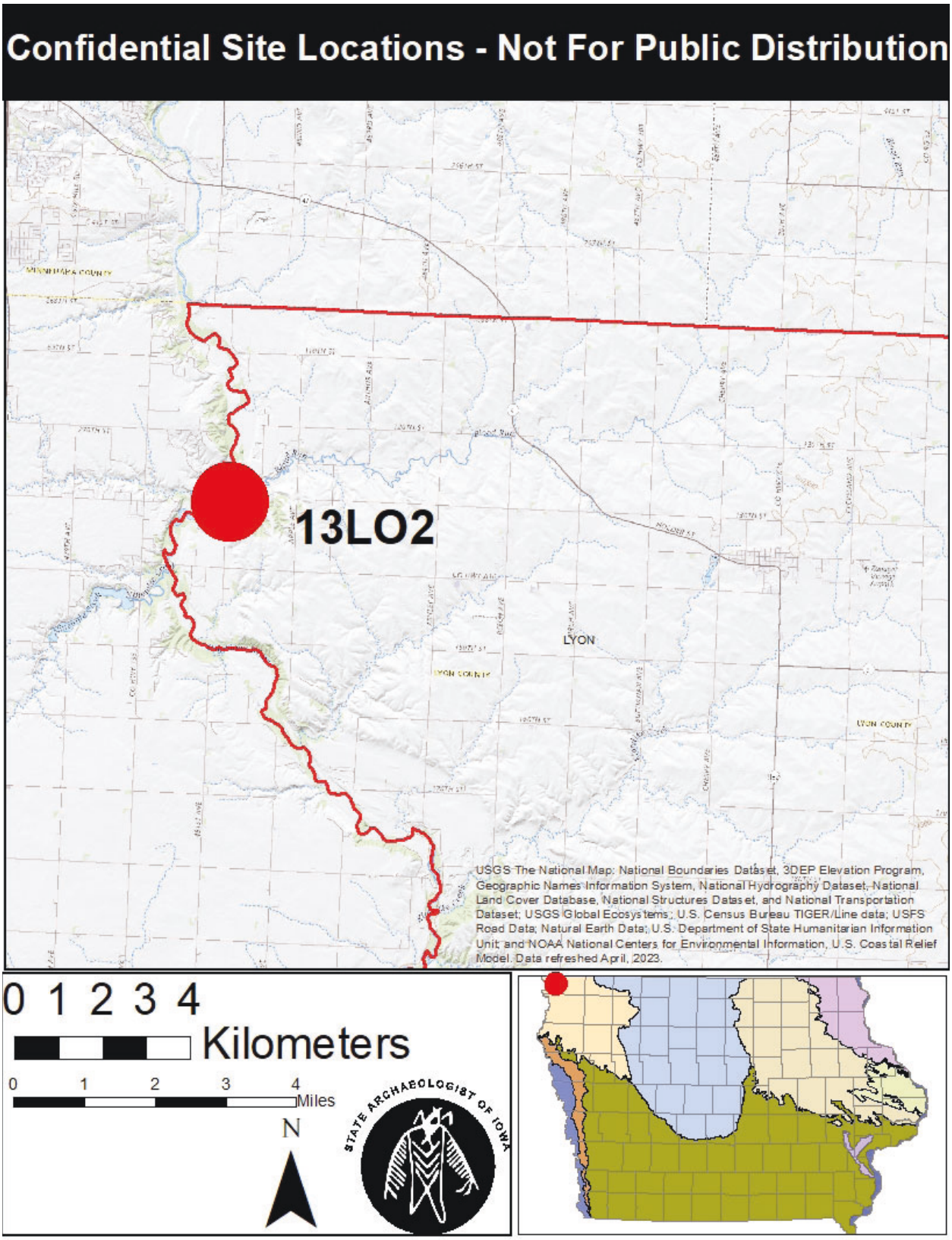

Figure 1. Findspot of human remains.
From USGS Corley, Lyon County, Iowa (1978), 7.5' series quadrangle map. Scale 1:100,000.

Table 1. Adult Commingled Remains BP 3812					
Element	**Number of Fragments/ Specimens**	**MNE Left**	**MNE Right**	**MNE Mid-line**	**MNE Un-sided**
Ulna	1		1		

Table 2. Juvenile Commingled Remains BP 3812						
Element	**Number of Fragments/ Specimens**	**MNE Left**	**MNE Right**	**MNE Midline**	**MNE Un-sided**	**Age Range**
Cranium/ mandible	1		1			8-11 yrs

Human Remains Transferred from University of Iowa Anthropology Department

Samantha Murphy

In November of 2022 human remains were identified in the University of Iowa Anthropology Department (UIAD) and transferred to the Office of the State Archaeologist (OSA). The remains include one cranium and commingled carpals, tarsals, and phalanges representing a minimum of three individuals. The total MNI reported here is four. This is a continuation of Burial Project 3126 and its associated report published in Bioarchaeology Reports on Human Skeletal Remains from Iowa and other Proveniences Volume 42 Number 2 (Hoffman, 2017).

Introduction

In 2016 three crania were transferred to the OSA from the UIAD, two of whom represent individuals of Inuit ancestry (Hoffman, 2017; OSA 2016). The remains from 2016 were connected to the collections of the Frank Russell expedition and when additional remains were identified in 2022 it was believed that these remains were related to the same expedition. One cranium likely originating from Indonesia based on records from the UIAD along with commingled carpals, tarsals, and phalanges were also transferred to the OSA. The remains transferred in 2022 are not associated with any of the previously transferred individuals documented by Hoffman (2017) as Individuals 1-3, therefore these additional remains are designated as Individual 4 and commingled remains.

Osteological Analysis

INDIVIDUAL 4

Individual 4 is represented by a single incomplete cranium. The mandible is not present and there is postmortem damage to the internal nasal bones and anterior maxillary bones. A setting agent or cheap concrete was poured into the cranial vault by the collector, likely in order to hold the cranial vault bones together. The filling in the cranial vault has made the crania significantly heavy and it appears to be deteriorating as stones and grit continually fall out of the cranial vault. The entire crania is stained dark brown and likely from being in a burial context.

Individual 4 only has maxillary teeth present and in occlusion; some were lost pre- and postmortem (See Table 1 for dental inventory and Table 2 for dental metrics). The right third molar was lost premortem with alveolus fully resorbed. The right second molar, second premolar, incisors, and left third molar were lost postmortem. The teeth that are present and in occlusion show high amounts of wear especially on the molars. This suggests that the individual is an older individual. All of the observable cranial sutures are completely closed but show no sign of obliteration. There are two small (12mm in length) asteronic bones present on the left and right sides. Cranial sutures taken into consideration with dental wear suggests a middle-aged adult (35-50 years) but potentially an individual on the older end of the middle adult age range. No pathologies were observed.

Based on the sexually dimorphic characteristics present the individual is a possible male. The supraorbital margins and the mastoid processes are ambiguous while the nuchal crest and glabella are slightly more robust than one would expect for a female. The zygomatic bones are also broader and more robust. A male designation is also supported by the FORDSIC analysis used to assess possible ancestry and the report of the individual originating in Indonesia. Cranial measurements were compared against modern populations in the general FORDISC database as well as Howell's 1973 cranial database (See Table 3 for cranial measurements). The individual was classified as a Japanese male with a posterior probability of 0.990 and a cross validation of 79.0% (188/238). When compared to Howell's database the individual was categorized as closest to the Andaman data set with a 0.792 posterior probability and a cross validation of 91.3% (126/138). The Andaman data set came from the Andaman and Nicobar Islands which are an archipelago in the Bay Bengal and are the closest geographically to Indonesia out of the populations in Howell's set. FORDISC analysis therefore supports the report that the individual originated in Indonesia or Southeast Asia more generally. Facial features that also support Asian ancestry include lack of prognathism, broad zygomatic bones, and a narrow nasal aperture.

COMMINGLED REMAINS

The total number of commingled elements is 12 and is made up of tarsals, carpals, and phalanges. There are no duplicating elements that would indicate more than one individual, however the difference in condition, size and color across the elements suggests multiple individuals. A minimum of three individuals are represented (See Table 4 for commingled elements). A lunate and trapezium are likely from one individual based on their size and color, both elements appear to have been bleached during postmortem modification/processing. Hand phalanges include two proximal, one middle and one distal that all likely originate from the same individual based on size and color. These phalanges have not been bleached as the lunate and trapezium were but were wired together. There is also a set of foot phalanges (proximal, middle, and distal). These phalanges are broader and darker than the others in this commingled set and appear to be older based on taphonomic degradation. The elements are also larger than feet phalanges typically are so the individual would have had long toes. The foot phalanges were all wired together at some point in time as an anatomical specimen. The final elements in the commingled remains are a right cuboid, right medial cuneiform, and right middle cuneiform. All of the tarsals appear to have originated from one individual, but it is unclear if they are associated with the phalanges or carpals. All of the elements have small (less than 1mm) holes in the bones so that the remains could be wired together in an anatomical collection. There is no provenience or records for the commingled remains. No pathologies were observed.

Summary

These individuals are documented as a continuation of a previous report published by the Bioarchaeology Program in 2017 (Hoffman 2017). In total a minimum of four individuals were transferred from UIAD and likely have connection to the Frank Russel collections and expeditions. The individuals include a male from Indonesia or Southwest Asia in general represented by an incomplete cranium. The other remains in this report are 12 commingled elements which include three tarsals, three pedal phalanges, two carpals, and four manual phalanges. All of the commingled remains have been modified postmortem in order for them to be wired together as part of an anatomical collection. There is no provenience for the commingled remains.

References Cited

Hoffman, Brianna V.
2017 Human Skeletal Remains from the University of Iowa Department of Anthropology, Iowa City, Iowa. In *Bioarchaeological Repors on Human Skeletal Remains from Iowa and other Proveniences,* edited by Jennifer E. Mack and Lara K. Noldner, pp. 89-96. Research Papers Vol. 42, No. 2. Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist (UI, OSA)
2016 Burial Project 3126. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Dental Inventory BP3126 Ind 4.						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MAXILLA:						
RM3	4		0	0	0	0
RM2	5		0	0	0	0
RM1	2		2	2	2	2
RP2	5	9				
RP1	2	1				
RC	2	1				
RI2	5	9				
RI1	5	9				
LM3	5		0	0	0	0
LM2	2		0	0	0	0
LM1	2		0	0	0	0
LP2	2	2				
LP1	2	2				
LC	2	1				
LI2	5	9				
LI1	5	9				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 2. Dental Metrics (mm) BP 3126 Ind. 4				
Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
MAXILLA:				
RM1	10.0	10.0		
RP1	6.0	9.0		
RC	6.0	9.0		
LM2	9.0	10.0		
LM1	11.0	11.0		
LP2	5.0	8.0		
LP1	6.0	8.0		
LC	7.0	4.0		

Table 3. Cranial Metrics (mm), BP 3126	
Cranial metric	**Individual 4**
Maximum cranial length	174
Maximum cranial breadth	135
Bizygomatic diameter	126
Basion-bregma height	142
Cranial base length	93
Basion-prosthion length	98
Maxillo-Alveolar breadth	63
Maxillo-Alveolar length	53
Biauricular breadth	117
Upper facial height	64
Minimum frontal breadth	90
Upper facial breadth	97
Nasal height	50
Nasal breadth	25
Orbital breadth L	39
Orbital breadth R	37
Orbital height L	37
Orbital height R	38
Biorbital breadth	102
Interorbital breadth	21
Frontal chord	108
Parietal chord	105
Occipital chord	95
Foramen magnum length	33
Foramen magnum breadth	30
Mastoid length L	20
Mastoid length R	23

Table 4. Adult Commingled Remains BP 3126					
Element	**Number of Fragments/ Specimens**	**MNE Left**	**MNE Right**	**MNE Midline**	**MNE Unsided**
Carpals	2				2
Hand phalanges	4				4
Tarsals	3		3		
Metatarsals					
Foot phalanges	3				3

Commingled Human Remains from Jim Pilgrim Donation

Samantha Murphy

Commingled human remains representing a minimum number of three individuals were donated to the Office of the State Archaeologist (OSA) by Jim Pilgrim. The human remains are primarily cranial elements and are severely damaged postmortem. They represent one adult male, an adult of unknown sex and age, and a juvenile of unknown sex and age. The remains are of ancient Native American ancestry and originated in Iowa, somewhere north of Clinton, but their provenience is unknown.

Introduction

In December of 2019 a donation was made on behalf of Jim Pilgrim to the OSA that included human remains (UI OSA 2019). Mr. Pilgrim was known to collect from Native American sites throughout Iowa and has made several donations of artifacts and human remains to the OSA (Hoffman 2017a; Hoffman 2017b; Lillie 2014, 2016). The 169 human bone fragments documented here represent at least three individuals, two adults and one juvenile. According to limited notes provided by Mr. Pilgrim the individuals were possibly interred somewhere north of Clinton, Iowa. They were collected between the years 2000 and 2009. One handwritten note references the remains collected "from the edge of a wood at the north edge of Clinton". A site determination cannot be made due this limited information and Mr. Pilgrim's wide-ranging collecting history.

Osteological Analysis

These 169 bone fragments exhibit postmortem chipping and flaking of cortical bone due to excavation, taphonomic damage, and improper storage. The human remains represent a minimum of three individuals. (See Table 1 for commingled remains). There are three temporal bones present, a left and right that appear to be a pair from one individual and a single left temporal from a second individual. The paired temporals represent a male individual based on the size of the mastoid processes. The third individual was identified by three parietal bone fragments that were noticeably thinner than the other cranial elements. The thinness of these bones suggest that this individual is younger than the other individuals and is possibly a juvenile. On the portion of sagittal suture visible on one of the parietal fragments, a small sutural bone is observable. The remaining bone fragments are primarily cranial with the exception of one un-sided piece of rib body fragment and one distal portion of ulna.

Identifiable remains from the cranial vault were one almost complete occipital and 32 parietal fragments. 20 other cranial vault fragments are too small to identify by element. Identifiable remains from the facial portion of the crania include a left maxilla and zygomatic that fit together, an un-sided maxilla, and a portion of an unsideable supraorbital margin. The remaining 99 facial bone fragments could not be identified further due to postmortem damage. A single tooth is present. The tooth consists of a single root possibly from a canine or incisor and is extremely worn to where no crown or enamel are present. No pathologies were observed on the fragmented remains.

There are potential funerary objects associated with these individuals. Mixed in with the human remains were 10 faunal elements. It is unknown if the faunal remains were purposely interred with the human

remains or were the result of bioturbation. There are also 11 pieces of stone, including one piece of black flint that has been flaked and worked.

The three individuals present are all of ancient Native American ancestry from Iowa.

Summary

These commingled remains represent a minimum of at least three individuals of Native American ancestry. The remains were heavily covered with soil indicating a prior burial context. The single tooth demonstrates a high amount of wear which is typical of Native American populations using ground stone tool technology to process food. In the records provided with these remains Mr. Pilgrim also refers to the individuals as Native American. He has made several donations to the OSA that included human remains as well as artifacts related to ancient Native Americans. The human remains were collected north of Clinton, IA, but their original provenience is unknown. The three individuals include an adult male, an adult of indeterminate sex and age, and a juvenile of unknown age. In addition to the human remains 21 possible funerary objects were included.

References Cited

Hoffmann, Brianna V.

2017a Human Skeletal Remains from 13CN9, Eagle Point Park, Clinton County, Iowa. In Bioarchaeological Reports on Human Skeletal Remains from Iowa and other Proveniences, editors by Jennifer E. Mack, and Lara K. Noldner, pp. 143–151. Research Papers Vol. 42, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

2017b Human Cranial Remains of Unknown Provenience. In Bioarchaeological Reports on Human Skeletal Remains from Iowa and other Proveniences, edited by Jennifer E. Mack, and Lara K. Noldner, pp. 97–98. Research Papers Vol. 42, No. 2. Office of the State Archaeologist, University of Iowa, Iowa City.

Lillie, Robin M.

2014 Human Skeletal Remains from 13CN162, Clinton County, Iowa. In Reports on Burial Projects Osteology and Archaeology, edited by Robin M. Lillie, and Shirley J. Schermer, pp. 31–46. Research Papers Vol. 38, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

2016 Additional Cranial Remains from 13CN162, Clinton County, Iowa. In Bioarchaeological Reports on Human Skeletal Remains from Iowa, edited by Jennifer E. Mack, and Lara K. Noldner, pp. 145–150. Research Papers Vol. 41, No. 3. Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist (UI, OSA)

2019 Burial Project 3477. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Adult Commingled Remains BP 3477					
Element	**Number of Fragments/ Specimens**	**MNE Left**	**MNE Right**	**MNE Midline**	**MNE Unsided**
Cranium/mandible	166	5	1	1	159
Maxillary teeth	1				1
Ribs 2-12	1				1
Ulna	1				1

Human Remains from Prescott, Arizona Transferred from the Sanford Museum

Samantha Murphy

Human remains consisting of the complete skull of an adult male of ancient Native American ancestry were transferred from the Sanford Museum in Cherokee, IA to the OSA in 2021. The remains were donated to the Sanford Museum by private citizens in 1958. The human remains were reportedly uncovered in Prescott, Arizona at an unknown time.

Introduction

At an unknown time, human remains were excavated by an unknown individual near Prescott, Arizona. The human remains were then transferred to individuals from Iowa who donated them to the Sanford Museum and Planetarium in Cherokee, Iowa in 1958. In January of 2021 the Sanford Museum transferred the remains to the OSA (OSA 2021). There are very few details about the excavation and how the private citizens came to obtain the remains. The only reported information in the Sanford Museum's catalogue description is: "human skull and mandible from Prescott, Arizona. There was a reason I took this which a friend of mine uncovered. I'll give you the details later", however details were never received. The single individual represented here demonstrates evidence of Native American ancestry, several dental pathologies and cranial modification.

Osteological Analysis

One single individual is represented by a complete skull including the mandible. The individual demonstrates some evidence of postmortem damage including a small amount of chipping to the right mastoid process. There is a small amount of flaking of the cortical bone on the cranial vault, specifically on the right and left parietal near the sagittal suture and on the frontal bone near the coronal suture. This flaking is due to taphonomic processes related to burial and subsequent exposure. The human remains also present a light brown staining indicative of a previous burial context. The skull is relatively complete with only the conchae missing. Several teeth show evidence of postmortem chipping and breaking.

The individual exhibits postmortem modifications aimed at reconstruction and preservation. On both the left and right mandibular condyles thick patches of glue indicate an attempt at rearticulation of the mandible and cranium. Similar glue is observed along the teeth in the mandible and maxilla, possibly to keep them from falling out. An additional patch of glue with small, barely visible cloth fibers attached to it is present on the right mandibular body inferior to the second and third molar. This is mirrored on the left side as well with a similar glue and fiber patch. On the inferior portion of the of the right ramus body the Sanford accession number 204-58-Z was written with black ink on a white background. This same accession number was placed on the inferior portion of the left parietal bone where the sagittal suture meets the temporal and occipital bones.

The individual is extremely robust with very broad features (see Table 1 for cranial measurements). The sexually dimorphic characteristics of the cranium and mandible strongly suggest that the individual is male. All of the facial features are broad with pronounced zygomatics and malar tubercles. The mandible is robust and thick, and the individual would have had a square jaw. The cranial vault presents two distinguishing

features: there are several Wormian bones present along the lambdoidal suture, three on the left and one on the right; and there is evidence of cultural modification from use of a cradle board on the posterior cranial vault. The inferior portion of the right parietal, posterior portion of the right temporal and right portion of the occipital bone along the right lambdoidal suture have been flattened. The foramen magnum also appears to have been affected by this modification as it is slightly angled to the left instead of the even oval typically presented. The cranial base is also more flexed than is typically expected.

The individual presents a combination of dentition that is present and in occlusion and that was lost pre- and postmortem. From the maxilla the (see Table 2 for dental inventory and Table 3 for dental metrics) right third and second molars and both incisors, and the left first incisor and second premolar are missing postmortem with no alveolar resorption. The mandibular left third molar was lost premortem (the alveolus is mostly resorbed with some remnant porosity and large dense trabeculae) and the left first incisor was last postmortem with no alveolar resorption.

The maxilla presents several dental pathologies. Caries in the right first molar and second premolar have completely destroyed the entire crowns of the teeth; a secondary abscess is demonstrated by a large 1cm diameter circular buccal perforation exposing the roots of the molar. Small amounts of calculus can be observed interproximally between most of the teeth on the maxilla as well as on the lingual and buccal aspects bordering the CEJ (see Table 4 for dental pathologies). A very small amount of calculus can be observed on the lingual and buccal aspects bordering the CEJ of the right canine. All of the observable teeth show high amounts of wear with significant loss of crown height and marked dentine exposure. On the left side of the mandible, the first and second molars show higher amounts of wear on their buccal halves. This high amount of wear is typical of an ancient Native American individual but also suggests an individual of older age.

The individual is likely a middle-aged adult individual based on the complete closure of the cranial sutures with no evidence of obliteration and is likely towards the older end of the middle-aged category due to advanced dental wear. The individual is of ancient Native American ancestry as demonstrated by the high amount of dental wear and evidence of cradle boarding. Craniofacial features are also indicative of Native American ancestry. FORDISC analysis, excluding cranial vault measurements due to cultural modification, also supports this estimation. When compared against African American, Native American, and European males the results found that the individual is closest to Native American males with a 0.943 posterior probability and cross validation rate of 85.1% (200/235). Condition and coloration of elements indicates the human remains are from a burial context.

Summary

One male individual of ancient Native American ancestry from the area of Prescott, Arizona is represented here. Native American ancestry is supported by the high amount of dental wear, facial characteristics, and FORDISC analysis. In 1958 the human remains were first transferred to the Sanford Museum and in 2021 were transferred to the OSA. The individual is represented by a complete skull with several distinguishable features including cranial modification from cradle boarding, Wormian bones along the lambdoidal suture, and several dental pathologies. The individual is an adult male and likely at the older end of middle-aged based on the extreme amount of dental wear observed.

References Cited

University of Iowa, Office of the State Archaeologist (UI, OSA)
2021 Burial Project 3560. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Cranial Metrics (mm), BP 3560	
Cranial metric	
Maximum cranial length	161
Maximum cranial breadth	140
Bizygomatic diameter	140
Basion-bregma height	140
Cranial base length	103
Basion-prosthion length	93
Maxillo-Alveolar breadth	66
Maxillo-Alveolar length	55
Biauricular breadth	133
Upper facial height	72
Minimum frontal breadth	98
Upper facial breadth	102
Nasal height	50
Nasal breadth	24
Orbital breadth L	40
Orbital breadth R	39
Orbital height L	36
Orbital height R	37
Biorbital breadth	101
Interorbital breadth	26
Frontal chord	110
Parietal chord	104
Occipital chord	90
Foramen magnum length	39
Foramen magnum breadth	35
Mastoid length L	32
Mastoid length R	31
Chin height	31
Mandibular height L	32
Mandibular height R	34
Bigonial width	100
Bicondylar breadth	120
Minimum ramus breadth L	34
Minimum ramus breadth R	32
Maximum ramus breadth L	45
Maximum ramus breadth R	43
Ramus height L	60
Ramus height R	61
Mandibular length	90
Mandibular angle	95

Table 2. Dental Inventory BP 3560						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MAXILLA:						
RM3	5		0	0	0	0
RM2	5		0	0	0	0
RM1	7		7	7	7	7
RP2	7	8				
RP1	7	4				
RC	2	5				
RI2	5	9				
RI1	5	9				
LM3	2		1	1	1	1
LM2	2		5	5	4	4
LM1	7		0	0	0	6
LP2	5	9				
LP1	7	9				
LC	2	3				
LI2	2	5				
LI1	5	9				
MANDIBLE:						
LM3	4		0	0	0	0
LM2	2		6	4	5	5
LM1	2		7	5	5	7
LP2	2	3				
LP1	2	3				
LC	7	3				
LI2	7	4				
LI1	5	9				
RM3	2		2	2	1	1
RM2	2		3	3	3	3
RM1	2		6	4	4	6
RP2	2	2				
RP1	2	3				
RC	2	4				
RI2	2	4				
RI1	2	4				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 3. Dental Metrics (mm) BP 3560

Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
MAXILLA:				
RC	9.0	10.0		
LM3	9.0	11.0		
LM2	10.0	11.0		
LC	6.0	8.0		
LI2	4.0	6.0		
MANDIBLE:				
LM2	11.0	11.0		
LM1	11.0	11.0		
LP2	7.0	10.0		
LP1	6.0	7.0		
RM3	12.0	11.0		
RM2	11.0	10.0		
RM1	10.0	11.0		
RP2	6.0	8.0		
RP1	6.0	7.0		
RC	7.0	6.0		
RI2	5.0	4.0		

Table 4. Dental Pathologies BP 3560					
Tooth	**Calculus:**		**Caries:**		**Abscess:**
	Presence	**Location**	**Number**	**Type**	**Type**
MAXILLA:					
RM1			1	Occlusal surface	buccal/labial alveolar channel
RP2			1	Occlusal surface	buccal/labial alveolar channel
LM2	Small amount	buccal/lingual			
LM1	Small amount	buccal/lingual			
LP2					
LP1	Small amount	buccal/labial			
LC	Small amount	buccal/labial			
MANDIBLE:					
RC	Small amount	buccal/labial			

Human Remains from Unknown Provenience Found Northwest of Sioux City, IA

Lara Noldner

Human remains representing a minimum of one individual were found by a Cherokee, IA resident in a private collection and turned into the Sanford Museum in Cherokee, IA. They were transferred to the OSA in April 2023. While associated elements were mentioned on a label, only an isolated femur was turned in. The label also indicates the individual's original burial location is unknown and is only vaguely referenced as northwest of Sioux City, IA. One adult female of unknown age is represented. Cortical bone preservation and coloration is typical of human remains from a burial environment; mention of Native American ancestry is indicated on the label.

Introduction

This report documents an isolated left femur from an unknown provenience. It was encountered in a private collection by a Cherokee, IA resident and turned in to the Sanford Museum whose archaeologist then notified the OSA. The element was transferred to the OSA in April 2023 (UI OSA 2023). A label on the lateral aspect of the diaphysis indicates a skull and mandible were once associated but it is unknown where those elements are now. The label also indicates the individual was found "in a pasture 12 miles NW of Sioux City, IA" in 1916, but no more specific location is provided; it also mentions the individual is believed to be of Native American ancestry.

Osteological Analysis

The left femur is complete and well preserved with minimal root etching sporadically distributed around its distal third. The coloration of the cortex and even minimal root etching indicates the remains are from a burial environment. Femoral head diameter (43.29mm) suggests the individual is female; Table 1 lists all other femoral dimensions. No pathologies are evident.

Summary

A single left femur represents an adult female of unknown age, originally interred somewhere northwest of Sioux City, IA and collected in 1916. There was no more specific provenience information associated with the remains nor an indication of who collected them. Preservation indicates they were once in a burial environment and are possibly Native American based on writing on the attached label.

References Cited

University of Iowa, Office of the State Archaeologist
2023 Burial Project 3594. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Femur Dimensions (mm) BP 3594	
Measurement	
Femoral head diameter	43
Max. length	436
Bicondylar length	432
Epicondylar breadth	76
AP subtrochanteric diameter	28
ML subtrochanteric diameter	32
AP midshaft diameter	30
ML midshaft diameter	27
Midshaft circumference	89

Human Remains Originating from Peru

Samantha Murphy

In August of 2021 human remains representing one adult female were transferred to the Office of the State Archaeologist (OSA) from a private citizen. The remains were located in a shed on her father in law's property. Based on documentation provided, the remains originated from southern Peru, are dated to the Late Intermediate Period, and were excavated in 1963.

Introduction

In August 2021 human remains were transferred to the OSA by a private citizen. The remains had been stored in a shed on the donor's father in law's property. The remains arrived with individuals vaguely indicated to have been collected possibly from Wapello County, IA (UI OSA 2021 this volume) (BP3623). Documentation provided with the individuals documented here notes that this individual originated in Southern Peru (UI OSA 2021) (BP 3619).

The main evidence for provenience of this individual is a sticker label placed on the right parietal and upper right occipital where the lambdoid, occipitomastoid and parietomastoid sutures meet. The label reads "excavated 1963 on Rio Yauca, So coast Peru. From Chincha Coast Tia-Huanaco Period 1000 to 1300 AD. Note very slight cranial separations across top of skull". The time period mentioned on the label suggests the Late Intermediate Period of pre-contact Peruvian history (Stanish 2003). It is possible that Tia-Huanaco is referring to the Tiwanku Period which was an empire that extended control into the Southern portion of Peru, however the Tiwanaku Period typically dates from 600 to 1000 AD (Stanish 2003). It is unknown if the donor's father-in-law excavated the individual himself or acquired it through other means. Newspaper dated to June 24th, 1970 was used to package and pad the remains, and suggests that the father-in-law acquired the remains sometime thereafter.

Osteological Analysis

The human remains are from one individual and consist of a mostly complete cranium. Except for the mandible and nasal conchae all of the bones of the skull are complete with minimal postmortem damage. There is slight postmortem chipping to the alveolar process of the maxilla and most of the maxillary teeth have been lost postmortem likely due to the taphonomic processes, excavation, and transportation over time. The remains are still lightly covered in soil and stained supporting the documentation of coming from a burial environment.

The only dentition that is present and in occlusion are the maxillary premolars (see Table 1 for dental inventory, Table 2 for dental metrics). All four of these teeth show a small amount of wear with blunting of the cusps. A moderate amount of calculus is found on all of the premolars' roots' buccal/labial aspects immediately adjacent to the CEJ (see Table 3 for dental pathology). The maxillary right lateral incisor and left third and right first molars were lost premortem with complete or mostly complete alveolar resorption. The maxillary left first and right second molars were lost premortem as well, but closer to the time of death; two of the root sockets for both molars remain, but the sockets for their lingual roots show a more advanced stage of resorption. The left second molar was lost premortem due to an abscess; there is a large spherical lesion in its position that has obliterated most of the alveolus and there are only remnants of a circular 8mm

diameter buccal perforation. The lesion is lined with mostly dense large trabeculae and only trace porosity. All other maxillary teeth were lost postmortem with no alveolar resorption. The remaining alveolar bone demonstrates evidence of severe periodontal disease with only the apices of the premolars' roots held in place in situ; recession from the CEJ is 3-6mm. The right first premolar appears to have three roots and the left first premolar likely has the same trait expression.

The individual is likely female based on the gracile sexually dimorphic features that are observable. The nuchal crest and glabella lack any projection and are almost completely flat. There is a slight asymmetry of the cranial vault and there is a slight bulge above the nuchal crest involving primarily the occipital. (See Table 4 for cranial measurements). The cranial sutures are almost obliterated or very faintly visible; the sagittal suture is completely obliterated. This would typically indicate an age range of an older adult, however given light dental wear, the individual is more likely an adult of middle age. It is unclear what the "cranial separations" of note, indicated on the sticker by the original collector, refer to.

The individual presents a healed depression fracture on the left portion of the frontal bone measuring roughly 20mm in diameter. The fracture is completely healed and lined with normal dense bone; three distinct remnants of radiating fractures off the initial point of impact are observable. Based on the amount of healing the trauma occurred well before the time of death and shows no evidence of infection. No other pathologies or traumas were observed.

Summary

Human remains representing one middle-aged adult female from southern Peru dated from 1000 to 1300 AD was transferred to the OSA. The individual is represented by a complete cranium missing the mandible and nasal conchae. Cranial vault asymmetry and a healed depression fracture are observable on this individual, as are numerous dental pathologies indicative of periodontal disease and abscess. The collector was a resident of Iowa; it is unclear how he acquired the remains, but it was sometime after 1970.

References Cited

Stanish Charles
2003 *Ancient Titicaca: The Evolution of Complex Society in Southern Peru and Northern Boliva.* University of California Press.

University of Iowa, Office of the State Archaeologist (UI, OSA)
2021 Burial Project 3619. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Dental Inventory BP3619						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MAXILLA:						
RM3	9		0	0	0	0
RM2	9		0	0	0	0
RM1	4		0	0	0	0
RP2	2	1				
RP1	2	1				
RC	9	0				
RI2	4	0				
RI1	9	0				
LM3	4		0	0	0	0
LM2	9		0	0	0	0
LM1	9		0	0	0	0
LP2	2	2				
LP1	2	2				
LC	9	0				
LI2	9	0				
LI1	9	0				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 2. Dental Metrics (mm) BP 3619				
Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
MAXILLA:				
RP2	5.0	6.0		
RP1	8.0	8.0		
LP2	6.0	5.0		
LP1	6.0	8.0		

Table 3. Dental Pathologies BP 3619		
Tooth	**Calculus:**	
	Presence	**Location**
MAXILLA:		
RP2	small amount	buccal/labial
RP1	small amount	buccal/labial
LP2	small amount	buccal/labial
LP1	small amount	buccal/labial
LM2	Abscess	

Table 4. Cranial Metrics (mm), BP 3619	
Cranial metric	
Maximum cranial length	175
Maximum cranial breadth	129
Bizygomatic diameter	118
Basion-bregma height	132
Cranial base length	95
Basion-prosthion length	90
Maxillo-Alveolar breadth	60
Maxillo-Alveolar length	50
Biauricular breadth	116
Upper facial height	65
Minimum frontal breadth	100
Upper facial breadth	96
Nasal height	48
Nasal breadth	24
Orbital breadth L	40
Orbital breadth R	40
Orbital height L	35
Orbital height R	36
Biorbital breadth	96
Interorbital breadth	26
Frontal chord	102
Parietal chord	123
Occipital chord	93
Foramen magnum length	29
Foramen magnum breadth	30
Mastoid length L	23
Mastoid length R	19

Human Remains from the University of Iowa Biology Department Teaching Collection

Samantha Murphy

Five adult individuals all represented by crania were transferred to the OSA from the University of Iowa Biology Department. The individuals had been a part of the educational collection for the department. The individuals include a Native American male presenting possible admixture, a White male presenting possible admixture, a Black female, and two Black males. All the individuals show evidence of being handled by multiple people over time typical of being in an educational collection.

Introduction

In March of 2022 the lab coordinator from the University of Iowa Biology Department, Erin Edgar, contacted Dr. Caroline Parris, the Research Collections Director at the OSA about transferring portions of the educational collection. The Biology Department was downsizing the collection and was reaching out to other departments who might be interested in the materials. While most of the educational collection were faunal remains, five human crania were included. The human remains were transferred to the Bioarchaeology Lab for documentation and proper storage and disposition as needed (UI OSA 2022).

Osteological Analysis

All the individuals in this burial project are adult individuals. There is no life history information for individuals, and it is unclear how they came to be in the educational collection. Almost all the individuals were prepared as anatomical specimens and show evidence of postmortem modification typical of individuals found in teaching collections. Individual 1 does not show any modification and cortical staining could indicate the cranium is from a burial context. Individuals 2-5 all have transverse autopsy cuts along the cranial vault typical for dissection of the brain and observation of the internal cranial vault. The other postmortem modification made to Individuals 2-5 was the attachment of springs for articulation of the mandible to the rest of the cranium. Individuals 2 and 5 had identifying labels placed on the interior of the cranial vault. The identifying labels stated, "Property of State University of Iowa" and a specific identification number, 26742 for Individual 2 and 26740 for Individual 5. The transition from State University of Iowa to University of Iowa occurred in 1964, suggesting that the individuals were added to the collection prior to this date.

INDIVIDUAL 1

Individual 1 is represented by the most damaged and least complete cranium. Individual 1 is also the only individual that does not have any of the modifications from dissection and rearticulation typically seen in educational and anatomical collections. Individual 1 is only represented by the cranial vault and the sphenoid bone with no facial or nasal bones, mandible, or post-cranial bones. There are no teeth present. The occipital, both parietals, both temporals and the frontal bone are present and complete, and the sutures show complete closure. The lambdoidal and sagittal sutures show evidence of obliteration. Based on this evidence it is likely that Individual 1 is a middle to older aged adult.

The nuchal crest, the mastoid processes and glabella are present, robust, and prominent, therefore Individual 1 is classified as male. The entirety of the cranium's cortex is covered with a dark brown staining suggesting that the individual might have been removed from a burial context prior to being a part of the educational collection. This is supported by the significant postmortem damage and lack of modifications from dissection and rearticulation seen in the other individuals. The damage and missing portions of Individual 1 appear to be postmortem and could have occurred during excavation as well as being handled by students over time. No pathologies are evident.

FORDISC analysis was completed to attempt to determine ancestry of the individual, despite the limited number of landmarks present for standard measurements. The measurements available (see Table 1 for cranial metrics) were compared against European males, African American males and Native American males and resulted in Native American male with a posterior probability of 0.748 and a cross validation of 71.55% (383/536). The first set of measurements contained two significant outliers at least three standard deviations above the mean (foramen magnum breadth and length) so data was run a second time without the two measurements. The results of the second analysis classified Individual 1 as a European male with a posterior probability of 0.789 and a cross validation of 71.5% (383/536). Observing the scatter plot provided by FORDISC, the individual often fell on the boundary of American Indian and White male. It is possible that these results are indicative of admixture and both Native American and European ancestry. Native American ancestry is supported by the evidence of being in a burial context prior to being in the educational collection.

INDIVIDUAL 2

Individual 2 is represented by a complete skull. This individual had been prepared using the methods mentioned above, and the spring attaching the mandible caused much of the postmortem damage to the teeth discussed below. The springs and pins were removed to prevent further damage and to make the necessary observations. On the mandible the pins left two 1mm holes in the inferior portion of the right and left coronoid processes.

On the cranium one pin was also inserted on each side. On the left side, the pin entered through the temporal and into the eye orbit but did not significantly damage the bone; on the right, the pin was inserted just posterior to the zygomatic bone into the temporal bone. The springs were then threaded through the zygomatic arches to attach to the mandible. In relation to the transverse autopsy cut for dissection of the brain, the cut is uniform with square margins and made with a power saw. There is minimal bone loss (less than 1mm) from the cut and pins with hooks were also placed along the cut to rearticulate the calvarium with the rest of the cranium. While the springs and pins in the lower facial features were removed, the pins and hooks in the calvarium were left for craniometric analysis.

Individual 2 is in relatively good condition for being part of an educational collection. Most of the nasal conchae are missing due to postmortem breakage but otherwise the cranium is complete. While all of the teeth are in situ several were damaged and chipped postmortem due to the springs pulling the mandible forcibly into occlusion with the maxilla and handling by students over time. The left maxillary incisors are damaged to the point that no measurements can be made, nor morphology or wear observed (see Table 2 for dental inventory). The mandibular left molar 1, left canine, right incisor 2, right canine, and right molar 1 were also damaged to the same extent. Observable wear varied somewhat on the teeth with some of the maxillary first molars showing moderate attrition and dentine exposure, and all other teeth showing minimal to no wear. Some wear was altered postmortem due to forcible articulation with the mandible but is evident by patches of bright white enamel with angular margins. Very small amounts of calculus can be observed interproximally between most of the teeth on the mandible and the maxilla, as well as on lingual and buccal aspects bordering the CEJ. Most teeth also have patches of brown staining on primarily their lingual surfaces.

Based on the sexually dimorphic characteristics the individual is a possible male. The nuchal crest is relatively flat and more ambiguous, but the mastoid processes, supraorbital margin and glabella are more robust and prominent suggesting male. Additionally, the mental eminence and the entire mandible are quite broad. All the sutures along the cranial vault are visible and closed with no signs of obliteration suggesting that the induvial was a middle adult. Considering this and the dental wear indicative of someone eating foods processed with modern technology, the individual is likely towards the older end of the middle age range.

Individual 2 presents two observable pathologies. The first is a healed depression fracture on the right anterior portion of the frontal bone. It is roughly circular in shape about 9mm antero-posteriorly and 11mm medio-laterally. The depression was completely healed at the time of death and shows no evidence of infection as it is lined with dense normal cortex. Any endocranial expression of the fracture is unobservable as the identifying sticker was placed directly where the depression occurs internally, and it cannot be easily removed. The second abnormality is extra bone growth on the postero-inferior corner of the right parietal. The extra growth is oval in shape, elevated about 2mm above surrounding cortical bone, and measures 25mm antero-posteriorly and 11mm supero-inferiorally. The cortex over the entire elevated area is normal and dense and there is no endocranial expression of it. The growth is likely not due to injury, trauma or disease.

FORDISC analysis was completed to determine ancestry. The cranial measurements (see Table 1) were compared against European, Native American and African American males. The data resulted in a posterior probability of 0.667 and a cross validation of 85.3% (197/231) for a European male. The data was run again, using only the facial features measurements and resulted in a posterior probability 0.655 with a cross validation of 79.8% (190/238) for an African American male. The nasal aperture size and shape are typical of European ancestry; the nasal bones are small, narrow and create a prominent nasal ridge; there is a sharp nasal sill and prominent nasal spine, and the zygomatics are gracile and retreating. The only craniofacial feature suggesting African American ancestry is very slight prognathism. FORDISC results show overlap with both groups when presented in the scatterplot. These data suggest that the individual is of mixed European and African American ancestry.

INDIVIDUAL 3

Individual 3 is represented by a complete skull. The individual had been prepared in the methods mentioned above, and the springs attaching the mandible caused much of the postmortem damage to the teeth discussed below. The springs and pins were removed to prevent further damage and to make the necessary observations. The springs entered the mandible at the inferior ramus body on both the right and left leaving two small (1mm) holes.

On the cranium pins were inserted on the superior posterior portion of the frontal bone on the right and left sides. The springs were then threaded under the zygomatic arches to attach to the mandible. The transverse autopsy cut is uniform with square margins and made with a power saw with about 2mm bone loss at the anterior frontal bone. Clay was used to estimate the original orientation of the calvarium for measurements.

Individual 3 is relatively complete for being part of an educational collection. Some of the nasal conchae are missing due to postmortem breakage but otherwise the cranium is complete. There are no teeth present. The sockets for right maxillary molars 2 and 3 show evidence of alveolar resorption suggesting antemortem loss. All the other teeth were lost postmortem due to the springs pulling the mandible forcibly into occlusion with the maxilla and handling by students over time (Table 3). A middle-aged adult is supported by a complete closure of the cranial sutures with no evidence of obliteration.

Based on the sexually dimorphic characteristics present the individual is a probable female. The nuchal crest, mastoid processes, supraorbital margin, and glabella are all relatively gracile. The mental eminence

is slightly more ambiguous and larger than one would expect for a female. There were no pathologies observed.

FORDISC analysis was completed to determine ancestry of the individual. The cranial measurements (see Table 1) were compared against African American, European, and Native American females. The first analysis using all measurements was inconclusive. The data was run again, only using facial measurements and resulted in a posterior probability of 0.996 with a cross validation 89.8% (141/157) for Black female. The craniofacial features are somewhat typical of African American ancestry with a very slight prognathism and moderate width to the nasal aperture.

INDIVIDUAL 4

Individual 4 is represented by a complete skull and an additional parietal. The parietal is complete and from the right side of an adult individual. The parietal was identified in the storage box of Individual 4 but does not fit with any of the other individuals. It was categorized as commingled and continues to be held with Individual 4.

Individual 4 had been prepared in the methods mentioned above. Only nasal conchae are missing. In the cranium the pins were placed on the right and left inferior spheno-temporal suture leaving a 1mm hole; the springs were threaded under the zygomatic arches and attached to the mandible. Wires attached to the springs were threaded through holes in the mylohyoid bridge on the right and left side. The springs and wires were removed to prevent further damage and to make the necessary observations. The transverse autopsy cut is uniform with square margins and made with a power saw. Clay was used to help stabilize the calvarium for measurements. On the calvarium all of the sutures have been covered with a heavy glue or sealant. It is unclear if this was done at the time of preparation or to remedy postmortem damage.

Individual 4 has sustained postmortem damage. Across the frontal bone on the calvarium, faint pencil markings write out “I am a head”. Other faint pencil markings can be observed on the cranial vault. Small cracks and chipping occur along the frontal and parietal bones. The mandibular condyles appear to have sustained postmortem damage showing wear and chipping from the springs pulling the mandible forcibly into occlusion with the temporal. The wear has exposed trabecular bone on the anterior portions of the condyles.

Teeth present a mix of in situ, postmortem and premortem loss (see Table 4 for dental inventory). The teeth that are in situ are the right canine, right incisor 2 and left incisor 1 in the maxilla. In the mandible the in-situ teeth are the left molar 2 and the right molars. Except for the mandibular left molar 2 and right molars 2 and 3 all other teeth were too damaged to take measurements or wear observations. Little to no dental wear is present. Very small amounts of calculus can be observed interproximally between the mandibular right molars as well as on the lingual aspects bordering the CEJ. Both right incisors were lost with complete alveolar resorption. This premortem tooth loss suggests that the individual is of older age. All the observable sutures are closed but largely not obliterated. The individual is likely a middle-aged adult.

Based on the sexually dimorphic characteristics present Individual 4 is a probable male. The nuchal crest, mastoid processes, glabella, and mental eminence are all well-defined, prominent, and robust which suggests a male individual. The supraorbital margins are the only feature that are less prominent and more ambiguous.

FORDISC analysis was completed to determine ancestry. The cranial measurements (see Table 1) were compared against European, African American, and Native American males. For the first analysis using all of the cranial measurements the results were indeterminate. The second analysis of the data was completed using only the facial features which resulted in a posterior probability of 0.979 with a cross-reference value of 85.1% (400/470) for African American male. There were three outliers in the data, upper facial height, nasal height, and basion to nasion length. The three measurements were all at least three standard deviations smaller than the reference groups. Individual 4 presents a smaller face, however the broad nasal aperture is consistent with African American ancestry.

INDIVIDUAL 5

Individual 5 is represented by a complete skull with the preparations mentioned above. The springs that attached the mandible caused much of the postmortem damage to the teeth discussed below. The springs and pins were removed to prevent further damage. On the mandible the pins left two small 1mm holes in the inferior portions of the right and left coronoid process. In the cranium the pins were placed in the temporal bones directly posterior to the zygomatic bones. The springs were threaded under the zygomatic arches. The transverse autopsy cut is less uniform and appears to have more bone loss than others, about 3mm along the frontal bone. The calvarium shows several cracks and postmortem breaks that have been refit with glue or sealants. The sutures along the calvarium have also been coated with a sealant. Along the frontal bone are faint pencil marks and the words "eat me". The palatine bone has been completely covered with white paint and the alveolar process to the nasal aperture has been shaded in with a pencil. Both the left and right mandibular condyles have also been damaged and are no longer present.

Individual 5 had a combination of teeth that were in-situ, present but not in situ, antemortem tooth loss and postmortem tooth loss (see Table 5 for dental inventory). There were 5 teeth in-situ and 9 loose in the bottom of the storage box containing the individual. The maxillary teeth that were in-situ are the right premolar 2, right molar 1, and left molar 1 and the in-situ mandibular teeth are the left premolar 2 and right molar 1. Teeth that are present but not in situ include the maxillary right molar 2, right molar 1, right canine, right incisor 2, and left premolars. Mandibular teeth that are present but not in situ are the left molar 2, left premolar 1, and the right molar 3. Observable wear varied somewhat on the teeth with mandibular teeth showing higher amounts of wear and a slight amount of dentine exposure. The mandibular wear appears to have occurred during the life of the individual while the wear and damage to the rest of the teeth was postmortem due to forcible articulation with the mandible. This is evidenced by patches of bright white enamel with angular margins where enamel was chipped off. Small amounts of calculus can be observed interproximally between most of the teeth on the mandible and the maxilla, as well as on the lingual and buccal aspects bordering the CEJ. Left incisor 1 and right incisor 1 from the mandible have been lost antemortem and show some evidence of resorption. All the other teeth have been lost postmortem. Small pockets of glue can be seen in the tooth sockets in the maxilla and mandible suggesting that attempts had been made to glue teeth back into place.

Despite the damages to Individual 5 the cranium is relatively complete and only the nasal conchae are unobservable. While not a pathology it is important to note that the mandibular torus on the individual has a moderate elevation of 2.5mm. Based on the sexually dimorphic characteristics Individual 5 is a probable male. The nuchal crest and glabella are ambiguous in expression, but the mastoid processes, supraorbital margin and mental eminence are robust. All of the observable cranial sutures have closed with some evidence of obliteration of the lambdoidal and sagittal sutures. In addition to dental wear that is advanced for someone eating foods processed with modern technology, this suggests the individual is likely towards the older end of the middle adult range.

FORDISC analysis was performed to determine ancestry. The cranial measurements (see Table 1) were compared against Native American, African American and European males. The first analysis included all the measurements, and the results were inconclusive. The second analysis only included the facial feature measurements, and the results were a posterior probability of 0.997 with a cross validation of 85.2% (202/237) for an African American male. The nasal aperture breadth, robust zygomatics and slight prognathism are typical of African American ancestry.

Summary

Five crania representing adult individuals and one right parietal were transferred to the OSA from the UI Biology Department's educational collection. The crania include a Native American male with possible

European admixture, a European male presenting possible African American admixture, an African American female and two African American males. There is no life history information or provenience for the individuals prior to their arrival in the educational collection. Individual 1 might have been removed from a burial. Individuals 2, 3, 4 and 5 have all been prepared to be in an educational collection with modifications typical of anatomized individuals. All the individuals experienced different levels of postmortem damage.

References Cited

University of Iowa, Office of the State Archaeologist (UI, OSA)
2022 Burial Project 3680. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Cranial Metrics (mm) BP3680					
Cranial metric	**Individual 1**	**Individual 2**	**Individual 3**	**Individual 4**	**Individual 5**
Max cr l	180	172	165	170	173
Max cr br	140	132	132	130	135
Bizyg diam		123	120	125	114
Ba-br ht	135	135	130	126	140
Cr base l		101	91	92	95
Ba-pr l		96	85	90	98
Mx-alv br		61	56	62	60
Mx-alv l		52	58	50	50
Biaur br	125	118	116	113	111
Up fac ht		70	59	54	65
Min fr br		93	97	92	100
Up fac br		100	100	99	105
Nas ht		51	45	43	47
Nas br		22	24	26	27
Orb br L		38	42	40	40
Orb br R		36	41	40	42
Orb ht L		36	38	33	34
Orb ht R		36	35	33	33
Biorb br		94	94	97	99
Int-orb br		23	24	22	21
Fr chd		116	100	105	114
Par chd	80	114	103	113	100
Occ chd	108	92	90	90	90
For mag l	30	33	33	39	32
For mag br	25	33	27	31	26
Mast l L	35	30	26	30	29
Mast l R	30	29	25	30	29
Chin ht		26	20	15	24
Mand ht L		24	21	18	26
Mand ht R		25	22	18	27
Bigon w		92	94	93	85
Bicond br		111	115	111	
Min ram br L		30	28	26	31
Min ram br R		30	30	30	32
Max ram br L		40	34	34	
Max ram br R		40	37	35	
Ram ht L		52	60	52	
Ram ht R		52	60	55	
Mand l		70	80	71	76
Mand ang		95	100	110	100

Table 2. Dental Inventory BP3680 Individual 2						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MAXILLA:						
RM3	2		1	1	1	1
RM2	2		1	1	1	1
RM1	2		1	4	4	2
RP2	2	3				
RP1	2	3				
RC	2	2				
RI2	2	1				
RI1	2	1				
LM3	2		1	1	1	1
LM2	2		1	1	1	1
LM1	2		4	4	0	0
LP2	2	2				
LP1	2	2				
LC	2	2				
LI2	7	9				
LI1	7	9				
MANDIBLE:						
LM3	2		1	1	1	1
LM2	2		1	1	1	1
LM1	7		0	0	0	0
LP2	2	1				
LP1	2	2				
LC	7	9				
LI2	2	1				
LI1	2	1				
RM3	2		1	1	1	1
RM2	2		2	2	1	1
RM1	7		0	0	0	0
RP2	2	2				
RP1	2	2				
RC	7	9				
RI2	7	9				
RI1	2	1				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 3. Dental Inventory BP3680 Individual 3

Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MAXILLA:						
RM3	4		0	0	0	0
RM2	4		0	0	0	0
RM1	5		0	0	0	0
RP2	5	9				
RP1	5	9				
RC	5	9				
RI2						
RI1	5	9				
LM3	5		0	0	0	0
LM2	5		0	0	0	0
LM1	5		0	0	0	0
LP2	5	9				
LP1	5	9				
LC	5	9				
LI2	5	9				
LI1	5	9				
MANDIBLE:						
LM3	5		0	0	0	0
LM2	5		0	0	0	0
LM1	5		0	0	0	0
LP2	5	9				
LP1	5	9				
LC	5	9				
LI2	5	9				
LI1	5	9				
RM3	5		0	0	0	0

Table 3. Dental Inventory BP3680 Individual 3 cont.						
		Attriction	Attrition Molars			
Tooth	Presence	I, C, P	Mes-ling	Mes-buc	Dis-ling	Dis-buc
RM2	5		0	0	0	0
RM1	5		0	0	0	0
RP2	5	9				
RP1	5	9				
RC	5	9				
RI2	5	9				
RI1	5	9				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 4. Dental Inventory BP3680 Individual 4						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MAXILLA:						
RM3	5		0	0	0	0
RM2	4		0	0	0	0
RM1	4		0	0	0	0
RP2	5	9				
RP1	5	9				
RC	7	9				
RI2	7	9				
RI1	5	9				
LM3	4		0	0	0	0
LM2	4		0	0	0	0
LM1	4		0	0	0	0
LP2	5	9				
LP1	5	9				
LC	5	9				
LI2	7	9				
LI1	5	9				
MANDIBLE:						
LM3	5		0	0	0	0

Table 4. Dental Inventory BP3680 Indivdiual 4 cont.						
Tooth	Presence	Attrition	Attrition-Molars			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
LM2	2		1	1	1	1
LM1	5		0	0	0	0
LP2	5	9				
LP1	5	9				
LC	5	9				
LI2	5	9				
LI1	4	9				
RM3	2		1	1	1	1
RM2	2		1	1	1	1
RM1	7		0	0	0	0
RP2	5	9				
RP1	5	9				
RC	5	9				
RI2	4	9				
RI1	4	9				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 5. Dental Inventory BP3680 Individual 5						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MAXILLA:						
RM3	5		0	0	0	0
RM2	1		4	0	0	4
RM1	1		0	0	0	0
RP2	7	9				
RP1	2	2				
RC	1	2				
RI2	1	2				
RI1	5	9				
LM3	5		0	0	0	0

Table 5. Dental Inventory BP 3860 Individual 5						
Tooth	Presence	Attrition	Attrition Molars			
		I, C, P	Mes-buc	Mes-dis	Dis-lling	Dis-buc
LM2	5		0	0	0	0
LM1	7		0	0	0	0
LP2	1	3				
LP1	1	1				
LC	5	9				
LI2	5	9				
LI1	5	9				
MANDIBLE:						
LM3	5		0	0	0	0
LM2	1		5	5	5	5
LM1	5		0	0	0	0
LP2	7	9				
LP1	1	4				
LC	5	9				
LI2	5	9				
LI1	4	9				
RM3	1		1	1	1	1
RM2	5		0	0	0	0
RM1	7		0	0	4	0
RP2	5	9				
RP1	5	9				
RC	5	9				
RI2	5	9				
RI1	4	9				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Juvenile Remains from Blood Run National Historic Landmark, 13LO2

Samantha Murphy

Human remains representing a single individual were identified in faunal remains that were collected from Blood Run National Historic Landmark, site 13LO2. Based on size and developmental stage of the single right ilium, the individual is likely aged 8- to 10-years old and is associated with the archaeologically defined Oneota cultural context.

Introduction

These human remains were transferred to the OSA along with faunal remains that had been collected at Blood Run National Landmark by Robert Ageson (UI OSA 3685). In April 2022, the human element was discovered among animal bones by OSA staff and transferred to the Bioarchaeology Program. Associated site 13LO2 has a long-recorded history of archaeological documentation, including burial mounds related to the archaeologically defined Oneota cultural period. The OSA Bioarchaeology Program has previously reported on numerous human remains originating from Blood Run (Lillie and Mack 2014; Mack 2019; Mack et al. 2017; Noldner 2019; Schermer 1984, 2004, 2015; Schermer et al. 1998).

Osteological Analysis

The human remains consist of a single right ilium fragment from a juvenile individual. The fragment consists of a portion of the iliac tuberosity, blade, auricular surface, and the posterior third of the iliac crest. No epiphysis is present. A small portion of the preauricular sulcus can be observed. On the lateral aspect of the element most of the cortical bone has been lost due to the taphonomic damage with the trabecular bone visible. The medial surface of intact cortical bone including the blade, spine and preauricular sulcus was stained green in the burial environment from contact with copper, which was commonly used for ornamentation and included among funerary objects by people associated with the Oneota tradition. The remains were too fragmented to take any measurements however based on general size and developmental stage the individual was around 8-10 years old. Sex cannot be determined on juvenile individuals as the secondary sexually dimorphic characteristics have not yet developed. No pathologies were observed on the remains.

Summary

A single individual is represented by a fragmented ilium that originated from Blood Run National Historic Landmark, site 13LO2. The individual is a juvenile likely between the ages of 8 to 10 with sex undeterminable. Based on the findspot being Blood Run and evidence of burial with copper items, the individual is of ancient Native American ancestry and associated with the archaeologically defined Oneota culture.

References Cited

Lillie, Robin M., and Jennifer E. Mack

2014 Human Skeletal Remains and Burial-Related Artifacts from the Amy Harvey Collection: 13AM60, 13LO2, 13WD7, 13WD8, 13HB0g, Northeast Iowa, 23BO1, and Unprovenienced Remains. In Reports on Burial Projects Osteology and Archaeology, edited by Robin M. Lillie, and Shirley J. Schermer, pp. 231–283. Research Papers Vol. 38, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

Mack, Jennifer E.

2019 Human Remains Collected from Blood Run National Historic Landmark (13LO2), Lyon County, Iowa, in the Nineteenth and Twentieth Centuries. In Bioarchaeological Reports on Human Skeletal Remains from Iowa and Other Proveniences, edited by Jennifer E. Mack, and Lara K. Noldner, pp. 11–16. Research Papers Vol. 44, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

Mack, Jennifer E., Robin M. Lillie, and Lily J. Doershuk

2017 Human Remains from the Blood Run Site (13LO2), Found in the Amy Harvey Collection and in the Luther College Archaeological Laboratory Collection. In Bioarchaeological Reports on Human Skeletal Remains from Iowa and other Proveniences, edited by Jennifer E. Mack, and Lara K. Noldner, pp. 17–22. Research Papers Vol. 42, No. 2. Office of the State Archaeologist, University of Iowa, Iowa City.

Noldner, Lara K.

2019 Human Remains Recovered from Eroding Landform at Blood Run National Historic Landmark (13LO2), Lyon County, Iowa. In Bioarchaeological Reports on Human Skeletal Remains from Iowa and Other Proveniences, edited by Jennifer E. Mack, and Lara K. Noldner, pp. 17–18. Research Papers Vol. 44, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

Schermer, Shirley J.

1984 Human Skeletal Remains from 13LO2, the Blood Run National Historic Landmark 1984–1986. In Miscellaneous Reports on Iowa Archaeology, by University of Iowa Office of the State Archaeologist, pp. 61–81. Research Papers Vol. 12, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

2004 Human Skeletal Remains from Four Blood Run National Historic Landmark Collections, 13LO2, Lyon County, Iowa. In Reports on Iowa Burial Projects: Osteology and Archaeology, edited by Shirley J. Schermer and Robin M. Lillie, pp.63-126. Research Papers Vol. 29, No. 2. Office of the State Archaeologist, University of Iowa, Iowa City.

2015 13LO2, Blood Run National Historic Landmark Site, Lyon County, Iowa. In Bioarchaeology of the Charles R. Keyes Collection, edited by Robin M. Lillie, and Lara K. Noldner, pp. 417–431. Research Papers Vol. 39, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

Schermer, Shirley J., Linda Forman, Robin M. Lillie, Jill Robinson, and Larry J. Zimmerman

1998 NAGPRA Inventory and Consultation: Human Remains and Funerary Objects in the Charles R. Keyes Collection. Research Papers Vol. 23, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist (UI, OSA)

2022 Burial Project 3685. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

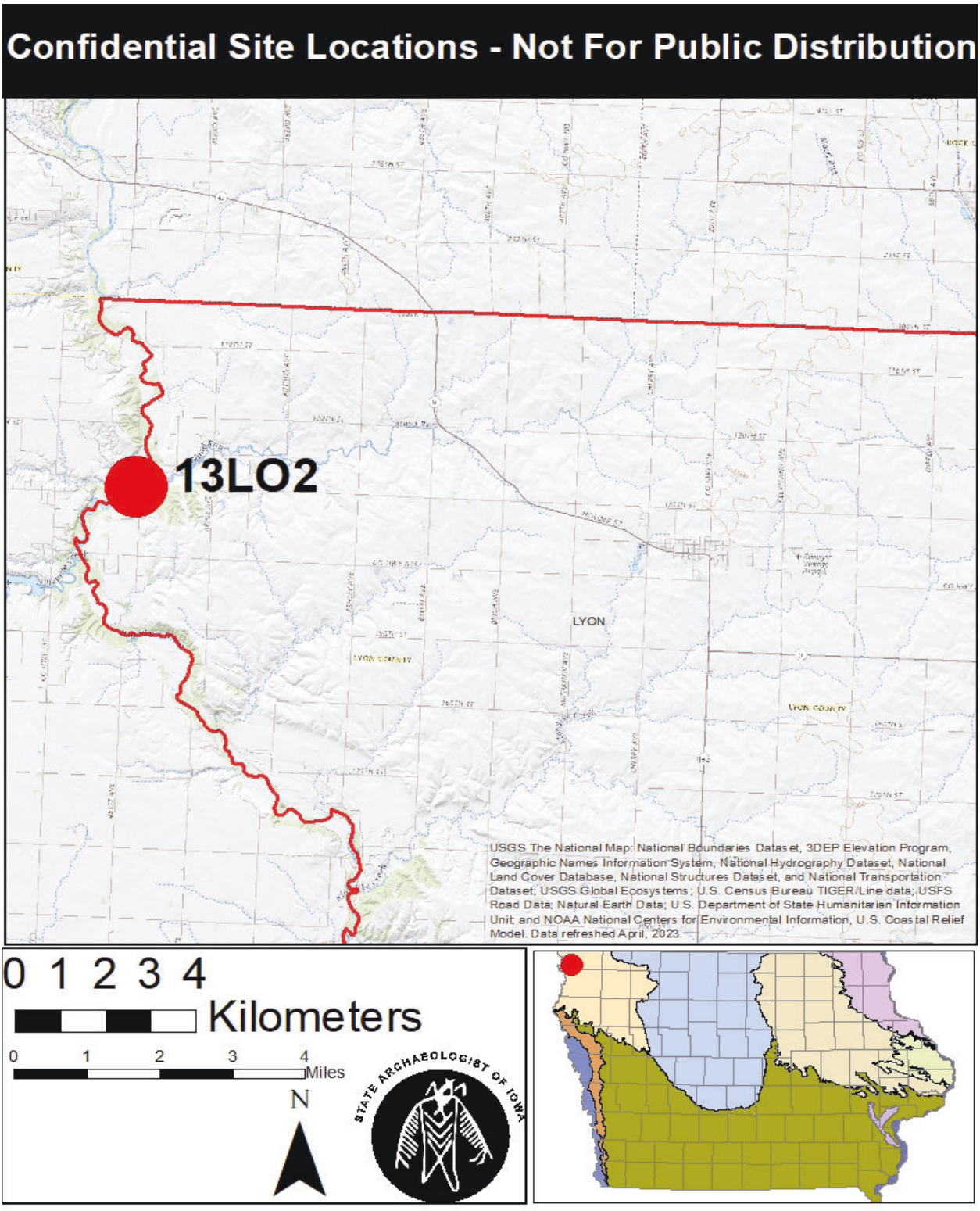

Figure 1. Findspot of human remains.
From USGS Corley, Lyon County, Iowa (1978), 7.5' series quadrangle map. Scale 1:100,000.

Human Molar from 13BN323

Samantha Murphy

A single human tooth, identified as a mandibular first right molar, was identified in the 2022 Jimmie Thompson Collection donation. The molar represents a single adult individual of ancient antiquity and Native American ancestry.

Introduction

One molar was identified among artifacts in the 2022 Jimmie Thompson Collection donation to the OSA that originated from site 13BN323 in Boone County Iowa. 13BN323 is a burial mound site first documented by Mr. Thompson in 1993; no further investigations of the site have been conducted. The site has only been referenced by the Bioarchaeology Program under BP 660 (UI OSA 1993), which has no associated documents, but was apparently initiated with a report of possible disturbance to the newly recorded mound. No human remains are associated with BP660 and there are no other associated reports. Following the identification of the molar described the human remains were transferred to the Bioarchaeology Lab (UI OSA 2022).

Osteological Analysis

The tooth is a mandibular right first molar that is fully developed with the apex closed indicating it is from an adult individual. The tooth appears to have been removed from the mandible postmortem. There is some evidence of postmortem damage to the tooth in the form of the chipping and cracks in the enamel of the occlusal surface. The molar presents a moderate amount of dental wear with the cusps beginning to flatten but still showing defined cusps (see Table 1 for dental inventory and Table 2 for dental metrics). The buccal half of the tooth has slightly more advanced wear than the lingual side. Based on the amount of wear the individual a young to middle aged adult. There are no pathologies observed. The dental wear and original provenience in a known Native American burial mound site indicate the individual is of ancient Native American ancestry.

Summary

A single right mandibular first molar was identified in an artifact collection from site 13BN323. The tooth is from an adult individual who is of ancient Native American ancestry.

References Cited

University of Iowa, Office of the State Archaeologist (UI, OSA)
2022 Burial Project 3686. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

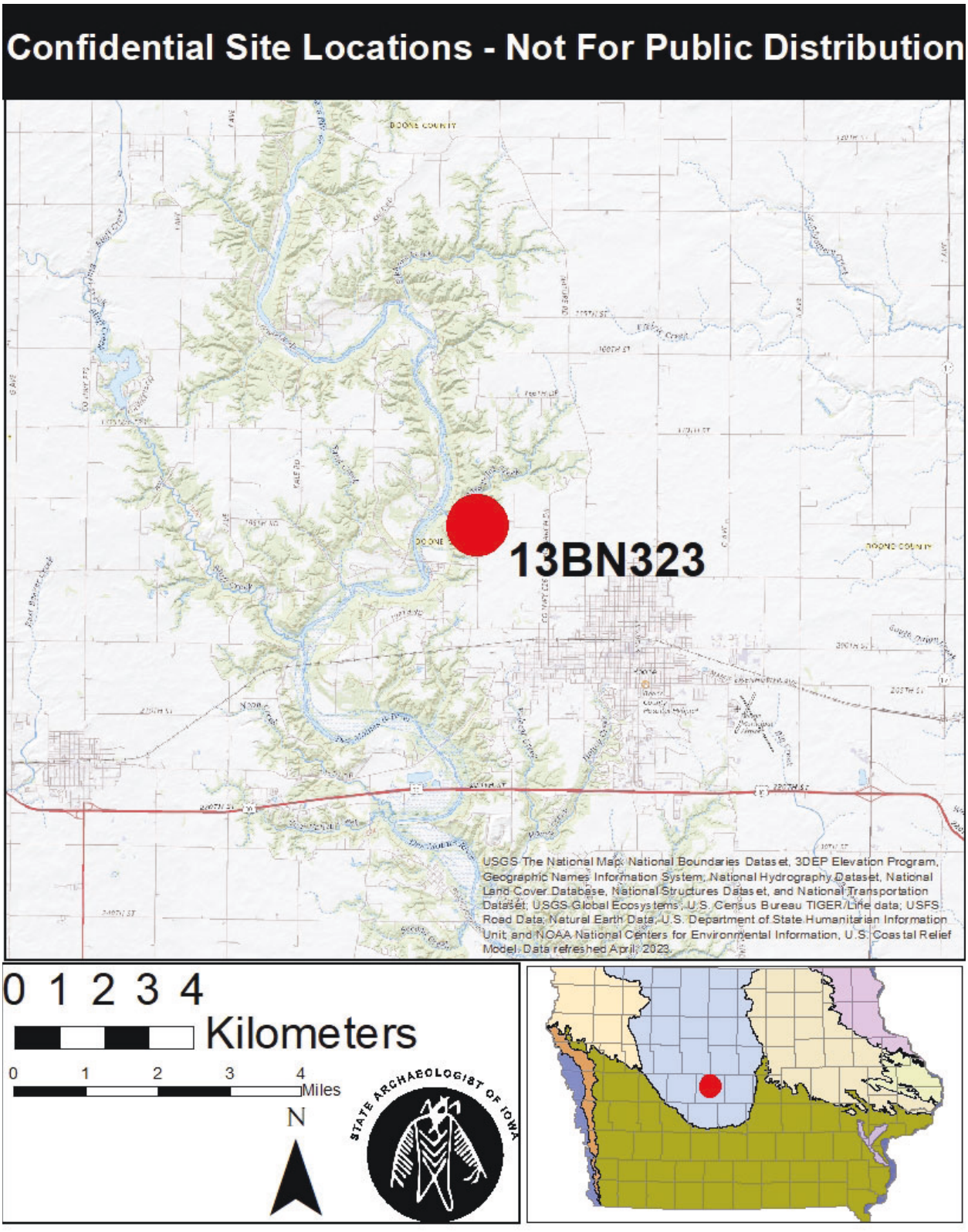

Figure 1. Findspot of human remains.
From USGS Corley, Boone County, Iowa (1978), 7.5' seri

Table 1. Dental Inventory BP 3686						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MANDIBLE:						
RM1	1		3	2	3	2

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 2. Dental Metrics (mm) BP 3686				
Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
RM1	11.0	10.0		

Human Remains from Site 13SR5

Samantha Murphy

Human remains representing at least one individual of ancient Native American ancestry were identified in the 2022 Jimmie Thompson Collection donation of artifacts from site 13SR5. Two rib fragments and one manubrium fragment represent a minimum of one adult individual of unknown sex and age.

Introduction

These human remains were collected from site 13SR5 in Story County, Iowa (see Figure 1 for findspot), which was first recorded as a precontact habitation site by avocational archaeologist Jimme Thompson in 1988. The site was exposed by erosion on the cutbank of the South Skunk River. A follow up site visit in 1993 recorded continued erosion and numerous artifacts in an area that had slumped, but no cultural material was present in the intact cutbank wall, and no additional human remains were encountered (Green and Lillie 1994). The human remains documented here were included in the Mr. Thompson's collection donation to the OSA in 2022. They were first thought to be faunal remains before properly being assessed as human (UI OSA 2022).

Osteological Analysis

The human remains present are three partial fragments: two small rib fragments unidentifiable by number and one fragment of manubrium. The manubrium fragment represents the superior portion of the manubrium with the jugular notch and a small portion of both clavicular notches observable. At least one adult individual is represented by the fragments. A specific age range or sex cannot be determined. No pathologies are observed on the remains. Based on the association of the human remains with archaeological site 13SR5 created by Native occupation the individual is most likely of ancient antiquity and Native American ancestry.

Summary

The three pieces of fragmented remains represent at least one adult individual of unknown sex and age. The individual is of ancient and antiquity and Native American ancestry based on the elements' association with the precontact Native American habitation site documented as 13SR5. There are no pathologies or associated funerary objects.

References Cited

Green, William, and Robin M. Lillie
1994 Archaeology and the Great Midwestern Floods of 1993. Research Papers Vol. 19, No. 4. Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist (UI, OSA)
2022 Burial Project 3693. On file, Office of the State Archaeologist, University of Iowa, Iowa City

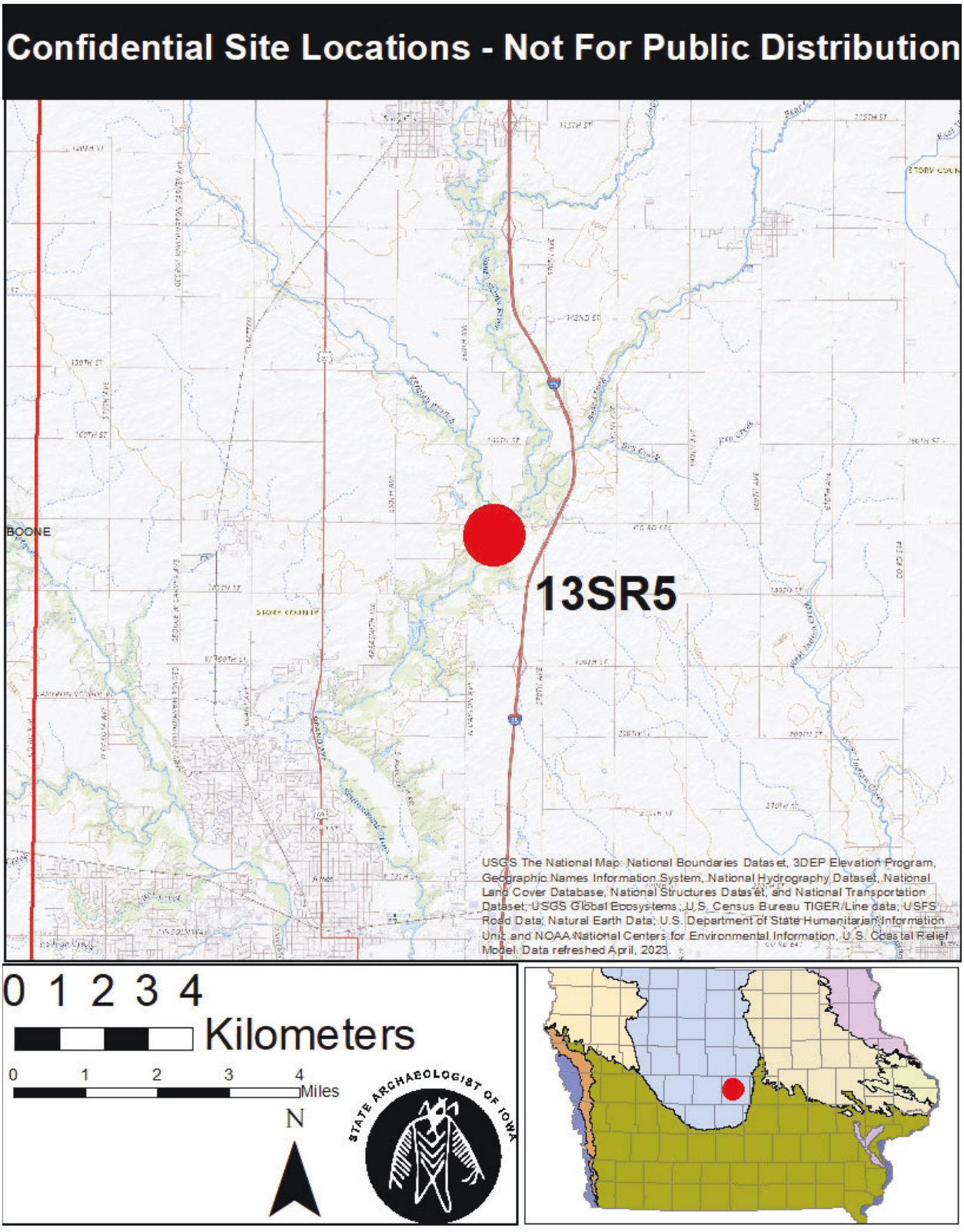

Figure 1. Findspot of human remains.
From USGS Corley, Story County, Iowa (1978), 7.5' series quadrangle map. Scale 1:100,000.

Human Remains from the Clarke W. Mangun Papers

Samantha Murphy

A single calotte representing one adult individual of unknown sex and age was identified in the Clarke W. Mangun Papers collection housed in the University of Iowa (UI) Library Special Collections. The human remains were part of an anatomical collection. There is no documentation of their place of origin but it is most likely Mr. Mangun or his father acquired them in medical school at the University of Iowa. The location of the rest of the individual's cranium/skull is unknown.

Introduction

In December of 2021 the Clarke W. Mangun Papers were donated to the UI Library Special Collections by Nancy Van Wechel and a human calotte was discovered in June of 2022 when the papers were being documented by library staff. The remains were transferred to the Bioarchaeology Program in October of 2022 (UI OSA 2022). There was no indication of the presence of human remains during the donation process and no documentation of the individual represented is included in the papers. Mrs. Van Wechel's contact information was provided and the Bioarchaeology Program contacted her to possibly get more information. She indicated the collection represents the careers of her father and grandfather, Clarke Mangun Jr. and Sr., both of whom graduated from the UI Medical College. While she also indicated both traveled extensively and were enlisted in World War II and World War I, respectively, the condition of the bone on the calotte transferred to the OSA strongly suggests it was most likely an anatomical specimen associated with one of their training careers here at UI. She was unaware of where the rest of the individual's skull might be.

Osteological Analysis

The human remains present include a calotte from a single individual. The calotte was created with a transverse autopsy cut with uniform square margins. The cut is slightly uneven leading to divots and chipping along the right parietal and frontal bone. The calotte includes most of the parietals and frontal bone and a small portion of occipital. There are no other bones associated. Based on the cranial bones present the only measures that could be taken were cranial length 185mm and breadth 137mm. All of the sutures are completely fused with no obliteration suggesting that the individual is a young to middle aged adult. Sex or ancestry could not be determined.

Based on what is known about the Mangun Papers and the postmortem modification the individual was likely part of an anatomical or educational collection. This would also suggest that the individual is nonancient meaning that its antiquity is less than 150 years old. There is no staining on the bone that would suggest a previous burial context.

Summary

A single calotte representing one individual was discovered in the Clarke W. Mangun Papers that Nancy Van Wechel donated to the UI Library's Special Collections. The individual is a young to middle aged adult; sex and ancestry cannot be determined. The individual was part of an anatomical or educational collection

prior to donation that was acquired by Mrs. Van Wechel's father or grandfather during their careers at the UI Medical College. She was supportive of the element becoming part of the OSA's teaching collection.

References Cited

University of Iowa, Office of the State Archaeologist (UI, OSA)
2022 Burial Project 3724. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Human Remains from Mound Site 13CT34

Lara Noldner

Human remains representing one adult and one older juvenile were identified among faunal remains in the OSA's collection from 13CT34. One right rib fragment represents an adult of unknown age and sex; a worn deciduous 2nd molar crown represents an older juvenile, possibly around the age of 10, or it is a naturally shed tooth and the true age of the individual at death is unknown. Their condition and number of individuals represented matches that of human remains previously reported from the OSA's 1979 investigation of the site.

Introduction

Site 13CT34 is one of two mounds (Early to Late Woodland period (Collins and Forman 1995)) designated the Buck Creek Mounds; 13CT34 indicates Mound 1 and 13CT36 indicates Mound 2 (Till and Hotopp 1979). Phase II and III investigations were conducted by the OSA in 1979 and 1995 (Collins and Forman 1995; Fokken et al. 1980; Till and Hotopp 1979). One fragmentary burial (Feature 1) on the mound floor and commingled remains encountered among a rock alignment of a central pit (Fokken et al. 1980) were initially reported on by Alton Fisher (1980); he identified a minimum of two adult individuals of unknown age and sex (Lillie 2002). Additional remains encountered from various levels in trenches 1, 3 and 4 were reported in 1995 (Collins and Forman 1995); no additional adult individuals were identified but a minimum of one additional possible juvenile was noted (Lillie 2002).

The two human bone fragments documented here were found among faunal remains from the same site (UI OSA 2022, BP3730) under OSA accession number 922-34 with no associated catalog number. They do not increase the MNI from 13CT34 previously reburied in July of 1980 and November of 2001.

Osteological Analysis

Two individuals, one adult and one older juvenile, both of unknown age and sex, are represented by a right rib angle fragment (unknown number) and a worn 2nd deciduous molar crown, respectively. The deciduous molar is unsideable due to taphonomic damage and advanced wear; it is also unidentifiable as maxillary or mandibular. Its crown is worn flat with pin point-sized areas of dentine exposure indicating an older age range; one lingual quadrant is missing due to postmortem breakage as are the roots. Given that stage of root development/resorption could not be assessed due to taphonomic damage, it is possible the individual represented was around the age of 10 years old, but the tooth could have also been naturally shed. No pathologies are evident on either of the two fragments.

Summary

Two human bone fragments found among faunal remains from 13CT34 in the OSA's collections and transferred to the Bioarchaeology Program in October 2022 represent a minimum of one adult individual and one older juvenile. The adult individual is of unknown age and sex; the juvenile could have been around the age of 10 years old, or the tooth was naturally shed and does not represent the true age of the individual

at death. The remains were excavated during the OSA's 1979 and 1995 Phase II and Phase III salvage investigations, respectively, and are likely associated with the remains of three individuals reburied by the OSA in 1980 and 2001.

References Cited

Collins, James M. and Linda Forman

1995 Phase III Archaeological Salvage of The Buck Creek Mounds (13CT34 and 13CT36) Local Systems Project GRS-1792(2) Clayton County, Iowa. *Project Completion Report 18(14),* Highway Archaeology Program, University of Iowa, Iowa City.

Fisher, Alton K.

1980 *Human Skeletal Fragments from Buck Creek Mound Number 1 (13CT34).* Unpublished report on file, Burial Project File No. 94, Office of the State Archaeologist, University of Iowa, Iowa City.

Fokken, Michael J., E. Arthur Bettis III, and Alton K. Fisher

1980 Draft Report of Phase II and III Investigations at the Buck Creek Mounds, 13CT34 and 13CT36; GRS-1792(2), Clayton County Local Raods. Project Completion Report Vol. 4, No. 5L supplement. Office of the State Archaeologist, University of Iowa, Iowa City.

Lillie, Robin M.

2002 Fragmented Skeletal Remains from Buck Creek Mounds, 13CT34 and 13CT36, Clayton County. In Reports on Iowa Burial Projects: Osteology and Archaeology, edited by Shirley J. Schermer, and Robin M. Lillie, pp. 149–154. Research Papers Vol. 27, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

Till, Anton, and John A. Hotopp

1979 The Buck Creek Terrace Mounds, 13CT34 and 13CT36, Clayton County, Iowa: A Preliminary Phase II Report prepared for The Iowa Department of Transportation, Secondary Roads Division. Project Completion Report Vol. 2, No. 67 supplement. Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist (UI, OSA)

2022 Burial Project 3730. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

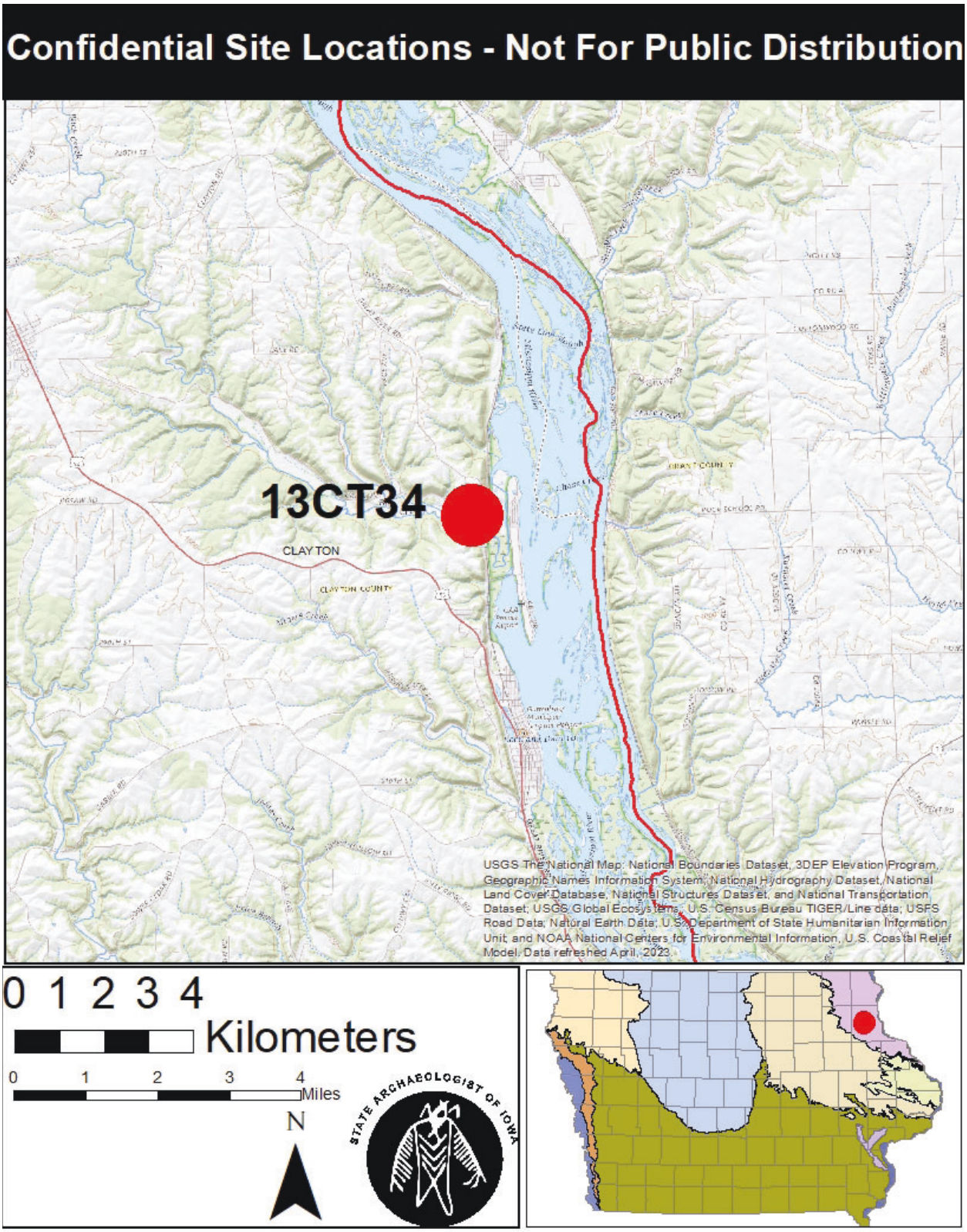

Figure 1. Findspot of human remains.
From USGS Corley, Clayton County, Iowa (1978), 7.5' series quadrangle map. Scale 1:100,000.

Human Remains from Mound Site 13JP12

Lara Noldner

Human remains representing one adult individual were identified among faunal remains in the OSA's collection from 13JP12. Six small calcined bone fragments, 5mm and less in diameter, include one cranial fragment and five long bone fragments that are all unidentifiable by element; sex and age are indeterminate. Their condition and evidence of cremation matches that of human remains previously reported from the OSA's 1977 investigation of the site.

Introduction

Site 13JP12 consists of two mounds documented in 1977 and reported as having no surface expression due to plowing. The 1977 investigation by the OSA involved excavating test units in the suspected location of Mound 1 ahead of the proposed site of the Sutton Coal Mine (Tiffany et al. 1977). Alton Fisher examined and reported on human bone recovered from squares 4, 5, and 13; remains consisted of around 100 small fragments ranging from 3-46mm in diameter and represented at least three individuals (one possible juvenile and presumably two adults) (Fisher 1978). Around half were calcined as a result of incineration and were from cranial and long bones that could not be identified by element. All the fragments were suspected to represent at least three individuals based on their separate burial locations.

The six human bone fragments documented here were found among faunal remains from the same site (OSA 2022, BP3732). All were designated accession number 131; they are also calcined, and one is labeled with "Mound 1 Sq.5" so they are most likely also associated with the cremains documented by Fisher (1978). The six fragments do not increase the MNI from 13JP12 previously reburied in May of 1979.

Osteological Analysis

These remains consist of six small human bone fragments: one cranial and five long bone. Hand-written labels on each fragment indicate the accession and catalog number separated with a hyphen. The cranial fragment is labeled 131-30. One long bone fragment (131-11) is indicated with provenience information "Mound 1 Sq. 5, AP". The four other long bone fragments (one labeled 131-8 and three labeled 131-35) do not have more provenience information.

All six fragments are unidentifiable by element and represent a minimum of one adult individual of unknown age and sex. No pathologies are observable.

Summary

Six human bone fragments found among faunal remains from 13JP12 in the OSA's collections and transferred to the Bioarchaeology Program in October 2022 represent a minimum of one adult individual of unknown age and sex. The remains were excavated during the OSA's 1977 investigation aimed at relocating Mound 1 ahead of the proposed Sutton Coal Mine and are likely associated with the remains of three individuals reburied by the OSA in 1979.

References Cited

Fisher, Alton K.
1978 Report on Human Remains from Six Archaeological Sites in Iowa. Research Papers Vol. 3, No. 4. Office of the State Archaeologist, University of Iowa, Iowa City.

Tiffany, Joseph A., Larry R. Abbott, and Duane C. Anderson
1977 Archaeological Investigations at the Proposed Site of the Sutton Coal Mine, Monroe, Iowa. Research Papers Vol. 2, No. 15. Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist (UI, OSA)
2022 Burial Project 3732. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

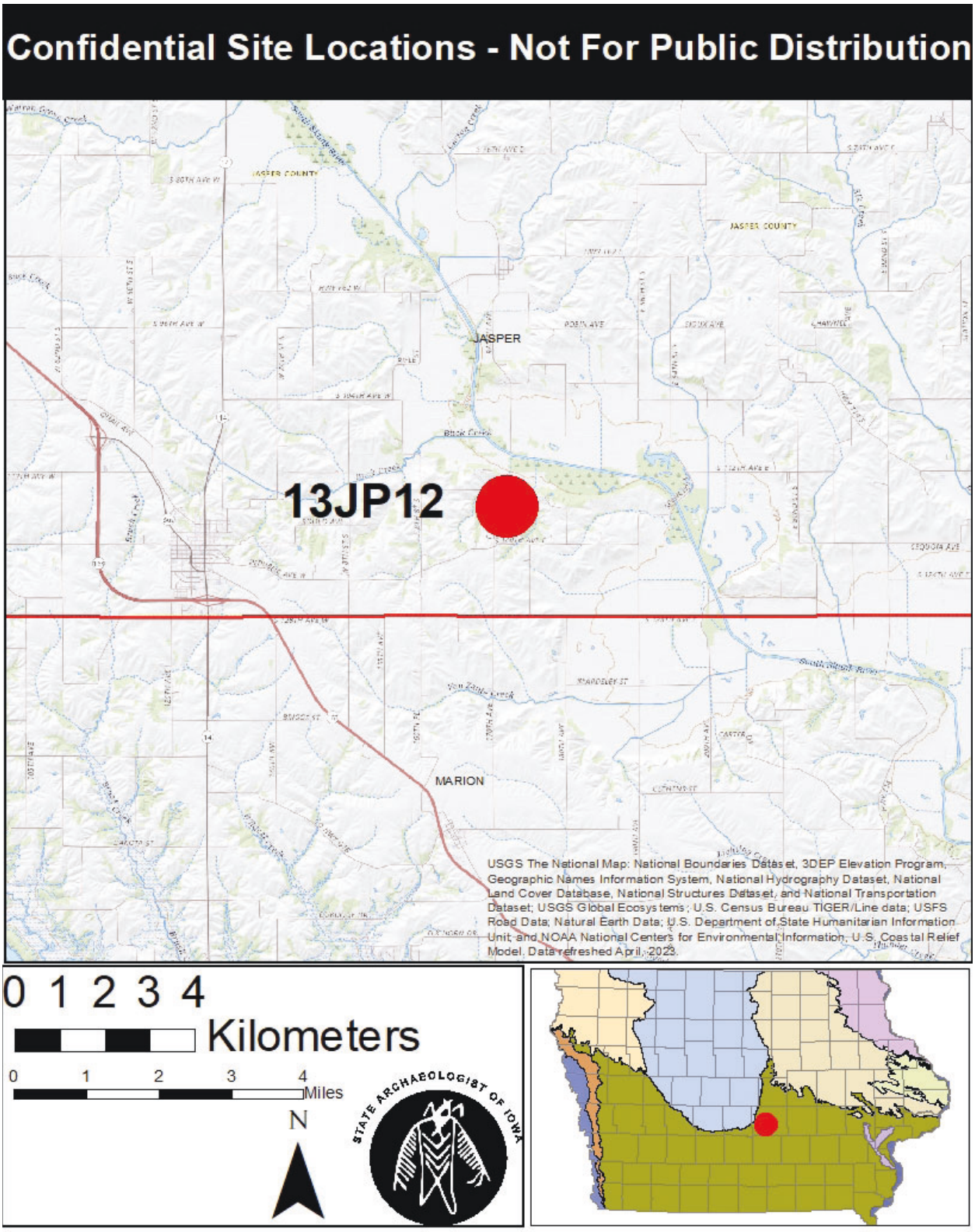

Figure 1. Findspot of human remains.
From USGS Corley, Jasper County, Iowa (1978), 7.5' series quadrangle map. Scale 1:100,000.

Human Remains of Unknown Provenience, Possibly Inuit Ancestry

Lara Noldner

Human remains representing one middle aged adult female were identified in a University of Iowa (UI) Anthropology professor's private collection and transferred to the OSA in 2022. The remains consist of one fairly complete mandible with evidence of anatomical preparation and a handwritten label indicating Inuit or Yupik ancestry. Caries are the only pathologies present. There was no associated documentation regarding the original provenience of the remains.

Introduction

This report documents one of two mandibles discovered in retired UI professor, Russ Ciochon's, private collection in November of 2022. Both were transferred to the OSA immediately after their discovery (UI OSA 2022a, 2022b) (BP3735, BP3736). The professor collected widely from the U.S. and other countries but was inconsistent about recording the provenience or original source of human skeletal remains. The mandible reported here (BP3735) was labeled with "Eskimo ♀" in pencil and demonstrates evidence of anatomical preparation, but there is no other documentation of the individual's life history or original provenience. With only the label as associated information, it is assumed the individual is of Inuit or Yupik ancestry.

Osteological Analysis

A middle-aged adult female is represented by a single fairly complete mandible with most molars in situ except for the left 2nd. All other teeth, including the left second molar, were lost postmortem with no alveolar resorption. Dental and osteometrics are included in Tables 1 and 2, respectively. The gracile and pointed mental eminence confirm the written designation on the left internal mandibular body surface that the individual is female. Moderate dental wear suggests a middle adult (35–50-year-old) range.

Anatomical preparation, likely for use in a teaching collection, is evidenced by the condition and bleached white color of all cortical bone and tooth roots. Bone cortex is dense with only minimal post-mortem cracking. There is also a 1mm diameter holed drilled through the middle of the coronoid process of the left ramus, which is typical of anatomical specimens where the mandible is secured to the cranium with a spring or wire. The right mandibular ramus is missing due to a vertical postmortem break immediately distal to the right third molar.

Dental wear is moderate with full cusp and crenulation removal but very little to no dentin exposure on the mandibular first molars, right second molar, and left third molar. The mandibular right third molar exhibits less wear; the cusps are rounded and crenulations are still visible (Table 3).

Caries are evident on the mandibular left and right first molars. The caries on the left 1st molar is an interproximal cervical caries on the distal root surface that also affects a sliver of the crown at the CEJ. The lesion extends across the lingual half of the root and is 2mm wide and 1mm deep. The caries on the right first molar also likely started as an interproximal cervical caries but was more advanced in tooth deterioration at the time of death; the lesion is spherical, about 2-3mm deep, and has removed most of the distal aspect of the distolingual quadrant. Recession of the intact alveolus 2-5mm from the CEJs of the molars indicates periodontal disease.

Summary

One fairly complete mandible represents a middle adult female with moderate dental wear, two caries affecting both first molars, and evidence of periodontal disease. There is no associated documentation or provenience information for the individual. The handwritten label on the left internal mandibular body surface indicates Inuit or Yupik ancestry. Cortical bone condition and postmortem modifications indicate anatomical preparation of the element and there is no evidence of prior burial.

References Cited

University of Iowa, Office of the State Archaeologist
2022a Burial Project 3735. On file, Office of the State Archaeologist, University of Iowa, Iowa City.
2022b Burial Project 3736. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Dental Metrics (mm) BP3735

Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
Mandible:				
LM3	11.03		9.7	
LM1	11.04	10.44	8.75	8.59
RM3	9.8	10.41		8.54
RM2	10.91	10.64	8.88	
RM1	10.79	11.01	9.1	

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 2. Osteometrics (mm) BP3735

Measurement	
L minimum ramus breadth	37.37
L maximum ramus breadth	44.77
L maximum ramus height	55
mandibular length	87
mandibular angle	111°

Table 3. Dental Inventory BP3735						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
Mandible						
LM3	2		0	3	4	4
LM2	5		0	0	0	0
LM1	2		4	3	3	5
LPM2	5	9				
LPM1	5	9				
LC	5	9				
LI2	5	9				
LI1	5	9				
RI1	5	9				
RI2	5	9				
RC	5	9				
RPM1	5	9				
RPM2	5	9				
RM1	2		3	3	3	3
RM2	2		3	3	4	3
RM3	2		2	4	2	1

Human Remains of Native American Ancestry from Unknown Provenience

Lara Noldner

Human remains representing one middle to older aged adult male were identified in a University of Iowa (UI) Anthropology professor's private collection and transferred to the OSA in 2022. The remains consist of one fairly complete mandible with advanced dental wear and evidence of prior burial. Periodontal disease is the only pathology evident. There was no associated documentation regarding the original provenience of the remains; dental wear is typical of ancient Native American populations.

Introduction

This report documents one of two mandibles discovered in retired UI professor, Russ Ciochon's, private collection in November of 2022. Both were transferred to the OSA immediately after their discovery (UI OSA 2022a, 2022b) (BP3735, BP3736). The professor collected widely throughout the U.S. and other countries but was inconsistent about recording the provenience or original source of human skeletal remains. The mandible reported here (BP3736) has no associated documentation or labels. Advanced and uniform dental wear is typical of ancient Native American populations using ground stone tools to process food, but a narrower geographic region cannot be identified.

Osteological Analysis

A middle to older-aged adult male is represented by a mostly complete mandible with evidence of attempted reconstruction; a break just right of midline separates the right and left halves and an attempt was made to glue them back together. The teeth were glued into their sockets and a light lacquer was applied over the whole element. The robust, square mental eminence indicates a male individual, and moderate to advanced dental wear suggests an age towards the older end of the middle adult range (45-50 years). See Table 1 for dental metrics.

Most of the rami are missing and several right teeth have chipped and cracked enamel due to postmortem breakage. All mandibular dentition are complete and in occlusion with the exception of the right first molar that was lost premortem with full alveolar resorption and the right lateral incisor that was lost postmortem with no resorption. Bone cortex is dense with little taphonomic damage, but light brown staining and dirt embedded in broken margins of the rami indicates a previous burial context.

Mandibular dental wear is moderate to advanced. The left first and second molars are worn flat with little to no dentine exposure, as are both second premolars. The right first and second molars have some cusps that have not yet been completely worn flat. All canines and incisors present exhibit more advanced wear with significant dentine exposure but complete enamel rims (Table 2).

Recession of the alveolus 3-6mm from the CEJ around all teeth present indicates periodontal disease; minimal amounts of calculus are present on the roots of the left lateral incisor, canine, and first premolar immediately adjacent to the CEJ. No caries or abscesses are evident.

Summary

One fairly complete mandible represents a middle to older adult male with moderate to advanced dental wear and evidence of periodontal disease. There is no associated documentation or provenience information for the individual. Cortical bone condition, staining, and adhering sediment indicate the remains were taken from a burial context. Advanced and uniform dental wear is typical of ancient Native American populations using ground stone tools to process food, but a narrower geographic region cannot be identified.

References Cited

University of Iowa, Office of the State Archaeologist
2022a Burial Project 3735. On file, Office of the State Archaeologist, University of Iowa, Iowa City.
2022b Burial Project 3736. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Dental Metrics (mm) BP3736

Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
Mandible:				
LM3	10.21	10.5	9.22	
LM2	9.83	11.06	8.49	
LM1	10.57	11.46	9.28	
LPM2	6.27	8.29	4.71	
LPM1	5.96	7.56	5.25	
LC	7.06	7.68	5.52	
LI2	6.14	6.18	3.88	
LI1	5.15	5.6	3.51	
RI1	5.18	5.55	3.44	
RI2				
RC			5.36	
RPM1			4.7	
RPM2	5.94		4.87	
RM1				
RM2	10.43	10.6	8.88	
RM3		10.15	8.88	

Table 2. Dental Inventory BP3736						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
Mandible:						
LM3	2		4	4	4	4
LM2	2		5	4	4	4
LM1	2		5	5	5	5
LPM2	2	4				
LPM1	2	5				
LC	2	4				
LI2	2	5				
LI1	2	5				
RI1	2	5				
RI2	5	9				
RC	7	9				
RPM1	2	6				
RPM2	2	4				
RM1	4		0	0	0	0
RM2	2		4	4	4	4
RM3	2		4	3	4	4

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Human Remains from an Anatomical Collection

Samantha Murphy and Lara Noldner

Two individuals represented by crania were transferred to the OSA by a physician at the University of Iowa (UI) Hospital. The individuals had been identified in her recently deceased father's possessions from his days in medical school in the 1940s. The individuals include a Native American male presenting possible European admixture and a European American male. The individuals show modifications typical of individuals found in anatomy collections.

Introduction

Liz Takacs a physician at UI contacted the Iowa Archaeological Society (IAS) about a skull found in her recently deceased father's possessions that was an anatomical specimen from his days in medical school in the 1940s. The two individuals represented were transferred to the OSA on December 23, 2023, for appropriate disposition (BP3742) (UI OSA 2022). There is no associated provenience or life history information for the individuals.

Osteological Analysis

INDIVIDUAL 1

Individual 1 is represented by a complete skull that was transferred from an anatomical collection, dating to the 1940s. Individual 1 shows modifications typical of anatomical and education collections. Transverse autopsy cuts were made along the cranial vault to remove the calotte, which is typical for dissection of the brain and observation of the internal cranial vault. The cut is uniform with square margins and made with a power saw. There is minimal bone loss, less than 1mm and pins and hooks were placed along the cut to hold the calotte to the cranium. The mandible was also rearticulated to the cranium with springs. On the mandible 1mm holes were drilled on the anterior portion of coronoid processes on the right and left side where the spring was attached. The springs were threaded through the temporal fossa and attached to pins placed in the frontal bone, nearly on the sphenofrontal suture on the right and left sides. The springs were removed in order to prevent further postmortem damage.

Individual 1 is in relatively good condition for being an anatomized specimen of over 70 years old. Some of the smaller internal nasal bones cannot be observed due to postmortem breakage but otherwise the cranium is complete. The cranium is covered in pencil and pen notations indicating non-metric traits and foramina and were likely made by the donor's father during his medical education. The teeth show evidence of postmortem damage and chipping due to the springs pulling the mandible forcibly into occlusion with the maxilla and handling over time. The mandibular condyles show evidence of postmortem wear from being forcibly held against the maxilla.

The teeth present a mix of in situ, present but not in occlusion, postmortem, and possible antemortem loss (See Table 1 for Dental Inventory and Table 2 for Dental Metrics). In the maxilla the teeth that are in situ are the first molars, left second premolar, and right third molar. In the mandible the in-situ teeth are the premolars, canines, right incisors, left central incisor and left first molar. All of the other teeth, with the exception of the left second and possibly third maxillary molars, and the right first mandibular molar, were

lost postmortem with no alveolar resorption. A small amount of calculus can be observed interproximally between the mandibular teeth on the lingual and buccal aspects bordering the CEJ. The teeth demonstrate a small amount of wear which might suggest an older individual, as by the 1940s food was machine processed. Dentistry would have also been available if the individual's socioeconomic status allowed for it.

Individual 1 exhibits extremely thin alveolar bone buccally on both the maxilla and mandible leading to taphonomic exposure of most root sockets, but several pathologies indicative of poor dental health are evident. These include several caries, abscesses secondary to caries, and periodontal disease.

Recession of the alveolus 2-4 mm from the CEJs of all teeth present is evident across the maxilla and mandible. An abscess with buccal perforation led to perimortem loss of the left maxillary second molar and likely third molar as well. There is no resorption of alveolus around the socket for the second molar, and it was enlarged mesially and distally into a spherical lesion lined with large porous trabeculae. The original size of the buccal perforation is unknown due to postmortem damage, but the superior scalloped and porous margin of the lesion extends slightly into the normal dense surrounding bone of the maxilla. There are also remnants of a scalloped perforation of the lesion into the third molar's root socket. The crowns of the maxillary right third molar and left second premolar were lost premortem likely due to advanced caries; only a faint ridge of the third molar's crown and none of the premolar's crown remain. Infection of the premolar caused a secondary abscess; a buccal perforation 2mm wide is present. The left first maxillary premolar also appears to have been lost by a similar process; remnants of a buccal perforation (original size unknown) are evident by a shallow groove lined with dense normal bone at the lesion's superior aspect; the tooth's root sockets are lined with large dense trabeculae. The mandibular right first molar was likely lost due to abscess as well, but well premortem; the margins of the lesion are lined with denser trabeculae and the inferior margin of its buccal perforation is a shallow depression of normal dense bone. A large interproximal caries has removed most of the mesial aspect of the lower central incisor's crown; two additional interproximal caries 2mm in diameter are present on its distal aspect: one midway up the crown, and one at the CEJ. Cervical caries also affected the mandibular left first molar: one has removed a 4 mm wide section of the root to a depth of about 4 mm on the lingual side and another 2mm wide lesion with a depth of about 1mm is present on the buccal aspect. An earlier stage abscess is also evident for the same lower first molar; a 1mm wide buccal perforation with dense margins inferiorly and large porous trabeculae superiorly is present.

This individual also experienced poor health due to disease or malnutrition early in life as evidenced by numerous enamel hypoplasias on anterior mandibular dentition. No cribra orbitalia is evident, but healed remnants of porosity at the posterior medial corner of the left parietal suggests at least one instance of porotic hyperostosis. Faint shallow lines with no coloration occur adjacent to the CEJ (less than 2mm away) on all the premolars. Lines are slightly deeper with no coloration and are 2mm away from the CEJ on the canines, and pitting is visible over most of the labial surface of their partial crowns occlusal to the lines. The right central incisor has a pitted groove on its labial aspect 1mm from the occlusal surface, and the right lateral incisor has a groove with yellow discoloration that extends across both labial and lingual aspects of the crown, 2mm from the occlusal surface.

This individual also has double-rooted maxillary premolars and maxillary second molars with only two roots.

Based on the sexually dimorphic characteristics the individual is a possible male. The nuchal crest, mastoid processes, supraorbital margins, and glabella are all robust and prominent. The mental eminence and entire mandible are robust and large which strongly suggests a male individual. All of the visible cranial sutures are closed and the lambdoidal and sagittal sutures show some evidence of obliteration. Considering this and the slight dental wear of an individual consuming foods processed with modern technology it is likely that the individual is likely towards the older end of the middle age range.

FORDISC analysis was completed in order to determine ancestry of Individual 1. All cranial measurements (see Table 3) were compared against African American, Native American, and European

males; the results were a posterior probability of 0.831 with and 85.3% (197/231) cross validation rate for Native American male. Individual 1 presents facial features typical of European decent such as a sharp nasal sill and spine, as well as a narrow nasal breadth. Additionally, there is a lack of prognathism and retreating zygomatic arches. The cranial measurements were run again, this time just comparing Native American and European males ; the results still indicated Native American ancestry with a posterior probability of 0.987 and a 90.7% (165/182) cross validation rate. When only using facial features, the results still point to Native American ancestry, however the probability is much lower, 0.593 posterior probability with an 88.5% cross validation. It is possible that the individual presents an admixture of Native American and European ancestry.

INDIVDIUAL 2

Individual 2 is represented by a partial cranium. Only the left maxilla and lower left portion of the frontal bone are present. Uniform cuts with square margins from a power saw are present through the frontal, temporal, zygomatic, and down the midline of the nasal aperture. There is a single hook on the portion of the zygomatic arch that is still present suggesting that Individual 2 was once articulated together with the rest of the cranial bones. A string was also attached to pass through the lacrimal foramen.

Three teeth are observable in situ: the left second incisor, canine and first premolar (see Table 4 for dental inventory and Table 5 for dental metrics). The teeth present show evidence of postmortem chipping and damage. All of these teeth show evidence of advanced wear and dentine exposure. The first premolar has a small caries on the occlusal surface (see Table 6 for dental pathology). The left first incisor and second premolar were lost postmortem and are no longer observable. All three molars on the left side were lost premortem with significant alveolar resorption. The wear, caries, and advanced alveolar resorption all suggest the individual is an older adult. It is impossible to estimate age beyond the teeth as there are no other aging metrics observable.

There are limited sexually dimorphic characteristics observable including only the glabella and left supra orbital margin. Both of these are robust and prominent which suggest male. FORDISC analysis was not possible for this individual (see Table 7 for cranial measurements). There is limited to no prognathism suggesting European ancestry.

Summary

Two individuals represented by a skull and a cranium were transferred to the OSA from a private citizen whose father had them as part of an anatomical collection dating to the 1940s. One cranium represents an adult male of Native American ancestry with European admixture and evidence of both poor dental health and poor health or malnutrition early in life. The second partial cranium represents an adult male of possible European ancestry. Both individuals had postmortem modifications typical of those found in anatomical collections. There is no provenience or life history for the individuals.

References Cited

University of Iowa, Office of the State Archaeologist (UI, OSA)
2022 Burial Project 3742. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Dental Inventory BP 3742 Individual 1						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MAXILLA:						
RM3	2		5	5	5	5
RM2	5		0	0	0	0
RM1	2		2	2	2	2
RP2	5	9				
RP1	5	9				
RC	5	9				
RI2	5	9				
RI1	5	9				
LM3	4		0	0	0	0
LM2	4		0	0	0	0
LM1	2		1	1	1	1
LP2	7	9				
LP1	5	9				
LC	5	9				
LI2	1	9				
LI1	1	9				
MANDIBLE:						
LM3	4		0	0	0	0
LM2	4		0	0	0	0
LM1	2		4	4	4	4
LP2	2	1				
LP1	2	1				
LC	7	9				
LI2	5	9				
LI1	2	9				
RM3	4		0	0	0	0
RM2	4		0	0	0	0
RM1	4		0	0	0	0
RP2	2	1				
RP1	2	1				
RC	7	9				
RI2	2	1				
RI1	2	1				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 2. Dental Metrics (mm) BP 3742 Individual 1

Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
MAXILLA:				
RM1	11.0	10.0		
LM1	10.0	10.0		
MANDIBLE:				
LM1	11.0	10.0		
LP2	5.0	7.0		
LP1	5.0	6.0		
RP2	6.0	5.0		
RP1	5.0	5.0		

Table 3. Cranial Metrics (mm), BP3724

Cranial metric	Individual 1
Maximum cranial length	178
Maximum cranial breadth	140
Bizygomatic diameter	127
Basion-bregma height	130
Cranial base length	95
Basion-prosthion length	96
Maxillo-Alveolar breadth	61
Maxillo-Alveolar length	56
Biauricular breadth	120
Upper facial height	64
Minimum frontal breadth	96
Upper facial breadth	100
Nasal height	46
Nasal breadth	22
Orbital breadth L	36
Orbital breadth R	40
Orbital height L	25
Orbital height R	25
Biorbital breadth	95

Table 3. Cranial Metrics (mm) BP3724 cont.	
Cranial Metric	**Individual 1**
Interorbital breadth	25
Frontal chord	106
Parietal chord	105
Occipital chord	90
Foramen magnum length	31
Foramen magnum breadth	29
Mastoid length L	29
Mastoid length R	30
Chin height	30
Mandibular height L	29
Mandibular height R	30
Bigonial width	90
Bicondylar breadth	114
Minimum ramus breadth L	30
Minimum ramus breadth R	29
Maximum ramus breadth L	42
Maximum ramus breadth R	42
Ramus height L	49
Ramus height R	51
Mandibular length	80
Mandibular angle	100

Table 4. Dental Inventory BP 3742 Individual 2						
Tooth	**Presence**	**Attrition:**	**Attrition- molars:**			
		I, C, P	**Mes-buc**	**Mes-ling**	**Dis-ling**	**Dis-buc**
MAXILLA:						
RM3	9		0	0	0	0
RM2	9		0	0	0	0
RM1	9		0	0	0	0
RP2	9	9				
RP1	9	9				
RC	9	9				
RI2	9	9				
RI1	9	9				
LM3	4		0	0	0	0
LM2	4		0	0	0	0
LM1	4		0	0	0	0
LP2	5	9				

Table 4. Dental Inventory BP 3742 Individual 2 cont.						
		Attrition	Attrition-molars			
Tooth	Presence	I, C,P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
LP1	7	9				
LC	2	3				
LI2	7	3				
LI1	5	9				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 5. Dental Metrics (mm) BP 3742 Individual 2				
Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
MAXILLA:				
LC	7.0	5.0		
LI2	3.0	5.0		

Table 6. Dental Pathologies BP 3742 Individual 2		
Tooth	Caries:	
	Number	Type
MAXILLA:		
LP1	1	occlusal surface

Table 7. Cranial Metrics (mm), BP3742	
Cranial metric	Individual 2
Orbital breadth L	40
Orbital height L	37

Human Remains from Site 13PM32 or 13PM33

Lara Noldner

Cremated human remains representing four adults of unknown age and sex were collected from one of the Blue Diamond Ranch Sites, 13PM32 or 13PM33, on August 19, 1966. The two sites are in close proximity on the same landform with unknown precise locations and extents. The human remains were transferred to the OSA from the University of Missouri Museum of Anthropology along with a number of other artifact collections from other sites in Iowa.

Introduction

In January of 2022 the OSA accepted the transfer of several collections of artifacts from sites in Iowa, as well as human remains thought to be from the West Broken Kettle Site (13PM25) (OSA 2022a BP3701 and 2022b BP3747), from the University of Missouri Museum of Anthropology (UMMA) Archaeology Division. UMMA's original site designation of 13PM25 for the human remains was based on a bag of unassociated artifacts labeled with the site number, however the human remains were more directly indicated as being collected from the "Blue Diamond Ranch Crematory" on August 19, 1966. As the date of excavation and site name more closely match sites documented by Rogers Banks in 1966 it is more likely the human remains originated from 13PM32 or 13PM33. West Broken Kettle is a significant distance from Blue Diamond Ranch and was excavated in subsequent years by Drexel Peterson in 1967 (Peterson 1967) and Dale Henning in 1969 (Henning 1969) with no mention of investigation by Banks (Anderson and McAlister 1972).

Sites 13PM32 and 13PM33 are secondary burial sites; 13PM32 is cited as "Blue Diamond Burial No. 1" (OSA 1977 BP17) and 13PM33 is cited as "Blue Diamond Burial No. 2" (Anderson and McAlister 1972). Tiffany (1977) additionally mentions 13PM33 as a mound site. The sites are in close proximity as documented in I-Sites, but their exact locations and extents are unknown, and they could represent burial components of the same larger upland cemetery as they are on the same landform. Site 13PM33 was questionably documented as Woodland based on associated pottery; a time period for 13PM32 was not recorded (Anderson and McAlister 1972, Tiffany 1977). 13PM32 is documented as a line of six skulls all facing the same direction with a pile of human bones at one end, and all were in association with a pyramid of rocks (Fisher 1977, Tiffany 1977). 13PM33 is only briefly indicated to consist of a concentration of burned bone and the base of a Woodland pot, and human remains were questionably transferred to the University of Missouri (Anderson and McAlister 1972). Given lack of detailed notes and provenience, it is unclear from which of the sites the cremains described below originated. The sites were possibly created in the Woodland Period, but could also be affiliated with Great Oasis and/or Mill Creek archaeological traditions given their upland locations and proximity to additional secondary burials.

The human remains were documented by UMMA osteologist K. Lauria (see Table 1 for inventory) on June 15, 2022 (OSA 2022a BP3747). Given the fragmentary nature of the cremains the inventory was verified but no further analysis was conducted by the OSA Bioarchaeology Program. No excavation records of the original orientation of the elements are available, but their fragmentation and coloration are consistent with cremation and secondary burial. A bag of ash and soil is also associated with the human remains.

Osteological Analysis

Four adult individuals of unknown sex and age are represented by commingled cranial and postcranial cremains. All elements were divided by Lauria into eight labeled bags; a handwritten inventory is included in BP file 3747. This inventory (Table 1) reflects identifiable elements in bags 1-6; bags 7 and 8 are indicated as containing 750+ fragments that were unidentifiable. Based on the presence of four mandibular fragments with complete mental eminences, the MNI was determined to be four. The color (black, grey, and bright white) and condition of all bone fragments are consistent with cremation. No pathologies are evident. No standard osteometrics were possible.

Summary

Highly fragmented cranial and postcranial human remains, consistent in coloration and condition with cremation and secondary burial, were removed from 13PM32 or 13PM33 by Roger Banks on August 19, 1966, with no record of their original provenience or orientations. They were subsequently transferred at an unknown date to the UMMA Archaeology Division. The sites were possibly created in the Woodland Period, but could also be affiliated with Great Oasis and/or Mill Creek archaeological traditions given their upland locations and proximity to additional secondary burials. The OSA accepted transfer of the human remains along with collections from several other sites in Iowa on January 13, 2023. Four adult individuals of unknown sex and age are represented.

References Cited

Anderson, Duane C., and Patricia McAlister Williams
1972 Salvaged and Excavated Sites in Northwestern Iowa. Northwest Chapter of the Iowa Archeological Society Newsletter 20(2):3–12.

Fisher, Alton K.
1977 Human Bones from the Blue Diamond Burial No 1, 13PM32. In Reports of Human Remains from Three Counties in Western Iowa, by Alton K. Fisher, Dean M. Thompson, and Joseph Tiffany, pp. 13–14. Research Papers Vol. 2, No. 11. Office of the State Archaeologist, University of Iowa, Iowa City.

Henning, Dale R.
1969 Plymouth County: Broken Kettle West 1969 Excavations. Documents on file, Office of the State Archaeologist, University of Iowa, Iowa City.

Peterson, Drexel A., Jr.
1967 A First Report on the Excavation of a Great Oasis Site 13PM25. Northwest Chapter of the Iowa Archeological Society Newsletter 15(4):3–8.

Tiffany, Joseph A.
1977 Introduction to 13PM27, 32 and 42. In Reports of Human Remains from Three Counties in Western Iowa, by Alton K. Fisher, Dean M. Thompson, and Joseph Tiffany, pp. 10–11. Research Papers Vol. 2, No. 11. Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist
1977 Burial Project 17. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist
2022a Burial Project 3701. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist
2022b Burial Project 3747. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

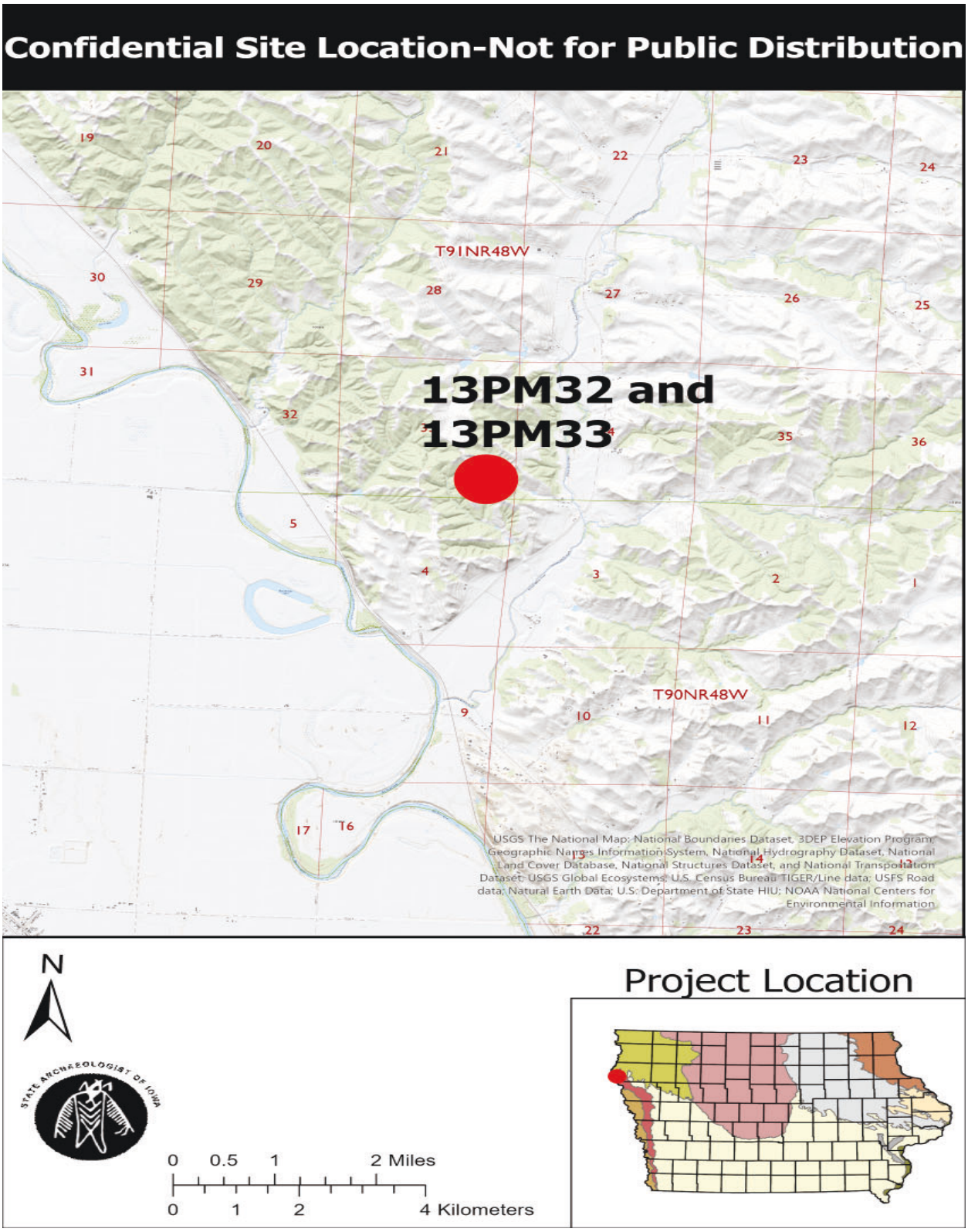

Figure 1. Findspot of human remains.
From USGS Corley, Plymoth County, Iowa (1978), 7.5' series quadrangle map. Scale 1:100,000.

Table 1. Adult Commingled Remains BP 3747					
Element	**Number of Fragments/ Specimens**	**MNE Left**	**MNE Right**	**MNE Midline**	**MNE Unsided**
Cranial fragments					
temporal	5	2	3		
occipital	2			2	
zygomatic	2		2		
frontal	3	1	2		
mandible	11	4	3	4	
Postcranial fragments					
clavicle	1				1
humerus	4	2	2		
radius	1				1
ulna	1		1		
femur	4	1	2		1
patella	1		1		
fibula	1				1
ribs (unidentifiable)	6				6
talus	1				1
navicular	1				1
metatarsal (unidentifiable)	1				1
metacarpal (unidentifiable)	1				1

Human Remains from Farm Field Near Castana, Monona County, IA

Lara Noldner

Human remains representing one older adult male were transferred to the OSA by the Monona County Sheriff's Office in February 2023. A mostly complete right parietal, articulating left parietal fragment, and partial mandible with five associated teeth are present; sex and age estimations are based on a prominent mental eminence and advanced dental wear, respectively. Highly degraded cortical bone on all surfaces of all elements and taphonomic damage indicate they were in a burial environment, likely in loess soil. The only known provenience is that they were collected from a farm field near Castana, IA, which is in Monona County. Dental wear and cortical preservation also indicate the individual is Native American.

Introduction

At an unknown date in 2021, the curator of the Mapleton Museum in Mapleton, IA turned these remains and several faunal bones, fossils, and non-cultural rocks over to the Monona County Sheriff's Office. There was no documentation as to the association of the items with the human remains. The curator reported the remains were in the possession of Russell McVicker and were donated to the museum by his wife Nadine after Russell's death in 1991. Nadine reported a farmer had given them to Russell after collecting them from a farm field near Castana, IA. The museum curator, Keith Robinson, did not have an exact date for the donation but believed it was in the late 1990s. Sheriff Jeff Pratt contacted the OSA and transferred the remains and items to the Bioarchaeology Program in February of 2023.

The items that were in the same box as the human remains upon their transfer to the Mapleton Museum include: six faunal bone fragments; one faunal long bone fragment that has smooth, polished edges suggesting it was found in a river; five fossil fragments; two fossilized faunal long bone fragments; a short string of leather with a knot in it; a small cylindrical piece of metal (~1cm high and about the same in diameter) with two perforations in the sides; and a cup-shaped concretion that is broken into three pieces and has the letters "E PM" etched on it (a piece likely including more of the etched word is missing). Due to differential preservation, it is unlikely that the faunal remains were buried with the human remains, and the leather and metal items are also too recently made to be associated funerary objects. It is unclear whether the fossils are associated, but such items are not common funerary objects.

Osteological Analysis

These parietal bones and partial mandible with associated teeth represent a minimum of one older adult male. Sex estimation is based on the prominent mental eminence and robust mandible and age estimation is based on advanced dental wear; the crowns of all teeth present have been reduced by half or more. Both right and left mandibular first molars have only an enamel rim remaining, and both have cup-shaped occlusal wear; their crown heights are higher lingually and slope downward buccally. The left second mandibular molar has slightly less occlusal wear with the enamel flattened but intact on its lingual half; the

buccal half only has an enamel rim remaining. The right mandibular canine and first premolar are worn flat with full dentin exposure and only an enamel rim remaining. All other teeth are missing postmortem.

Taphonomic damage to the alveolus has significantly reduced the depth of all tooth sockets present and both right and left mandibular rami are missing; all broken margins are rounded. The mandible was broken into two pieces postmortem at a vertically oriented crack across the socket of the left canine; the two halves refit but the edges of the break are rounded by taphonomic wear. Taphonomic processes have also severely degraded cortical bone on all surfaces of all elements present. Root etching is evident and bone condition is typical of elements buried in loess soil. The only intact cortex observable are two patches on the lateral surface of the left mandibular body, one inferior to the premolar and first molar sockets and one immediately inferior to the break that removed the left mandibular ramus. No pathologies are evident.

Summary

The human remains include a mostly complete right parietal, articulating partial left parietal, partial mandible and five teeth. Severely degraded cortical bone on all surfaces of each element indicate they are ancient and were in a burial environment, likely in loess soil. Dental wear also confirms their antiquity and that the individual represented is Native American of older adult age (50+ years) at death. A prominent mental eminence indicates the individual is male. The remains were originally donated to the Mapleton Museum, in Mapleton, IA and transferred to the Monona County Sheriff's Office by the museum curator in 2021. The Sheriff transferred the remains to the OSA in February 2023. They were accompanied by 14 non-cultural items and faunal bone fragments and two modern artifacts upon their transfer to the museum; these items are still with the remains at the OSA. The modern artifacts are too recently made to be associated with the human remains and faunal remains are most likely not from the same burial environment; it is unclear whether the non-cultural items are associated funerary objects, but they are not culturally modified (except for modern etching) and are not common burial items.

References Cited

University of Iowa, Office of the State Archaeologist (UI, OSA)
2023 Burial Project 3757. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Dental Inventory BP3757						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MANDIBLE:						
LM3	5		0	0	0	0
LM2	5		7	5	5	7
LM1	2		7	6	6	7
LP2	5	9				
LP1	5	9				
LC	5	9				
LI2	5	9				
LI1	5	9				
RM3	3		0	0	0	0
RM2	5		0	0	0	0
RM1	2		7	9	7	7
RP2	5	6				
RP1	2	6				
RC	2	6				
RI2	5	9				
RI1	5	9				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Human Remains from the Gilliam Family Donation

Samantha Murphy

Human remains representing a minimum of five individuals from unknown original proveniences were transferred to the OSA from the Gilliam Family. The human remains were transferred with funerary items that had been collected in the 1930s and 40s by the great-grandfather and grandfather of Amy Gilliam; she transferred the collection to the OSA following her grandfather's recent death. Two adult males, at least one juvenile aged 6-8, one juvenile aged 12-16, and at least one other adult individual of unknown sex and age are represented. All funerary items are unassociated with these individuals and are reported separately.

Introduction

The human remains of five individuals were transferred to the OSA by the Gilliam Family in February of 2023. They were part of a collection of artifacts acquired by Amy Gilliam's great grandfather and grandfather. The collection had been housed by Gilliam's grandfather at his residence until his recent passing. The family contacted the State Historical Society about donating the collection and upon discovery of the human remains the OSA was contacted. The OSA requested transfer of the human remains and any potential funerary objects in the collection. According to the records kept by Gilliam's grandfather the artifacts were collected from documented sites in eastern and western Iowa in the 1930s and 40s, with a majority originating from Blood Run National Historic Landmark (13LO2). The human remains were purchased by the original collector, but the date of purchase is unknown and there is no documentation of original provenience for any of the elements. Likely funerary objects were identified based on documentation available; any items described as being associated with burial mounds or graves were transferred to the OSA along with the human remains. All funerary objects are reported separately as they are not directly associated with the human remains.

Osteological Analysis

The human remains represent a minimum of five individuals: three adults and two juveniles. Despite the lack of documentation, the condition and morphological features of the remains, as well as the original collectors' tendency to collect Native American artifacts, indicate that the individuals are of ancient Native American ancestry.

INDIVIDUAL 1

Individual 1 is represented by a complete skull. The mandible has been permanently attached to the crania through a type of soldering glue that was common in the 1930s and 40s, which is congruent with the time period that the artifacts were being collected. The glue was applied at the temporal mandibular joint and along the remaining molars. A lacquer was applied to the sphenoid and palatine bones.

The cranium is relatively complete except for the internal nasal bones that are unobservable. There is also postmortem damage to the left ramus of the mandible. The cranium has sustained postmortem chipping and thinning of the bone on both zygomatics, the right alveolar process and the right parietal. The cortical

bone is severely degraded over the majority of the cranial vault and facial bones; cortical preservation is better on the basicranium and mandible.

The dentition also have significant postmortem damage. The individual lost their right mandibular first and second molars premortem and the associated alveolar bone is completely resorbed (Table 1 for dental metrics and Table 2 for dental inventory). The teeth that were lost postmortem include the maxillary canines, incisors, right second premolar, left second molar, and both third molars, and the mandibular right incisors. The left mandibular second and third molars were lost perimortem and likely due to abscess; there are no defined tooth sockets just remnants of spherical depressions that are lined with course trabeculae. The upper right first premolar was also possibly lost due to abscess but taphonomic damage to the alveolus does not allow a definitive determination; there is a large spherical lesion lined with large dense trabeculae and some porosity where the tooth's apex would have been. The root of left maxillary second premolar has been glued back into the socket, but the crown is unobservable. The teeth still in situ are the maxillary first molars, right second molar, left second premolar, first molar, and the mandibular premolars, right third molar, canines, left incisors, and first molar. All of these teeth show high amounts of wear to the point that they are worn flat with moderate dentin exposure.

Caries are present on the maxillary right third molar and left first molar on the interproximal surfaces, and on the mandibular right third molar on the interproximal surface (See Table 3 for dental pathology). The caries on the mandibular right third molar is located on the mesial aspect of the root at the CEJ; it is a 1mm wide lesion less that 1mm deep. The right second molar has a 3mm wide caries across the distal aspect of root that is 1mm deep and has also eroded the crown. The left maxillary first molar is missing its entire mesiolingual quadrant due to a caries that also may have started interproximally at the CEJ, but its precise origin is unclear. Abscess secondary to this caries is also evident by remnants of a buccal perforation at the tooth's root apices; the original size of the perforation is unknown due to taphonomic damage, but its superior exterior margin is smooth normal dense bone.

Based on the robust and pronounced sexually dimorphic characteristics and the general robusticity of the cranium and mandible the individual is a male. An age of older adult was estimated from the complete closure of the observable cranial sutures and the high amount of dental wear. The high amount of dental wear, condition of the remains and the collectors focus on Native American sites strongly suggest that the individual is of ancient Native American ancestry. FORDISC analysis of cranial metrics (See Table 4 for cranial metrics) confirmed the estimation that the individual is a Native American male with a posterior probability of 1.000 and a cross validation of 84.2%.

INDIVIDUAL 2

Individual 2 is represented by a small partial mandible fragment. The fragment is the anterior most portion including the mental eminence and mental foramina, and the vertical postmortem breaks occur at the left first premolar and the right second premolar sockets. There are four teeth observable: the left second incisor, and the right second incisor, canine and first premolar (Table 5 for dental metrics and Table 6 for dental inventory). Apart from the right canine these teeth were not in situ but could be refit into the sockets. Based on the observable sockets all other teeth were lost postmortem. The observable teeth show minimal evidence of wear.

Based on the size and thickness of the mandible fragment and the complete development of the teeth the individual is an adult (See Table 7 for cranial metrics). Due to the lack of wear the individual was likely younger to middle aged. The only sexually dimorphic characteristic present is the mental eminence which is pronounced and robust suggesting that the individual is male. The shovel shaped incisors support Native American ancestry. No pathologies were noted on this individual.

COMMINGLED INDIVIDUALS

The commingled human remains represent at least three individuals: two juveniles and one adult, all represented by various dentition. The juvenile dentition supports two different age categories to suggest two different individuals. There are no pathologies observed on any of the commingled dentition.

Juvenile Commingled

The juvenile dentition consists of five teeth (See Table 8 for juvenile commingled remains). Four of the teeth include a right maxillary deciduous second molar, left maxillary deciduous first and second molars, and a partially formed permanent first mandibular molar. The permanent molar's crown is complete with the root is halfway formed and the deciduous molars are completely developed with a moderate amount of wear suggesting an age range of 3 and 7. The partially developed permanent molar suggests an age between 6 and 8 years old. Because the wear on the deciduous teeth suggest the older end of the age range, and the age range for the permanent molar overlaps with the deciduous teeth, these four teeth could belong to one individual aged 6-8 years old.

The fifth tooth is a partially developed permanent third molar. The crown is completely formed but no roots have begun to form. This stage of third molar development typically occurs between the ages of 12 and 16. This is a significant enough age difference from the other juvenile teeth present to define as a second individual.

Adult Commingled

There are three adult teeth present in the commingled remains (See Table 9 for adult commingled remains). The teeth are all fully developed with evidence of postmortem chipping; on two of the teeth the enamel has been completely removed including the crowns' occlusal surfaces. There is one left maxillary canine that is the least damaged with little to no wear and slight shoveling can be observed. There is one premolar too damaged to determine side or if it is upper or lower and one suspected canine. The suspected canine has no distinguishing features and has been categorized based on the size and shape of the root.

Summary

The human remains that were transferred to the OSA from the Gilliam family represent a minimum of five individuals, two adult males, at least one juvenile aged 6-8, one juvenile aged 12-16, and at least one other adult individual of unknown sex and age. This was based off of a nearly complete cranium and mandible, a partial mandible fragment and commingled dentition. While the family had the general location and year of collection documentation for the artifacts acquired by the original collector there is no provenience information for any of the human remains; the skull was purchased at an unknown date. Based on the documentation for the artifacts the human remains were also likely acquired in the 1930s and 40s, but this cannot be confirmed. Morphological characteristics, the condition of the remains, and the collector's history of targeting known archaeological sites, all indicate the individuals are of ancient Native American ancestry.

References Cited

University of Iowa, Office of the State Archaeologist (UI, OSA)

2023 Burial Project 3758. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Dental Metrics (mm) BP 3758 Ind 1		
Tooth	**Mesiodistal**	**Buccolingual**
MAXILLA:		
RM1	11.0	9.0
LM1	8.0	10.0
MANDIBLE:		
LP2	5.0	7.0
LP1	6.0	7.0
LC	6.0	4.0
RM3	9.0	10.0
RP2	5.0	6.0
RP1	6.0	7.0
RC	4.0	4.0

Table 2. Dental Inventory BP3758 Ind 1						
Tooth	**Presence**	**Attrition:**	**Attrition- molars:**			
		I, C, P	**Mes-buc**	**Mes-ling**	**Dis-ling**	**Dis-buc**
MAXILLA:						
RM3	5		0	0	0	0
RM2	7		0	0	0	0
RM1	2		4	4	4	4
RP2	5	9				
RP1	5	9				
RC	5	9				
RI2	5	9				
RI1	5	9				
LM3	5		0	0	0	0
LM2	5		0	0	0	0
LM1	2		4	0	0	0
LP2	7	9				
LP1	5	9				
LC	5	9				
LI2	5	9				
LI1	5	9				
MANDIBLE:						
LM3	2		4	4	4	4
LM2	4		0	0	0	0
LM1	4		0	0	0	0
LP2	2	6				
LP1	2	6				
LC	2	6				

Table 2. Dental Inventory BP 3758 Ind 2 cont.						
		Attrition	Attrition-Molars			
Tooth	Presence	I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
LI2	5	9				
LI1	5	9				
RM3	5		0	0	0	0
RM2	5		0	0	0	0
RM1	2		4	0	0	0
RP2	2	6				
RP1	2	6				
RC	2					
RI2	7	9				
RI1	7	9				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 3. Dental Pathologies BP 3758 Individual 1					
Tooth	Calculus:		Caries:		Abscess:
	Presence	Location	Number	Type	Type
MAXILLA:					
RM3			1	interproximal surface	
RM2			1	interproximal surface	
MANDIBLE:					
RM3			1	interproximal surface	

Table 4. Cranial Metrics (mm), Individual 1 BP 3758	
Cranial metric	**Individual 1**
Maximum cranial length	176
Maximum cranial breadth	140
Bizygomatic diameter	131
Basion-bregma height	134
Cranial base length	99
Basion-prosthion length	90
Maxillo-Alveolar breadth	55
Maxillo-Alveolar length	47
Biauricular breadth	129
Upper facial height	59
Minimum frontal breadth	96
Upper facial breadth	108
Nasal height	48
Nasal breadth	26
Orbital breadth L	42
Orbital breadth R	41
Orbital height L	37
Orbital height R	38
Biorbital breadth	100
Interorbital breadth	19
Frontal chord	107
Parietal chord	101
Occipital chord	96
Foramen magnum length	36
Foramen magnum breadth	33
Mastoid length L	24
Mastoid length R	23
Chin height	28
Mandibular height L	29
Mandibular height R	29
Bigonial width	97
Minimum ramus breadth L	36
Mandibular length	76

Table 5. Dental Metrics (mm) BP 3758 Individual 2		
Tooth	**Mesiodistal**	**Buccolingual**
MANDIBLE:		
LI2	5.0	2.0
RP1	6.0	7.0
RC	6.0	4.0
RI2	5.0	6.0

Table 6. Dental Inventory BP 3758 Individual 2						
Tooth	**Presence**	**Attrition:**	**Attrition- molars:**			
		I, C, P	**Mes-buc**	**Mes-ling**	**Dis-ling**	**Dis-buc**
MANDIBLE:						
LM3	9		0	0	0	0
LM2	9		0	0	0	0
LM1	9		0	0	0	0
LP2	9	9				
LP1	9	9				
LC	5	9				
LI2	1	1				
LI1	5	9				
RM3	9		0	0	0	0
RM2	9		0	0	0	0
RM1	9		0	0	0	0
RP2	1	1				
RP1	9	9				
RC	2	1				
RI2	1	1				
RI1	5	9				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 7. Cranial Metrics (mm), BP 3758 Individual 2	
Cranial metric	
Chin height	20

Table 8. Juvenile Commingled Remains BP 3758						
Element	**Number of Fragments/ Specimens**	**MNE Left**	**MNE Right**	**MNE Midline**	**MNE Unsided**	**Age Range**
Maxillary teeth	3	2	1			3-7
Mandibular teeth	1		2			6-7,12-16

Table 9. Commingled Dental Remains BP 3758			
	# Left	**# Right**	**# Unsided**
Maxilla:			
C	1		
Mandible:			
C			1

Commingled Remains from Jim Pilgrim Donation

Samantha Murphy

Human remains representing at least three individuals were transferred from the personal collection of Jim Pilgrim to the OSA in March of 2023. The remains represent two adult males and one juvenile aged birth to two years old. The remains were excavated at an unknown time from an unknown location. Based on the condition of the remains and Mr. Pilgrim's tendency to collect from known Native American sites the individuals are likely of ancient Native American ancestry.

Introduction

The human remains were transferred to the OSA in March of 2023 by the family of Jim Pilgrim following his death. Previous donations of Mr. Pilgrim's collections for artifacts and human remains have been made to the OSA (Hoffman 2017a, Hoffman 2017b, Lillie 2016, Lillie 2014, Murphy this volume). Mr. Pilgrim collected and excavated from Native American sites throughout Iowa from the 1960s to the early 2000s. There is no known original provenience or year when for when the remains reported here were collected. With the commingled remains was one note stating "unidentified skull and small skeletal bones. Writing destroyed by insects prior to 10/10/2009. JSP", This note was written on the back of a September/October 1972 calendar from Fred D. Kamrath McEleney Motors Inc. McEleney Motors has been based out of Clinton Iowa since 1914. The other note was on a plane index card and read "2 pieces of point, 1 piece of mussel, 1 piece of seashell, human bones from point of bluff above Kramer's house Clinton IA". The date of this tag is unknown but Mr. Pilgrim's daughter, Lisa Caruso, noted it was possibly from the 1960s. Multiple Kramers were identified in Clinton so a specific location could not be identified. Additionally, it is unclear if this note is referring to all or only some of the remains identified.

Osteological Analysis

ADULT COMMINGLED REMAINS

The adult commingled remains include two right temporals, 1 fragment of occipital, 2 fragments of an incomplete frontal, 4 cranial vault fragments, and a right second maxillary premolar. There is one fragment of right scapula which includes the glenoid fossa and a portion of the acromion, the superior portion of the sternum, and two left rib fragments: one body fragment and one head including the tubercle. The rest of the remains are long bones. They include one left femur midsection, 4 middle pedal phalanges, 1 middle hand phalanx, and 1 long bone fragment unidentifiable by element (Table 1 adult commingled remains and 2 commingled dental remains). No pathologies were observed on any of the remains.

Based on these remains, specifically the two right adult temporals, there are at least two adult individuals represented. Both of the temporals have robust and prominent mastoid processes suggesting that both of the individuals were male. The appearance of dirt in the cranial sutures and postmortem breaks suggest a previous interment and ancient Native American ancestry.

JUVENILE COMMINGLED REMAINS

The juvenile remains consist of both first ribs, seven other unidentifiable rib fragments, one neural arch that has not fused, one scapula fragment which includes the glenoid fossa, a left ulnar head, a midsection of a radius, one fragment of humerus, fragments of the left and right femur, and a left iliac crest (Table 3 juvenilie commingled remains). Neural arches typically fuse around the age of two years. Without any other ossification centers the neural arch and size provide the only evidence for age. The juvenile individual likely ages between birth and two years of age. Similar to the other remains there is dirt in postmortem breaks suggesting a previous burial context. The previous burial context and Mr. Pilgrim's tendency to collect from Native American sites support ancient Native American ancestry.

Funerary Objects

With the human remains, possible funerary objects were also transferred to the OSA. There is no documentation other than the note above to suggest that these artifacts were once part of a burial. However, it is not certain that the burial mentioned in the note included the individuals present. The artifacts transferred include one black chert early-stage biface, one white chert point base and 14 shell fragments. At the time of reporting the shells were actively flaking and cracking so the number of fragments could change.

Summary

Human remains representing at least three individuals were transferred from the collection of Jim Pilgrim to the OSA in March of 2023. The transfer included human remains representing at least two adult males and one juvenile aged birth to two years old and possible funerary objects. The individuals were possibly excavated near Clinton, IA between the 1960s and 2009.

References Cited

Hoffmann, Brianna V.

2017a Human Skeletal Remains from 13CN9, Eagle Point Park, Clinton County, Iowa. In Bioarchaeological Reports on Human Skeletal Remains from Iowa and other Proveniences, editors by Jennifer E. Mack, and Lara K. Noldner, pp. 143–151. Research Papers Vol. 42, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

2017b Human Cranial Remains of Unknown Provenience. In Bioarchaeological Reports on Human Skeletal Remains from Iowa and other Proveniences, edited by Jennifer E. Mack, and Lara K. Noldner, pp. 97–98. Research Papers Vol. 42, No. 2. Office of the State Archaeologist, University of Iowa, Iowa City.

Lillie, Robin M.

2014 Human Skeletal Remains from 13CN162, Clinton County, Iowa. In Reports on Burial Projects Osteology and Archaeology, edited by Robin M. Lillie, and Shirley J. Schermer, pp. 31–46. Research Papers Vol. 38, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

2016 Additional Cranial Remains from 13CN162, Clinton County, Iowa. In Bioarchaeological Reports on Human Skeletal Remains from Iowa, edited by Jennifer E. Mack, and Lara K. Noldner, pp. 145–150. Research Papers Vol. 41, No. 3. Office of the State Archaeologist, University of Iowa, Iowa City.

Murphy, Samantha MK.

2024a Human Remains from a Precontact Cemetery in Iowa. In Bioarchaeological Reports on Human Skeletal Remains from Iowa. edited by Samantha MK Murphy, and Lara K. Noldner. pp 214–228. Research Papers Vol. 49, No. 1. Office of the State Archeologist, University of Iowa, Iowa City.

2024b Human Tibia from Jim Pilgrim Collection. In Bioarchaeological Reports on Human Skeletal Remains from Iowa. edited by Samantha MK Murphy, and Lara K. Noldner. pp 105–106. Research Papers Vol. 49, No. 1. Office of the State Archeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist (UI, OSA)

2023 Burial Project 3770. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Adult Commingled Remains BP 3770					
Element	**Number of Fragments/ Specimens**	**MNE Left**	**MNE Right**	**MNE Midline**	**MNE Unsided**
Cranium/mandible	8		2	3	3
Maxillary teeth	1		1		
Sternum	1			1	
Ribs 2-12	2	2			
Scapula	2		2		
Hand phalanges	1				1
Femur	1	1			
Foot phalanges	4				4
Long bone fragments	2				2

Table 2. Commingled Dental Remains BP 3770			
	# Left	**# Right**	**# Unsided**
Maxilla:			
P2		1	

Table 3. Juvenile Commingled Remains BP 3770						
Element	**Number of Fragments/ Specimens**	**MNE Left**	**MNE Right**	**MNE Midline**	**MNE Unsided**	**Age Range**
Unidentified vertebrae	1			1		0-2
Rib 1	2	1	1			0-2
Ribs 2-12	7				7	0-2
Scapula	1				1	0-2
Humerus	1	1				0-2
Radius	1				1	0-2
Ulna	1	1				0-2
Os coxa	1	1				0-2
Femur	2	1	1			0-2

Human Tibia from Jim Pilgrim Collection

Samantha Murphy

A midshaft fragment from a left tibia representing one adult individual was identified in the donated collection from Jim Pilgrim. The tibia fragment was collected at an unknown time likely form the area of Clinton, Iowa.

Introduction

In March of 2023 the family of Mr. Jim Pilgrim donated portions of his archaeological collection to the OSA, that he had obtained through excavations and collections starting in the 1960s. Mr. Pilgrim was known to collect and excavate from precontact Native American sites and collect human remains in addition to artifacts. His family has made several transfers of artifacts and human remains to the OSA (Hoffman 2017a, Hoffman 2017b, Lillie 2016, Lillie 2014, Murphy this volume). The tibia documented here (UI OSA 2023) was collected at an unknown time, likely in the area surrounding Clinton, IA as this where Mr. Pilgrim did most of his collecting. Records provided with the human remains stated "Surface human bone. Above Deer Creek Village Site in Eagle Point Park. Found by Ewald Zickao during dirt borrowing to build dike (at riverfront)." At this time the specific location of the site Pilgrim references has yet be located and does not match the locational data of the Deer Creek Village (13CN7) in OSA records. Dirt on the remains as well as Mr. Pilgrim's tendency to collect from known Native American sites suggest the individual is likely of ancient Native American ancestry.

Osteological Analysis

The human remains consist of a single left tibia midshaft fragment. The fragment is from one adult individual. The fragment has suffered postmortem chipping, breaking and cracking as well as high amounts of rodent gnawing activity. The gnawing activity has made many of the distinguishing features of the tibia unobservable.

Summary

Human remains of ancient Native American ancestry were identified in the donated collection from Jim Pilgrim which was made by his family in March of 2023. One left tibia midsection represents an adult individual of unknown sex and age. The remains likely originated in the area of Clinton, IA. They were collected at an unknown time and from an unknown location as the site name referenced does not match the location of the Deer Creek Village site (13CN7) in I-sites.

References Cited

Hoffmann, Brianna V.

2017a Human Skeletal Remains from 13CN9, Eagle Point Park, Clinton County, Iowa. In Bioarchaeological Reports on Human Skeletal Remains from Iowa and other Proveniences, editors by Jennifer E. Mack, and Lara K. Noldner, pp. 143–151. Research Papers Vol. 42, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

2017b Human Cranial Remains of Unknown Provenience. In Bioarchaeological Reports on Human Skeletal Remains from Iowa and other Proveniences, edited by Jennifer E. Mack, and Lara K. Noldner, pp. 97–98. Research Papers Vol. 42, No. 2. Office of the State Archaeologist, University of Iowa, Iowa City.

Lillie, Robin M.

2014 Human Skeletal Remains from 13CN162, Clinton County, Iowa. In Reports on Burial Projects Osteology and Archaeology, edited by Robin M. Lillie, and Shirley J. Schermer, pp. 31–46. Research Papers Vol. 38, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

2016 Additional Cranial Remains from 13CN162, Clinton County, Iowa. In Bioarchaeological Reports on Human Skeletal Remains from Iowa, edited by Jennifer E. Mack, and Lara K. Noldner, pp. 145–150. Research Papers Vol. 41, No. 3. Office of the State Archaeologist, University of Iowa, Iowa City.

Murphy, Samantha MK.

2024a Human Remains from a Precontact Cemetery in Iowa. In Bioarchaeological Reports on Human Skeletal Remains from Iowa. edited by Samantha MK Murphy, and Lara K. Noldner. pp 214–228. Research Papers Vol. 49, No. 1. Office of the State Archeologist, University of Iowa, Iowa City.

2024b Commingled remains from Jim Pilgrim Donation. edited by Samantha MK Murphy, and Lara K. Noldner. pp 101–104. Research Papers Vol. 49, No. 1. Office of the State Archeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist (UI, OSA)

2023 Burial Project 3772. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Human Remains of Native American Ancestry from Unknown Proveniences in Illinois

Lara Noldner

Human remains representing a minimum two individuals were found in the collections of the University of Northern Iowa (UNI) and transferred to the OSA in 2023. One partial juvenile parietal fragment was removed from somewhere near Chicago, IL, and one partial cranium was taken from a mound in southern Illinois. One juvenile of unknown age and an adult possible male of unknown age are represented. There was no associated documentation regarding the original provenience of the remains; cortical bone preservation and staining are typical of ancient burial environments.

Introduction

This report documents human remains with little provenience that were found in collections at UNI and transferred to the OSA in 2023 (UI OSA 2023). Several accession numbers assigned by UNI are associated with the transfer (see BPs 3774, 3776 and 3777); those from locations in Illinois are reported here (BP3775). From what limited information is associated, one juvenile individual (UNI acc: 70.74.0482F) was collected from an undocumented location near Chicago, IL by Bill Borden in 1965, and one adult possible male (UNI acc: 00.4.11.280.0003) was collected from a mound in southern Illinois sometime before 1964. No more specific proveniences nor documentation of their excavations are available.

Osteological Analysis

Individual 1

The adult partial cranium, UNI accession number 00.4.11.280.0003, is documented as being excavated from a mound in southern Illinois sometime before 1964. No site number or other documentation of the excavation was recorded. The cranium consists of parts of both parietals, the occipital, and frontal; all elements are in articulation with the sagittal suture completely obliterated both endo- and ectocranially, and the coronal suture is mostly closed with complete obliteration at the lateral ends. The segments of lamdoidal sutures observable are complex and incompletely fused. No craniometric measurements were possible.

The supraorbital margin is rounded suggesting a male individual, but glabella and over half of the brow ridge are unobservable as they are missing due to postmortem breakage, so the individual is documented here as a possible male.

Observable pathologies include porotic hyperostosis and a healed depression fracture. The medial thirds of both parietals are covered with pin point-sized porosity typical of porotic hyperostosis that was in an advanced stage of healing; the margins of all the lesions are rounded and surrounding cortical bone is dense and normal. On the right side of the frontal, 3cm superiorly from the supraorbital margin is a healed depression fracture, with another possible fracture of the same type immediately medial to it but partially missing due to postmortem breakage. For the fully observable depression fracture, the depression is 1cm in diameter and a 2.5cm area of bone surrounding it was also affected as it is raised slightly in relation to surrounding unaffected bone cortex. Cortical bone in the depression is slightly roughened, but

non-porous and surrounding raised bone is normal and dense, indicating complete healing with no infection evident. Medial to the complete depression fracture is another of similar size and morphology, also completely healed with no infection, but half of it is missing due to postmortem breakage. Diploe visible at the broken margin is also of normal texture and density. Neither depression fracture appears to have affected the endocranial surface.

Sharp, jagged, and square margins on most broken edges of the parietals, occipital, and frontal that have little to no staining from contact with sediment on exposed cortical bone and diploe suggest postmortem breakage that occurred during or soon after excavation. A linear shallow groove 3cm long in the cortex that is typical of damage from digging tools suggests these postmortem modifications occurred mostly during excavation.

Individual 2

One partial right parietal fragment from a juvenile individual, UNI accession number 70.74.0482F, has some associated information for its original provenience. It is indicated to have been "excavated near Chicago, Ill. in 1965" and was collected by Bill Borden. The thickness of the parietal fragment is typical of juvenile individuals. No more refined age can be determined. No pathologies are evident.

Summary

Human remains found in collections at UNI represent one juvenile of unknown age originally interred somewhere near Chicago, IL and one adult of unknown sex and age originally interred in a mound in Illinois. No more specific provenience or record of their excavations were documented.

References Cited

University of Iowa, Office of the State Archaeologist
2023 Burial Project 3775. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Human Remains of Native American Ancestry from Unknown Provenience

Lara Noldner

Human remains representing a minimum of four individuals were found in the collections of the University of Northern Iowa (UNI) and transferred to the OSA in 2023. None have any indication of original provenience. One middle to older adult of unknown sex, one juvenile 1-5 years old, and two adults of unknown sex, one younger adult and one of unknown age, are also represented. There was no associated documentation regarding the original provenience of the remains; dental wear and cortical bone preservation are typical of ancient Native American populations and burial environments, respectively.

Introduction

This report documents human remains with little to no provenience that were found in collections at UNI (UI OSA 2023). Several accession numbers assigned by UNI are associated with the transfer (see BPs 3774, 3775, and 3776); those from undocumented locations are reported here (BP3777). From what limited information is available the three accessions described below they represent three different collection events: two in the 1960s and one in May of 1989. Inventories for each accession and what information is associated are listed below. The adult commingled remains are recorded in Table 1 and the juvenile remains in Table 2.

Osteological Analysis

A right maxilla fragment, UNI accession number 00.4.13.520.4, has only first and second molars in situ; all other teeth were lost postmortem with no alveolar resorption (Table 3 for dental inventory and Table 4 for dental metrics). It is noted as being collected by Dr. D. A. Hoffman sometime before 1964. A circular sticker label on the lateral aspect of the alveolus has 1180 written on it. It is unclear what this number references. Both molars are completely developed and in occlusion with minimal blunting of cusps so likely represent a young adult individual. The third molar had complete root sockets, so was likely in occlusion as well; a single occlusal caries 1mm in diameter is present on the lingual margin of the tooth crown in the crevice between cusps. Transverse grooves off to the right of the right canine socket's apex indicate some sort of postmortem modification.

Accession 1989.43.0317 is associated with a partial right second or third rib from an adult of unknown age and sex, and conists of the head, neck and angle. The sternal half was broken off postmortem. It is indicated to have been acquired May 5, 1989, but it is unclear whether this refers to UNI's acquisition or the collector's. No other information besides its dimensions is indicated.

Accession 00.4.13.519.2 is associated with 13 elements indicated in the UNI catalogue as "fossil mammalian bones" so must have been mistaken for animal bones initially. They are not fossilized but cortical bone preservation and taphonomic damage are consistent with coming from a burial environment. They were acquired sometime in 1964.

One juvenile 1-5 years and one middle to older adult are represented. Juvenile age is based on a smaller partial temporal with an open foramen of Hushke; the individual is also represented by two partial

thoracic vertebral bodies with fully fused arches and full fusion of the arches to centra, but the vertebrae are not of adult size.

The adult's age is based on dental wear observable on teeth associated with a right maxilla and articulating zygomatic. The right maxillary first and second molars, and central and lateral incisors are completely developed and in occlusion, and although much of the tooth crowns are missing due to postmortem damage, their occlusal surfaces are flat with significant dentine exposure. The individual's right third molar is also present but only partially erupted with no wear; given the advanced wear on all other teeth, the third molar was likely impacted. Both premolars and the canine were lost postmortem with no alveolar resorption. While they were not in situ, the right lateral and central incisor under the same accession number articulate with the maxilla. The lateral incisor has pronounced shoveling and exhibits part of a tuberculum dentale; since the enamel around the CEJ was broken postmortem a score for the trait could not be determined. The remaining elements representing an adult individual include: a right parietal fragment, left parietal fragment, unidentifiable cranial vault fragment with pronounced pacchionian depressions, a left zygomatic, an atlas, two thoracic vertebrae 2-9, and a right talus. No pathologies are evident on any of these elements.

Summary

Commingled human remains found in collections at UNI with no provenience information represent four individuals: a juvenile 1-5 years old, a young adult of unknown sex, an adult of unknown age and sex, and a mid-older adult of unknown sex. These individuals were acquired through a total of three different collection events with no provenience recorded.

References Cited

University of Iowa, Office of the State Archaeologist
2023 Burial Project 3777. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Adult Commingled Remains BP 7777					
Element	**Number of Fragments/ Specimens**	**MNE Left**	**MNE Right**	**MNE Midline**	**MNE Unsided**
Cranium/mandible		2	4		1
Maxillary teeth	2		2		
Atlas	1			1	
Ribs 2-12	2			2	
Thoracic vertebrae	2			2	
Talus	1		1		

Table 2. Juvenile Commingled Remains BP3777						
Element	**Number of Fragments/ Specimens**	**MNE Left**	**MNE Right**	**MNE Midline**	**MNE Unsided**	**Age Range**
Cranium/mandible	1				1	1-5
Thoracic vertebrae	2			2		1-5

Table 3. Dental Inventory Accession 00.4.13.520.4						
Tooth	**Presence**	**Attrition:**	**Attrition- molars:**			
		I, C, P	**Mes-buc**	**Mes-ling**	**Dis-ling**	**Dis-buc**
MAXILLA:						
RM3	5		0	0	0	0
RM2	2		3	3	3	3
RM1	2		3	3	3	3
RP2	5	9				
RP1	5	9				
RC	5	9				
RI2	5	9				
RI1	5	9				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 4. Dental Metrics (mm) Accession 00.4.13.520.4				
Tooth	**Mesiodistal**	**Buccolingual**	**CEJ mesiodistal**	**CEJ buccolingual**
MAXILLA:				
RM2	11.0	13.0		
RM1	11.0	11.0		

Anatomically Prepared Human Remains from Unknown Provenience

Lara Noldner

Human remains representing a minimum of one individual were found in a Davenport, IA residence during an estate sale. No provenience or life history information for the individual accompanied the remains. A cranium and articulated hand with a radius also attached represent a minimum of one individual but it is unknown if the two sets of remains are from the same individual. The human remains were transferred to the Scott County Medical Examiner who then transferred them to the OSA in May 2023. A middle-aged adult female of non-Native ancestry is represented.

Introduction

This report documents human remains with no provenience that were prepared as anatomical specimens at an unknown time. An isolated cranium and complete hand with attached radius articulated with wire were found in a Davenport, IA residence during an estate sale. They were transferred to Dr. Hari at the Scott County Medical Examiner's Office, and then to the OSA in May 2023 (UI OSA 2024). No documentation of the remains' original provenience/source accompanied the bones and the decedent had no family that could be asked for information. Condition of bone cortex and postmortem modifications to the elements are consistent with anatomical preparation. While FORDISC database analysis produced inconclusive results due to the individual being too dissimilar to all reference samples, both the Howell's database analysis and facial characteristics indicate non-Native ancestry.

Osteological Analysis

The elements reported here include a complete cranium missing all maxillary teeth and a right radius and mostly complete hand also prepared anatomically and wired together. The forearm and hand are all articulated with wire and consist of a right radius missing the neck and head due to postmortem breakage, and all carpals (except for a missing pisiform), metacarpals, and proximal, middle and distal phalanges. The condition and coloration of the radius and hand bones is somewhat similar to that of the cranium, but it is unclear whether they are from the same individual.

The cranium has a square-edged uniformly circular hole 1cm in diameter from an electric drill at bregma, which is a typical technique used to insert hardware for suspension of articulated anatomical skeletons. There are 1mm diameter drilled holes on the lateral anterior aspects of the frontal on both sides, and the sphenoid on the left side, that were for articulating the mandible to the cranium with wire or springs. Postmortem breakage of the few partial teeth present, including roots of the right first premolar, canine and lateral incisor and the left central incisor, is also consistent with breakage of anterior teeth commonly caused by articulating the mandibular and maxillary dentition forcibly with springs. The occipital condyles have 2mm drilled holes at their lateral margins which indicates the spinal column was also articulated to the cranium with hardware.

Maxillary dental morphology is unobservable. All maxillary teeth were lost postmortem except for the left first premolar which was lost premortem with full alveolar resorption. As mentioned, the right first premolar, canine and lateral incisor and the left central incisor consist only of roots in situ with their

crowns broken off postmortem. No pathologies are evident on any of the remains.

Age could only be estimated from cranial suture closure; most exhibited significant to complete closure indicating a middle adult age range.

FORDISC (Jantz and Ousley 2005) analysis produced inconclusive results for ancestry but the individual is most likely non-Native. See Table 1 for cranial measurements. FORDISC database analysis indicated the individual was too dissimilar from reference samples to make a determination of ancestry and the result was similar through several iterations of narrowing down reference samples to Native versus European and Native versus Asian etcetera. Howell's database analysis indicated European female samples were most similar, again, in several iterations of using most reference samples and then gradually narrowing them down to only Native versus European and Native versus Asian populations. The estimation of European ancestry is somewhat consistent with facial morphology as the individual has small receding zygomatics, small thin nasal bones, a sharp nasal sill and prominent nasal spine, lack of prognathism, sloping orbits, and a parabolic dental arcade. However, south Asian ancestry is also possible given the more ambiguous and less sexually dimorphic expression of the browridge and nuchal region. If the individual originated from India it may also explain the inconclusive FORDISC results as there are no Indian populations in the FORDISC or Howells databases.

Summary

Human skeletal remains consisting of a cranium and articulated radius and hand were found among a Davenport, IA resident's belongings during an estate sale and transferred via the Scott County Medical Examiner to the OSA. The condition of cortical bone and postmortem modifications are consistent with preparation as anatomical specimens. A possible female, 35-50 years old, of non-Native ancestry is represented.

References Cited

Jantz RL, Ousley SD
2005 FORDISC 3: Computerized Forensic Discriminant Functions. Version 3.1. The University of Tennessee, Knoxville.

University of Iowa, Office of the State Archaeologist
2024 Burial Project 3794. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1: Craniometrics (mm) BP3794	
Measurement	
Maximum cranial length	182
Maximum cranial breadth	138
Bizygomatic diameter	116
Basion-Bregma height	117
Cranial base length	96
Basion-Prosthion length	97
Maxillo-Alveolar breadth	58
Maxillo-Alveolar length	57
Biauricular breadth	115
Upper facial height	67
Minimum frontal breadth	93
Upper facial breadth	100
Nasal height	52.6
Nasal breadth	28.4
Orbital breadth left	35.7
Orbital breadth right	36.4
Orbital height left	33.5
Orbital height	32.2
Biorbital breadth	93.3
Interorbital breadth	24.2
Frontal chord	104
Parietal chord	111.5
Occipital chord	93
Foramen magnum length	33.3
Foramen magnum breadth	30
Mastoid length left	28.3
Mastoid length right	27.8

Human Remains from Site 13PK61

Samantha Murphy and Lara Noldner

In May of 2023, human remains representing one adult of unknown age and sex were encountered in a pit feature associated with the Oneota component of Old Fort Des Moines (13PK61) during a Phase III excavation ahead of water main replacement. The human remains were isolated, highly fragmentary and unidentifiable by element, but were likely from a long bone. The human remains were transferred to the OSA Bioarchaeology Program and excavation of the rest of the pit feature was monitored by the Director and tribal representatives. No other human remains were encountered in the pit feature nor elsewhere at the site

Introduction

These human remains were encountered by Wapsi Valley Archaeology Inc. on the north side of West Martin Luther King Parkway east of 5th Avenue, while performing a Phase III excavation in May of 2023 at the request of the City of Des Moines to prepare for the placement of a new watermain that crosses through Old Fort Des Moines (13PK61) (UI OSA 2023) (Figure 1). The site has Late Archaic, Late Woodland, Oneota, Euroamerican settlement, and postcontact components (UI OSA 2000), and numerous archaeological investigations have been conducted. See Whittaker and Peterson (2009) for a comprehensive summary. No other human remains or burial features had been encountered prior to Wapsi Valley's 2023 excavation.

Human remains representing one adult of unknown age and sex were encountered in a pit feature associated with the site's Oneota component. This determination is based on the presence of diagnostic pot sherds in the same feature; the sherds were found in levels well above the human remains so were not associated with them. The human remains were encountered over 2m into the feature. They are highly fragmentary long bone fragments that represent an isolated secondary deposition; they were not in articulation and do not represent a primary burial. Upon discovery of the remains all excavation within 100ft of the feature was stopped, and the OSA Bioarchaeology Program and tribal representatives were contacted. Upon assessment of the unit and project area by all interested parties, the removal of the rest of the pit feature was allowed with both tribal monitors and the Bioarchaeology Program Director present, and with the understanding that reassessment would be needed if more human remains were discovered. No other human remains were discovered in the pit feature nor over the course of the rest of Wapsi Valley's Phase III.

Osteological Analysis

The human remains are severely degraded and damaged by taphonomic processes. They are highly fragmented and continue to breakdown when handled. The remains are from long bones, but cannot be identified by element. Based on the structure of the bone present the individual is likely an adult. No other specific information could be observed.

Summary

Human remains representing an adult individual of Native American ancestry were identified during a Phase III excavation conducted by Wapsi Valley Archaeology at Old Ft. Des Moines (13PK61) ahead of water main replacement by the City of Des Moines. The individual is associated with the Oneota component of the site as the human remains were found in a pit feature that also contained diagnostic pot sherds unassociated with the remains. The highly fragmentary and degraded long bone fragments represent a secondary deposition and were not associated with a primary burial. No other human remains were identified in the same pit feature as it was fully removed under tribal and Bioarchaeology Program monitoring, nor were additional human remains encountered throughout the rest of the site's 2023 Phase III excavation.

References Cited

University of Iowa, Office of the State Archaeologist (UI, OSA)
2000 Burial Project 1429. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist (UI, OSA)
2023 Burial Project 3798. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Whittaker, William E., and Cynthia L. Peterson
2009 Des Moines' Buried Past: Archaeological Excavations at Fort Des Moines No. 2, 13PK61, Southeast Connector Project, Des Moines, Iowa. Contract Completion Report 1600. Office of the State Archaeologist, University of Iowa, Iowa City. Submitted to Kirkham Michael Consulting Engineers, Des Moines, Iowa, and City of Des Moines, Iowa. Copy on file, Office of the State Archaeologist, University of Iowa, Iowa City.

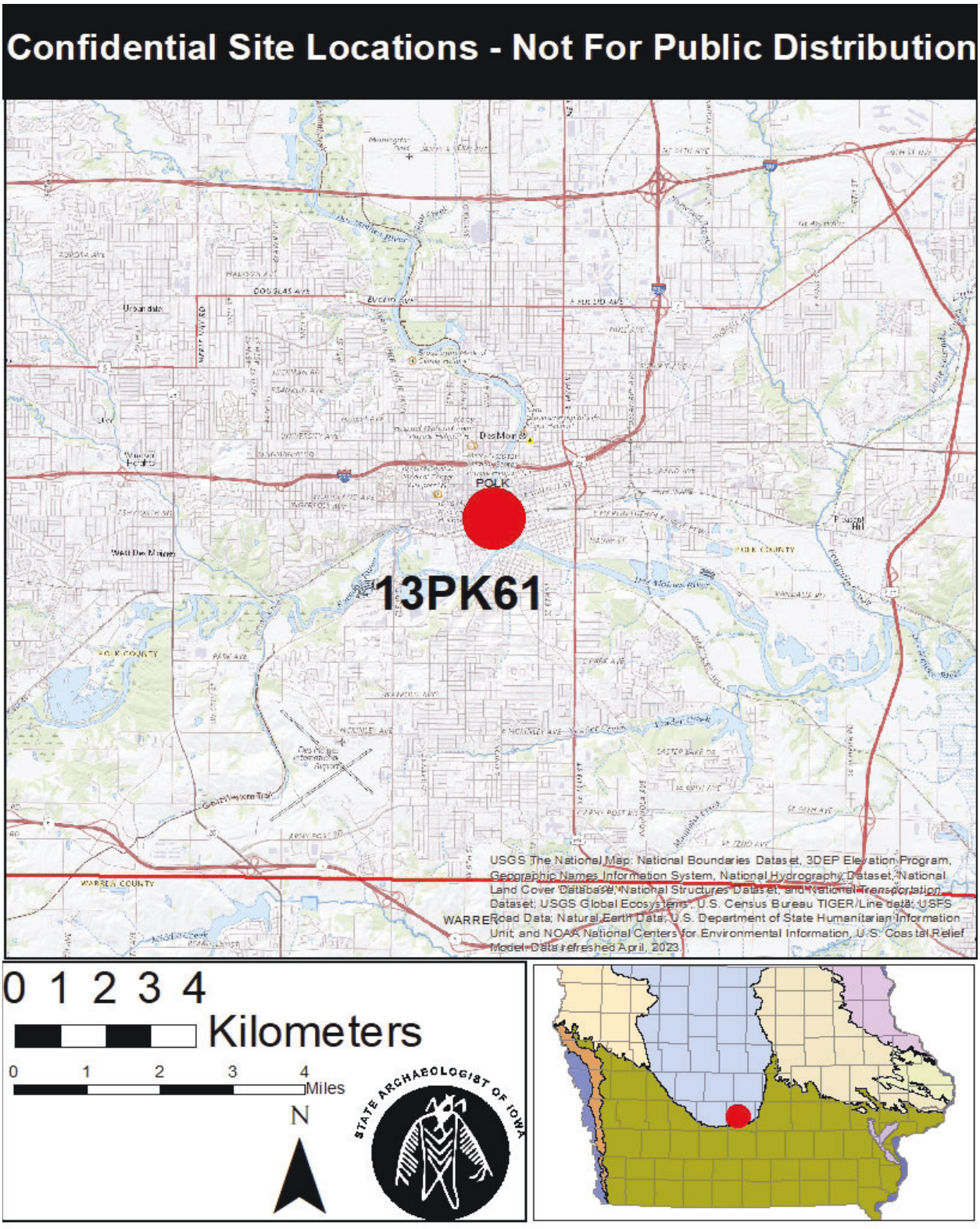

Figure 1. Findspot of human remains.
From USGS Corley, Polk County, Iowa (1978), 7.5' series quadrangle map. Scale 1:100,000.

Human Remains of Native and non-Native Ancestry from the Iowa Wesleyan Anatomical Collection Donation

Lara Noldner

Human remains representing a minimum of three individuals included in the Iowa Wesleyan University donation of anatomically prepared human remains were identified as possibly Native American. One male and one female were determined to be non-Native, likely of European and Asian ancestry, respectively, and one individual's remains were identified as possibly Native American as they were removed from a burial environment. No provenience or life history information for the individuals accompanied the collection donation, but the possibly Native individual's remains were inconsistent in overall condition, cortical preservation, and coloration in relation to all other anatomically prepared elements in the collection. A determination of MNI for the whole Wesleyan Collection is forthcoming.

Introduction

This report documents human remains with no provenience that were largely prepared as anatomical specimens at an unknown time. Upon the closure of Iowa Wesleyan University, they made a donation of several natural history collections to the University of Iowa in May of 2023 so that they could continue being used for education and research. Among the collections were several sets of anatomically prepared human skeletal remains that are now reposed at the OSA (UI OSA 2024). No documentation of the remains' original provenience/source accompanied the donation. Condition of bone cortex and postmortem modifications to the majority of elements in the collection are consistent with anatomical preparation, however it was necessary to measure two crania to determine ancestry, and one set of long bones were determined to likely be from a burial environment. FORDISC database analysis indicates the crania represent a female of Asian ancestry and a male of European ancestry. The isolated long bones are considered to possibly represent an individual of Native ancestry as this cannot be ruled out osteologically. A determination of MNI for the whole Wesleyan Anatomical Collection is forthcoming.

Osteological Analysis

INDIVIDUAL 1

This isolated cranium represents an older adult male of European ancestry. Mastoid processes, supraorbital margins, and glabella are all of possible male morphology. Cranial suture closure was the only method possible for age estimation.

Dark staining on the cortical bone suggests a burial environment and the individual was prepared as an anatomical specimen. Two pins placed bilaterally at the locations of left and right frontotemporale indicate a mandible was once articulated with wires or springs. There is a large 1 cm diameter machine drilled hole at bregma typical for suspension of an articulated skeleton as well as 5 mm diameter drilled holes through both occipital condyles for articulation of the vertebral column. Cortical bone is dense, well preserved, and coated with a sealant.

The right side of the dental arcade was reconstructed with plaster and contains two molars, a mandibular premolar, and a broken unidentifiable tooth. It is unclear whether these teeth are actually associated with the individual, so they are not assumed to be. The canines', lateral incisors', and left central incisor's

crowns have been removed by postmortem breakage and only their roots remain in the sockets. The right central incisor was lost postmortem with no alveolar resorption. The rest of the left dental arcade and alveolus is missing due to postmortem damage.

FORDISC (Jantz and Ousley 2005) analysis including all male databases resulted in a White male classification with a cross-validation rate of 65.8% and posterior probability of 0.30, and the next closest classification with similar posterior probability was Hispanic males. When source populations were narrowed to Native, Asian, African, and European males, the classification result remained European male with a cross-validation rate of 85.3% and posterior probability of .996. Craniofacial features including a narrow nasal aperture, small narrow nasal bones, a prominent nasal spine and sill, and receding zygomatics support this classification. (See Table 1 for craniometrics).

INDIVIDUAL 2

Individual 2 is an older adult female of Asian ancestry represented by a mostly complete skull. Advanced dental wear and cranial suture closure are indicative of age. The skull was prepared as an anatomical specimen as evidenced by the bleached white color and condition of cortical bone and postmortem modifications. Several teeth are also glued in.

The calotte was removed with a saw cut and small holes punched into the diploe along the cut rim indicate pegs once held the calotte in articulation. Two hooks were also drilled into the superior aspects of both temporals and corresponding pegs/pins for latching the calotte to the basicranium are evidenced by 1 mm diameter drilled holes on the parietals opposite the saw cut from the hooks. While the upper central incisors were lost premortem with full alveolar resorption all other upper and lower incisors were lost postmortem with no alveolar resorption. Both lower canines and the left upper first premolar are missing half of their crowns due to postmortem breakage. See Table 2 for the dental inventory and Table 3 for all possible dental measurements.

Pathologies evident include periodontal disease and dental abscesses. Malocclusion of maxillary and mandibular dentition has also caused unusual dental wear patterns. Periodontal disease is evident with alveolar recession of 3-5 mm across both mandibular and maxillary dental arcades. Large concentrations of calculus occur on the crowns and extending onto exposed roots of the maxillary first molars, and on the lingual aspect of the left mandibular second molar's crown (there was also likely a similar concentration on the right second molar that fell off postmortem). An abscess likely led to premortem loss of the right first maxillary second molar as there is a large spherical divot in the alveolus, but alveolar resorption is too advanced to confirm. An abscess with a buccal perforation is also present at the mesiobuccal root of the right maxillary first molar; cortical bone surrounding the remnants of the lesion is porous with evidence of active bone modification at death, however the original size of the buccal perforation is unclear due to postmortem damage. An abscess also led to loss of the right mandibular first molar with the alveolus completely resorbed past the root apices; trabeculae lining the lesion are large, irregular, and slightly porous. The same abscess likely led to loss of the right mandibular second premolar as its root socket is still complete but trabeculae lining it are large and porous indicating active alveolar resorption. While the database entry for this individual indicates the left mandibular second molar is in occlusion the determination is uncertain; an abscess has removed most of its surrounding alveolus and glue used to rearticulate the tooth largely obscures the lesion, so the tooth could have been lost peri-mortem.

FORDISC analysis including all female databases resulted in an Asian classification with a cross-validation rate of 83.3% and posterior probability of 0.641. Several measurements were flagged as outliers. After these measurements and Hispanic populations (based on the individual's craniofacial morphology) were removed, the cross-validation rate for Asian classification increased to 87% and posterior probability to 0.729. No indication of Native admixture was detected. (Craniometrics are in Table 4). The individual's prominent malar tubercles, lack of prognathism, and wider nasal aperture with quanset hut-shaped nasal bridge also support the determination of Asian ancestry.

INDIVIDUAL 3

Individual 3 is represented by a fairly complete but broken right femur missing the proximal end including both trochanters, a proximal right tibia consisting of only the partial tibial plateau, and a right ischium missing most of the ischiopubic ramus. All breakages are postmortem and due to taphonomic processes. All elements have the same cortical preservation and coloration and are consistent enough in size to belong to the same individual. Unlike the rest of the anatomically prepared human skeletal elements in the Wesleyan Collection donation, this individual was definitely removed from a burial environment; the cortical bone of these elements is dry, unsealed with preservative, stained a light brown, and there are traces of sediment in exposed trabeculae.

The elements are not complete enough for measurements, nor are there any features diagnostic of ancestry. No pathologies are evident. Their original provenience was not documented. These elements were singled out as the only ones possibly representing an individual of Native ancestry in the Wesleyan Collection.

Summary

Human skeletal remains representing three individuals included in the Iowa Wesleyan University donation of anatomically prepared human remains were isolated for additional analysis in order to determine whether they were of Native American ancestry and therefore subject to repatriation. No documentation of the individuals in the collection nor their place of origin accompanied the remains. One cranium, one skull, and isolated long bone fragments are reported here; a determination of the MNI in the full collection is forthcoming. FORDISC analysis and craniofacial morphology indicate the cranium (Individual 1) represents an older adult male of European ancestry and the skull (Individual 2) represents an older adult female of Asian ancestry. Ancestry cannot be determined for the isolated long bones (Individual 3), but they originated from a burial environment and are therefore considered to be possibly of Native American ancestry.

References Cited

Jantz RL, Ousley SD
2005 FORDISC 3: Computerized Forensic Discriminant Functions. Version 3.1. The University of Tennessee, Knoxville.

University of Iowa, Office of the State Archaeologist
2024 Burial Project 3802. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Individual 1 Craniometrics (mm) BP3802	
Measurement	
Maximum cranial length	178
Maximum cranial breadth	136
Bizygomatic diameter	127
Basion-Bregma height	134
Cranial base length	96
Basion-Prosthion length	92
Maxillo-Alveolar length	53
Biauricular breadth	121
Upper facial height	64
Minimum frontal breadth	94
Upper facial breadth	104
Nasal height	45.8
Nasal breadth	22.7
Orbital breadth left	35.6
Orbital breadth right	36.8
Orbital height left	32.9
Orbital height	32.9
Biorbital breadth	95.2
Interorbital breadth	26.5
Frontal chord	110
Parietal chord	114
Occipital chord	100
Foramen magnum length	35.7
Foramen magnum breadth	29.5
Mastoid length left	30.5
Mastoid length right	30

Table 2. Individual 2 Dental Inventory BP3802						
Tooth	**Presence**	**Attrition:**	**Attrition- molars:**			
		I, C, P	**Mes-buc**	**Mes-ling**	**Dis-ling**	**Dis-buc**
Mandible						
LM3	2		3	3	4	3
LM2	2		5	5	3	5
LM1	2		5	3	5	6
LPM2	2	2				
LPM1	2	2				
LC	7	5				
LI2	5	9				

Table 2. Indivdiual 2 Dental Inventory BP3802 cont.						
Tooth	Presence	Attrition	Attrition-molars			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
LI1	5	9				
RI1	5	9				
RI2	5	9				
RC	7	4				
RPM1	2	2				
RPM2	4	9				
RM1	4		0	0	0	0
RM2	2		3	2	5	3
RM3	2		3	2	4	3
Maxilla						
LM3	5		0	0	0	0
LM2	4		0	0	0	0
LM1	2		5	7	6	5
LPM2	2	5				
LPM1	4	9				
LC	4	9				
LI2	5	9				
LI1	4	9				
RI1	5	9				
RI2	5	9				
RC	2	4				
RPM1	2	3				
RPM2	2	3				
RM1	2		4	5	5	4
RM2	4		0	0	0	0
RM3	2		3	3	3	2

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 3. Indivdiual 2 Dental Metrics (mm) BP3802				
Tooth	**Mesiodistal**	**Buccolingual**	**CEJ mesiodistal**	**CEJ buccolingual**
Mandible:				
LM3	9.87	9.05	8.82	
LM2	10.83	10.09	8.82	
LM1	9.33	9.54	9.15	
LP2	6.55	8.19	5.02	
LP1	6.45	7.73	4.45	
LC		7.22	5.28	
LI2				
LI1				
RI1				
RI2				
RC			4.99	7.75
RP1	6.19	7.24	5.28	
RP2				
RM1				
RM2	10.13	9.97	8.93	
RM3	9.52	8.67		
Maxilla:				
LM3				
LM2				
LM1	9.43	10.57	7.51	
LP2	6.33	8.51	4.38	7.86
LP1				
LC				
LI2				
LI1				
RI1				
RI2				
RC	7.53	7.3	5.55	7
RP1			4.69	
RP2	6.13	8.32	4.12	
RM1	9.36	10.61	7.5	
RM2				
RM3	8.69	10.4	7.05	9.67

Table 4. Individual 2 Craniometrics (mm) BP3802	
Measurement	
Maximum cranial length	171
Maximum cranial breadth	124
Bizygomatic diameter	118
Basion-Bregma height	121
Cranial base length	90
Maxillo-Alveolar breadth	66
Biauricular breadth	109
Minimum frontal breadth	91
Upper facial breadth	101
Nasal height	43.3
Nasal breadth	26.5
Orbital breadth left	37
Orbital breadth right	37.5
Orbital height left	31.4
Orbital height	31.8
Biorbital breadth	92
Interorbital breadth	22
Foramen magnum length	29.8
Foramen magnum breadth	25
Mastoid length left	21.5
Mastoid length right	23
Chin height	32.8
Height of the mandibular body left	31
Bigonial width	83.5
Bicondylar breadth	104
Minimum ramus breadth left	29
Minimum ramus breadth right	28
Maximum ramus breadth left	40
Maximum ramus breadth right	40
Maximum ramus height left	52
Maximum ramus height right	52
Mandibular length	70
Mandibular angle	126

Human Remains Found in Private Collection with No Provenience

Lara Noldner

Human remains representing a minimum of two individuals were found in a decedent's home in Clay County, IA in July of 2023. No provenience information was found associated with the human remains so original burial location is unknown. A mostly complete cranium represents a young adult Native American female. Attempts were made by the collector to reconstruct the anterior dental arcade, but teeth were placed in incorrect locations and a central incisor and premolar from another individual were incorporated. Root etching indicates a burial environment, but cortical bone condition and coloration are not typical of Iowa soils.

Introduction

This report documents a mostly complete cranium that was reported and transferred to the Iowa State Medical Examiner's (IOSME) by Clay County medical examiners (IOSME case #:23-05093). The mostly complete cranium was found on a shelf in a decedent's home. No associated documentation as to the individual's place of origin was found; family members did indicate the decedent used to live in Arizona and was interested in Maya and Aztec histories. Cortical bone condition and root etching do indicate a burial environment, but most likely in a more arid climate as condition and cortical coloration are not consistent with individuals buried in Iowa soils. Dental wear is typical of populations using stone tool technology to prepare food indicating ancient antiquity. The IOSME concurred that the remains were ancient and not of medicolegal significance and transferred them to the OSA (UI OSA 2023).

Osteological Analysis

This isolated cranium represents a young adult female of Native ancestry; the central incisors are shoveled and FORDISC analysis indicates Native ancestry with a cross-validation rate of 83.1% and 0.997 posterior probability. See Table 1 for craniometrics. Dental wear is relatively light on anterior maxillary teeth for ancient Native populations and the third molars are in occlusion with no wear. Along with cranial suture closure a young adult age range is most likely.

Remnant cribra orbitalia is observable on the superior surface of the left eye orbit. Pinpoint sized lesions have rounded margins but several larger porosities are present among them. Porotic hyperostosis is also evident on both parietals; there is a 3cm diameter concentration of sharp-edged lesions 1-2 mm in diameter at the posterior lateral corner of the right parietal, and a smaller 1 cm diameter concentration of similarly sized and active lesions at the anterior lateral corner of the left parietal. Lesion concentrations at both corresponding locations on the endocranial surface are also apparent. Two more concentrations of 1-2 mm lesions are also present at the midlines of the occipital and frontal, and again, both have corresponding lesions on the endocranial surface. The concentration on the occipital is 4 cm inferior to lambda and the one on the frontal is 4.5 cm from nasion.

A supernumerary tooth (possibly a canine though crown morphology is not completely observable) is present partially erupting from the lingual aspect of the alveolus immediately adjacent to the left canine.

Postmortem modifications to the cranium and maxillary teeth were made by the collector. The calotte was removed with saw cuts to dry bone. Grayish blue material that could be remnants of some type of cleaning substance is embedded in most porotic hyperstosis lesions on their ectocranial aspects.

Attempts at reconstruction of the dental arcade are also evident. A central incisor and premolar from a second adult individual were glued into the primary individual's dental arcade. This young adult female's dental inventory (Table 2) and metrics (Table 3) only include the teeth that are clearly in situ or otherwise associated. She is therefore missing both lateral incisors and the left 2nd premolar postmortem with no alveolar resorption. The right central incisor is in the correct socket, but the tooth in the right lateral incisor's socket is clearly the left central incisor as it is of similar size and has a wear pattern matching that of the right central incisor that is in the correct location. In the socket for the left central incisor is another individual's central incisor; the root coloration and wear are not consistent with the other teeth and the root does not fit the socket. In the socket for the left lateral incisor is a canine that is missing 1/3 of the crown, likely due to caries; the canines that do belong to his individual are in situ and articulate well with their sockets. The canine glued into the wrong socket is consistent in coloration, wear, and presence of enamel hypoplasias so could very well be one of the primary individual's mandibular canines. In the socket for the left second premolar is another individual's premolar; the tooth's size and coloration of both the crown and root are inconsistent with the primary individual's other teeth. The root also does not fit the socket and there is postmortem breakage of the alveolus on the buccal aspect from the attempted reconstruction.

Summary

A mostly complete cranium represents a young adult Native American female of ancient antiquity. Attempts at reconstruction by the collector resulted in misplacement of the individual's teeth and the introduction of teeth from at least one other individual. Root etching and cortical bone condition and coloration suggest burial in an arid environment. While the collector did reside in the Southwest, the individual's original burial location is unknown due to lack of associated provenience information.

References Cited

University of Iowa, Office of the State Archaeologist
2023 Burial Project 3813. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Craniometrics (mm) BP3813	
Measurement	
Maximum cranial length	173
Maximum cranial breadth	132
Bizygomatic diameter	130
Basion-Bregma height	131
Cranial base length	91
Basion-Prosthion length	91
Maxillo-Alveolar breadth	65
Maxillo-Alveolar length	51
Biauricular breadth	126
Upper facial height	67.2
Minimum frontal breadth	93
Upper facial breadth	101.6
Nasal height	50
Nasal breadth	24.6
Orbital breadth left	40
Orbital breadth right	40
Orbital height left	34.7
Orbital height	34.8
Biorbital breadth	95.3
Interorbital breadth	22
Frontal chord	107
Parietal chord	96
Occipital chord	100
Foramen magnum length	33.4
Foramen magnum breadth	28
Mastoid length left	22.8
Mastoid length right	25

Table 2. Dental Inventory BP3813						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
Maxilla						
LM3	2		1	1	1	1
LM2	2		1	2	2	1
LM1	2		4	5	3	3
LPM2	5	9				
LPM1	2	2				
LC	2	1				
LI2	5	9				
LI1	2	3				
RI1	2	3				
RI2	5	9				
RC	2	2				
RPM1	2	2				
RPM2	2	2				
RM1	2		4	5	3	2
RM2	2		1	2	1	1
RM3	2		1	1	1	1

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 3. Dental Metrics (mm) BP3813				
Tooth	**Mesiodistal**	**Buccolingual**	**CEJ mesiodistal**	**CEJ buccolingual**
Mandible:				
LM3	9.12	11.06	7.91	
LM2	9.75	11.7	7	
LM1	10.44	11.38	7.48	
LP1	7.35	9.5	4.72	
LC	8.2	8.37	5.89	
LI1		7.2	5.66	
RI1	9.36	6.98	6.04	
RC	8.56	8.59	5.86	
RP1	6.83	9.23	4.62	
RP2	6.85	8.92	3.68	
RM1	10.56	11.18	7.52	
RM2	9.87	10.87	6.93	
RM3	9.64	11.24	7.55	

Human Remains from Gillett Grove, Site 13CY2, Clay County, IA

Samantha Murphy and Lara Noldner

Human remains originating from site 13CY2 were transferred to the OSA through a donation from private collector Darrell Frerichs. The single molar was identified amongst other materials from the site; the tooth's exact original location within the site was not documented. The remains represent an older juvenile 14-16 years old, of ancient Native American ancestry, associated with the archaeologically defined Oneota culture.

Introduction

These human remains arrived at the OSA through a donation from private collector Darrell Frerichs in June 2023. The collector is known to the OSA and has collected throughout the state. A previous donation from him also included isolated human remains from 13LO2 (UI OSA 2023a) (BP3812). The molar reported here was identified in other archaeological materials from Gillett Grove, site 13CY2 (Figure 1) (UI OSA 2023b) (BP3817), which is also an archaeologically defined Oneota site with associated burial mounds that was frequently targeted by collectors in the early 1900s (Shott and Doershuk 1996). The original provenience of the tooth and date of collection are unknown, but staining on the tooth crown indicates it was buried at one time. As is common at other Oneota sites another isolated tooth was also recovered from a pit feature at 13CY2 during the 1998 Iowa Lakeside Laboratory Archaeological Field School (Lillie 2002). 13CY2 has a history of several archaeological excavations performed through the University of Iowa and the OSA, but other than the excavation by the field school no other human remains have been encountered.

Osteological Analysis

The remains consist of a single mandibular left second molar (Table 1 and 2). Between the roots of the molar there is a small amount of adhering alveolar bone; the margins of the small piece of bone indicate postmortem removal from the mandible. The molar has sustained significant postmortem chipping and breakage leaving a small amount of enamel on the most central portion of the occlusal surface and part of the buccal surface. On the cusps that are observable there is minimal dental wear, and the roots are fully formed but the apices have not yet closed, suggesting a 14–16-year-old individual. No pathologies are present.

Summary

Human remains representing an older juvenile individual 14-16 years old and of Native American ancestry were identified in the collection of a private donor. The remains were originally collected from site 13CY2, a known and well documented Oneota site. Their original provenience and date of collection are unknown, but staining and dirt adhering to the enamel indicates they were once buried.

References Cited

Lillie, Robin M.
2002 A Mandibular Molar from Gillett Grove, 13CY2, Clay County, Iowa. In Reports on Iowa Burial Projects: Osteology and Archaeology, edited by Shirley J. Schermer, and Robin M. Lillie, pp. 177–178. Research Papers Vol. 27, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

Shott, Michael J., and John F. Doershuk
1996 Recent Investigations at the Gillett Grove (13CY2) Oneota Site, Clay County, Iowa. Paper presented at the 41st Midwest Archaeological Conference, Beloit, Wisconsin. Copy on file, Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist (UI, OSA)
2023a Burial Project 3812. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist (UI, OSA)
2023b Burial Project 3817. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

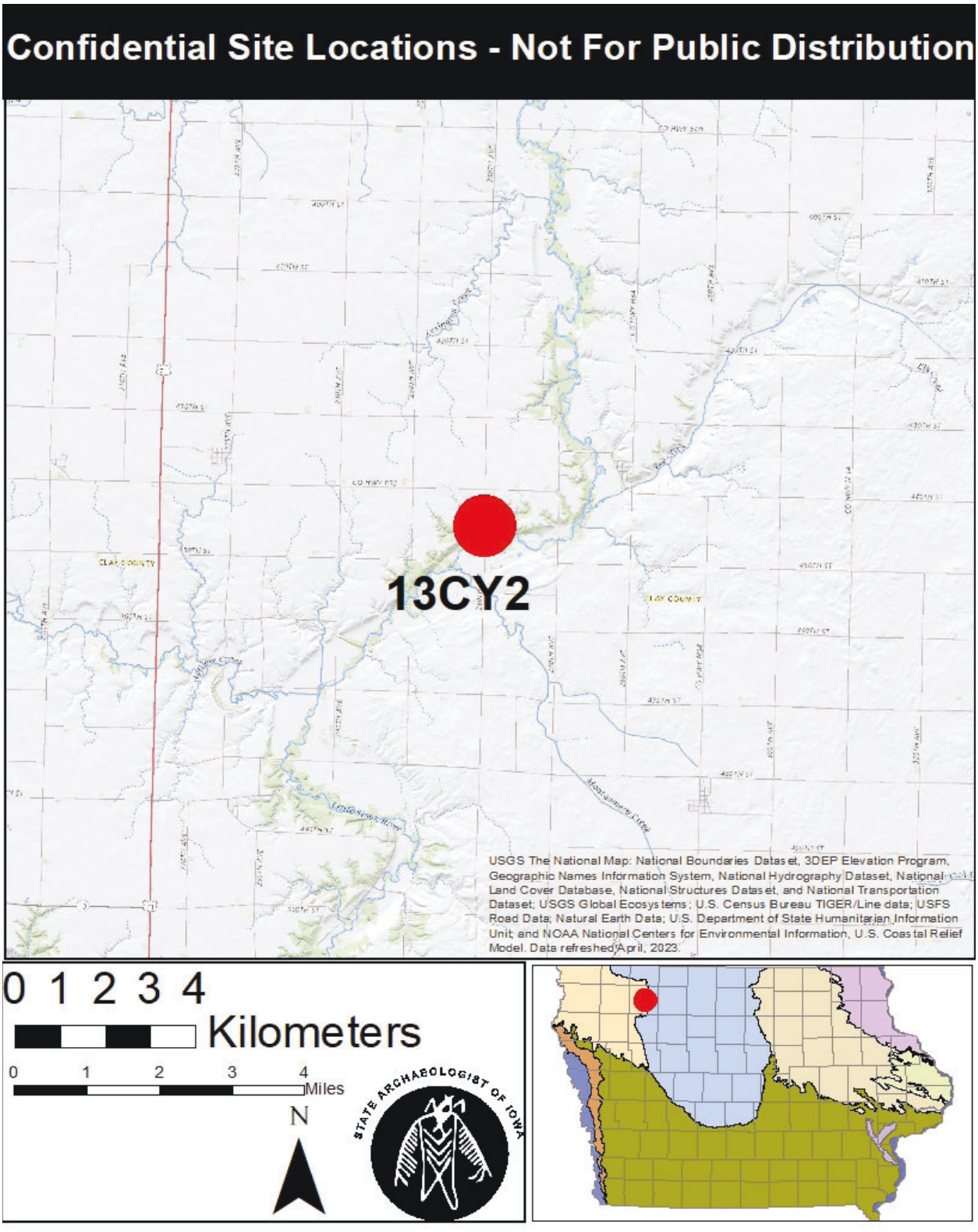

Figure 1. Findspot of human remains.
From USGS Corley, Clay County, Iowa (1978), 7.5' series quadrangle map. Scale 1:100,000.

Table 1. Dental Inventory Ind 1 BP 3817						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MAXILLA:						
RM3	9		0	0	0	0
RM2	9		0	0	0	0
RM1	9		0	0	0	0
RP2	9	9				
RP1	9	9				
RC	9	9				
RI2	9	9				
RI1	9	9				
LM3	9		0	0	0	0
LM2	9		0	0	0	0
LM1	9		0	0	0	0
LP2	9	9				
LP1	9	9				
LC	9	9				
LI2	9	9				
LI1	9	9				
MANDIBLE:						
LM3	9		0	0	0	0
LM2	7		0	0	0	0
LM1	9		0	0	0	0
LP2	9	9				
LP1	9	9				
LC	9	9				
LI2	9	9				
LI1	9	9				
RM3	9		0	0	0	0
RM2	9		0	0	0	0
RM1	9		0	0	0	0
RP2	9	9				
RP1	9	9				
RC	9	9				
RI2	9	9				
RI1	9	9				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 2. Dental Metrics (mm) Ind1 BP 3817

Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
MANDIBLE:				
LM2			8.0	10.0

Human Remains Found on Sandbar in Little Sioux River, Clay County, 13CY82

Lara Noldner

Human remains representing a minimum of one individual were found by kayakers on a sandbar in the Little Sioux River and transferred to the OSA in August of 2023. No other elements were found with the partial cranium; the individual's original burial location is unknown. One middle to older adult female is represented. Cortical bone preservation and coloration is typical of human remains inundated for some time indicating ancient antiquity.

Introduction

This report documents a partial cranium that was reported and transferred to the Iowa State Medical Examiner's (IOSME) Office by Agent Burns of the Clay County Sherriff's Department (IOSME case #:23-06266). Kayakers found the human remains on a sand bar in the Little Sioux River in Clay County, IA near Sioux Rapids. Agent Burns provided GPS coordinates and the find spot is now documented at 13CY82. No other bones were noted in the vicinity. The IOSME concurred that the remains were ancient and not of medicolegal significance and transferred them to the OSA (UI OSA 2023). The nearest documented burial site is 13CY1, but this mound site is on a high landform well away from the river valley. 13CY4 upstream and around the next bend in the river to the north is also a mound site on a high elevation; there is a steep slope from it down to the river and areas on lidar where it looks like sediment has slumped. A follow up investigation of 13CY4 was conducted on April 30, 2024. Walkover of the northeasternmost site boundary revealed thick vegetation and no exposed soils on the shoulderslope of the landform. On lidar the erosional feature is measured to be 113ft north of the site boundary. Given this distance, the lack of an identifiable area of erosion affecting the site, and that cranial elements can be transported significant distances in rivers, the original burial location of these human remains is unknown.

Osteological Analysis

This partial cranium represents a possible female adult individual of mid-older age; cranial suture closure is advanced but not all locations could be scored due to taphonomic damage. While the nuchal region and supraorbital margins are ambiguous, the left mastoid and glabella exhibit female morphology. The cranium consists of a mostly complete frontal, left temporal, left parietal, and partial right parietal and occipital. The basicranium and facial bones were removed postmortem due to taphonomic processes. There were not enough cranial landmarks present to take craniometric measurements for ancestry estimation.

All elements are uniformly stained dark brown, which is consistent with long term inundation. Rounded margins on elements broken postmortem are also consistent with transport by the river. Cortical bone is pitted and flaking over most of the ectocranial surface except for a roughly coronally oriented band across the posterior halves of the parietals and left edge of the occipital where bone cortex is intact. Cortex is also degraded due to taphonomic processes over the whole endocranial surface.

No pathologies are evident.

Summary

A partial cranium found on a sandbar in the Little Sioux River in Clay County, IA represents a female individual of mid-older age. The original burial location is unknown, but the findspot is documented as 13CY82. Taphonomic staining and damage is consistent with transport via water and long-term inundation.

References Cited

University of Iowa, Office of the State Archaeologist
2023 Burial Project 3818. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

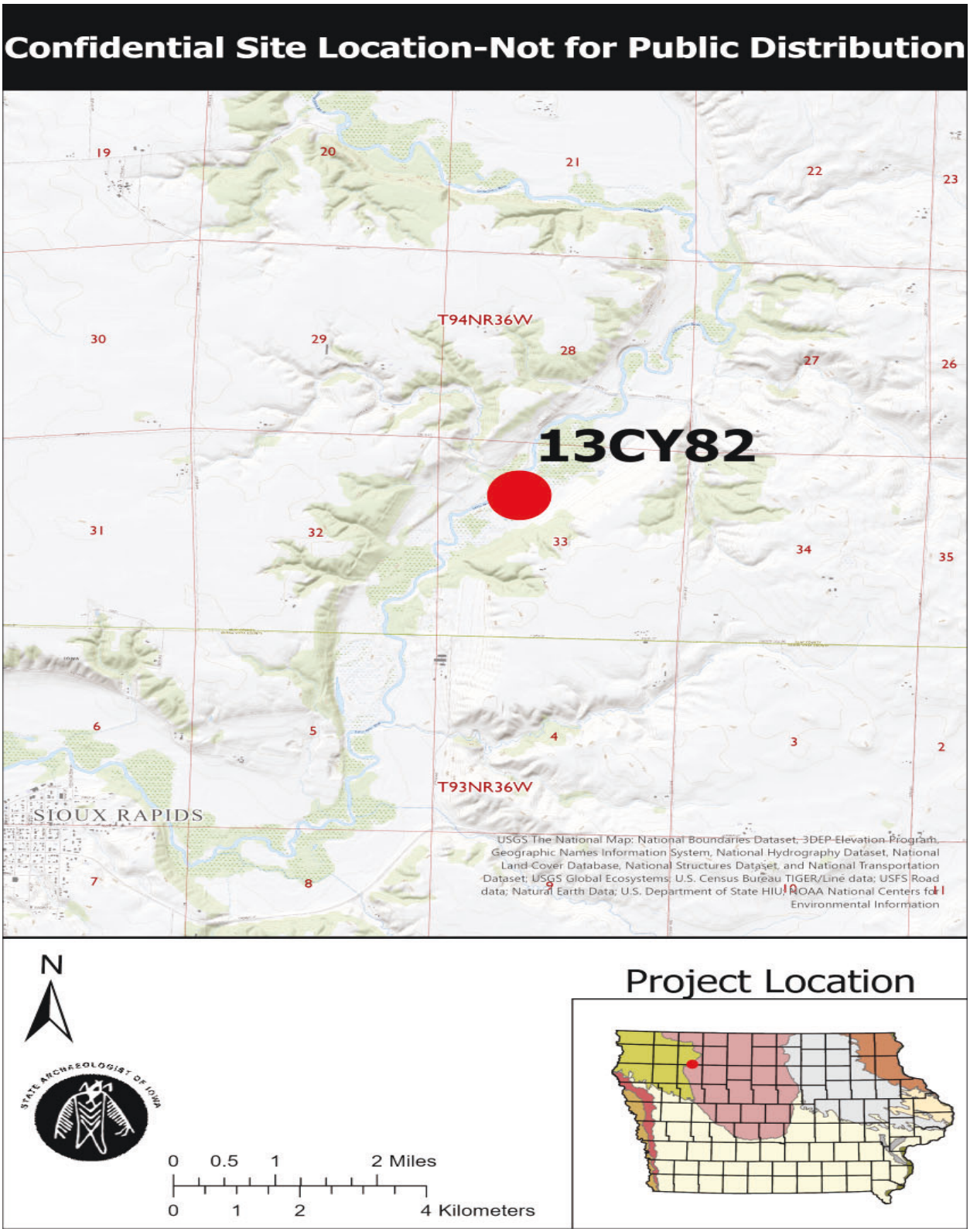

Figure 1. Findspot of human remains.
From USGS Corley, Clay County, Iowa (1978), 7.5' series quadrangle map. Scale 1:100,000.

Human Remains Disturbed from an Early Settler Family Cemetery (13CK179) by Hallett Materials Quarry in Cherokee, IA

Lara Noldner

Human remains representing a minimum of nine individuals were inadvertently disturbed by quarrying activity at the Hallett Materials quarry in Cherokee, IA. The individuals' graves were initially impacted well in advance of the first report to law enforcement, which occurred upon exposure of a complete cranium in late August 2023. Condition of the remains and the presence of coffin wood and hardware indicate they were likely buried in an early postcontact era family cemetery. None of the remains were in situ as they had been redistributed during topsoil removal and quarrying. Most of the elements were commingled, but six distinct individuals could be identified for further analysis that represent a minimum of five of the nine individuals. At least two adult males (one middle and one older in age), one adult female, one young adult of unknown sex, one older adult of unknown sex, one fetus less than 28 weeks, one 1-1.5 year-old, one 12-15 year old, and one 14-18 year old are represented.

Introduction

This report documents the disturbance of an early postcontact era family cemetery by quarrying activity at the Hallett Materials quarry in Cherokee, IA. On August 22, 2023, the OSA was notified by the Iowa Department of Public Safety's Division of Criminal Investigation of a human skull and femur that were encountered in a talus slope at the northwest corner of the quarry. Special Agent Lynn Olesen had already sent photos to the State Medical Examiner. Forensic anthropologists, Drs. Thompson and Garvin-Elling, agreed that the remains were not of medicolegal significance. The Cherokee County Sheriff's Office reposed the remains until the OSA could follow up. Upon the OSA's investigation on August 25th the elements collected represented the remains of at least two individuals (one older adult male and a 12-15 year-old) who had been displaced from their original burial locations. A minimum of an additional seven individuals were identified over the course of subsequent investigations detailed below. The individuals' graves were impacted during topsoil removal for quarry expansion well in advance of the initial report to law enforcement, and elements subsequently fell into the talus slope of the northwest wall of the quarry along with the quickly slumping sand and gravel.

The human remains were encountered when quarry personnel were collecting sand from a talus slope at the northwest corner of the quarry; they were embedded in the talus slope and were exposed when material was removed. Quarry personnel indicated that all of the topsoil above the talus slope where they were encountered had previously been removed. The quarry wall above the talus slope was roughly 50 feet high and very actively eroding; gravel was constantly raining down during the first day of investigation and large areas of the quarry wall kept coming loose. To avoid the remains becoming buried in gravel any deeper, the talus slope around the area of the initially exposed elements was systematically scooped up with a front-end loader and spread out for survey that included raking through large piles with the assistance of Cherokee County Sheriff's Office deputies, medical investigators, and quarry personnel. The vast amount of material that had to be sifted through precluded screening by hand, so it is likely that not all human skeletal elements disturbed were recovered. Because remains kept being encountered in all gravel removed the first day, follow up surveys using a similar survey method were conducted September 7th and the week

of September 11th. A load of sand/gravel was spread out in a thin layer over the quarry floor and surveyed; any small piles were raked out to expose any additional elements. In addition to the material from the talus slope surrounding the initial findspot, the large piles investigated August 25th were also spread out in the same manner for survey as they had not been distributed as carefully for survey the first time. In between all OSA investigations, quarry personnel were instructed that no additional material could be removed from the area, and that they were to collect any elements encountered. All elements collected between OSA investigations were reposed with the Sheriff's Office until they could be transferred to our archaeologists.

On September 7th a walkover of the area above the talus slope was conducted and more human remains were encountered on the surface. A left humerus, right femur, and partial right rib (5-10) were collected. All of the elements had been exposed to the elements for some time as their cortex was sun bleached and flaking. The ground surface was entirely sand and was bordered on the north by large berms of remnant topsoil mixed with sand. As the berms were likely to also contain human remains, additional work to sift through them was scheduled for the week of October 9th.

Given the small area and relatively unstable surface of the unquarried area above the talus slope where remains were initially exposed, a smaller front-end loader was used to spread out the berms, again using the same method as previous investigations. Five additional human bone fragments and coffin wood fragments were encountered.

After the conclusion of 2023 surveys, quarry personnel were instructed to report any additional elements encountered to the OSA and local law enforcement. Another follow up survey was attempted on August 16, 2024 to inspect the area above the talus slope, but too much material had fallen away to safely access it. Later in the same month, and again in early October 2024 additional human remains were encountered and collected. The quarry has agreed to discontinue the removal of material from the northwest corner of the quarry where it is likely elements would continue to be encountered. The OSA was onsite to designate the area of avoidance and collect the additional elements.

In lab documentation of human remains collected through all OSA investigations and interim element recovery by quarry personnel revealed that human remains representing a minimum of nine individuals were recovered. All elements were displaced from their original contexts and therefore commingled. However, given the very different developmental stages of three sets of elements, a complete cranium with articulating mandible, and elements representing most parts of the skeleton that were all of notable robusticity, at least five of the nine individuals are identifiable by sets of remains of varied completeness. Each set of remains is described in detail below. An additional sixth individual is also described. Individuals 1, 2, and 3 are all juveniles of distinct ages. Individual 4 was assigned to the mostly complete skull initially encountered by quarry personnel. Individual 5 was assigned to the femur and most likely associated os coxae, sacrum, and other long bones that were also encountered in the same vicinity as Individual 4. Lack of articulating elements precludes a firm association between elements present for Individuals 4 and 5, but it also cannot be ruled out that they represent the same individual as both represent a male of similar age range. Therefore, Individuals 4 and 5 represent a minimum of one individual. Individual 6 is a male who was identifiable by extremely robust elements of similar coloration and preservation. Individual 3 and Individual 4/5 were those initially exposed in the talus slope and reported. More of their skeletal elements as well as Individuals 1, 2, and 6 were recovered during subsequent investigations with methods outlined above.

Commingled elements that could not be assigned to any of the identifiable individuals are also described below. Among them are singular elements representing a minimum of another four individuals based on disparity in identifiable age or elements duplicating those of other identified individuals. They include: one adult female likely young to middle age based on an incomplete os coxa with partial auricular surface visibility; an older adult of unknown sex based on an additional, partial and edentulous maxilla fragment; a young adult of unknown sex based on a visible metaphyseal line around a humeral head; and a juvenile aged 14-18 years based on partial fusion of the greater trochanter on a left femur.

Osteological Analysis

INDIVIDUAL 1

Individual 1 is represented only by very thin, friable cranial bones in early stages of development. They include both halves of an unfused frontal, an unsideable parietal, partial occipital, and four unidentifiable cranial fragments. No other associated elements were recovered. The size and thinness of the elements indicate they represent a fetus less than 28 weeks old. No pathologies are evident.

INDIVIDUAL 2

Individual 2 is represented by a thoracic neural arch, right second and left third ribs, a left ischium and ilium, a right humerus and ulna, a left tibia, one occipital fragment, and a mandible with some dentition (see Table 1 for dental inventory and Table 2 for dental metrics). Dental development and long bone lengths (Table 3) indicate an age of 1-1.5 years at death. No pathologies are evident.

The only permanent teeth partially observable are the lower first molars. The permanent mandibular left first molar is visible in its crypt with stage of development unobservable. The permanent mandibular right first molar was lost postmortem and the spherical crypt is present though partial due to taphonomic damage; no remnants of root sockets are present. The deciduous mandibular second molars were also still in their crypts at the time of death; the left second molar is visible in its crypt and stage of development is unobservable. The deciduous right molar was lost postmortem and its partial taphonomically damaged crypt is spherical. The deciduous first molars were in occlusion at death and their roots halfway developed. Deciduous canines were present but not in occlusion with roots at ¼ of their full lengths. Sockets for all of the deciduous incisors are present but the teeth were lost postmortem so stage of development is unobservable. All teeth that were in occlusion have little to no wear.

INDIVIDUAL 3

Individual 3 is represented by partial parietals, a right temporal, right and left maxillae, a left zygomatic, partial mandible, all five lumbar vertebrae, a thoracic vertebral arch and body, sacral segments, a right first rib, several unidentifiable rib fragments, fairly complete os coxae, upper and lower limb long bone diaphyses and some epiphyses, right second and left third metacarpals, right and left tali and calcanei, both first metatarsals, and a right fifth and three unidentifiable metatarsals. Observable dental development (Table 4), epiphyseal suture closure, and humerus dimensions (Table 3) indicate age at death is 12-15 years. Sex is indeterminate. Other than caries, no pathologies are evident.

All dentition of both the maxilla and mandible is permanent (see Table 5 for dental metrics); all deciduous teeth were lost well before the time of death. The mandibular left third molar and both maxillary third molars are unerupted and visible in their crypts. Maxillary first and second molars and premolars were in occlusion at the time of death and those present (right M1, M2, left M1, right PM1 and left PM2) exhibit little to no wear. All maxillary anterior teeth were also in occlusion as evidenced by fully developed root sockets but wear was not observable as they were lost postmortem or were taphonomically damaged. The mandible consists of only the left ramus and body up to the socket for the second premolar. The left mandibular third molar is not in occlusion nor partially erupted. The left first molar is the only other mandibular tooth in situ, but taphonomic damage and possibly cariogenic activity have removed most of the crown. The lower mandibular first molar and second premolar were lost postmortem.

In addition to humeral dimensions, epiphyseal fusion also supports a 12-15 year age range. The epiphyseal rings of both thoracic and lumbar vertebral bodies are unfused, as are the coracoid and acromion of the

scapula, humeral head, proximal and distal radius, iliac crest, ischial tuberosity, all secondary centers of the femur, proximal and distal tibia, and distal fibula. Partial union of both the distal humerus and proximal ulna is observable. Fusion lines of the ilium to pubis and ischium to ilium were open, but fusion of the ischium to the pubis was complete. All sacral segments are separate with no fusion but there was complete fusion of neural arches to vertebral bodies for both lumbar and thoracic vertebrae.

Dental pathologies were the only type of pathology evident. The right maxillary first molar has a small caries 1mm in diameter on its buccal aspect adjacent to the occlusal surface. The left maxillary first molar has a larger occlusal caries 3mm in diameter at the center of the crown. The only mandibular tooth present is the left first molar; its crown has been largely removed by taphonomic processes but also possibly due to the presence of a large caries. The enamel that is left has very sharply broken margins suggesting taphonomic damage, but the pulp chamber also seems to have been previously hollowed out by infection. Cortical bone preservation is typical of coffin burials and both mandibular first molars have prominent Carabelli's cusps suggesting an early settler association and Euroamerican ancestry, respectively.

INDIVIDUAL 4

Individual 4 is represented by paired male os coxae and an articulating sacrum, a left scapula, radius, and ulna that could be reasonably associated, and a left femur that articulates well with the left os coxa and also has a femoral head size (48.7mm in diameter) typical of males (see Table 6 for all other postcranial metrics). These elements were also found in the same vicinity of the talus slope where the cranium was initially discovered by quarry excavators and reported to law enforcement. This individual may also have elements represented in the commingled elements described below, and could also represent Individual 5. Lack of articulating elements precludes a firm association of the two individuals and association of any other commingled elements.

Except for the greater sciatic notch, all other sexually dimorphic features of the os coxae and sacrum were of probable male morphology. Auricular surface (Phase 5) and pubic symphysis (Suchey-Brooks Phase 4) morphology are indicative of a middle adult age range, 40-44 years old at death. No pathologies are evident.Cortical bone preservation is typical of coffin burials, and numerous fragments of coffin wood were in the immediate vicinity of these remains in the talus slope, suggesting an early settler association.

INDIVIDUAL 5

Individual 5 is represented by a mostly complete skull. The commingled inventory for this site described below likely includes associated postcranial remains, but none could be definitively associated with this individual. It is also possible that Individual 4 described above represents the same individual as both sets of remains were found in the same general location in the talus slope, but again, lack of articulating elements precludes definitively associating the two individuals. The individual is an older adult male, likely towards the younger end of old adulthood (50-60years). Age estimation is based on significant premortem tooth loss, moderate dental wear (see Table 7 for complete dental inventory and Table 8 for dental metrics), and cranial suture closure. A slightly younger age may also be possible as this age estimation may be biased by a high frequency of dental pathologies causing tooth loss. Craniofacial features, including a narrow nasal aperture, small steeple shaped nasal bones, a sharp nasal sill and prominent nasal spine, and retreating zygomatics, as well as lack of shoveled incisors strongly suggest Euroamerican ancestry. FORDISC analysis of craniometric data (Table 9) also suggests Euroamerican ancestry though not as definitively (posterior probability: 0.39, cross validation rate: 74.3%).

Only dental pathologies are present. The upper right first molar, premolars, canine, and central incisor were lost premortem with alveolus completely resorbed. The right upper first molar may have also been lost due to abscess, but with more healing evident; there is a small 3mm diameter remnant of a tooth socket in the alveolus, and a linear vertically oriented perforating lesion on the buccal aspect of the maxilla where

the tooth's distal root would have been. The lower anterior teeth (canines and incisors) exhibit significant calculus deposits on their lingual aspects at the CEJs. All teeth present exhibit slight to moderate wear.

Dental pathologies include caries and a large abscess. Linear cervical caries that extend most of the mesiodistal length of the tooth occur on the buccal aspects of the right first, second and third mandibular molars. One small occlusal caries occurs adjacent to the buccal edge of the left third mandibular molar between the mesiobuccal and distobuccal cusps. There is also a large circular cervical caries on the right upper third molar affecting the distal half of the tooth root and crown at the CEJ. A large abscess with both lingual and buccal perforations led to loss of the upper left second molar. The lesion exposes the entire mesial root of the adjacent third molar, and the apex of the tooth's distal root is visible through the lingual perforation. The lesion is spherical and about 1.5cm in diameter with smooth dense margins.

INDIVIDUAL 6

Individual 6 is represented by both cranial and postcranial remains (see Table 10 for metrics) that could be reliably associated to the same individual due to their extreme robusticity. Numerous refits of elements were possible and all broken margins were very recent, likely caused by heavy machinery used to distribute the large amounts of gravel and sand material for survey. A middle adult male, 40-45 years at death, is represented. All observable sexually dimorphic features of the pelvis and skull are of probable male morphology. Age estimation is based on moderate dental wear (see Table 11 for complete inventory and Table 12 for dental metrics) and pubic symphysis (Suchey-Brooks Phase 4) and auricular surface morphology (Phase 5).

The only pathologies noted are dental; a large linear cervical caries 2-3 mm wide spans almost the whole mesiodistal width of the lower left second molar's CEJ. Smaller 1-2mm wide circular cervical caries also occur at the lower right first and second molars' CEJs; two occur on each tooth. Dental wear indicates the individual had an overbite and may have used his anterior teeth as tools as large wear facets extend onto the labial/buccal curvatures of the lower canines and premolars. Small to moderate amounts of calculus are present on the buccal and lingual aspects of the upper right first molar, mandibular left canine and on the lingual surfaces of lower right first and second molars.

COMMINGLED ELEMENTS

At least five individuals are represented by commingled elements. See Table 13 for a complete inventory. An additional four individuals represented by singular elements contribute to the MNI. They include: one adult female likely young to middle age based on an incomplete os coxa with partial auricular surface visible; an older adult of unknown sex based on an additional, partial and edentulous maxilla fragment that duplicates what is present for adult individuals designated above; a young adult of unknown sex based on a visible metaphyseal line around a humeral head; and a juvenile aged 14-18 years based on partial fusion of the greater trochanter on a left femur.

COFFIN HARDWARE

Coffin hardware recovered includes two double lug swing bail handles with visible embossed designs, eight coffin screws, 28 machine cut nails, two small wooden dowels, and a possible stone dowel of similar size (Figures 1 and 2). The embossed designs on one of the coffin handles (Figure) most closely matches the C. Sidney Norris No. 64 (ca. 1880:27) and Miller Brothers hardware catalog No. 116 (1871:17) types and therefore dates to circa 1871-1880 (Garrow 1987; Lillie et al. 2013). The other coffin handle (Figure) most closely matches Russell and Erwin's nos. 1140, 1160, and 1900 (1865:335), which date to 1865. Both coffin handle types were associated with both infant and adult male burials at the Dubuque Third Street Cemetery (Lillie et al. 2013), so it is not possible to estimate which individual's coffin they may have belonged to at this cemetery (13CK179).

Figure 1. Coffin hardware including handles, nails and screws.

Figure 2.Coffin hardware, close up of handle details.

Both coffin handle types suggest a late 1800 to early 1900 time period for the cemetery. The presence of coffin screws, which fastened the lid to the body of the coffin, and machine cut coffin nails also support a mid to late 1800s date range. Coffin screws were available in the U.S. as early as 1853 and were gradually replaced by more decorative thumbscrews that could be placed by hand in the 1860s to 1880s (Crow 2004; Mainfort and Dawson 2006), and the transition to machine made nails occurred in 1820-1840 and their use continued into the early 1900s (Adams 2002). Given that the cemetery is located in what was a remote part of Iowa, access to the most recently created coffin hardware types would have likely been delayed in comparison to locations near manufacturing centers in larger cities. It is also important to consider that various coffin hardware types would have been available for significant time periods. For these reasons it is not possible to narrow down a more specific date range for the cemetery at 13CK179, but burials did occur there as early as the late 1860s. Because a representative sample was not recovered it is unclear when the first interments were made.

Summary

An early settler/family cemetery (13CK179) was impacted by the Hallett Quarry in Cherokee, IA at some point prior to 2023. All graves had been disturbed and human skeletal remains redistributed by top soil removal well before the first report of human remains that were encountered in actively eroding and quarried sand and gravel in late August 2023, so the exact location of the cemetery is unknown and all skeletal elements were commingled. No in situ graves were observable. Surveys by the OSA, Cherokee County Sheriff's Office Deputies, and quarry personnel were conducted in late August, early September, and early October, and additional human skeletal elements were exposed and reported in August and October 2024. Human remains representing at least nine individuals were recovered including at least two adult males (one middle and one older in age), one adult female, one young adult of unknown sex, one older adult of unknown sex, one fetus less than 28 weeks, one 1-1.5 year-old, one 12-15 year old, and one 14-18 year old. At least five individuals could be identified by sets of elements for individual documentation. The use of wood coffins for interments was indicated by the presence of coffin wood and hardware in proximity to displaced remains and the condition and coloration of most individuals' elements. Individuals with observable cranial and dental morphology are of European ancestry. Given the age distribution and number of individuals recovered, the cemetery was likely a family plot. Coffin hardware suggests the interments were made in the late 1800s (post 1865) to early 1900s. Removal of material at the northwest corner of the quarry has been discontinued.

References Cited

Adams, William H.

2002 Machine Cut Nails and Wire Nails: American Production and Use for Dating 19th-Century and Early-20th-Century Sites. *Historical Archaeology* 36(4):66–88.

C. Sidney Norris & Co.

c. 1880. *Illustrated Catalogue of Coffin Handles and Undertakers' Trimmings*. Baltimore, Maryland.

Crow, Michael Scott

2004 Mortuary Practice in Sociohistorical and Archaeological Contexts: Texas, 1821-1870. Unpublished Master's thesis, Department of Anthropology, Texas A&M University, College Station, Texas.

Garrow, Patrick H.

1987 A Preliminary Seriation of Coffin Hardware Forms in Nineteenth and Twentieth Century Georgia. *Early Georgia* Vol. 15(1 & 2):19–45.

Lillie, Robin M., Mack, Jennifer E., and Nagel, Cindy L.

2013 Chapter 9. Coffin Hardware and Construction. In *Bioarchaeology and History of Dubuque's Third Street Cemetery, 13DB476, Dubuque County, Iowa,* Robin M. Lillie and Jennifer E. Mack, editors. Research Papers Vol. 37, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

Mainfort, Robert C., Jr. and James M. Davidson, eds.

2006 *Two Historic Cemeteries in Crawford County, Arkansas*. Arkansas Archeological Survey Research Series No. 62. Fayetteville, Arkansas.

Miller Brothers and Co.

1871 *Illustrated Catalog of Coffin Trimmings*. Boston, Massachusetts.

Russell and Erwin Manufacturing Co.

1865 *Illustrated Catalog of American Hardware of the Russell & Erwin Mfg Co*. New Britain, Connecticut.

University of Iowa, Office of the State Archaeologist (UI, OSA)

2023 Burial Project 3827. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

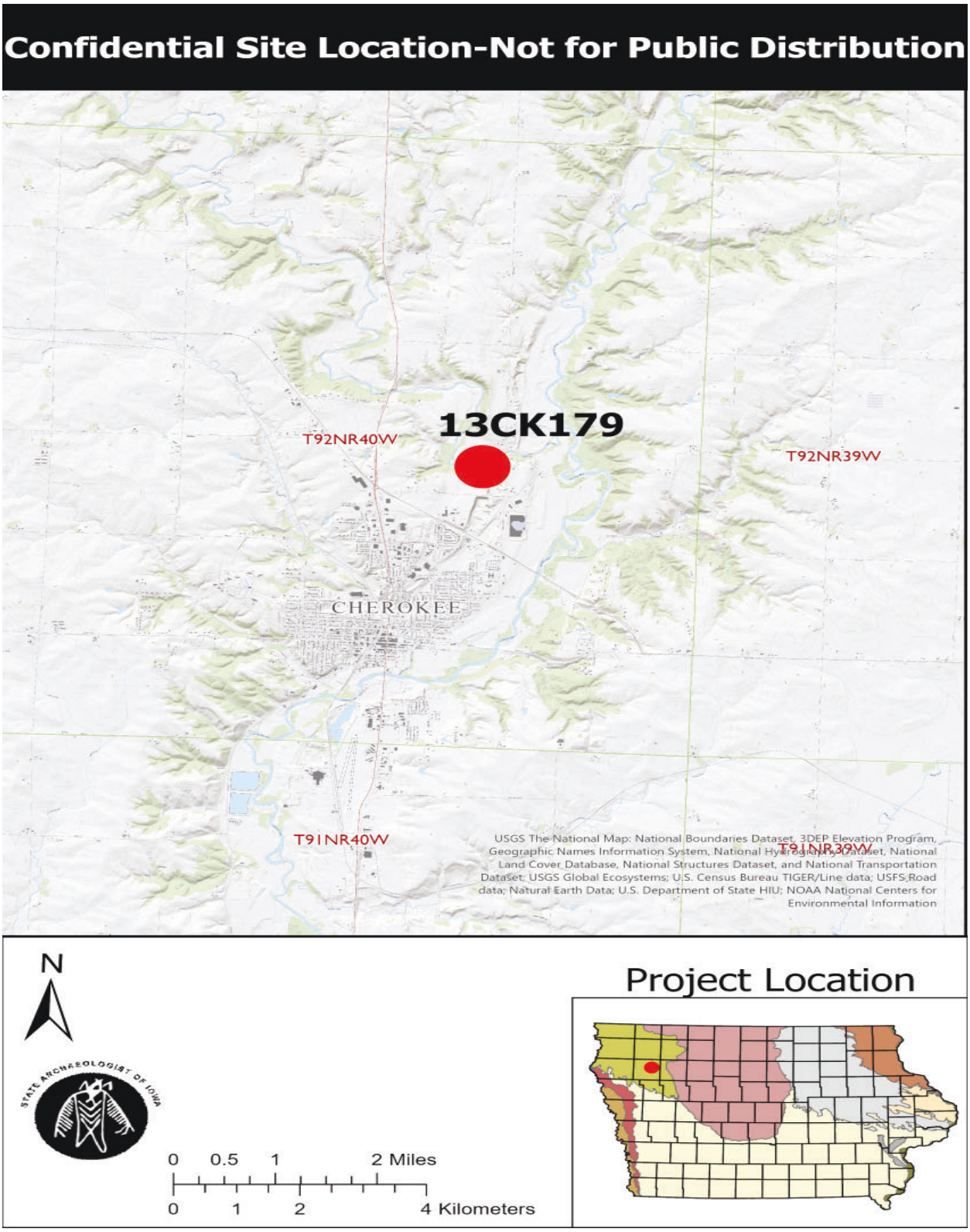

Figure 3. Findspot of human remains.
From USGS Corley, Cherokee County, Iowa (1978), 7.5' series quadrangle map. Scale 1:100,000.

Table 1. Individual 2 Dental Inventory (mandible only, maxilla not present) BP3827							
Tooth	Presence	Development	Attrition:	Attrition- molars:			
			I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
Mandible							
LM1	8	9		0	0	0	0
Lm2	8	9		0	0	0	0
Lm1	2	R1/2		1	1	1	1
Lc	5	9	9				
Li2	5	9	9				
Li1	5	9	9				
Ri1	5	9	9				
Ri2	5	9	9				
Rc	1	R1/4	1				
Lm1	2	R1/2		1	1	1	1
Lm2	5	9		0	0	0	0
RM1	5	9		0	0	0	0

Juvenile Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable
Development
Ci Initial cusp formation
Cco Coalescence of cusps
Coc Cusp outline complete
Cr1/2 Crown ½ complete
Cr3/4 Crown ¾ complete
Crc Crown complete
Ri Initial root formation
Cli Initial cleft formation
R1/4 Root length ¼
R1/2 Root length ½
R3/4 Root length ¾
Rc Root length complete
A1/2 Apex ½ closed
Ac Apical closure complete
Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable
Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 2. Individual 2 Dental Metrics (mm) BP3827				
Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
MANDIBLE:				
Rm1	8.3	7.37	6.06	5.33
Rc	5.69	5.4	4.37	4.4
Lm1	8.54	6.49	6.65	5.29

Table 3. Individuals 2 & 3 Postcranial Metrics (mm) BP 3827		
Measurement	**Individual 2**	**Individual 3**
Ilium length L	59	
Ischium length L	29.3	
Ischium width L	22	
Humerus length L		283
Humerus length R	108.3	283
Humerus width R		44.53
Humerus diameter R	9.9	18
Tibia length L	116.2	
Tibia diameter L	11.9	

Table 4. Individual 3 Dental Inventory BP3827						
Tooth	**Presence**	**Attrition:**	**Attrition- molars:**			
		I, C, P	**Mes-buc**	**Mes-ling**	**Dis-ling**	**Dis-buc**
Mandible						
LM3	8		0	0	0	0
LM2	5		0	0	0	0
LM1	7		0	0	0	0
LPM2	5	9				
LPM1	3	9				
LC	3	9				
LI2	3	9				
LI1	3	9				
RI1	3	9				
RI2	3	9				
RC	3	9				
RPM1	3	9				
RPM2	3	9				
RM1	3		0	0	0	0
RM2	3		0	0	0	0
RM3	3		0	0	0	0
Maxilla						
LM3	8		0	0	0	0
LM2	5		0	0	0	0
LM1	2		1	1	1	1
LPM2	2	1				
LPM1	5	9				
LC	5	9				
LI2	5	9				
LI1	5	9				

Table 4. Individual 3 Dental Inventory BP3827 cont.						
Tooth	Prescence	Attrition	Attrition-molars			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
RI1	5	9				
RI2	7	9				
RC	5	9				
RPM1	2	1				
RPM2	5	9				
RM1	2		1	1	1	1
RM2	2		1	1	1	1
RM3	8		0	0	0	0

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 5. Individual 3 Dental Metrics (mm) BP3827				
Tooth	**Mesiodistal**	**Buccolingual**	**CEJ mesiodistal**	**CEJ buccolingual**
MAXILLA:				
RM2	9.93	12.12	8.15	11.06
RM1	11.23	11.63	7.85	
RP1	6.69	9.3	4.36	8.28
RI2			4.79	6.81
LM1	10.78	11.04	7.91	10.51
LP2	7.12	9.62	4.75	7.92
MANDIBLE:				
LM2			8.04	9.7

Table 6. Individual 4 Postcranial Metrics (mm) BP 3827		
Measurement	**Left**	**Right**
scapula height		
scapula breadth	116.6	
humerus length	343	
humerus epicondylar breadth	62.6	
humeral head vertical diameter	45.7	
humerus minimum diameter	19.8	
humerus maximum diameter	23.13	
radius length	242	
radius anterior posterior diameter	13.13	
radius medial lateral diameter	17.5	
ulna length		
ulna anterior posterior diameter	16.48	
ulna medial lateral diameter	15.87	
ulna physiological length	253	
ulna minimum circumference	362	
os coxae height		222
iliac breadth		
pubis length		81.67
ischium length	82.72	81.97
femur maximum length	463	
femur bicondylar length	463	
femur epicondylar breadth	80.89	
femur maximum diameter of femoral head	48.72	
femur anterior posterior subtrochanteric diameter	30.83	
femur medial lateral subtrochanteric diameter	33.15	
femur anterior posterior midshaft diameter	31.54	
femur medial lateral midshaft diameter	29.9	
femur midshaft circumference	95	
sacrum breadth	122.02	
sacrum maximum diameter of base	59.88	

Table 7. Individual 5 Dental Inventory BP3827						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
Mandible						
LM3	2		3	3	3	4
LM2	4		0	0	0	0
LM1	4		0	0	0	0
LPM2	2	3				
LPM1	2	3				
LC	2	1				
LI2	2	2				
LI1	2	3				
RI1	2	3				
RI2	2	2				
RC	2	2				
RPM1	2	2				
RPM2	2	2				
RM1	2		5	3	3	5
RM2	2		4	3	4	4
RM3	2		3	2	4	3
Maxilla						
LM3	2		4	3	3	4
LM2	4		0	0	0	0
LM1	4		0	0	0	0
LPM2	4	9				
LPM1	4	9				
LC	4	9				
LI2	2	4				
LI1	5	9				
RI1	4	9				
RI2	5	9				
RC	5	9				
RPM1	4	9				
RPM2	4	9				
RM1	4		0	0	0	0
RM2	2		4	3	4	4
RM3	2		4	3	3	4

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 8. Individual 5 Dental Metrics (mm) BP3827

Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
MAXILLA:				
RM3	9.84	10.85	8.14	9.75
RM2	10.54	11.57	7.85	11.45
LM3	10.26	11.65	8.9	9.96
LI2	6.62	5.66	4.89	6.01
MANDIBLE:				
LM3	10.52	10.23	8.98	
LP2	6.93	8.67	4.98	
LP1	6.7	8.08	4.92	
LC	7.16	7.25	5.98	
LI2	5.71	5.98	3.4	
LI1	5.46	6.77	3.35	
RI1	5	6.55	3.52	
RI2	6	6.88	3.38	
RC	7.2	8.74	6.39	
RP1	6.59	8.32	4.73	
RP2	6.54	8.65	4.69	
RM1	10.73	10.7	8.71	
RM2	9.76	10.56	9.32	
RM3	10.39	10.26	9.54	

Table 9. Ind. 5 Cranial Metrics (mm) BP 3827	
Measurement	**Individual 5**
Maximum cranial length	185
Maximum cranial breadth	144
Bizygomatic diameter	130
Basion-Bregma height	124
Cranial base length	93
Basion-Prosthion length	90
Maxillo-Alveolar breadth	
Maxillo-Alveolar length	55
Biauricular breadth	127
Upper facial height	72
Minimum frontal breadth	97
Upper facial breadth	103
Nasal height	51
Nasal breadth	25.71
Orbital breadth left	38
Orbital breadth right	37
Orbital height left	35
Orbital height	34.47
Biorbital breadth	95.05
Interorbital breadth	24.3
Frontal chord	112.77
Parietal chord	108.85
Occipital chord	93
Foramen magnum length	38.27
Foramen magnum breadth	34.66
Mastoid length left	31
Mastoid length right	28.33
Chin height	31.36
Height of the mandibular body left	30.6
Mandibular height right	31
Bigonial width	111.25
Bicondylar breadth	124.25
Minimum ramus breadth left	30.15
Minimum ramus breadth right	30.6
Maximum ramus breadth left	40.71
Maximum ramus breadth right	41.76
Maximum ramus height left	65
Maximum ramus height right	65
Mandibular length	72
Mandibular angle	121

Table 10. Individual 6 Cranial and Postcranial Metrics (mm) BP 3827			
Measurement	**Left**	**Right**	**Singular**
Mastoid length	35.47		
Mandibular body height	34.35	34.27	
Bigonial width			108.52
Minimum ramus breadth	41.69		
Maximum ramus height	64		
Mandibular length	86		
Mandibular angle	115		
Humerus: maximum length	343	343	
Humerus: epicondylar breadth	73.32	71.84	
Humerus: vertical diameter of head	47.99	48	
Humerus: minimum diameter at midshaft	22.31	21.82	
Humerus: maximum diameter at midshaft	25.31	25.6	
Radius: maximum length			
Radius: anterior posterior diameter	15.99		
Radius: medial lateral diameter	20.34		
Ulna: maximum length	294	294	
Ulna: anterior posterior diameter	19.12	19.28	
Ulna: medial lateral diameter	17.86	17.71	
Ulna: physiological length	261	261	
Ulna: minimum circumference	47	48	
Sacrum length			116.1
Sacrum breadth			127.95
Sacrum diam			60.4
Os Coxae: height	242		
Os Coxae: iliac breadth length	176		
Os Coxae: pubis length	95.07		
Os Coxae: ischium length	97.34		
Femur: maximum length	487	489	
Femur: bicondylar length	484	486	
Femur: epicondylar breadth	83.89	82.82	
Femur: maximum diameter of the femur head	50.11	50.83	
Femur: anterior posterior subtrochanteric diameter	31.1	30.7	
Femur: medial lateral subtrochanteric diameter	33.15	35.24	
Femur: anterior posterior diameter at midshaft	33.65	35.32	
Femur: medial lateral diameter at midshaft	31.56	30.77	
Femur: midshaft circumference	102	102	
Tibia: length	402		
Tibia: maximum proximal epiphyseal breadth	78.96	80.07	
Tibia: maximum distal epiphyseal breadth	58	57.16	

Table 10. Individual 6 Cranial and Postcranial metrics (mm) BP 3827 cont.			
Measurement	Left	Right	Singular
Tibia: maximum diameter at the nutrient foramen	36.66	35.77	
Tibia: medial lateral diameter at the nutrient foramen	27.93	28.33	
Tibia: circumference at the nutrient foramen	98	103	
Fibula: maximum length			
Fibula: maximum diameter at midshaft			
Calcaneus: maximum length	89		
Calcaneus: middle breadth	45.17		
Talus height	35	35	
Talus breadth	51.85	51.08	
Talus length	60	60	

Table 11. Individual 6 Dental Inventory BP3827						
Tooth	**Presence**	**Attrition:**	**Attrition- molars:**			
		I, C, P	**Mes-buc**	**Mes-ling**	**Dis-ling**	**Dis-buc**
Mandible						
LM3	4		0	0	0	0
LM2	2		3	1	1	3
LM1	2		5	3	3	5
LPM2	2	3				
LPM1	2	1				
LC	2	2				
LI2	5	9				
LI1	5	9				
RI1	5	9				
RI2	5	9				
RC	2	4				
RPM1	2	2				
RPM2	2	3				
RM1	2		5	3	3	5
RM2	2		4	2	3	3
RM3	4		0	0	0	0
Maxilla						
LM3	4		0	0	0	0
LM2	4		0	0	0	0
LM1	5		0	0	0	0

Table 11. Individual 6. Dental Inventory BP3827 cont.						
Tooth	Presence	Attrition	Attrition-molars			
		I,C,P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
LPM2	2	5				
LPM1	2	5				
LC	2	3				
LI2	5	9				
LI1	5	9				
RI1	5	9				
RI2	5	9				
RC	2	4				
RPM1	2	2				
RPM2	2	3				
RM1	2		3	5	3	3
RM2	4		0	0	0	0
RM3	3		0	0	0	0

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 12. Individual 6 Dental Metrics (mm) BP3827				
Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
MAXILLA:				
RM1	11.6	11.18	8.21	11.51
RP2	6.42	8.88	4.19	
RP1	6.33	8.53	5.11	
RC	7.94	7.84	5.88	
LC	7.8	7.9	5.64	
LP1	6.52	8.72	5.08	
LP2	6.5	9.53	5.03	
MANDIBLE:				
LM2	11.19	10.72		
LM1	11.61	10.74	9.76	
LP2	7.43	9.12	5.49	
LP1	6.48	7.78	5.19	
LC	6.8	7.69	5.25	

Table 12. Individual 6. Dental Metrics (mm) BP3827 cont.				
Tooth	**Mesiodistal**	**Buccolingual**	**CEJ mesiodistal**	**CEJ buccolingual**
RC	6.78	8.73	5.36	
RP1	6.4	7.86	5.23	7.68
RP2	7.4	9.24	5.21	
RM1	11.23	10.26	9.61	
RM2	10.97	10.3	9.64	10.84

Table 13. Commingled Remains BP3827							
Element	**Number of Fragments/ Specimens**	**MNE Left**	**MNE Right**	**MNE Midline**	**MNE Unsided**	**Age**	**Sex**
Cranium fragments	**1**					juvenile	
Temporal	**2**		**1**		**1**	adult	1 male
Zygomatic	1	1				adult	
Maxilla	1				1	juvenile	
Maxilla	1		1			older adult	
Sphenoid	5			5		adult	
Occipital	1		1			adult	
Cervical vertebrae 7	2			2		adult	
Cervical vertebrae (3-7)	3			3		adult	
Thoracic vertebrae	2			2		adult	
Thoracic vertebral fragments	10					adult	
Lumbar vertebrae (1-4)	1			1		adult	
Lumbar vertebral fragments	8					adult	
Rib 1	1	1				adult	
Rib 2	1	1				adult	
Rib fragments	53	14	5		34	adult	
Sternum	1			1		adult	
Manubrium	1			1		adult	
Scapula	8				8	adult	
Humerus	1		1			young adult	
Humerus	2	2				adult	
Radius	1		1			adult	
Ulna	1		1			adult	
Clavicle	2	2				adult	
Clavicle	1		1			juvenile	
Metacarpal 1	1	1				adult	
Metacarpal 2	3	1	2			adult	

Table 13. Commingled Remains BP3827 cont.							
Element	**Number of Fragments/ Specimens**	**MNE Left**	**MNE Right**	**MNE Midline**	**MNE Unsided**	**Age**	**Sex**
Metacarpal 4	2	1	1			adult	
Metacarpal 5	2	1				adult	
Proximal hand phalanges	2				2	adult	
Proximal hand phalanx 1	1				1	adult	
Os coxa	1		1			adult	female
Ilium	1				1	adult	
Femur	1	1				adult	
Femur	1	1				juvenile	
Femur	1		1			adult	male
Fibula	2				2	adult	
Metatarsal 2	1	1				adult	
Metatarsal 3	1		1			adult	
Metatarsal 4	1	1				adult	
Metatarsal 5	1	1				adult	
Long bone fragments	8				8	adult	

Human Remains of Native Ancestry in Unauthorized Reburial (XX15032) on the Edge of Evergreen Cemetery, Sabula, IA, Jackson County

Lara Noldner

Human remains representing a minimum of six individuals were removed from their original burial location at an unknown time and reburied by an unknown private citizen, likely upon their discovery in someone's personal collection, at the edge of Evergreen Cemetery in Sabula, IA, Jackson County. They were subsequently discovered by another citizen while on a walk and reported to the Sabula Police Department. The original burial location of the individuals is unknown, and all elements are commingled. At least two females, one male, one adult of unknown sex, a juvenile 12-16 years old and an infant or fetus are represented.

Introduction

This report documents human remains with no provenience that were excavated at an unknown time by an unknown collector. A minimum of six individuals were reburied at an unknown time, relatively recently, at the edge of Evergreen Cemetery in Sabula, IA. The unauthorized reburial was reported to the Sabula Police Department (PD) by a private citizen who encountered isolated elements while walking his dog down the access road on the northern border of the cemetery; a few elements were exposed on the ground surface between the cemetery fence and the two-track road cut. Chief of Police Shane Nixon contacted the Iowa Office of the State Medical Examiner (IOSME) on May 25, 2023, thinking the remains represented a missing person. Dr. Heather Garvin-Elling (forensic anthropologist with Des Moines University) was dispatched to investigate the following day and soon concluded in consultation with the OSA that the remains were ancient and not of medicolegal significance; all of the elements were piled in a generally small area and shallowly buried, none of the elements were in articulation, dental wear was more advanced than is common for modern populations, and there was modern refuse (bits of plastic and insulation) mixed in among the bones.

All of the remains excavated by Dr. Garvin-Elling were left with the Sabula PD and collected on June 1, 2023 for transport to the OSA. On the same date the find spot was also re-visited in order to define any discernible profile of the reburial event and get an idea of the underlying substrate. Backfilled sediment was removed, and the southern wall of the reburial feature troweled back into a straight profile. The bottom of the feature was also shovel skimmed and troweled an additional ~10 cm below Dr. Garvin's excavation (Figure 1). All sediment was screened with 1/4-inch mesh.

The only additional skeletal elements encountered through this investigation included an upper central incisor, one proximal pedal phalanx (2-5), one right lunate, and three lumbar vertebrae fragments. The central incisor was noted to be shovel-shaped further affirming that the individuals are of Native ancestry. In addition to the modern refuse Dr. Garvin noted intermixed with the remains, more recent, shallow reburial of these individuals after their disturbance elsewhere was also confirmed by their location above a thick layer of gravel that is continuous with the modern service roadbed underlying the reburial feature. Given the very loose sandy loam and its homogenous (dark greyish brown (10YR4/1)) coloration to the depth of the gravel layer (35 cm below modern ground surface), a profile of the reburial event was not discernible. The full depth of the gravel layer was not determined.

Figure 1. Findspot and excavation location of human remains.

Given these observations and that remnants of a rodent nest were encountered in the relatively complete cranium of Individual 1 during processing in the Bioarchaeology Lab, it is hypothesized that the human remains were discovered in the garage, attic, or basement of the collector, and that the individual who discovered them wanted to see to their disposition but was unaware of the appropriate avenues/reporting procedures and likely feared punishment for having them. The edge of an established cemetery was chosen for a reburial location but the gravel roadbed prevented deep excavation and therefore the remains were exposed easily by natural processes. The unauthorized reburial location was documented as Notable Location XX15032.

It is unclear when the reburial occurred but there was enough time for roots to have grown into many of the elements. The dark greyish brown sediment covering the elements was consistent along the entire length of the cemetery bordering the access road, but upon lab processing it was noted that light brown fine sand was adhered directly to bone cortex of many elements underlying the dark brown sediment. The same light brown sand was also embedded in exposed trabeculae and foraminae suggesting that this type of sediment represents the original burial environment. There is no indication that the remains were ever inundated in or transported by water.

While the remains are commingled, three individuals were recorded separately as two adult individuals had relatively complete dental arcades, and a third individual could be singled out by smaller, more gracile elements indicative of younger, non-adult age.

Osteological Analysis

INDIVIDUAL 1

Individual 1 is represented by a mostly complete skull fragmented by postmortem taphonomic damage; the left parietal and frontal are broken, the facial elements were separated from the cranium, and the

right and left maxillae were separated as well. Despite the breakage and postmortem mixing with other individuals' remains the dental arcade is also fairly complete. The right maxillary second premolar and first molar are missing with no alveolar resorption, and the left maxillary second and third molars are missing due to postmortem damage and missing alveolus. The right mandibular incisors, canine, and first premolar and the left mandibular canine are missing with no alveolar resorption.

A young adult female of Native ancestry is represented. Age estimation is based on relatively light dental wear, with little to no dentine exposure and no wear facets visible on fully erupted third molars present (see Table 1 for complete inventory and Table 2 for dental metrics). The mastoid processes, supraorbital margins, glabella, and mental eminence are all of female morphology. Ancestry is indicated by shoveling and double shoveling of all upper and lower incisors. Due to postmortem breakage craniometric analysis was not possible.

The right maxillary canine, central incisor, and left canine all have several faint linear enamel hypoplasias in bands 2-3 mm wide adjacent to the CEJ. No other pathologies are evident.

INDIVIDUAL 2

Individual 2 is represented by articulated maxillae, zygomatics, and an associated mandible missing the left ramus due to postmortem breakage. No other cranial elements that could possibly be associated are present. Despite postmortem breakage and commingling, Individual 2 has a relatively complete dental arcade (see Tables 3 and 4 for inventory and metrics, respectively). Only the upper central incisors and left third molar, and the lower left canine and second molar are missing with no alveolar resorption. The lower left third molar is missing but postmortem breakage and missing alveolus do not allow determination of pre- vs. postmortem. The lower right second and third molars were lost premortem with alveolus resorbing or fully resorbed.

A middle adult male of Native ancestry is represented. Age estimation is based on moderate dental wear. Most teeth are worn flat with some dentine exposure but generally 2/3 of crown heights are still present. Sex is indicated by mental eminence morphology and robusticity of the right gonial angle and zygomatics. Ancestry is indicated by strong shoveling of the lower incisors and upper lateral incisors and dental wear typical of populations using stone tool technology to process food.

Two dental pathologies are evident: a small occlusal caries (2 mm in diameter) is present at the center of the distal crown margin of the lower left second molar and an abscess that was healing at death led to loss of the lower right second molar premortem. At the site of the abscessed tooth there are no intact root sockets visible, just a spherical lesion lined with large trabeculae and mostly normal dense bone. The buccal aspect of the lesion removed a semicircular section of alveolus to a depth of 6 mm suggesting premortem expansion of a buccal perforation.

INDIVIDUAL 3

Individual 3 is represented by a partial occipital, parietals, first and second ribs, a partial sternum and manubrium, several carpals, tarsals, metacarpals and metatarsals, and all upper and lower limb long bones except for the os coxae, the left radius, and both fibulae. All elements were determined to represent a 12-16 year-old individual based on similarity in size and stage of development. All long bone epiphyses observable were either completely or partially fused, but both the acromial and sternal end of a clavicle were open. Long bone lengths were consistent with a 12-14 year age range (Table 5).

Also included in the inventory for Individual 3 is a commingled partial occipital from a much younger individual, likely an infant or fetus, based on its size and thickness.

No pathologies are evident on elements from either individual.

COMMINGLED HUMAN REMAINS

The remaining commingled elements recovered from the unauthorized reburial represent at least two females (one late middle to older adult and one of unknown age), one male of unknown age, and one adult of unknown sex and age. It is possible that elements identified as Individuals 1 and 2 are associated with these individuals but not enough articulating elements are present to confirm, so Individuals 1 and 2 do not increase the MNI for adults. See Table 6 for a full inventory of commingled elements. An MNI of four for adults is also supported by the presence of four right tibiae and four right femora; no other elements had as many duplicates.

The late middle-aged female (~40-50 years old) is represented by paired, mostly complete os coxae. The sciatic notches, ischiopubic rami, and subpubic angles are all of female morphology. Age was estimated from pubic symphysis and auricular surface morphology (pubic symphyses – Todd: phase 9, Suchey-Brooks: phase 5, auricular surface: phase 5). A second adult female is represented by a less complete pair of os coxae that are missing their pubic symphyses and auricular surfaces due to taphonomic damage; sex estimation is only based on very wide sciatic notches. One possible male is also represented by a partial ilium that preserves a narrow sciatic notch. Several femoral and humeral head diameters were measured, but did not offer any additional information in terms of numbers of males and females as all but one fell in the ambiguous range. One right humeral head diameter (42.3 mm) indicated the element was from a female individual; all other femoral and humeral head diameters were 45-46 mm).

Periostitis evident on likely paired tibiae and a fibula also suggest these elements are from one individual. The left tibia exhibits the most advanced expression of infection with 90% of the diaphysis affected by advanced periostitis; the whole shaft appears swollen by mostly dense irregular bone growth with venous markings. The lateral aspect of the shaft exhibits transversely oriented striae and porosity. The right tibia has less periostitis evident with a small area of irregular bone density on the lateral aspect of the distal 1/4 of the shaft and another along the anterior crest 3 cm distal to the tubercle. The possibly associated right fibula has an area of periostitis about 4 cm long on the anterior edge of the distal 1/3 of the shaft; the area exhibits macroporosity but also postmortem taphonomic damage that obscures much of the pathological bone surface.

Summary

These commingled remains were part of an unauthorized shallow reburial (XX15032) that was placed at the edge of Evergreen Cemetery in Sabula, IA and eventually exposed by erosion. The individuals' original burial locations are unknown but given modern refuse included with the remains they were likely collected by a private citizen and stored in a garage, attic, or basement prior to reburial. Dental morphology, dental wear and the condition of remains indicate all are of ancient antiquity and Native ancestry. In addition to four adults (one young adult female, one late middle adult female, one middle adult male, and one adult of unknown sex and age), a 12-16 year old juvenile, and an infant or fetus are represented, bringing the MNI to a total of six.

References Cited

University of Iowa, Office of the State Archaeologist
2023 Burial Project 3801. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Individual 1 Dental Inventory BP3801						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
Mandible						
LM3	2		1	1	1	1
LM2	2		3	1	3	3
LM1	2		4	4	3	4
LPM2	2	3				
LPM1	5	9				
LC	5	9				
LI2	5	9				
LI1	5	9				
RI1	2	2				
RI2	2	2				
RC	5	9				
RPM1	2	3				
RPM2	2	2				
RM1	2		5	4	4	5
RM2	2		3	1	2	3
RM3	2		2	1	1	1
Maxilla						
LM3	3		0	0	0	0
LM2	3		0	0	0	0
LM1	2		4	5	4	4
LPM2	2	2				
LPM1	2	3				
LC	2	2				
LI2	2	2				
LI1	2	2				
RI1	5	2				
RI2	5	2				
RC	2	2				
RPM1	2	2				
RPM2	2					
RM1	5		0	0	0	0
RM2	2		1	2	3	2
RM3	2		1	1	1	1

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 2. Individual 1 Dental Metrics (mm) BP3801

Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
Mandible:				
LM3	10.64	10.15	8.22	
LM2	10.56	10.13	9.36	
LM1	11.48	10.76	8.97	7.31
LP2	8.17	7.24	5.04	7.27
RI1	5.14	5.54	3.14	5.01
RI2	5.58	6.29	3.25	6.02
RP1	6.7	7.8	5.1	6.6
RP2	6.67	8.17	4.57	
RM1	11.21	10.66	9.14	
RM2	10.59	10.11	8.76	
RM3	10.11	10.26		
Maxilla:				
LM1	10.84	11.8	8.17	11.16
LP2	7.3	9.54	4.46	8.36
LP1	7.44	9.71	5.39	8.67
LC	8.01	8.05	5.89	7.77
LI2	6.7	6.45	4.49	5.95
LI1	8.52	7.2	6.52	6.25
RI1	8.31	7.07	6	6.38
RI2	6.88	6.24	4.47	6.26
RC	8.15	7.33	5.96	
RP1	7.28	9.71	5.32	8.42
RM2	9.87	11.37	7.67	10.5
RM3	8.6	10.61	6.82	9.72

Table 3. Individual 2 Dental Inventory BP3801						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
Mandible						
LM3	3		0	0	0	0
LM2	5		0	0	0	0
LM1	2		5	5	5	5
LPM2	2	3				
LPM1	2	2				
LC	5	9				
LI2	2	5				
LI1	2	5				
RI1	2	5				
RI2	2	5				
RC	2	5				
RPM1	2	4				
RPM2	2	4				
RM1	2		5	5	5	5
RM2	4		0	0	0	0
RM3	4		0	0	0	0
Maxilla						
LM3	5		0	0	0	0
LM2	2		4	5	4	4
LM1	2		5	6	5	5
LPM2	2	3				
LPM1	2	2				
LC	2	2				
LI2	5	9				
LI1	2	3				
RI1	5	9				
RI2	2	3				
RC	2	4				
RPM1	2	4				
RPM2	2	4				
RM1			5	5	5	5
RM2			4	5	4	4
RM3	2		1	1	1	1

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 4. Individual 2. Dental Metrics (mm) BP3801

Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
Mandible:				
LM1	10.95	10.72	8.86	8.96
LP2	6.48	7.79	3.92	
LP1	5.53	6.94	4.39	
LC				
LI2	5.95	6.01	4.09	6.03
LI1	5.26	5.59	3.38	5.46
RI1	4.73	5.5	3.4	
RI2	5.55	5.94	3.59	
RC	6.84	7.06	5.34	7.29
RP1	6.01	7.27	4.18	6.31
RP2	6.78	7.69	4.61	6.56
RM1	10.88	10.63	8.95	
Maxilla:				
LM2	8.56	11.18	6.38	10.15
LM1	9.67	11.88	7.67	
LP2	5.81	9.02	4.28	
LP1	6.18	9.08	4.62	
LC	7.26	8.54	5.25	7.88
LI2	6.85	6.4	4.98	5.99
RI2	7.24	6.36	5.08	6.1
RC	7.45	8.39	5.42	7.66
RP1	6.04	9.09	4.52	
RP2	5.53	8.72	4.08	
RM1	9.77	11.52	7.56	
RM2	8.8	10.95	5.94	9.83
RM3	8.97	10.89	7.22	9.36

Table 5. Individual 3 Postcranial metrics (mm) BP3801	
Measurement	
clavicle_length_right	127
clavicle_diam_left	9.9
clavicle_diam_right	10.4
humerus_width_left	52.3
humerus_diam_left	19
humerus_diam_right	19.8
ulna_length_left	243
ulna_diam_left	15.3
radius_length_left	222
radius_diam_left	13.6
radius_diam_right	12
femur_length_left	397
femur_diam_left	23.9
femur_diam_right	24.7
tibia_length_left	336
tibia_diam_left	27.5
tibia_diam_right	28

Table 6. Commingled Elements Inventory BP3801						
Bone	**Side**	**Segment**	**complete**	**Count**	**Age**	**Sex**
Unknown rib frags	U	H	1-25%	3	adult	
Unknown rib frags	U	BO	1-25%	72	adult	
Sternum			complete	1	adult	
Sternum			51-75%	1	adult	
Manubrium			complete	1	adult	
R1	L		complete	1	adult	
R1	R		76-99%	1	adult	
R2	L		76-99%	1	adult	
R2	R	BO	51-75%	1	adult	
R12	R		complete	1	adult	
Unknown rib frags	R	H	1-25%	5	adult	
Unknown rib frags	R	A	1-25%	9	adult	
Unknown rib frags	R	BO	26-50%	9	adult	
Unknown rib frags	L	H	1-25%	5	adult	
Unknown rib frags	L	A	26-50%	3	adult	
Unknown rib frags	L	BO	26-50%	12	adult	
Unknown rib	L		76-99%	5	adult	

Table 6. Commingled Elements Inventory cont. BP 3801						
Bone	**Side**	**Segment**	**Complete**	**Count**	**Age**	**Sex**
Proximal pedal phalanges, unknown number or side	U		complete	10	adult	
Proximal pedal phalanx 1	U		complete	1	adult	
Unknown metatarsal frag	U	PE	1-25%	1	adult	
Metatarsal 1	R		76-99%	2	adult	
Metatarsal 1	L		76-99%	2	adult	
Metatarsal 2	L		complete	1	adult	
Unknown metatarsal frag	L		76-99%	1	adult	
Metatarsal 2	R		complete	1	adult	
Metatarsal 4	L		complete	2	adult	
Metatarsal 4	R		complete	1	adult	
Metatarsal 3	L		complete	1	adult	
Metatarsal 3	R		complete	1	adult	
Metatarsal 5	L		51-75%	1	adult	
Metatarsal 5	R		complete	1	adult	
Navicular	L		complete	1	adult	
Navicular	R		complete	1	adult	
Medial Cuneiform	L		complete	1	adult	
Medial Cuneiform	R		complete	1	adult	
Middle Cuneiform	L		complete	1	adult	
Middle Cuneiform	R		complete	1	adult	
Lateral Cuneiform	L		complete	1	adult	
Lateral Cuneiform	R		complete	2	adult	
Cuboid	R		complete	1	adult	
Calcaneus	L		76-99%	1	adult	
Calcaneus	R		complete	1	adult	
Talus	L		complete	1	adult	
Talus	R		complete	1	adult	
Proximal pedal phalanx 1	U		complete	2	adult	
Metacarpal 1	L		complete	1	adult	
Metacarpal 1	R		complete	2	adult	
Metacarpal 2	L		complete	2	adult	
Metacarpal 2	R		complete	1	adult	
Metacarpal 3	L		complete	2	adult	

Table 6. Commingled Elements Inventory cont. BP 3801						
Bone	**Side**	**Segment**	**Complete**	**Count**	**Age**	**Sex**
Metacarpal 3	R		complete	2	adult	
Metacarpal 4	R		complete	1	adult	
Metacarpal 5	L		complete	1	adult	
Metacarpal 5	R		complete	2	adult	
Unknown metacarpal frag	U	D	26-50%	1	adult	
Unknown metacarpal frag	U	DE	1-25%	1	adult	
Trapezoid	R		complete	1	adult	
Scaphoid	R		complete	1	adult	
Capitate	R		complete	1	adult	
Hamate	R		complete	1	adult	
Proximal manual phalanx 1	U		complete	1	adult	
Proximal manual phalanges, unknown number or side	U		complete	7	adult	
Middle manual phalanges, unknown number or side	U		complete	4	adult	
Distal manual phalanx 1	U		complete	1	adult	
Distal manual phalanges, unknown number or side	U		complete	1	adult	
Molar, maxillary	R		complete	1	adult	
Molar, mandibular	U		51-75%	1	adult	
Canine, mandibular	U		complete	2	adult	
C1	S		complete	1	adult	
C1	S		26-50%	1	adult	
C2	S		complete	1	adult	
C2	S		1-25%	1	adult	
Unspecified Cervical Vert	S		complete	5	adult	
Unspecified Cervical Vert	S	B	26-50%	5	adult	
Unspecified Cervical Vert	S	NA	1-25%	7	adult	
Unspecified Thoracic Vert	S		76-99%	7	adult	
T10	S		76-99%	1	adult	
T11	S		76-99%	1	adult	
T12	S		76-99%	1	adult	

Table 6. Commingled Elements Inventory cont. BP 3801						
Bone	**Side**	**Segment**	**Complete**	**Count**	**Age**	**Sex**
T1	S		76-99%	1	adult	
Unspecified Thoracic Vert	S	B	26-50%	6	adult	
Unspecified Thoracic Vert	S	B	1-25%	4	adult	
Unspecified Thoracic Vert	S	NA	26-50%	6	adult	
Unspecified Thoracic Vert	S	NA	1-25%	14	adult	
L5	S		76-99%	1	adult	
L5	S		1-25%	1	adult	
Unspecified Lumbar Vert	S		76-99%	3	adult	
Unspecified Lumbar Vert	S	NA	26-50%	3	adult	
Unspecified Lumbar Vert	S	NA	1-25%	5	adult	
Unspecified Vertebral Fragment		B	1-25%	8	adult	
Unspecified Vertebral Fragment		NA	1-25%	3	adult	
Sacrum	S		26-50%	1	adult	
Coccyx	S		26-50%	1	adult	
Whole os coxae	R		76-99%	1	adult	F
Whole os coxae	L		76-99%	1	adult	F
Acetabular fragment	U		1-25%	1	adult	
Ischium	R		51-75%	1	adult	
Whole os coxae	R		26-50%	1	adult	F
Ilium	R		26-50%	1	adult	M
Ilium	U		1-25%	1	adult	
Whole os coxae	L		51-75%	1	adult	F
Pubis	R		26-50%	1	adult	
Scapula	L		51-75%	2	adult	
Scapula	L		26-50%	6	adult	
Scapula	R		51-75%	1	adult	
Scapula	R		1-25%	1	adult	
Clavicle	R		complete	1	adult	M
Clavicle	U	D	26-50%	1	adult	
Ulna	L		complete	2	adult	
Ulna	L		51-75%	1	adult	M
Ulna	R		complete	2	adult	

Table 6. Commingled Elements Inventory cont. BP 3801						
Bone	**Side**	**Segment**	**Complete**	**Count**	**Age**	**Sex**
Ulna	R		1-25%	1	adult	
Radius	L		complete	1	adult	
Radius	R		complete	2	adult	
Radius	L		26-50%	1	adult	
Humerus	R		76-99%	1	adult	F
Humerus	R		76-99%	1	adult	
Humerus	L		76-99%	1	adult	
Humerus	L		26-50%	2	adult	
Patella	L		complete	2	adult	
Patella	R		complete	2	adult	
Femur	R		76-99%	3	adult	
Femur	R		26-50%	1	adult	
Femur	L		76-99%	2	adult	
Femur	L	DE	1-25%	1	adult	
Tibia	R		76-99%	3	adult	
Tibia	R		26-50%	1	adult	
Tibia	L		76-99%	3	adult	
Fibula	R		76-99%	2	adult	
Fibula	L		76-99%	3	adult	
Fibula	U		51-75%	2	adult	
Fibula	U		1-25%	2	adult	

Human Remains Found on Sandbar in Indian Creek, Jasper County, 13JP261

Lara Noldner

Human remains representing a minimum of one individual were found by local residents in Indian Creek and transferred to the OSA in September of 2023. No other elements were found with the partial cranium; the individual's original burial location is unknown. One middle adult male is represented. Cortical bone preservation and coloration is typical of human remains inundated for some time indicating ancient antiquity.

Introduction

This report documents a partial cranium that was reported and transferred to the Iowa State Medical Examiner's (IOSME) Office by Jasper County Sheriff John Halferty (IOSME case #:23-07700, Jasper Co. Sheriff's Department case #:23-50-422). Local artifact hunters found the cranium in Indian Creek, roughly 300 yards south of the Eagle Street Bridge north of Mingo, IA, on September 4, 2023. No other bones were noted in the vicinity. The IOSME concurred that the remains were ancient and not of medicolegal significance and transferred them to the OSA (UI OSA 2023). There are no documented cemeteries within 5 miles upstream of the findspot, which is now documented as site 13JP261. As cranial elements can be transported significant distances in rivers, the original burial location is unknown.

Osteological Analysis

This partial cranium represents an adult male individual of middle age (35-50 years); cranial suture closure is minimal to significant. While the nuchal region is ambiguous, the supraorbital margins, mastoids, and glabella exhibit male morphology. The cranium consists of a mostly complete frontal, both parietals and temporals, and most of the occipital. The basicranium and facial bones were removed postmortem due to taphonomic processes. Some craniometric measurements were possible (Table 1), but there were not enough to yield reliable ancestry estimation results.

All elements are uniformly stained dark brown mottled with light gray, which is consistent with long term inundation. Cortical bone is mostly intact over most of the ectocranial surface except for light taphonomic abrasions that removed some of the dark brown staining and created the light gray splotches across all elements. Cortex is slightly degraded due to taphonomic processes over the whole endocranial surface.

No pathologies are evident.

Summary

A partial cranium found on a sandbar in Indian Creek north of Mingo, IA represents a middle-aged male individual. The original burial location is unknown, but the findspot is documented as 13JP261. Taphonomic staining and damage is consistent with ancient antiquity and long-term inundation.

References Cited

University of Iowa, Office of the State Archaeologist
2023 Burial Project 3835. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Craniometrics (mm) BP 3835	
Measurement	
Max. cranial length	181
Max. cranial breadth	145
Biauricular breadth	121
Min. frontal breadth	98
Upper facial breadth	109
Parietal chord	113
Occipital chord	103
Mastoid length L	28
Mastoid length R	31

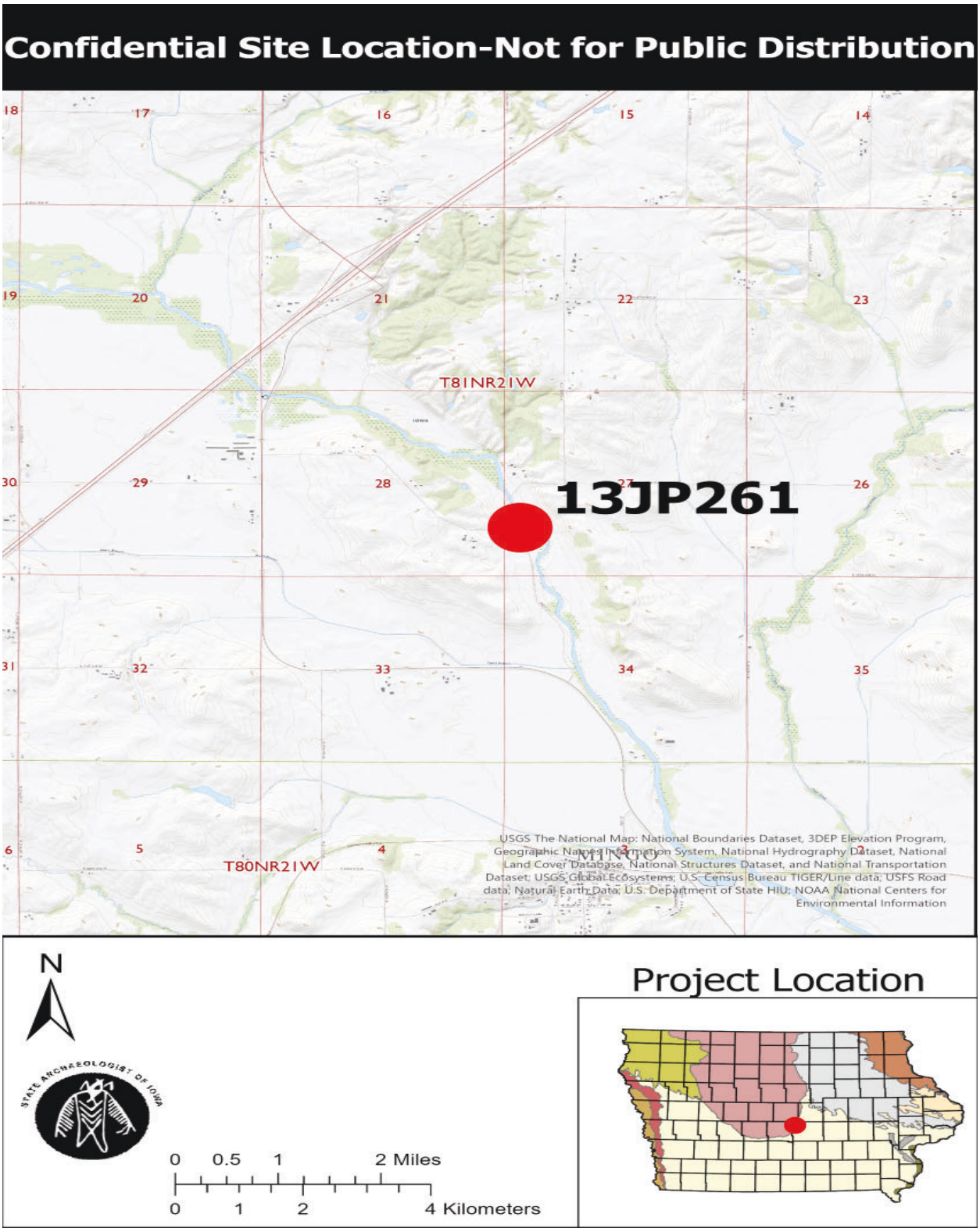

Figure 1. Findspot of human remains.
From USGS Corley, Jasper County, Iowa (1978), 7.5' series quadrangle map. Scale 1:100,000.

Human Remains of non-Native Ancestry at the History Center in Cedar Rapids, IA

Lara Noldner

Human remains representing a minimum of one individual were discovered in collections of the History Center in Cedar Rapids, IA. The mostly complete articulated skeleton was originally in the possession of a local Knights of Pythias chapter and was donated to the History Center upon the chapter's closing. Indications of anatomical preparation are evident. One middle-aged adult male individual of European ancestry likely with admixture from an unidentifiable population is represented.

Introduction

This report documents the report and analysis of non-ancient human remains, prepared anatomically as a mostly complete articulated skeleton. The individual was donated to the History Center in Cedar Rapids, IA in 2005 by an individual who was either a member or the relative of a member of a local Knights of Pythias Chapter that recently closed. No associated original provenience information accompanied the remains. The skeleton was reportedly used by the chapter in rituals. Upon discovery of the remains in the History Center's collections, the Linn County Medical Examiner's Office was contacted to determine what steps should be taken and they contacted the OSA for guidance. Transfer of the remains to the OSA was requested in order to determine ancestry and whether compliance with NAGPRA and state law is necessary (UI OSA 2024).

While craniometric analysis using FORDISC (Jantz and Ousley 2005) was inconclusive, craniofacial and dental characteristics most strongly suggest European ancestry. Inconclusive craniometric analysis likely indicates admixture or that the individual's population of origin is not represented in available databases. As the skeleton was articulated most postcranial measurements were not possible. Anatomical preparation, bone cortex condition, lack of evidence of being in a burial environment, and minimal dental wear indicate non-ancient antiquity.

Osteological Analysis

This mostly complete and almost fully articulated anatomically prepared skeleton represents a middle-aged (35-50 year old) adult male of mixed, non-Native ancestry. Except for the morphology of the ischiopubic ramus, all sexually dimorphic features of the skull and os coxae are of possible or probable male morphology. Cranial suture closure, and dental wear are the only indicators of age observable as the pelvis is fully articulated with hardware. No pathologies are evident.

Anatomical preparation is evident by the condition of bone cortex and a circumferential saw cut that was made to remove the calvarium. No evidence of the remains being in a burial environment were observed. The calotte was re-attached to the cranium with pins inserted in the diploe exposed by the cut as well as hooks inserted on both parietals. The mandible was articulated to the cranium with springs and the whole axial skeleton articulated with wires and a metal rod through the skull and spinal column. Axial skeletal elements were also articulated with wires and bolts. Upon transfer to the OSA the individual's left arm and leg had been detached from the rest of the skeleton. Except for the hyoid, left patella, and a few hand and foot phalanges, all skeletal elements are present and appear to articulate well; it does not appear that any other individuals' remains were incorporated.

Except for the mandibular incisors present that have at least ¼ of the crown height reduced by wear, dental wear is minimal with only small dentin exposures on the upper left premolars and first molar, which is atypical of individuals of ancient antiquity. The upper incisors were lost postmortem, as was the upper left canine, right 2nd premolar and right first molar. The left upper second and third molars were lost premortem with alveolus completely resorbed, as were the right upper first and third molars. After loss of the upper right first molar, it appears that the second and third molars migrated slightly mesially. Also of note is the upper second and third molars appear rotated; what would be the mesio-distal axis of the third molar is rotated buccally and the second molar root sockets are similarly oriented. The upper right third molar crown has an elongated, ovoid (rather than square or round) shape, and has at least five cusps as well as an accessory cusp on its lingual aspect; its placement is atypical of a Carabelli's cusp and is otherwise not a dental morphological trait scored using the Arizona State University Dental Anthropology System (Turner et al. 1991) nor *Dental Morphology for Anthropology* (Edgar 2017) manual (See Table 1 for dental inventory).

The lower right second and third molars, right second premolar, left lateral incisor, left premolars, and left third molar were lost postmortem with no alveolar resorption. The lower left first molar was lost premortem with complete alveolar resorption and the left second molar was lost closer to the time of depth. A socket for the tooth remains but individual root sockets are no longer defined, and the depression is lined with coarse, dense trabeculae.

Craniofacial features suggestive of European ancestry include retreating zygomatics, presence of canine fossae, sloping orbits, a depressed nasion, narrow, steeple-shaped nasal bones, a narrow nasal aperture, prominent nasal spine and sharp nasal sill. Malar tubercles are somewhat pronounced though and prognathism is intermediate which are traits atypical of European populations. FORDISC (Jantz and Ousley 2005) analysis including all male databases of European, African, Asian, and Native American populations resulted in inconclusive results. When all populations were considered, and when only European and Native populations were considered, the individual was too disparate to be confidently placed with any one group. Nevertheless, craniofacial features are most suggestive of European ancestry. Inconclusive FORDISC results, molar morphology complexity, slight malar tubercle development, and intermediate prognathism are likely indicative of admixture. Cranial metrics used are presented in Table 2.

Summary

Human skeletal remains discovered in the collections of the History Center in Cedar Rapids, IA represent a middle-aged (35-50 year old) male individual of non-Native ancestry and non-ancient antiquity, most likely originating from European and at least one other as yet unidentified populations. The individual was anatomically prepared as a fully articulated skeleton, likely for teaching purposes. The place of origin and where the individual was acquired are unknown as this information did not accompany the remains upon their donation to the History Center from an individual with ties to the Knights of Pythias.

References Cited

Edgar, Heather J.H.
2017 Dental Morphology for Anthropology: An Illustrated Manual. Routledge, New York.

Jantz RL, Ousley SD
2005 FORDISC 3: Computerized Forensic Discriminant Functions. Version 3.1. The University of Tennessee, Knoxville.

Turner, Christy G. II, Christian R. Nichol, and G. Richard Scott
1991 Scoring Procedures for Key Morphological Traits of the Permanent Dentition: The Arizona State University Dental Anthropology System. In *Advances in Dental Anthropology*, edited by Marc A. Kelley and Clark Spencer Larsen. Wiley-Liss, New York.

University of Iowa, Office of the State Archaeologist
2024 Burial Project 3883. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

Table 1. Dental Inventory 3883						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MAXILLA:						
RM3	2		1	1	1	1
RM2	5		0	0	0	0
RM1	4		0	0	0	0
RP2	5	9				
RP1	2	1				
RC	7	9				
RI2	5	9				
RI1	5	9				
LM3	4		0	0	0	0
LM2	4		0	0	0	0
LM1	2		5	5	5	5
LP2	2	3				
LP1	2	3				
LC	5	9				
LI2	5	9				
LI1	5	9				
MANDIBLE:						
LM3	4		0	0	0	0
LM2	4		0	0	0	0
LM1	4		0	0	0	0
LP2	5	9				
LP1	5	9				
LC	7	9				
LI2	5	9				
LI1	2	5				
RM3	5		0	0	0	0
RM2	5		0	0	0	0
RM1	7		2	0	2	0
RP2	2	1				
RP1	2	1				
RC	7	9				
RI2	2	5				
RI1	2	5				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 2. Cranial Metrics (mm), BP3883

Cranial metric	
Maximum cranial length	187
Maximum cranial breadth	140
Bizygomatic diameter	138
Basion-bregma height	131
Cranial base length	104
Basion-prosthion length	100
Maxillo-Alveolar breadth	64
Maxillo-Alveolar length	57
Biauricular breadth	133
Upper facial height	70
Minimum frontal breadth	98
Upper facial breadth	106.8
Nasal height	46.5
Nasal breadth	27
Orbital breadth L	40.8
Orbital breadth R	39
Orbital height L	34
Orbital height R	35
Biorbital breadth	106
Interorbital breadth	24
Frontal chord	115
Parietal chord	102
Occipital chord	88
Foramen magnum length	37
Foramen magnum breadth	30.7
Mastoid length L	32
Mastoid length R	30
Chin height	33.7
Mandibular height L	30.4
Mandibular height R	31.5

Table 2. Cranial Metrics (mm) BP3883 cont.	
Cranial metric	
Bigonial width	99
Bicondylar breadth	124
Minimum ramus breadth L	33
Minimum ramus breadth R	33.5
Maximum ramus breadth L	43
Maximum ramus breadth R	42
Ramus height L	55
Ramus height R	55
Mandibular length	77
Mandibular angle	121

Human Remains from the West Des Moines Burial Site (13PK38)

Samantha Murphy and Lara Noldner

Commingled human remains representing a minimum of 19 adults, one fetus, two infants and five juveniles (ages ranging 2-17 years) were excavated from the West Des Moines Burial Site, 13PK38. The Great Oasis site was impacted by construction in 1963 and subsequently excavated by the State Department of History and Archives, now the State Historical Society of Iowa the same year. Human remains excavated were transferred to the OSA in 1983 and then temporarily loaned to Doug Owsley while at Louisiana State University. Owsley then took the collection with him upon his transition to the Smithsonian Institution's National Museum of Natural History. The human remains were transferred back to the OSA in November of 2021.

Introduction

In November of 2021, the OSA accepted the transfer of human remains representing 27 individuals from 13PK38 (UI OSA 2021) (BP3641), archaeologically defined Great Oasis site also called the West Des Moines Burial Site. The site was impacted by home construction in 1963, looted by local residents, and partially archaeologically excavated the same year under the direction of Jack Musgrove, curator of the State Historical Museum at the State Department of History and Archives, now the State Historical Society of Iowa (Musgrove and Boy 1964, Schermer 2001). Human remains that were excavated by Musgrove were reposed at the State Historical Museum and eventually transferred to the OSA in 1983 (UI OSA 1982, 2014) (BP172, BP879). They were then temporarily loaned to Doug Owsley while at Louisiana State University and he took the collection with him upon his transition to the Smithsonian Institution's National Museum of Natural History (SNMNH).

15 individuals from the same site were reburied by the OSA and claimant tribes in October of 2001 (UI OSA 1979, 1982, 1995) (BP129, BP172, BP879), and one individual was reburied in August of 2021 (UI OSA 2012) (BP2754).

In the original Notice of Inventory Completion originally published by the OSA on February 26, 2024, the MNI was published as 21 adults, two infants and three juveniles ranging in age from 2-17 for a total of 26. This was based on SNMNH's initial analysis of the remains. Upon closer examination more specific age ranges for the juveniles were determined which affected the MNI. Juvenile remains that had been grouped with the adults were reassigned which lowered the number of adults and increased the number of juveniles making the final MNI 27.

Osteological Analysis

Original documentation of the excavation of 13PK38 describes identifiable burials and individuals (Holland 1982). Five individuals originally recorded by Thomas Holland in 1982 were included in the 2001 reburials. The documentation provided by the SNMNH at the time of transfer to the OSA in 2021 identified six discrete burials from the site and 13 paired elements. The elements were originally labeled with identifying numbers and tags, but prior to transfer the identification tags were removed and placed in the bottom of the storage containers and the human remains were stored by element instead of by individual. Based on size, condition, and estimated age, possible pairs of elements were made, and only in the case

of Infant A were multiple elements assigned to an individual. The rest of the remains were recorded as commingled.

Multiple elements were labeled in pencil with OSA catalog numbers that associate with x-rays taken for the original burial report (UI OSA 1982). The numbers include 38 for the site number (13PK38) and their assigned number within each element group (e.g. Mandible 38-15). For the elements that had a catalog number assigned closer to their initial excavation, one of each type of element was recorded under that number and all others labeled with arbitrarily assigned letters. The letters do not indicate articulating elements. For instance Tibia A and Femur A do not come from the same individual. In the groups with a high number of elements the juveniles were separated from the adults with the juveniles being numbered as Juvenile Tibia A, and the adults as Tibia A. In addition to the pencil catalog number many elements had a "L" or "R" written in pencil to indicate the side. Complete counts of all the elements, sides, and specific details can be found in Tables 1–3.

JUVENILES

There are eight identified juveniles that range from fetal to 17 years old. Age was determined based on epiphyseal fusion, dental development, element dimensions, and cast comparisons. The OSA maintains a comparative plastic cast collection for juvenile remains ranging from prenatal to 12 years of age. Due to postmortem damage and fragmentation of elements, age ranges are wider than typical. See Table 1 for all juvenile elements and age ranges and Table 2 for all elements associated with Infant A.

Fetal Remains

The fetal remains include one femur and one humerus (labeled Fetal Femur and Juvenile Humerus A). In the SMNMH inventory, the fetal femur was associated with Infant A, but when comparing sizes of the other elements associated with Infant A the fetal femur is significantly smaller in diameter. It is incomplete with only the midshaft present. The fetal humerus is noticeably smaller than the rest of the juvenile and infant remains as well. The humerus is incomplete and includes the distal portion of the diaphysis and a portion of midshaft. The femur and humerus are most similar in size to the OSA's casts of perinatal elements; due to the incomplete nature of the fragments age measurements were not possible.

Infant A

Infant A is the only identifiable individual due to the narrow age range presented by infant remains. Infant A is represented by the lateral occipital, right petrous pyramid, left scapula, a neural arch from a cervical vertebra, both ilia, the first rib, four other unidentifiable ribs, the right tibia, and the right femur. Initially the tibia and femur were stored with the other tibiae and femora, however based on size and condition comparison they were grouped with Infant A. Almost all the remains associated with Infant A have a slight brown/black speckling along the remains from taphonomic conditions. The age of Infant A was determined to be between birth and two months. The ilia were the most complete elements, and both measured 40mm in width. This is an estimated measurement due to some taphonomic breakage, but it aligns with the late fetal stage of development. The femur and the tibia are fragmented but when compared to casts of similar ages both were slightly larger than the fetal remains and significantly smaller than six-month-old elements. The developmental stage of the petrous pyramid is typical of an older infant. No pathologies were observed on the elements present.

Commingled Infant Remains

The remaining infant elements were aged between one and two years. While the remains are of the same age range it cannot be confirmed that they are from one individual or several. The remains include Mandible 38–51, Juvenile Humerus B, and Juvenile Tibia B. Mandible 38–51 is a partial fragment from the left side (see Table 3 and 4 for dental inventory and metrics). One left first molar is present and in occlusion and development appears to be nearly complete, but it would have only been partially erupted. The surrounding

tooth sockets suggest complete development of the incisors and the partial development of the left second molar. Based on dental development and the size of the mandible the individual was 12 to 18 months old. Juvenile Humerus B is a left complete diaphysis with no evidence of fusion to the epiphyses. The length of Juvenile Humerus B (110mm) indicates an age between 10 and 12 months (Cunningham et al. 2016; Maresh 1970). Juvenile Tibia B is a left nearly complete diaphysis with a break just above the distal end. There is no evidence of fusion of the proximal epiphysis. Juvenile Tibia B measures 132mm, which combined with cast comparisons, ages the individual to 12 to 24 months. No pathologies were observed.

Commingled Juveniles Aged 2-17

The remainder of the juvenile remains represent five individuals: two individuals three to eight years old, one individual 9 to 15 years old, and two individuals 15 to 20 years old. Due to postmortem damage and lack of diagnostic features, wider age range estimations had to be made than is typical with juveniles.

Two individuals aged three to eight years old are represented by one mandible fragment, two ulnae, one humerus, four os coxae fragments, one fibula, four tibiae, and four femora. The mandible fragment (Mandible 38-53, see Table 5 for dental inventory) includes the portion from the left canine to right second molar. Due to postmortem damage neither ramus nor posterior body portions are present. Only a partially erupted deciduous second molar with a medium parastyle on the mesial buccal quadrant is observable and it does not appear to have any evidence of enamel hypoplasias. Based on this single tooth and size comparison the individual was aged between two and three years old. Despite the individual's young age, the mandible shows evidence of significant premortem tooth loss and resorption from the partially erupted right molar to the left canine. The left canine was lost postmortem. This amount of tooth loss and resorption is typically seen in older adult individuals as a result of poor dental health, limited access to nutritional foods, and age-related wear and is not typically seen in juveniles. It is unclear whether trauma or disease/infection caused the initial tooth loss. The upper limbs are represented by two ulnae (Ulna B and Ulna J) and one humerus (Juvenile Humerus C). Ulna B is a right proximal portion and midshaft and is estimated to represent an individual 2 to 5 years old. Ulna J is a left midshaft and distal fragment estimated to be between five and eight years old. Juvenile Humerus C is a nearly complete left diaphysis with no evidence of fusion of the epiphyses. Juvenile Humerus C measures 150mm in length indicating an age between 3 and 3.5 years.

Four os coxae and one sacrum representing at least two individuals were identified in the 3- to 8-year-old age range. Three were left sided (Os Coxa T, Os Coxa U, and Os Coxa V) and one right (Os Coxa S). Os Coxa S is an ischium and partial pubic bone with no evidence of fusion at the vertical flange of the triradiate cartilage but partial fusion at the ischiopubic ramus. Os Coxa T is a singular ischium with no evidence of fusion. Os Coxa U is an iliac blade with the sciatic notch and partially visible auricular surface. Based on size and refitting it is possible that Os Coxa T and U are form the same individual. Os Coxa V is an iliac blade with well-defined acetabulum and auricular surface. Sacrum C is a partial sacrum including the first two sacral vertebrae, alae, and auricular facets. The vertebrae are fully developed but are not completely fused suggesting an age of 6 to 9 years.

Lower limbs include one fibula, four femora and four tibiae representing individuals aged between 3 and 6 years old. Fibula H is a left proximal and partial midshaft with no evidence of fusion at the epiphysis with an age estimation of 3 to 5 years based on cast comparison and lack of fusion. The juvenile femora include Juvenile Femur C, D, E, and F. Juvenile Femur C is a right neck and trochanters with no evidence of fusion of the head or trochanters; age estimation is 6 to 8 years. Juvenile Femur F is a left complete diaphysis with no evidence of fusion of the head, trochanters, or distal end. A complete diaphyseal measurement of 310mm suggests an age range between 7.5-8.5 years old. Juvenile Femur F is a possible pair to Juvenile Femur C based on the angle of the neck, but this cannot be confirmed. Juvenile Femur D is a left distal portion and partial midshaft. Only the medial epicondyle is observable and does not show evidence of fusion. Comparison to casts suggests an age of 4 to 7 years old. Juvenile Femur E is a right proximal and partial midshaft with no evidence of fusion at the head or trochanters. Based on cast comparisons Juvenile Femur

E was aged to 4 to 7 years. The four tibiae include Juvenile Tibia C, D, E and F. Juvenile Tibia C and E are a pair from the same individual. Both C and E are marked as 38-8 in pencil and are of a similar size and condition. Juvenile Tibia C is a left nearly complete diaphysis with the entire metaphysis missing and none of the unfused surface observable. Juvenile Tibia E is a right sided, nearly complete diaphysis with the entire distal metaphysis missing and none of the unfused surface observable. The proximal metaphysis shows no evidence of fusion, and the proximal epiphysis is present also with no evidence of fusion. Juvenile Tibia E measures 245mm in length which ages the individual (Juvenile Tibia C and E) between 6 and 8 years old. Juvenile Tibia D is a left diaphyseal midsection with a small portion of the superior tuberosity; age of the individual is estimated to be between 5 and 10 years. Juvenile Tibia F is a right complete diaphysis with no evidence of epiphyseal fusion. Length of the diaphysis is 200mm which suggests an age between 3.5 to 5 years old.

There is one individual aged between 9 and 15 years old and represented by a humerus, femur, and tibia. Humerus L is a left proximal portion and partial midshaft. Postmortem damage has made the distal end unobservable. There is no evidence of fusion of the head indicating that the individual is younger than 15; the size of the element indicates an age older than 8. Juvenile Femur A is a right complete diaphysis with no evidence of fusion at the epicondyles. Due to damage, it is undetermined if the head had begun to the fuse. A full-length measurement of 373mm ages the individual between 10 and 15 years which aligns with the observable epiphyseal fusion. Juvenile Tibia G is a right proximal and nearly complete shaft with the most distal end having been damaged postmortem. There is no evidence of fusion at the proximal epiphysis, but the tibial tuberosity has been completely fused which suggests an age range between 10 and 15 years.

There are two individuals aged between 15 and 20 years old represented by three humeri. Humerus I and Humerus J are a right and left pair based on size, age, and condition. Both are complete with complete fusion of the epicondyles and nearly complete fusion of the head with only a thin line visible. Full length measurements are 320mm (I) and 315mm (J), vertical head measurements are 42mm for both, and both have transverse head diameters of 40mm and epicondylar widths of 55mm. Rissech, Lopez-Costas and Turbon inverse function (Cunningham, Scheuer and Black, 2016) for age prediction resulted in an age of 15.7 years. The measurements of 315-320mm in length indicates an age range of 14.5 to 16 years (Cunningham, Scheuer and Black, 2016). The third humerus, Humerus A, is a left head and partial midshaft. A faint line at the head is evidence that fusion was underway but not complete indicating an age between 14 and 19 years. The vertical head measurement of 35mm and transverse head measurement of 36mm suggest an age of 13 years old (Cunningham, Scheuer and Black, 2016; Rissech et al. 2013).

The juvenile remains also include elements for which estimation of a narrower age range is not possible due to a lack of standard metrics for age range. There are six juvenile ribs (4-10), all fragmented, which include two body sections, three head, neck and partial body portions, and one sternal end and partial body. On the observable heads there is no evidence of epiphyseal fusion suggesting that the individuals had not gone through puberty. There are six juvenile vertebral fragments: two indeterminate by type, one lumbar, and three thoracic. Four arches and bodies are completely fused suggesting an age of at least six years old. No pathologies were observed on the juvenile remains.

ADULTS

No specific individuals could be identified from the adult remains as the remains were stored by element instead of by individual or burial. The MNI for adults is 19 which was calculated from the right femora. Table 6 includes all adult elements, measurements and defining features.

Crania and Dentition

The cranial elements include bones of the cranial vault, maxilla, and mandible. There are three partial cranial vaults. Cranial Vault A consists of both parietals and occipital. Based on the size of the occipital protuberance the individual is likely male. The observable sutures are completely fused with some almost

obliterated suggesting a middle to older adult. Cranial Vault B is a left parietal and frontal. The glabella is relatively flat with minimal projection and smooth supra orbital margins suggesting a female individual. There is evidence of porotic hyperostosis on the parietal and cribra orbitalia in the eye orbits. The parietal shows evidence of healing while the eye orbits' lesions were active at death. This suggests repeated periods of nutrient deficiencies during the individual's lifetime. Cranial Vault C is a nearly complete vault that consists of the occipital, both parietals, left temporal, and frontal. The left parietal fragment that is no longer articulated with the vault has a portion of the temporal suture present. The observable sutures are completely closed or obliterated indicating an older adult individual. The observable mastoid process is intermediate in size and projection, but the occipital protuberance, glabella, and supraorbital margins are robust and prominent suggesting a male individual. One occipital (Occipital A) is present, with a prominent occipital protuberance suggesting a male individual. On the left of the protuberance is an indentation from a prominent blood vessel. There are six parietal fragments, two left and four right, that refit into two different parietals. There are 11 total temporals, four rights and seven lefts. Based on the observable mastoid processes there are five males, three females and four are indeterminate. Four frontal fragments represent three males and one female. A single sphenoid is present with most of the body present and a small portion of the wings. The sphenoid is very fragile and continued to have small breaks and flaking during the documentation process.

The remainder of the cranial bones included eight mandibles and five maxillae, with two paired maxillae and mandibles. Tables 7 thru 13 include dental inventory and metrics for the adult mandibles and maxillae. Maxilla 38-60 was identified in the same storage bag as Mandible 38-58 and upon closer examination the teeth of the maxilla occlude well with teeth of the mandible and are of similar size and condition. Maxilla 38-60 is a partial left fragment from the area of the left third molar to the right second incisor. There are two teeth in occlusion: the left second premolar and first molar. Both teeth show a significant amount of wear so that only a small ring of enamel is present on the edge of the teeth. The teeth demonstrate higher wear on the lingual portion than the buccal creating a steep angle. A small caries is present on the occlusal surface of the first molar. Calculus is observable on the roots of both teeth. The alveolar bone has receded from the teeth likely indicating periodontal disease. The left second and third molars were lost premortem with complete alveolar resorption.

Mandible 38-58 is nearly complete, missing only the right ramus and the left condyle. The right third and second molars were lost premortem with complete alveolar resorption and healing. The socket of right first molar shows evidence of a possible abscess in the process of healing. The second left incisor, canines, left premolars, and left first and second molars are in occlusion with all other teeth unobservable. The right premolars were lost premortem; it is unknown whether the incisors were lost pre- or postmortem due to damage to the alveolus. The right canine has a heavy amount of wear with only a small amount of enamel on the rim of the tooth and complete dentin exposure on the occlusal surface. The wear on the tooth is steeply angled towards the lingual side. The remaining left sided teeth present similar heavy wear but the wear is more prominent on the buccal portion. Small amounts of calculus can be seen on the buccal portion of the exposed root of the right second incisor and first premolar. The left first incisor which was likely lost premortem due to dental disease with evidence of partial healing and resorption, and the third molar was lost premortem possibly from an abscess that had not perforated the alveolar process. Maxilla 38-60/ Mandible 35-58 is likely a male individual based on the robusticity of the mandible and the protruding mental eminence Based on the high amount of dental wear and disease the individual was a middle to older aged adult.

The second paired maxilla and mandible are Maxilla 38-56 and Mandible 38-56. The two elements were paired by the original OSA examination and confirmed as an articulating pair in this most recent documentation based on similar size, color, condition, and dental refit. Maxilla 38-56 consists of both the left and right side but has broken at the nasal spine resulting in two fragments. Postmortem damage resulted in removal of half of the nasal cavity and a portion of the palatine closest to the alveolar bone on

both the left and right sides. Only a small portion of the left zygomatic is present. The left dental arch has three teeth that are in situ: the second incisor, and the first and second molars. On the right, only the first and second molar are in situ. All other maxillary teeth were lost postmortem. The lingual 2/3 of the right maxillary first molar is also missing due to postmortem damage. Of what can be observed all the teeth have moderate dental wear; the occlusal surfaces of the molars are flattened with no dentin exposure, and a distinct line of dentine is exposed on the left lateral incisor. The wear on molars is angled down towards the lingual side with heavier wear on the mesio- and disto-lingual quadrants. On the observable portion of the right first molar darker staining is present suggesting the remnant of a caries on the occlusal surface that is no longer complete due to postmortem damage. All the observable teeth have a slight amount (1-2mm) of root exposure suggesting periodontal disease. Mandible 38-56 consists of only the right side with the break separating the two halves at the mesial edge of the right canine. The teeth in occlusion and in situ are the first and second molars, the first premolar and the canine. The right third molar and second premolar were lost postmortem. All the observable teeth have moderate dental wear with the enamel worn flat but no dentin exposure. The mandibular teeth do not present the same angled wear pattern as the maxilla. The second molar has a large caries that has perforated 4mm into the dentine on the distolingual and distobuccal surface with the lesion measuring 7mm by 5mm. The depth and shape of the caries on the second molar suggests therapeutic dentistry. Therapeutic dentistry has been observed in other Woodland burials and typically included carving out the decayed portion of tooth to create a cavity into the pulp chamber (Nase et al. 2022). The right canine has evidence of enamel hypoplasia indicating periods of stress due to disease/malnutrition at an earlier life stage, likely between 5 and 7 years of age. The mental eminence is not observable, but the observable fragment is more gracile suggesting a possible female individual. Based on the moderate dental wear and tooth loss the individual was a middle-aged adult.

The remainder of the maxillae and mandibles could not be paired suggesting different individuals, but this cannot be confirmed due to the varying levels of postmortem damage. There are four identifiable maxillae with one being comprised of multiple fragments. Maxilla 38-54 is a partial left maxilla consisting of a segment preserving sockets for the incisors and canine and four teeth in situ and in occlusion: the premolars and first and second molars. The dentition has minimal dental wear with most dental morphology observable. There is some root exposure suggesting periodontal disease. The canine and incisors were lost postmortem. Based on minimal dental wear the individual was a younger adult.

Maxilla A consists of three fragments: the left and right halves including some alveolus, and the upper portion of the right maxilla including the eye orbit and right zygomatic bone. Most of the dental arch is unobservable due to taphonomic damage; no dentition is present and only some partial root sockets are preserved. Due to the postmortem damage of Maxilla A, it is somewhat difficult to determine which teeth were lost pre and postmortem. Sockets for the central incisors, right lateral incisor and right canine suggest postmortem loss. Remnant alveolus where the right second premolar and first molar indicates premortem loss well before death with the molar likely lost due to abscess; the alveolus is significantly resorbed to the point where only a partial remnant of a buccal perforation is visible. Bone surrounding the remnant perforation is normal and dense. Active lesions along most of the left alveolus indicate antemortem tooth loss likely due to periodontal disease. Sockets for the left lateral incisor, canine and first premolar are exposed labially and lined with thick, dense trabeculae. The socket for the left second premolar is mostly intact indicating postmortem loss, but the socket is also surrounded by dense, course trabeculae; the tooth would have exhibited significant alveolar recession. Alveolus where the left first molar would have been indicates antemortem loss, again due to periodontal disease; only a small remnant of the deepest part of the lingual most root is visible and all surrounding alveolus consists of thick, coarse trabeculae.

Maxilla B is a small right fragment with a small portion of nasal cavity visible and partial sockets for the incisors, canine and first premolar. Of the observable dental sockets, the dentition was lost postmortem with no evidence of dental disease. Maxilla C is a small fragment of a left maxilla with a small portion of nasal cavity and alveolar process visible. Due to postmortem damage most of the tooth sockets are unobservable;

only those for the right premolars are intact indicating postmortem loss. No dentition is in situ. There is no clear evidence of pathology and the clearly visible tooth socket is likely from the first or second premolar; it is undetermined if the tooth was lost ante- or postmortem.

There are five mandible fragments. Mandible 38-52 is a nearly complete mandible that has broken into two fragments postmortem with the break occurring at the mental eminence. At some point an attempt was made to glue the mandible back together with glue still visible in the break. There are two teeth in situ: the right and left second premolars. Both teeth have moderate dental wear with some dentin exposure as well as caries. The left second premolar has caries on the occlusal surface and both mesial and distal aspects at the CEJ. The right second premolar has a caries on the distal interproximal surface at the CEJ. Both premolars also have small amounts of calculus along the roots with significant root exposure suggesting periodontal disease. The right molars appear to have been lost premortem with evidence of healing and complete resorption. The alveolus where the right first premolar would have been demonstrates nearly complete alveolar resorption with only a shallow depression lined with thick dense trabeculae remaining. The left third and first molar were lost well premortem with nearly complete resorption, while the second molar appears to have been lost closer to death due to an abscess; it appears that rather than a lingual or buccal perforation the abscess extended inferiorly from the tooth roots into the body of the mandible were a deep lesion lined with porous bone is visible. The rest of the alveolus where the left second molar would have been demonstrates early stages of healing; the sockets are completely resorbed and the shallow lesion is lined with porous bone. Through the socket of the left canine the crown of an unerupted, impacted left first premolar is visible. It appears that the gap left by the unerupted premolar caused malocclusion, where upper dentition created a large facet on the mesial half of the second premolar's crown; most of the tooth's mesial half was worn to the point of significant dentine exposure over time. The observable portion of the mandible's mental eminence does not protrude, and it is gracile overall suggesting a female individual. Based on premortem tooth loss, dental disease, resorption, and heavy wear, the individual was an older adult.

Mandible 38-55 is a nearly complete mandible with the left ramus and condyle unobservable. Three teeth are no longer in situ: the right first molar and canines. Both canines were lost postmortem, the right first molar was lost antemortem with slight porosity in the remaining cavity suggesting early stages of resorption. The incisors have high levels of dental wear, as a thin line of dentin is exposed on all four teeth. The remainder of the teeth have minimal to moderate dental wear; the right premolar's cusps are blunted and the molars are slightly worn, but cusps and features are still observable. The wear that is observable is slightly angled downward to the buccal side with the heaviest wear found on the mesio- and disto-buccal portions of the left molars. The cusps of the premolars and molars have not been flattened and are still distinguishable. There are no caries, calculus or root exposure suggesting minimal dental disease with the exception of the right first molar, as the porosity in the cavity suggests healing and resorption. The mandible is generally robust with a prominent mental eminence suggesting a male individual. Based on minimal dental wear the individual was a young adult.

Mandible 38-57 is a partial mandible fragment with the break occurring at the left second premolar. The observable teeth still in situ are the right molars, right second premolar, right first incisor, left first incisor and left first premolar. The right first premolar, right canine, and secondary incisors were lost postmortem. A portion of the canine's root is still observable in the socket; the crown was broken off due to taphonomic damage. Only half of the socket of the left second premolar is intact; it is possible that the tooth was lost antemortem due to the presence of porous bone lining the socket. The observable teeth have moderate amounts of dental wear with slight blunting of cusps and morphology still distinct. There is a slight amount of root exposure (1–2 mm) suggesting periodontal disease. The mandible is robust with a prominent mental eminence suggesting a male individual. Based on the minimal dental wear and lack of dental disease the individual was younger adult.

Mandible A is a partial mandible fragment with the break occurring at the left canine. The right superior portion of the ramus and condyles are unobservable as well. The right first premolar is the only observable tooth which presents a moderate amount of dental wear and slight root exposure. The right molars and second premolar were lost premortem with complete alveolar resorption. The right canine and second incisor were lost postmortem. Postmortem damage has made the remainder of the alveolus unobservable. The mandible is small and gracile with a slightly protruding mental eminence suggesting a female individual. Due to the amount of dental wear and antemortem tooth loss the individual was a middle to older adult.

Mandible B is a right mandibular condyle that does not refit onto any of the other mandibles present.

There are five teeth out of occlusion that do not refit into any of the mandibles or maxillae. There is one mandibular right third molar, two maxillary left first premolars and two maxillary right premolars. The third molar has minimal dental wear. Wear on the premolars was more significant with the occlusal surface worn flat. There is a single caries on one of the left premolars on the interproximal surface. Both right premolars have slightly split roots.

Post Cranial

The post cranial remains are in varied conditions due to taphonomy, postmortem damage, and storage conditions. Based on the completeness of elements, measurements to assess age and sex were taken when possible. A complete list of all elements and measurements can be found in Table 6.

The upper limbs identified in the ossuary are 10 scapulae, 11 clavicles, 15 humeri, 13 radii, 12 ulnae, seven carpals, 22 metacarpals, and 22 phalanges. The 10 scapulae include three rights (Scapula A, B, and C) and seven lefts (Scapula D, E, F, F, G, H I, and J). Scapulae C and D presented lipping and porosity on the glenoid fossae indicating osteoarthritis and middle to older aged individuals. The 11 clavicles include seven rights (Clavicle D, E, F, G, H, I, and K) and four lefts (Clavicle A, B, C, and J). Clavicle A and C present rugosity at the deltoideus and trapezius insertions suggesting habitual manual labor requiring shoulder abduction and stabilization of the scapula. Clavicle B, E, G, and H present eburnation and porosity at the acromial and sternal articular surfaces. This suggests older adult individuals with the early stages of osteoarthritis and supports the repeated physical activity indicators observed at muscle entheses.

Of the humeri, there are six lefts (Humerus B, C, D, H, K, and N) and nine rights (Humerus E, F, G, M, O, P, Q, R, and S). In cases where measurements of the head and length were possible, sex estimations were made with two females (Humerus C and P) and one male (Humerus F) individual identified. Of the adult humeri, R and N are a likely pair based on similar size and condition. Both have similar sized septal apertures and porosity and eburnation on the anterior portion of the lateral epicondyles. Lipping has is also present on both lateral epicondyles. This evidence of osteoarthritis suggests an older adult individual is represented. Humerus Q also presented a slight eburnation on the epicondyles suggesting osteoarthritis.

The 13 radii include six rights (Radius B, D, H, I, J, and L) and seven lefts (Radius A, C, E, F, G, K, and M). Rugosity at muscle entheses and more robust radial tuberosities on Radius G and J suggest that the individuals were participating in activities requiring repetitive flexion of the elbow and lifting heavy loads. Lipping and eburnation on the radial head of Radius F, G, and L indicate older adult individuals. Radius D has an observable but very faint metaphyseal line at the distal end suggesting that complete fusion had recently occurred, and a young adult individual is represented. Of the 12 ulnae, five rights (Ulna C, F, I, K, and M) and seven lefts (Ulna A, D, E, G, H, L, and N) were identified. Ulna E and I were identified as a possible pair based on size and condition, specifically that both present the same severity of enthesopathy on the ulnar head at the triceps insertion. Enthesopathy is a pathology expressed by bony projections and/or pitting at tendon and ligament insertions and is caused by microtrauma to those structures (Ortner 2003). Large pits with irregular, porous margins are present across the entire ulnar heads of both Ulna E and I suggesting bilateral trauma at the triceps brachii tendon insertion for a significant amount of time. It also suggests the individual was an older adult. Ulna L has observable lipping around the olecranon and anterior ridge suggesting an older adult with osteoarthritis. The bones of the wrist and hand include seven carpals

(one lunate, three scaphoids, two hamates and one capitate,), 22 metacarpals and 22 hand phalanges (3 distal, 10 middle and 9 proximal) (sides recorded in Table 6). Two first metacarpals, a left and right, and one distal phalanx were distinguishable as likely belonging to the same individual as they were significantly more robust than the others.

In the 13PK38 ossuary the elements from the axial skeleton include ribs and cervical, thoracic, and lumbar vertebrae. 78 total ribs were identified, with 8 possible first ribs (four left and four right) and four possible second ribs (all rights). All the ribs were fragments and of various sizes suggesting multiple individuals. An older individual was identified by a rib that had a significant amount of of lipping and porosity on the head and tubercle. Of the 85 vertebrae identified there are 24 cervical, 49 thoracic and 12 lumbar. Three atlases, three axes and one fifth lumbar vertebra were identifiable. One of the atlases is significantly larger than the rest measuring 81 mm long and 50 mm in width. Two cervical, three thoracic and two lumbar vertebrae have observable compression of their vertebral bodies and osteophytes and porosity indicating degenerative joint disease and an older individual.

A total of three sacra and 18 os coxae are present. Sacrum A is complete and fully fused with postmortem chipping. Sacrum B and C are both partial sacrum fragments including the first sacral vertebra and the alae. Of the 18 os coxae, eight left (Os Coxa A, B, C, D, E, F, G, and H) and 10 right (Os Coxa I, J, K, L, M, N, O, P, Q, and R) were identified. Of the fragments that had observable sexually dimorphic features five males (Os Coxa A, C, G, N, and P) and nine females (Os Coxa D, E, F, H, I, J, K, L, and Q) were identified. Age ranges of individuals that could be estimated include five young adults (Os Coxa D, F, J, L and M), four middle aged adults (Os Coxa E, G, N, and I) and three older adults (Os Coxa A, C and Q). Due to postmortem damage not all the fragments could be aged and sexed. No pathologies or traumas were observed on the os coxae.

The lower limbs are represented by 32 femora, 6 patellae, 21 tibiae, 13 fibulae, 8 calcanei, 8 tali, 16 tarsals, 37 metatarsals, and 16 pedal phalanges. The femora determined the MNI for adults as they were the most repeated element with 19 rights (Femur A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, S, and T) and 13 lefts (Femur R, U, V, W, X, Y, Z, AA, BB, CC, DD, EE, and FF). Where femoral measurements were possible, six males (Femur F, H, J, S, BB, and DD) and eight females (Femur A, D, G, I, R, T, EE, and FF) were identified. At an unknown point in time Femora A, H, I, J, DD, EE, and FF were cross sectioned with saw cuts. Of the observable remains, the femora were the only elements purposely cross sectioned for analysis, but no associated publications regarding cross-sectional geometry have been found at this time. With only visual examinations of those cross sectioned and other femora that were broken postmortem, cortical bone thickness varied across individuals. Similar to the upper limbs the femora demonstrated evidence of osteoarthritis. Femora G and I had evidence of eburnation and lipping on the head and condyles. Femur D is likely a younger adult individual as there is a faint metaphyseal line at the head and neck suggesting fusion was only recently completed. In addition to the osteoarthritis several of the femora had robust and pronounced entheses. The gluteal and hip adductor entheses were more pronounced on 11 of the femora indicating greater development of hip extensors, stabilizers, and adductors in some individuals.

Of the 21 tibiae, 11 rights (Tibia A, B, C, H, M, N, O, Q, S, T, and U) and 10 lefts (Tibia D, E, F, G, I, J, K, L, P, and R) were identified. Where tibial measurements were possible, six males (Tibia J, L, P, Q, R, and T) and six females (Tibia D, F, I, N, S, and U) were identified. Some tibiae have age-related porosity on distal epiphyses but not the significant levels of osteoarthritis observed in other elements. The fibulae include six lefts (Fibula B, C, D, E, J, and L) and seven rights (Fibula A, F, G, I, K, M, and N). Periostitis was identified on Fibula A on the anterior surface at midshaft, proximal to the interosseous crest. The raised plaque-like bone formation measures 25mm in length, 5mm in width and is 2mm thick. Fibula M has periostitis on the posterior distal midshaft measuring 20mm in length, 4mm in width and 1mm thick. Periostitis on Fibula A appears to have been healing while it was more active at death on Fibula M. The eight calcanei included an equal number of rights (Calcaneus E, F, G, and H) and lefts (Calcaneus A, B, C and D). Pairs could not be definitely made due to postmortem damage. A majority of the calcanei present

have significantly developed achilles tendon attachments, which is likely due to high mobility but is also indicative of older age. The eight tali include an equal number of lefts and rights, but only one possible pair could be identified. Of the 16 tarsals there are three naviculars, three cuboids, four first cuneiforms, one second cuneiform, three third cuneiforms and two unidentifiable tarsals due to postmortem damage (sides presented in Table 6). 37 metatarsals and 16 pedal phalanges were identified including 13 middle and 3 proximal. Similar to the bones of the hand, 5 pedal bones (a left and right navicular, one left first metatarsal and three proximal pedal phalanges) were more robust than the others indicating multiple individuals. It cannot be determined if the robust pedal bones are from the same individual as the robust hand bones, but they are of similar condition, color and preservation.

Pathologies

The most common pathology identified was dental disease and premortem tooth loss. Almost all the mandibles and maxillae had a minor to severe case of periodontal disease and several caries and abscesses were noted. Great Oasis communities were early adopters of agriculture and maize in the Midwest, and maize is notoriously high in starch and low in nutritional value which increases the risk of tooth decay and disruptions to dental development, respectively. The evidence of cribra oribitalia, enamel hypoplasias, and periostitis suggest that some individuals experienced periods of stress from inadequate nutrition or disease processes. The severe premortem tooth loss and advanced alveolar remodeling evident on a young juvenile is uncommon and the degree of alveolar resorption makes it unclear whether tooth loss and remodeling was due to trauma or infection. Dental wear on all individuals is typical of populations using ground stone technology for processing food.

Osteoarthritis and enthesopathies suggest a population engaged in heavy work loads and frequent travel on foot. Agriculture typically requires a high amount of work and repetitive motions, and the populations' diet would have been supplemented by hunting and gathering. Pit houses were a common form of shelter at Great Oasis sites, and their construction would have also required heavy manual labor and repetitive motions. The arthritis also indicates that individuals were living into the older adult age category. The individuals with high amounts of dental wear also indicate individuals living into later life stages.

The lack of the trauma from interpersonal violence on the individuals suggests positive interactions with other communities in the area or that the community was isolated from others. It can also indicate that internally the community had minimal violent conflict.

Summary

The remains excavated at the West Des Moines Burial Site represent a broad spectrum of community members including 19 adults, one fetal individual, two infants, and five juveniles aged 2-17 years. The communal burial of individuals of all ages and both males and females indicates a lack of discrimination based on age and gender during burial practices. The West Des Moines Burial is similar to other known Great Oasis cemeteries with multiple primary and secondary interments over a significant period of time at a single location. The dental pathologies and premortem tooth loss are common in communities heavily reliant on corn due to high starch content and low nutritional value. The Great Oasis communities were some of the earliest domesticators of corn in the Midwest. The relatively few individuals with skeletal signatures of nutritional stress suggests the community was not completely reliant on agriculture and was supplementing their diet with other sources. Occupational stress markers also support high mobility and frequent periods of heavy physical labor likely associated with pit house construction and agricultural lifeways supplemented by hunting and gathering, which is consistent with primary activities evident from the archaeological records at Great Oasis sites. Despite the amount of pathologies observed, a majority of the individuals were older adults suggesting that the population was relatively healthy and living to older ages.

References Cited

Bass, William M.
1995 *Human Osteology: A Laboratory and Field Manual*. 4th ed. Special Publication No. 2. The Missouri Archaeological Society, Columbia.

Nase et al.
2022 Therapeutic dentistry in prehistoric Maryland–New analyses from the Hughes (18MO1) archaeological site. International Journal of Osteoarcheology. 32(5). 1011-1019.

Musgrove, Jack W., and Richard D. Boyt
1964 Report of the Investigation of the West Des Moines Indian Burials. Manuscript on file, Office of the State Archaeologist, University of Iowa, Iowa City.

Ortner, Donal J.
2003 Identification of Pathological Conditions in Human Skeletal Remains. Academic Press, San Diego, California.

Schermer, Shirley J.
2001 Great Oasis Osteology and Burial Practices. Paper presented at the 59th Annual Plains Anthropological Conference, Lincoln, Nebraska. Copy on file, Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist
2021 Burial Project 3641. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist
2018 Burial Project 3368. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist
2014 Burial Project 879. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist
2012 Burial Project 2754. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist
1988 Burial Project 294. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist
1982 Burial Project 172. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

University of Iowa, Office of the State Archaeologist
1979 Burial Project 129. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

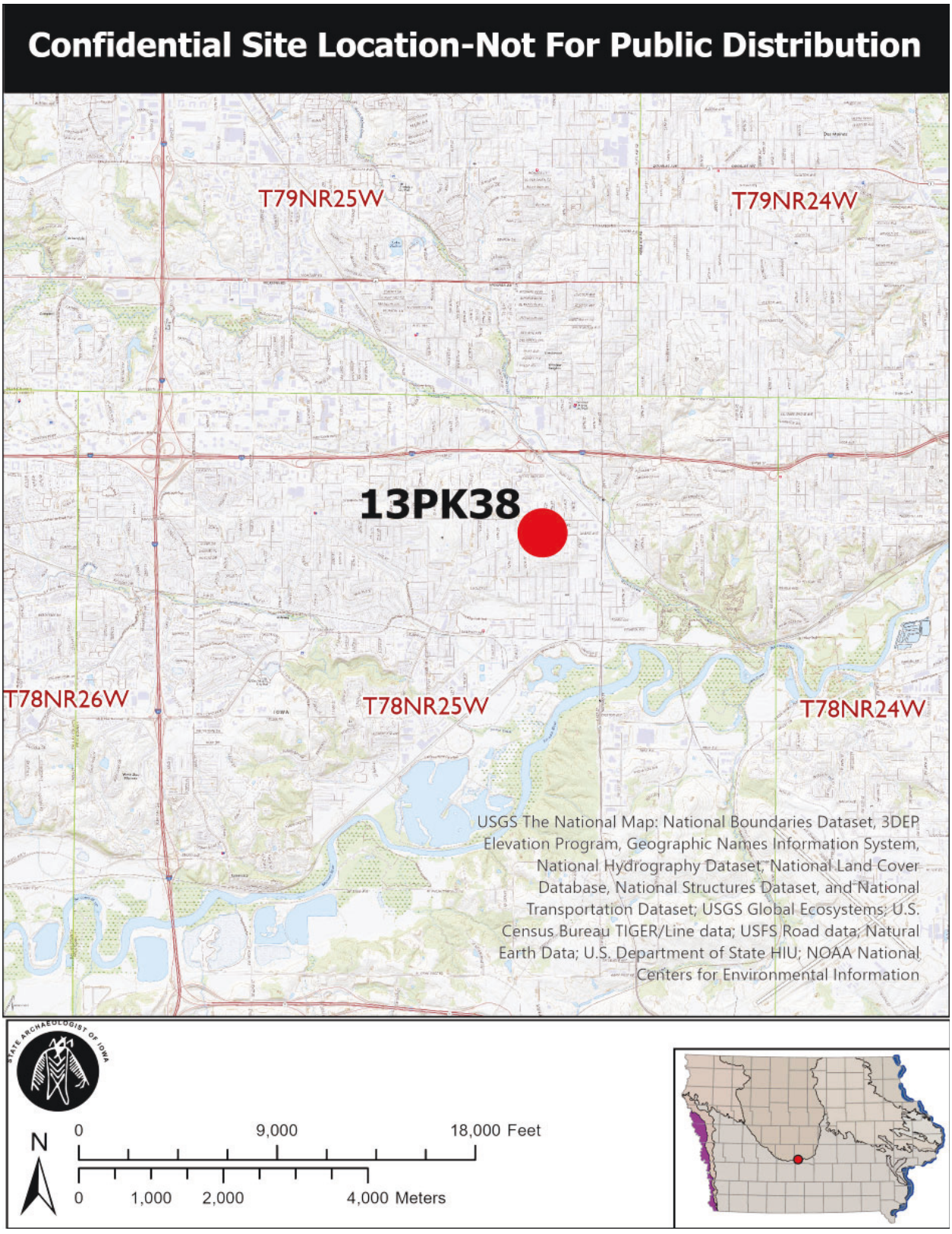

Figure 1. Findspot of human remains.
From USGS Corley, Polk County, Iowa (1978), 7.5' series quadrangle map. Scale 1:100,000.

BP 3641 Table 1 Juvenile Element and Details				
Element	**Side**	**Age**	**Measurements**	**Notes**
Mandible 38-51	N/A	1-1.5 yrs		one tooth left in occlusion, partial development of crown and root
Mandible 38-53	N/A	2-3 yrs		severe antemortem tooth loss
Sacrum C	N/A	6-9 yrs		
Os Coxa S	R	6-8 yrs		
Os Coxa T	L	3-6 yrs		possible same individual as Os Coxa U
Os Coxa U	L	3-5 yrs		possible same individual as Os Coxa T
Os Coxa V	L	6-10 yrs		
Clavicle L	R	< 18		
Juvenile Ribs		< 12		6 in total
Juvenile Vertebrae	N/A	> 6		6 in total, 3 thoracic, 1 lumbar
Perinatal remains		Fetal		Fetal Femur and Juvenile Humerus A
Juvenile Hand Bones				6 in total all metacarpal
Juvenile Fibula	L			distal end
Juvenile Humerus A/ Perinatal	L	Perinatal		
Juvenile Humerus B	L	10-12 months		
Juvenile Humerus C	L	3-3.5 yrs		
Humerus A	L	14-19 yrs	Vertical head diameter 35mm, Transverse head diameter 36mm	Inverse function for age prediction calculated 13 yrs
Humerus I	R	14-19 yrs	Vertical head diameter 42mm, Transverse head diameter 40mm, Epicondyle breadth 55mm, Full length 320mm	Pair to Humerus J, Inverse age predication calculated 15.7 yrs
Humerus J	L	14-19 yrs	Vertical head diameter 42mm, Transverse head diameter 40mm, Epicondyle breadth 55mm, Full length 315mm	Pair to Humerus I, Inverse age predication calculated 15.7 yrs
Humerus L	L	9-15 yrs		Cast comparison to age
Ulna B	R	2-5 yrs		Cast comparison to age

BP 3641 Table 1 Juvenile Elements and Details cont.				
Element	**Side**	**Age**	**Measurments**	**Notes**
Ulna J	L	5-10 yrs		Cast comparison to age
Juvenile Tibia B	L	1-2 yrs	Full length 132mm	
Juvenile Tibia C (38-8)	L	6-8 yrs		Pair to Juvenile Tibia E
Juvenile Tibia D	L	5-10 yrs		Cast comparison to age
Juvenile Tibia E (38-8)	R	6-8 yrs	Full length 245mm	Unfused proximal epiphysis present, Pair to Juvenile Tibia C
Juvenile Tibia F (38-10)	R	3.5-5 yrs	Full Length 200mm	
Juvenile Tibia G	R	10-15 yrs		Cast comparison to age
Fibula H	R	< 15		
Juvenile Femur A (38-5)	R	10-15yrs	Full Length 375mm	
Juvenile Femur C (38-8)	R	6-8 yrs		Cast comparison to age
Juvenile Femur D	L	4-7 yrs		Cast comparison to age
Juvenile Femur E	R	6-8 yrs		Cast comparison to age
Juvenile Femur F (38-8)	L	7.5-8.5 yrs	Full length 310mm	

BP 3641 Table 2 Infant A Details			
Element	**Side**	**Measurements**	**Notes**
Lateral Occipital	N/A		
Petrous Pyramid	R		
Cervical Neural Arch	N/A		
Scapula	L		
1st Rib	INT		1
Ribs	INT		5 in total
Ilium A	L	40mm	Aligns with late stage fetal
Ilium B	R	40mm	Aligns with late stage fetal
Juvenile Tibia A	R		
Juvenile Femur B	L	3/4 length 90mm	

Table 3. Dental Inventory Mandible 38-51							
Tooth	Presence	Development	Attri-tion:	Attrition- molars:			
			I, C, PM	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MANDIBLE:							
Ldm2	5			0	0	0	0
Ldm1	8	initial root formation		1	1	1	1
Ldc	5		9				
Ldi2	5		9				
Ldi1	5		9				
Rdm2	3			0	0	0	0
Rdm1	3			0	0	0	0
Rdc	3		9				
Rdi2	3		9				
Rdi1	3		9				

Juvenile Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable
Development

Ci	*Initial cusp formation*
Cco	*Coalescence of cusps*
Coc	*Cusp outline complete*
Cr1/2	*Crown ½ complete*
Cr3/4	*Crown ¾ complete*
Crc	*Crown complete*
Ri	*Initial root formation*
Cli	*Initial cleft formation*
R1/4	*Root length ¼*
R1/2	*Root length ½*
R3/4	*Root length ¾*
Rc	*Root length complete*
A1/2	*Apex ½ closed*
Ac	*Apical closure complete*

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable
Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 4. Dental Metrics (mm) Mandible 38-51				
Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
MANDIBLE:				
Ldm1	5.0	7.0		

Table 5. Dental Inventory Mandible 38-53							
Tooth	Presence	Development	Attrition:	Attrition- molars:			
			I, C, PM	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MANDIBLE:							
Ldm2	3			0	0	0	0
Ldm1	3			0	0	0	0
Ldc	5		9				
Ldi2	4		9				
Ldi1	4		9				
Rdm2	8	initial root formation		1	1	1	1
Rdm1	4			0	0	0	0
Rdc	4		9				
Rdi2	4		9				
Rdi1	4		9				

Juvenile Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable
Development

Ci	*Initial cusp formation*
Cco	*Coalescence of cusps*
Coc	*Cusp outline complete*
Cr1/2	*Crown ½ complete*
Cr3/4	*Crown ¾ complete*
Crc	*Crown complete*
Ri	*Initial root formation*
Cli	*Initial cleft formation*
R1/4	*Root length ¼*
R1/2	*Root length ½*
R3/4	*Root length ¾*
Rc	*Root length complete*
A1/2	*Apex ½ closed*
Ac	*Apical closure complete*

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable
Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

BP 3641 Table 6 Adult Element and Details					
Element	**Side**	**Sex**	**Age**	**Measurements**	**Notes**
Mandible 38-52	N/A	F	Older Adult		Dental Disease
Mandible 38-55	N/A	M	Young-Middle Adult		Dental Disease
Mandible 38-56	N/A	F	Young-Middle Adult		Enamel hypoplasia, pair to Maxilla 38-56
Maxilla 38-56	N/A	F	Young-Middle Adult		Dental Disease, pair to Mandible 38-56
Mandible 38-57	N/A	M	Young Adult		Dental Disease
Mandible 38-58	N/A	M	Older Adult		Unique wear, dental disease, pair to Maxilla 38-60

BP 3641 Adult Elements and Details cont.					
Element	**Side**	**Sex**	**Age**	**Measurements**	**Notes**
Maxilla 38-60	N/A	M	Older Adult		Unique wear, dental disease, pair to Mandible 38-58
Mandible A	N/A	INT	Older Adult		
Mandible B	N/A	INT	INT		only a condyle
Maxilla 38-54	N/A	INT	Young Adult		
Maxilla A	N/A	INT	INT		
Maxilla B	R	INT	INT		
Maxilla C	L	INT	INT		
Parietal A	L	INT	INT		two refit pieces
Parietal B	R	INT	INT		two refit pieces
Parietal C	L	INT	INT		
Parietal D	L	INT	INT		
Occiptial A	N/A	M	INT		
Temporal A	R	M?	INT		
Temporal B	R	M?	INT		
Temporal C	R	M	INT		
Temporal D	R	M	INT		
Temporal E	L	INT	INT		
Temporal F	L	INT	INT		
Temporal G	L	F	INT		
Temporal H	L	M	INT		
Temporal I	L	F	INT		
Temporal J	L	F	INT		
Temporal K	L	M?	INT		
Frontal A	N/A	F	Young-Middle Adult		
Frontal B	N/A	M	INT		
Frontal C	N/A	M	INT		
Frontal D	N/A	M	INT		
Spenoid 38-56	N/A	INT	INT		
Cranial Vault A	N/A	M	Older Adult		
Cranial Vault B	N/A	F	INT		Cribra Orbitalia on parietal and eye orbits, healed on parietal active in orbits

BP 3641 Adult Elements and Details cont.					
Element	**Side**	**Sex**	**Age**	**Measurements**	**Notes**
Cranial Vault C	N/A	M	Older Adult		
Clavicle A	L	INT	INT		
Clavicle B	L	INT	INT		
Clavicle C	L	INT	INT		
Clavicle D	R	INT	INT		
Clavicle E	R	INT	INT		
Clavicle F	R	INT	INT		
Clavicle G	R	INT	Older Adult?		Pitting and lipping sternal end
Clavicle H	R	INT	INT		
Claivcle I	R	INT	INT		
Clavicle J	L	INT	INT		
Clavicle K	R	INT	INT		
Sacrum A	N/A	INT	INT		
Sacrum B	N/A	INT	INT		
Sacrum D	N/A	INT	Older adult?		osteoarthritis
Os Coxa A	L	M	Older Adult		two refit fragments
Os Coxa B	L	INT	INT		
Os Coxa C (38-78)	L	M	Older Adult		
Os Coxa D (38-79)	L	F	Young Adult		two refit fragments
Os Coxa E	L	F	Middle Aged Adult		
Os Coxa F (38-47)	L	F	Young Adult		
Os Coxa G (38-80)	L	M	Young-Middle Adult		
Os Coxa H	L	F	INT		
Os Coxa I (38-76)	R	F	Young-Middle Adult		
Os Coxa J (38-74)	R	F	Young Adult		
Os Coxa K (38-71)	R	F?	INT		
Os Coxa L (38-73)	R	F	Young Adult		

BP 3641 Adult Elements and Details cont.					
Element	**Side**	**Sex**	**Age**	**Measurments**	**Notes**
Os Coxa M (38-75)	R	INT	Young Adult		
Os Coxa N	R	M	Middle Aged Adult		
Os Coxa O	R	INT	INT		
Os Coxa P	R	M?	INT		
Os Coxa Q	R	F	Older Adult		
Os Coxa R	R	INT	INT		
Adult Ribs	N/A	INT	INT		78 in total, 1 with severe osteoarthritis, 8 First, 4 second
Adult Cervical Vert	N/A	INT	INT		24 in total, 3 C1, 3 C2 2 with significant arthritis, porosity and compression
Adult Thoracic Ver	N/A	INT	INT		49 in total, 2 with significant arthritis, porosity and compression
Adult Lumbar Vert	N/A	INT	INT		12, 1 L5 2 with significant arthritis, porosity and compression
Adult Patella		INT	INT		6 in total 4 left, 2 right
Calcaneus A	L	INT	INT		
Calcaneus B	L	INT	INT		
Calcaneus C	L	INT	INT		
Calcaneus D	L	INT	INT		
Calcaneus E	R	INT	INT		
Calcaneus F	R	INT	INT		
Calcaneus G	R	INT	INT		
Calcaneus H	R	INT	INT		

BP 3641 Adult Elements and Details cont.					
Element	**Side**	**Sex**	**Age**	**Measurments**	**Notes**
Tallus		INT	INT		8 in total 4 left, 4 right
Tarsals	9R/6L/1 INT	INT	INT		16 in total, 3 navicular, 3 cuboid, 4 first cuneiform, 1 second cuneiform, and 3 third cuneiform, 2 INT
Metatarsals	12R/11L/14 INT	INT	INT		37 in total, 4 left firsts, 3 left first
Pedal Phalanges		INT	INT		16 in total, 13 middle and 3 proximal
Carpals	5R/2L	INT	INT		7 in total, 1 lunate, 3 scaphoids, 2 hamate, 1 capitate,
Metacarpals	8R/9L/5 INT	INT	INT		22 in total
Hand Phalanges		INT	INT		22 in total, 3 distal, 10 middle and 9 proximal
Scapula A	R	INT	INT		
Scapula B	R	INT	INT		
Scapula C	R	INT	INT		lipping on glenoid fossa
Scapula D	L	INT	INT		
Scapula E	L	INT	INT		
Scapula F	L	INT	INT		
Scapula G	L	INT	INT		
Scapula H	L	INT	INT		
Scapula I	L	INT	INT		
Scapula J	L	INT	INT		
Fibula A	R	INT	INT		Perostosis
Fibula B	L	INT	INT		
Fibula C	L	INT	INT		
Fibula D	L	INT	INT		
Fibula E	L	INT	INT		
Fibula F	R	INT	INT		
Fibula G	R	INT	INT		
Fibula I	R	INT	INT	Complete Length 378mm	
Fibula J	L	INT	INT		

BP 3641 Adult Elements and Details cont.					
Element	**Side**	**Sex**	**Age**	**Measurements**	**Notes**
Fibula K	R	INT	INT		
Fibula L	L	INT	INT		
Fibula M	R	INT	INT		Perostosis
Fibula N	R	INT	INT		
Humerus B	L	INT	INT		
Humerus C	L	F	INT	Vertical Diam. 40mm Transvers Diam 37mm	
Humerus D	L	INT	INT		Septal Aperture
Humerus E	R	INT	INT		
Humerus F	R	M	INT	Vertical Diam. 50mm Transvers Diam 44mm	
Humerus G	R	INT	INT		
Humerus H	L	INT	INT		
Humerus K	L	INT	INT		
Humerus M	R	INT	INT		
Humerus N	L	INT	INT		Septal Aperture, Possible Pair to Humerus R
Humerus O	R	INT	INT		
Humerus P	R	F	INT	Vertical Diam. 40mm Transvers Diam 35.5mm	
Humerus Q	R	INT	INT		
Humerus R	R	INT	INT		Septal Aperture Possible Pair to Humerus N
Humerus S	R	INT	INT		
Radius A	L	INT	INT		
Radius B	R	INT	INT		
Radius C	L	INT	INT		
Radius D	R	INT	INT		
Radius E	L	INT	INT	Full length 250mm	
Radius F	L	INT	INT		
Radius G	L	INT	INT		
Radius H	R	INT	INT		slight bowing
Radius I	R	INT	INT		
Radius J	R	INT	INT		
Radius K	L	INT	INT		

BP 3641 Adult Elements and Details cont.					
Element	**Side**	**Sex**	**Age**	**Measurments**	**Notes**
Radius L	R	INT	INT		
Radius M	L	INT	INT		slight bowing
Ulna A	L	INT	INT		
Ulna C	R	INT	INT		
Ulna D	L	INT	INT		
Ulna E	L	INT	INT		Enthesopathy, pair to Ulna I
Ulna F	R	INT	INT		
Ulna G	L	INT	INT		
Ulna H	H	INT	INT		
Ulna I	R	INT	INT		Enthesopathy, pair to Ulna E
Ulna K	R	INT	INT		
Ulna L	L	INT	Older Adult		heaving lipping and polishing
Ulna M	R	INT	INT		
Ulna N	L	INT	INT		
Tibia A	R	INT	INT		
Tibia B	R	INT	INT		
Tibia C	L	INT	INT		
Tibia D	L	F	INT	Proximal Breadth 69mm	
Tibia E	L	INT	INT		
Tibia F	L	F	INT	Circumference at Nutrient Foramen 83mm	
Tibia G (38-14)	L	INT	INT	Circumference at Nutrient Foramen 91, sectioning point	
Tibia H	R		INT		
Tibia I	L	F	INT	Distal Breadth 47mm	
Tibia J	L	M	INT	Distal Breadth 51mm	
Tibia K	L	INT	INT		
Tibia L	L	M	INT	Proximal Breadth 78mm, Circumfer-ence at Nutrient Foramen 105mm	
Tibia M	R	INT	INT		

BP 3641 Adult Elements and Details cont.					
Element	**Side**	**Sex**	**Age**	**Measeaurments**	**Notes**
Tibia N	R	F	INT	Distal Breadth 46mm	
Tibia O	R		INT		
Tibia P	L	M	INT	Distal Breadth 56mm	
Tibia Q	R	M	INT	Circumference at Nutrient Foramen 103mm	
Tibia R	L	M	INT	Circumference at Nutrient Foramen 107mm, Distal Breadth 51mm, Total Length 370mm	
Tibia S (38-9)	R	F	INT	Circumference at Nutrient Foramen 90mm. Distal Breadth 47mm, Total Length 410mm	possible squatting facet
Tibia T (38-12)	R	M	INT	Circumference at Nutrient Foramen 103mm, Proximal Breadth 78mm, Distal Breadth 51mm, Total Length 390mm	
Tibia U (38-13)	R	F	INT	Circumference at Nutrient Foramen 92mm, Total length 365mm	
Femur A (38-4)	R	F	INT	Head diameter 39mm, Bicondylar width 70mm, Total length 360mm	cross sectioned
Femur B	R	INT	INT		
Femur C	R		INT		
Femur D	R	F	Young Adult	Vertical diameter 40mm	
Femur E	R	INT	INT		
Femur F (38-1)	R	M	INT	Vertical diameter 47mm	
Femur G	R	F	Middle-Older Adult	Popliteal length 115mm, Bicondylar width 73mm,	some wear and polish on epicondyles

BP 3641 Adult Elements and Details cont.					
Element	**Side**	**Sex**	**Age**	**Measurement**	**Notes**
Femur H	R	M	Middle-Older Adult	Poplietal length 140mm	Lipping and polishing to epicondyles
Femur I (38-6)	R	F	Middle-Older Adult	Bicondylar width 75mm, Popliteal length 98mm	cross sectioned, lipping and polish on epicondyles and tibia auricular surface
Femur J (38-7)	R	M		Poplietal length 120mm Est full length 430mm	Cross sectioned
Femur K	R	INT	INT		
Femur L	R	INT	INT		
Femur M	R	INT	INT		
Femur N	R	INT	INT		
Femur O	R	INT	INT		
Femur P	R	INT	INT		
Femur Q	R	INT	INT		
Femur R	L	F	INT	Vertical Diameter 42mm	
Femur S	R	M	INT	Est. Vertical diameter 48mm	
Femur T	R	F	INT	Bicondylar width 73mm	
Femur U	L	INT	INT		
Femur V	L	INT	INT		
Femur W	L	INT	INT		
Femur X	L	INT	INT		
Femur Y	L	INT	INT	Vertical Diameter 44mm Sectioning point	
Femur Z	L	INT	INT	Epicondyle breadth 75mm, Popliteal length 110mm both in indeterminate range	
Femur AA	L	INT	INT		
Femur BB	L	M	INT	Bicondylar width 78mm, Popliteal length 135mm	
Femur CC	L		INT		

BP 3641 Adult Elements and Details cont.					
Element	**Side**	**Sex**	**Age**	**Measurements**	**Notes**
Femur DD (38-7)	L	M	INT	Vertical diameter 47mm	cross sectioned
Femur EE (38-3)	L	F	INT	Vertical diameter 39mm, Full length 370mm	cross sectioned
Femur FF (38-2)	L	F	INT	Vertical diameter 41mm, Bicondylar width 60mm, Poplietal width 90mm, Full length 380mm	cross sectioned

Table 7. Dental Inventory Maxilla 38-60 and Mandible 38-58						
Tooth	**Presence**	**Attrition:**	**Attrition- molars:**			
		I, C, P	**Mes-buc**	**Mes-ling**	**Dis-ling**	**Dis-buc**
MAXILLA:						
RM3	9		0	0	0	0
RM2	9		0	0	0	0
RM1	9		0	0	0	0
RP2	9	9				
RP1	9	9				
RC	9	9				
RI2	9	9				
RI1	9	9				
LM3	4		0	0	0	0
LM2	4		0	0	0	0
LM1	2		7	7	7	7
LP2	2	7				
LP1	5	9				
LC	4	9				
LI2	5	9				
LI1	5	9				
MANDIBLE:						
LM3	4		0	0	0	0
LM2	2		3	3	3	3
LM1	1		0	0	7	7
LP2	2	7				
LP1	2	7				
LC	2	8				

Table 7. Dental Inventory Maxilla 38-60 and Mandible 38-58 cont.						
		Attrition:	Atrrition-molars:			
Tooth	Presence	I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
LI2	2	8				
LI1	4	9				
RM3	4		0	0	0	0
RM2	4		0	0	0	0
RM1	4		0	0	0	0
RP2	5	9				
RP1	5	9				
RC	2	8				
RI2	3	9				
RI1	3	9				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 8. Dental Metrics (mm) Maxilla 38-60 and Mandible 38-58				
Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
MAXILLA:				
LM1		11.0		
LP2	6.0	10.0		
MANDIBLE:				
LM2	9.0	10.0		
LM1	9.0	11.0		
LP2	7.0			
RC	7.0			

Table 9. Dental Inventory Mandible and Maxilla 38-56						
Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MAXILLA:						
RM3	4		0	0	0	0
RM2	2		4	4	4	4
RM1	2		0	4	4	0
RP2	4	9				
RP1	4	9				
RC	5	9				
RI2	5	9				
RI1	5	9				
LM3	4		0	0	0	0
LM2	2		4	4	4	4
LM1	2		4	5	4	4
LP2	4	9				
LP1	4	9				
LC	5	9				
LI2	2	3				
LI1	5	9				
MANDI-BLE:						
LM3	9		0	0	0	0
LM2	9		0	0	0	0
LM1	9		0	0	0	0
LP2	9	9				
LP1	9	9				
LC	9	9				
LI2	9	9				
LI1	9	9				
RM3	4		0	0	0	0
RM2	2		3	3	0	0
RM1	2		3	3	3	3
RP2	2	3				
RP1	5	9				
RC	2	3				
RI2	9	9				
RI1	9	9				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 10. Dental Metrics (mm) Mandible and Maxilla 38-56

Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
MAXILLA:				
RM2	10.0	11.0		
LM2	9.0	11.0		
LM1	11.0	11.0		
LI2	8.0	3.0		
MANDIBLE:				
LM2	12.0	10.0		
LM1	12.0	12.0		
LP1	7.0	7.0		
LC	6.0	5.0		

Table 11. Dental Inventory Maxilla 38-54

Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MAXILLA:						
RM3	9		0	0	0	0
RM2	9		0	0	0	0
RM1	9		0	0	0	0
RP2	9	9				
RP1	9	9				
RC	9	9				
RI2	9	9				
RI1	9	9				
LM3	3		0	0	0	0
LM2	2		1	1	1	1
LM1	2		2	2	2	2
LP2	2	1				
LP1	2	1				
LC	5	9				
LI2	5	9				
LI1	5	9				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 12. Dental Metrics (mm) Maxilla 38-54

Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
MAXILLA:				
LM2	9.0	10.0		
LM1	11.0	11.0		
LP1	11.0	10.0		

Table 13. Dental Inventory Mandible 38-52

Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MANDIBLE:						
LM3	4		0	0	0	0
LM2	4		0	0	0	0
LM1	4		0	0	0	0
LP2	2	2				
LP1	8	9				
LC	5	9				
LI2	5	9				
LI1	3	9				
RM3	4		0	0	0	0
RM2	4		0	0	0	0
RM1	4		0	0	0	0
RP2	2	2				
RP1	5	9				
RC	5	9				
RI2	3	9				
RI1	3	9				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 14. Dental Metrics (mm) Mandible 38-52

Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
MANDIBLE:				
RP2		7.0		

Table 15. Dental Inventory Mandible 38-55

Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MANDIBLE:						
LM3	2		1	1	1	1
LM2	2		2	2	2	2
LM1	2		2	2	2	2
LP2	2	1				
LP1	2	1				
LC	5	9				
LI2	2	3				
LI1	2	3				
RM3	2		1	1	1	1
RM2	2		1	1	1	1
RM1	4		0	0	0	0
RP2	2	1				
RP1	2	1				
RC	5	9				
RI2	2	3				
RI1	2	3				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 16. Dental Metrics (mm) Mandible 38-55				
Tooth	**Mesiodistal**	**Buccolingual**	**CEJ mesiodistal**	**CEJ buccolingual**
MANDIBLE:				
LM3	10.0	9.0		
LM2	12.0	10.0		
LM1	10.0	11.0		
LP2	7.0	9.0		
LP1	5.0	7.0		
LI2	5.0	2.0		
LI1	5.0	2.0		
RM3	10.0	10.0		
RP2	7.0	8.0		
RP1	6.0	7.0		
RI2	5.0	2.0		
RI1	4.0	2.0		

Table 17. Dental Inventory Mandible 38-57						
Tooth	**Presence**	**Attrition:**	**Attrition- molars:**			
		I, C, P	**Mes-buc**	**Mes-ling**	**Dis-ling**	**Dis-buc**
MANDIBLE:						
LM3	9		0	0	0	0
LM2	9		0	0	0	0
LM1	9		0	0	0	0
LP2	9	9				
LP1	2	1				
LC	5	9				
LI2	2	5				
LI1	5	9				
RM3	2		3	3	3	
RM2	2		4	3	3	4
RM1	2		4	3	3	4
RP2	2	1				
RP1	2	1				
RC	5	9				
RI2	5	9				
RI1	2	3				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 18. Dental Metrics (mm) Mandible 38-57

Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
MANDIBLE:				
LP1	7.0	8.0		
LI2	6.0	6.0		
RM3	10.0	11.0		
RM2	12.0	11.0		
RM1	12.0	12.0		
RP2	7.0	9.0		
RI1	5.0	6.0		

Table 19. Dental Inventory Mandible A

Tooth	Presence	Attrition:	Attrition- molars:			
		I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
MANDIBLE:						
LM3	9		0	0	0	0
LM2	9		0	0	0	0
LM1	9		0	0	0	0
LP2	9	9				
LP1	9	9				
LC	3	9				
LI2	3	9				
LI1	3	9				
RM3	4		0	0	0	0
RM2	4		0	0	0	0
RM1	4		0	0	0	0
RP2	5	9				
RP1	2	3				
RC	5	9				
RI2	5	9				
RI1	3	9				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

Table 20. Dental Metrics (mm) Mandible A

Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
MANDIBLE:				
RM1	7.0	8.0		

Human Remains from a Precontact Cemetery in Clinton, Iowa

Samantha Murphy

Human remains from a precontact cemetery representing at least 13 individuals were excavated from the vicinity of Eagle Point Park in Clinton, Iowa in the 1950s. The individuals represent an adult male and commingled human remains representing a minimum of 12 individuals: six adults and six juveniles. The age range of the juveniles is infant to adolescent. The individuals are of ancient Native American ancestry determined by documentation, excavation context and identifiable features on the human remains.

Introduction

The human remains were originally excavated by Jim Pilgrim of Clinton Iowa, and Lowell S. Miller of the Davenport Public Museum in the spring and summer of 1954. The exact dates and location of excavation are unknown, but they were likely along the northern edge of Eagle Point Park in Clinton, Iowa (Figure 1). A sketched map of the area was provided by Jim Pilgrim, but it does not show the location of the excavation (Figure 2). There are several documented sites and notable locations in the vicinity of Eagle Point Park, including burial mounds (13DB1), but the individuals and excavation cannot be associated with any one site. In the provided documentation the site is called the "Deer Creek Village Site" but there is no site recorded as such in the Iowa Site File. On modern maps, Deer Creek Road East and Deer Creek border the northern edge of Eagle Point Park so it is possible that excavation occurred in this area, but again, a more specific location cannot be determined. A partial news article provided as part of the documentation described mounds in the area that had been plowed over multiple times but it is unclear which farm field in the vicinity is being referenced. The article is from a secondary page without the title, name of newspaper, date published or author. Multiple searches could not locate the rest of the article. There is no OSA site number or records of this excavation. The provided documentation references human remains and funerary objects, however no associated funerary artifacts were transferred to the OSA. After the excavation, it is likely that the artifacts and remains were divided among the various individuals working on the excavation. According to documentation, Burials 3,4, 6, and 7 were stored at the home of Pilgrim following the excavation with no mention of any artifacts or where other human remains or artifacts from the excavation were transferred to.

Pilgrim was a known artifact collector in the state of Iowa and had previously made transfers of artifacts and human remains to the OSA and the Bioarchaeology Program ((Hoffman 2017a, Hoffman 2017b, Lillie 2016, Lillie 2014, Murphy this volume). He had a specific interest in precontact Native American sites. Upon his death in 2020 his family continued to transfer any identified artifacts and human remains. In March of 2023 the human remains described here were brought to the OSA (UI OSA 2023). The family also transferred copies of photographs from the excavation, a sketch map of the area of excavation, a partial newspaper article discussing the excavation (source and date unknown) and other notes found in the collection. Not all the notes transferred were relevant to these individuals and excavation. Based on the photographs of the excavations multiple individuals were interred in each burial.

Osteological Analysis

Upon arrival at the OSA most of the human remains were still in matrix suggesting they had been taken immediately from excavation and placed into storage. The soil was very dry and compacted indicating the

human remains had been in soil for a long period of time. To remove them, the soil had to be dampened with water and the soil scraped away with trowels and other tools. Following the removal of the human remains the soil was dried, screened through ¼ inch mesh and stored to be included with the reburial. Despite the remains being assigned a burial number by Pilgrim the remains were analyzed as commingled due to the lack of specific information about the burials, excavation, and storage. To aide in discussion of the remains they will be discussed with the burial numbers assigned by Pilgrim, but the MNI was calculated across all of the burials. The human remains represent both male and female adults and juveniles from a broad age range.

BURIAL 3 - OSA BP INDIVIDUAL 1

In the documentation available from Pilgrim, this skull was associated with Burial 3, however all the other remains transferred to the OSA with Burial 3 notations were stored in the same box as Burial 4 and no labels delineating individuals were included. It is therefore not possible to sort Burial 3 from Burial 4, and there are no articulating elements. For osteological documentation purposes, the skull was assigned Individual 1 by the OSA BP for database entry.

Individual 1 is represented by a nearly complete skull that was completely encased in soil upon arrival to the OSA. Based on documentation, this individual was excavated from Burial 3. Elements include portions of the maxillae, frontal, occipital, left zygomatic, left parietal and mandible. The sphenoid, internal nasal bones, and much of the right side of the cranial vault and maxilla are unobservable. Cranial metrics that could be taken are in Table 1. Once the compacted soil holding the skull together was removed, evidence of postmortem damage from crushing was revealed. This aligns with the documentation of the area of excavation being previously plowed.

The left side of the mandible and teeth present are stained black from taphonomic processes. The black staining obscures dental morphological features. Across the frontal and parietal bones, the cortical bone is flaking off. The inferior portion of the left temporal bone has portions of exposed trabecular bone due to taphonomic damage. There are nine maxillary and seven mandibular teeth present and in occlusion. 14 teeth were lost postmortem, and one tooth (the maxillary third left molar) could not be assessed as the associated alveolar bone is missing due to postmortem damage. The teeth that are observable are the maxillary right molars and premolars and the left maxillary premolars and first two molars. Observable mandibular teeth are the right and left second premolars and molars. The amount of wear on the observable teeth is very high with enamel only present on the outer edge of the molars (Table 2 and Table 3). Dental wear suggests that the individual is middle to older age. No observable dental pathologies or pre/antemortem tooth loss was observed.

Based on observable sexually dimorphic characteristics of glabella, the right mastoid process, and mental eminence, the individual is male. The features are prominent and robust even where postmortem and taphonomic damage has occurred. Observable cranial sutures including the anterior sagittal, bregma and midcoronal, are completely closed suggesting a young adult, but more likely a middle-aged adult when also considering moderate to heavy dental wear.

BURIAL 3/4

Burials 3 and 4 were combined at some point during excavation and storage, and represent multiple adults and juveniles. The elements in Burial 3/4 were highly fragmented due to postmortem crushing, likely from the plowing of mounds mentioned in the documentation.

Juveniles

There is no documentation discussing any differences in the burials of juveniles versus adults or whether adults and juveniles were interred together. The process of aging juvenile individuals based on dental development allowed for documentation of separate age groups identified in the commingled remains. All juvenile dentition and predicted ages for Burials 3/4 are presented in Table 4. The juvenile dentition

is a combination of loose deciduous teeth and partially formed third molars that are not in situ. Most teeth showed a slight amount of wear indicating consumption of foods prepared with ground stone technology. The incisors are shovel-shaped indicating Native American ancestry. One individual aged 3 to 5 years and 1 individual aged 8.5 to 11 years old are represented.

A fragment of a right maxillary facial bone is present, but it cannot be determined which teeth originated from the fragment. A right second molar is still in situ and in occlusion and shows minimal wear suggesting it had just erupted. During the cleaning process a partially developed third molar with complete crown and partial root formation was found in the alveolus. This tooth had not fully erupted, and the crypts for other permanent teeth were observable in the alveolus; all other permanent teeth had been lost postmortem. Based on the erupted second permanent molar and the partially developed third molar the individual was estimated to be 10 to 15 years old.

A mandible fragment including the left gonial angle and ramus was also determined to be juvenile based on size and gracility but a more specific age estimation could not be made.

A fragment of occipital likely represents an individual between 3 to 5 years old based on size.

The only post-cranial element from a juvenile individual is a left midshaft section of a humerus. A small portion of the distal end is present with the superior aspect of the olecranon fossa intact. Neither the proximal nor distal epiphyses are present. Postmortem damage removed the proximal and distal ends so age estimation from length was not possible.

Adults

As with the juvenile elements teeth that are not in situ are recorded separately in Table 5. Most of the dentition showed a minimal amount of wear which suggests that the individual from which these teeth originated was a young adult. All of the incisors present are shovel-shaped. There was no evidence of dental pathologies on any of the teeth. Some had suffered from postmortem damage which made analysis of wear and dental features impossible. The same black staining observed on the mandible of Individual 1 was also observed on some of the teeth associated with Burial 3/4.

An adult mandible fragment is identifiable by the mental eminence and the left mental foramen. Based on the protruding mental eminence the individual is likely male. No teeth are in situ and all were lost postmortem.

The other cranial fragments identified include six parietals, two frontal bone fragments with two that refit, five temporal fragments and one occipital. There were 19 cranial bone fragments that were too small to identify by element. All the mastoid processes were damaged postmortem on the temporal fragments so sex could not be determined. The two frontal pieces that could be refit include the frontal crest and the left and right supraorbital margins. The postmortem break occurred down the midline of the frontal crest along the path of the interorbital breadth measurement.

Postcranial elements represented are the ribs, scapulae, upper limb long bones, metatarsals, os coxae and lower limb long bones. There is one identifiable left first rib however the other nine rib fragments could not be identified by side or number. Two fragments of scapula were identified: the first is a left acromion fragment which included a portion of the scapular spine and the second is the tip of an acromion. Two metatarsal fragments of unknown number and side are present. Each fragment includes the shaft and the base.

The upper limb long bones were the most common bones representing Burial 3/4. In total there are four humeri, one radii, and five ulnae. Of the four adult humeri there are three lefts and one right. The most complete humerus has the proximal end still attached with postmortem damage to the lesser tubercle; a portion of the distal end is also present with the trochlea, olecranon fossa, and portions of the epicondyles observable. Enough of the distal portion is present to measure the length of the humerus at 305mm. The humeral head is 43mm at the vertical diameter and 34mm at the transverse diameter. These measurements

suggest that the individual is female. Eight ulna fragments are associated with Burial 3/4, with four lefts, three rights and one unsidable due to postmortem damage.

Four fragments of os coxa were identified in the human remains associated with Burial 3/4. The first fragment is the most complete with a portion of the greater sciatic notch, auricular surface, and the anterior superior iliac spine. Based on the observable portion of the of the greater sciatic notch the individual is male. No other os coxae fragments could be sexed. The second fragment is primarily acetabulum and ischial spine. The last two fragments are partial acetabula and surrounding bone. The cortical bone on the last two fragments is heavily degraded due to taphonomic processes exposing spongy bone.

The lower limbs were represented by two femora, one patella, and two fibula fragments. The femur fragments are a right and left midshaft section from an adult individual. The right femur fragment has a small portion of the neck visible while the left is only from midshaft. A right nearly complete patella is present, with a large portion of the base absent due to postmortem breakage. Two fibula fragments include one left midshaft section and one left lateral malleolus. Due to postmortem damage to both fragments, it is not possible to determine if they are from the same individual.

BURIAL 6

Juveniles

There at least two different juveniles associated with Burial 6. The first juvenile is represented by an occipital and dentition, and the second by a humerus and metatarsal. There are four loose juvenile teeth indicating age ranges of 3 to 7 years. All teeth present are listed in Table 6.

A juvenile individual aged 0 to 5 months old was identified by a humerus and a right fifth metatarsal. The infant humerus is not complete enough for accurate measurement but when compared to juvenile casts it is most similar in size to the prenatal to five-month old individual. The metatarsal is un-sideable and measures 26mm in length with no evidence of fusion of the head; this suggests the individual is past the fetal stage but no more than 5 months.

Adults

The adult human remains associated with Burial 6 included cranial, axial, and appendicular elements representing multiple individuals. Due to postmortem damage, there is a significant amount of indeterminate fragments which were weighed to be 153 grams; unidentifiable long bone fragments weighed 85 grams.

There are two left temporals and one right temporal. Two of the temporal fragments (one left and one right) are relatively complete with the second left temporal only represented by the petrous pyramid. There are three frontal bones with two that refit together to form a nearly complete frontal including the supraorbital margins and frontal crest. The frontal bone that does not refit only includes the frontal crest. There are 21 parietal pieces with the left and right sides represented. In total there are four occipital fragments with two that refit. Among the occipital fragments are two external occipital protuberances representing at least two individuals. Eight craniofacial fragments were identified including left and right zygomatic and maxilla fragments. One small fragment of palatine and alveolar process and one sphenoid fragment were identified. A left anterior portion of mandible that includes the mental eminence and left mental foramen is also present. Based on the mental eminence the mandible is from a male individual. There are no teeth associated with the mandible and based on the observable tooth sockets the teeth were lost postmortem. 11 loose teeth are associated with Burial 6. Dental wear varies from minimal blunting and no visible dentition to high levels of enamel loss and dentin exposure; no dental pathologies were noted. The specific teeth and wear present are listed in Table 7.

There are 11 vertebral fragments which include a C1 fragment only identifiable by the anterior arch, one cervical vertebral fragment (C3-C7), two body fragments of thoracic vertebrae, number indeterminate, and eight indeterminate vertebral fragments. The indeterminate fragments consist of two body fragments and

six arch fragments. There are 24 rib fragments associated with Burial 6. The fragments are from both sides of the body and vary in condition and amount of landmarks present. Two fragments of left scapula include a neck and acromion process; it is not possible to determine whether the fragments originated from the same individual.

The upper limb elements represented in association with Burial 6 include the radius, ulna, and various bones of the hand and phalanges. There are 6 radius fragments: one right radial head and tuberosity, two radial heads that cannot be sided due to the damage to their tuberosities, and three diaphysis sections that are too small to be sided and do not refit with the radial head fragments. Ulna fragments include: a right ulna missing the distal 1/3 and a small un-sideable diaphysis fragment. There are three carpals: two lunates (a left and right) and an un-sideable trapezium. A left third metacarpal and three un-sided middle hand phalanges were identified. Phalanges only consist of the bases and shafts as the heads are missing due to postmortem damage.

Seven fragments of os coxae are present in Burial 6. The first os coxa is represented by two refitting fragments that complete a right acetabulum and portion of the iliac crest including the auricular surface and greater sciatic notch. The greater sciatic notch is wide and combined with a deep preauricular sulcus suggests a female individual. The auricular surface is not very billowy or dense indicating an older individual possibly around 50 years old (Phase 7). There is heavy lipping on the posterior and inferior acetabular margin which supports the older adult age estimation. The second os coxa is a fragment of right acetabulum and ischial tuberosity. Based on the extreme robustness of the ischial tuberosity the individual was likely male. The third os coxa fragment is a left greater sciatic notch. Based on the narrow nature of the notch the sex is likely male. The final three fragments of os coxa were too damaged to sex and include: one left acetabulum/iliac spine, a left greater sciatic notch and auricular surface, and a left iliac crest including the auricular surface. The os coxae from Burial 6 were combined with the os coxae from Burial 3/4 to determine adult MNI as these were the most repeated element. In total there are six adult individuals represented by six left os coxae. There is only one right os coxa represented.

The lower limbs are represented by femora, tibiae, fibulae, tarsals, and foot phalanges. There are two femora represented by three fragments: one fragment including a head and neck, and two diaphysis fragments that refit and represent 50% of the original femur. The head, neck and midshaft of the refit femur is more gracile than expected for an adult individual, yet all observable epiphyses are completely fused which does not occur until young adulthood. The second femur is a left midsection with the proximal and distal portions missing due to postmortem damage. There are two distinct tibiae made up of three fragments. The first tibia is a left and consists of two fragments: the proximal end and midshaft. The second tibia is represented by a small fragment of the proximal end including the intercondylar eminence and a small portion of the medial and lateral condyles; due to postmortem damage the fragment cannot be sided. There are two fibula fragments associated with Burial 6: a left diaphysis fragment with no proximal or distal ends and a fragment of lateral malleolus. Due to postmortem damage to the lateral malleolus, it was not possible to side.

The final elements associated with Burial 6 represent the foot. Three calcanei were identified: a left, a right, and one that could not be sided. The calcaneus that could not be sided consists of two fragments that refit. Two talus fragments include one unsideable talus, and a right that includes the head and talus ridge. A total of six tarsals and metatarsals are present: a left and right intermediate cuneiform, a right navicular, a left first metatarsal, a right second metatarsal and an indeterminate metatarsal. There are two complete first proximal pedal phalanges, side undetermined, and a middle pedal phalanx side also undetermined.

BURIAL 7

Burial 7 is unique compared to the other burials as only juvenile remains were identified. It is unknown if this is all the individuals associated with the burial or if the juveniles were specifically selected by the original excavator.

A minimum of four juvenile individuals are represented: a 4 to 5 year-old, three individuals 5-8 years and one individual 8-13 years. There are 46 fragments that were not identifiable due to postmortem damage. All of the cranial fragments originated from one individual based on count, refits, age indicators and condition of the remains. There is a frontal bone with two partial eye orbits, 10 parietal fragments, and right and left temporals. Age was determined to be between 2 and 5 years old based on fusion of the tympanic ring on the temporals, which closes around two years old, and the presence and size of the Huschke foramen, which typically closes around five years of age. The complete frontal bone dimensions (frontal chord=108mm, arc=99mm) suggest an age of 2 to 4 years old when using R.W. Young's frontal chord and arc dimensions for age estimation (1957 American Journal of Physical Anthropology Bass handbook). There is only a mandibular deciduous canine associated with Burial 7 that has reached full development which occurs around 4 to 5 years old.

The post cranial remains associated with Burial 7 include ribs, upper limb long bones, lower limb long bones, and phalanges. There are four fragments of ribs 2-12 that were unidentifiable by number and side. The rib fragments were too small to determine age. A fragment of left humerus midshaft is present, however due to the lack of distal and proximal ends it was not possible to determine age from length or epiphyseal fusion. The other elements related to the upper limb are two indeterminate hand phalanges which are not sided or numbered. The lower limbs are represented by five femur and two tibia fragments. There are two proximal femur fragments that include the neck and midshaft portion, with one being a left and one being a right. The third femur fragment is a left diaphysis that lacks epiphyseal ends. The fourth femur is a right midshaft fragment; the distal portion, head, and greater and less trochanters are unobservable due to postmortem damage, however, the proximal metaphysis is visible, and the head is not fused. The final femur is represented by a left diaphysis fragment, with no distal or proximal ends. Based on the size of the femur fragments the individuals were between 5 and 8 years old. There are two tibia fragments, the first being a nearly complete right tibia. Most of the postmortem damage is to the distal end with the medial malleolus unobservable. Based on the lack of fusion of the proximal epiphysis the individual is under 13 years old. The second tibia is a left midshaft fragment. Both proximal and distal ends are missing due to postmortem damage, so aging based on epiphyseal fusion is not possible. Based on the size of the tibia fragment the individual is under 13 years old but older than 8.

FUNERARY OJBECTS

After screening the soil, funerary objects were found in the soil matrix with the human remains. The documentation provided did not list any artifacts transferred with the individuals which suggests that the original excavator did not know the artifacts were present. The funerary objects consisted of 13 flakes, one drill fragment and six faunal bones. It is undetermined if the faunal remains were a purposeful interment or the result of bioturbation over time.

Within the transfer of remains were other items from Pilgrim's collection that do not appear to be related to the Deer Creek Village site as they were all in their own separate storage bags. One bag contains one faunal bone and a post contact pipestem. The pipestem is from a ball clay pipe, which are common in both Euro-American and post contact Native American sites from the late 18th century to the early 20th century (Peterson 2015). The pipestem has a small floral etching at the base of the stem on the mold seam. A second bag contains two faunal bones that are documented to have been originally collected by Bill Matje in the Clinton, IA area. They were given to Pilgrim as a remembrance of Matje following his death in 1961. The final items include two faunal elements with the note "Bone from high hill west of site, high ground from refuse boxes at Phillips site Cherokee, IA. 7/30-Aug 4th, 1956. J Pilgrim Collection". A search of OSA site records did not reveal any reports or records of a Phillips site. Pilgrim possibly meant the Phipps site (13CK21) which is large Mill Creek village site near Cherokee.

Summary

A minimum of 13 individuals were identified in the assemblage transferred from the private collection of Jim Pilgrim. One identifiable individual is a middle-aged adult male represented by a nearly complete cranium. The rest of the individuals are represented by commingled remains and include a minimum of six adults based on sideable os coxae, and six juveniles: one 0-5 months, one 3-5 year-old, three 7-11 year-olds, and one 10-15 year-old. All the commingled remains are listed in Table 8 for juveniles and Table 9 for adults. From the os coxae and other human remains that could be sexed there is a minimum of four males and two females. The only pathology noted on the remains was arthritis on one of the acetabula. Aside from dental wear, dental health was relatively good with no caries or abscesses noted. 19 funerary objects were identified in soil matrix with the remains including one drill fragment, 13 flakes, and six faunal elements. The human remains are of ancient Native American ancestry based on dental wear typical of populations using ground stone tool technology to process food, the presence of shovel shaped incisors, and the limited excavation descriptions by Pilgrim.

References Cited

Hoffmann, Brianna V.

2017a Human Skeletal Remains from 13CN9, Eagle Point Park, Clinton County, Iowa. In Bioarchaeological Reports on Human Skeletal Remains from Iowa and other Proveniences, editors by Jennifer E. Mack, and Lara K. Noldner, pp. 143–151. Research Papers Vol. 42, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

2017b Human Cranial Remains of Unknown Provenience. In Bioarchaeological Reports on Human Skeletal Remains from Iowa and other Proveniences, edited by Jennifer E. Mack, and Lara K. Noldner, pp. 97–98. Research Papers Vol. 42, No. 2. Office of the State Archaeologist, University of Iowa, Iowa City.

Lillie, Robin M.

2014 Human Skeletal Remains from 13CN162, Clinton County, Iowa. In Reports on Burial Projects Osteology and Archaeology, edited by Robin M. Lillie, and Shirley J. Schermer, pp. 31–46. Research Papers Vol. 38, No. 1. Office of the State Archaeologist, University of Iowa, Iowa City.

2016 Additional Cranial Remains from 13CN162, Clinton County, Iowa. In Bioarchaeological Reports on Human Skeletal Remains from Iowa, edited by Jennifer E. Mack, and Lara K. Noldner, pp. 145–150. Research Papers Vol. 41, No. 3. Office of the State Archaeologist, University of Iowa, Iowa City.

Murphy, Samantha MK.

2024a. Human Tibia from Jim Pilgrim Collection. In Bioarchaeological Reports on Human Skeletal Remains from Iowa. edited by Samantha MK Murphy, and Lara K. Noldner. pp 105–106. Research Papers Vol. 49, No. 1. Office of the State Archeologist, University of Iowa, Iowa City.

2024b Commingled remains from Jim Pilgrim Donation. edited by Samantha MK Murphy, and Lara K. Noldner. pp 101–104. Research Papers Vol. 49, No. 1. Office of the State Archeologist, University of Iowa, Iowa City.

Peterson, Cynthia L.

2015 *Artifact Identification Guide for Iowan Historical Archaeology.* Office of the State Archaeologist, University of Iowa. Iowa City

University of Iowa, Office of the State Archaeologist (UI, OSA)

2023 Burial Project 3769. On file, Office of the State Archaeologist, University of Iowa, Iowa City.

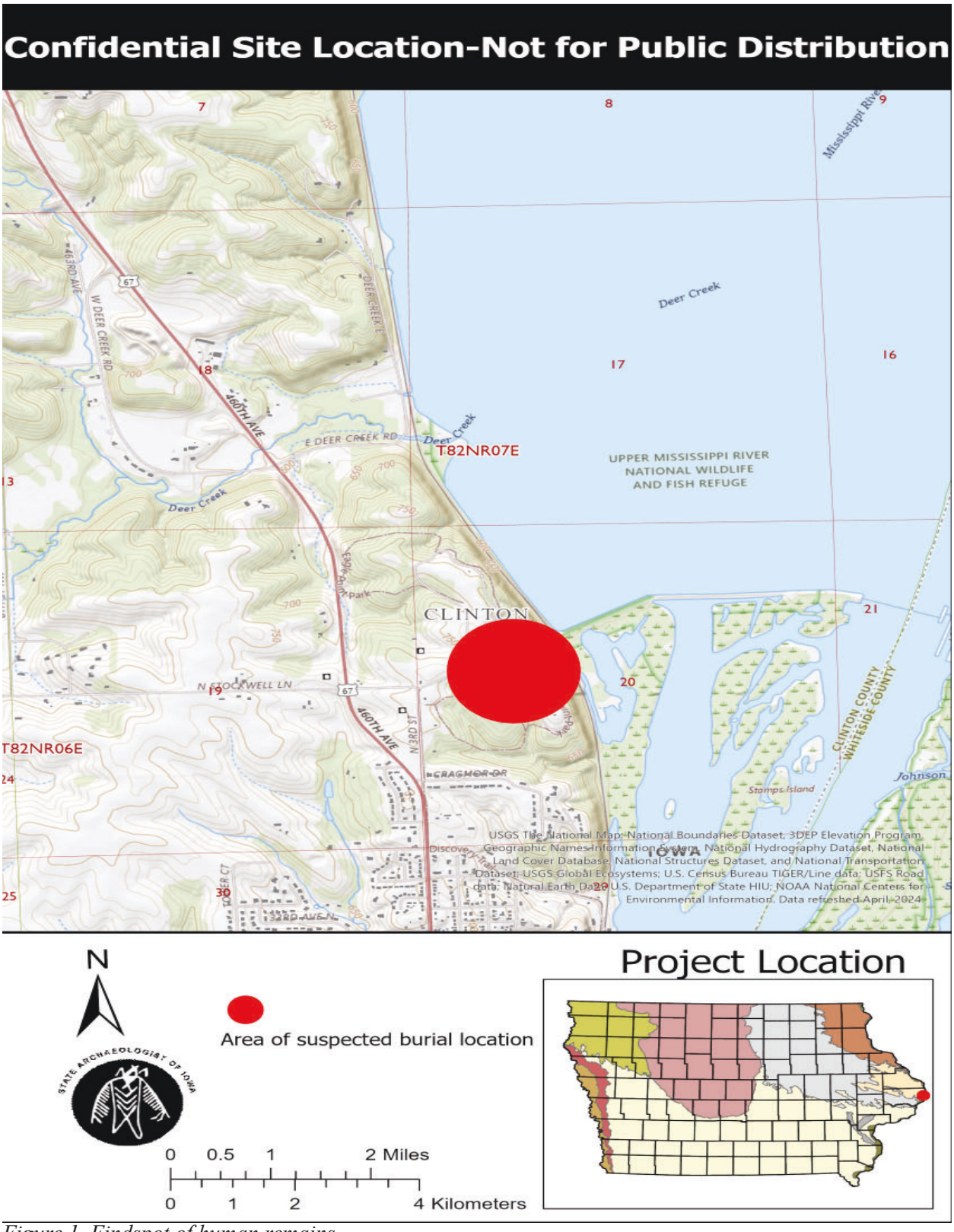

Figure 1. Findspot of human remains.
From USGS Corley, Clinton County, Iowa (1978), 7.5' series quadrangle map. Scale 1:100,000.

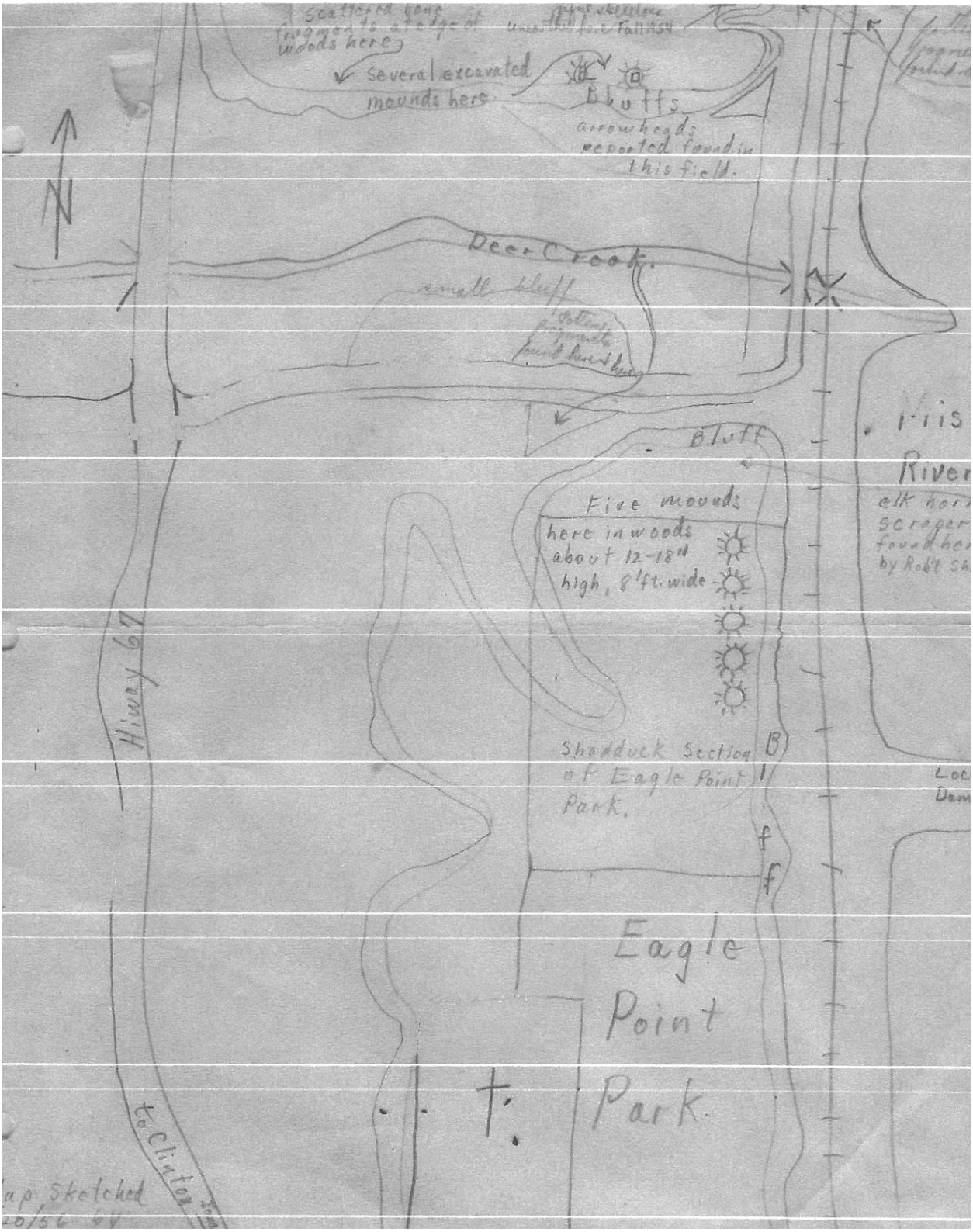

Figure 2. Site sketch map drawn by Jim Pilgrim.

BP3769 Table 1. Individual 1 Cranial Metrics (mm)	
Cranial metric	**Individual 1**
Mandibular height L	29
Mandibular height R	27
Bigonial width	95
Minimum ramus breadth R	26
Mandibular length	76
Mandibular angle	35

BP 3769 Table 2. Dental Inventory Individual 1						
Tooth	**Presence**	**Attrition:**	**Attrition- molars:**			
		I, C, P	**Mes-buc**	**Mes-ling**	**Dis-ling**	**Dis-buc**
MAXILLA:						
RM3	2		7	7	7	7
RM2	2		7	7	7	7
RM1	2		7	7	7	7
RP2	2	6				
RP1	2	6				
RC	5	9				
RI2	5	9				
RI1	5	9				
LM3	9		0	0	0	0
LM2	2		5	5	5	5
LM1	2		7	7	7	7
LP2	2	6				
LP1	2	6				
LC	5	9				
LI2	5	9				
LI1	5	9				
MANDIBLE:						
LM3	2		5	5	5	5
LM2	2		5	5	5	5
LM1	2		6	6	6	6
LP2	2	6				
LP1	5	9				
LC	5	9				
LI2	5	9				
LI1	5	9				
RM3	2		3	3	3	3
RM2	2		4	4	3	3
RM1	2		0	4	4	0

BP 3769 Table 2. Dental Inventory Individual 1 cont.						
		Attrition:	Attrition-molars:			
Tooth	Presence	I, C, P	Mes-buc	Mes-ling	Dis-ling	Dis-buc
RP2	2	4				
RP1	5	9				
RC	5	9				
RI2	5	9				
RI1	5	9				

Dental Inventory Key:
Presence
1 Present but not in occlusion
2 Present, development completed, in occlusion
3 Missing, with no associated alveolar bone
4 Missing, with alveolus resorbing or fully resorbed: antemortem loss
5 Missing, with no alveolar resorption: postmortem loss
6 Missing, congenital absence
7 Present, damage renders measurements impossible
8 Present but unobservable (e.g. teeth in crypts)
9 Unobservable

Attrition (I, C, PM)
1 Unworn or small facets
2 Point or hairline of dentin
3 Dentin line of distinct thickness
4 Moderate dentin exposure, not resembling a line
5 Large dentin area with rim complete (two areas on premolars)
6 Large dentin area with enamel rim lost on one side (two areas coalesced on premolars)
7 Enamel rim lost on two sides (at least one side lost on premolars)
8 Complete loss of crown, no enamel remaining
9 Unobservable

Attrition (molars)
0 Unobservable
1 Wear facets invisible or very small
2 Wear facets large, but cusps and surface features still evident
3 Any cusp in quadrant is rounded, but not flat
4 Quadrant is worn flat, but no dentin is exposed (except pinprick-sized)
5 Quadrant is flat, dentin exposed on ¼ of quadrant
6 More than ¼ of dentin is exposed, with enamel ring still complete
7 Enamel is found on only two sides of quadrant
8 Enamel on only one side of quadrant, but enamel is still thick
9 Enamel on only one side of quadrant and it is very thin
10 No enamel remaining. Wear extends below the cervicoenamel junction onto the root

BP 3769 Table 3. Dental Metrics (mm) Individual 1				
Tooth	Mesiodistal	Buccolingual	CEJ mesiodistal	CEJ buccolingual
MAXILLA:				
RM3	8.0	10.0		
RM2	9.0	11.0		
RM1	11.0	10.0		
RP2	4.0	8.0		
RP1	6.0	9.0		
LM2	10.0	11.0		
LM1	10.0	11.0		
LP2	6.0	8.0		
LP1	7.0	9.0		
MANDIBLE:				
LM3	10.0	11.0		
LM2	11.0	10.0		
LM1	10.0	11.0		
LP2	6.0	8.0		
RM3	9.0	9.0		
RM2	11.0	10.0		
RM1	10.0	10.0		
RP2	5.0	7.0		

BP 3769 Table 4. Burial 3/4 Juvenile Dental Inventory		
Tooth	**Count**	**Age Range**
Mandibular ldi1	1	3+ years
Mandibular lrdi1	1	3+ years
Canine Crown Complete	2	5-7 years
Premolar Crown 1/2 developed	1	3-5 years
Premolar Root 1/2 developed	1	8-10 years
M2 root 1/4 developed	1	9-11 years

BP 3769 Table 5. Commingled Dental Remains Burial 3/4 Adult Dentition			
	# Left	**# Right**	**# Unsided**
Maxilla:			
M3			
M2		1	
M1	1		
P2		2	
P1			
C		1	
I2		1	
I1		1	
Mandible:			
M3			
M2			
M1			
P2			
P1			1
C			
I2	1	1	
I1	2	1	
Unidentified teeth			1

BP 3769 Table 6. Burial 6 Juvenile Dental Inventory		
Tooth	**Count**	**Age Range**
Premolar crown 1/2 complete	1	2-5 years
M1 crown complete	1	4-7years
Maxillary LI1 crown complete	1	4-6 years
Maxillary dm1	1	4-7 years

BP 3769 Table 7. Adult Commingled Dental Remains			
	# Left	# Right	# Unsided
Maxilla:			
M3			
M2			
M1	1		
P2			
P1	1		
C			1
I2		1	
I1	1		
Mandible:			
M3	1		
M2			
M1	1	1	
P2	1		
P1			
C			
I2			
I1			
Unidentified teeth			2

BP3769 Table 8. Juvenile Commingled Remains						
Element	**Number of Fragments/ Specimens**	**MNE Left**	**MNE Right**	**MNE Midline**	**MNE Unsided**	**Age Range**
Cranium/mandible	15	1				4-7 years
Maxillary teeth	4	3			1	3+ years, 3-5 years, 4-7 years, 5-7 years, 10-15 years
Mandibular teeth	3	1	1		1	3+, 2-5 years, 8-10 years, 9-11 years
Hyoid						
Atlas						
Axis						
Cervical vertebrae (3-7)						
Thoracic vertebrae						
Lumbar vertebrae						
Unidentified vertebrae						
Sacrum						
Sternum						
Rib 1						
Ribs 2-12	4				4	
Clavicle						
Scapula						
Humerus	3	2			1	0-5 months
Radius						
Ulna						
Carpals						
Metacarpals						
Hand phalanges	2				2	
Os coxa						
Femur	5	3	2			<10
Patella						
Tibia	2	1	1			<13
Fibula						
Talus						
Calcaneus						
Tarsals						
Metatarsals	1				1	0-5 months
Foot phalanges						
Long bone fragments	2					
Indeterminate fragments	46					

BP 3769 Table 9. Adult Commingled Remains					
Element	**Number of Fragments/ Specimens**	**MNE Left**	**MNE Right**	**MNE Midline**	**MNE Unsided**
Cranium/mandible	78				78
Maxillary teeth	14	4	7		3
Mandibular teeth	11	6	3		2
Atlas	1				1
Cervical vertebrae (3-7)	1				1
Thoracic vertebrae	2				2
Unidentified vertebrae	8				8
Rib 1	1	1			
Ribs 2-12	32				32
Scapula	4	3			1
Humerus	5	4	1		
Radius	8		1		7
Ulna	8	4	2		2
Carpals	4	1	2		1
Metacarpals	1	1			
Hand phalanges	5				5
Os coxa	7	6	1		
Femur	5	3	2		
Patella	1		1		
Tibia	3	2			1
Fibula	4	3			1
Talus	1				1
Calcaneus	3	1	1		1
Tarsals	2	1	1		
Metatarsals	8	1	1		6
Foot phalanges	3				3
Long bone fragments	85g				85g
Indeterminate fragments	280g				280g