ORIGINS OF THE MAYA: BLADEN PALEOINDIAN AND ARCHAIC ARCHAEOLOGICAL PROJECT

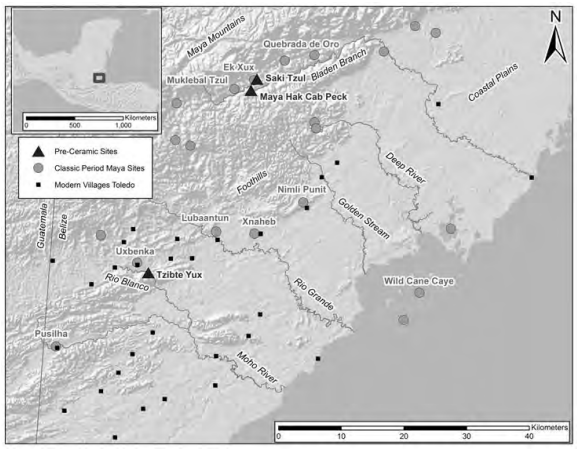
Report of the 2019 Research

Institute of Archaeology, National Institute of Culture and History

Forest Department

By Keith M. Prufer

With contributions from:
Erin E. Ray
Paige Lynch



Chapter 1. Bladen Paleoindian and Archaeology Project: Introduction

Research being conducted by the BPAAP in Southern Belize is changing the way we view the pre-ceramic history of the region. Over a 10,000 year period people repeatedly visited and found shelter in MHCP and ST. Evidence from these shelters indicates that humans we using these spaces for tool use or manufacture based on large amount of chert debitage and worked igneous rock. They were regularly transporting rocks to the shelters from the rivers below each site. The presence of Late Paleoindian bifaces, commonly known as Lowe Points is suggestive of hunting (Prufer et al. 2019). In all levels and time periods we have evidence of hunting mammal, reptiles, and birds. In the Late Archaic it would appear that *jute* snails were harvested in the clear flowing waters of the Bladen Branch as an industry, and millions of consumed shells were deposited in the rockshelters. Remarkably, these shelters were also used episodically a mortuary spaces for over 10,000 years. They contain individuals of all ages and both sexes. Future research will continue to illuminate mortuary practices throughout the human adaptations in the neotropics.

This report describes research conducted by the Bladen Paleoindian and Archaic Project (BPAAP) in the Bladen Nature Reserve, a protected area in the Toledo District of southern Belize. This study is part of a broader research program that involved limited excavations in rockshelters in the Ek Xux Valley of the upper (western) Bladen reserve. Permits for this project were granted by the Forestry Department and the Belize Institute of Archaeology (IA) to complete this research from March 1 to April 5, 2018. The research presented here is conducted with permits issued by the Belize Institute of Archaeology by researchers from the University of New Mexico and Exeter University.

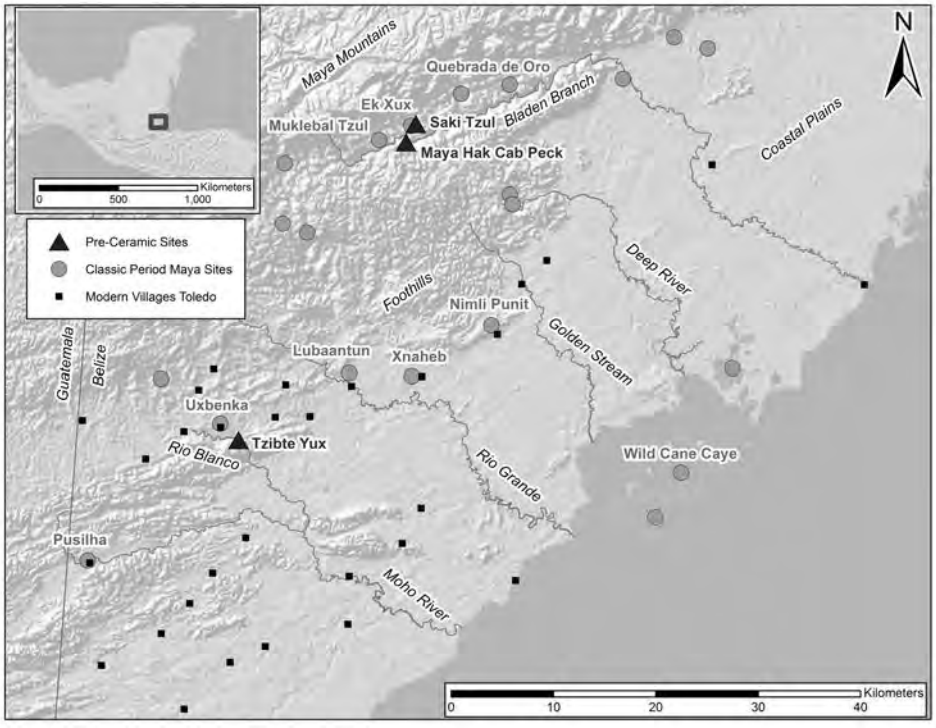


Figure 1 Figure 1 Location of Saki Tzul rockshelter in relation to nearby Classic Period Maya centers, Muklebal Tzul and Ek Xux as well as AC Camp. The broader southern Belize

In this report we detail the information gathered from two excavations conducted at Mayahak Cab Pek (MHCP) in 2019. This site is located in the Ek Xux valley of the Maya Mountains, within the uninhabited wilderness of the Bladen Nature Reserve (BNR), in the Toledo District. The purpose of this study is to explore the earliest presence of humans in Central America, and more specifically Belize,

during the Paleoindian (10,500-8,000 BC) and Archaic Period (8,000-2,500 BC). Previous research conducted by project PI Dr. Keith Prufer during the 1990s and the 2014 through 2018 BPAAP field seasons al indicate that these earliest pioneering hunters and gatherers occupied this region, and this project explores their presence through limited excavations in two rockshelters in the upper Bladen for a comparative analysis of early human occupations.

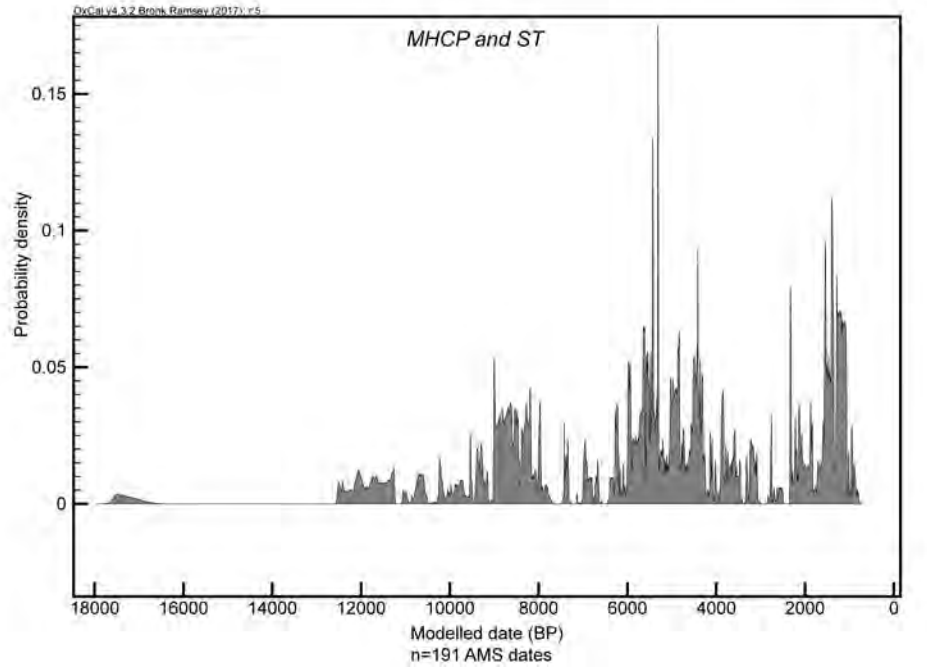


Figure 2 Summed probability distribution of all dates from MHCP and ST as a single phase. These are a proxy for the use-intensity of the rockshelters. While probability distributions can be difficult to justify statistically, they are a best estimate for the c chronological distribution of the items dated and they provide a visualization of the overall distribution of dated events within the phase (Bronk Ramsey 2017, 2017).

Archaeological Context: Early New World Colonization

In the neotropical lowlands of Mesoamerica the generally accepted chronology of Paleoindian Period from 13,500 – 10,000 BP. followed by a long Archaic from 10,000-2900 BP (Lohse et al. 2006) is not particularly anchored to cultural changes reflected in well dated regional archaeological records (Prufer et al. 2019) and likely need to be revised in light of emerging genetic and paleodietary data (Posth et al. 2018; Kennett et al. In Press). Conservatively it is estimated the initial New World colonists would have lived in in Central America prior to 14,500 BP (Braje et al. 2017). There they encountered a far less tropical, environment than today. At that time the landscape was probably composed of "heterogeneous, even patchy, vegetation across small distance scales; and stretches of forest alongside water courses in regions where forests were significantly reduced" (Piperno 2006:286). Pollen and macrofossil plant data suggest the structure of forests may have already been tropical, but the distribution of broadleaf forests was significantly less than in the modern climate regime (Piperno and Pearsall 1998) and vegetation was more diverse than simple Pleistocene grassland / Holocene forest dichotomies would suggest (Piperno 2011). Confronted with a greater diversity of large mammals and a wider range of riparian forest and grasslands humans would have initially adapted to ecosystems that were far different than today. By 9,000 BP conditions were becoming wetter and warmer (Winter et al. 2020) and, in the Petén, there is evidence that closed canopy forests were experiencing at least some anthropogenic burning (Renssen et al. 2009; Anderson

and Wahl 2015) with mixed herbaceous and woody plants being represented in charcoal records. Pre-agricultural burning peaks much later, between 8,000 and 6,000 BP (Schüpbach et al. 2015), during the Holocene Thermal Maximum, arguably the warmest and wettest period of the Holocene (Renssen et al. 2009). After 10,500 BP the abundance of higher-ranked plant and animal resources declined as rainforest overtook many Pleistocene open areas where game would have fed on scrub and grasses (Piperno and Pearsall 1998). Dates reported here as CalBP are based on calibrated radiocarbon dates using the IntCal13 calibration in the software package Oxcal (Bronk Ramsey 2017; Reimer et al. 2013). Other estimates in years BP are derived from generalized chronologies in the literature, but both refer to years before the present, (present=1950).

Rockshelter and Excavation Descriptions

Mayahak Cab Pek (MHCP) and Saki Tzul (ST) are rockshelters located in an interior valley of the Maya Mountains in the Bladen Nature Reserve, a protected wilderness area where there has been minimal modern human disturbance of archaeological sites (Figure 1). Recent work from 2014-2019 has demonstrated that the cultural use of these rockshelters began prior to 13,000 CalBP and continued through 1,000 CalBP. The two sites were first documented in 1997-1998 (Prufer 2002). At that time, shallow excavations at MHCP produced burials with excellent preservation of human and faunal remains but did not identify pre-agricultural contexts (Saul et al. 2005). Though the two rockshelters are located 1.4km apart, they have similar stratigraphic sequences an d contain similar assemblages of artifacts and biological remains. Both have dry sediments and large overhangs, reflecting that little direct rainfall affected cultural deposits. This also helps to explain the excellent preservation of unburned bone and other organic materials and only minor root activity close to the driplines. A Classic Period Maya center is located between the two rockshelters in the Ek Xux valley, and another is located just 2.7 miles distant (Dunham and Prufer 1998), indicating that the interior of the Maya Mountains were dynamic and active cultural landscapes for thousands of years.

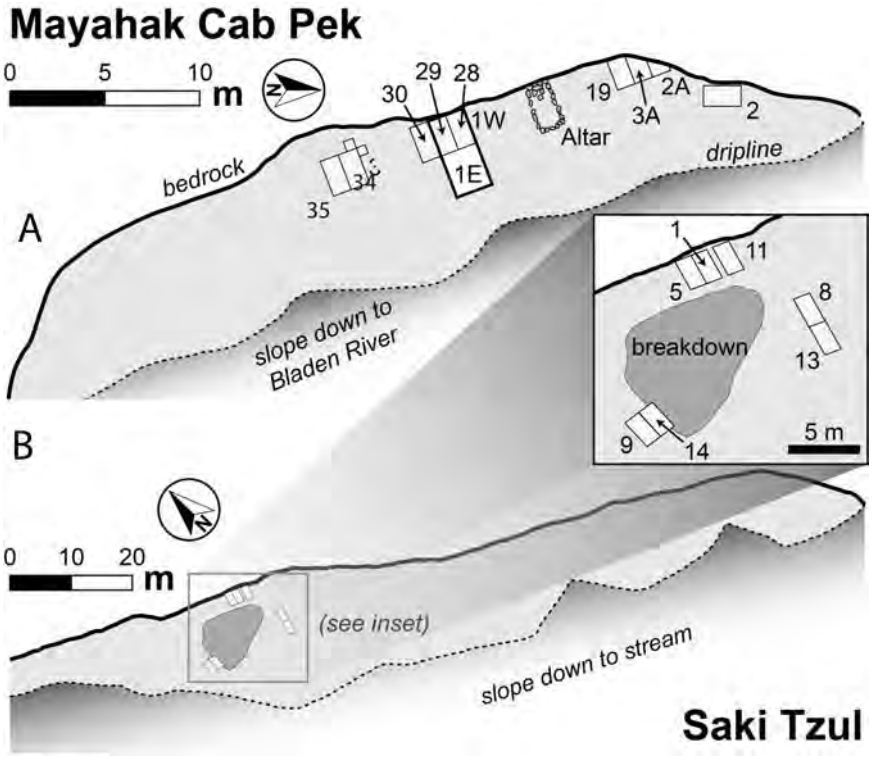


Figure 3 Figure 3. Plan view of MHCP (A) and ST (B). After Kennett et al. In Press Figure S1. Graphic by K. Prufer, A. Alsgaard, and T. Harper for the BPAAP.

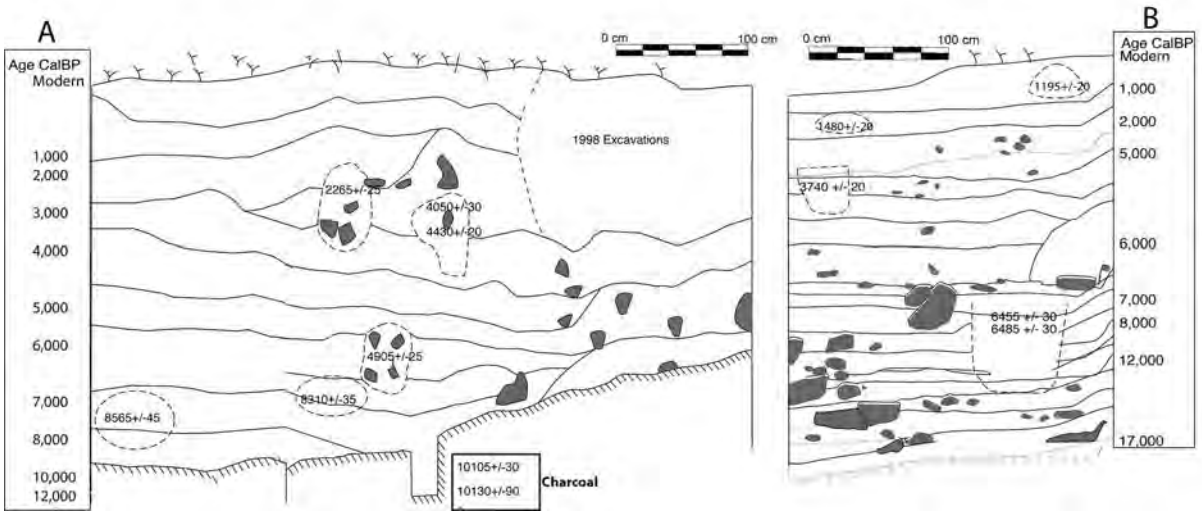


Figure 4 Schematic profiles of MHCP Unit 1 (2014-2017) and ST Unit 1 (2016) showing generalized stratigraphy and age model in years CalBP. Dashed circles represent selected mortuary features and dates of directly dated human skeletal material (uncalibrated). Figures by K. Prufer, A. Alsgaard, and E. Ray.

Mayahak Cab Pek (MHCP)

MHCP is an east facing shelter (Figure 2) under a 20m high limestone face with easily discernable bedding planes, many marked by caramel colored chert lenses and cobbles. The ground surface of the rockshelter runs roughly south-southeast to north-northwest with a slope gradient that varies between 6 and 14 degrees steepening towards the south. The shelter surface is located approximately 20m above the present-day stream bed of an unnamed tributary of the Bladen Branch of the Monkey River. The rockshelter overhang offers a substantial amount of shelter to the surface below, which is extremely dry and dusty. The drip line extends to ~8m from the cliff face. The rockshelter floor shows no signs of erosion from water flow. The rockshelter wall shows a few indicators of travertine growth, likely from water seepage. The overall area of the rockshelter floor is approximately 180m^2 . Disturbance from plant growth is not significant since the ground surface is largely sheltered from rain. The east facing aspect and high canopy forest cover limits direct sunlight. Recent studies in 2014, 2016-2018 documented preceramic contexts.

In 1998 and from in 2014-2019 a dozen excavation units were placed in MHCP extending to a depth of over 320cm below the surface (Figure 3a). These were done in 5cm to 15cm arbitrary and natural levels based on observed stratigraphic changes and cautious level endings when stratigraphic changes were not observed. The original 1998 excavations consisted of 1x2m units along the back wall of the rockshelter (Units 2A-34, see Figure 3a). Several of the units partially excavated in 1998, were then reopened and excavated to bedrock in subsequent years (Units 28-30). The 1998 basal excavation surface had been covered to protect deeper contexts.

The general stratigraphy at MHCP is consistent and well dated (Prufer et al. 2019). The ceramic bearing upper portions (dating from 1,000-3,000 B.P.) of the stratigraphy can be generally characterized as repeating two sub-stratigraphic soil units, which include midden fill overlying dense concentrations of cobbles that likely represent occupation surfaces. This sequence of midden deposit and cobble fill was repeated no less than three times. The midden deposits contain high amounts of flake stone, faunal material, ceramics, much of which show evidence for burning. Jute (*Pachychilus* sp., a freshwater snail) concentrations comprise up to 50 percent of the matrix, particular toward the bottom of the ceramic levels and continuing into the top of the aceramic levels. These jute shells all appear to be spire lopped,

which has been suggested elsewhere as an indicator that jute was a prepared food product (Halperin et al. 2003). These levels contain dense cobble rich horizons primarily of sub-round to sub-angular limestone and porphyritic igneous clasts. Given the generally rounded nature of the clasts, they likely derived from river gravels, not roof fall, and would have been transported to the rockshelter by humans. Many of the igneous rocks were worked by crude splitting and flaking of volcanic rocks for expedient chopping and cutting tools, with little evidence of retouch. In the Bladen River, below the shelter, more than 50% of the float are porphyritic igneous cobbles, suggesting they are a source of expedient tools manufactured at or carried to the rockshelter. The fine-grained matrix found in both midden and cobble horizons consisted of black (10 YR 2/1) silt to silty-loam sediments.

The aceramic levels were characterized as black (10YR 2/1) silt to silty-loam fine grained matrix with varying degrees of sub-angular to angular cobble-boulder sized clasts of limestone interpreted as roof fall mixed with crude porphyritic igneous tools. This stratigraphic unit is poorly sorted and likely represents the natural accumulation of exogenic (silt) and endogenic (roof fall) sediment. The intrusive nature of some burials made it difficult to interpret stratigraphic sub-units. Artifact and faunal concentrations are moderate and consistent in the aceramic levels and jute snail concentrations decline with depth to less than 10 percent of the matrix in the lowest cultural levels. The size and the number of cobbles, both limestone and porphyritic igneous rocks and expedient tools, tended to increase with depth and comprising up to 75% percent of the matrix between strata dated to 5,000-9,000 CalBP. In the lowest cultural levels, earlier than 9,000 years ago the soils are a silty matrix we found a smaller frequency of chert tools, but they were larger and have a higher concentration of expedient unifacial and bifacial blades. These silty matrices terminate on bedrock (likely roof fall breakdown) over reddish clays and decaying limestone devoid of any cultural materials. The silty matrix above decaying limestone likes represents the first intensive human use of the rockshelter and at MHCP dates to approximately 12,000 B.P (Prufer et al. 2019).

General Chronology

The occupation sequences at MHCP and ST span close to 12,000 years. Stratigraphic integrity (Figure 5) is largely intact, with some mixing within stratigraphic units presumably from human and animal activity. These disturbances are much more pronounced in the upper levels dating to the Classic Period (1,000-3,000 CalBP). The middle and early Holocene stratigraphy is much more and has fewer reversals (Prufer et al. 2019). Both rockshelters show definitive evidence of human use prior to 12,000 CalBP. The stratigraphy of ST is more compact, with a long chronology relative to depth. This may suggest more intensive used of MHCP over time. It is easier to access, requiring a climb of < 30m from the creek below, while accessing ST requires a much more difficult and steeper climb of over 80m. ST is also much larger, and human activity may have been distributed across the larger surface resulting in shallower contexts of similar age. Finally, differences in stratigraphy may be related in part to aspect. ST has a south facing shelter open to the large (1km wide) Ek Xux valley with some windblown rainfall and more air circulation today. MHCP opens to the NE and partially faces into a box canyon and receives very little sunlight or air circulation. These differences in sunlight, moisture, and air circulation may have facilitated more biogenic decay and movement of fine sediments at ST than MHCP, and less accumulation over time. Several early dates at ST (pre-15,000 CalBP) predate occupations known in Central America by several millennia, but are consistent with early dates proposed for North America (Waters et al. 2018) and South America (Dillehay et al. 2015). Similarly old dates have been recovered from a small rockshelter in southern Belize, but additional work is needed to ascertain the relationship of these dates to human activity (Prufer et al. 2017, 2019).

The overall occupation sequence of both rockshelters is based on 191 ASM radiocarbon dates on both charcoal and human bone (Kennett et al. In Press; Prufer et al. 2019). They suggest regular use of the sites starting in the late Pleistocene and continuing through the Classic Period (Figure 6). The data suggest steady but episodic use from 13,000 through the adoption of agriculture at 4,700-4,000 CalBP, and a separate rise in use of the rockshelters during the Classic Period (ca. 2,800-1,000 CalBP). With excavations still on-going it is possible that we will fill some of these temporal gaps as more radiocarbon dates are run.

Mortuary use

Elsewhere (Kennett et al. In Press; Posth et al. 2018) we have described the burial population from MHCP and Saki Tzul and their individual dates. To date, we have fully analyzed 52 skeletons from these two rockshelters. These directly dated burials span from 9,610 CalBP to 1,060 CalBP. The population consists of 13 males and 12 females and 27 individuals for whom sex could not be determined using standard osteological methods because they were too young or too fragmentary. The age profile of these samples includes 31 adults (young, middle, and older, though in many cases these subcategories could not be determined), 6 juveniles, and 11 infants. There were four individuals for whom age could not be determined.

The earliest are two individuals from MHCP. They were recovered in 2014 and in 2017 from excavations in the lowest, silt rich soils within 30 cm of non-cultural bedrock. The oldest is Burial MHCP.17.1.8, recovered just 15cm above bedrock at a depth of 252cm below the surface. This consists of the remains of a male adult (sex assessed during field and osteological analysis) buried in the shallow pit in a flexed position. The skeleton was directly dated to 9610–9470 CalBP (2σ PSUAMS 4290) on enamel carbonate with the integrity of the enamel confirmed with FTIR. Enamel carbonates are known to potentially produce dates younger than the actual time of death. The other, Burial MHCP.14.1.6, was an older female (determined by DNA) who was fully disarticulated and buried 205cm below the ground surface in a shallow pit (Posth et al. 2018). The skeleton, which was largely complete, was in a matrix rich in large chert flakes. The skeleton was directly dated on XAD purified amino acids from bulk tissue collagen to 9430-9140 calBP (2σ,UCIAMS 151854 and 151855).

At ST the oldest two individuals we found in a shallow (20-25cm deep) pit cut into the hard plaster or lime marl floor dating to before 7,500 CalBP. Burials ST.16.1.2 and ST.16.1.3 at the remains of two males individuals found together as a single interment. A rock layer, consisting of porphyritic volcanic river float and limestone cobbles covered the burial. This is a constructed cultural feature indicating intentional burial architecture for these two individuals. Burial feature artifacts included human remains, lithics, carbonized plants and seeds, and faunal bone, but no specific patterning was indicated for these materials found in the burial cut. The burials were placed on a prepared layer of flat river cobbles that had been set into the pit.

Burials ST.16.1.2 and ST.16.1.3 are both middle-adult males who were interred in flexed positions within the same burial feature, the base of which is located 191 cm below the modern (Posth et al. 2018) ground surface at ST. ST16.1.2 was directly dated to 7440-7310 calBP (2σ, PSUAMS-3205) and ST16.1.3 was directly dated to 7460-7320 calBP (2σ, PSUAMS-3206). Both assays conducted on tooth enamel. FTIR was used to confirm the integrity of the enamel, and several comparative enamel/collagen studies suggest that the age of these ST individuals is likely underestimated by 200 years. Combined, these individuals are the oldest burials recovered from stratified mortuary contexts in Central America. They represent remarkable window into mortuary practices of some of the earliest New World residents. They are largely contemporaneous with some of the earliest known skeletons from South America, and

for Burials MHCP.14.1.6 and ST.16.1.2 and ST.16.1.3 they show genetic affinity with early population dispersal as people first moved into the Neotropics (Posth et al. 2018). An additional 12 individuals who predate 4,650 CalBP and are distinctive non-maize consumers and likely foragers, based on analysis of $\delta^{13}C$ (carbon isotope) values measured on both bone collagen and bone apatite (Kennett et al. In Press). These 16 individuals have $\delta^{13}C$ values ranging between -21.6 and -20.3‰ suggesting minimal or no maize (C_4 plant) consumption. Combined, these represent an unprecedented view into the preceramic populations in neotropical Central America.

Ten additional skeletons dating between 4680-4010 CalBP are incipient maize consumers based on $\delta^{13}C$ carbon isotope values between -20.6‰ and -13.1‰ from bone collagen (Kennett et al. In Press). These individuals are remarkable in that they have isotope values indicating that they grounded in two worlds. First the foraging populations long hypothesized to have been experimenting with different plants throughout the early Holocene while also living largely mobile lifestyles in what were probably semi-sedentary groups without formal villages or architecture, as has been proposed elsewhere in neotropical Central America (Ranere and Cooke 2003; Piperno and Pearsall 1998). Second, they were consuming some degree of maize but are not using maize as a staple component of their diet. Elsewhere, we have hypothesized that this may be indicative of the consumption of maize stalk juice, a liquid high in sucrose that also could have been fermented (Kennett et al. In Press), and has been also suggested elsewhere in Mesoamerica (Smalley and Blake 2003).

The remaining 18 individuals for whom we have complete data were all maize consumers, with ^{13}C -12.2‰ and -8.2‰. They date between 4,000 and 1,060 CalBP and may include some individual who lived at one or more of the know Classic Period Centers in the Maya Mountains (Dunham and Prufer 1998). OF particular interest is four individuals who date between 3,000 and 4,000 CalBP (Kennett et al. In Press), In the Maya Lowlands the earliest known settled agricultural villages date to around 3,000 CalBP (Ebert et al. 2019). This suggests the presence of semi-mobile forager-farmers in the region at least 1,000 years before the development of settled villages and public architecture that characterize Maya societies.

2019 Field Logistics

This project consisted of camping in the Bladen Nature Reserve (BNR) for 24 nights. While the crew hiked in and out from Golden Stream (Figure 5), supplies, and equipment were brought into the BNR via Astrum Helicopter. Prior to the field season, the patch of land (approximately 1 km^2) that was initially cleared at the beginning of the 2016 field season for the safe transportation of field equipment (referred to as the Helicopter landing spot or HLS) was cleared prior to the 2019 field season by Rangers from Ya'axché Conservation Trust (YCT). The HLS is approximately 1.5km southeast of AC Camp. AC Camp, which was established by archaeologists in the 1990s and was also used during recent field seasons in 2014 and 2016; the camp is adjacent to AC cave (Figure 2). At the end of the season, all equipment, archaeological samples, personal gear, and garbage was removed from the BNR. Fire pits were deconstructed and buried and the ash was buried in the latrines.

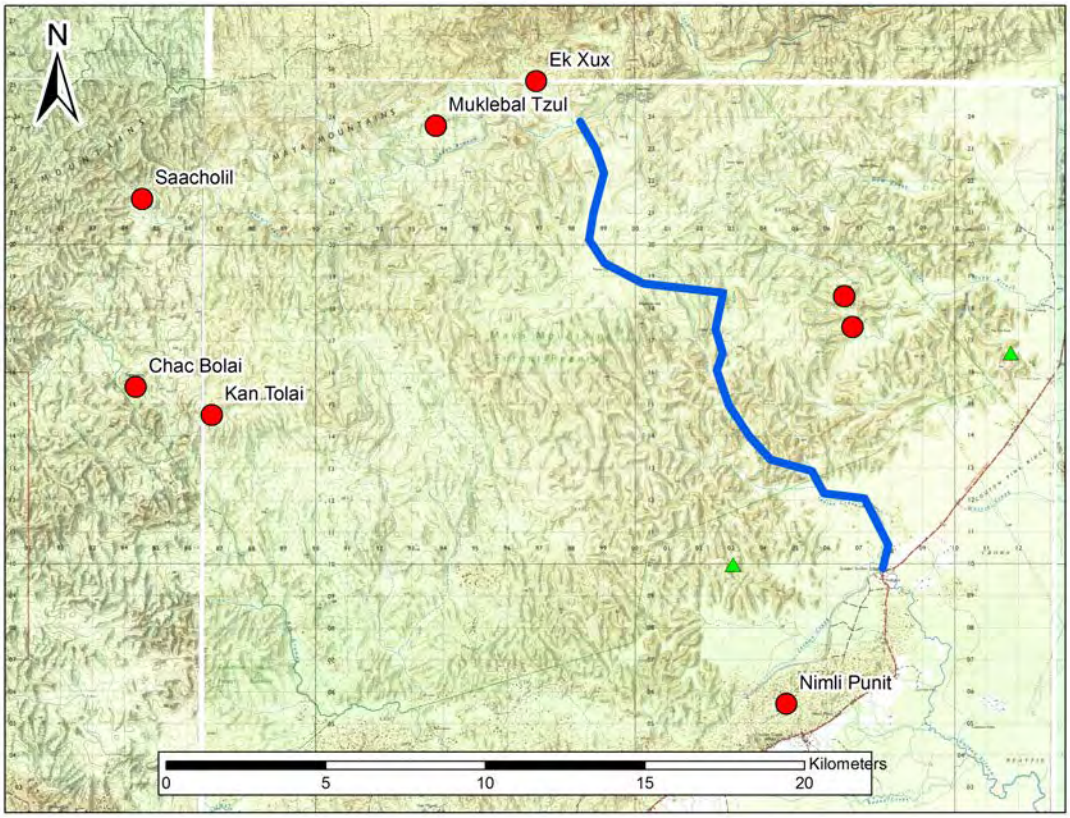


Figure 5 ***GPS track of the hike from Golden Stream village to AC camp, which is located near MHCP. (Map by A. Thompson)***

Methods

The excavations of MHCP followed the 2014 and 2018 protocols. Excavation units were established on a north-south grid. The uppermost levels were excavated based on stratigraphic layers while deeper levels were excavated based on 5 to 10cm arbitrary levels. Horizontal provenience control was maintained using excavation unit corner nails, and vertical control relied on a permanent line level embedded in the rockshelter wall that was 25cm above ground surface. All sediment was screened through $^{1}/_{4}$ inch mesh screen and screened artifacts were bagged separately by artifact/ecofact classification (e.g. flaked stone, ceramics, and fauna). Diagnostic artifacts, radiocarbon samples, large faunal elements, unusual or unique artifacts, and burial materials (human remains and associated artifacts) were point plotted using hand tape measures for northing and easting coordinates and line levels for elevations. Due to the depth of the unit, at various points secondary datums were established that were linked to the primary datum. All datum values included here are corrected to reflect the primary datum depth. All artifacts and ecofacts (except *jute*) were collected. Charcoal for radiocarbon dating and species identification, and sediment samples were taken from each level as well as from burials. Two soil samples were taken from each context, one bulk sample that was exported for further laboratory work and one sample that was sieved through metal soil sieves. At the conclusion of this field season's work, the excavation units were lined with tarps and back filled.

Chapter 1. Mayahak Cab Pek, May 17-June 7, 2019

Excavation descriptions by *Erin E. Ray*

SubOp 19-01

A 3x1 m excavation unit was placed roughly adjacent to the rock altar's southern boundary and north of previous unit 1. This unit and later extensions to the north, contained 11 natural strata (Figure 1) these strata along with any other definable contexts were assigned a context number (C#). Three primary burials and two cremations were uncovered during this excavation along with at least one intentional faunal deposit. The following description of each context begins with the oldest contexts.

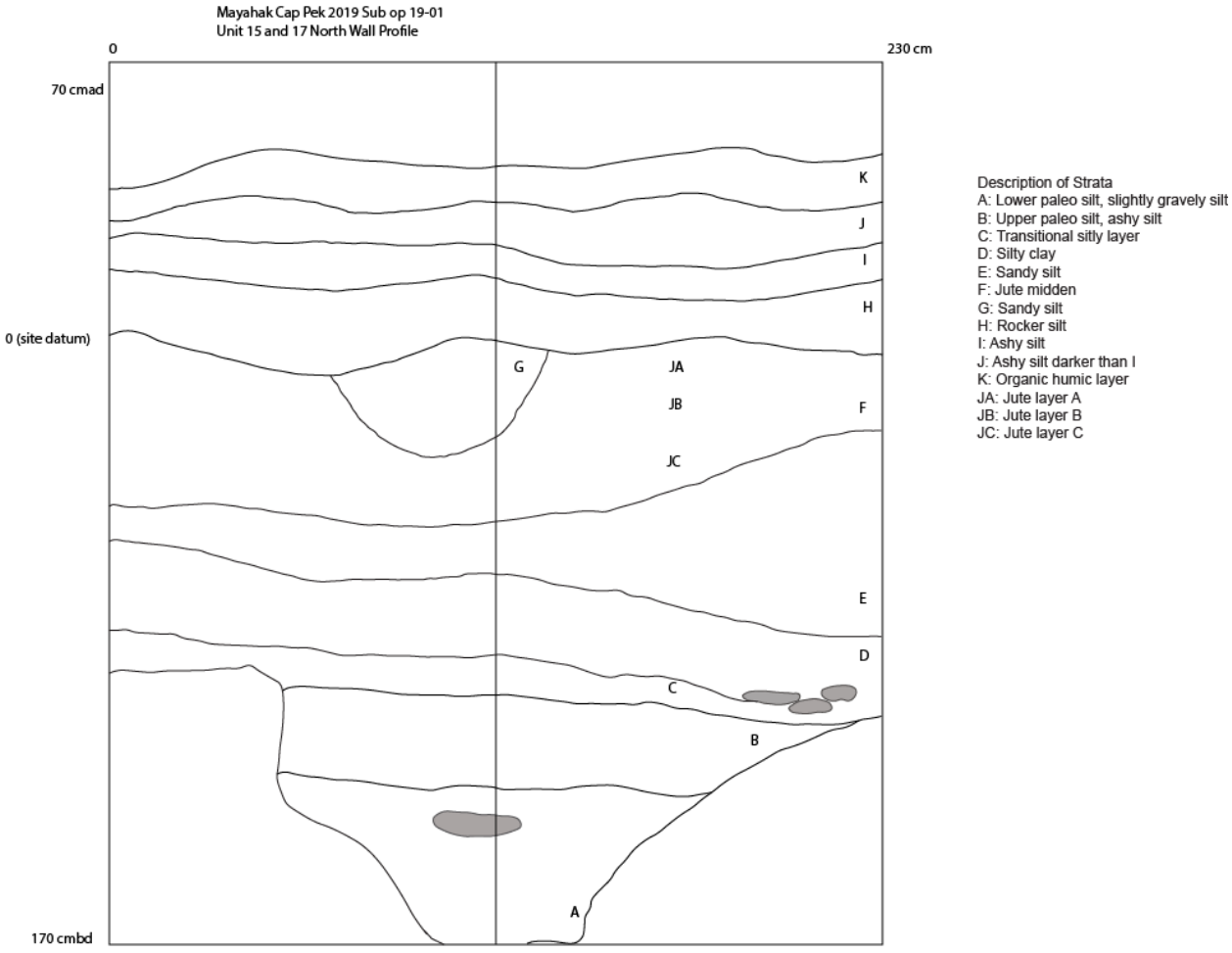


Figure 6. Unit 15 and 17 North Wall Profile

Unit 12

C17 (MHCP.19.12.17)-The earliest context consisted of a single burial (Figure 2) between undulating bedrock morphology. The burial was that of a loosely flexed individual with moderate preservation. The individual was placed head to the west, with legs flexed and arms lightly flexed over the pelvis. Vertebrae were much better preserved than later burials however the cranium almost completely missing. Several portions of the cranium including 1 temporal bone present. This could be due to the position of the individual with the cranium on the highest piece of bedrock within the burial feature.

E. Moes made a field assessment of the sex of the individual and determined that it is consistent with male based on the narrowness of the sciatic notch, but this is only very preliminary since it is based on a single characteristic. Macrobotanicals and chert were also found abundantly throughout the context.

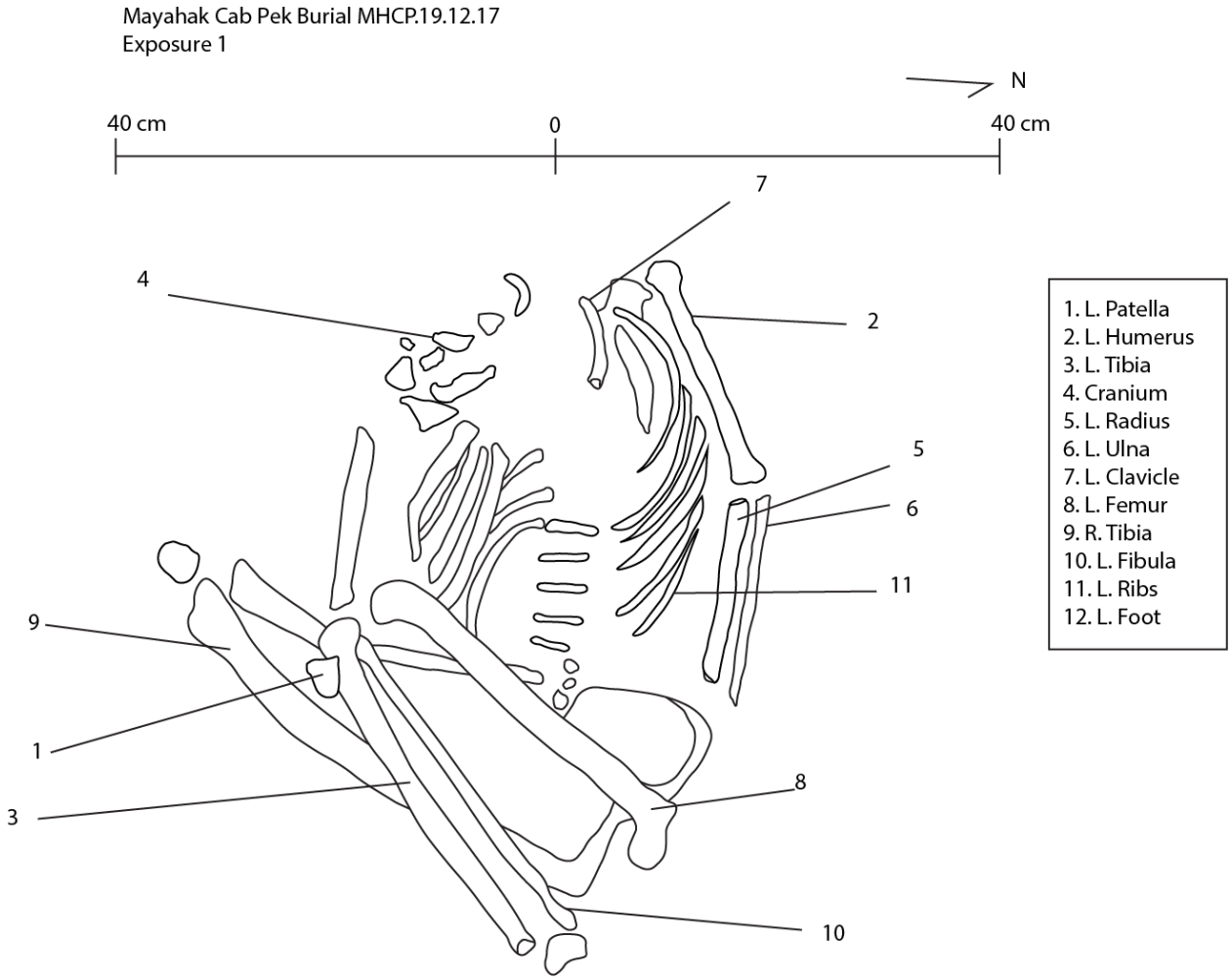


Figure 7. MHCP.19.12.17 Exposure 1, remains of one individual

C16-The soil is markedly loose, dry and silty within this context. The rest consisted of large rocks, which were likely breakdown from the top of the rockshelter. This context was mostly sterile but did contain a few macrobotanicals and some expedient stone tools.

C15-Many expedient stone tools were found in this context, mainly end battered rocks, an abundance of nicely worked chert, burnt seeds, charcoal, obsidian, and burnt clay. Based on the material found in this context and the depth of this context, in reference to other dated contexts in this rockshelter, it is possibly Early Archaic or on the boundary of the Early Archaic/Late Archaic transition.

C14-A cremation was uncovered within and below C13 in the area of the unit 15 extension. Small burnt human remains were recovered from this context and a single chopper (Figure 3) was also recovered. The bones were blue-white in color suggesting modification by a high temperature. fire.

Figure 8. Chopper found in C14 cremation, may be associated with the cremains

C13-The matrix of this context was mostly soft loose silt. This was the most recent context before the beginning of the jute midden so it is marked by the absence of jute. Lithics were found throughout the context as well as some faunal, isolated human remains, and charcoal.

C12-This context marks the beginning of the jute midden with still relatively few jute present. Faunal bone, lithics, and isolated human remains were also recovered. A single ceramic sherd was also found within this context but it is likely intrusive and not in its original context.

C11-This cremation measured approximately 60 cm x 40 cm x 5 cm deep just at the boundary between the jute midden above and silty archaic soils below. It contained mixed burnt human and faunal bone. The bones contained within also were of a blue-white color suggesting a similar heating temperature as the other cremation (C14).

C9 -This context contained a large portion of the jute midden, this marks the boundary between the ceramic and the preceramic. It is characterized by loose soils with a marked increase in the number of jute within the matrix as compared with contexts above and below. Within this context an isolated mandible of an older individual with poor dental health was recovered along with other isolated human remains, faunal bone, obsidian, charcoal, and paleobotanics. Many lithics were also found, most of which are end battered rocks but also a couple groundstone artifacts (Figure 4).

Figure 9. Example of end battered expedient tools found throughout the excavations, these are from C9.

C10 (MHCP.19.12.10)-This was a partially closed burial of a tightly flexed individual (Figure 5), estimated female based on forehead, brow ridge and overall size of crania. Three flat rocks above the burial formed a C-shape and are likely the capstones for the burial. Fortunately, no rocks were placed above the cranium so the face intact though top of cranium was smashed. Head to the east facing south. So tightly bound that many of the long bones were broken in a manner consistent with tight binding. Thoracic and lumbar vertebrae mostly missing and poorly preserved. Tightly packed with jute, a few lithics found in association with the burial including a scraper found adjacent to the left patella. There did not appear to be an obvious burial cut so it appears that the individual was placed within the jute midden.

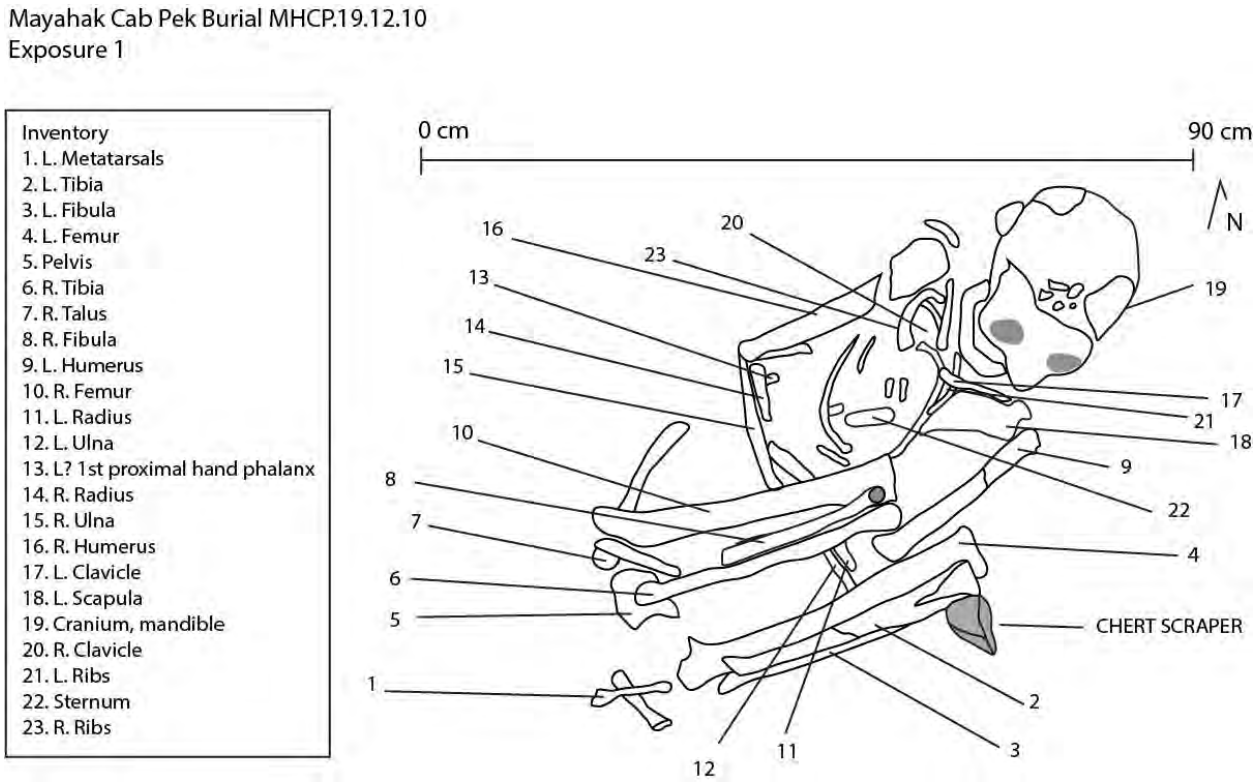


Figure 10. MHCP.19.12.10, exposure 1, remains of a single tightly flexed individual

C18 (MHCP.19.12.18)-This individual (Figure 6) was a primary burial in western third of the unit also near the bottom of the jute midden, and it appears to be the same level as C9 or Burial C10. The individual is also tightly flexed with head to the east facing south. The individual was interred in a shallow cut under flat river cobbles in a similar manner to the C10 burial, this may suggest that they were interred at a similar time. Also like the C10 burial this individual is in a state of very poor

preservation. The bones have significant signs of taphonomy and pathology, but the analysis of these indications will be completed at a later time in the lab. Initial inspection by E. Moes suggests that the individual may be female based on smooth eye orbits and lack of brow ridge but additional lab analysis will be needed to confirm this assessment.

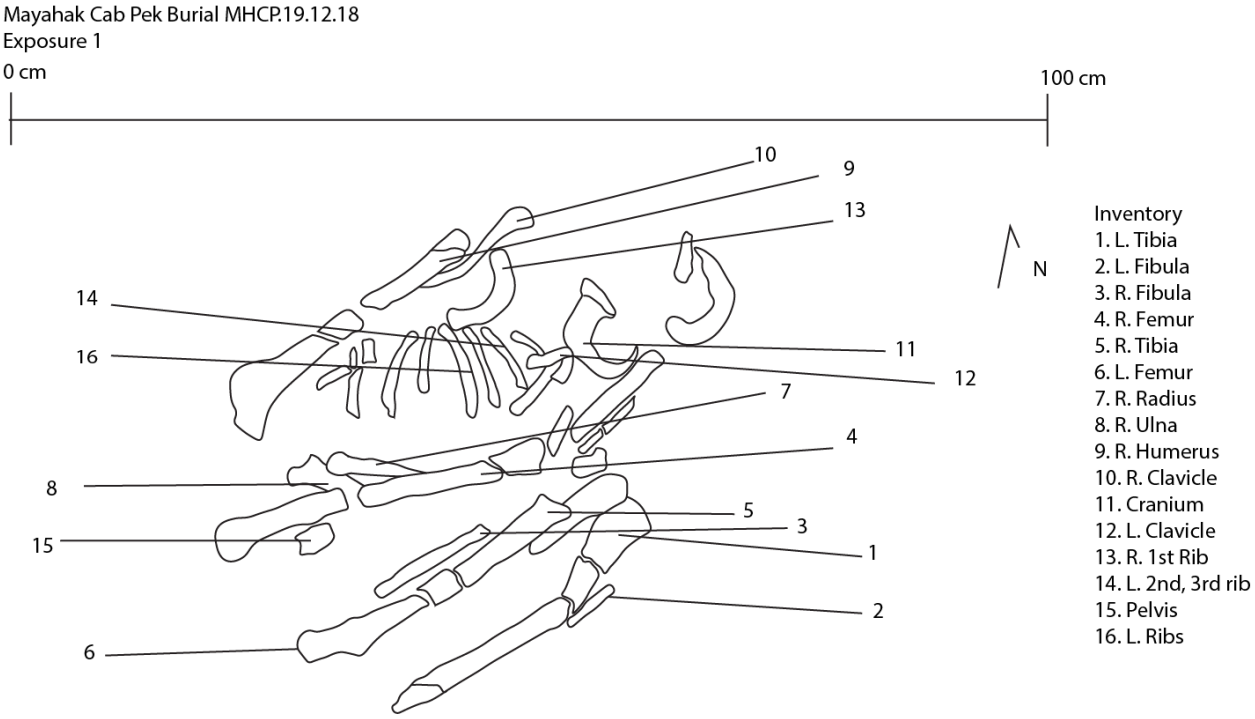


Figure 11. MHCP.19.12.18, exposure 1, remains of a single tightly flexed individual

C8 -This context was identified by a concentration of flat stones roughly in the center of the unit. After removal of the stones and cobbles nothing was identified as a special context and the matrix was similar to the jute midden surrounding the stones. Very few cultural materials were present however some small rodent bones, lithic flakes, 2 sherds, charcoal, and one isolated juvenile rib fragment were also recovered. It should be noted that the concentration of rocks extended much further to the south than the burial C10 so it unlikely to be associated with this burial.

C7 -The matrix of this context was mostly very loose ashy soil and very few cultural materials, with only small cobbles and jute present throughout. A few isolated elements including proximal fibula and child's rib were uncovered prior to the C18 burial. However it also contained a series of stacked stones at the bottom of the context just above and associated with the C18 burial.

C5 -Two isolated tali (a right and a left) were found in the ashy matrix along western 1/3 of the unit. Cultural material including lithics, ceramics, faunal, charcoal, obsidian, and other isolated human remains were also uncovered in this context.

C4 -This is roughly the top of the jute midden as it contained fewer jute than lower levels. Ceramics, lithics (including end battered rocks and obsidian), and faunal bone were present throughout. One human ulna was also recovered from this level.

C6 -This was an interesting deposit of animal remains, mostly crania, within and below C5. A total of 5 animal crania and other various faunal remains were recovered from this context. Paca, paca/agouti, peccary, and armadillo crania were recovered mostly complete. One additional crania from unidentified species was also recovered along with bones from a large bird, and a turtle. Abundance of charcoal in the immediate area suggest an activity area was present in the past. However the faunal bone was not burned but neatly stacked on top of each other (Figure 7).

Figure 12. Possible intentional deposit of faunal crania. Upturned tapir cranium above several paca/agouti crania.

C3 -Initially identified by a deposit of small cobbles in the middle of the unit. Turned out to be natural as there was no difference in the matrix once excavated. Approximately two courses of fist sized cobbles and small boulders some chert cobbles mixed in but very few cultural materials compared with the surrounding matrix.

C2-This was the beginning of material collection. Ceramics, lithics, fauna, and isolated human remains present throughout and ashy cobbly matrix with some jute mixed throughout.

C1-The uppermost context contained leaf litter and perhaps some backdirt from the 1990's excavation of the Altar. None of the material recovered from this context was kept or screened. The matrix was silty and contained cobbles and jute.

Unit 15

This was a 50 cm (north) x 1.3 m(E-W) extension to the north-east of the main unit 12. The primary purpose of this unit was recovery of the C10 burial (MHCP.19.12.10).

C8- This context was just above the cremation C14. It contained some jute and some isolated human remains not associated with the cremation. Based on depths it is roughly the same context as C13 unit 12.

C7- This context also contained some isolated human remains but contained an abundance of lithics which were mostly end battered rocks however a chopper (Figure 8) was also recovered from this context. Based on depths it is roughly the same context as C12 unit 12.

Figure 13. Chopper found in C7 Unit 15

C6 -The matrix below the C10 burial contained few jute than upper levels. Some isolated remains not associated with the burial were recovered from this context. Based on depths it is roughly the same level as C9 unit 12.

C5 – Compact, jute-dense soil categorizes this context. Isolated remains, lithics, faunal bone, and ceramics were present throughout the context located just above the C10 burial.

C4 -This context revealed a tapir skull, ribs, pelvis, metaphysis, and other associated remains which extended into the wall (Figure 9). Some undercutting of the wall demonstrated that these are likely all the remains in the deposit. The soil around the bones contained an abundance of ash however the bones themselves were not burned.

Figure 14. Partial tapir remains found in the east wall of Unit 15

C3- A dark compact layer of soil identified this context. Isolated human remains, fauna, lithics, jute, and fauna were present throughout. increased jute from C2 darker soil

C2- This context had fewer jute than that below it and was predominantly dark silty soil. A flat rock was removed from the eastern corner of the unit and may be associated with the partial tapir remains found in C4.

C1- As this context was uppermost level and just to the south of the altar where excavations by the MMAP project had taken place in the 1990's, none of the material was recovered or screened from this level. It was mostly leaf litter and possible backdirt.

Unit 17

This was a 40 cm (north) x 1.1 m(E-W) extension to the north-west of the main unit 12. The primary purpose of this unit was recovery of the C17 burial (MHCP.19.12.17).

C4 -Overall the soil in this unit was much less compacted than that of the primary unit (12) or the previous extension (15). Jute, ceramics, lithics, and isolated human and faunal bone were found throughout.

C3 – This context also had loose ashy soil with some jute, ceramics, lithics, and isolated human and faunal bone found throughout.

C2 – This context was the first of this unit in which material was recovered. Loose soil with some cobbles, jute, ceramics, lithics, and isolated human and faunal bone were found throughout.

C1-As this context was uppermost level and just to the south of the altar where excavations by the MMAP project had taken place in the 1990's, none of the material was recovered or screened from this level. It was mostly leaf litter and possible backdirt.

SubOp 19-01 Summary

The excavations yielded three individuals likely dating to the Early Archaic (MHCP.19.12.17) and the Late Archaic/Preclassic transition (MHCP.19.12.10, MHCP.19.12.18). Additionally several potential caches of faunal material were also recovered. Two cremations were identified in the field and will be analyzed later. The most common non-bone artifact type was lithic, the majority of which included expedient stone tools. Ceramics were found in the upper-half of the unit and are listed for all contexts and units in the appendix.

Mayahak Cab Pek Rockshelter SubOp 19-02

Excavation Descriptions – *by Paige Lynch*

Unit 13

Unit 13 was reopened on May 17, 2019 following the 2016 excavations and corresponding to the Unit 33/34 excavations from 1997-1998 by the Maya Mountain Archaeological Project. The 1997 burial reached a depth of 134 cm and the 1998 excavated burial reached a depth of 142 cm. C0-C6 were considered the backfill from the 1998 excavation. Excavations began, removing the backfill from the previous seasons, creating a 2 x 3 meter unit. The backfill was removed until the tarp marking the end of the 1998 season was uncovered. Once the tarp was removed, the first context in Unit 13 for the 2019 field season was C7, picking up after the C6 from the 1998 excavations. Figure 1 shows Unit 13 C7 prior to beginning excavations.

C7 – For this unit, a new datum was set 10 cm below the site datum. The context was excavated down about 10-15 cm and was filled with jute and a silty/ashy sediment, reaching a depth of 124 cm below the new datum and covered the entire area of the unit, except for C8. There was a "cobble-like" floor extending southwest to southeast within the context. There was a jute midden above the "cobble-like" floor, then the jute decreased underneath the cobbles. Additionally, there were pits from the 1998 excavation present in which it appears the jute midden was cut through in order to dig the pit, then filled with loose sediment. There was more fauna bone recovered on the western half of the context, especially crab claws. The Munsell reading was 10 YR 7/2. Lithics (80500), fauna bone (80501), human bone (80502), charcoal (80504, 80509), obsidian (80505, 80506), ceramics (80507), and paleobotanical (80508) samples were recovered.

C8 – Rock feature in a semilunar shape located in the northeast corner of the unit within C7. All the rocks were fire cracked and the sediment was filled with jute. C8 reached a depth of 122 cm. Worked lithics (80510), obsidian (80511), and charcoal (80512) were recovered.

Figure 1. Starting depths for C7.

C9 – Sediment was very ashy with jute present throughout. There was a potential cobble floor on the western half. There were ceramics present, but was likely due to mixing from previous excavations. There were some human remains present that appeared to be going into the northeast corner, in which Unit 14 was opened to further investigate the burial. C9 reached a depth of 171 cm and covered the entire area of the unit. The Munsell reading was 7.5 YR 2.5/2. Fauna bone (80513), lithics (80514), ceramics (80515), bone tool (80516), charcoal (80517, 80519), human bone (80518), and a sediment sample (80553) were recovered.

C10 – MHCP.19.13.10 was a burial continuous with C10 in Unit 14 (Figure 2). The top most layer of C10 was marked by a rock feature, in which there were at least 12 rocks on top of the burial. The sediment was soft with less jute present. The overall shape of the pit was shallow and in an oval shape. The remains were of an adult due to fully fused epiphyses for several skeletal elements. The Munsell reading was 10 YR 2/2. Human bone (80520), conch shell (80548), charcoal (80549, 80550, 80551), and a sediment sample (80552) were recovered.

Figure 2. Burial MHCP.19.13.10 with its second exposure. The cranium, vertebrae, and ribs of an adult were exposed.

Exposure 1: The body was laid on the left side. Both knees were flexed, but slightly offset in which the right knee was closer to the southern wall. The body appears twisted due to the left side of the skull was facing upward. The bones were very fragile and fragmentary. Elements collected include fragments of the humerus, left ulna, left radius, ulna, radius, right and left clavicles, scapula, cranial bones, mandible, ribs, pelvis, phalanges, teeth, left fibula, femur, tarsals, metatarsals, right and left tibiae, vertebrae, and miscellaneous bones.

Exposure 2: The sediment was consistent with exposure 1. The burial appears to be primary due to the majority of the remains in anatomical position. Based on the location of vertebrae and ribs, it appears the back was in the ground and the chest was facing upward. Elements collected include vertebrae, pedal phalanges, right and left ribs, sternum, right humerus, and right and left scapula.

Exposure 3: The outline of the pit was defined by soft, loose soil with harder, more compact soil underneath. There were rocks scattered at the bottom of the burial pit. Elements collected include ribs and vertebrae.

C11 – The context had silty sediment with packed jute and several large rocks throughout. There were humans remains present, but do not appear to be associated with a burial. C11 reached a depth of 156 cm and covered the entire area of the unit. The Munsell reading was 10 YR 4/3. Charcoal (80554), fauna bone (80555), lithics (80556), obsidian (80557), human bone (80558), and a sediment sample (80559) were recovered.

C12 – The sediment was soft, silty, and there was a decrease in jute and cobbles present. There were two fire pits (one on the southern half and western half of Unit 13) contemporary to each other with fire cracked rocks and river rocks. The fire pits were filled in with soft sediment with a jute layer throughout. Throughout the context, roots were becoming more prevalent. Overall, the context transitions into a soft, silty, sediment with a decreasing amount of jute present. C13 reached a depth of 161 cm and covered the entire area of the unit. The Munsell reading was 7.5 YR 3/2. Fauna bone (80566), lithics (80567), obsidian (80568), charcoal (80570, 80573), human bone (80571), and ceramics (80572) were recovered.

C13 – There was a burial found in the southeast corner after a portion of the southern wall collapsed. Due to that, the burial was higher in height than the surrounding contexts. The burial was not fully excavated, however loose elements were collected. C13 reached a depth of 134cm. Human bone (80560) and fauna bone (80561) were recovered.

C14 – MHCP.19.13.14 was a burial along the southern wall that cuts into C11, C12 and C15 (Figure 3). The pit was very shallow and the sediment was soft with jute and pebbles throughout. The remains were of an infant due to the size and shape of the bones present. C14 reached a depth of 168 cm. Charcoal (80564, 80569), and human bone (80565) were recovered.

Exposure 1: The orientation of the remains appeared to be lying on the right side due to the left side facing upward. The elements were extremely fragile. Primary or secondary burial was difficult to distinguish due to the condition of the remains. Elements collected include ribs, sternum, vertebral body, tibia, long bones, a possible adult rib, cranial fragments, and miscellaneous bones.

Exposure 2: The remainder of the skeletal elements were removed, but in very poor condition. Elements collected include vertebrae, ribs, and a scapula.

Figure 3. Burial MHCP.19.13.14 with its first exposure. The exposure includes a juvenile skeleton with highly fragmented elements.

C15 – The sediment was an ashy silt mixture that was dryer than previous contexts. The amount of jute present was decreasing from previous contexts. There was a fire pit in the center of the context with one river stone cobble present. C15 reached a depth of 173 cm and covered the entire area of the unit. The Munsell reading was 10YR 2/3. Human bone (80574), fauna bone (80575), lithics (80576), charcoal (80577), and sediment sample (80578) were recovered.

C16 – There was a cobble stone concentration on the western wall. The sediment was a continuation from C15; however, it appears more compact. There were many roots present. C16 reached a depth of 184 cm and covered the entire area of the unit. The Munsell reading was 10 YA 3/3. Fauna bone (80580), a sediment sample (80581), lithics (80582), human bone (80583), and charcoal (80584) was recovered.

C17 – C17 was likely a continuation of C15 and C16, however separated as a control. The sediment composition was the same as the two previous contexts. C17 reached a depth of 183 cm and covered the entire area of the unit. The Munsell reading was 7.5 YR 3/2. Fauna bone (80585), lithics (80586), a sediment sample (80587), and human bone (80588) were recovered.

C18 – C18 sediments were a continuation of C15 – C17. There was a large increase in the amount of fauna bone present. Additionally, there was a low point recovered on the western portion of the unit. There was an increase in charcoal. Human remains were exposed, creating C19. C18 reached a depth of 192 cm and covered the entire area of the unit. The Munsell reading was 7.5 YR 3/2. Charcoal (80589, 80595), fauna bone (80590), lithics (80591), a sediment sample (80592), human bone (80593), and a low (80594) were recovered.

C19 – MHCP.19.13.19 was a burial along the northern baulk, that extends into the northern baulk (Figure 4). This context was directly below C20 and C21. There were fire cracked rocks on top of the cut of the pit and extend into the northern baulk. Within the pit, the sediment was silty and looser. The remains appear to represent one adult due to the size of the elements and presence of epiphyseal closure of along bones. The remains were fragile. C19 reached a depth of 191 cm. Human bone (80596), lithics (80606), fauna bone (80607), charcoal (80608), and quartz (80609) were recovered.

Figure 4. Burial MHCP.19.13.19 with its second exposure. The remains include one adult.

Exposure 1: There were many cobble stones mixed within the human remains. There were few jute shells present. The sediment was soft, but has a clay-like texture. Due to the skeletal elements exposed, the skeleton doesn't appear to be in anatomical position or have a distinguishable orientation, suggesting a secondary burial. Elements collected include fragments of ribs, patella, ulna, femur, radius, vertebrae, cranial bones, tibia, scapula, and miscellaneous bone.

Exposure 2: There were small cobbles scattered throughout the pit with the remains. The sediment was silty and clay-like still. The long bones appear to create the shape of a rough horse shoe with the cranium in the middle. Elements collected include fragments of ribs,

phalanges, metatarsals, mandible, vertebrae, ulna, femur, scapula, cranial, radius, patella, and miscellaneous bone.

Exposure 3: The sediment remains consistent with the other two exposures. There still was no clear orientation of the skeletal elements. Elements collected include fragments of the radius, ribs, teeth, metacarpals, humerus, vertebrae, sternum, clavicle, scapula, phalanges, mandible, femur, and miscellaneous bone.

Exposure 4: The sediment quality remains consistent. There were fewer skeletal elements exposed, but there still was small cobble stones scattered throughout. Elements collected include fragments of foot bones, femur, pelvis, ribs, phalanges, vertebrae, sternum, and miscellaneous bones.

Exposure 5: This was exposure had the smallest concentration of remains, in which most of the skeletal elements were concentrated in the center of the pit. Elements collected include fragments of tarsals, vertebrae, sternum, and pelvis.

C20 – Unit 13's north extension in which 122 cm was removed from the top soil downward in order to provide access to C19 burial. The extension expanded on the northern baulk at the 115 cm and 193 cm marks 45 cm (northward). Fauna bone (80597), ceramics (80598), and lithics (80599) were recovered.

C21 – C21 was the jute midden directly below C20 in the north extension. C21 reached a depth of 176 cm. Lithics (80600), fauna bone (80601), human bone (80602), ceramics (80603), and obsidian (80604) were recovered.

C22 – C22 extends the entire floor of Unit 13. MHCP.19.13.19 cuts through the northern baulk. The sediment was silty and ashy; there was a mixture of end battered and regular cobbles throughout as well as several large limestones. C22 reached a depth of 212 cm and covered the entire area of the unit. The Munsell reading was 7.5 YR 3/3. Fauna bone (80610), lithics (80611), charcoal (80612), human bone (80613), a sediment sample (80614), and obsidian (80615) were recovered.

C23 – C23 extends the entire floor of Unit 13. On the eastern half, there was a mixture breakdown of limestone, fauna bone, lithics, and charcoal. On the western half, there was fauna bone and lithics throughout, but the frequency was decreasing. The sediment overall was holding more moisture; there was a mixture of silts and decaying limestone making the sediment sticky. C23 reached a depth of 7.5 YR 3/2 and covered the entire area of the unit. The Munsell reading was 7.5 YR 3/2. Fauna bone (80616), lithics (80617), a sediment sample (80618), charcoal (80619, 80620, 80621, 80627), and human bone (80622) were recovered.

C24 – The sediment was silty and retaining moisture, similar to previous context. C24 appears isolated under one of the limestone rocks (A) noted in C22. There were burned human remains

present, noted due to their brown/black charring. Within the human remains, lithics and cobbles were throughout. C24 reached a depth of 215 cm and was located close to the southern baulk on the eastern side. The Munsell reading was 7.5 YR 2.5/3. Human bone (80623, 80626), lithics (80624), a sediment sample (80625) were recovered.

C25 – C25 was directly below C23. There were large amounts of decaying bedrock and the sediment was wet. The western baulk was cut by MHCP.19.13.26. There were small amounts of lithics and faunal material present. C25 reaches a final depth of 253 cm. Human bone (80628), fauna bone (80629), lithics (80630), a sediment sample (80635), and obsidian (80636) were recovered.

C26 – MHCP.19.13.26 was a burial on the western half of Unit 13, partially underneath large, decaying limestones (Figure 5). The burial appears to be of an adult due to the size and epiphyseal closure of the long bones, but likely a younger adult due to the occipital synchondrosis not fully being fused. C26 reaches a depth of 243 cm. Human bone (80631, 80640), fauna bone (80632, 80641), lithics (80633, 80642), a sediment sample (80634, 80638), charcoal (80637, 80644), obsidian (80639, 80643) were recovered.

Exposure 1: The skeletal elements exposed were in an approximate anatomical position. More overlying limestone that could be removed was in order to expose more of the skeleton. Elements collected include cranial bones, mandible, and miscellaneous bones.

Exposure 2: The sediment was silty and consisted of a few small cobbles and jute. The outline of the pit appears as a hole that was then surrounded by large limestones. The orientation does not indicate a tightly flexed individual. The arms come together at the elbows and the legs come together at the knees. The individual appears to be laying on their back with their chest facing upward. The condition of the remains was fragile, but not as fragile as the previous burials in Unit 13. Due to the majority of the skeletal elements exposed, it appears this was a primary burial since the remain are in a relative anatomical position. Elements collected include fragments of the ulna, radius, ribs, scapula, phalanges, sacrum, vertebrae, humerus, sternum, femur, and pelvis.

Figure 5. Burial MHCP.19.13.26 with its second exposure. The remains include one adult.

Exposure 3: The sediment was consistent with the previous exposure. The remains appear to have been laid on top of bedrock. There was a large decaying limestone rock partially on top of the legs in which the appeared to extend

east. Elements collected include fragments of ribs, scapula, teeth, vertebrae, clavicle, metacarpals, and miscellaneous bone.

C27 – The sediment was red, directly above the bedrock. C27 reached a final depth at 257 cm and covers the entire area of the unit. There was a lot of decaying limestone mixed throughout. Fauna bone (80645) and lithics (80646) were recovered.

Unit 14

C0 – Unit 14 was an extension of northeast corner of Unit 13. It extends out 50 cm east, 60 cm north, and 100 cm west. Leaf litter layer on the surface, not sifted, and covered the entire unit area.

C1-6 – The sediment was silty and a jute midden and cobble stones mixed throughout. The contexts were consistent with Unit 33/34 of the 1998 excavations. C1-6 reached a depth of 107 cm and covered the entire unit area. Ceramics (80522, 80526, 80530, 80534), fauna bone (80523, 80525, 80528, 80531, 80535, 80537), lithics (80527, 80529, 80532, 80536, 80538), charcoal (80533), obsidian (80539), and human bone (80524) were recovered.

C7 – Sediment was consistent with sediment above and Unit 33/34 from 1998 excavations. There were cobble stones throughout, but not a distinctive cobble floor. C7 reached a depth of 122 cm and covered the entire unit area. Fauna bone (80540) and lithics (80541) were recovered.

C8 – Sediment was silty and sandy with jute throughout and less cobble stones present. C8 reached a depth of 129 cm and covered the entire unit area. Fauna bone (80542) and lithics (80543) were recovered.

C9 – Not present.

C10 – There was a rock feature in the western half the unit. The context was continuous with Unit 13 C10, an extension of the burial feature. Lithics (80544), fauna bone (80545), charcoal (80546), and a sediment sample (80547) were recovered.

Conclusions

All units at MHCP were closed due to the end of the field season. A tarp was laid down across the base of the units and backfilled. In total, 4 burials were identified in SubOp 19-02 during the 2019

field season at MHCP. Charcoal and bone samples will be submitted for AMS 14C dates. Ceramics from MHCP will be analyzed by Erin Ray and Keith Prufer. However, results from previous fieldwork at MHCP indicate that the earliest use of the rockshelter was in the Early Archaic, supported by the lack of ceramics in the lowest levels and well-dated contexts through AMS dating.

Appendix 1. Ceramic Descriptions

Unit	Lot Number	Context	Vessel Form	Type	Sphere	Group	Ware	Count	Description
12	80000	C2	jar body	Unknown monochrome black	Unknown	Unknown	Unknown	2	
12	80000	C2	jar body	Unknown monochrome red	Unknown	Unknown	Unknown	2	
12	80000	C2	jar body	Unknown eroded	Unknown	Unknown	Unknown	7	
12	80000	C2	bowl body	Unknown monochrome red	Unknown Classic	Unknown	Unknown	12	slipped interior only
12	80000	C2	bowl body	Unknown eroded	Unknown	Unknown	Unknown	4	slipped int/ext, eroded
12	80000	C2	bowl body	Achote Black	Tepeu 2-3	Achote	Peten Gloss	1	crazed with orange paste
12	80000	C2	jar neck	Unknown unslipped	Unknown	Unknown	Unknown	2	
12	80000	C2	jar body	Unknown unslipped	Unknown	Unknown	Unknown	70	
12	80000	C2	bowl body	Unknown eroded	Unknown	Unknown	Unknown	4	fingernail impressions
12	80000	C2	jar rim	Unknown unslipped	Unknown	Unknown	Unknown	8	
12	80000	C2	bowl rim	Unknown eroded	Unknown	Unknown	Unknown	1	direct rim/firecloudin g
12	80000	C2	bowl body	Unknown eroded	Unknown Classic	Unknown	Peten Gloss	4	
							Total	**117**	
12	80007	C3	jar body	Unknown unslipped	Unknown	Unknown	Unknown	4	
12	80007	C3	bowl body	Unknown monochrome red	Unknown	Unknown	Unknown	1	
12	80007	C3	jar body	Unknown eroded	Unknown	Unknown	Unknown	2	
							Total	**7**	
12	80028	C4	jar body	Unknown unslipped	Unknown	Unknown	Unknown	18	
12	80028	C4	bowl body	Unknown eroded	Unknown	Unknown	Unknown	16	
12	80028	C4	jar body	Unknown monochrome red	Unknown	Unknown	Unknown	3	
12	80028	C4	jar body	Unknown eroded	Unknown	Unknown	Unknown	7	
12	80028	C4	jar neck	Unknown unslipped	Unknown	Unknown	Unknown	3	
12	80028	C4	jar rim	Unknown unslipped	Unknown	Unknown	Unknown	1	
12	80028	C4	jar body	Unknown Red and unslipped	Unknown	Unknown	Unknown	1	oblique applique with small puntations around shoulder

									unslipped, red slip above
							Total	49	
12	80012	C5	bowl body	Unknown monochrome black	Unknown Classic	Unknown	Unknown	3	preslip incision
12	80012	C5	bowl rim	Unknown unslipped	Unknown	Unknown	Unknown	2	refit but old break
12	80012	C5	jar shoulder	Unknown unslipped	Unknown	Unknown	Unknown	1	puntations
12	80012	C5	bowl body	Unknown eroded	Unknown	Unknown	Unknown	1	int/ext slip
12	80012	C5	bowl body	Unknown eroded	Unknown	Unknown	Unknown	1	int slip
12	80012	C5	bowl body	Unknown eroded	Unknown	Unknown	Unknown	1	ext slip
12	80012	C5	jar rim	Unknown unslipped	Unknown	Unknown	Unknown	1	groove on lip interior
12	80012	C5	jar body	Unknown unslipped	Unknown	Unknown	Unknown	7	
12	80012	C5	body	Puluacax unslipped	Tepeu	Puluacax	Temax Gross	1	with plastered surface
							Total	**18**	
12	80018	C6	jar body	Unknown unslipped	Unknown	Unknown	Unknown	1	
							Total	**1**	
12	80023	C7	jar body	Unknown eroded	Unknown	Unknown	Unknown	1	
12	80023	C7	jar body	Unknown unslipped	Unknown	Unknown	Unknown	1	
12	80023	C7	bowl body	Unknown eroded	Unknown	Unknown	Unknown	1	
							Total	**3**	
12	80035	C8	jar body	Unknown eroded	Unknown	Unknown	Unknown	2	
12	80035	C8	bowl body	Unknown eroded	Unknown	Unknown	Unknown	1	
							Total	**3**	
12	80063	C10	strap handle	Unknown unslipped	Unknown	Unknown	Unknown	1	burned
							Total	**1**	
12	80077	C12	jar body	Unknown unslipped	Unknown	Unknown	Unknown	1	burned
							Total	**1**	
15	80050	C2	jar body and rim	Unknown monochrome red	Unknown	Unknown	Unknown	7	
15	80050	C2	bowl body	Unknown eroded	Unknown	Unknown	Unknown	2	int/ext slip
15	80050	C2	jar body	Unknown unslipped	Unknown	Unknown	Unknown	7	
15	80050	C2	bowl body	Unknown eroded	Unknown	Unknown	Unknown	2	int slip
							Total	**18**	
15	80055	C3	jar body	Unknown unslipped	Unknown	Unknown	Unknown	1	

15	80055	C3	jar body	Unknown eroded	Unknown	Unknown	Unknown	3	1 burned int
15	80055	C3	bowl body	Unknown monochrome red	Unknown	Unknown	Unknown	2	
15	80055	C3	body	Unknown monochrome brown	Unknown	Unknown	Unknown	2	
15	80055	C3	bowl body	Unknown eroded	Unknown	Unknown	Unknown	1	ext slip, fingernail punctations looks almost like unit stamp
							Total	**9**	
15	80058	C5	jar body	Unknown unslipped	Unknown	Unknown	Unknown	1	
15	80058	C5	bowl rim	Unknown monochrome red	Unknown	Unknown	Unknown	1	
							Total	**2**	
17	80106	C2	bowl body	Unknown monochrome black	Unknown Classic	Unknown	Unknown	1	preslip incision
17	80106	C2	jar rim	Unknown unslipped	Unknown	Unknown	Unknown	1	
17	80106	C2	jar body	Sierra Red	Chicanel	Sierra	Paso Caballo	1	
17	80106	C2	bowl rim	Chaquiste Impressed	Tepeu	Tinaja	Peten Gloss	1	fireclouding, punctations exterior
							Total	**4**	
17	80116	C4	bowl body	Unknown eroded	Unknown	Unknown	Unknown	1	int/ext slip
17	80116	C4	jar body	Unknown eroded	Unknown	Unknown	Unknown	2	
17	80116	C4	bowl rim	Unknown monochrome red	Unknown	Unknown	Unknown	1	
							Total	**4**	
17	80110	C3	dish rim	Unknown monochrome red	Chicanel	Sierra	Paso Caballo	1	waxy tan red slip see photo and drawing
17	80110	C3	dish body	Unknown monochrome red	Unknown	Unknown	Unknown	1	puntations at break
17	80110	C3	bowl base	Unknown monochrome black	Unknown	Unknown	Unknown	1	
17	80110	C3	jar body	Chan Pond	Chicanel	Chan Pond	Uaxactun Unslipped	1	squashed button applique
17	80110	C3	jar body	Unknown unslipped	Unknown	Unknown	Unknown	5	
							Total	**9**	
14	80522	C1	ring base	Unknown monochrome black	Unknown Classic	Unknown	Unknown	1	
14	80522	C1	jar body	Unknown unslipped	Unknown	Unknown	Unknown	4	

14	80522	C1	bowl body	Unknown polychrome	Unknown Classic	Unknown	Unknown	1	very burned
14	80522	C1	bowl body	Unknown monochrome red	Unknown	Unknown	Unknown	1	
14	80522	C1	bowl body	Unknown eroded	Unknown	Unknown	Unknown	1	
							Total	**8**	
14	80526	C2	bowl body	Unknown eroded	Unknown	Unknown	Unknown	3	
14	80526	C2	jar body	Unknown unslipped	Unknown	Unknown	Unknown	2	
14	80526	C2	bowl body	Unknown eroded	Unknown	Unknown	Unknown	1	int slip
							Total	**6**	
14	80530	C3	jar body	Unknown eroded	Unknown	Unknown	Unknown	1	
14	80530	C3	bowl body	Unknown eroded	Unknown	Unknown	Unknown	1	int/ext slip, burned interior
14	80530	C3	dish/bowl rim	Unknown eroded	Unknown	Unknown	Unknown	1	
							Total	**3**	
14	80534	C4	bowl body	Unknown polychrome	Unknown Classic	Unknown	Unknown	1	red and black on orange
14	80534	C4	bowl body	Unknown eroded	Unknown	Unknown	Unknown	2	int/ext slip
							Total	**3**	
13	80507	C7	jar neck	Unknown unslipped	Unknown	Unknown	Unknown	1	
13	80507	C7	jar body	Unknown eroded	Unknown	Unknown	Unknown	5	
13	80507	C7	jar body	Unknown unslipped	Unknown	Unknown	Unknown	2	
13	80507	C7	bowl body	Unknown monochrome black	Unknown	Unknown	Unknown	1	int/ext slip
							Total	**9**	
13	80515	C9	bowl body	Unknown eroded	Unknown	Unknown	Unknown	1	
							Total	**1**	
13	80572	C12	bowl body	Unknown eroded	Unknown	Unknown	Unknown	1	int/ext slip
13	80572	C12	bowl body	Unknown eroded	Unknown	Unknown	Unknown	1	int slip
							Total	**2**	

BPAAP 2018, ST.18.14.8a-d
Accession #: 2018.07.40a-d

Emily Moes
September 2019

Summary: ST.18.14.8a consists of the primary interment of an old adult female. Approximately 95% of the skeleton is present. Although most long bones are fragmented (ex. broken at midshaft and epiphyses), the overall condition of the remains is good. Gnaw marks are pronounced on the pleural aspects of the ribs. This individual is edentulous. Skeletal pathological changes include osteoporosis, osteoarthritis, trauma, infection, and non-specific childhood stress. All instances of trauma, infection, and stress occurred antemortem as they all have either healed, or are in the process of healing.

Comingled Individuals: ST.18.14.8b-d consists of comingled elements of a second, third, and fourth individual in this burial context. Individuals 8b and 8c are adults of unknown sex. Individual 8d is a juvenile (1-3 years) of unknown sex. Bones of these individuals were found throughout the grave and were not associated in one area.

ST.18.14.8b: These elements are distinguished from the other individuals because they are significantly larger than 8a, and exhibit neither pathological nor taphonomic changes. Elements of this individual consist of: a proximal manual phalanx, two intermediate manual phalanges, a radial head, a sternal body, the left lamina of a lower cervical vertebra, left medial cuneiform, left talus fragment, and right ribs fragment. This individual is an adult based on fused epiphyses.

ST.18.14.8c: These elements are distinguished from the other individuals because parts or all of each are blackened from charring. Elements include: proximal manual phalanx, proximal pedal phalanx, R. MC2, R. MT5, three vertebral body fragments, the distal shaft of the right ulna, a tibia midshaft fragment, a rib fragment, and four miscellaneous fragments. This individual is estimated to be an adult based on the thickness of the cortex.

ST.18.14.8d: This individual is distinguished from other individuals in that the elements belong to a juvenile. Bone include: a lumbar neural arch, three thoracic neural arches (around T1-T3), three parietal fragments, and a left rib (likely the third or fourth). This individual is estimated to be 1-3 years of age based on the lack of fusion of the neural arches to the body (Baker et al., 2005).

Burial Context: ST.18.14.8a was buried prone in an extended position, slightly turned on the left side. Hips are extended, but the knees are tightly flexed such that the feet are next to the pelvis. Arms are extended under the body, with the elbows slightly flexed so that the forearms crossed, and hands were directly under the pubis. This individual was buried with the head in the east, turned slightly so it was facing south. ST.18.14.8a was buried under an overhang of the large boulder located in the center of the rock shelter. This individual was covered by rocks (unknown number of courses and size). The femora were pressed against limestone rockfall, with three large limestone rocks (approximately 30-40 cm in diameter) just south of the skeleton.

ST.18.14.9a

Age Estimation: I estimate this individual to be 72+ years of age. Although we used the standard age estimation techniques given by Buikstra and Ubelaker (1994), I place more emphasis on newer methods that have shown higher accuracy rates for older individuals (Godde and Hens, 2012; Mulhern and Jones, 2005). Table 1 shows the age estimates from all applied methods. Using the auricular surface, I estimate

ST.18.14.8a is 72 years (Buckberry and Chamberlain, 2002). Using transition analysis (Milner and Boldsen, 2016), I estimate the age around 80 years.

Method	Elements Used	Estimated Mean Age (yrs)
Todd	Pubic symphysis	50+
Suchey-Brooks	Pubic symphysis	60+
Lovejoy et al.	Auricular surface	60+
Buckberry and Chamberlain*	Auricular surface	72
Transition analysis*	Auricular surface, pubic symphysis	80

Table 1: Age estimation methods applied to ST.18.14.8a. * indicates the methods on which I based the final age estimation.

Sex Estimation: The estimated sex of the individual is female. Table 2 shows the scores for the sex-diagnostic traits of the cranium (Buikstra and Ubelaker, 1994).

Pelvis	Score (L, R)		Cranium	Score
Ventral Arc	1	3	**Nuchal Crest**	2
Subpubic Concavity	2	2	**Mastoid Process**	2
Ischiopubic Ramus Ridge	2	2	**Supraorbital Margin**	3
Greater Sciatic Notch	-	2	**Glabella**	2
Preauricular Sulcus	3	3	**Mental Eminence**	--
Estimated Sex	2 = Female			2 = Female

Table 2: Sex estimation scores from the pelvis and cranium (1 = female condition; 5 = male condition).

Stature: This individual was 143-144 cm tall according to the length of the left fibula, and left humerus. This estimation originates from the ratio of long bones to stature among females given by Genoves (1967, Table 13, p. 75). The length of the radius is also available for ST.18.14.8a, but this metric is less correlated with final stature as compared to the humerus and fibula (Genoves, 1967, Table 16, p. 76). Although stature estimation is often done using the femur and tibia, the maximum lengths of these bones were not available due to fragmenting.

Body Mass: Body mass is estimated to be 46.79-51.35 kg. The right femoral head breadth, 38.7 mm, was used following three common methods for body mass estimation. Table 3 depicts the method and associated mass estimate.

Method	Mass Estimate (kg)
McHenry (1992)	46.79
Grine et al. (1995)	51.35
Ruff et al. (2012)	48.56

Table 3: Body mass estimations (kg) for ST.18.14.8a based on three methods using femoral head breadth.

Population Affinity: Based on the location of the burial in a rock shelter in Belize, and relative dating to pre-contact, this individual is Native American.

Dental Pathology: This individual is edentulous; all teeth were lost antemortem. There is significant alveolar resorption in the mandible and maxilla.

Skeletal Pathology: Overall, ST.18.14.8a has pathological changes consistent with polydactyly, osteoarthritis, trauma (in the ribs, lower spine, hand, and legs), infection (in the legs, and nasal cavity), and non-specific childhood stress (porotic hyperostosis). All instances of trauma, infection, and stress occurred antemortem as they all have either healed, or are in the process of healing. Additionally, skeletal elements are light in weight, suggesting that this individual also has osteoporosis.

Evidence of osteoarthritis is spread throughout the skeleton. Specifically, changes included lipping and porosity on joint surfaces. The following is a list of areas with evidence of joint destruction:

- Proximal right humerus, and distal surface between the trochlea and capitulum
- Proximal and distal left humerus
- Proximal left ulna, proximal and distal left radius (this is less extensive than on the right radius)
- Proximal and distal right radius
- Distal right ulna, there is also active bone growth on the distal surface, next to the styloid process
- Right and left carpals, proximal metacarpals, and proximal surfaces of a left proximal phalanx
- Proximal and distal right femur and patella
- Distal left femur, left patella, and proximal left tibia
- Left tarsals and proximal left metatarsals

The remaining descriptions of pathological changes seen on ST.18.14.8a are organized by regions of the body.

Cranium: There is healed porotic hyperostosis on all of the cranial vault; diploë is expanded. The endocranial surface has Pacchionian pits on the parietals. The endocranial surface of a frontal fragment has reactive bone that is plaque-like and smooth. On two other cranial vault fragments (possibly parietal), there are two cyst-like lesions on the endocranial surface; they have rounded edges and smooth walls. One of them perforates the outer table. These lesions are approximately 8 mm in diameter. In the left nasal cavity, there is a plate-like bony deposit, approximately 12 mm in diameter.

Vertebrae: The cervical vertebrae have little to no lipping on their articular facets, however, centra have extensive lipping and annular rings resorption from the inferior surface of C3 to the inferior surface of C5. Vertebra C6 show initial stages of annular ring resorption. No changes are observed on C7.

The thoracic vertebrae have little to no lipping on the bodies of T1-T8. Vertebrae T9-T11 have slight to moderate lipping around the superior margins of the bodies. All costal facets are actively resorbing. Additionally, all articular facets have slight to moderate lipping. There is a compression fracture in the center of the superior surfaces of the bodies of both T11 and T12, although it is most pronounced in T12. Both are accompanied by trabecular bone loss.

The lumbar vertebrae have severe lipping only on the superior margins of the centra of L4 and L5. These surfaces also have complete resorbed their annular rings. Vertebra L3 is minimally affected by these changes, but lipping is observed at the anterior margin of the superior surface of the body. The inferior surfaces of these vertebrae are unaffected. There is margin degeneration and lipping of the left superior articular facets of L2-L5.

Ribs: The left and right rib heads have a trace amount of lipping, and also have subchondral bone exposure. The superior surface of the second right rib has active reactive bone that has a flakey appearance. There is a well-healed fracture at near midshaft of a left middle range rib (#3-9). Many of the shafts of the ribs in this area on the left and right sides have healed, reactive bone with vascularization. A right rib (likely fourth or fifth) has a poorly aligned healed fracture at the costal angle, with a healing cloaca on the pleural surface of this rib.

Arms: The right acromion has reactive bone on the superior surface, creating a scalloped edge. No changes are observed on the right clavicle or right humeral head. The greater tubercle of the left humerus is thinned and pronounced on the anterior margin so that the intertubercular groove appears like an excavated depression with rounded margins and smooth walls. There is a large (16.5 mm in diameter) macroporotic and lytic lesion on the posterior margin of the head.

Hands: The distal articular surface of a right proximal manual phalanx (likely second) has eburnation on the medial condyle. This is mirrored on the proximal surface of the associated intermediate phalanx. Both surfaces have severe lipping. The proximal phalanx also has an enthesis on the palmar surface, just below the distal end. There is another, smaller enthesis on the lateral surface of the distal end. On the lateral surface of the distal end of an intermediate right manual phalanx (likely fourth), there is a tiny sliver of eburnation. The margins of this end are actively resorbing. The entire distal surface of the fifth middle phalanx has subchondral bone exposure.

There is a healing fracture on a left proximal manual phalanx (likely second or third) at the proximal surface. The fracture looks similar to a crushing fracture. The left hand also exhibits evidence of polydactyly at the fifth intermediate phalanx.

Pelvis: The lunate surface of the right os coxa has an area of macroporosity and active resorption on the anterior-most portion, 15 z 12 mm.

Legs and Feet: the left tibia has an active infection just below midshaft, such that the cortex is expanded around the entire shaft. There is healing periosteal reaction on the lateral surface of the distal and proximal areas of the diaphysis. The medial surface of the diaphysis has active, woven bone growth. The left fibula has a healed periosteal reaction just below midshaft. The nutrient foramen of the left first metatarsal is enlarged (3.9 x 2 mm) with rounded, well-defined margins. According to anecdotal accounts, this is likely associated with the infection in the left tibia.

The right tibia has a healing callus at midshaft such that the cortex is thickened so there is a bulge. The callus is well-integrated into the surrounding surface. There is healing periosteal reactive bone on the lateral portion of the distal diaphysis and entire medial portion of the shaft. Vascular lines are present around midshaft. The right fibula has active and healing periosteal reaction on the entire shaft. There is additional bone growth in globules, especially on the medial surface, near the distal diaphysis. This may be due to a healing fracture since the distal end is slightly misaligned (although the latter may be developmental).

Skeletal Inventory: ST.18.14.8a is approximately 95% complete and is in good condition, although most long bones are fragmented (though largely intact). Missing elements include rib fragments, cranial fragments (especially on the right side), most of the manubrium, and the proximal epiphyses of the tibia. Please see the burial inventory recording forms for a complete list of all present and absent elements. Table 4 presents the metric data for the postcrania. Some measurements of the mandible were

recorded but are not presented in the table below due to the extensive alveolar resorption, which affects mandibular metrics. They can be found on form 5a of the recording forms.

Element	Measurement	Left	Right
Clavicle	Max. Length	132	--
	A-P Diameter at Midshaft	10.2	--
	S-I Diameter at Midshaft	8.3	--
Scapula	Height	--	119.9
	Breadth	90.81	--
Humerus	Max. Length	266	--
	Epicondylar Breadth	52.4	52.3
	Vertical Diameter of Head	35.0	34.4
	Max. Diameter at Midshaft	18.4	19.1
	Min. Diameter at Midshaft	13.1	13.3
Radius	Max. Length	--	205
	A-P Diameter at Midshaft	10.7*	9.1
	M-L Diamter at Midshaft	14.4*	12.0
Ulna	Min. Circumference	30	31
Sacrum	Max. Trans. Diameter of the Base	43.6	
Pelvis	Height	--	178
	Pubis Length	--	78
	Ischium Length	--	79.8
Femur	Max. Diameter of the Head	--	38.7
	A-P Subtrochanteric Diameter	24.1	22.3
	M-L Subtrochanteric Diameter	25.5	27.4
	A-P Midshaft Diameter	23.2*	24.1*
	M-L Midshaft Diameter	24.6*	24.9*
	Midshaft Circumference	75*	77*
Tibia	Max. Distal Epiphyseal Breadth	40	--
	Max. Diameter at the Nutrient Foramen	--	31.4
	M-L Diameter at the Nutrient Foramen	--	22.1
	Circumference at the Nutrient Foramen	--	82.5
Fibula	Max. Length	299	--
	Max. Diameter at Midshaft	14.4	14.8*
Calcaneus	Max. Length	63.7	63.8
	Middle Breadth	33.7	31.3
Sternum	Max. Breadth at 1st	25.1	

Table 4. Postcranial metric data. Measurements taken in mm. – indicates that the measurement was not taken due to absence of materials or bony landmarks. * indicates measurement was taken at approximate location due to reconstruction or landmarks could not clearly be observed due to soil adherence. Max. = maximum. Min = minimum. A-P = anteroposterior. M-L = mediolateral. Prox. = proximal. Dist = distal. Sup-Inf = superior-inferior

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ARIZONA STATE MUSEUM
HUMAN REMAINS DOCUMENTATION PACKET

PROVENIENCE

Site Name: BPAAP 2018 Unit Tzul **Site No.:**

Designation/ID: ST. 18.14.8a, ST. 18.14.8b, ST. 18.14.8c, ST. 18.14.8d

accession #s: 2018.07.40a - d

Observer(s): E. Moes, C. Burks **Date:** Sept. 2019

BIOLOGICAL PROFILE

MNI: 4

Age: a: 70-80 yrs, b-c: adult, d: 1-3 yrs

Sex: a: Female, b-d: unknown

Ancestry: a-d: Native American

FORM LIST (indicate forms used)

- [X] 1 Skeletal Inventory
- [X] 2a Age and Sex Assessment - Adult
- [ ] 2b Age Assessment - Juvenile
- [ ] 3a Permanent Dental Inventory/Pathology
- [ ] 3b Deciduous Dental Inventory/Pathology
- [ ] 4a Dental Morphology - Permanent
- [ ] 4b Dental Morphology - Deciduous
- [X] 5a Measurements - Adult
- [ ] 5b Measurements - Juvenile
- [X] 6 Non-Metric Traits
- [X] 7 Pathology Checklist
- [ ] 8 Degenerative Joint Disease
- [ ] 9 Spinal Osteophytosis
- [ ] 10 Artificial Cranial Modification
- [ ] 11 Cremated Remains
- [ ] 12 Isolated Remains
- [X] Skeletal Visual Recording Forms
- [X] Additional Forms, Notes, Sketches, Photo Log, etc.

PRESERVATION

- a [X] **Complete skeleton** (>75%)
- [ ] **Partial skeleton** (25-75% present)
- b-d [X] **Fragmentary skeleton** (<25% present, includes at least one complete element)
- [ ] **Fragments of bone** (small amount of fragmented bone; <<25% is present)
- [ ] **Skull** (only cranial remains present and partially preserved)
- [ ] **Teeth** (only loose teeth are present)
- [ ] **Cremated bone** (burned remains of any quantity; excludes cases of incidental charring of otherwise unburned skeleton)
- [ ] **Soft tissues present**

Describe: 8a is approx. 95% complete, 8b-d are about 15% complete made of duplicate elements and juvenile elements.

CONDITION

Yes	No	Unobservable	
[X]	[ ]	[ ]	Cracking
[X]	[ ]	[ ]	Breaks
[ ]	[X]	[ ]	Brittle
[ ]	[X]	[ ]	Exfoliation
[ ]	[X]	[ ]	Warping
[ ]	[X]	[ ]	Cut marks
[X]	[ ]	[ ]	Gnaw marks
[ ]	[X]	[ ]	Root or insect damage
[ ]	[X]	[ ]	Staining
[ ]	[X]	[ ]	Soil adhering

Describe (include severity & elements affected):

Gnaw marks pronounced on plenral aspects of ribs. Most long bones are fragmented. Overall condition is good.

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SKELETAL INVENTORY
RECORDING FORM (1)

Codes:
f = 1-25% present
p = 25-75% present
c = 75-100% present

Provenience: ______

Designation/ID: ST. 18. 14. 8a

CRANIAL	left	right
Frontal	P	P
Parietal	P	P
Occipital	P	P
Temporal	C	P
TMJ	C	C
Mandible	C	–
Zygomatic	C	–
Maxilla	C	–
Nasal	–	–
Lacrimal	–	–
I. N. C.	–	–
Palatine	–	–
Sphenoid	F	F
Ethmoid	–	
Vomer	–	
Hyoid	P	
Thyroid/Crycoid	–	
Ossicles	–	
Unident. Cranial (#):		

teeth	#	cond
Incisors	–	–
Canines	–	–
Premolars	–	–
Molars	–	–
Unidentified Teeth (#):		

edentulous

AXIAL	#	cond
1st Cervical		P
2nd Cervical		C
3-6 Cervical	4	C
7th Cervical		C
1-9 Thoracic	9	C
10th Thoracic		C
11th Thoracic		C
12th Thoracic		C
1-4 Lumbar		C
5th Lumbar		C
Sacrum	3	P-C
Coccyx	3	C

	#	cond
Manubrium		F
Sternal Body		C
xiphoid		–
Left Ribs	10	P-C
Right Ribs	12	P-C
Unidentified Axial (#):		

APPEND.	left	right
Scapula	C	C
glenoid	C	–
Clavicle	C	P?
med. epi.	C	C
Ilium	C	C
auricular	C	F
Pubis	P	C
symphysis	C	C
Ischium	P	C
acetabulum	F	C
Patella	C	C
Unidentified Append. (#):		

APPENDICULAR	left epi-p	left prox	left mid	left dist	left epi-d	right epi-p	right prox	right mid	right dist	right epi-d
Humerus	C	C	C	C	C	C	C	C	C	C
Radius	C	C	C	P	C	C	C	C	C	C
Ulna	P	P	C	P	C	–	–	P	C	C
Femur	P	C	C	C	C	C	C	C	C	P
Tibia	F	P	P	C	C	F	P	C	C	P
Fibula	C	C	C	C	C	P	C	C	C	–

Unidentified Long Bones (#):

EXTREMITIES	#	cond
Scaphoid	2	C
Lunate	1	C
Trapezium	2	C
Trapezoid	1	C
Capitate	2	C
Hamate	2	C
Triquetral	1	C
Pisiform	2	C
Metacarpals	10	C
Prox. Phalanges	10	C
Mid. Phalanges	8	C
Dist. Phalanges	7	C
Sesamoids	Ø	–

	#	cond
Calcaneus	2	C
Talus	2	C
Cuboid	2	C
Navicular	2	C
Med. Cuneiform	2	C
Inter. Cuneiform	2	C
Lat. Cuneiform	1	C
Metatarsals	10	C
Prox. Phalanges	6	C
Mid. Phalanges	Ø	–
Dist. Phalanges	Ø	–
Sesamoids	Ø	–
Unident. Extremities (#):		

Notes:
~~[illegible]~~
~~[illegible] phalanges~~
~~[illegible]~~
~~[illegible]~~

L. hand
capitate, hamate,
trapezium, scaphoid
trapezoid, pisiform
MC 1-5
prox phalanges [illegible]
mid phalanges: IIII
dist phalanges: IIII

L. foot
calcaneus, talus,
med - lat cuneiforms,
cuboid, navicular
MT 1-5
prox 1st phalanx

R. hand
scaphoid,
pisiform,
hamate, lunate,
capitate, triquetral
trapezium
MC 1-5
prox phalanges [illegible]
mid phalanges: IIII
dist phalanges [illegible]

R. foot
calcaneus,
talus, cuboid,
medial & intermed.
cuneiforms
navicular
MT 1-5
1st prox &
distal phalanges

Unsided elements
prox pedal phalanges: IIII

†This form includes information derived from Buikstra and Ubelaker (1994), *Standards for Data Collection from Human Skeletal Remains*, Arkansas Archeological Survey, and is used with permission of the publisher.

ST. 18.14.8b

- Elements found in fill of 8a. Adult remains (fused epiphyses). Significantly larger than same elements of 8a.
- Inventory: prox. manual phalanx
  mid. manual phalanges: 2
  radial head
  sternal body
  Left lamina of a cervical vert (likely C5)
  L. medial cuneiform
  L. talus fragment
  R. rib fragment

ST. 18.14.8c

- Elements/fragments found in fill of 8a, but all or parts of each is charred. Cortex is thick. Adult remains.
- Inventory: prox. manual phalanx
  prox pedal phalanx
  R. MC2
  R. MT5
  Vert. body frags: 3
  R ulna distal shaft frag
  tibia mid-shaft frag
  rib frag
  misc. frags: 4

ST. 18.14.8d

- Elements found in fill of 8a. Juvenile remains.
- Inventory: lumbar neural arch
  thoracic neural arches: 3 (T1 - T3)
  parietal fragments: 3
  L. rib (likely #3 or 4)
- Age estimation: neural arches have completed fusion, but are not yet fusing to the centra ⇒ 1-3 yrs (Baker et al., 2005)

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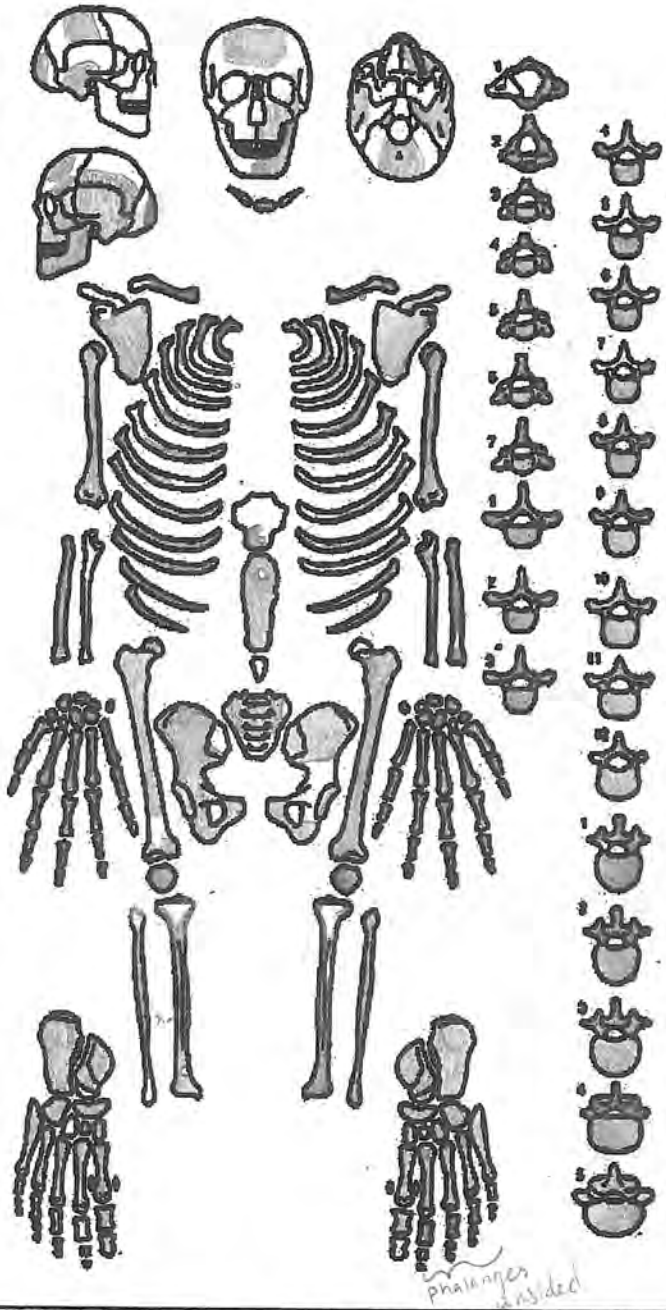
SKELETAL INVENTORY
RECORDING FORM (1)

ST 18 14.9a

Fill in skeletal elements present and record notes along side.
Label "U" if unsided, and "A" to denote approximated location.

Right **Left**



Additional observations:

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SKELETAL MEASUREMENT
ADULT - RECORDING FORM (5a)

Record all measurements millimeters.

Provenience: _____

Designation/ID: ST 18 14 8a

CRANIAL

1. **GOL** Maximum Cranial Length		18. **DKB** Interorbital Breadth	
2. **XCB** Maximum Cranial Breadth		19. **FRC** Frontal Chord	
3. **ZYB** Bizygomatic Breadth		20. **PAC** Parietal Chord	
4. **BBH** Basion-Bregma Height		21. **OCC** Occipital Chord	
5. **BNL** Basion-Nasion Length		22. **FOL** Foramen Magnum Length	
6. **BPL** Basion-Prosthion Length		23. **FOB** Foramen Magnum Breadth	
7. **MAB** Maxillo-Alveolar Breadth		24. **MDH** Mastoid Length	
8. **MAL** Maxillo-Alveolar Length		25. **GNI** Chin height	21
9. **AUB** Biauricular Breadth		26. **HML** Mandibular Body Height	2.57
10. **NPH** Upper Facial Height		27. **TML** Mandibular Body Breadth	11.3
11. **WFB** Minimum Frontal Breadth		28. **GOG** Bigonial Width	–
12. **FMB** Upper Facial Breadth		29. **CDL** Bicondylar Breadth	–
13. **NLH** Nasal height		30. **WRL** Minimum Ramus Breadth	28.63
14. **NLB** Nasal Breadth		31. **MRL** Maximum Ramus Breadth	44.5
15. **OBB** Orbital Breadth		32. **XRL** Maximum Ramus Height	43.7
16. **OBH** Orbital Height		33. **MLT** Mandibular Length	31
17. **EKB** Biorbital Breadth		34. **MLX** Mandibular Angle	[illegible]

excensive alveolar resorption in most of the dentition

POSTCRANIAL

	left	right		left	right
35. **Clavicle:** Max. Length	127	–	60. **Femur:** Max. Length	–	–
36. A-P Diam. Midshaft	10.2		61. Bicondylar Length	–	–
37. Sup.-Inf. Diam. Midshaft	8.3	–	62. Epicondylar Breadth	–	–
38. **Scapula:** Height	–	119.92	63. Max. Diam. Head	–	38.7
39. Breadth	90.81	–	64. A-P Subtroch. Diam.	24.1	22.3
40. **Humerus:** Max. Length	266	–	65. M-L Subtroch. Diam.	25.5	27.4
41. Epicondylar Breadth	52.4	52.3	66. A-P Midshaft Diam.	23.2*	24.1*
42. Vertical Diam. Head	35.04	34.4	67. M-L Midshaft Diam.	24.6*	24.9*
43. Max. Diam. Midshaft	18.4	19.1	68. Midshaft Circumference	75*	77*
44. Min. Diam. Midshaft	13.1	13.3	69. **Tibia:** Max. Length	–	–
45. **Radius:** Max. Length	–	205	70. Max. Prox.Epiph. Breadth	–	–
46. Ant.-Post. Diam. Midshaft	10.7*	9.1	71. Max. Distal Epiph. Breadth	40	–
47. Med.-Lat. Diam. Midshaft	14.4*	12.07	72. Max. Diam. Nutrient For.	–	31.4
48. **Ulna:** Max. Length	–	–	73. M-L Diam. Nutrient For.	–	22.1
49. A-P Diameter	–	–	74. Circ. Nutrient Foramen	–	82.5
50. M-L Diameter	–	–	75. **Fibula:** Max. Length	299	–
51. Physiological Length	–	–	76. Max. Diameter Midshaft	14.4	14.8*
52. Min. Circumference	30	31	77. **Calcaneus:** Max. Length	63.7	63.8
53. **Sacrum:** Anterior Length		–	78. Middle Breadth	33.7	31.3
54. Anterior Superior Breadth		–			
55. Max. Trans. Diam. Base		43.6	79. **Sternum:** Length Mesostern.		–
56. **Pelvis:** Height	–	178	80. Max. Breadth 1st		25.1
57. Iliac Breadth	–	–			
58. Pubis Length	–	38.0			
59. Ischium Length	–	79.8			

* = measurement taken with sliding caliper

Body mass estimation:

FHB (femoral head breadth) = 38.7 mm

equations for females:

McHenry (1992)	2.24 (FHB) − 39.9	=	46.79
Grine et al. (1995)	2.27 (FHB) − 34.5	=	51.35
Ruff et al (2012)	2.18 (FHB) − 35.8	=	48.56

} kg

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AGE & SEX ASSESSMENT
ADULT - RECORDING FORM (2a)

Age: _____
Sex: Female

Provenience: _____
Designation/ID: ST. 18 14.8a

AGE

PELVIC:		left	right
Pubic Symphysis			
Todd (1-10)		10	10 50+
Suchey-Brooks (1-6)		6	6 60+
Auricular Surface			
Lovejoy et al. (1-8)		8	— 60+

POSTCRANIAL: Epiphyseal Union*			
Clavicle	Sternal epiphysis		___
Vertebral Annular Epiphyses	Cervical	superior	___
		inferior	___
	Thoracic	superior	___
		inferior	___
	Lumbar	superior	___
		inferior	___
Sacrum	S1/S2 fusion		___
Innominate	Iliac crest		___

complete fusion

CRANIAL:	Suture Closure*	
External Cranial Vault	1. Midlambdoid	___
	2. Lambda	___
	3. Obelion	___
	4. Anterior Sagittal	___
	5. Bregma	___
	6. Midcoronal	___
	7. Pterion	___
	8. Sphenofrontal	___
	9. Inf. Sphenotemporal	___
	10. Sup. Sphenotemporal	___
Palatine	11. Incisive Suture	___
	12. Anterior Median	___
	13. Posterior Median	___
	14. Transverse Palatine	___
Internal Cranial Vault	15. Sagittal	___
	16. Left Lambdoid	___
	17. Left Coronal	___

Estimated Age:

Subadult (12-20 years)	___
Young Adult (20-35 years)	___
Middle Adult (35-50 years)	___
Old Adult (50+ years)	X

*Suture and Epiphysis Codes:
0 = open
1 = minimal
2 = significant
3 = complete

Observations: Buckberry & Chamberlain (2002) = 72 yrs
Transition analysis = 80 yrs

SEX

PELVIC:	left	right
Ventral Arc (1-3)	1	3
Subpubic Concavity (1-3)	2	2
Ischiopubic Ramus Ridge (1-3)	2	2
Greater Sciatic Notch (1-5)	-	2
Preauricular Sulcus (0-4)	3	3

Estimated Sex, Pelvis (1-5): 2 = female

CRANIAL:	
Nuchal Crest (1-5)	2
Mastoid Process (1-5)	2
Supraorbital Margin (1-5)	-
Glabella (1-5)	-
Mental Eminence (1-5)	-

Estimated Sex, Skull (1-5): 2 = female

Observations:

Buckberry & Chamberlain (2002) Aging using auricular surface

	left
Transverse organization	5
Surface texture	4
Microporosity	2
Macroporosity	3
Apical changes	3
	17 composite score

⇒ stage 7, mean age 72.25

Transition Analysis Scoring

Case/Site/Collection: BPAAP 2018 **ID:** ST.18.14.80

Observer: E. Moes **Date:** 9 / 6 / 19

Cranial Sutures	Left	Right
Coronal Pterica	-1 2 3 4 5	-1 2 3 4 5
Sagittal Obelica (midline)	-1 2 3 4 5	
Lambdoidal Asterica	-1 2 3 4 5	-1 2 3 4 5
Interpalatine (midline)	-1 3 4 5	
Zygomaticomaxillary	-1 2 3 4 5	-1 2 3 4 5

Pubic Symphysis	Left	Right
Symphyseal Relief	-1 2 3 4 5 6	-1 2 3 4 5 6
Symphyseal Texture	-1 2 3 4	-1 2 3 4
Superior Apex	-1 2 3 4	-1 2 3 4
Ventral Symphyseal Margin	-1 2 3 4 5 6 7	-1 2 3 4 5 6 7
Dorsal Symphyseal Margin	-1 2 3 4 5	-1 2 3 4 5

Iliac Auricular Surface	Left	Right
Superior Demiface Topography	-1 2 3	-1 2 3
Inferior Demiface Topography	-1 2 3	-1 2 3
Superior Surface Morphology	-1 2 3 4 5	-1 2 3 4 5
Middle Surface Morphology	-1 2 3 4 5	-1 2 3 4 5
Inferior Surface Morphology	-1 2 3 4 5	-1 2 3 4 5
Inferior Surface Texture	-1 2 3	-1 2 3
Superior Posterior Iliac Exostoses	-1 2 3 4 5 6	-1 2 3 4 5 6
Inferior Posterior Iliac Exostoses	-1 2 3 4 5 6	-1 2 3 4 5 6
Posterior Exostoses	-1 2 3	-1 2 3

Codes: - (Missing or Not Observable), 1-7 (defined in Transition Analysis manual)

corrected: point estimate 80.6 (62, 92.8)

uncorrected: 90 (61.6, 110) p = .66

Pubic Symphysis: 96.2 (58.2, 110) p = .59

Auricular area: 82.5 (39.3, 110) p = .6

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NONMETRIC TRAITS
RECORDING FORM (6)

Codes:
0 =absent
1 = present/partial
2 = complete/multiple
9 = unobservable

Provenience: _____

Designation/ID: ST. 18 14.8a

	L	M	R
1. Metopic suture:		9	
2. Supraorbital structures:			
a. Supraorbital notch:	9		9
0 = absent			
1 = present, < ½ occluded by spicules			
2 = present, > ½ occluded by spicules			
3 = present, degree of occlusion unknown			
4 = multiple notches			
b. Supraorbital foramen:	9		9
0 = absent			
1 = present			
2 = multiple foramina			
3. Infraorbital suture:	0		9
4. Multiple infraorbital foramina:	0		9
0 = absent			
1 = internal division only			
2 = two distinct foramina			
3 = more than two distinct foramina			
5. Zygomatico-facial foramina:	5		9
0 = absent			
1 = 1 large			
2 = 1 large plus smaller f.			
3 = 2 large			
4 = 2 large plus smaller f.			
5 = 1 small			
6 = multiple small			
6. Parietal foramen:	9		9
0 = absent			
1 = present, on parietal			
2 = present, sutural			
7. Sutural bones:			
a. epiteric bone	0		9
b. coronal ossicle	9		9
c. bregmatic bone		9	
d. sagittal ossicle		9	
e. apical bone		0	
f. lambdoid ossicle	9		9
g. asterionic bone	0		9
h. ossicle in occipito-mastoid suture	0		9
i. parietal notch bone	0		9

	L	M	R
8. Inca bone:		0	
0 = absent			
1 = complete, single bone			
2 = bipartite			
3 = tripartitie			
4 = partial			
9. Condylar canal	1		1
0 = not patent			
1= patent			
10. Divided hypoglossal canal:	2		9
0 = absent			
1 = partial, internal surface			
2 = partial, within canal			
3 = complete, internal surface			
4 = complete, within canal			
11. Flexure of superior sagittal sulcus	3		
1 = right			
2 = left			
3 = bifurcate			
12. Foramen ovale incomplete	9		9
0 = absent			
1 = partial formation			
2 = no definition of foramen			
13. Foramen spinosum incomplete	9		9
0 = absent			
1 = partial formation			
2 = no definition of foramen			
14. Pterygo-spinous bridge	9		9
0 = absent			
1 = trace (spicule only)			
2 = partial bridge			
3 = complete bridge			
15. Pterygo-alar bridge	9		9
0 = absent			
1 = trace (spicule only)			
2 = partial bridge			
3 = complete bridge			
16. tympanic dehiscence:	0		0
0 = absent			
1 = foramen only			
2 = full defect present			

†This form includes information derived from Buikstra and Ubelaker (1994), *Standards for Data Collection from Human Skeletal Remains*, Arkansas Archeological Survey, and is used with permission of the publisher.

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NONMETRIC TRAITS
RECORDING FORM (6a)

	L	M	R
17. Auditory exostosis:	0		0
0 = absent			
1 = < 1/3 canal occluded			
2 = 1/3-2/3 canal occluded			
3 = > 2/3 canal occluded			
18. Mastoid foramen:	1		1
a. Location			
0 = absent			
1 = temporal			
2 = sutural			
3 = occipital			
4 = both sutural and temporal			
5 = both occipital and temporal			
b. Number:	1		1
0 = absent			
1 = 1			
2 = 2			
3 = more than 2			
19. Mental foramen:	1		9
0 = absent			
1 = 1			
2 = 2			
3 = more than 2			
20. Mandibular torus:	0		9
0 = absent			
1 = trace (can palpate but not see)			
2 = moderate: elevation between 2-5 mm.			
3 = marked: elevation greater than 5 mm.			
21. Mylohyoid bridge:			
a. Location	0		9
0 = absent			
1 = near mandibular foramen			
2 = center of groove			
3 = both bridges described in 1) and 2) w/hiatus			
4 = both bridges described in 1) and 2) no hiatus			
b. Degree	/		/
22. Atlas Bridging:			
a. Lateral bridging	0		9
b. Posterior bridging	0		9
23. Accessory Transverse Foramina			
-- in 7th cervical vertebra	0		0
24. Septal aperture:	1		2
0 = absent			
1 = small foramen (pinhole) only			
2 = true perforation			
25. keeling:	9		9
26. post bregmatic depression:	9		

	L	M	R
27. inion hook:	0		
30. venous markings (frontal)	9		
31. sutures:	1		
1 = simple			
2 = medium			
3 = complex			
33. *OsJaponicum*:	0		
36. zygomatic projection	0		
(at nasal aperture):			
1 = projecting			
2 = intermediate			
3 = retreating			
37. inferior projection of	0		
zygomatic/maxilla:			
38. zygomatic posterior tubercle:	0		
41. nasal aperture:	9		
1 = narrow			
2 = medium			
3 = wide			
42. nasal depression:	2		
1 = straight			
2 = depressed			
3 = deeply depressed			
45. nasal spine:	9		
0 = absent			
1 = small			
2 = large			
47. palatine torus:	0		
0 = absent			
1 = slight			
2 = marked			
48. palatine suture:	1		
1 = straight			
2 = anterior convexity			
3 = posterior convexity			
49. dental arcade:	1		
1 = parabolic			
2 = elliptic			
3 = hyperbolic			
50. chin shape:	1		
1 = pointed			
2 = blunt			
3 = bilobate			
51. mandible lower border:	3		
1 = straight			
2 = rocker			
3 = undulating			

Additional observations:

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PATHOLOGY CHECKLIST
RECORDING FORM (7)

Provenience: _____

Designation/ID: ST. 18.14.8a

CRANIAL	present	absent	unobs.
Porotic hyperostosis	X		
Cribra orbitalia			X
Premature synostosis			X
Osteomas			X
Periosteal reactions	X		
Lytic reactions	X		
Proliferative reactions			X
Trauma			X
Cultural modifications			X

AXIAL	present	absent	unobs.
Ankylosis		X	
Arch defects		X	
Compression fractures	X		
Schmorl's nodes		X	
Periosteal reactions		X	
Lytic reactions		X	
Osteoporosis	X		
Trauma	X		
Reaction on pleural aspect of ribs		X	
Accessory facets		X	

APPENDICULAR	present	absent	unobs.
Periosteal reaction	X		
Lytic reactions	X		
Proliferative reactions	X		
Osteoporosis	X		
Trauma	X		
Cultural modifications		X	
Osteomyelitis		X	
Exostoses	X		
Accessory facets		X	

EXTREMITIES	present	absent	unobs.
Lytic reactions	X		
Proliferative reactions		X	
Periosteal reactions	X		
Trauma	X		
Exostoses	X		
Accessory facets		X	

Observations (describe pathology in detail and use individual element visual recording forms to illustrate morphology and extent):

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Paleopathology notes for ST.18.14.8a

- Lipping, and porosity on joint surfaces, associated with osteoarthritis. Changes are seen on:
  - prox R. humerus, distal also has joint destruction btwn trochlea & capitulum
  - prox & dist. R. radius
  - dist. R. ulna, also has active bone growth on distal surface, next to styloid process
  - R. & L. carpals & prox MCs', prox surface of L. prox phalanx
  - prox & dist. R. femur, R. patella
  - prox & dist. L. humerus,
  - prox L. ulna, prox & dist L. radius (less extensive than on R.)
  - dist L. femur, L. patella, prox. L. tibia
  - L tarsals and prox L. MTs

L. tibia. active infection just below midshaft, such that cortex is expanded around entire shaft. Healing periosteal reaction on lat. surface of distal diaphysis, and on prox diaphysis. Active woven bone growth on medial surface.

L. fibula healed periosteal reaction just below midshaft.

L MT 1: at site of nutrient foramen (on medial midshaft), hole is much larger (3.9 x 2 mm) with rounded well-defined margins. This is likely associated with the infection seen in L. tibia (as said by Lexi, but cortex?)

R. fibula. active & healing periosteal reaction on entire shaft. Bone growth is in globules, especially on medial surface, near distal diaphysis. May be due to a healing fx since distal end is slightly misaligned.

R. Tibia healing callus at midshaft such that cortex is thickened so there is a bulge, Callus is well-integrated into the surrounding surface. Healing periosteal reactive bone on lat. distal diaphysis & entire medial surface of shaft. Vascular tracks.

Dist. art surface of a R. prox hand phalanx (likely 2nd) has eburnation on medial condyle. This is mirrored on the prox surface of a middle phalanx. Both surfaces have severe lipping. The prox. phalanx also has an enthesis on palmar surface just below distal end. There is another, smaller enthesis on lateral surface of distal end. There is a tiny sliver of eburnation on the lateral surface of the distal end of a middle R. phalanx (likely 4th). The margins of this end are actively resorbing. Entire distal end of the 5th middle phalanx has subchondral bone exposure.

Lumbar verts have severe lipping only on sup. margins of the centra of L4 & L5, accompanied by complete resorption of the annular rings. L3 is minimally affected by these changes, primarily at ant. margin. Inferior surfaces are unaffected. Marginal degeneration and lipping of the left Sup. art. facets of L2-5.

Thoracic verts of T1-8. have little to no lipping on bodies. All articular facets have slight to moderate lipping. Compression fx in the center of sup. surfaces of both T11 and T12, although it is more pronounced in T12. Both are accompanied by trabecular bone loss. T9 - T11 have slight to moderate lipping around superior margins of bodies. Costal facets are actively resorbing.

(2)

@ L/L0L+L,╠¿╠⌐L‼L L¶L £¥/5L↕ ☺<♣♣☺

↕►♦☺♦♥♣☺♣♥♠☺♠♥☻☺☻♥ ☺☺↕ ↔↨↑↓☻☺

· Cervical Verts have little to no lipping on the articular facets. Centra have extensive lipping and annular ring ~~de~~ resorption from inferior surface of C3 to inf. surface of C5. C6 shows initial stages of annular ring resorption. No changes on C7.

\ Cranium has healed PH on all of cranial vault. Diploe is expanded. Endocranial surface has Pacchonian pits on parietals. Endocranial surface of a frontal fragment has reactive bone that is plaque-like and smooth. There are 2 endocranial cyst-like lesions on two fragments (possible parietals). They have rounded edges and smooth walls. One of them goes through the outer table. Lesions are approximately 8 mm in diameter.

. In the left nasal cavity, there is a plate-like bony deposit, ~12 mm in diam.

\ Active reactive bone on sup. surface of R rib 2, has a flakey appearance.

Rib heads have trace lipping on both L & R sides, but ~~do~~ all also have subchondral bone exposure. Midshaft on a L. 3-9 rib has a well-healed fracture. Many of the shafts of middle range ribs on both sided have healed reactive bone with vascularization. A R. rib (likely 4-5) has a poorly aligned healed fx @ costal angle such that it is near the costal angle. There is a healing cloaca on the ~~pl...~~ pleural surface

L. humerus g. tubercle is thinned and pronounced on ant. margin so that the ~~...~~ intertubercular groove appears like an excavated depression with rounded margins & smooth walls. Large (16.5 mm diam.) macroporotic & lytic lesion on posterior margin of the head.

There is a healing fx on a left prox hand phalanx (2nd or 3rd), at prox surface. Fx, looks similar to a crushing fx.

Sternal foramen present.

Polydactyly on left hand at the 5th middle phalanx.

Lunate surface of R. os coxa has area of macroporosity and active resorption on anterior most portion. 15 x 12 mm

Edentulous.

R. Scapula acromion has reactive bone creating a scalloped edge.

Bones are light in weight, likely an ~~...~~ indicator of osteoporosis.

BPAAP 2018, Saki Tzul, ST.18.11.9
Accession #: 2018.07.38
Emily Moes, Cole Burks
August 2019

Summary: ST.18.11.9 is a primary interment of a middle adult male Native American. Approximately 80% of the skeleton is present. Almost all elements are fragmented, and the missing bones are primarily those that would be in the hands, feed, and some of the vertebrae. Overall, bones are robust; they are thick, especially in the arms, with thick cortical bone. This individual has pathological changes consistent with systemic disturbance as seen through porotic hyperostosis, nonspecific infection as seen in the legs, healed trauma in the head and one rib, and joint degeneration as seen in lipping and resorption of some joints.

Burial Context: This individual was found in the same stratigraphic layer (C4) as burial ST.18.11.8, although excavation notes indicate that they are not necessarily associated. ST.18.11.9 was slightly below individual 11.8. The burial cut for individual 11.8 likely disrupted the burial of 11.9 at the feet, which is where the cranium for 11.8 is located. Therefore, individual 11.8 was a later interment despite being in a continuous matrix. One course of three large, flat stones (approximately 25-50 cm wide) covered individual 11.9 over the thorax, knees, and abdomen. This individual was buried in a flexed position on the right side, with the head to the south, facing east. Arms were flexed such that the hands were near the face.

Age Estimation: We estimate this individual to be 40-50 years of age. The standard age estimation techniques given by Buikstra and Ubelaker (1994) give estimates of 40-45 years (Todd, pubic symphysis), 45 years (Suchey-Brooks, pubic symphysis), and 45-49 years (Lovejoy et al. auricular surface). Using the auricular surface from Buckberry and Chamberlain (2002), age estimation is given as 37.8 ± 13.08 years. Transition analysis (Milner and Boldsen, 2016) estimates the age around 50 years. Because these methods are based on white skeletal samples, we are not necessarily confident in the absolute age estimates, but can say that this individual was a middle adult.

Sex Estimation: The estimated sex of this individual is malle. Table 1 shows the scores for the sex-diagnostic traits of the pelvis and cranium (Buikstra and Ubelaker, 1994).

Pelvis	Left Score	Right Score	**Cranium**	Score
Ventral Arc	-	3	**Nuchal Crest**	4
Subpubic Concavity	-	-	**Mastoid Process**	2
Ischiopubic Ramus Ridge	-	2	**Supraorbital Margin**	5
Greater Sciatic Notch	4	3	**Glabella**	4
Preauricular Sulcus	-	2	**Mental Eminence**	4
Estimated Sex	4 = Male			4= Male

Table 1: Sex estimation scores from the pelvis and cranium (1 = female condition; 5 = male condition).

Stature: Stature was not estimated for this individual since maximum length measurements are not available for standard long bones of the legs used in stature estimation methods.

Body Mass: Body mass is estimated to be 56.8-63.6 kg. The left femoral head breadth, 44.1 mm, was used following three common methods for body mass estimation. Table 2 depicts the method and associated mass estimate.

Method	Mass Estimate (kg)
McHenry (1992)	58.9
Grine et al. (1995)	63.6
Ruff et al. (2012)	56.8

Table 2: Body mass estimation (kg) based on three methods using the femoral head breadth.

Population Affinity: This individual is Native American based on the location of its burial in a rock shelter in Belize, and relative dating to _____ BP.

Dental Analysis:
Dental Inventory:
Teeth present: URM3 (only ¼ or less of the crown is present), URM2, URM1, URP4, URP3, URC, URI2, URI1, ULC, ULP3, ULP4, ULM1, ULM2, ULM3, LLM2, LLP4, LLP3, LLC, LLI2, LLI1, LRI1, LRI2, LRC, LRP3, LRM1, LRM2
Teeth missing (antemortem): ULI2, LLM3, LLM1, LRM4
Teeth missing (postmortem): ULI1
Congenitally absent: LRM3

Dental Pathology: Dental development is complete. Dentition is characterized by extreme dental wear and soil adhesion to the roots and occlusal surfaces. Crowns of anterior teeth are either almost destroyed or less than half of the crown remains. Caries are only present mostly on molars. Occlusal caries are present on ULM3, LLM2, and LRM2, as well as URP3 and LLP4. An interproximal caries is present on the distal surface of LLM2. Very little dental calculus is present; it can be seen only on maxillary molars URM2, ULM2, and ULM3. Dental attrition scores range from 5 to 8 on anterior teeth; molar quadrant scores range from 3 to 9. There are no observable patterns of wear. Linear enamel defects are present on LLI2 and LLC. Distances to the defects cannot be measured due to soil adhesion at/near the cemento-enamel junction. Two linear defects are present are the LLI2 and four are present on the LLC. All are cream in color. There is a lingual abscess at URI2. The crowns and roots of URI2 and URI1 have been destroyed by wear and/or dental caries. There is extensive, active, alveolar resorption around the roots of all mandibular molars.

Dental Morphology: Morphology was not scoreable due to the amount of wear on all teeth.

Pathology: ST.18.11.9 shows pathological changes consistent with systemic disturbance, nonspecific infection, trauma, and joint degeneration. We see evidence of systemic disturbance during childhood the presence of healed porotic hyperostosis on the cranium. Signs of nonspecific infection are in the periosteal reactions in the legs. Trauma to the skeleton is limited to a rib fracture and a depression fracture, which are mostly healed and completely healed respectively. Joint degeneration is observable throughout the entire skeleton by osteophytic lipping, and osteochondritis dissecans in the knee. Overall, bones are robust, with thick cortical bone.

Cranium: There is a very well-healed depression fracture just superior and medial to the left supraorbital margin (11.5 x 6.1 mm; ML x SI, 0.6 mm deep). It has smooth walls that slope into a smooth floor, with

rounded margins. The cranium also exhibits healed porotic hyperostosis on the superior aspects of the parietals. The surface of the occipital cannot be observed due to soil adhesion.

Thorax: The cervical and thoracic vertebrae have slight lipping on all articular facets. The thoracic vertebrae also have slight lipping on the margins of all bodies. Lumbar vertebrae have severe lipping around the body margins of L2 through the superior surface of L5. The inferior surface is only slightly lipped.

The righter inferior articular facet of L3 has extensive lipping and its surface is macro- and microporotic. The superior margin of the original facet has eburnation on a 6mm triangular surface. A few vertebrae have depressions on their bodies, near the posterior margin. The inferior surface of the L1 body has two triangular areas of resorptive bone; both are located in an area that is 18.6 x 9 mm (ML x AP), and expose the underlying trabeculae. The margins of these resorptive depressions are sharp and almost porotic. Th walls and floor are not well-defined due to soil adhesion. The inferior surface of L3 also has these hole sin almost the same place as in L1, except they are rounder and deeper. Their walls are exposed trabeculae; floors are not defined. L2 is too damaged from taphonomic processes to observe the presence or absence of these lesions.

Additionally, the inferior surface of L3 is depressed 2-3 mm below the annular ring. The inferior and superior surface of the body of L4 are also depressed, although it is more pronounced on the inferior surface. Here, the inferior surface has an actively resorbing lesion just right of the midline near the posterior margin. Unlike the changes on L1 and L3, this one does not have well-defined margin, and has sloping walls to a trabeculae-filled floor. This lesion is a 10 mm – diameter circle. The inferior surface of the body of L5 is depressed, but the deepest areas of depression are on the left and right sides (4 mm deep) of the midline, rather than in the middle.

The left lateral surface of the L1 body has two circular lesions, 14 mm apart, about 3 mm in diameter. The more anteriorly placed one (on the aortic depression) has a sharp, medial margin, and a rounded, sclerotic lateral margin. The posterior lesion has rounded, coalescing margins. Both expose the underlying trabeculae and are about 3 mm deep. Neither has any associated reactive bone.

Since all ribs are fragmented, few pathological changes could be observed. A right rib head (likely of rib 11 or 12) has moderate lipping and new bone growth on the articular surface. Two left ribs (likely ribs 10 and 11) have minor lipping on their heads with active resorption in the centers of the articular facets. A left rib fragment has a healing fracture 20 mm from the sternal end; the fractured end is slightly displaced posteriorly. The fracture has completely healed on the plural surface, whereas the external surface still has remnants of a callus that is integrating into the cortex. It extends 13.4 mm and is the width/height of the rib.

Legs: The right femur has minor-moderate lipping around the entire distal articular surface. There is osteochondritis dissecans on the medial patellar surface, as well as extensive active resorption and new bone growth on the posterior surface of the lateral condyle (14 x 10 mm; SI x ML). The lateral part of the patellar surface has a lesion (17.7 x 7.4 mm; SI x ML) that is actvely resorbing the outer cortex. It is likely related to the osteochondritis observed on the ridge of the right patella (see below). The left femur has moderate lipping around the articular facet of the intercondylar notch.

The right patella has pronounced osteochondritis dissecans on the intercondylar ridge (9.1 x 10.8 mm; ML x SI). Additionally, the articular surface has moderate lipping around the entire margin. The left

patella has a cavernous lytic lesion o the central ridge of the posterior articular surface (8.4 x 4.3 mm; SI x ML) with a protrusion of dense bone superior to it (5.8 x 7 mm; SI x ML).

The right tibia has moderate lipping on the anterior and medial margins of the lateral condylar facet. (The medial facet is not observable.) There is osteochondritis dissecans on the posterior margin of the lateral condylar facet, causing the margin to slope downward and have part of it on the posterior surface of the tibia. The left tibia has extensive resorption in the center of the lateral condylar facet, which has been exacerbated by taphonomic damage. There is minor lipping around the margins of all observable facets. The left tibia also has healed periosteal reaction on the anterior crest, near midshaft.

The right and left fibulae have healed periosteal reactive bone along most of the length of the diaphysis. This surface is also slightly expanded on the left fibula, along 114 mm of the diaphysis.

In the right foot, there is moderate lipping on all observable articular facets of the calcaneus, talus, navicular, a proximal phalanx, and MT2. Additionally, the facet on the talus for the sustentaculum tali has an area of subchondral bone exposure (8.5 x 3 mm).

Arms: Both left and right clavicles have large areas (~20 x 12 mm) of elongated lesions at the attachment sites of the sternocleidomastoid muscle. The lesions have smooth margins, but walls and floors are occluded by soil adherence. On the left clavicle, the lateral surface of the acromial end has extensive resorption such that the entire surface is macroporotic.

The right scapula has slight lipping on the superior margin of the glenoid fossa. The apex of the fossa also has a 4 mm – diameter area of subchondral bone exposure. The right humerus has subchondral breakdown along the lateral rim of the trochlea.

The left and right radii have pathological changes to the tuberosity, which may likely have been associated with the pronator teres muscle. Both surfaces are covered by soil adhesion which limit a complete description. Both tuberosities are actively resorbing such that the medial margin is raised relative to the rest of the surface. The right radius has two lytic depressions on the tuberosity, which have rounded margins.

The left hand has moderate lipping on all articular surfaces of the carpals, metacarpals, and proximal phalanges. The only evidence of change on the right hand is on the scaphoid, which also has moderate lipping on its articular surfaces.

Skeletal Inventory and Measurements: ST.18.11.9 is approximately 80% complete. The skeleton is in fair to good condition, although most elements are fragmented. All long bones of the arms and legs are present. The hands and feet are about 50% complete. Most vertebrae are present, although heavily fragmented. The cranium is also fragmented but the vault has been reconstructed using masking tape. Please see the skeletal inventory recording forms for a complete list of complete elements for ST.18.11.9. Tables 3 and 4 present the mandibular and postcranial measurements available for this individual.

Trait	Measurement (mm)
Chin Height	29.5
Mandibular Body Height	30.5
Mandibular Body Breadth	12.3
Bigonial Width	90.6*
Mandibular Length	93.1*

Table 3: Mandibular measurements for ST.18.11.9. * indicates measurement was taken at the approximate location due to reconstruction or cracking.

Element	Trait	Left (mm)	Right (mm)
Radius	A-P Diam. Midshaft	12.9*	13.4*
	M-L Diam. Midshaft	15.3*	15.4*
Ulna	A-P Diameter	--	15.4*
	M-L Diameter	--	16.4*
	Min. Circumference	37	--
Pelvis	Iliac Breadth	147.4	--
Femur	Max. Diam. Head	44.1	44.4
	A-P Subtroch. Diam.	25.9*	--
	M-L Subtoch. Diam.	28.4*	--
	A-P Midshaft Diam.	29.3*	28.3*
	M-L Midshaft Diam.	25*	26.1*
	Midshaft Circumference	88*	85*
Tibia	Max. Prox. Epiphyseal Breadth	--	70.7
	Max. Diam. Nutrient Foramen	32.3	33.3
	M-L Diam. Nutrient Foramen	21.8	22.9
	Circ. Nutrient Foramen	81	88
Fibula	Max. Length	347	--
	Max. Diam. Midshaft	14.8	--
Calcaneus	Max. Length	--	69.8

Table 4: Postcranial metric data for ST.18.11.9. – indicates that the measurement was not taken on the opposite side due to absence of materials or bony landmarks. * indicates measurement was taken at approximate location due to reconstruction or landmarks could not clearly be observed. Max. = maximum. Min = minimum. S-I = superior-inferior. A-P = anteroposterior. M-L = mediolateral.

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HUMAN REMAINS DOCUMENTATION PACKET

PROVENIENCE

Site Name: Sak Tzul BPAAP 2018 **Site No.:**

Designation/ID: ST. 18-11.9

accession # 2017.07.38

Observer(s): E. Moes C. Burks **Date:** August 2019

BIOLOGICAL PROFILE

MNI: 1

Age: 40-50 yrs

Sex: male

Ancestry: Native American

FORM LIST (indicate forms used)

- [X] 1 Skeletal Inventory
- [X] 2a Age and Sex Assessment - Adult
- [ ] 2b Age Assessment - Juvenile
- [X] 3a Permanent Dental Inventory/Pathology
- [ ] 3b Deciduous Dental Inventory/Pathology
- [ ] 4a Dental Morphology - Permanent
- [ ] 4b Dental Morphology - Deciduous
- [X] 5a Measurements - Adult
- [ ] 5b Measurements - Juvenile
- [X] 6 Non-Metric Traits
- [X] 7 Pathology Checklist
- [ ] 8 Degenerative Joint Disease
- [ ] 9 Spinal Osteophytosis
- [ ] 10 Artificial Cranial Modification
- [ ] 11 Cremated Remains
- [ ] 12 Isolated Remains
- [X] Skeletal Visual Recording Forms
- [X] Additional Forms, Notes, Sketches, Photo Log, etc.

PRESERVATION

- [X] **Complete skeleton** (>75%)
- [ ] **Partial skeleton** (25-75% present)
- [ ] **Fragmentary skeleton** (<25% present, includes at least one complete element)
- [ ] **Fragments of bone** (small amount of fragmented bone; <<25% is present)
- [ ] **Skull** (only cranial remains present and partially preserved)
- [ ] **Teeth** (only loose teeth are present)
- [ ] **Cremated bone** (burned remains of any quantity; excludes cases of incidental charring of otherwise unburned skeleton)
- [ ] **Soft tissues present**

Describe: Approximately 80% of the skeleton is complete. All long bones of the arms and legs are present. Hands and feet are ~50% complete. Most verts are present although fragmented. Cranium is also fragmented but has been reconstructed using tape.

CONDITION

Yes	No	Unobservable	
X			Cracking
X			Breaks
	X		Brittle
	X		Exfoliation
	X		Warping
	X		Cut marks
	X		Gnaw marks
X			Root or insect damage
	X		Staining
X			Soil adhering

Describe (include severity & elements affected):
Water damage to supraorbital ridges that has worn away cortex. Extensive soil adhesion on posterior cranium, cervical verts

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SKELETAL INVENTORY RECORDING FORM (1)

Codes:
c = 76-100% present
p = 26-75% present
r = 1-25% present

Provenience: _____

Designation/ID: S.T. 18.11.9

CRANIAL	left	right
Frontal	P	C
Parietal	P	P
Occipital	F	C
Temporal	C	C
TMJ	C	F
Mandible	C	C
Zygomatic	C	C
Maxilla	P	P
Nasal	C	C
Lacrimal	?	?
I. N. C.	?	?
Palatine	P	F
Sphenoid	F	P/F
Ethmoid	?	
Vomer	?	
Hyoid	P	
Thyroid/Crycoid	?	
Ossicles	/	
Unident. Cranial (#):	46	

teeth	#	cond
Incisors	5	C
Canines	3	C
Premolars	8	C
Molars	8	C
Unidentified Teeth (#):		1

AXIAL	#	cond
1st Cervical		P
2nd Cervical		F
3-6 Cervical	3	P
7th Cervical		F
1-9 Thoracic	2	P
10th Thoracic		F
11th Thoracic		F
12th Thoracic		F
1-4 Lumbar		P
5th Lumbar		C
Sacrum	?	P
Coccyx	1	P

Manubrium		F
Sternal Body		F
xiphoid		—
Left Ribs	9	F
Right Ribs	7	F
Unidentified Axial (#):		

APPEND.	left	right
Scapula	F	F
glenoid	F	C
Clavicle	P	P
med. epi.	C	C
Ilium	C	P
auricular	C	F
Pubis	F	F
symphysis	P	P
Ischium	C	P
acetabulum	C	P
Patella	C	C
Unidentified Append. (#):		—

APPENDICULAR

	left epi-p	left /prox	left /mid	left /dist	left /epi-d	right epi-p	right /prox	right /mid	right /dist	right /epi-d
Humerus	—	—	—	—	P	P	P	C	P	C
Radius	C	C	F	F	C	C	C	C	—	—
Ulna	C	C	P	F	C	C	P	C	C	—
Femur	C	C	C	C	P	C	—	C	C	C
Tibia	P	—	C	—	—	C	C	P	F	F
Fibula	C	C	C	C	C	C	C	C	—	—

Unidentified Long Bones (#): —

Notes:

EXTREMITIES

	#	cond		#	cond
Scaphoid	1	C	Calcaneus	1	C
Lunate	1	C	Talus	1	C
Trapezium	1	C	Cuboid	—	—
Trapezoid	1	C	Navicular	1	C
Capitate	1	C	Med. Cuneiform	—	—
Hamate	1	C	Inter. Cuneiform	1	C
Triquetral	0	—	Lat. Cuneiform	—	—
Pisiform	0	—	Metatarsals	1	C
Metacarpals	5	C	Prox. Phalanges	1	C
Prox. Phalanges	3	C	Mid. Phalanges	2	C
Mid. Phalanges	3	C	Dist. Phalanges	2	C
Dist. Phalanges	3	C	Sesamoids	—	—
Sesamoids	—	—	*Unident. Extremities (#):*	1	

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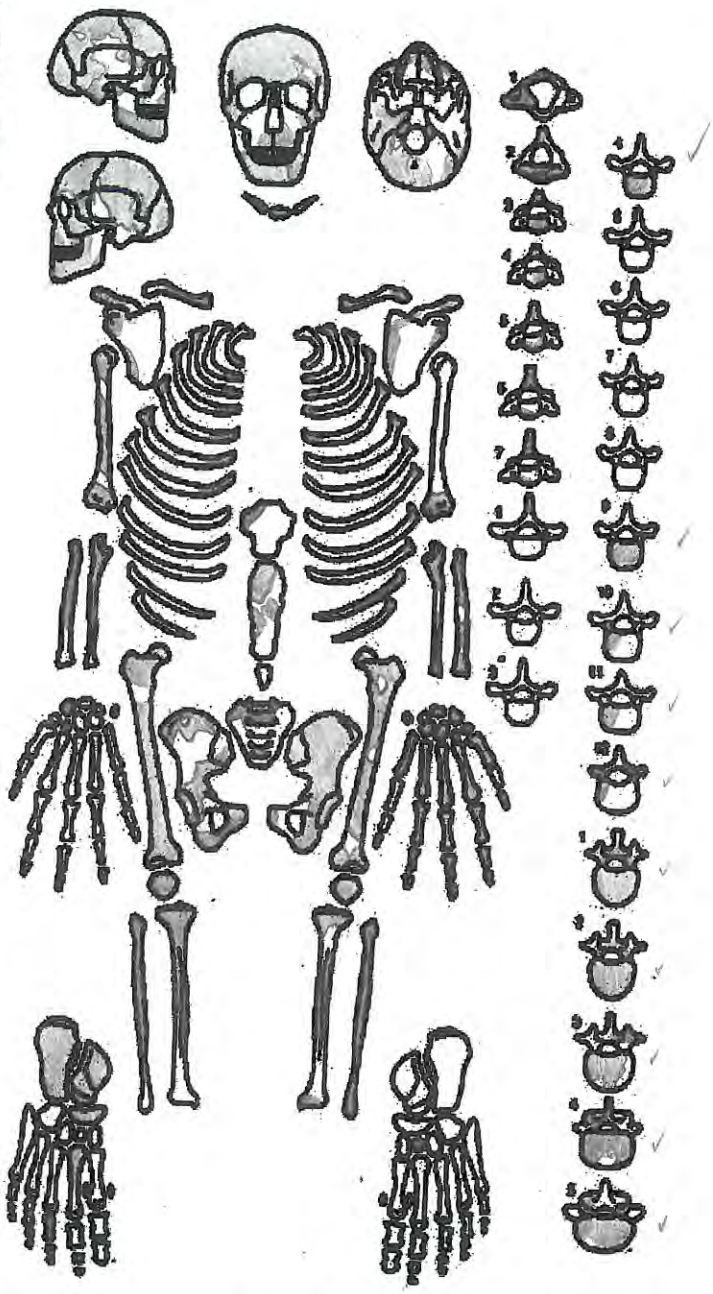
SKELETAL INVENTORY
RECORDING FORM (1)

S.T. 18.11.9

Fill in skeletal elements present and record notes along side. Label "U" if unsided, and "d" to denote approximated location.

Right **Left**



Additional observations:

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AGE & SEX ASSESSMENT
ADULT - RECORDING FORM (2a)

Age: _____
Sex: _____

Provenience: _____
Designation/ID: ST. 18.11.9

AGE

PELVIC:		left	right	
Pubic Symphysis				
Todd (1-10)		–	8	40-45
Suchey-Brooks (1-6)		–	5	45
Auricular Surface				
Lovejoy et al. (1-8)		6	6	45-49

POSTCRANIAL: Epiphyseal Union*			
Clavicle	Sternal epiphysis		___
Vertebral Annular Epiphyses	Cervical	superior	___
		inferior	___
	Thoracic	superior	___
		inferior	___
	Lumbar	superior	___
		inferior	___
Sacrum	S1/S2 fusion		2
Innominate	Iliac crest		___

complete fusion

CRANIAL:	Suture Closure*	
External Cranial Vault	1. Midlambdoid	___
	2. Lambda	___
	3. Obelion	___
	4. Anterior Sagittal	___
	5. Bregma	___
	6. Midcoronal	___
	7. Pterion	___
	8. Sphenofrontal	___
	9. Inf. Sphenotemporal	___
	10. Sup. Sphenotemporal	___
Palatine	11. Incisive Suture	___
	12. Anterior Median	___
	13. Posterior Median	___
	14. Transverse Palatine	___
Internal Cranial Vault	15. Sagittal	___
	16. Left Lambdoid	___
	17. Left Coronal	___

Estimated Age:
Subadult (12-20 years) ___
Young Adult (20-35 years) ___
Middle Adult (35-50 years) X
Old Adult (50+ years) ___

*Suture and Epiphysis Codes:
0 = open
1 = minimal
2 = significant
3 = complete

Observations: Buckberry & Chamberlain, 2002: ~~38.6~~ 37.8 ± 13.08 yrs
Transition analysis: 50.6 yrs

SEX

PELVIC:	left	right
Ventral Arc (1-3)	–	3
Subpubic Concavity (1-3)	–	–
Ischiopubic Ramus Ridge (1-3)	–	2
Greater Sciatic Notch (1-5)	4	3
Preauricular Sulcus (0-4)	–	2

Estimated Sex, Pelvis (1-5): 4 = male

CRANIAL:	
Nuchal Crest (1-5)	4
Mastoid Process (1-5)	2
Supraorbital Margin (1-5)	5
Glabella (1-5)	4
Mental Eminence (1-5)	4

Estimated Sex, Skull (1-5): 4 = male

Observations:

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Buckberry & Chamberlain, 2002

	Left
Transverse organization	3
Surface texture	2
microporosity	1
Macroporosity	2
Apical Changes	2
	10

stage III

37.8 ± 13.08 (13)

Body Mass estimation

FHB = 44.1 mm

Ruff et al (2012)	2.8 (FHB) - 66.7	= 56.78 kg
McHenry (1992)	2.24 (FHB) - 39.9	= 58.9
Grine et al (1995)	2.27 (FHB) - 36.5	= 63.6

Transition Analysis Scoring

Case/Site/Collection: _____ **ID:** ST.18.11 9

Observer : E. Moes **Date:** 12 / 4 / 19

Cranial Sutures	**Left**	**Right**
Coronal Pterica	-1 2 3 4 5	-1 2 3 4 5
Sagittal Obelica (midline)	-1 2 3 4 5	
Lambdoidal Asterica	-1 2 3 4 5	-1 2 3 4 5
Interpalatine (midline)	-1 3 4 5	
Zygomaticomaxillary	-1 2 3 4 5	-1 2 3 4 5

Pubic Symphysis	**Left**	**Right**
Symphyseal Relief	-1 2 3 4 5 6	-1 2 3 4 5 6
Symphyseal Texture	-1 2 3 4	-1 2 3 4
Superior Apex	-1 2 3 4	-1 2 3 4
Ventral Symphyseal Margin	-1 2 3 4 5 6 7	-1 2 3 4 5 6 7
Dorsal Symphyseal Margin	-1 2 3 4 5	-1 2 3 4 5

Iliac Auricular Surface	**Left**	**Right**
Superior Demiface Topography	-1 2 3	-1 2 3
Inferior Demiface Topography	-1 2 3	-1 2 3
Superior Surface Morphology	-1 2 3 4 5	-1 2 3 4 5
Middle Surface Morphology	-1 2 3 4 5	-1 2 3 4 5
Inferior Surface Morphology	-1 2 3 4 5	-1 2 3 4 5
Inferior Surface Texture	-1 2 3	-1 2 3
Superior Posterior Iliac Exostoses	-1 2 3 4 5 6	-1 2 3 4 5 6
Inferior Posterior Iliac Exostoses	-1 2 3 4 5 6	-1 2 3 4 5 6
Posterior Exostoses	-1 2 3	-1 2 3

Codes: - (Missing or Not Observable), 1-7 (defined in Transition Analysis manual)

Results

	Pt estimate	95% Confidence Interval	p value
corrected	50.6	(33, 78.4)	
uncorrected	48.8	(33, 74.6)	0.82
pubic symph.	52.0	(31.1, 92.1)	0.00
auricular	46.6	(24.4, 80.1)	0.47

TA Form version 3.1

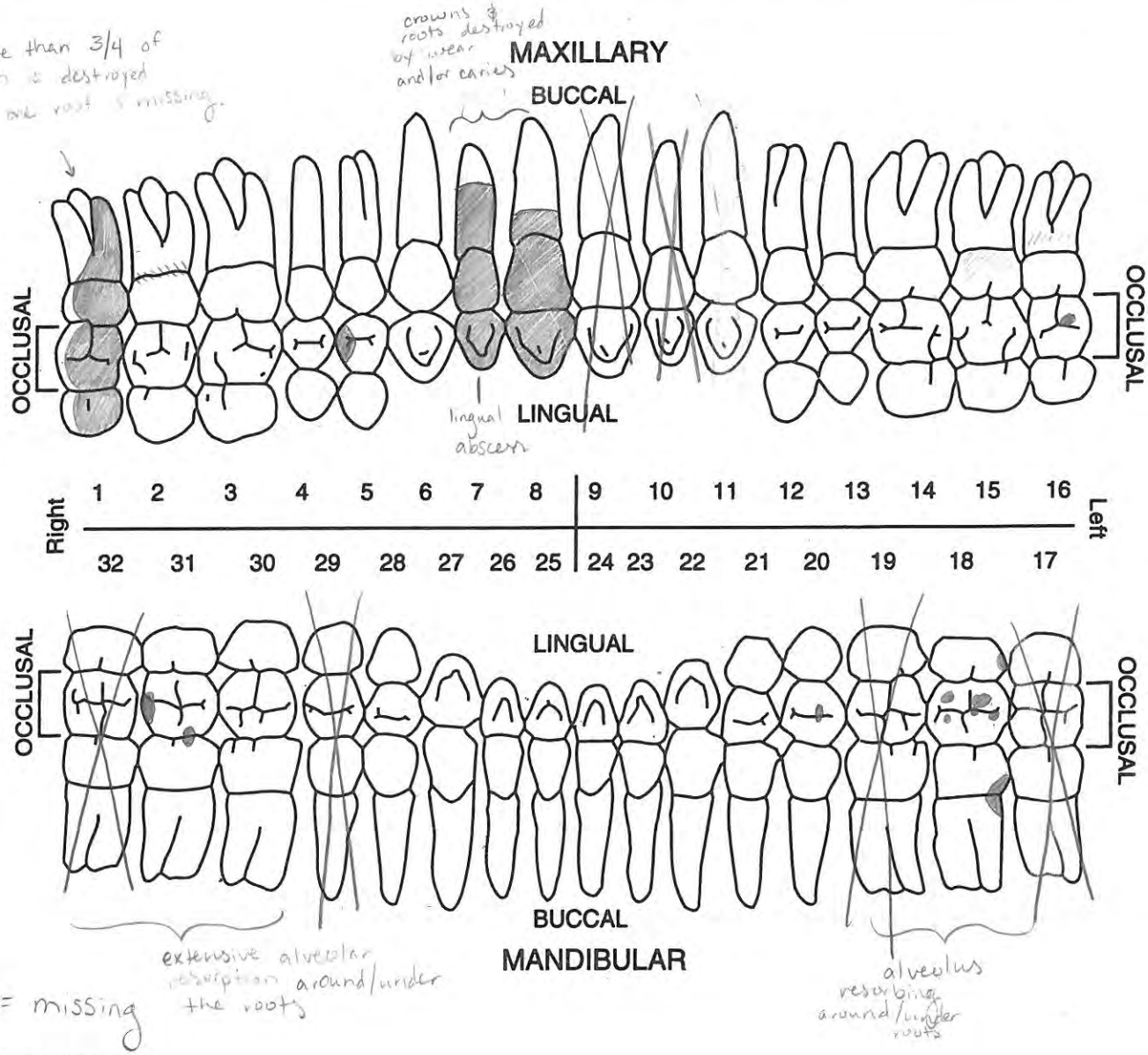
DENTAL INVENTORY
VISUAL RECORDING FORM: PERMANENT DENTITION

Site Name/Number BPAAP / Observer E. Moes

Feature/Burial Number / Date 8/2/19

Burial/Skeleton Number / ST. 18.11.9

Present Location of Collection UNM LOHO



X = missing

• = caries

\\\ = calculus

Extreme dental wear and soil adhesion to roots and occlusal surfaces. Anterior tooth crowns are either almost destroyed, or < 1/2 of crown remains. Few measurements taken and morphology unobservable.

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DENTAL INVENTORY & PATHOLOGY
PERMANENT - RECORDING FORM (3a)

Mark a dash if not observable

Provenience: _____

Designation/ID: ST. 18 11.9

	Right								Left							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Maxilla	M^3	M^2	M^1	PM^2	PM^1	C	I^2	I^1	I^1	I^2	C	PM^1	PM^2	M^1	M^2	M^3
Inventory (1-9)	7	2	2	2	2	2	7	7	5	4	2	7	2	2	2	2
Development (1-14)	14	–	–	–	–	–	–	–	–	–	–	–	–	–	–	7
Caries (1-7)	6	0	0	0	2	0	–	–	–	–	0	–	0	0	0	1
Abcesses (1-2)	1	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–
Calculus (1-3)	–	1	1	0	0	1	–	–	–	–	0	0	0	1	1	2
Chipping (#)																
Periodontitis (1-2)																
Attrition Score*	–	22	31	5	6	6	–	–	–	–	8	7	6	32	24	14
Mesio-Buccal (1-10)		4	6	*[Attrition scores: I, C, PM (1-8); M (1-10)]										6	4	4
Mesio-Lingual (1-10)		7	9											9	7	3
Disto-Lingual (1-10)		6	8											9	7	3
Disto-Buccal (1-10)		5	8											8	6	4
M-D diameter (mm)	–	10.1	–	6.4	–	–	–	–	–	–	–	–	–	–	9.5	8.1
B-L diameter (mm)	–	12.4	12.5	9.5	9.8	9.1	–	–	–	–	–	–	9.4	12.3	12.7	11.5
Crown height (mm)																

	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Mandible	M^3	M^2	M^1	PM^2	PM^1	C	I^2	I^1	I^1	I^2	C	PM^1	PM^2	M^1	M^2	M^3
Inventory (1-9)	6	2	2	4	2	2	2	2	2	2	2	2	2	4	2	4
Development (1-14)	–	14	–	–	–	–	–	–	–	–	–	–	–	–	–	7
Caries (1-7)	–	1.2	–	–	2	0	0	0	0	0	0	0	1	–	1.2	–
Abcesses (1-2)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Calculus (1-3)	–	0	0	–	0	0	0	0	0	0	0	0	0	–	1	–
Chipping (#)																
Periodontitis (1-2)																
Attrition Score*		–	31	–	7	6	7	8	8	7	6	6	8		23	
Mesio-Buccal (1-10)		7	9	*[Attrition scores: I, C, PM (1-8); M (1-10)]											6	
Mesio-Lingual (1-10)		5	7												6	
Disto-Lingual (1-10)		8	6												6	
Disto-Buccal (1-10)		–	9												5	
M-D diameter (mm)		–	11.7	–	–	–	–	–	–	–	–	–	–		–	
B-L diameter (mm)		11.2	11.4	–	–	8.0	6.3	–	–	6.5	8.3	–	–		13.2	
Crown height (mm)																

Enamel Defects																
Tooth	$L I_2$	$L C_x$														
Defect No. on Tooth	2 defects	4 defects														
Defect Type (1-7)	1	1														
Distance from CEJ (mm)																
Color (1-4)	2	2														

cannot observe due to soil adhesion

*. all measurements should be considered minimums due to wear.

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SKELETAL MEASUREMENT
ADULT - RECORDING FORM (5a)

Record all measurements millimeters.

Provenience: _____

Designation/ID: ST. 18.11.9

CRANIAL

1. **GOL** Maximum Cranial Length		18. **DKB** Interorbital Breadth	
2. **XCB** Maximum Cranial Breadth		19. **FRC** Frontal Chord	
3. **ZYB** Bizygomatic Breadth		20. **PAC** Parietal Chord	
4. **BBH** Basion-Bregma Height		21. **OCC** Occipital Chord	
5. **BNL** Basion-Nasion Length		22. **FOL** Foramen Magnum Length	
6. **BPL** Basion-Prosthion Length		23. **FOB** Foramen Magnum Breadth	
7. **MAB** Maxillo-Alveolar Breadth		24. **MDH** Mastoid Length	
8. **MAL** Maxillo-Alveolar Length		25. **GNI** Chin height	29.5
9. **AUB** Biauricular Breadth		26. **HML** Mandibular Body Height	30.5
10. **NPH** Upper Facial Height		27. **TML** Mandibular Body Breadth	12.3
11. **WFB** Minimum Frontal Breadth		28. **GOG** Bigonial Width	90.6*
12. **FMB** Upper Facial Breadth		29. **CDL** Bicondylar Breadth	–
13. **NLH** Nasal height		30. **WRL** Minimum Ramus Breadth	–
14. **NLB** Nasal Breadth		31. **MRL** Maximum Ramus Breadth	–
15. **OBB** Orbital Breadth		32. **XRL** Maximum Ramus Height	–
16. **OBH** Orbital Height		33. **MLT** Mandibular Length	93.1*
17. **EKB** Biorbital Breadth		34. **MLX** Mandibular Angle	–

POSTCRANIAL

	left	right		left	right
35. **Clavicle:** Max. Length	–		60. **Femur:** Max. Length	–	–
36. A-P Diam. Midshaft	–		61. Bicondylar Length	–	–
37. Sup.-Inf. Diam. Midshaft	–		62. Epicondylar Breadth	–	–
38. **Scapula:** Height	–	–	63. Max. Diam. Head	44.1	44.4
39. Breadth	–	–	64. A-P Subtroch. Diam.	25.9*	–
40. **Humerus:** Max. Length	–	–	65. M-L Subtroch. Diam.	28.4*	–
41. Epicondylar Breadth	–	–	66. A-P Midshaft Diam.	29.3*	28.3*
42. Vertical Diam. Head	–	–	67. M-L Midshaft Diam.	25*	26.1*
43. Max. Diam. Midshaft	–	–	68. Midshaft Circumference	88*	85*
44. Min. Diam. Midshaft	–	–	69. **Tibia:** Max. Length	–	–
45. **Radius:** Max. Length	–	–	70. Max. Prox.Epiph. Breadth	–	70.7
46. Ant.-Post. Diam. Midshaft	12.9*	13.4*	71. Max. Distal Epiph. Breadth	–	–
47. Med.-Lat. Diam. Midshaft	15.3*	15.4*	72. Max. Diam. Nutrient For.	32.3	33.3
48. **Ulna:** Max. Length	–	–	73. M-L Diam. Nutrient For.	21.8	22.9
49. A-P Diameter	–	15.4*	74. Circ. Nutrient Foramen	81	88
50. M-L Diameter	–	16.4*	75. **Fibula:** Max. Length	347	–
51. Physiological Length	–	–	76. Max. Diameter Midshaft	14.8	–
52. Min. Circumference	37	–	77. **Calcaneus:** Max. Length		68.8
53. **Sacrum:** Anterior Length			78. Middle Breadth		–
54. Anterior Superior Breadth					
55. Max. Trans. Diam. Base			79. **Sternum:** Length Mesostern.		
56. **Pelvis:** Height	–		80. Max. Breadth 1st		
57. Iliac Breadth	147.4				
58. Pubis Length	–				
59. Ischium Length	–				

* = measurement taken at estimated location

ST. 18.11.9

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NONMETRIC TRAITS
RECORDING FORM (6a)

	L	M	R
17. Auditory exostosis:	9		0
0 = absent			
1 = < 1/3 canal occluded			
2 = 1/3-2/3 canal occluded			
3 = > 2/3 canal occluded			
18. Mastoid foramen:	9		1
a. Location			
0 = absent			
1 = temporal			
2 = sutural			
3 = occipital			
4 = both sutural and temporal			
5 = both occipital and temporal			
b. Number:	9		1
0 = absent			
1 = 1			
2 = 2			
3 = more than 2			
19. Mental foramen:	1		1
0 = absent			
1 = 1			
2 = 2			
3 = more than 2			
20. Mandibular torus:	0		0
0 = absent			
1 = trace (can palpate but not see)			
2 = moderate: elevation between 2-5 mm.			
3 = marked: elevation greater than 5 mm.			
21. Mylohyoid bridge:			
a. Location	9		0
0 = absent			
1 = near mandibular foramen			
2 = center of groove			
3 = both bridges described in 1) and 2) w/hiatus			
4 = both bridges described in 1) and 2) no hiatus			
b. Degree	-		-
22. Atlas Bridging:			
a. Lateral bridging	0		9
b. Posterior bridging	0		9
23. Accessory Transverse Foramina -- in 7th cervical vertebra	9		9
24. Septal aperture:	2		2
0 = absent			
1 = small foramen (pinhole) only			
2 = true perforation			
25. keeling:	0		0
26. post bregmatic depression:	0		

	L	M	R
27. inion hook:		0	
30. venous markings (frontal)		0	
31. sutures:		1	
1 = simple			
2 = medium			
3 = complex			
33. *OsJaponicum*:		9	
36. zygomatic projection (at nasal aperture):		9	
1 = projecting			
2 = intermediate			
3 = retreating			
37. inferior projection of zygomatic/maxilla:		9	
38. zygomatic posterior tubercle:		9	
41. nasal aperture:		9	
1 = narrow			
2 = medium			
3 = wide			
42. nasal depression:		9	
1 = straight			
2 = depressed			
3 = deeply depressed			
45. nasal spine:		9	
0 = absent			
1 = small			
2 = large			
47. palatine torus:		9	
0 = absent			
1 = slight			
2 = marked			
48. palatine suture:		9	
1 = straight			
2 = anterior convexity			
3 = posterior convexity			
49. dental arcade:		9	
1 = parabolic			
2 = elliptic			
3 = hyperbolic			
50. chin shape:		2	
1 = pointed			
2 = blunt			
3 = bilobate			
51. mandible lower border:		1	
1 = straight			
2 = rocker			
3 = undulating			

Additional observations:

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NONMETRIC TRAITS
RECORDING FORM (6)

Codes:
0 = absent
1 = present/partial
2 = complete/multiple
9 = unobservable

Provenience: _____

Designation/ID: ST 18.11 9

	L	M	R
1. Metopic suture:		1	
2. Supraorbital structures:			
a. Supraorbital notch: (0 = absent; 1 = present, < ½ occluded by spicules; 2 = present, > ½ occluded by spicules; 3 = present, degree of occlusion unknown; 4 = multiple notches)	0		3
b. Supraorbital foramen: (0 = absent; 1 = present; 2 = multiple foramina)	1		9
3. Infraorbital suture:	9		9
4. Multiple infraorbital foramina: (0 = absent; 1 = internal division only; 2 = two distinct foramina; 3 = more than two distinct foramina)	9		9
5. Zygomatico-facial foramina: (0 = absent; 1 = 1 large; 2 = 1 large plus smaller f.; 3 = 2 large; 4 = 2 large plus smaller f.; 5 = 1 small; 6 = multiple small)	1		9
6. Parietal foramen: (0 = absent; 1 = present, on parietal; 2 = present, sutural)	1		1
7. Sutural bones:			
a. epiteric bone	9		9
b. coronal ossicle	9		9
c. bregmatic bone		0	
d. sagittal ossicle		9	
e. apical bone		9	
f. lambdoid ossicle	9		9
g. asterionic bone	9		9
h. ossicle in occipito-mastoid suture	9		9
i. parietal notch bone	0		0

	L	M	R
8. Inca bone: (0 = absent; 1 = complete, single bone; 2 = bipartite; 3 = tripartitie; 4 = partial)		0	
9. Condylar canal (0 = not patent; 1= patent)	9		9
10. Divided hypoglossal canal: (0 = absent; 1 = partial, internal surface; 2 = partial, within canal; 3 = complete, internal surface; 4 = complete, within canal)	9		9
11. Flexure of superior sagittal sulcus (1 = right; 2 = left; 3 = bifurcate)	9		
12. Foramen ovale incomplete (0 = absent; 1 = partial formation; 2 = no definition of foramen)	9		9
13. Foramen spinosum incomplete (0 = absent; 1 = partial formation; 2 = no definition of foramen)	9		9
14. Pterygo-spinous bridge (0 = absent; 1 = trace (spicule only); 2 = partial bridge; 3 = complete bridge)	9		9
15. Pterygo-alar bridge (0 = absent; 1 = trace (spicule only); 2 = partial bridge; 3 = complete bridge)	9		9
16. tympanic dehiscence: (0 = absent; 1 = foramen only; 2 = full defect present)	9		9

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PATHOLOGY CHECKLIST
RECORDING FORM (7)

Provenience: _____

Designation/ID: ST. 18. 11. 9

CRANIAL	present	absent	unobs.
Porotic hyperostosis	X		
Cribra orbitalia		X	
Premature synostosis		X	
Osteomas		X	
Periosteal reactions			X
Lytic reactions			X
Proliferative reactions			X
Trauma	X		
Cultural modifications		X	

AXIAL	present	absent	unobs.
Ankylosis		X	
Arch defects		X	
Compression fractures		X	
Schmorl's nodes		X	
Periosteal reactions	X		
Lytic reactions	X		
Osteoporosis		X	
Trauma	X		
Reaction on pleural aspect of ribs		X	
Accessory facets		X	

APPENDICULAR	present	absent	unobs.
Periosteal reaction	X		
Lytic reactions	X		
Proliferative reactions		X	
Osteoporosis		X	
Trauma		X	
Cultural modifications		X	
Osteomyelitis		X	
Exostoses		X	
Accessory facets		X	

EXTREMITIES	present	absent	unobs.
Lytic reactions		X	
Proliferative reactions		X	
Periosteal reactions		X	
Trauma		X	
Exostoses		X	
Accessory facets		X	

Observations (describe pathology in detail and use individual element visual recording forms to illustrate morphology and extent):

†This form includes information derived from Buikstra and Ubelaker (1994), *Standards for Data Collection from Human Skeletal Remains*, Arkansas Archeological Survey, and is used with permission of the publisher.

Pathology Notes (1)

Cranium: Very well-healed depression fx just supero-medial to the left supraorbital margin. 11.5 x 6.1 mm (ML x SI). 0.6 mm deep, with smooth walls/floor and rounded margins. Cranium also exhibits healed PH on superior parietals. Surface of occipital cannot be observed due to extensive soil adhesion.

Cervical verts: slight lipping on all articular facets

Thoracic verts: slight lipping on ~~anterior~~ margins of all bodies and articular facets.

Lumbar verts: Severe lipping around margins of bodies of L2 - sup. L5. Inf. body of L5 has slight lipping. Right inferior articular facet of ~~L3~~ L3 has extensive lipping and its surface is macro- and microporotic. The superior margin of the original facet has eburnation on a ~6 mm triangular surface.

Inferior surface of L1 body has 2 triangular areas of resorptive bone near the posterior margin. Both triangles are in a 18.6 x 9 mm (ML x AP) area and both expose the underlying trabeculae. Margins are sharp and almost porotic. Walls and floor are not well-defined due to soil adhesion. The inferior surface of L3 also has these holes in almost the same place as on L1 except they are rounder and deeper. Walls are exposed trabeculae, floors not defined. L2 is too damaged to observe the presence/absence of these lesions. Entire inf. surface of L3 is depressed ~2-3 mm below annular ring. L4 inf. & sup. surfaces of the body are also depressed although it is more pronounced (~3 mm) than the sup. surfaces. The inferior surface also has an actively resorbing lesion just right of the midline near the posterior margin. Unlike the changes on L4 and L3, this one does not have well-defined margins and has sloping walls to a trabeculae-filled floor. Lesion is a 10 mm-diameter circle. Inferior surface of L5 body is depressed so it is the most concave on the right and left sides (4 mm). The left lateral surface of the L1 body has two circular lesions, 14 mm apart, about 3 mm in diameter. The more anterior one (right where the aortic depression is) has a sharp medial margin, and a rounded, sclerotic lateral margin. The posterior lesion has rounded, coalescing margins. Both expose underlying trabeculae and are ~3 mm deep. Neither has any associated reactive bone.

Bones overall are very robust.

L. radius has likely path. changes to the tuberosity which caused the medial margin to be sharp and significantly raised over the rest of the surface. However, I cannot give any more description due to soil adhesion. Pronounced attachment site for pronator teres.

R. radius tuberosity is actively resorbing and has two lytic depressions on its surface which have rounded margins. Surface is slightly occluded due to soil adhesion. Similar to the left side, the medial margin of the tuberosity is raised relative to the rest of the surface, likely due to resorption of the latter.

Extensive resorption on the lateral surface of the acromial end of the left clavicle, such that the entire surface is macroporotic. At the attachment site of the SCM on both right and left clavicles, there is a large (~20 x 12 mm) area of lesions with smooth margins. Both are occluded by soil adherence.

L. hand: moderate lipping on all articular surfaces of the carpals, metacarpals, and proximal phalanges.

R. patella: osteochondritis dessicans on the intercondylar ridge 9.1 x 10.8 mm (ML x SI); articular surface also has moderate lipping.

R. humerus: subchondral breakdown along the lateral rim of the trochlea

R. Scapula: slight lipping on superior margin of the glenoid fossa. The apex of the fossa also has a 4 mm diameter area of subchondral breakdown.

A right rib head (likely rib 11 or 12) has moderate lipping and ~~macroporotic~~ new bone growth on the articular surface.

~~The sternal end of~~ a left rib fragment has a healing fx 20 mm from the sternal end, such that the fractured end is slightly displaced posteriorly. Fx has completely healed on the plural side, whereas the exterior surface still has remnants of a callus that is integrating into the cortex, extending 13.4mm and is the width/height of the rib. Two other left ribs (likely 10 and 11) have minor lipping on their heads with active resorption (macro and microporosity) in the centers of the facets.

R. femur: minor-mod. lipping around entire dist art surface. Osteochondritis dessicans on medial patellar surface as well as extensive active resorption and new bone growth on the post. surface of lateral condyle 14 x 10 mm (SI x ML). Lateral part of patellar surface has a lesion 17.7 x 7.4 mm (SI x ML) that is actively resorbing the outer cortex. It is likely related to the O.D. observed on the R. patellar ridge.

L. femur: ~~minor~~ moderate lipping around art. facet of intercondylar notch.

L. Patella: cavernous lytic lesion on central ridge of post. art. surface 8.4 x 4.3 (SI x ML) with a protrusion of dense ~~b~~ bone superior to it. 5.8 x 7 mm (SI x ML)

R. tibia: moderate lipping on ant. & med. margin of lateral condylar facet. (Medial facet margins not observable). O.D. on post. margin of this facet, causing the margin to slope downward and have part of it on the posterior surface of the tibia

L. tibia: extensive resorption in the center of the lateral condylar facet, which has been exacerbated by taph. damage. Minor ~~to~~ lipping around the margins of all obs. facets. Healed periosteal reaction on ant. crest, near midshaft.

R. foot: moderate lipping on all obs. articular facets of the calcaneus, talus, navicular, a proximal phalanx and MT2. Also, the facet on the talus for the sustentaculum tali has an area of subchondral bone exposure (8.5 x 3mm)

R. scaphoid has moderate lipping on its articular surfaces.

R. fibula: healed periosteal reaction on a diaph. frag., near midshaft.

L. fibula: healed p.r. most of length of diaphysis and is also slightly expanded 114 mm of fibula

BPAAP 2018, ST.18.14.9a-b
Accession #: 2018.07.41a-b

Emily Moes
August 2019

Summary: ST.18.14.9a consists of the primary interment of a middle adult female. Approximately 60% of the skeleton is present; it is highly fragmentary with few intact long bones. This skeleton is in poor condition such that the cortex is soft and easily affected by cleaning. (Polishing appears on some elements, which is from vigorous washing and not mortuary treatment.) Gnaw marks are present on long bones. Dental pathological changes include caries, moderate dental calculus, and moderate attrition. All molars, except for the left second molars, were lost antemortem. Pathological changes include healed metabolic diseases, slight osteoarthritis in the lower spine, arms, left hand, and left hallux.

ST.18.14.9b consists of comingled elements of a second individual in this burial context. Bones of this individual were found throughout the grave and were not associated in one area. Elements include: L. MC1, R. MC3, a first proximal manual phalanx, an unnumbered proximal manual phalanx, R. MT5, a first proximal pedal phalanx, an unnumbered proximal pedal phalanx, R. calcaneus, and a fragmented metatarsal head. This individual is distinguished from 9a by significantly larger bones of the hands and feet. Robustness of the bones suggests this individual is an adult male, but this is not a formal age estimation and should be based on aDNA analysis. There are no pathological conditions associated with this individual.

Burial Context: ST.18.14.9a is a primary burial in a simple grave where the individual was placed in a flexed position on the left side, with the knees to the chest, and ankles near the pelvis. The arms were slightly flexed at the elbow but were on the sides such that the left arm was directly under the ribs. Both hands were next to the acetabula. This individual was buried with the head in the north, facing east. A ceramic fragment (approximately 10 x 15 mm) was found covering the cranial vault, concentrated over the occipital.

ST.18.14.9a

Age Estimation: This individual is estimated to be a middle adult (35-50 years). All postcranial elements are in complete stages of union. Neither the auricular of the ilium nor pubic symphysis are present, which are the preferred features for age estimation. Instead, age is based on pathological changes, including lipping on most joint surfaces (see Skeletal Pathology below), and dental pathology (moderate to severe attrition, and antemortem molar loss; see Dental Pathology below). Evidence in these areas is indicative of an individual of middle age.

Sex Estimation: The estimated sex of the individual is possible female. Table 1 shows the scores for the sex-diagnostic traits of the cranium (Buikstra and Ubelaker, 1994).

Cranium	Score
Nuchal Crest	2
Mastoid Process	2
Supraorbital Margin	3
Glabella	2
Mental Eminence	--

Estimated Sex	2 = Female

Table 1: Sex estimation scores from the cranium (1 = female condition; 5 = male condition).

Stature and Body Mass: Neither stature nor body mass are estimated for this individual due to the fragmentary condition of the remains.

Population Affinity: Based on the location of the burial in a rock shelter in Belize, and relative dating to pre-contact, this individual is Native American.

Dental Pathology:
Overview: All dental development is complete. Tooth wear scores for anterior teeth that were in occlusion range from 3 to 6. LRP4 was likely impacted and not in occlusion, given its lack of attrition (score of 1). Molar quadrant scores range from 4 to 8. Only the left second molars are present. All other molars were lost ante-mortem. Occlusal caries are present in LLP4; root caries are present on LRP3, LRC; interproximal caries are present on URP3, URP4, ULP4, ULM2, LLP4, and LLP3. There is a large caries on the LLM2 such that the crown is separated from the root. No dental abscesses are present. Little dental calculus is present on the maxillary teeth, and little to severe amounts are present on the mandibular teeth; the mandibular incisors have the most extensive calculus. There is a supernumerary mandibular tooth that is impacted and the crown is erupting lingual to LLP4.
Inventory
Teeth present: URP4, URP3, URC, URI2, URI1, ULI1, ULI2, ULC, ULP3, ULP4, ULM2, LLM2, LLP4, LLP3, LLC, LLI2, LLI1, LRI1, LRI2, LRC, LRP3, LRP4
Teeth lost antemortem: URM3, URM2, URM1, ULM1, ULM3, LLM3, LLM1, LRM1, LRM2, LRM3.
Teeth missing: URP3, ULP3, LLM1

Dental Morphology (from Edgar, 2017)
Maxilla: winging URI1 (0); labial curvature ULI1 (1); double shoveling ULI1 (1), URI2 (2), ULI2 (1); shoveling ULI1 (2), UI2 (2); peg/reduced tooth UI2 (0); congenital absence UI2 (0); interruption groove ULI1 (0), UI2 (0); tuberculum dentale ULI1 (0), UI2 (3), UC (0); accessory cusps UP3 (0), UP4 (0); distosagittal ridge UP3 (0); cusp five ULM2 (0); Carabelli's ULM2 (0); enamel pearl on ULM2

Mandible: shoveling LLI1 (2), LI1 (1); congenital absence LLI1 (0); peg/reduced LLI1 (0); elongated form LP3 (0), LP4 (0); premolar complexity LP3 (4), LRP4 (1); groove pattern LLM2 (0); protostylid LLM2 (1), supernumerary tooth that is lingual to LLP4 and had premolar morphology

Skeletal Pathology: Overall, ST.18.14.9a has pathological changes consistent with prior metabolic disease(s) (such as scurvy or rickets) that resulted in porotic hyperostosis and expanded sternal rib ends. This individual likely experienced these health disruptions in childhood since the lesions have remodeled. There is also evidence of osteoarthritis in the lower spine, arms, left hand, and left hallux.

Cranium: The occipital, frontal, and parietals have evidence of healed porotic hyperostosis, accompanied by diploic expansion.

Vertebrae: The entire margins of the superior surfaces of the bodies of L3-L5 have moderate lipping. The anterior portions of the annular rings are actively resorbing. There is a smooth-walled, smooth-floored round depression on the lateral surface of the body, just right of the midline. The depression is 7 mm in diameter, and 3 mm deep. The entire annular ring of S1 has resorbed. Pathological changes are not observed in other area of the vertebral column.

Ribs: At least two left ribs (in the rib 5-9 region) have expanded trabeculae in sternal ends and shafts, so they are approximately 30% thicker than the other ribs. Two other rib ends (in rib 4-7 region) are also expanded, but only on the pleural side. These have subchondral breakdown on the anterior rim of one, and active resorption on the other. The right ribs are also expanded at the sternal ends, and at least one rib is thickened, as on the left side. These changes (rachitic rosary) in the ribs are consistent with scurvy and/or rickets in childhood (Aufderheide and Rodríguez-Martín, 1998, p. 313). A right rib, possibly 11th or 12th, has an area of healed, thickened bone deposition (20 x 7 mm) on the lateral/anterior surface, which has distinct inferior margins, but integrated superior margins.

Arms: There are patches of active, woven bone growth (2-3 mm in diameter) on the subscapular fossa of the right scapula. It also has a 2 x 4 mm hole through the subscapular and infraspinous fossae; it has rounded margins and no reactive bone surrounding it. This is likely a developmental defect since there is no evidence of trauma. There is minor lipping around the entire margin of the right humeral head. The left radius has a trace amount of lipping on the articular surfaces of the left radius.

Hands: There are pronounced enthesophytes on the palmar surfaces of proximal manual phalanges at the distal ends of the diaphyses. Several left carpals have slight lipping on the articular surfaces; these bones include hamate, trapezium, lunate, and capitate.

Pelvis: The left ilium has a 6 x 5 mm hole through the blade. It has rounded margins and lacks reactive bone surrounding it. This suggests that it is likely a developmental defect rather than traumatic.

Feet: The plantar surface of the head the left first metatarsal has extensive lipping. The lateral-most surface of the head has eburnation and is actively resorbing. Mirroring these changes, there is moderate-severe lipping is present on the proximal articular surface of the first proximal pedal phalanx, which is especially pronounced on the plantar margin.

Skeletal Inventory: ST.18.14.9a is approximately 60% complete and in poor condition. The skeleton is highly fragmented with few intact bones present. All regions of the body are represented, but do not have complete elements, except in the hands and feet. Long bones of the legs, the vertebrae, pelvis, and ribs are the most fragmented. Missing elements include the sternum, most vertebrae, and the left shoulder. Please see the burial recording forms for a full inventory of present elements. Because the skeleton is so fragmented, few elements could be measured. Table 2 shows the postcranial metrics available for this individual.

Element	Measurement	Left	Right
Humerus	Vertical Diameter of Head	--	38.1
	Max. Diameter at Midshaft	-	18.7*
	Min. Diameter at Midshaft	-	15.7*
Ulna	A-P Diameter at Midshaft	12.1*	--
	M-L Diameter at Midshaft	14.7*	--
Femur	A-P Subtrochanteric Diameter	--	23.5
	M-L Subtrochanteric Diameter	--	32.3
	A-P Midshaft Diameter	--	24.9*
	M-L Midshaft Diameter	--	24.4*
	Midshaft Circumference	--	78*

Table 2. Postcranial metric data. Measurements taken in mm. – indicates that the measurement was not taken due to absence of materials or bony landmarks. * indicates measurement was taken at approximate location due to reconstruction or landmarks could not clearly be observed due to soil adherence. Max. = maximum. Min = minimum. A-P = anteroposterior. M-L = mediolateral. Prox. = proximal. Dist = distal. Sup-Inf = superior-inferior

References

Aufderheide AC, and Rodríguez-Martín C. 1998. The Cambridge Encyclopedia of Human Paleopathology. Cambridge University Press.

Buikstra JE, Ubelaker DH. 1994. Standards for Data Collection from Human Skeletal Remains. Arkansas Archaeological Survey Research Series No. 44. Fayetteville: Arkansas Archaeological Survey.

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HUMAN REMAINS DOCUMENTATION PACKET

PROVENIENCE

Site Name: Sak. Tzul BPAAP 2018 **Site No.:**

Designation/ID: ST.18.14.9a accession # 2018.07.41a

ST.18.14.9b accession # 2018.07.41b

Observer(s): E. Moes **Date:** Aug. 2019

BIOLOGICAL PROFILE

MNI: 2

Age: adults

Sex: 9a: possible female 9b: unk

Ancestry: Native American

FORM LIST (indicate forms used)

- [X] 1 Skeletal Inventory
- [ ] 2a Age and Sex Assessment - Adult
- [ ] 2b Age Assessment - Juvenile
- [X] 3a Permanent Dental Inventory/Pathology
- [ ] 3b Deciduous Dental Inventory/Pathology
- [X] 4a Dental Morphology - Permanent
- [ ] 4b Dental Morphology - Deciduous
- [X] 5a Measurements - Adult
- [ ] 5b Measurements - Juvenile
- [ ] 6 Non-Metric Traits
- [X] 7 Pathology Checklist
- [ ] 8 Degenerative Joint Disease
- [ ] 9 Spinal Osteophytosis
- [ ] 10 Artificial Cranial Modification
- [ ] 11 Cremated Remains
- [ ] 12 Isolated Remains
- [X] Skeletal Visual Recording Forms
- [X] Additional Forms, Notes, Sketches, Photo Log, etc.

PRESERVATION

- [ ] **Complete skeleton** (>75%)
- [X] **Partial skeleton** (25-75% present)
- [ ] **Fragmentary skeleton** (<25% present, includes at least one complete element)
- [ ] **Fragments of bone** (small amount of fragmented bone; <<25% is present)
- [ ] **Skull** (only cranial remains present and partially preserved)
- [ ] **Teeth** (only loose teeth are present)
- [ ] **Cremated bone** (burned remains of any quantity; excludes cases of incidental charring of otherwise unburned skeleton)
- [ ] **Soft tissues present**

Describe: 9b is fragmentary, only hands and feet. 9a is highly fragmented with few whole bones present.

CONDITION

Yes	No	Unobservable	
[X]	[ ]	[ ]	Cracking
[X]	[ ]	[ ]	Breaks
[ ]	[X]	[ ]	Brittle
[ ]	[X]	[ ]	Exfoliation
[ ]	[X]	[ ]	Warping
[ ]	[X]	[ ]	Cut marks
[X]	[ ]	[ ]	Gnaw marks
[ ]	[X]	[ ]	Root or insect damage
[ ]	[X]	[ ]	Staining
[ ]	[X]	[ ]	Soil adhering

Describe (include severity & elements affected):
9a is in poor condition and cortex is soft. Most elements are fragmented. Gnaw marks present on long bones.

* polishing appears on some elements. This is from washing, regardless of not mortuary treatment. J

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SKELETAL INVENTORY RECORDING FORM (1)

Codes:
f = 1-25% present
p = 25-75% present
c = 75-100% present

Provenience: _____

Designation/ID: ST. 18.14.9a accession # 2018 07 53
ST. 18.14.9b inventory in gray box

CRANIAL	left	right
Frontal	C	C
Parietal	P	P
Occipital	P	P
Temporal	C	F
TMJ		P
Mandible	P	C
Zygomatic	F	
Maxilla	P	F
Nasal	C	C
Lacrimal		
I. N. C.		
Palatine		
Sphenoid	P	
Ethmoid		
Vomer		
Hyoid	C	
Thyroid/Crycoid		
Ossicles (1)	C	
Unident. Cranial (#):		

teeth	#	cond
Incisors	7	C
Canines	4	C
Premolars	9	C (supernumerary)
Molars	2	C
Unidentified Teeth (#):		

AXIAL	#	cond
1st Cervical		F
2nd Cervical		-
3-6 Cervical	2	F
7th Cervical		
1-9 Thoracic		
10th Thoracic	7	F
11th Thoracic		
12th Thoracic		
1-4 Lumbar	2	P
5th Lumbar		C
Sacrum	1	P
Coccyx		

Manubrium		-
Sternal Body		-
xiphoid		-
Left Ribs	7	F-P
Right Ribs	6	F-P
Unidentified Axial (#):		

APPEND.	left	right
Scapula	P	C
glenoid	-	P
Clavicle		P
med. epi.		-
Ilium	P	F
auricular	-	-
Pubis	-	F
symphysis	-	-
Ischium	P	F
acetabulum	F	P
Patella	C	
Unidentified Append. (#):		

APPENDICULAR

	left epi-p	left /prox	left /mid	left /dist	left /epi-d	right epi-p	right /prox	right /mid	right /dist	right /epi-d
Humerus	-	F	P	C	-	P	C	C	C	-
Radius	P	P	P	F	P	-	F	C	C	-
Ulna	F	C	C	F	-	F	F	-	-	-
Femur	P	P	C	F	F	P	C	C	-	F
Tibia	F	P	C	P	P	F	P	C	-	-
Fibula	-	P	P	P	-	-	C	C	F	-

Unidentified Long Bones (#): _____

EXTREMITIES

	#	cond		#	cond
Scaphoid	-	-	Calcaneus	2	F-P
Lunate	1	C	Talus	2	C
Trapezium	-	-	Cuboid	1	C
Trapezoid	-	-	Navicular	2	C
Capitate	2	C	Med. Cuneiform	2	C
Hamate	2	C	Inter. Cuneiform	2	C
Triquetral	1	C	Lat. Cuneiform	2	C
Pisiform	-	-	Metatarsals	8	C
Metacarpals	6	P-C	Prox. Phalanges	4	C
Prox. Phalanges	9	C	Mid. Phalanges	-	-
Mid. Phalanges	7	C	Dist. Phalanges	-	-
Dist. Phalanges	8	C	Sesamoids	-	-
Sesamoids	-	-	***Unident. Extremities (#):***		

Notes: ST. 18.14.9b
Commingled elements?
- L. MC 1
- R. MC 3
- 1st prox. hand phalanx
- R. MT 5
- prox. hand phalanx
- prox. pedal phalanx
- prox. 1st pedal phalanx
- R. calcaneus
- ~~(L or R)~~ MT head

R. hand
hamate, capitate
MC 3, 5

L. hand
capitate, lunate, triquetral, hamate
MC 4, 5, 3

2. foot
navicular, talus, calcaneus, med - lat cuneiforms
MT 2, 3, 4, 5
prox phalanx; 1

L. foot
lateral, cuboid, talus
2d - lat cuneiforms, calcaneus (F)
MT 1, 3, 4, 5
prox phalanges: II

†This form includes information derived from Buikstra and Ubelaker (1994), *Standards for Data Collection from Human Skeletal Remains*, Arkansas Archeological Survey, and is used with permission of the publisher. 1-1

Unsided elements
prox hand phalanges: IIII IIII
mid. hand phalanges: IIII II
dist. hand phalanges: III
prox pedal phalanges: I
MC

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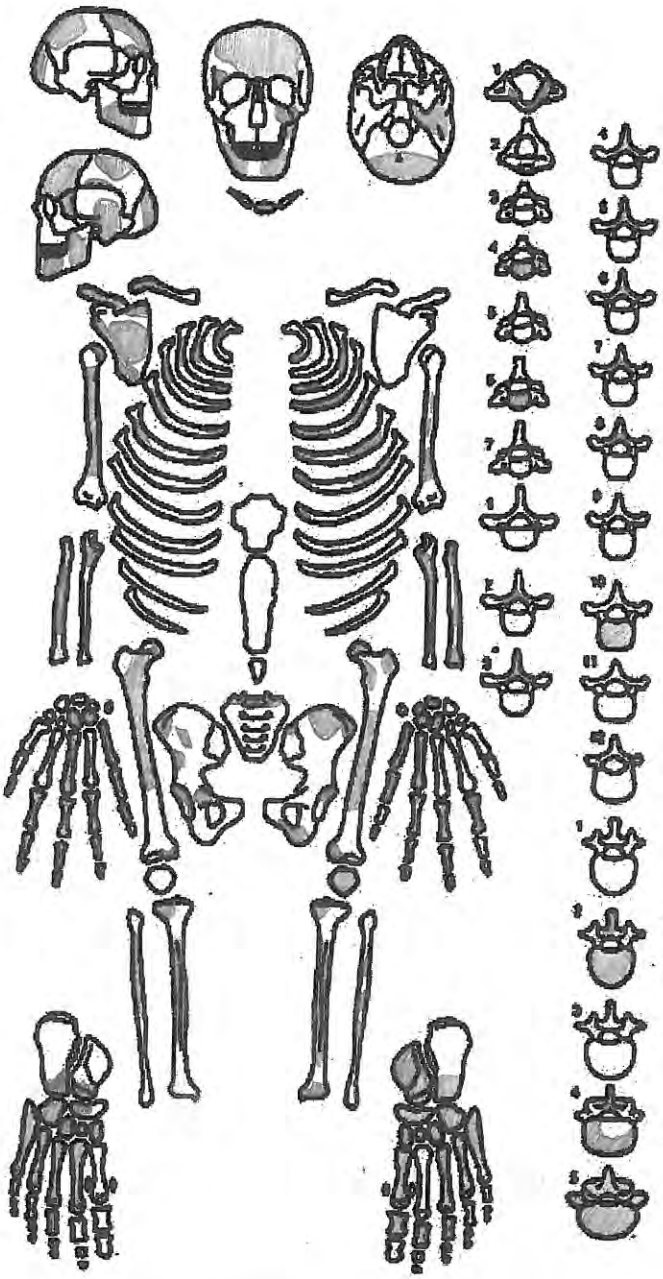
SKELETAL INVENTORY
RECORDING FORM (1)

ST. 18.14.9a
accession # 2018.09.53

Fill in skeletal elements present and record notes along side.
Label "U" if unsided, and "A" to denote approximated location.

Right **Left**



A

A

Comingled elements ST. 18.14.9b

L. MC1
R. MC3
1st prox. hand phalanx
prox hand phalanx

R. MT5
prox pedal phalanx
1st prox. pedal phalanx
R. calcaneus
MT head

ST. 18.14.9b distinguished by significantly larger bones (hands and feet) than 9a.

Additional observations:

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AGE & SEX ASSESSMENT
ADULT - RECORDING FORM (2a)

Age: _____
Sex: _____

Provenience: _____
Designation/ID: ST. 18.14.9a

AGE

PELVIC:		left	right
Pubic Symphysis			
Todd (1-10)		___	___
Suchey-Brooks (1-6)		___	___
Auricular Surface			
Lovejoy et al. (1-8)		___	___

POSTCRANIAL: Epiphyseal Union*			
Clavicle	Sternal epiphysis		___
Vertebral Annular Epiphyses	Cervical	superior	___
		inferior	___
	Thoracic	superior	___
		inferior	___
	Lumbar	superior	___
		inferior	___
Sacrum	S1/S2 fusion		___
Innominate	Iliac crest		___

CRANIAL:	Suture Closure*	
External Cranial Vault	1. Midlambdoid	___
	2. Lambda	___
	3. Obelion	___
	4. Anterior Sagittal	___
	5. Bregma	___
	6. Midcoronal	___
	7. Pterion	___
	8. Sphenofrontal	___
	9. Inf. Sphenotemporal	___
	10. Sup. Sphenotemporal	___
Palatine	11. Incisive Suture	___
	12. Anterior Median	___
	13. Posterior Median	___
	14. Transverse Palatine	___
Internal Cranial Vault	15. Sagittal	___
	16. Left Lambdoid	___
	17. Left Coronal	___

complete

Estimated Age:
- Subadult (12-20 years) ___
- Young Adult (20-35 years) ___
- Middle Adult (35-50 years) X
- Old Adult (50+ years) ___

*Suture and Epiphysis Codes:
0 = open
1 = minimal
2 = significant
3 = complete

Observations: Adult; development complete. Middle adult based on pitch changes and moderately-worn teeth.

SEX

PELVIC:	left	right
Ventral Arc (1-3)	___	___
Subpubic Concavity (1-3)	___	___
Ischiopubic Ramus Ridge (1-3)	___	___
Greater Sciatic Notch (1-5)	___	___
Preauricular Sulcus (0-4)	___	___

Estimated Sex, Pelvis (1-5): ___ = ___

CRANIAL:	
Nuchal Crest (1-5)	2
Mastoid Process (1-5)	2
Supraorbital Margin (1-5)	3
Glabella (1-5)	2
Mental Eminence (1-5)	–

Estimated Sex, Skull (1-5): 2 = possible female

Observations:

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SKELETAL MEASUREMENT
ADULT - RECORDING FORM (5a)

Record all measurements millimeters.

Provenience: _____

Designation/ID: ST. 18 14.9a

CRANIAL

1.	**GOL** Maximum Cranial Length		
2.	**XCB** Maximum Cranial Breadth		
3.	**ZYB** Bizygomatic Breadth		
4.	**BBH** Basion-Bregma Height		
5.	**BNL** Basion-Nasion Length		
6.	**BPL** Basion-Prosthion Length		
7.	**MAB** Maxillo-Alveolar Breadth		
8.	**MAL** Maxillo-Alveolar Length		
9.	**AUB** Biauricular Breadth		
10.	**NPH** Upper Facial Height		
11.	**WFB** Minimum Frontal Breadth		
12.	**FMB** Upper Facial Breadth		
13.	**NLH** Nasal height		
14.	**NLB** Nasal Breadth		
15.	**OBB** Orbital Breadth		
16.	**OBH** Orbital Height		
17.	**EKB** Biorbital Breadth		
18.	**DKB** Interorbital Breadth		
19.	**FRC** Frontal Chord		
20.	**PAC** Parietal Chord		
21.	**OCC** Occipital Chord		
22.	**FOL** Foramen Magnum Length		
23.	**FOB** Foramen Magnum Breadth		
24.	**MDH** Mastoid Length		
25.	**GNI** Chin height		
26.	**HML** Mandibular Body Height		
27.	**TML** Mandibular Body Breadth		
28.	**GOG** Bigonial Width		
29.	**CDL** Bicondylar Breadth		
30.	**WRL** Minimum Ramus Breadth		
31.	**MRL** Maximum Ramus Breadth		
32.	**XRL** Maximum Ramus Height		
33.	**MLT** Mandibular Length		
34.	**MLX** Mandibular Angle		

POSTCRANIAL

		left	right
35.	**Clavicle:** Max. Length		
36.	A-P Diam. Midshaft		
37.	Sup.-Inf. Diam. Midshaft		
38.	**Scapula:** Height		
39.	Breadth		
40.	**Humerus:** Max. Length	–	–
41.	Epicondylar Breadth	–	–
42.	Vertical Diam. Head	–	38.1
43.	Max. Diam. Midshaft	–	18.7*
44.	Min. Diam. Midshaft	–	15.7*
45.	**Radius:** Max. Length		
46.	Ant.-Post. Diam. Midshaft		
47.	Med.-Lat. Diam. Midshaft		
48.	**Ulna:** Max. Length	–	
49.	A-P Diameter	12.1*	
50.	M-L Diameter	14.7*	
51.	Physiological Length	–	
52.	Min. Circumference	–	
53.	**Sacrum:** Anterior Length		
54.	Anterior Superior Breadth		
55.	Max. Trans. Diam. Base		
56.	**Pelvis:** Height		
57.	Iliac Breadth		
58.	Pubis Length		
59.	Ischium Length		
60.	**Femur:** Max. Length	–	–
61.	Bicondylar Length	–	–
62.	Epicondylar Breadth	–	–
63.	Max. Diam. Head	–	–
64.	A-P Subtroch. Diam.	–	23.5
65.	M-L Subtroch. Diam.	–	32.3
66.	A-P Midshaft Diam.	–	24.9*
67.	M-L Midshaft Diam.	–	24.4*
68.	Midshaft Circumference	–	78*
69.	**Tibia:** Max. Length		
70.	Max. Prox.Epiph. Breadth		
71.	Max. Distal Epiph. Breadth		
72.	Max. Diam. Nutrient For.		
73.	M-L Diam. Nutrient For.		
74.	Circ. Nutrient Foramen		
75.	**Fibula:** Max. Length		
76.	Max. Diameter Midshaft		
77.	**Calcaneus:** Max. Length		
78.	Middle Breadth		
79.	**Sternum:** Length Mesostern.		
80.	Max. Breadth 1st		

* = measurement at estimated location

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PATHOLOGY CHECKLIST
RECORDING FORM (7)

Provenience: _____

Designation/ID: ST.18.14.9a

CRANIAL	present	absent	unobs.
Porotic hyperostosis	X		
Cribra orbitalia		X	
Premature synostosis		X	
Osteomas		X	
Periosteal reactions		X	
Lytic reactions		X	
Proliferative reactions		X	
Trauma		X	
Cultural modifications		X	

AXIAL	present	absent	unobs.
Ankylosis		X	
Arch defects		X	
Compression fractures		X	
Schmorl's nodes		X	
Periosteal reactions	X		
Lytic reactions		X	
Osteoporosis		X	
Trauma		X	
Reaction on pleural aspect of ribs	X		
Accessory facets		X	

APPENDICULAR	present	absent	unobs.
Periosteal reaction	X		
Lytic reactions		X	
Proliferative reactions		X	
Osteoporosis		X	
Trauma		X	
Cultural modifications		X	
Osteomyelitis		X	
Exostoses		X	
Accessory facets		X	

EXTREMITIES	present	absent	unobs.
Lytic reactions		X	
Proliferative reactions		X	
Periosteal reactions	X		
Trauma		X	
Exostoses	X		
Accessory facets		X	

Observations (describe pathology in detail and use individual element visual recording forms to illustrate morphology and extent):

See reverse for details

†This form includes information derived from Buikstra and Ubelaker (1994), *Standards for Data Collection from Human Skeletal Remains*, Arkansas Archeological Survey, and is used with permission of the publisher.

ST. 18.14.9a Pathology Notes

Cranium: healed PH on occipital & parietals. Diploic expansion, PH observed on frontal & two

Ribs: at least 2 left ribs (~#5-9) have expanded trabeculae in sternal ends & shafts, so they are ~30% thicker than the other ribs. Two other rib ends are expanded, but only on the pleural side. These ribs (~#4-7) have subchondral breakdown on the ~~external~~ anterior rim of one, and active resorption on the other.

Right rib ends are also expanded, and at least 1 rib is thickened as on the left side. These changes in the ribs are consistent with scurvy and/or rickets in childhood, (Ortner, Rachitic rosary year) A right rib (#11 or 12) has an area of healed, thickened bone deposition (20 x 7 mm) on the lateral/anterior surface that has distinct inf. margins, but integrated sup. margins.

Verts: L3-L5 have moderate lipping on the entire margins of the superior surface of ~~their~~ thier bodies. Anterior portions of the superior annular rings are actively resorbing. There is a smooth-walled, smooth-floored round depression on the lateral surface of the body, just right of the midline. Depression is 7 mm in diam, and 3 mm deep.
Entire annular ring of S1 ~~as~~ has resorbed.

Arms: Minor lipping around entire margin of R. humeral head
Active patches of woven bone growth (2-3 mm in diam) on subscapular fossa
R. scapula has a 2x4 mm hole through the subscapular and infraspinous fossae with rounded margins and no reactive bone surrounding it. This is likely a developmental defect since there is no evidence of trauma.
~~Minor~~ Trace lipping on articular surfaces of left radius.

Charred ends (blackened) of prox. right ulna, rib fragments, and a long bone diaphysis frag.
L. ilium has a 6 x 5 mm hole through the iliac blade. It has rounded margins and no reactive bone surround it. This suggests it is likely developmental rather than traumatic

Feet: Extensive lipping on plantar surface of head of left MT 1. Eburnation on ~~the~~ lateral-most surface of head, with active resorption. Moderate-severe lipping on proximal articular surface of 1st prox. pedal phalanx. Especially pronounced on plantar margin.

Hands: pronounced enthesophytes on palmar surfaces of prox. manual phalanges at distal ends of shafts.
Slight lipping on articular surfaces of L. hamate, L. trapezium, L. lunate, & L. capitate

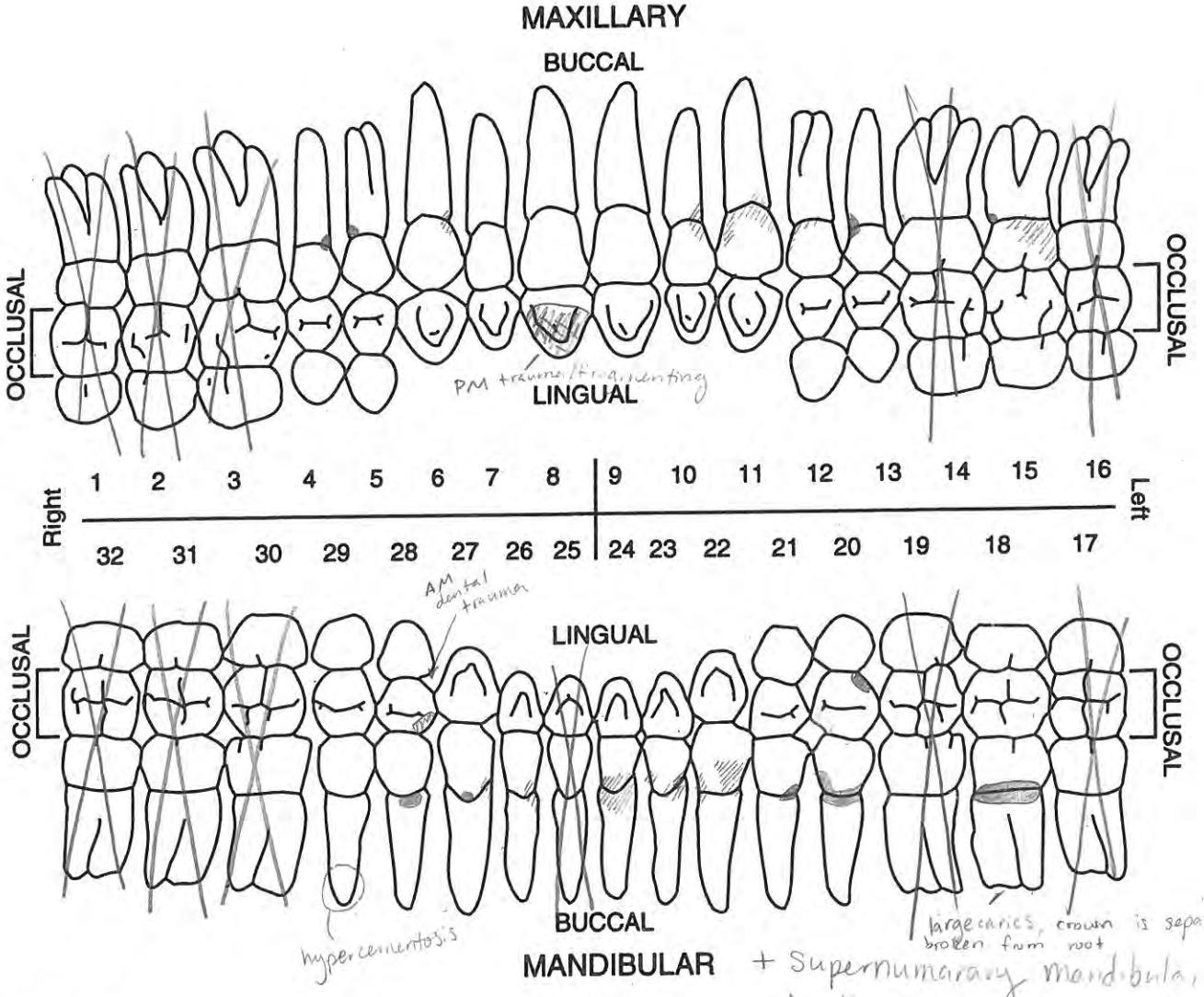
DENTAL INVENTORY
VISUAL RECORDING FORM: PERMANENT DENTITION

Site Name/Number _____/_____ Observer E. Moes

Feature/Burial Number _____/_____ Date 8/23/19

Burial/Skeleton Number _____/ ST. 18. 14.9a

Present Location of Collection UNM LOHO



X = missing

// = calculus

• = caries

+ Supernumerary mandibular tooth that is impacted and crown is erupting lingual to LP_4.

Teeth are friable, especially the roots

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DENTAL INVENTORY & PATHOLOGY
PERMANENT - RECORDING FORM (3a)

Mark a dash if not observable

Provenience: _____

Designation/ID: ST. 18.14 9a

	Right								Left							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Maxilla	M^3	M^2	M^1	PM^2	PM^1	C	I^2	I^1	I^1	I^2	C	PM^1	PM^2	M^1	M^2	M^3
Inventory (1-9)	3	3	3	2	2	2	2	2	2	2	2	2	2	3	2	3
Development (1-14)				14											3	
Caries (1-7)				2	2	0	0	–	0	2	5	0	2		2	
Abcesses (1-2)				0	0	0	0	0	–	–	–	–	–		–	
Calculus (1-3)				1	0	1	1	1	0	1	1	1	1		2	
Chipping (#)																
Periodontitis (1-2)																
Attrition Score*				5	5	5	5	–	5	4	4	3	4		24	
Mesio-Buccal (1-10)				*[Attrition scores: I, C, PM (1-8); M (1-10)]											5	
Mesio-Lingual (1-10)															8	
Disto-Lingual (1-10)															6	
Disto-Buccal (1-10)															5	
M-D diameter (mm)				6.7	7.0	7.9	6.9	–	–	6.7	8.0	7.2	6.9		10.3	
B-L diameter (mm)				9.5	9.6	8.6	6.7	–	7.2	6.8	8.5	9.0	9.6		11.8	
Crown height (mm)																

	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Mandible	M^3	M^2	M^1	PM^2	PM^1	C	I^2	I^1	I^1	I^2	C	PM^1	PM^2	M^1	M^2	M^3
Inventory (1-9)	3	3	3	2	2	2	2	3	2	2	2	2	2	4	2	3
Development (1-14)				14											3	
Caries (1-7)				5	4	4	5		0	0	5,1	2,5	1,4,5		1,6	
Abcesses (1-2)				–	–	–	–	–	–	–	0	0	0		–	
Calculus (1-3)				0	1	1	2		3	2	1	1	0			
Chipping (#)																
Periodontitis (1-2)																
Attrition Score*				1	4	4	5	–	6	4	4	4	3		19	
Mesio-Buccal (1-10)				*[Attrition scores: I, C, PM (1-8); M (1-10)]											5	
Mesio-Lingual (1-10)															4	
Disto-Lingual (1-10)															4	
Disto-Buccal (1-10)															6	
M-D diameter (mm)				6.5	6.6	6.7	6.4	–	–	6.5	6.9	6.6	7.2		10.5	
B-L diameter (mm)				7.8	7.7	7.2	6.2	–	6.2	6.5	7.4	7.2	8.0		10.4	
Crown height (mm)																

Enamel Defects																
Tooth																
Defect No. on Tooth																
Defect Type (1-7)																
Distance from CEJ (mm)																
Color (1-4)																

* Severe periodontal disease given the amount of alveolar resorption in the mandible

RP_4 was likely impacted and not in occlusion given the lack of occlusal wear and presence of impacted supernumerary tooth on the left side.

SPECIMEN NUMBER ST. 18 14.9a DATA COLLECTOR E. Moes DATE 8/23/19

COLLECTION BPAAP COLLECTION LOCATION UNM LOHO

OTHER IDENTIFIERS/NOTES

TRAIT	UI1		UI2		UC		UP3		UP4		UM1		UM2		UM3	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
Winging	0	-														
Diastema	-	-														
Labial Curvature	-	1														
Double Shoveling	-	1	2	1												
Shoveling	-	2	2	2	-	-										
Peg/Reduced tooth			0	0											-	-
Congenital Absence			0	0											-	-
Interruption Groove	-	0	0	0												
Tuberculum Dentale	-	0	3	3	0	0										
Mesial Ridge					-	-										
Distal Accessory Ridge					-	-										
Accessory Cusps							0	0	0	0						
Distosagittal Ridge							0	0								
Mesial Accessory Ridge							-	-	-	-						
Distal Accessory Ridge							-	-	-	-						
Metacone											-	-	-	-	-	-
Hypocone											-	-	-	-	-	-
Cusp 5											-	-	-	0	-	-
Carabelli's											-	-	-	@	-	-
Parastyle											-	-	-	-	-	-
Enamel Extension											-	-	-	-	-	-

SPECIMEN NUMBER ST. 18. 14. 9a DATA COLLECTOR _____ DATE _____

NOTES _____

TRAIT	LI1		LI2		LC		LP3		LP4		LM1		LM2		LM3	
	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R
Shoveling	2	–	1	1												
Congenital Absence	0	–													–	–
Peg/Reduced tooth	0	–														
Distal Accessory Ridge					–	–										
Elongated Form							0	0	0	0						
Premolar Complexity							4	4	–	1						
Anterior Fovea											–	–				
Deflecting Wrinkle											–	–				
Groove Pattern											–	–	–	–	–	–
Cusp Number											–	–	1	–	–	–
Protostylid											–	–	–	–	–	–
Trigonid Crest											–	–	1	–	–	–
Cusp 5											–	–	–	–	–	–
Cusp 6											–	–	–	–	–	–
Cusp 7											–	–	–	–	–	–
Enamel Extension											–	–	–	–	–	–

RARE TRAITS

Talon tooth _____

Mesial Bending _____

Tri-cusped Premolar _____

Odontome _____

Enamel Pearl ULM2

Supernumerary mandibular left supernumerary, lingual to LP_4, has premolar morphology.

Other Observations _____

BPAAP 2018, ST.18.11.15
Accession #: 2018.07.39
Emily Moes

Summary: This individual consists of a primary interment of a 3-6 year-old Native American juvenile. Sex is unknown. Pathological changes are due to non-specific infection, which is especially pronounced in the left arm. The left humerus was fractured near the proximal diaphysis but was well healed. Periosteal reaction can also be observed in the left tibia and right first metacarpal.

Approximately 70% of the skeleton is present. No teeth were recovered, and only a few cranial bones are present. Skeletal remains are in fair to good condition but are fragmented due to taphonomic breakage and compression. Most elements are cracked or broken. All have varying degrees of soil adhesion. Root and water damage have eroded some of the cortex in the bones of the pelvis, legs, and metaphyses.

Three additional elements were found comingled which ST.18.11.15. A left MT1 and distal hand phalanx of an adult skeleton. A right ischium is that of a neonate individual. These comingled elements, found in the burial fill of the primary burial, indicate that the minimum number of individuals for this burial is three.

Burial Context: The burial pit was not well defined, and few rocks were associated with the burial. Larger stones were placed over the cranium and pelvis. This individual was buried in a flexed position on the left side with the head to the north, facing east. Arms are flexed so the hands would have been in front of the chest.

Age Estimation: The final estimated age of ST.18.11.15 is 3-6 years. All observable epiphyses are in open stages of union. The primary ossification centers of the os coxae and sacrum are also open; the thoracic and lumbar vertebrae have mixed stages of union such that the neural arches of the thoracic and lumbar vertebrae have completely fused, and the neural arches have minimal fusion. This stage of union is the primary indicator of age (from Baker et al., 2005) in this individual since dental age estimation is not available.

Sex Estimation: Sex estimation of juveniles has been shown to be highly variable, and inaccurate. For these reasons, sex was not estimated for ST.18.11.15.

Stature: Stature could not be estimated for this individual since femoral, humeral, and tibial lengths could not be measured. These metrics are required for juvenile stature estimation (Danforth et al., 2009) which is likely the most ideal method because regression equations are specific to ancient Maya populations.

Body Mass: There are few methods available to estimate body mass of juveniles. Ruff (2007) estimates body mass using the femoral distal metaphysis, and the femoral head diameter. Robbins et al. (2010) uses cross-sectional properties of the femur. The femur of ST.18.11.15 could not be evaluated examining cross-section geometry, and the functions given in Ruff (2007) begin at a skeletal age older than the ST.18.11.15. As such, body mass was not estimated.

Population Affinity: Based on the location of the burial in a rock shelter in Belize, and relative dating from charcoal to _____BP, the individual is Native American.

Dental Inventory and Pathology: No teeth were recovered in association with this individual.

Skeletal Pathology: Pathological changes in ST.18.11.15 are consistent with nonspecific infection at various locations throughout the body.

The left humerus has a well-healed, but poorly aligned fracture at the proximal diaphysis. There is no evidence of a callus. The proximal portion is displaced at a medial angel relative to the distal portion of approximately 10-20°. (The proximal end of the humerus is missing.) The internal surface of the misaligned portion has a dense, smooth trabecular layer along the walls that converge distally into a smooth but slightly porous filling. This has created a separate section of the medullary cavity so that it is not continuous. Instead, the distal medullary cavity ascends to a bone cyst just lateral to the site of the fracture. The walls and floor are completely smooth, but the margins of the cyst have likely been widened by taphonomic damage. This is likely a unicameral bone cyst, which has been cited as being common at the site of a well-healed fracture (Lewis, 2017, p. 236).

The left ulna and radius also have evidence of infection. The left radius has active, reactive bone growth around the tubercle, with lesions perforating this surface. The pathological changes have been exacerbated by taphonomic damage; a lytic lesion has penetrated through the cortex, into the medullary cavity, where thick trabeculae surrounded the internal margins. The left ulna has healing, reactive bone just inferior to the coronoid process, the affected area is approximately 25 mm in length. The nutrient foramen is enlarged, which has been commonly seen in association with infection.

Skeletal Inventory: Approximately 70% of the skeleton is present. In general, bones that are missing include: almost all cranial bones, clavicles, most cervical vertebrae, most of the scapulae, right tibia and fibula, carpals, and almost all metatarsals and phalanges. Please see the inventory recording forms for a complete list of present and absent materials. Table 1 presents the metric data available for ST.18.11.15.

Element	Measurement	Left (mm)	Right (mm)
Ischium	Length	-	54.0
	Width	-	32.5
Pubis	Length	-	44.3
Humerus	Diameter	13.6*	13.7*
Ulna	Diameter	9.5*	9.1*
Radius	Diameter	9.1*	9.2*
Femur	Diameter	16.7*	17.0*
Tibia	Diameter	15.7*	-
Fibula	Length	-	206*
	Diameter	-	7.7*

Table 1. Metric data for cranial and postcranial elements. * indicates measurement was taken at approximate location due to reconstruction or landmarks could not clearly be observed due to soil adherence

References

Baker BJ, Dupras TL, Tocheri MW. 2005. The Osteology of Infants and Children. 1st Edition. Texas A&M University anthropology series; no. 12.

Danforth ME, Wrobel GD, Armstrong CW, Swanson D. 2009. Juvenile age estimation using diaphyseal long bone lengths among ancient Maya populations. Latin American Antiquity. 20(1): 3-13.

Lewis M. 2017 Paleopathology of Children: Identification of Pathological Conditions in the Human Skeletal Remains of Non-Adults. Academic Press.

Ruff C. 2007. Body size prediction from juvenile skeletal remains. American Journal of Physical Anthropology. 133: 698-716.

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ARIZONA STATE MUSEUM
HUMAN REMAINS DOCUMENTATION PACKET

PROVENIENCE

Site Name: BPAAP 2018 **Site No.:**

Designation/ID: ST. 18. 11. 15

accession #: 2018.07.39

Observer(s): E. Moes **Date:** Sept. 2019

BIOLOGICAL PROFILE

MNI: 3 (1 primary, 2 comingled)

Age: 3-6 yrs

Sex: unknown

Ancestry: Native American

FORM LIST (indicate forms used)

- [X] 1 Skeletal Inventory
- [ ] 2a Age and Sex Assessment - Adult
- [X] 2b Age Assessment - Juvenile
- [ ] 3a Permanent Dental Inventory/Pathology
- [ ] 3b Deciduous Dental Inventory/Pathology
- [ ] 4a Dental Morphology - Permanent
- [ ] 4b Dental Morphology - Deciduous
- [ ] 5a Measurements - Adult
- [X] 5b Measurements - Juvenile
- [ ] 6 Non-Metric Traits
- [ ] 7 Pathology Checklist
- [ ] 8 Degenerative Joint Disease
- [ ] 9 Spinal Osteophytosis
- [ ] 10 Artificial Cranial Modification
- [ ] 11 Cremated Remains
- [ ] 12 Isolated Remains
- [X] Skeletal Visual Recording Forms
- [ ] Additional Forms, Notes, Sketches, Photo Log, etc.

PRESERVATION

- [ ] **Complete skeleton** (>75%)
- [X] **Partial skeleton** (25-75% present)
- [ ] **Fragmentary skeleton** (<25% present, includes at least one complete element)
- [ ] **Fragments of bone** (small amount of fragmented bone; <<25% is present)
- [ ] **Skull** (only cranial remains present and partially preserved)
- [ ] **Teeth** (only loose teeth are present)
- [ ] **Cremated bone** (burned remains of any quantity; excludes cases of incidental charring of otherwise unburned skeleton)
- [ ] **Soft tissues present**

Describe: ~70% present. Almost all cranial bones are missing, as are both clavicles and left scapula. Right fibula and tibia are missing as well as all pedal phalanges and most metatarsals

CONDITION

Yes	No	Unobservable	
[X]	[ ]	[ ]	Cracking
[X]	[ ]	[ ]	Breaks
[ ]	[X]	[ ]	Brittle
[ ]	[X]	[ ]	Exfoliation
[ ]	[X]	[ ]	Warping
[ ]	[X]	[ ]	Cut marks
[ ]	[X]	[ ]	Gnaw marks
[X]	[ ]	[ ]	Root or insect damage
[ ]	[X]	[ ]	Staining
[X]	[ ]	[ ]	Soil adhering

Describe (include severity & elements affected): Most elements are cracked or broken. All have varying degrees of soil adhesion. Root and Gnaw damage has eroded some of the cortex in the bones of pelvis and tea bones, and metaphyses.

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SKELETAL INVENTORY RECORDING FORM (1)

Codes:
f = 1-25% present
p = 25-75% present
c = 75-100% present

Provenience: ____________________

Designation/ID: ST. 18.11.15

CRANIAL	left	right
Frontal		
Parietal		P
Occipital	F	
Temporal		
TMJ		
Mandible		
Zygomatic		
Maxilla		
Nasal		
Lacrimal		
I. N. C.		
Palatine		
Sphenoid		
Ethmoid		
Vomer		
Hyoid		
Thyroid/Crycoid		
Ossicles		
Unident. Cranial (#):		

teeth	#	cond
Incisors		
Canines		
Premolars		
Molars		
Unidentified Teeth (#):		

AXIAL	#	cond
1st Cervical		P
2nd Cervical		P
3-6 Cervical		
7th Cervical		
1-9 Thoracic } (1-9, 10th, 11th Thoracic)	7	P
10th Thoracic		
11th Thoracic		
12th Thoracic		C
1-4 Lumbar		
5th Lumbar		
Sacrum	4	P-C
Coccyx	1	C

	#	cond
Manubrium		C
Sternal Body	3	C (sternebrae)
xiphoid		
Left Ribs	9	P-C
Right Ribs	8	P-C
Unidentified Axial (#):		

APPEND.	left	right
Scapula		F
glenoid		P
Clavicle		
med. epi.		
Ilium	P	P
auricular	C	C
Pubis	–	C
symphysis	–	C
Ischium	P	C
acetabulum	F	C
Patella		
Unidentified Append. (#):		

APPENDICULAR	left epi-p	left prox	left mid	left dist	left epi-d	right epi-p	right prox	right mid	right dist	right epi-d
Humerus	–	P	C	C	–	P	C	C	P	–
Radius	–	C	C	P	–	–	C	C	C	C
Ulna	–	C	C	P	–	–	C	C	C	–
Femur	P	C	C	P	C	P	C	C	–	C
Tibia	C	C	C	–	C					P
Fibula	–	C	C	C	–					

Unidentified Long Bones (#):

EXTREMITIES	#	cond
Scaphoid		
Lunate		
Trapezium		
Trapezoid		
Capitate		
Hamate		
Triquetral		
Pisiform		
Metacarpals	9	P-C
Prox. Phalanges	6	C
Mid. Phalanges	5	C
Dist. Phalanges	3	C
Sesamoids		

	#	cond
Calcaneus	2	C
Talus	2	C
Cuboid	1	C
Navicular		
Med. Cuneiform	1	C
Inter. Cuneiform	2	C
Lat. Cuneiform	2	C
Metatarsals	1	C
Prox. Phalanges		
Mid. Phalanges		
Dist. Phalanges		
Sesamoids		
Unident. Extremities (#):		

Notes:

Right foot
talus
calcaneus
[illegible] cuneiform
[illegible]
cuneiform

Left foot
L. MT3
calcaneus
[illegible] cuboid
[illegible]

Right hand
MC 1, 5
MC diaphysis II

Left hand
MC 2-5
prox phalanx
mid phalanx

†This form includes information derived from Buikstra and Ubelaker (1994), *Standards for Data Collection from Human Skeletal Remains*, Arkansas Archeological Survey, and is used with permission of the publisher.

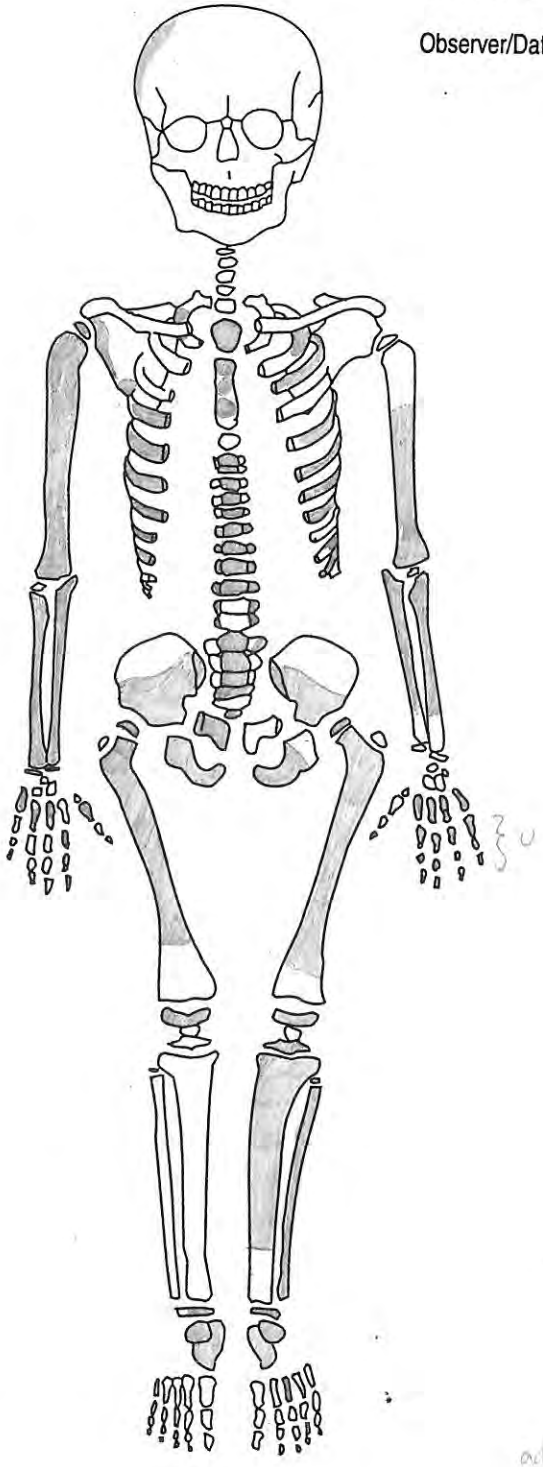
Unsided elements
prox [illegible] phalanges: ||||
mid. hand phalanges: ||||
distal hand phalanges: ||

JUVENILE SKELETON VISUAL RECORDING FORM
a. CHILD ANTERIOR VIEW

Series/Burial/Skeleton ST. 18.11.15

Observer/Date E. Moes

accession #:
2018.07.39



Cervical verts. 2
Thoracic verts. 8
Lumbar verts. 4

Commingled elements
adult { L. MT 1
distal hand phalanx
neonate – R. ischium

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SKELETAL MEASUREMENT
JUVENILE - RECORDING FORM (5b)

Provenience: _____

Designation/ID: ST. 18. 11. 15 accession #: 2018.07.39

CRANIAL

		left	mid	right
1.	**Lesser wing sphenoid:** length	____		____
	width	____		____
2.	**Gr. wing sphenoid:** length	____		____
	width	____		____
3.	**Body sphenoid:** length		____	
	width		____	
4.	**Petrous portion:** length	____		____
	width	____		____
5.	**Basilar part occipital:** length	–		–
	width		–	

		left	right
6.	**Zygomatic:** length	____	____
	width	____	____
7.	**Maxilla:** length	____	____
	height	____	____
	width	____	____
8.	**Mandible:** body length	____	____
	width of arc	____	____
	(½ mandible) full length	____	____

POSTCRANIAL

		left	right
9.	**Clavicle:** length	____	____
	diameter	____	____
10.	**Scapula:** length (ht)	____	–
	width	____	–
	spine length	____	–
11.	**Ilium:** length	–	–
	width	–	–
12.	**Ischium:** length	–	54.0
	width	–	32.5
13.	**Pubis:** length	____	44.3
14.	**Humerus:** length	–	–
	width	–	–
	diameter	13.6*	13.7*

		left	right
15.	**Ulna:** length	–	–
	diameter	9.5*	9.1*
16.	**Radius:** length	–	–
	diameter	9.1*	9.2*
17.	**Femur:** length	–	–
	width	–	–
	diameter	16.7*	17.0*
18.	**Tibia:** length	–	____
	diameter	15.7*	____
19	**Fibula:** length	____	206*
	diameter	____	7.7*

Additional observations:

*: measurement taken at approximate location

Pathology notes

R. MC1 has active, reactive, woven bone growth around the diaphysis, which appears rippling on the dorsal surface. Nonspecific infection. Cortex is thin, internal surface is all trab.

Active periosteal reaction at posterior midshaft of the L. tibia. Affected surface is 3cm in length, and is not observable on the anterior surface.

The L. radius has active, reactive bone growth around the tubercle, with lesions perforating this surface. The path. changes have been exacerbated by taphonomic damage; a lytic lesion has penetrated through the cortex, into the medullary cavity, where thick trabeculae surrounds the internal margins.

L. humerus has a well-healed, poorly aligned fx at the prox. diaphysis. No evidence of a callus, but the proximal portion is displaced medially approximately 10-20°. (Proximal end of humerus is missing.) The internal surface of the misaligned portion has dense, smooth trabecular along the walls that converge distally into a smooth but slightly porous filling so that the medullary cavity of the distal humerus is not continuous with the proximal. Instead, the distal medullary cavity ascends to a lytic cyst just lateral to the site of the fx. Walls and floor are completely smooth, but margins of the cyst have been widened by taph. damage. Unicameral bone cysts (Lewis, 2017, p. 236), common at the site of well healed fx.

L. ulna has healing, reactive bone just inferior to the coronoid process, continuing for 2.5cm. Nutrient foramen is enlarged. Check for ref

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AGE ASSESSMENT
JUVENILE - RECORDING FORM (2b)

Stage of Union:
0 = open
1 = minimal
2 = complete

Provenience: _____

Designation/ID: ST. 18 H.15

Epiphyseal Union

Element	epiphysis	stage of union left	stage of union right
Scapula	coracoid		
	acromium		
Clavicle	sternal		
Humerus	head	0	
	distal		
	med. epicondyle		
Radius	proximal		
	distal		0
Ulna	proximal		
	distal		
Os Coxa	iliac crest	-	-
	ischial tuberosity	0	0
Femur	head	0	0
	greater trochanter	-	-
	lesser trochanter	-	-
	distal	0	0
Tibia	proximal	0	-
	distal	0	0
Fibula	proximal	0	
	distal	0	
Metacarpals	proximal (1st)		
	distal (2-5)	0	
Metatarsals	proximal (1st)		
	distal (2-5)	0	
C. Phalanges	proximal	0	
T. Phalanges	proximal		

Primary Ossification Centers

Element	area of union	stage of union
Innominate	ilium-pubis	0
	ischium-pubis	0 (L), 1 (R)
	ischium-ilium	0
Sacrum	1-2	0
	2-3	0
	3-4	0
	4-5	0
Cervical vertebrae		
	neural arches to each other	
	neural arches to centrum	
Thoracic vertebrae		
	neural arches to each other	2 1-6
	neural arches to centrum	0-1 3-6 yrs
Lumbar vertebrae		
	neural arches to each other	2 1-6
	neural arches to centrum	1 3-6
Cranium		
	basilar suture	
Occipital		
	lateral – squama	
	basilar – lateral	
Mandibular Symphysis		
Metopic Suture		

4-8

Age Assessment

	Age class	Age range in months or years	
Fetus		lunar months	
Infant (birth – 2 yr)		months/years	
Child (2 – 12 yr)	X	years	
Subadult (12-20yr)		years	

Comments (criteria used for age assessment):

3-6 yrs (Baker et al, 2005)

†This form includes information derived from Buikstra and Ubelaker (1994), *Standards for Data Collection from Human Skeletal Remains*, Arkansas Archeological Survey, and is used with permission of the publisher.

BPAAP 2017: ST.18.14.4
Accession #2018.07.44

Emily Moes, Alexis O'Donnell

March 2019

Summary: This individual is a middle adult Native American male. Skeletal pathological changes include healed periosteal reactions, cranial modification, porotic hyperostosis, trauma to the left fibula, lytic lesions, and depressions of unknown etiology. Dental pathological changes are limited to a few caries, little wear, and enamel defects on the mandibular molars. All teeth are present except for two third molars, which are absent due to congenital defect.

Approximately 95% of the skeleton is present and complete. The feet, left *ossa coxa,* lumbar 3-5, sternal body, and most hand elements are missing. All long bones are cracked lengthwise, and most have broken diaphyses. The cranium is fragmented although it has been reconstructed using Elmer's glue. This has revealed tabular cranial modification. Exfoliation and warping mainly affect the epiphyses in the arm. Gnaw marks are present on the right tibia and fibula

Burial Context: ST.18.14.4 is a primary interment of an extended adult, buried prone on a north-south axis with the head in the north, facing down. Burial was located underneath a shelf of the giant boulder in the center of Saki Tzul. Burial was likely originally closed since joints are articulated and bones are in anatomical position. The right ossa coxa and sacrum were rotated to the left and lower lumbar vertebrae as well as left ossa coxa were not recovered. There are two stones under ST.18.14.4 protruding upwards into the pelvic region, which likely caused these elements to be disturbed and/or destroyed upon decomposition. Soil matrix above and below the burial consists of loose, silty soil. No grave goods are associated with this individual. ST.18.14.4 was covered by large rocks over the head and shoulders, as well as around the legs. The burial and grave cut is bound to the east by three additional large (~40 cm) limestone rocks. The left arm was flexed, with the left hand under the face. The right arm was extended under the head. Legs are slightly flexed, with the left leg flexed at approximately a right angle, with distal left tibia crossing above the midshaft of the right tibia. Feet were not recovered, suggesting the grave cut was intruded southeast of the burial, causing the feet to be disturbed.

Age Estimation: We estimate this individual to be 30-39 years of age. Although we used the standard age estimation techniques given by Buikstra and Ubelaker (1994), we place more emphasis on newer methods. Table 1 shows the age estimates from all applied methods.

Method	Elements Used	Estimated Mean Age (yrs)
Todd	Pubic symphysis	35-39
Suchey-Brooks	Pubic symphysis	35
Lovejoy et al.	Auricular surface	35-39
Buckberry and Chamberlain	Auricular surface	38
Transition analysis	Auricular surface, pubic symphysis	30

Table 1: Age estimation methods applied to ST.18.14.4.

Sex Estimation: We estimate that ST.18.14.4 is male based on features of the right *ossa coxa* and cranium. All scorable traits listed in Buikstra and Ubelaker (1994) for sex estimation were observable on

at least one side, with scores of 3 and 4 for the pelvis, and 4 and 5 for the cranium. These are considered masculine trait expressions.

Stature: This individual was 160 – 166 cm tall (Genoves, 1967) according to the estimated length of the right tibia. Although stature is often estimated using the femur and tibia together, the maximum lengths of both bones were not available due to fragmenting.

Body Mass: Body mass was estimated as 58.18 - 64.74 kg based on the maximum diameter of the left femoral head (44.6 mm). Table 2 displays the estimates for a male based on three methods.

Method	Body Mass Estimate (kg)
McHenry, 1992	60.00
Grine et al., 1995	64.74
Ruff et al., 2012	58.18

Table 2: Body mass estimation following three methods using the femoral head diameter.

Population Affinity: Based on this individual's burial location in a rock shelter in Belize and its relative dating to precontact, ST.18.14.4 is Native American.

Dental Analysis:
Dental Inventory:
Teeth present: URM2, URM1, URP4, URP3, URC, URI2, URI1, ULI1, ULI2, ULP3, ULP4, ULM1, ULM2, ULM3, LLM2, LLM1, LLP4, LLP3, LLC, LLI2, LLI1, LRI1, LRI2, LRC, LRP3, LRP4, LRM1, LRM1, LRM2, LRM3
Congenital absence: URM3, LLM3
Teeth missing: none

Dental Pathology: Dental development is complete. Only two caries are present; both are root caries located on ULM2 and ULM3. Dental calculus is present on all teeth, although the amount ranges from slight to severe. Generally, the left posterior teeth have more calculus than the right in both the maxilla and mandible. There is no evidence for abscesses. Dental wear is slight with scores ranging from 1-2 in the anterior teeth of the maxilla, and 1-3 in the mandible. Molar quadrant scores range from 1-5 in both arcades. Linear enamel hypoplasias are observable on the following teeth (defect distance from CEJ): LLP3 (5.8 mm), LRP3 (6.2 mm), LLM2 (5.5 mm, 4.2 mm), LRM2 (3.9 mm), LRM3 (4.5 mm). All defects are cream/white in color. No defects were observable on the maxillary teeth.

Dental Morphology: Most dental morphological features were observable in this individual's dentition since attrition is slight.

Maxilla: winging UI1 (1); diastema UI1 (0); labial curvature UI1 (0); double shoveling UI1 (4), ULI2 (3); shoveling UI1 (4), ULI2 (3), URC (5); peg/reduced tooth URI2 (1), ULI2 (0), URM3 (0), ULM3 (1); congenital absence UI2 (0), URM3 (1), ULM3 (0); tuberculum dentale URC (2); mesial ridge URC (2); distal accessory ridge URC (1); accessory cusps UP3 (0), UP4 (0); distosagittal ridge UP3 (0); mesial accessory ridge URP3 (0), ULP3 (2), URP4 (0), ULP4 (3); distal accesstory ridge URP3 (1); metacone UM1 (4), UM2 (4), ULM3 (2); hypocone UM1 (4), UM2 (3), ULM3 (0); cusp five UM1 (0), UM2 (0), ULM3 (0); Carabelli's cusp UM1 (6), URM2 (2), ULM2 (1), ULM3 (0); parastyle UM1 (0), UM2 (0), ULM3 (2); enamel extension UM2 (2), ULM3 (0).

Mandible: shoveling LI1 (3), LI2 (2); congenital absence LI1 (0), LLM3 (1), LRM3 (0); peg/reduced tooth LI1 (0), distal accessory ridge LC (3); elongated form LP3 (0), LP4 (0); premolar complexity LP3 (1), LLP4 (5), LRP4 (1); anterior fovea LM1 (2); deflecting wrinkle LM1 (0); groove pattern LM1 (0), LLM2 (1), LRM2 (2), LRM3 (2); cusp number LM1 (5), LM2 (5), LRM3 (4); protostylid LLM1 (1), LRM1 (0), LRM2 (0), LRM3 (0), trigonid crest LM1 (0), LM2 (0), LRM3 (0); cusp five LLM1 (4), LRM1 (5), LLM2 (2), LRM3 (0); cusp six LM1 (0), LM2 (0), LRM3 (0); cusp seven LM1 (0), LM2 (0), LRM3 (0); enamel extension LM1 (0), LLM2 (1), LRM2 (0, LRM3 (1).

Skeletal Pathology: Overall, pathological changes include cranial modification, evidence of infection, trauma, and lytic lesions. There is slight lipping on most articular surfaces, especially in the vertebrae as well as the humeral and femoral heads. Depression of unknown etiology are observed on a lumbar vertebra, the right acetabulum, the medial surfaces of the clavicle, and the clavicular notches of the manubrium.

Cranium and Mandible: Although the cranium was fragmented EM reconstructed it in the Laboratory of Human Osteology at UNM using Elmer's glue since it is water soluble. Reconstruction was only done due to some evidence of cranial modification on the frontal and some parietal fragments. After reconstructing the cranial vault, we were able to determine that ST.18.14.4 had tabular cranial modification on both the occipital and frontal bones. Pad descriptions are not possible for the impressions on the occipital since it is fragmented and has taphonomic damage, although pressure was centered at lambda. Pad location on the frontal is low, just below the frontal boss. There is symmetrical reshaping of the anterior aspect of the cranium. Two circular pads were located on the frontal, symmetrically lateral to the midline. Neither bregmatic elevation, binding impression, nor post-coronal depressions are present.

Healed porotic hyperostosis covers the frontal, occipital, and posterior aspects of the parietals; diploë is only slightly thickened. Additional changes to the cranium include lytic lesions that cover the endocranial surface of the left greater wing of the sphenoid. Lesions are 3-6 mm in diameter, with smooth walls and rounded margins. The right side is also affected, but to a lesser degree, such that lesions are only 2-3 mm in diameter. Also, there are approximately a third the number of lesions on the right as compared to the left.

Due to fragmenting of the left mandibular corpus, the internal structures are visible. The mylohyoid canal has ossified with small (1-2 mm) bony spicules protruding around the entire surface. This is within normal human variation since it has been observed in contemporary anatomical samples (Arensburg and Nathan, 1979).

Thorax: With the exception of slight lipping on articular surfaces, the vertebrae exhibit few pathological changes. The superior surface of the body of L1 has a well-defined depression just medial and central to the right pedicle (8.3 x 6.2 mm; AP x ML; 4 mm deep). The depression is actively healing on the anterior half, such that the walls are sloping, and the floor is smooth. The posterior half has rounded edges but are sharp on the posterior-most margin. The floor of the depression is irregular and indistinct in this area since it has an appearance like the underlying trabeculae. At the center of the superior surface, there is dense new bone growth causing the surface to be coarse and bumpy. Connecting this area with the depression, there is an area of smooth, remodeled bone that slopes towards the depression. No pathological changes are observed on the inferior surface of T12. On the anterior margin of the sacral promontory, there is a curved divot at the midline, 3 mm below the normal surface of the body.

The right *ossa coxa* has a deep, healed, round depression (3.8 mm in diameter, 4 mm deep) above the acetabular notch on the lunate surface. Edges are rounded and well-defined. Walls and floor are smooth. The medial surface of the anterior-most portion of the lunate surface has been resorbed and is actively healing. The resorption has created a 16 x 10 mm hole, 5.4 mm deep, with irregular walls and floor, all of which are porotic. Medial margin is poorly defined while the lateral margin is well-defined with rounded edges.

Right and left ribs have slight subchondral exposure on most rib heads with added microporosity in the lower ribs. Similar changes are not seen on the thoracic vertebrae. Both clavicles have a depression in the center of the medial ends. On the right clavicle, this depression is 3.5 mm deep, 4.3 mm in diameter. Edges are rounded, but the walls and floors are irregular, with three internal spiraling ridges. On the left side, the depression is only 1.8 mm in diameter, and has resorbing, microporotic activity on the posterior portion of the medial surface. The left clavicle has an expanded diaphysis, similar to the radius (see below). Corresponding changes are observable on the clavicular notches of the manubrium. The hole in the right notch is larger (4 x 7.1 mm) than the left side (2.2 x 5.3 mm). Both are oval in shape, with rounded, well-defined edges and a depressed, smooth ridge running medio-laterally.

Arms: Both humeri have slight marginal lipping around the entire head. The posterior, anterior, and medial surfaces of the distal radii have observable lines of epiphyseal fusion. The line of fusion can also be seen on the lateral surfaces of the distal epiphyses of both ulnae. The left ulna has an expanded diaphysis such that the cortical bone is thicker, and the medullary cavity is filled with trabecular bone. Overall, the ulna is abnormally heavy. This could possibly be from an internal infection since there is no evidence of a fracture. However, there is neither a cloaca nor periosteal reactive bone. The left radius also has an expanded diaphysis, although it is less extensive than the left ulna. The radius is heavier than normal and has thicker cortical bone. However, the medullary cavity is not filled with trabeculae like the ulna.

Legs: Changes observed in the right acetabulum are not seen on the right femoral head. Instead, both heads have slight lipping around the entire margin. The lateral surfaces of both femora have healed periosteal reactive bone. The right tibia has a patch (40 x 12 mm) of healed periosteal reactive bone on the medial surface, just above midshaft. Similar to the radii and ulnae, the line of epiphyseal fusion is still observable on the medial condyle of the right tibia, 24 mm long. This feature is also observable on the medial condyle of the left tibia, although it is less pronounced. The left fibula has a well-healed, oblique fracture on the proximal diaphysis. This is possibly from a greenstick fracture so that the proximal aspect of the shaft is convexly angled. The callus is roughened, 48.6 mm long, 11.44 mm wide.

Skeletal Inventory: Approximately 95% of the skeleton is complete. Bones are well-preserved although broken. All long bones are cracked along the long axis and broken on the diaphyses. Missing elements include both feet, the left ossa coxa, lumbar vertebrae 3-5, the sternal body, and most bone in the hands. Please see the skeletal inventory forms for a complete list of what is present. Where possible, standard metrics were taken, especially by fitting fragmented pieces together. Please refer to the skeletal measurement recording form for a list of all metrics.

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HUMAN REMAINS DOCUMENTATION PACKET

PROVENIENCE

Site Name: Sak. Tzul BPAAP 2018 **Site No.:**

Designation/ID: ST. 18. 14 4

accession # 2018.07.44

Observer(s): E. Moes, A. O'Donnell **Date:** Mar 2019

BIOLOGICAL PROFILE

MNI: 1

Age: 30-39

Sex: male

Ancestry: Native American

FORM LIST (indicate forms used)

- [X] 1 Skeletal Inventory
- [X] 2a Age and Sex Assessment - Adult
- [ ] 2b Age Assessment - Juvenile
- [X] 3a Permanent Dental Inventory/Pathology
- [ ] 3b Deciduous Dental Inventory/Pathology
- [X] 4a Dental Morphology - Permanent
- [ ] 4b Dental Morphology - Deciduous
- [X] 5a Measurements - Adult
- [ ] 5b Measurements - Juvenile
- [ ] 6 Non-Metric Traits
- [X] 7 Pathology Checklist
- [ ] 8 Degenerative Joint Disease
- [ ] 9 Spinal Osteophytosis
- [X] 10 Artificial Cranial Modification
- [ ] 11 Cremated Remains
- [ ] 12 Isolated Remains
- [X] Skeletal Visual Recording Forms
- [X] Additional Forms, Notes, Sketches, Photo Log, etc.

PRESERVATION

- [X] **Complete skeleton** (>75%)
- [ ] **Partial skeleton** (25-75% present)
- [ ] **Fragmentary skeleton** (<25% present, includes at least one complete element)
- [ ] **Fragments of bone** (small amount of fragmented bone; <<25% is present)
- [ ] **Skull** (only cranial remains present and partially preserved)
- [ ] **Teeth** (only loose teeth are present)
- [ ] **Cremated bone** (burned remains of any quantity; excludes cases of incidental charring of otherwise unburned skeleton)
- [ ] **Soft tissues present**

Describe: Most elements are present and complete. Feet, left os coxa, lumbar 3-5, sternal body, and most hand elements are missing.

CONDITION

Yes	No	Unobservable	
[X]	[ ]	[ ]	Cracking
[X]	[ ]	[ ]	Breaks
[ ]	[X]	[ ]	Brittle
[X]	[ ]	[ ]	Exfoliation
[X]	[ ]	[ ]	Warping
[ ]	[X]	[ ]	Cut marks
[X]	[ ]	[ ]	Gnaw marks
[X]	[ ]	[ ]	Root or insect damage
[ ]	[X]	[ ]	Staining
[ ]	[X]	[ ]	Soil adhering

Describe (include severity & elements affected):
All long bones are cracked lengthwise, and most are broken on the diaphysis. Cranium is fragmented. Overall, bones are in good condition. Exfoliation and warping mainly affects the arm epiphyses. Gnaw marks are present on the right tibia and fibula.

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SKELETAL INVENTORY RECORDING FORM (1)

Codes:
f = 1-25% present
p = 25-75% present
c = 75-100% present

Provenience: BPAAP 2018 Sak Tzul, Unit 14, burial C4

Designation/ID: ST. 18. 14. 4

CRANIAL	left	right
Frontal	p	p
Parietal	p	p
Occipital	c	c
Temporal		p
TMJ		c
Mandible	c	c
Zygomatic	c	c
Maxilla	c	c
Nasal	c	-
Lacrimal	c	c
I. N. C.	c	c
Palatine	c	c
Sphenoid	p	p
Ethmoid		
Vomer	c	
Hyoid	c	
Thyroid/Crycoid		
Ossicles		
Unident. Cranial (#):		

teeth	#	cond
Incisors	4	c
Canines	4	c
Premolars	8	c
Molars	10	c
Unidentified Teeth (#):		

AXIAL	#	cond
1st Cervical		c
2nd Cervical		c
3-6 Cervical	4	c
7th Cervical		c
1-9 Thoracic	9	c
10th Thoracic		c
11th Thoracic		c
12th Thoracic		c
1-4 Lumbar	2	c
5th Lumbar		
Sacrum	5	c
Coccyx	1	c

	#	cond
Manubrium		c
Sternal Body		
xiphoid		
Left Ribs	12	c
Right Ribs	12	c
Unidentified Axial (#):		

APPEND.	left	right
Scapula	c	c
glenoid	c	c
Clavicle	c	c
med. epi.	c	c
Ilium		c
auricular		c
Pubis		c
symphysis		c
Ischium		c
acetabulum		c
Patella	c	c
Unidentified Append. (#):		

APPENDICULAR	left epi-p	left prox	left mid	left dist	left epi-d	right epi-p	right prox	right mid	right dist	right epi-d
Humerus	c	c	c	c	c	c	c	p	c	c
Radius	c	c	c	c	c	c	c	c	c	c
Ulna	c	c	c	c	c	c	c	c	c	c
Femur	c	c	c	c	c	c	c	f	c	c
Tibia	c	c	c	c	c	c	c	p	c	c
Fibula	c	c	p	-	-	c	c	c	c	c

Unidentified Long Bones (#):

EXTREMITIES	#	cond
Scaphoid		
Lunate	1	c
Trapezium	1	c
Trapezoid		
Capitate	1	c
Hamate		
Triquetral		
Pisiform		
Metacarpals	2	c
Prox. Phalanges	1	c
Mid. Phalanges		
Dist. Phalanges	3	c
Sesamoids		

	#	cond
Calcaneus		
Talus		
Cuboid		
Navicular		
Med. Cuneiform		
Inter. Cuneiform		
Lat. Cuneiform		
Metatarsals		
Prox. Phalanges		
Mid. Phalanges		
Dist. Phalanges		
Sesamoids		
Unident. Extremities (#):		

R. hand
trapezium
MC1

L. hand
capitate, lunate
MC4

Notes:

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unsided hand elements
distal phalanges: III
prox. phalanges: I

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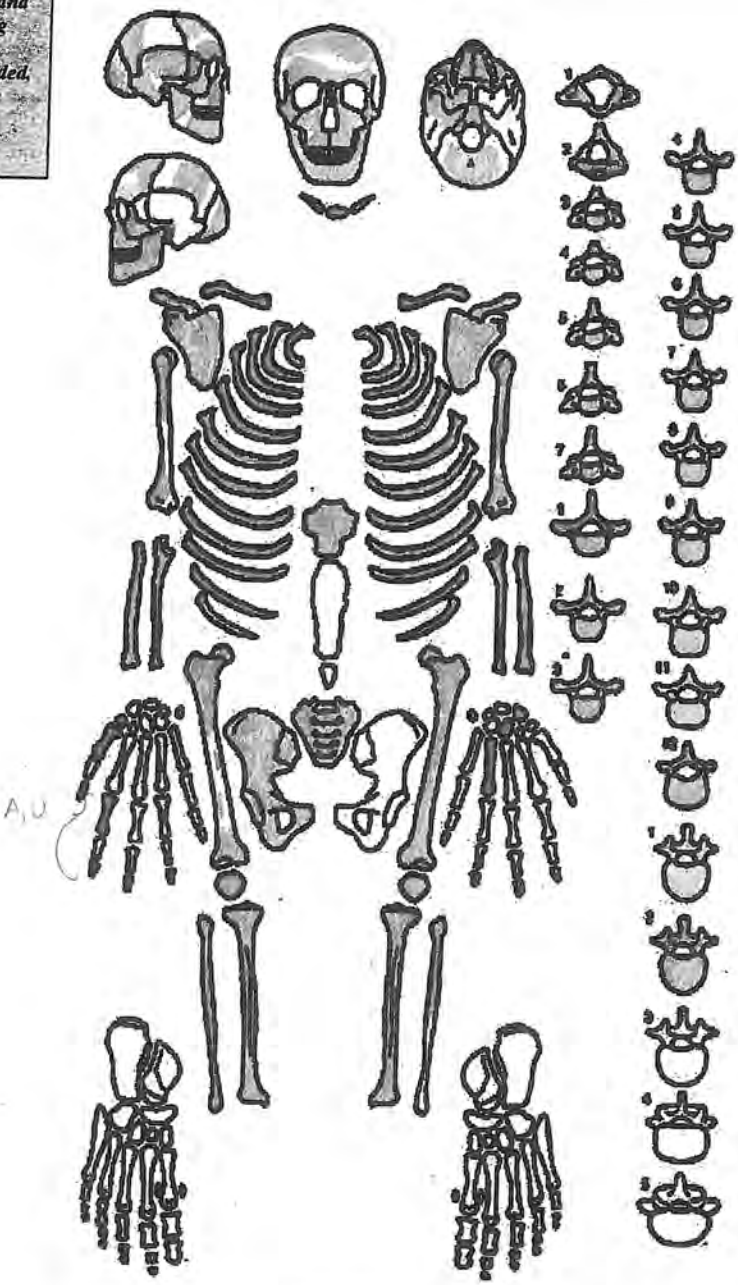
SKELETAL INVENTORY
RECORDING FORM (1)

ST. 18 14.4
accession #

Fill in skeletal elements present and record notes along side.
Label "U" if unsided, and "A" to denote approximated location.

Right **Left**



A, U

Additional observations:

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SKELETAL MEASUREMENT
ADULT - RECORDING FORM (5a)

Record all measurements millimeters.

Provenience: _____

Designation/ID: ST. 18. 14. 4

CRANIAL

1. **GOL** Maximum Cranial Length	–	18. **DKB** Interorbital Breadth	–
2. **XCB** Maximum Cranial Breadth	–	19. **FRC** Frontal Chord	–
3. **ZYB** Bizygomatic Breadth	–	20. **PAC** Parietal Chord	–
4. **BBH** Basion-Bregma Height	–	21. **OCC** Occipital Chord	–
5. **BNL** Basion-Nasion Length	–	22. **FOL** Foramen Magnum Length	–
6. **BPL** Basion-Prosthion Length	–	23. **FOB** Foramen Magnum Breadth	–
7. **MAB** Maxillo-Alveolar Breadth	–	24. **MDH** Mastoid Length	–
8. **MAL** Maxillo-Alveolar Length	–	25. **GNI** Chin height	40.4
9. **AUB** Biauricular Breadth	–	26. **HML** Mandibular Body Height	38
10. **NPH** Upper Facial Height	–	27. **TML** Mandibular Body Breadth	12.8
11. **WFB** Minimum Frontal Breadth	–	28. **GOG** Bigonial Width	–
12. **FMB** Upper Facial Breadth	–	29. **CDL** Bicondylar Breadth	–
13. **NLH** Nasal height	–	30. **WRL** Minimum Ramus Breadth	29.9
14. **NLB** Nasal Breadth	–	31. **MRL** Maximum Ramus Breadth	39
15. **OBB** Orbital Breadth	–	32. **XRL** Maximum Ramus Height	56
16. **OBH** Orbital Height	–	33. **MLT** Mandibular Length	90*
17. **EKB** Biorbital Breadth	–	34. **MLX** Mandibular Angle	31

POSTCRANIAL

	left	right		left	right
35. **Clavicle:** Max. Length	–	140	60. **Femur:** Max. Length	–	–
36. A-P Diam. Midshaft	14.3	12.8	61. Bicondylar Length	–	–
37. Sup.-Inf. Diam. Midshaft	10.1	10.4	62. Epicondylar Breadth	–	81.5
38. **Scapula:** Height	147	–	63. Max. Diam. Head	44.6	44.5
39. Breadth	96.4	–	64. A-P Subtroch. Diam.	25.4	–
40. **Humerus:** Max. Length	–	–	65. M-L Subtroch. Diam.	32.6	–
41. Epicondylar Breadth	61.3	–	66. A-P Midshaft Diam.	28.1*	–
42. Vertical Diam. Head	43.2	43.7	67. M-L Midshaft Diam.	27*	–
43. Max. Diam. Midshaft	24*	–	68. Midshaft Circumference	89*	–
44. Min. Diam. Midshaft	16.3*	–	69. **Tibia:** Max. Length	–	355*
45. **Radius:** Max. Length	241*	–	70. Max. Prox.Epiph. Breadth	–	77.6
46. Ant.-Post. Diam. Midshaft	12.1*	11.8*	71. Max. Distal Epiph. Breadth	46.4	50.3
47. Med.-Lat. Diam. Midshaft	13.9*	14.7*	72. Max. Diam. Nutrient For.	41.1	38.8*
48. **Ulna:** Max. Length	258	259	73. M-L Diam. Nutrient For.	32.2	31*
49. A-P Diameter	19.3	18.3	74. Circ. Nutrient Foramen	111	113*
50. M-L Diameter	16.2	14.3	75. **Fibula:** Max. Length	–	–
51. Physiological Length	230	231	76. Max. Diameter Midshaft	–	–
52. Min. Circumference	40		77. **Calcaneus:** Max. Length	–	–
53. **Sacrum:** Anterior Length	103*		78. Middle Breadth	–	–
54. Anterior Superior Breadth	109				
55. Max. Trans. Diam. Base	53.5		79. **Sternum:** Length Mesostern.	–	
56. **Pelvis:** Height	202		80. Max. Breadth 1st	47.6	
57. Iliac Breadth	145				
58. Pubis Length	94				
59. Ischium Length	89				

*: estimated location

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AGE & SEX ASSESSMENT
ADULT - RECORDING FORM (2a)

Age: _____
Sex: _____

Provenience: _____

Designation/ID: ST. 18-14-4

AGE

PELVIC:		left	right
Pubic Symphysis			
Todd (1-10)		___	7 (35-39)
Suchey-Brooks (1-6)		___	4 (35)
Auricular Surface			
Lovejoy et al. (1-8)		___	4 (35-39)

POSTCRANIAL: Epiphyseal Union*			
Clavicle	Sternal epiphysis		C
Vertebral Annular Epiphyses	Cervical	superior	C
		inferior	C
	Thoracic	superior	C
		inferior	C
	Lumbar	superior	C
		inferior	C
Sacrum	S1/S2 fusion		C
Innominate	Iliac crest		C

CRANIAL:	Suture Closure*	
External Cranial Vault	1. Midlambdoid	___
	2. Lambda	___
	3. Obelion	___
	4. Anterior Sagittal	___
	5. Bregma	___
	6. Midcoronal	___
	7. Pterion	___
	8. Sphenofrontal	___
	9. Inf. Sphenotemporal	___
	10. Sup. Sphenotemporal	___
Palatine	11. Incisive Suture	___
	12. Anterior Median	___
	13. Posterior Median	___
	14. Transverse Palatine	___
Internal Cranial Vault	15. Sagittal	___
	16. Left Lambdoid	___
	17. Left Coronal	___

Estimated Age:
Subadult (12-20 years) ___
Young Adult (20-35 years) ___
Middle Adult (35-50 years) ___
Old Adult (50+ years) ___

Suture and Epiphysis Codes:
0 = open
1 = minimal
2 = significant
3 = complete

Observations:

SEX

PELVIC:	left	right
Ventral Arc (1-3)	___	3
Subpubic Concavity (1-3)	___	3
Ischiopubic Ramus Ridge (1-3)	___	3
Greater Sciatic Notch (1-5)	___	4
Preauricular Sulcus (0-4)	___	0

Estimated Sex, Pelvis (1-5): ___ = 5

CRANIAL:	
Nuchal Crest (1-5)	5
Mastoid Process (1-5)	5
Supraorbital Margin (1-5)	5
Glabella (1-5)	5
Mental Eminence (1-5)	4

Estimated Sex, Skull (1-5): 5 = male

Observations:

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Buckberry and Chamberlain, 2002.

Age estimation from auricular

	Right
Transverse organization	5
Surface Texture	1
Microporosity	1
Macroporosity	1
Apical changes	1

9 = stage III

⇒ mean age 37.86 ± 13.08 yrs

Transition Analysis Scoring

Case/Site/Collection: _____ **ID:** ST.18.14.4

Observer: E. Moss Date: 06 / 17 / 2019

Cranial Sutures	**Left**	**Right**
Coronal Pterica	-1 2 3 4 5	-1 2 3 4 5
Sagittal Obelica (midline)	-1 2 3 4 5	
Lambdoidal Asterica	-1 2 3 4 5	-1 2 3 4 5
Interpalatine (midline)	-1 3 4 5	
Zygomaticomaxillary	-1 2 3 4 5	-1 2 3 4 5

Pubic Symphysis	**Left**	**Right**
Symphyseal Relief	-1 2 3 4 5 6	-1 2 3 4 5 6
Symphyseal Texture	-1 2 3 4	-1 2 3 4
Superior Apex	-1 2 3 4	-1 2 3 4
Ventral Symphyseal Margin	-1 2 3 4 5 6 7	-1 2 3 4 5 6 7
Dorsal Symphyseal Margin	-1 2 3 4 5	-1 2 3 4 5

Iliac Auricular Surface	**Left**	**Right**
Superior Demiface Topography	-1 2 3	-1 2 3
Inferior Demiface Topography	-1 2 3	-1 2 3
Superior Surface Morphology	-1 2 3 4 5	-1 2 3 4 5
Middle Surface Morphology	-1 2 3 4 5	-1 2 3 4 5
Inferior Surface Morphology	-1 2 3 4 5	-1 2 3 4 5
Inferior Surface Texture	-1 2 3	-1 2 3
Superior Posterior Iliac Exostoses	-1 2 3 4 5 6	-1 2 3 4 5 6
Inferior Posterior Iliac Exostoses	-1 2 3 4 5 6	-1 2 3 4 5 6
Posterior Exostoses	-1 2 3	-1 2 3

Codes: - (Missing or Not Observable), 1-7 (defined in Transition Analysis manual)

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ARTIFICIAL CRANIAL MODIFICATION RECORDING FORM (10)

Provenience: _____

Designation/ID: ST. 18. 14.4

ARTIFICIAL CRANIAL MODIFICATION: 1
1. Tabular
2. Circumferential
3. Other (describe)

Description:

POSTERIOR ASPECT

Deformation present: 1
1. Yes
2. No

Pressure centered at: 1
1. Lambda
2. Squamous portion of occipital
3. Below inion

Plane of pressure: _____
(relation to transverse plane)
1. Perpendicular (90°)
2. Obtuse (>90°)

Any of the following present? _____
1. Sagittal elevation
2. Lambdic elevation
3. Lambdic depression

Pad impressions: _____
0. No pad impressions
1. One pad
2. Two pads
3. More than two pads

Pad location: _____
1. Midline
2. Symmetrically lateral to midline
3. Asymmetrically left
4. Asymmetrically right

Pad shape: _____
1. Circular or oval
2. Donut-shaped
3. Triangular
4. Irregular form

Impression of bindings visible: _____
1. Yes (describe below)
2. No

ANTERIOR ASPECT

Cranial deformation present: 1
1. Yes
2. No

Pad location: 2
1. High, near coronal suture
2. Low, near or below frontal boss

Symmetrical reshaping? 1
1. Yes
2. No, right side more deformed
3. No, left side more deformed

Bregmatic elevation? 2
1. Yes
2. No

Pad impressions: 2
0. No pad impressions
1. One pad
2. Two pads

Pad location: 2
1. Midline
2. Symmetrically lateral to midline
3. Asymmetrically left
4. Asymmetrically right

Pad shape: 1
1. Circular or oval
2. Donut-shaped
3. Triangular
4. Irregular form

Impression of bindings visible: 2
1. Yes (describe below)
2. No

Post-coronal depression present? 2
1. Yes
2. No

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PATHOLOGY CHECKLIST
RECORDING FORM (7)

Provenience: _____

Designation/ID: ST.18.14.4

CRANIAL	present	absent	unobs.
Porotic hyperostosis	X		
Cribra orbitalia		X	
Premature synostosis		X	
Osteomas		X	
Periosteal reactions		X	
Lytic reactions	X		
Proliferative reactions		X	
Trauma		X	
Cultural modifications	X		

AXIAL	present	absent	unobs.
Ankylosis		X	
Arch defects		X	
Compression fractures		X	
Schmorl's nodes		X	
Periosteal reactions		X	
Lytic reactions		X	
Osteoporosis		X	
Trauma		X	
Reaction on pleural aspect of ribs		X	
Accessory facets		X	

APPENDICULAR	present	absent	unobs.
Periosteal reaction	X		
Lytic reactions	X		
Proliferative reactions		X	
Osteoporosis		X	
Trauma	X		
Cultural modifications		X	
Osteomyelitis		X	
Exostoses		X	
Accessory facets		X	

EXTREMITIES	present	absent	unobs.
Lytic reactions			X
Proliferative reactions			X
Periosteal reactions			X
Trauma			X
Exostoses			X
Accessory facets			X

Observations (describe pathology in detail and use individual element visual recording forms to illustrate morphology and extent):

Please see the attached notes

†This form includes information derived from Buikstra and Ubelaker (1994), *Standards for Data Collection from Human Skeletal Remains*, Arkansas Archeological Survey, and is used with permission of the publisher.

Pathology notes

GET / ~~HTTP/1.1~~
Host: ~~129.24.98.220:9100~~

- Right and left ribs have slight subchondral exposure on most rib heads with added microporosity in the lower ribs. Similar changes are not seen on the thoracic vertebrae.
- Overall, all bones are robust, which makes sense for a male in the estimated age range.
- Sup. surface of the body of L1 has a well-defined depression just medial and central to ~~tel~~ the right pedicle (8.3 x 6.2 mm AP x ML, 4 mm deep). The depression is actively healing on the anterior half, such that the walls are sloping and the floor is smooth. The posterior half has rounded edges but are slightly sharp on the posterior margin. The floor of the depression is irregular and indistinct in this area since it has an appearance like the underlying trabecular bone. At the center of the superior surface, there is dense new bone growth causing the surface to be coarse and bumpy. Connecting this area with the depression, there is an area of smooth, remodeled bone that slopes towards the depression. No pathological changes are observed on the inf. surface of the T12 body.
- All vert superior and inferior art surfaces have slight lipping.
- Sacrum: ant. promontory has a curved divot at the midline, 3-4 mm below the normal surface of the body. This may have been from a healed compression fx.
- L fibula has a well-healed oblique fx on the prox diaphysis, possibly from a greenstick fx so that the [illegible] aspect of the shaft is convexly angled. Callus is rougned, 48.6 long, 11.44 mm wide
- Healed PH throughout the occipital, parietal, and frontal bones

Right ossa coxa has a deep, healed round hole above the acetabular notch. 3.8 mm in diameter, 4 mm deep. Edges are rounded, well-defined, and the walls and floor are smooth. The medial surface of the ant.-most portion of the lunate surface has been resorbed and is actively healing. The resorption has created a 16 x 0 mm hole, 5.4 mm deep, with irregular walls and floor which are macroporotic. Medial margin is poorly defined while the lateral margin is well-defined with rounded edges.

- Corresponding changes are not seen on the right femoral head. Instead, both heads have slight lipping around the entire margin. Also, the lateral surfaces of both femora have healed periosteal reactive bone.
- R. tibia has a small patch (40 x 12 mm) of healed periosteal reactive bone on the medial surface, just above midshaft. Line of epiphyseal fusion is still observable on the medial condyle, 24 mm long. This feature is also observable on the medial condyle of the left tibia, although less pronounced.
- R & L humeri have slight marginal lipping around the entire head.
- Posterior, anterior, and medial surfaces of the distal R & L radii have observable ~~l~~ lines of epiphyseal fusion. Line of fusion can also be seen on the lateral surfaces of the distal epiphyses of both ulnae.
- L. ulna has expanded diaphysis such that the cortical bone is thicker and the medullary cavity is filled with trabecular bone. Overall, the ulna is abnormally heavy and thick. This could possibly be from an internal infection since there's no evidence of a fracture. However, there is neither a cloaca or periosteal reactive bone. →

- L. radius also has an expanded diaphysis, although it is less extensive than the left ulna. The radius is heavier than normal and also has a thicker cortical bone. However, the medullary cavity is not filled with trabeculae like the ulna.
- Both clavicles have a depression in the center of the medial ends. On the right clavicle, this depression is like a 3.5 mm deep hole, 4.2 mm in diameter. Edges are rounded, but the walls and floor are irregular, but have 3 internal spiraling ridges. On the left side the depression is only 1.8 mm in diameter but has resorbing, microporotic activity on the posterior portion of the medial surface. L clavicle has expanded diaphysis, like the radius.
- Corresponding changes are observable on the clavicular notches of the Sternum. The hole on the right notch is larger (4 x 7.1 mm) than on the left side (2.2 x 5.3 mm). Both are oval in shape, with rounded, well defined edges, and a depressed ridge running m-L that is smooth. No associated porotic changes.
- Large lytic lesions covering the endocranial surface of the left greater wing of the sphenoid. Lesions are 3-6 mm in diameter. They have smooth walls and rounded margins. The right side is also affected, but to a lesser degree, such that lesions are 2-3 mm in diameter. There are approximately 1/3 the number of lesions on the right as compared to the left.
- Healed PH covers the frontal, occipital, and posterior aspects of the parietals.

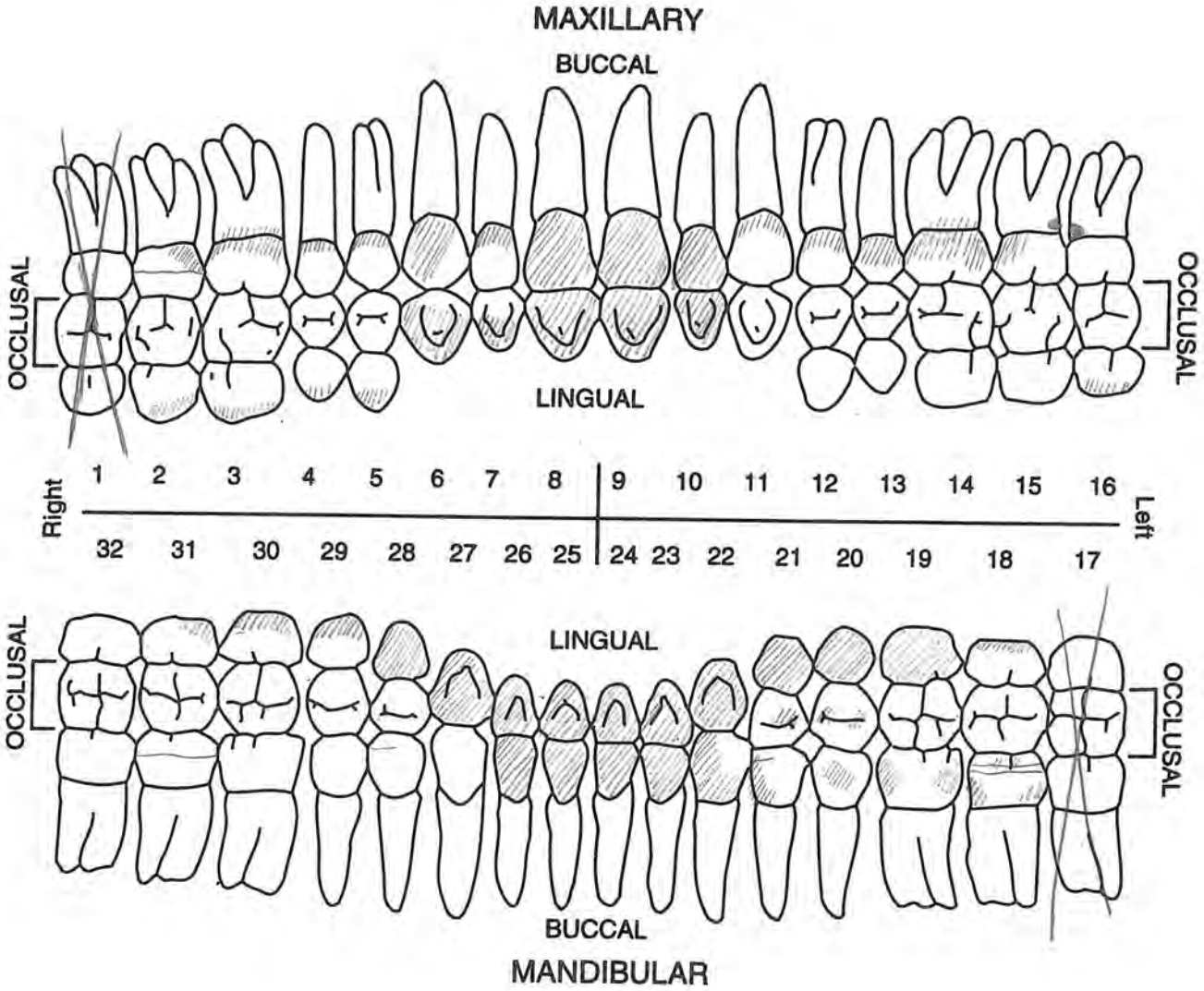
DENTAL INVENTORY
VISUAL RECORDING FORM: PERMANENT DENTITION

Site Name/Number BPAAP / Observer E. Moes

Feature/Burial Number / Date 7/08/19

Burial/Skeleton Number / ST. 18.14.4

Present Location of Collection UNM 1040



X = congenital absence

/// = calculus

— = enamel hypoplasia

● = caries

Unless otherwise noted, all [illegible] practices

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DENTAL INVENTORY & PATHOLOGY
PERMANENT - RECORDING FORM (3a)

Mark a dash if not observable

Provenience: _____

Designation/ID: ST 18. 14. 4

	Right								Left							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Maxilla	M^3	M^2	M^1	PM^2	PM^1	C	I^2	I^1	I^1	I^2	C	PM^1	PM^2	M^1	M^2	M^3
Inventory (1-9)	6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Development (1-14)	-	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Caries (1-7)	-	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5
Abcesses (1-2)	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Calculus (1-3)	-	2	2	2	1	1	2	2	2	1	1	2	3	3	2	1
Chipping (#)	-															
Periodontitis (1-2)	-															
Attrition Score*	-	13	14	1	1	1	1	1	1	2	2	1	1	15	16	7
Mesio-Buccal (1-10)	-	3	4	*[Attrition scores: I, C, PM (1-8); M (1-10)]										3	3	1
Mesio-Lingual (1-10)	-	3	3											4	4	2
Disto-Lingual (1-10)	-	4	4											4	4	2
Disto-Buccal (1-10)	-	3	3											4	5	2
M-D diameter (mm)	-	9.6	10.4	6.6	6.5	7.5	5.2	8.3	8.0	6.2	7.8	6.9	6.4	10.6	9.4	7.3
B-L diameter (mm)	-	12.7	12.6	9.5	10.1	8.7	5.1	7.7	7.6	6.0	8.8	10.1	9.7	12.8	12.5	10.1
Crown height (mm)	-	9.5	11.0	7.9	6.6	11.0	9.3	11.9	11.4	10.0	12.0	-	-	-	9.5	5.6

	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Mandible	M^3	M^2	M^1	PM^2	PM^1	C	I^2	I^1	I^1	I^2	C	PM^1	PM^2	M^1	M^2	M^3
Inventory (1-9)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	6
Development (1-14)	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	
Caries (1-7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Abcesses (1-2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Calculus (1-3)	0	1	2	3	2	3	1	1	2	3	3	2	2	3	1	-
Chipping (#)																-
Periodontitis (1-2)																-
Attrition Score*	5	10	11	2	2	3	2	3	3	3	2	3	2	16	14	-
Mesio-Buccal (1-10)	2	4	5	*[Attrition scores: I, C, PM (1-8); M (1-10)]										5	4	-
Mesio-Lingual (1-10)	1	1	1											4	3	-
Disto-Lingual (1-10)	1	1	1											3	3	-
Disto-Buccal (1-10)	1	4	4											4	4	-
M-D diameter (mm)	11.9	10.6	12.5	6.8	6.7	6.7	5.9	4.7	4.6	5.7	6.7	6.7	5.9	11.9	10.8	-
B-L diameter (mm)	11.3	11.3	12.0	7.9	8.3	8.7	6.1	5.9	5.6	6.3	8.4	8.1	8.05	11.2	11.5	-
Crown height (mm)	8.2	7.5	7.5	7.7	8.4	11.6	8.6	7.6	7.3	8.2	12.0	8.9	7.1	7.3	8.4	-

Enamel Defects																
Tooth	LP_3	RP_3	LM_2	LM_2	RM_2	RM_2										
Defect No. on Tooth	1	1	1	2	1	1										
Defect Type (1-7)	1	1	1	1	1	1										
Distance from CEJ (mm)	5.8	6.2	5.5	4.2	3.9	4.5										
Color (1-4)	2	2	2	2	2	2										

SPECIMEN NUMBER ST.18.14.4 DATA COLLECTOR H. Edgar, E. Moss DATE 7/08/19

COLLECTION BPAAP COLLECTION LOCATION Maxwell

OTHER IDENTIFIERS/NOTES

TRAIT	UI1		UI2		UC		UP3		UP4		UM1		UM2		UM3	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
Winging	1	1														
Diastema	0	0														
Labial Curvature	0	0														
Double Shoveling	4	4	-	3												
Shoveling	4	4	-	3	5	-										
Peg/Reduced tooth			1	0											0	1
Congenital Absence			0	0											1	0
Interruption Groove	-	-	-	-												
Tuberculum Dentale	-	-	-	-	2	-										
Mesial Ridge					2	-										
Distal Accessory Ridge					1	-										
Accessory Cusps							0	0	0	0						
Distosagittal Ridge							0	0								
Mesial Accessory Ridge							0	2	0	3						
Distal Accessory Ridge							1	-	-	-						
Metacone											4	4	4	4	-	2
Hypocone											4	4	3	3	-	0
Cusp 5											0	0	0	0	-	0
Carabelli's											6	6	2	1	-	0
Parastyle											0	0	0	0	-	2
Enamel Extension											-	-	2	2	-	0

SPECIMEN NUMBER ST. 18. 14. 4 DATA COLLECTOR H. Edgar, E Moss DATE 7/08/19

NOTES

TRAIT	LI1		LI2		LC		LP3		LP4		LM1		LM2		LM3	
	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R
Shoveling	3	3	2	2												
Congenital Absence	0	0													1	0
Peg/Reduced tooth	0	0														
Distal Accessory Ridge					3	3										
Elongated Form							0	0	0	0						
Premolar Complexity							1	1	5	1						
Anterior Fovea											2	2				
Deflecting Wrinkle											0	0				
Groove Pattern											0	0	1	2	–	2
Cusp Number											5	5	5	5	–	4
Protostylid											1	0	–	0	–	0
Trigonid Crest											0	0	0	0	–	0
Cusp 5											4	5	2	–	–	0
Cusp 6											0	0	0	0	–	0
Cusp 7											0	0	0	0	–	0
Enamel Extension											0	0	1	0	–	1

RARE TRAITS

Talon tooth –

Mesial Bending –

Tri-cusped Premolar –

Odontome –

Enamel Pearl –

Supernumerary –

Other Observations

BPAAP 2018, Saki Tzul, ST.18.11.8
Accession #: 2018.07.37
Emily Moes, Alexis O'Donnell
August 2019

Summary: ST.18.11.8 is a primary interment of an old adult female Native American. Approximately 85% of the skeleton is present. Almost all elements are fragmented, and the missing bones are primarily in the cranium, and thoracic spine, both of which only 25% are present. Soil adhesion is present on most elements, if only on fragments, although this is especially pronounced on the cranium. Taphonomic damage is limited as there is no evidence of warping, or rodent or insect damage. This individual has pathological changes consistent with systemic disturbance, trauma, joint degeneration, and osteochondritis dissecans.

Minimum number of individuals for this burial is 2. Details of this report refer to an adult skeleton, but there are also elements of a comingled second adult (right radius, right third metacarpal, and six manual phalanges). These were likely found loose in the fill since although this burial cuts into ST.18.11.9, positional location of where ST.18.11.8 disrupts 11.9 (at the feet) precludes these elements from belonging to the latter. Additionally, a right radius is already associated with 11.9.

Burial Context: This individual was found in the same stratigraphic layer (C4) as burial ST.18.11.9, although excavation notes indicate that they are not necessarily associated. ST.18.11.8 was slightly above individual 11.9. The burial cut for individual 11.8 likely disrupted the burial of 11.9 at the feet, which is where the cranium for 11.8 is located. Therefore, individual 11.8 was a later interment despite being in a continuous matrix. One course of three large rocks (approximately 30-50 cm) covered this individual. Stones were above the cranium, thorax, and abdomen. Burial 11.8 was buried in a flexed position on the right side, with the head in the south, facing east.

Age Estimation: We estimate this individual to be 60-81 years of age. Standard age estimation techniques given by Buikstra and Ubelaker (1994) estimated that ST.18.11.8 is 40-50+ years. However, we place more emphasis on newer methods that have shown higher accuracy rates for older individuals (Godde and Hens, 2012; Mulhern and Jones, 2005). Using the auricular surface, we estimate this individual is 60-67 years (Buckberry and Chamberlain, 2002). Using transition analysis (Milner and Boldsen, 2016), we estimate the age around 81 years.

Sex Estimation: The estimated sex of this individual is female. Table 1 shows the scores for the sex-diagnostic traits of the pelvis and cranium (Buikstra and Ubelaker, 1994).

Pelvis	Left Score	Right Score	**Cranium**	Score
Ventral Arc	2	1	**Nuchal Crest**	-
Subpubic Concavity	1	-	**Mastoid Process**	2
Ischiopubic Ramus Ridge	1	1	**Supraorbital Margin**	4
Greater Sciatic Notch	1	1	**Glabella**	-
Preauricular Sulcus	2	2	**Mental Eminence**	3
Estimated Sex	1 = Female			3 = ambiguous

Table 1: Sex estimation scores from the pelvis and cranium (1 = female condition; 5 = male condition).

Stature: Stature was not estimated for this individual since maximum length measurements are not available for long bones of the legs.

Body Mass: Body mass is estimated to be 47.46-52.03 kg. The left femoral head breadth, 39 mm, was used following three common methods for female body mass estimation. Table 2 depicts the method and associated mass estimate.

Method	Mass Estimate (kg)
McHenry (1992)	46.1
Grine et al. (1995)	50.6
Ruff et al. (2012)	47.9

Table 2: Body mass estimation (kg) based on three methods using the femoral head breadth.

Population Affinity: This individual is Native American based on the location of its burial in a rock shelter in Belize, and carbon dating to 4390 ± 20 BP.

Dental Analysis:
Dental Inventory:
Teeth present: URM3, URM2, URM1, URP4, URP3, URC, URI2, ULI2, LLM3, LLM2, LRI1, LRI2, LRC, LRP3, LRM2
Teeth missing (antemortem): URI1, ULI1, ULC, ULP3, ULP4, ULM1, ULM2, LLM1, LLC, LLI2, LLI1, LRP4, LRM1, LRM3
Teeth missing (no alveolus): ULM3, LLP4, LLP3

Dental Pathology: Dental development is complete. Dentition is characterized by periodontal disease in the maxilla as evident by lines of calculus on the roots 2-3 mm above the cemento-enamel junction (CEJ). Few caries are present: occlusal caries are present on LLM3, LRI2 and LRC; an interproximal caries is present on the mesial surface of URP3. A small amount of dental calculus is observable on all molars, right maxillary premolars, and URC. Calculus is adhered to the lingual surfaces of all affected teeth, buccal surfaces of the molars, and the occlusal surfaces of URM2, LLM3, and LLM2. Dental attrition scores range from 5 to 8 on anterior teeth; molar quadrant scores range from 2 to 8. The right anterior teeth have extensive attrition such that approximately half of the crown remains. Pit-type enamel defects are present on the labial surfaces of URI2 (3.3 mm from CEJ) and ULI2 (2.0 mm from CEJ).

Dental Morphology: Morphological traits are scored mostly on posterior teeth due to extensive attrition on anterior teeth. In the maxilla: peg/reduced tooth UI2 (0), URM3 (0); congenital absence UI2 (0), URM3 (0); interruption groove UI2 (0); metacone URM2 (4), URM3 (3); hypocone URM3 (3); fifth cusp URM3 (1); Carabelli's URM3 (0); parastyle URM3 (2); enamel extension URM3 (0). In the mandible: elongated form LRP3 (0); cusp number LLM3 (5); protostylid LM2 (1), LLM3 (1); trigonid crest LLM3 (0); fifth cusp LLM3 (4); sixth cusp LLM3 (5); seventh cusp LLM3 (5); enamel extension LM2 (2), LLM3 (1). Morphology scores based on Edgar (2017).

Pathology: Overall, ST.18.11.8 shows pathological changes consistent with systemic disturbance as seen in porotic hyperostosis, trauma in the left ulna and a fifth proximal manual phalanx, and joint degeneration throughout the body, and osteochondritis dissecans in both knees.

Cranium: The occipital exhibit evidence of healed porotic hyperostosis near the lambdoidal suture. The roof the left eye orbit has a rectangular-shaped active lesion with well-defined margins. Its walls expose the underlying trabeculae (5.1 x 7.7 x 3.1 mm; ML x AP x SI). The lesion is exacerbated by taphonomic processes and there is a lot of soil adhesion within and without it, but the margins have rounded edges.

Spine and Ribs: The second and third cervical vertebrae are fused along the entire left laminae and spinous processes. The other portions of these vertebrae are not observable. In the superior body of a lower cervical vertebra (possible C7), there is a cystic/lytic depression, 9.4 mm in diameter, 6.6 mm deep, with well-defined margins on the right half of the body. The exposed trabeculae of the walls and floor are smooth. The left inferior articular facet of a middle cervical vertebra has extensive lipping with dense new bone growth over the entire surface. Few elements of the thoracic vertebrae are present, so the only pathological change observable in this section of the spine is osteophytic growth on the anterior margin of the superior surface of the body of a lower thoracic vertebra. All observable thoracic articular facets have slight lipping.

The third through fifth lumbar vertebrae have extensive lipping and osteophytic spicules on the margins of the superior bodies, and their annular rings are actively resorbing. The right superior and inferior articular facets of these same vertebrae have extensive lipping with macroporotic changes covering the surfaces. The right inferior articular facet of L5 also has slight eburnation on the superior half. The inferior surfaces of L4 and L5 bodies have moderate lipping with a syndesmophyte protruding from L3 on the right side. Annular rings on the right lateral-most margins are degenerating on both L4 and L5. All annular ring destruction exposes subchondral bone. There is a macroporous lesion on the inferior surface of an upper lumbar spinous process; it is poorly defined.

The right superior articular facet of the sacrum has eburnation on the medial ¾ of the surface. It also has extensive lipping to mirror that seen on L5. The superior surface of the S1 body has extensive lipping with subchondral bone exposure on the annular ring at the lateral margins. The first coccygeal element is fused to the last vertebra of the sacrum.

An upper right rib head has a moderate amount of lipping and resorption as seen by subchondral bone exposure. (Only two right rib heads are available for observation.) A left right fragment has a spot of new bone growth on the lateral surface that is well integrated into the original surface. The new bone is smooth, with healing microporous lesions. A separate left rib fragment has thickened cortical bone at the costal angle, with a small nodule protruding 3 mm over the costal groove. The nodule is macroporous; its margins are completely integrated into the cortex.

Legs: The left tibia has osteochondritis dissecans on the medial plateau (17.5 x 10.6 mm; ML x AP). The subchondral bone has detached. The entire margin of the medial plateau has moderate lipping, which is especially pronounced on the anterior portion. The line of fusion is observable on the lateral condyle for 23 mm, which is abnormal given the advanced age of this individual.

Both femora exhibit osteochondritis dissecans on their distal surfaces. The left femur is affected only on the medial condyle. It's distal articular surface also has moderate lipping. The right femur is severely affected by osteochondritis dissecans and has extensive lipping around the entire margin of the distal articular surface. It has five areas of subchondral detachment; all are 10-20 mm in diameter and are spread between both condyles and the patellar surface. The distal-most portion of the lateral condyle is macroporotic, yet has active, dense bone growth. The margins are necrotic. The third trochanter is present on the left femur (a non-metric trait).

The right tarsals and metatarsals have slight to moderate lipping. Squatting facets are present on both right and left tali (a non-metric trait). Active sclerotic lesions are degenerating the squatting facet on the right talus. The left MT5 has a well-healed oblique fracture on the distal shaft with a laterally protruding exostosis at the fracture site (7.3 x 6.1 mm; prox-dist x plantar-dorsal). There is moderate lipping on all proximal articular facets of the pedal phalanges.

Arms: The medial surface of the right clavicle is microporous. The acromial end of the left clavicle has a ~90° angle on the anterior surface rather than a smooth curve as normally observed. The inferior surface of the acromial end has sharply defined ridges along the oblique line for the trapezoid ligament, likely from ossification. The pathological changes may be due to a remote fracture on the acromial end that is misaligned, but very well healed. There is no observable callus. Also, there are no associated changes on the acromion of the left scapula.

The left humerus has slight lipping on the anterior margin of the head and entire surface of the trochlea. The lateral margin of the capitulum has subchondral bone exposure (5.8 x 4.1 mm, SI x ML) and active margin degeneration. The distal articular surface of the left radius has moderate lipping around the entire margin. The left ulna has a well-healed, well-aligned parry fracture at the distal third of the shaft. Evidence of this fracture on the left radius is not present. There is a tiny bone splinter (2 mm long, 0.76 mm wide) lodged into the lateral surface of the trochlear notch. The margins surrounding the splinter are rounded, indicative of bone remodeling around the splinter. There is slight-moderate lipping around the margin of the trochlear notch of the right ulna.

Generally, the bones of the left hand are gracile, and the proximal phalanges are slender. A fifth proximal phalanx has a flattened, diagonally sloping distal articular surface with no signs of remodeling or callus. This indicates that this is a site of a well-healed fracture, possibly from crushing the associated distal fifth phalanx. No other pathological changes are evident on the hands.

Skeletal Inventory and Measurements: ST.18.11.8 is approximately 70% complete. The skeleton is in fair condition, almost all elements are fragmented. Most skeletal elements are present, except the thoracic vertebrae and bones of the cranial vault, of which less than 25% is present. The ribs and scapulae are highly fragmented. Please see the skeletal inventory recording forms for a complete list of complete elements for ST.18.11.8. Table 3 presents the mandibular and postcranial measurements available for this individual.

Element	Trait	Left (mm)	Right (mm)
Clavicle	A-P Diam. Midshaft	-	10*
	S-I Diam. Midshaft	-	8.2*
Humerus	Max. Length	-	294*
	Epicondylar Breadth	49.1	49.8
	Vertical Diam. Head	-	38.6
	Max. Diam. Midshaft	18.1*	18.7*
	Min. Diam. Midshaft	12.7*	12.8*
Radius	A-P Diam. Midshaft	9.5*	-
	M-L Diam. Midshaft	11.6*	-
Femur	Max. Diam. Head	39	38.1
	A-P Subtroch. Diam.	22.9	-
	M-L Subtroch. Diam.	30.6	-
Tibia	Max. Diam. Nutrient Foramen	31.8	-
	M-L Diam. Nutrient Foramen	19.7	-
	Circ. Nutrient Foramen	80	-
Fibula	Max. Diam. Midshaft	13.9*	14.9*

Table 3: Postcranial metric data for ST.18.11.8. – indicates that the measurement was not taken on the opposite side due to absence of materials or bony landmarks. * indicates measurement was taken at approximate location due to reconstruction or landmarks could not clearly be observed. Max. = maximum. Min = minimum. S-I = superior-inferior. A-P = anteroposterior. M-L = mediolateral. Epiph = epiphyseal.

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PROVENIENCE

Site Name: Sak. Tzu BPAAP 2018 **Site No.:**

Designation/ID: ST. 18. 11. 8 accession#: 2018.07.37

Observer(s): E. Moes, A. O'Donnell **Date:**

BIOLOGICAL PROFILE

MNI: 2 (comingled R. radius; RMC2, manual phalanges)

Age: 60-81 yrs

Sex: female

Ancestry: Native American

FORM LIST (indicate forms used)

- [X] 1 Skeletal Inventory
- [X] 2a Age and Sex Assessment - Adult
- [ ] 2b Age Assessment - Juvenile
- [X] 3a Permanent Dental Inventory/Pathology
- [ ] 3b Deciduous Dental Inventory/Pathology
- [X] 4a Dental Morphology - Permanent
- [ ] 4b Dental Morphology - Deciduous
- [X] 5a Measurements - Adult
- [ ] 5b Measurements - Juvenile
- [ ] 6 Non-Metric Traits
- [X] 7 Pathology Checklist
- [ ] 8 Degenerative Joint Disease
- [ ] 9 Spinal Osteophytosis
- [ ] 10 Artificial Cranial Modification
- [ ] 11 Cremated Remains
- [ ] 12 Isolated Remains
- [X] Skeletal Visual Recording Forms
- [X] Additional Forms, Notes, Sketches, Photo Log, etc.

PRESERVATION

- [ ] **Complete skeleton** (>75%)
- [X] **Partial skeleton** (25-75% present)
- [ ] **Fragmentary skeleton** (<25% present, includes at least one complete element)
- [ ] **Fragments of bone** (small amount of fragmented bone; <<25% is present)
- [ ] **Skull** (only cranial remains present and partially preserved)
- [ ] **Teeth** (only loose teeth are present)
- [ ] **Cremated bone** (burned remains of any quantity; excludes cases of incidental charring of otherwise unburned skeleton)
- [ ] **Soft tissues present**

Describe: Most skeletal elements are present, except thoracic vert. and cranial vault in which ≤25% are present. Almost all elements are fragmented.

CONDITION

Yes	No	Unobservable	
[X]	[ ]	[ ]	Cracking
[X]	[ ]	[ ]	Breaks
[ ]	[X]	[ ]	Brittle
[ ]	[X]	[ ]	Exfoliation
[ ]	[X]	[ ]	Warping
[ ]	[X]	[ ]	Cut marks
[ ]	[X]	[ ]	Gnaw marks
[ ]	[X]	[ ]	Root or insect damage
[ ]	[X]	[ ]	Staining
[X]	[ ]	[ ]	Soil adhering

Describe (include severity & elements affected): Soil adhesion present on most elements, if only on fragments, especially prevalent on cranium. All elements except hands and feet are fragmented.

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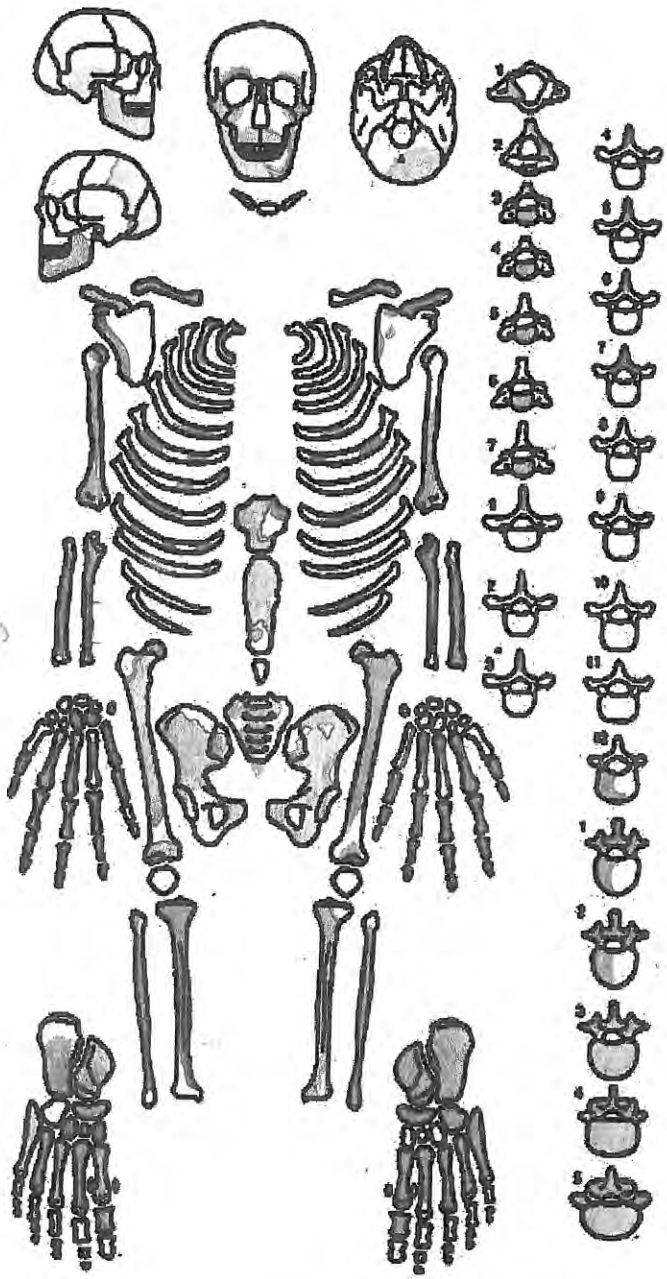
SKELETAL INVENTORY
RECORDING FORM (1)

ST. 18.11.8

Fill in skeletal elements present and record notes along side.
Label "U" if unsided, and "A" to denote approximated location.

Right **Left**



all ribs are broken & fragment placement is an approximation

+ complete R. radius and R MC2

Additional observations:

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SKELETAL INVENTORY
RECORDING FORM (1)

Codes:
f = 1-25% present
p = 25-75% present
c = 75-100% present

Provenience: Sak Tzul BPAAP 2018

Designation/ID: ST. 18. 11.8 accession # 2018.07.47

CRANIAL	left	right
Frontal		
Parietal	C	
Occipital	P	
Temporal		C
TMJ		
Mandible	C	C
Zygomatic		
Maxilla	P	P
Nasal		
Lacrimal		
I. N. C.		
Palatine		
Sphenoid		
Ethmoid		
Vomer		
Hyoid	F	
Thyroid/Crycoid		
Ossicles		
Unident. Cranial (#):	?	

teeth	#	cond
Incisors	1	
Canines	2	
Premolars	4	
Molars	6	
Unidentified Teeth (#):		

AXIAL	#	cond
1st Cervical		F
2nd Cervical		F
3-6 Cervical	4	P
7th Cervical		
1-9 Thoracic		
10th Thoracic	7	F-P
11th Thoracic		
12th Thoracic		
1-4 Lumbar		P-C
5th Lumbar		C
Sacrum	?	
Coccyx	?	

Manubrium	C
Sternal Body	C
xiphoid	-
Left Ribs ~ 5	F
Right Ribs ~ 7	P
Unidentified Axial (#):	

3 very fragmentary # is approx.

APPEND.	left	right
Scapula	F	F
glenoid	-	P
Clavicle	P	C
med. epi.	-	C
Ilium	C	P
auricular	P	C
Pubis	C	-
symphysis	C	-
Ischium	C	F
acetabulum	C	C
Patella		
Unidentified Append. (#):		

APPENDICULAR	left					right				
	epi-p	/prox	/mid	/dist	/epi-d	epi-p	/prox	/mid	/dist	/epi-d
Humerus	P	P	C	C	C	P	C	C	C	C
Radius	-	C	C	C	C	P	C	C	C	P
Ulna	C	C	C	C	P	C	C	C	C	C
Femur	C	C	C	P	P	P	C	C	P	P
Tibia	P	C	C	C	C	C	C	C	P	F
Fibula	-	C	C	C	C	P	C	C	C	-

Unidentified Long Bones (#):

EXTREMITIES	#	cond		#	cond
Scaphoid	0	-	Calcaneus	2	C
Lunate	2	C	Talus	2	C
Trapezium	1	C	Cuboid	2	C
Trapezoid	1	C	Navicular	2	C
Capitate	2	C	Med. Cuneiform	1	C
Hamate	2	C	Inter. Cuneiform	1	C
Triquetral	0		Lat. Cuneiform	1	C
Pisiform	0	-	Metatarsals	10	C
Metacarpals	7	C	Prox. Phalanges		
Prox. Phalanges	10	C	Mid. Phalanges		
Mid. Phalanges	8	C	Dist. Phalanges		
Dist. Phalanges	9	C	Sesamoids		
Sesamoids	0	-	***Unident. Extremities (#):***		

Notes:

R hand:
MC 2-5
Capitate
Hamate
Prox phlgs 1-5
Int. Phlgs 2-4
Dist " 1-4

L hand:
Lunate, Capitate,
Hamate, trapezium
Trapezoid
MC 2-4
Prox Phle 1-5
Int " 1-4
Dist " 1-5

* Extra Right
MC 2

2. foot
calcaneus, navicular, middle cuneiforms
MT 1, 2, 4, 3, 5
1st prox phalanx medial & lateral cuneiforms, cuboid?

1. foot
talus, cuboid
MT 2, 5, 3, 4, 1
calcaneus
med cuneiform
1st prox phlx
navicular

†This form includes information derived from Buikstra and Ubelaker (1994), *Standards for Data Collection from Human Skeletal Remains*, Arkansas Archeological Survey, and is used with permission of the publisher. 1-1

Unsided elements
Prox phalanx x3
Int phalanx x1
Dist phalanx x2
} extra

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SKELETAL MEASUREMENT
ADULT - RECORDING FORM (5a)

Record all measurements millimeters.

Provenience: _____

Designation/ID: ST. 18.11.8

CRANIAL

1.	**GOL** Maximum Cranial Length		
2.	**XCB** Maximum Cranial Breadth		
3.	**ZYB** Bizygomatic Breadth		
4.	**BBH** Basion-Bregma Height		
5.	**BNL** Basion-Nasion Length		
6.	**BPL** Basion-Prosthion Length		
7.	**MAB** Maxillo-Alveolar Breadth		
8.	**MAL** Maxillo-Alveolar Length		
9.	**AUB** Biauricular Breadth		
10.	**NPH** Upper Facial Height		
11.	**WFB** Minimum Frontal Breadth		
12.	**FMB** Upper Facial Breadth		
13.	**NLH** Nasal height		
14.	**NLB** Nasal Breadth		
15.	**OBB** Orbital Breadth		
16.	**OBH** Orbital Height		
17.	**EKB** Biorbital Breadth		
18.	**DKB** Interorbital Breadth		
19.	**FRC** Frontal Chord		
20.	**PAC** Parietal Chord		
21.	**OCC** Occipital Chord		
22.	**FOL** Foramen Magnum Length		
23.	**FOB** Foramen Magnum Breadth		
24.	**MDH** Mastoid Length		
25.	**GNI** Chin height		
26.	**HML** Mandibular Body Height		
27.	**TML** Mandibular Body Breadth		
28.	**GOG** Bigonial Width		
29.	**CDL** Bicondylar Breadth		
30.	**WRL** Minimum Ramus Breadth		
31.	**MRL** Maximum Ramus Breadth		
32.	**XRL** Maximum Ramus Height		
33.	**MLT** Mandibular Length		
34.	**MLX** Mandibular Angle		

POSTCRANIAL

		left	right
35.	**Clavicle:** Max. Length		–
36.	A-P Diam. Midshaft		10*
37.	Sup.-Inf. Diam. Midshaft		8.2*
38.	**Scapula:** Height		
39.	Breadth		
40.	**Humerus:** Max. Length	–	294*
41.	Epicondylar Breadth	49.1	49.8
42.	Vertical Diam. Head	–	38.6
43.	Max. Diam. Midshaft	18.1*	18.7*
44.	Min. Diam. Midshaft	12.7*	12.8*
45.	**Radius:** Max. Length	–	
46.	Ant.-Post. Diam. Midshaft	9.5*	
47.	Med.-Lat. Diam. Midshaft	11.6*	
48.	**Ulna:** Max. Length		
49.	A-P Diameter		
50.	M-L Diameter		
51.	Physiological Length		
52.	Min. Circumference		
53.	**Sacrum:** Anterior Length		
54.	Anterior Superior Breadth		
55.	Max. Trans. Diam. Base		
56.	**Pelvis:** Height		–
57.	Iliac Breadth		–
58.	Pubis Length		–
59.	Ischium Length		–

		left	right
60.	**Femur:** Max. Length	–	
61.	Bicondylar Length	–	
62.	Epicondylar Breadth	–	
63.	Max. Diam. Head	39	38.1
64.	A-P Subtroch. Diam.	22.9	
65.	M-L Subtroch. Diam.	30.6	
66.	A-P Midshaft Diam.		
67.	M-L Midshaft Diam.		
68.	Midshaft Circumference		
69.	**Tibia:** Max. Length	–	
70.	Max. Prox.Epiph. Breadth	–	
71.	Max. Distal Epiph. Breadth	–	
72.	Max. Diam. Nutrient For.	31.8	
73.	M-L Diam. Nutrient For.	19.7	
74.	Circ. Nutrient Foramen	80	
75.	**Fibula:** Max. Length	–	–
76.	Max. Diameter Midshaft	13.9*	14.9*
77.	**Calcaneus:** Max. Length		–
78.	Middle Breadth		–
79.	**Sternum:** Length Mesostern.		
80.	Max. Breadth 1st		

FHB = 39 mm

Body mass estimation

McHenry 1992	2.24 (FHB) - 39.9	= 47.46
Grine et al. (1995)	2.27 (FHB) - 36.5	= 52.03
Ruff et al. (2012)	2.18 (FHB) - 35.8	= 49.22

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AGE & SEX ASSESSMENT
ADULT - RECORDING FORM (2a)

Age: 60-81 yo
Sex: F

Provenience: _____
Designation/ID: ST. 18. 11. 8

AGE

PELVIC:		left	right
Pubic Symphysis		–	
Todd (1-10)		___	10 50+
Suchey-Brooks (1-6)		–	5 49 (25+)
Auricular Surface		50-59	
Lovejoy et al. (1-8)		7	5 40-44

POSTCRANIAL: Epiphyseal Union*			
Clavicle	Sternal epiphysis		___
Vertebral Annular Epiphyses	Cervical	superior	___
		inferior	___
	Thoracic	superior	___
		inferior	___
	Lumbar	superior	___
		inferior	___
Sacrum	S1/S2 fusion		___
Innominate	Iliac crest		___

complete

CRANIAL:	Suture Closure*	
External Cranial Vault	1. Midlambdoid	___
	2. Lambda	___
	3. Obelion	___
	4. Anterior Sagittal	___
	5. Bregma	___
	6. Midcoronal	___
	7. Pterion	___
	8. Sphenofrontal	___
	9. Inf. Sphenotemporal	___
	10. Sup. Sphenotemporal	___
Palatine	11. Incisive Suture	___
	12. Anterior Median	___
	13. Posterior Median	___
	14. Transverse Palatine	___
Internal Cranial Vault	15. Sagittal	___
	16. Left Lambdoid	___
	17. Left Coronal	___

Estimated Age:

Subadult (12-20 years)	___
Young Adult (20-35 years)	___
Middle Adult (35-50 years)	___
Old Adult (50+ years)	X

*** Suture and Epiphysis Codes:**
0 = open
1 = minimal
2 = significant
3 = complete

Observations: Buckberry & Chamberlain (2002) 60-66.7 yo
Transition analysis 81 yo

SEX

PELVIC:	left	right
Ventral Arc (1-3)	2	1
Subpubic Concavity (1-3)	1	–
Ischiopubic Ramus Ridge (1-3)	1	1
Greater Sciatic Notch (1-5)	1	1
Preauricular Sulcus (0-4)	2	2

Estimated Sex, Pelvis (1-5): 1 = female

CRANIAL:	
Nuchal Crest (1-5)	–
Mastoid Process (1-5)	2
Supraorbital Margin (1-5)	4
Glabella (1-5)	–
Mental Eminence (1-5)	3

Estimated Sex, Skull (1-5): 3 = ambiguous

Observations:

†This form includes information derived from Buikstra and Ubelaker (1994), *Standards for Data Collection from Human Skeletal Remains*, Arkansas Archeological Survey, and is used with permission of the publisher.

Buckberry & Chamberlain, 2002:

	Left	Right
transverse organization:	4	5
surface texture:	3	3
microporosity:	3	3
macroporosity:	2	2
apical changes:	2	2
	14	15
mean age:	59.94 yrs	66.7 yrs

Transition Analysis Scoring

Case/Site/Collection: BPAAP **ID:** ST.18.11.8

Observer: E. Moes **Date:** 7 / 22 / 2019

Cranial Sutures	**Left**	**Right**
Coronal Pterica	- 1 2 3 4 5	- 1 2 3 4 5
Sagittal Obelica (midline)	- 1 2 3 4 5	
Lambdoidal Asterica	- 1 2 3 4 5	- 1 2 3 4 5
Interpalatine (midline)	- 1 3 4 5	
Zygomaticomaxillary	- 1 2 3 4 5	- 1 2 3 4 5

Pubic Symphysis	**Left**	**Right**
Symphyseal Relief	- 1 2 3 4 5 6	- 1 2 3 4 5 6
Symphyseal Texture	- 1 2 3 4	- 1 2 3 4
Superior Apex	- 1 2 3 4	- 1 2 3 4
Ventral Symphyseal Margin	- 1 2 3 4 5 6 7	- 1 2 3 4 5 6 7
Dorsal Symphyseal Margin	- 1 2 3 4 5	- 1 2 3 4 5

Iliac Auricular Surface	**Left**	**Right**
Superior Demiface Topography	- 1 2 3	- 1 2 3
Inferior Demiface Topography	- 1 2 3	- 1 2 3
Superior Surface Morphology	- 1 2 3 4 5	- 1 2 3 4 5
Middle Surface Morphology	- 1 2 3 4 5	- 1 2 3 4 5
Inferior Surface Morphology	- 1 2 3 4 5	- 1 2 3 4 5
Inferior Surface Texture	- 1 2 3	- 1 2 3
Superior Posterior Iliac Exostoses	- 1 2 3 4 5 6	- 1 2 3 4 5 6
Inferior Posterior Iliac Exostoses	- 1 2 3 4 5 6	- 1 2 3 4 5 6
Posterior Exostoses	- 1 2 3	- 1 2 3

Codes: - (Missing or Not Observable), 1-7 (defined in Transition Analysis manual)

	Pt. estimate	confidence interval	p value
corrected	81	(64.4, 92.7)	
uncorrected	88.5	(64.5, 110)	0.06
pubic symph	110	(78.7, 110)	1
auricular	69.5	(36.3, 101.5)	0.92

TA Form version 3.1

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PATHOLOGY CHECKLIST
RECORDING FORM (7)

Provenience: _____

Designation/ID: ST. 18.11.8

CRANIAL	present	absent	unobs.
Porotic hyperostosis	X		
Cribra orbitalia		X	
Premature synostosis		X	
Osteomas		X	
Periosteal reactions		X	
Lytic reactions	X		
Proliferative reactions		X	
Trauma		X	
Cultural modifications			X

AXIAL	present	absent	unobs.
Ankylosis		X	
Arch defects		X	
Compression fractures		X	
Schmorl's nodes		X	
Periosteal reactions	X		
Lytic reactions		X	
Osteoporosis	X		
Trauma		X	
Reaction on pleural aspect of ribs		X	
Accessory facets		X	

APPENDICULAR	present	absent	unobs.
Periosteal reaction		X	
Lytic reactions		X	
Proliferative reactions		X	
Osteoporosis	X		
Trauma	X		
Cultural modifications		X	
Osteomyelitis		X	
Exostoses		X	
Accessory facets		X	

EXTREMITIES	present	absent	unobs.
Lytic reactions	X		
Proliferative reactions		X	
Periosteal reactions		X	
Trauma	X		
Exostoses	X		
Accessory facets	X		

Observations (describe pathology in detail and use individual element visual recording forms to illustrate morphology and extent):

See reverse for notes

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Paleopathology notes

healed PH on occipital

L3-L5 have extensive lipping and osteophytic spicules on the margins of the superior bodies with annular rings actively resorbing. ~~[illegible] covered with osteophytes~~. Right superior and inf. art. facets of these same verts have extensive lipping with microporotic changes covering the surfaces. The right inf. art. facet of L5 also has slight eburnation on the superior half. The inf. surfaces of L4 & L5 bodies have moderate lipping with a syndesmophyte protruding from L4 on the right side. Annular rings on the right-most lateral margins are degenerating on both L4 & L5. All annular ring destruction exposes subchondral bone. Macroporous lesion on inf. surface of an upper lumbar spinous process, poorly defined margins. osteophytic growth on anterior margin of sup. surface of a body of a lower T vert. Observable articular facets have slight lipping.

C2 and C3 fused along the entire left lamina and spinous process. The rest of these verts are not observable. In the superior body of a lower C vert (possibly 7), there is a cystic depression, 9.4mm in diam., with well-defined margins, 6.6mm in depth on the right half of the body. Exposed trabeculae of the walls and floor are smooth. Left inf. art. facet of a mid. c-vert has extensive lipping with dense new bone growth over the entire surface.

1st coccygeal element fused to last vert of sacrum. Right sup art facet of sacrum is eburnated on medial 3/4 of the surface. It also has extensive lipping to mirror that seen on L5. Sup. surface of S1 body has extensive lipping with subchondral exposure on the annular ring at the lateral margins.

Roof of L. eye orbit has a rectangular-shaped active lesion with well-defined margins, walls expose the underlying trabeculae. 5.1 × 7.7 × 3.1 mm (ML × AP × SI), lesion is exacerbated by taph. processes and there is a lot of soil adhesion within & without the lesion, but margins have rounded edges.

An upper right rib head has moderate lipping and surface resorption as seen by subchondral bone exposure. Only 2 R. rib heads present for obs.

A L. rib fragment has a spot of new bone growth on the lateral surface that is well integrated into the original surface. New bone is smooth with healing microporous lesions. A separate L. rib fragment has thickened cortical bone at the costal angle with a small nodule protruding 3mm over the costal groove. Nodule is macroporous, margins are completely integrated into the original cortex.

Distal art surface of L. radius has moderate lipping around the entire margin

R. clavicle medial surface is microporous.

L. clavicle acromial end has a ~90° angle on the ant. surface rather than a smooth curve as normally observed. The inferior surface of the acromial end has sharply defined ridges along the oblique line for the trapezoid ligament, likely from ossification. These path changes may be due to a remote fx on the acromial end that is misaligned but very well healed. No observable callus. No associated changes are on the acromion of the L scapula.

L. humerus has slight lipping on the ant. margin of the head and entire surface of the trochlea. Lateral margin of capitulum has subchondral bone exposure and active margin degeneration 5.8 × 4.1 mm (SI × ML)

✓ Slight-moderate lipping around margin of R. ulna trochlear notch.

✓ L. tibia has subchondral exposure on the medial plateau (17.5 x 10.6 mm; ML x AP). Entire margin of medial plateau has moderate [illegible] which is especially pronounced on the anterior portion. Line of fusion is observable on the lateral condyle for 23 mm.

✓ L. ulna has a well healed, well-aligned, [illegible] fx at the distal third of the shaft. Fx not observed on L. radius. There is a tiny bone splinter lodged into the lateral surface of the trochlear notch. Splinter is 2mm long, 0.76 mm wide. Margins surrounding the splinter are rounded, indicating remodeling around the splinter, and not [illegible] damage. *Assessed Dino-lite microscope images of this feature.

- General observation: left hand bones are very gracile and proximal phalanges are slender.
- A 5th prox. pedal phalanx has a flattened but diagonally sloping distal art. surface with no signs of remodelling or callus, ⇒ well-healed fx, possibly from crushing of distal 5th digit?

Moderate lipping on all proximal articular facets of pedal phalanges.

- R. foot tarsals and MTs have slight-moderate lipping. Active sclerotic lesions degenerating a squatting facet on the lateral portion of the dorsal R. talar neck.
- L. talus has a lateral squatting facet on dorsal neck.

L MT5 has a well healed oblique fx on distal shaft with a laterally protruding exostosis @ fx site (7.3 x 6.1 mm; Prox Dist x Plant Dors)

- Severe osteochondritis dessicans on the distal epiph. of R. femur and extensive lipping around entire margin. Distal-most portion of lateral condyle is macroporotic yet has active dense bone growth, margins are degenerating, ⇒ necrosis. There are 5 areas of subchondral detachment all are 10-20mm in diameter, and are spread over both condyles and the patellar surface.
- L. tibia osteo chondritis dessicans evident on medial plateau; subchondral bone is detached. Extensive lipping around the entire margin of this surface.
- This is mirrored on the medial condyle of the L. femur. Distal art. surface also has moderate lipping. Femoral head margin has slight lipping around its entire margin. Third trochanter present.

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DENTAL INVENTORY & PATHOLOGY
PERMANENT - RECORDING FORM (3a)

Mark a dash if not observable

Provenience: _____

Designation/ID: ST. 18. 11.8

	Right								Left							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Maxilla	M^3	M^2	M^1	PM^2	PM^1	C	I^2	I^1	I^1	I^2	C	PM^1	PM^2	M^1	M^2	M^3
Inventory (1-9)	2	2	2	2	2	2	2	4	4	2	4	4	4	4	4	3
Development (1-14)	14	14	14	14	14	14	14	-	-	14	-	-	-	-	-	-
Caries (1-7)	0	0	0	0	2	0	0			0						
Abcesses (1-2)	0	0	0	0	0	0	0			0						
Calculus (1-3)	1	1	1	1	1	1	1			1						
Chipping (#)																
Periodontitis (1-2)																
Attrition Score*	10	21	31	5	6	7	7			7						
Mesio-Buccal (1-10)	3	6	8	*[Attrition scores: I, C, PM (1-8); M (1-10)]												
Mesio-Lingual (1-10)	3	5	8													
Disto-Lingual (1-10)	2	5	8													
Disto-Buccal (1-10)	2	5	7													
M-D diameter (mm)	10.2	9.4	10.1	-	-	-	-			-						
B-L diameter (mm)	12.3	11.8	12.4	9.7	-	8.4	6.4			5.7						
Crown height (mm)	-	-	-	-	-	-	-			-						

	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Mandible	M^3	M^2	M^1	PM^2	PM^1	C	I^2	I^1	I^1	I^2	C	PM^1	PM^2	M^1	M^2	M^3
Inventory (1-9)	4	2	4	4	2	2	2	2	4	4	4	3	3	4	2	2
Development (1-14)		14			14	14	14	14	-	-	-	-	-	-	14	14
Caries (1-7)		0			0	1	1	0							0	1
Abcesses (1-2)		0			0	0	1	1							0	0
Calculus (1-3)		1			0	0	0	0							1	1
Chipping (#)																
Periodontitis (1-2)																
Attrition Score*		28			-	7	8	8							27	11
Mesio-Buccal (1-10)		8		*[Attrition scores: I, C, PM (1-8); M (1-10)]											8	3
Mesio-Lingual (1-10)		6													5	3
Disto-Lingual (1-10)		8													6	2
Disto-Buccal (1-10)		6													8	3
M-D diameter (mm)		11.3			-	-	-	-							11.1	11.1
B-L diameter (mm)		11.1			-	-	-	-							10.8	11.5
Crown height (mm)					-	-		-							-	-

Enamel Defects																
Tooth	$R1^2$	$L1^2$														
Defect No. on Tooth	1	1														
Defect Type (1-7)	5	5														
Distance from CEJ (mm)	2	2														
Color (1-4)	3.3	2.0														

SPECIMEN NUMBER ST. 18.11.8 DATA COLLECTOR E. Moes DATE 7/22/19

COLLECTION BPAAP COLLECTION LOCATION UNM LOHO

OTHER IDENTIFIERS/NOTES

TRAIT	UI1		UI2		UC		UP3		UP4		UM1		UM2		UM3	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
Winging	°	°														
Diastema	°	°														
Labial Curvature	°	°														
Double Shoveling	°	°	–	–												
Shoveling	°	°	–	–	–	°										
Peg/Reduced tooth			0	0												
Congenital Absence			0	0											0	°
Interruption Groove	°	°	0	0											0	°
Tuberculum Dentale	°	°	–	–	–	°										
Mesial Ridge					–	°										
Distal Accessory Ridge					–	°										
Accessory Cusps							–	–	–	–						
Distosagittal Ridge							–	–								
Mesial Accessory Ridge							–	–	–	–						
Distal Accessory Ridge							–	–	–	–						
Metacone											–	°	4	°	3	°
Hypocone											–	°	–	°	3	°
Cusp 5											–	°	–	°	1	°
Carabelli's											–	°	–	°	0	°
Parastyle											–	°	–	°	2	°
Enamel Extension											–	°	–	°	0	°

SPECIMEN NUMBER ST. 18.11.8 DATA COLLECTOR E.Moes DATE 7/22/19

NOTES

TRAIT	LI1		LI2		LC		LP3		LP4		LM1		LM2		LM3	
	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R
Shoveling	0	0	0	–												
Congenital Absence	0	0													0	0
Peg/Reduced tooth	0	0														
Distal Accessory Ridge					–	–										
Elongated Form							0	0	0	0						
Premolar Complexity							0	–	0	0						
Anterior Fovea											0	0				
Deflecting Wrinkle											0	0				
Groove Pattern											1	0	–	–	–	0
Cusp Number											1	0	–	–	5	0
Protostylid											0	0	1	1	1	0
Trigonid Crest											0	0	–	–	0	0
Cusp 5											0	0	–	–	4	0
Cusp 6											0	0	–	–	5	0
Cusp 7											0	0	–	–	5	0
Enamel Extension											0	0	2	2	1	0

RARE TRAITS

Talon tooth –

Mesial Bending –

Tri-cusped Premolar

Odontome –

Enamel Pearl –

Supernumerary –

Other Observations

BPAAP 2018, Saki Tzul, ST.18.14.12
Accession #: 2018.07.42

Emily Moes, Alexis O'Donnell

February 2019

Summary: ST.18.14.12 is a primary interment of a middle adult male Native American. Approximately 80% of the skeleton is present. Almost all elements are fragmented, and the missing bones are primarily those that would be in the legs and pelvis. The skeleton is very fragmented. Cortical bone is roughened from taphonomic damage and has made the surface porous or has revealed underlying trabeculae. This individual has pathological changes consistent with systemic disturbance as seen through porotic hyperostosis, local infection as seen in the left tibia and right ulna, and joint degeneration as seen in lipping and resorption of some joints.

According to the excavation notes, the burial was located less than 30 cm under the overhang of a large, flat boulder located in the rock shelter. This individual was supine and in a tightly flexed position, with the head in the north. Hands were uncrossed and on the shoulders, although flexed inwards toward the center of the chest. The knees were brought up to the chest, feet also uncrossed. The burial was accompanied by multiple and complete and fragmentary ceramics. A Middle Preclassic resist ware plate was over the head, with an unslipped, punctated, spouted vessel next to it. A complete, handled jar was located next to the feet. The burial was within very loose silt, with some rock inclusions. The rocks were likely added as grave furniture and the silt may be a nature filling.

Minimum number of individuals for this burial is 3. Details of this report refer to an adult skeleton, but there are also elements of a comingled second adult (first pedal phalanx, left MT4, right MT2, and a thoracic vertebrae), and a comingled juvenile (left MC3). These were likely found loose in the fill since there is no evidence of ST.18.12 cutting into other nearby burials.

Age Estimation: We estimate this individual to be a middle adult, 33-56 years. The elements that are most reliable and standard in skeletal age estimation (pubic symphysis, auricular surface) are not available for analysis. Instead, we used the sternal end of rib 4 and compared with the rib casts from Iscan and Loth (1993), assigning ST.18.14.12 to be within the descriptions for both phase 5 and 6, which produced the reported age estimate. Although this method has been shown to be "least inaccurate" relative to other single-element indicators (Martrille et al., 2007), no one indicator is a reliable age estimator. That being said, age-related changes seen in this individual are consistent with the given age range, such as the breakdown of the acromial end of the clavicle and left glenoid, lipping around the humeral heads and distal femora, and the light weight of all vertebrae.

Sex Estimation: We estimate that ST.18.14.12 is male. Few scorable traits are observable that are typically scored on the pelvis and cranium listed in Buikstra and Ubelaker (1994) for sex estimation. Only three traits were observable, and their combination was ambiguous as to whether this individual is male or female. Specifically, the scored traits are mastoid process (4), supraorbital margin (3), and glabella (3). We made our sex estimation as male due to the size of the femoral head (46 mm for the left) (Timonov et al., 2015) as well as the maximum length of the calcaneus (75 mm) (Wilbur, 1998).

Stature: Stature was not estimated for this individual since maximum length measurements are not available for long bones of the legs.

Body Mass: Body mass is estimated to be 63.2-68.8 kg. The left femoral head breadth, 46.4 mm, was used following three common methods for body mass estimation. Table 1 depicts the method and associated mass estimate.

Method	Mass Estimate (kg)
McHenry (1992)	64.03
Grine et al. (1995)	68.8
Ruff et al. (2012)	63.2

Table 1: Body mass estimation (kg) based on three methods using the femoral head breadth.

Population Affinity: This individual is Native American based on the location of its burial in a rock shelter in Belize, and relative dating to _____ BP.

Dental Analysis:
Dental Inventory:
Teeth present: URM1, URP4, URP3, ULP3, ULP4, URM1, ULM3, LLM2, LLM1, LLP4, LLP3, LLC, LLI1, LRP3, LRP4, LRM1, LRM2
Teeth missing (no alveolus): URM3, URM2, URC, URI2, URI1, ULI1, ULI2, ULC, ULM2, LLM3, LLI2, LRI1, LRI2, LRC, LRM3

Dental Pathology: Dental development is complete. Postmortem taphonomic processes have damaged all molar roots, and mandibular left premolar roots. Maxillary first molars are especially affected as the lingual half of both teeth is missing, making identification difficult, and most features unobservable. Most teeth have caries; since many maxillary teeth are missing, no observations can be made as to whether there is a concentration on one side of the mouth. Interproximal caries occur on six teeth: ULP3, LLP4, LLP3, LRP3, LRP4, and LRM1. LRM2 is the only tooth with a cervical caries. Root caries occur on three teeth: URP3, ULP3, and LRM1. ULM3 has a large root caries that has destroyed the entire crown. Presence or absence of abscesses is unobservable due to lack of alveolus. Dental calculus ranges from slight to severe, such that an extensive amount of calculus is present on LLI1, and URM1. Dental attrition scores range from 3 to 5 in the anterior teeth; molar quadrant scores range from 3 to 8. There are no observable patterns of wear. There are no observable enamel defects.

Dental Morphology: Dental wear and taphonomic damage have rendered many morphological features unobservable. The only features observable in the maxillary teeth are the lack of a distosagittal ridge on the third premolars, and lack of size reduction and congenital absence of the left third molar. In the mandible: elongated form LP3 (0), LP4 (0); premolar complexity LLP3 (3), LLP4 (1), LRP4 (3); cusp number LM1 (4), LM2 (5); protostylid LM1 (0), LM2 (0); cusp five LM1 (0); cusp six LM1 (0), LM2 (0); cusp seven LM1 (0), LM2 (0); enamel extension LRM1 (1), LM2 (0). Morphology scores based on Edgar (2017).

Pathology: ST.18.14.12 shows pathological changes consistent with systemic disturbance, local infection, and joint degeneration.

This individual experienced systemic disturbance during childhood as evidenced by the healed porotic hyperostosis on the parietals and occipital.

Localized infection is observable in the left tibia and right ulna. On the left tibia, there is mixed active and healing periosteal reaction at midshaft that circumscribes the bone. The affected area has a

concentration of dense woven bone (callus) that is integrating into the cortex. The typical striated bone seen in tibial periosteal reactions is concentrated on the inferior margins of the callus. Vascular impressions are observable in the woven bone. The right ulna has healed reactive bone along the diaphysis; it is especially pronounced (undulating and thickened) on the distal portion of the fragment (near midshaft). Because the bone is fragmented, we cannot identify if this infection is from a fracture or something else.

Evidence of joint degeneration is observable throughout much of the skeleton. The acromial ends of the left and right clavicles are actively resorbing such that the articular surfaces do not have clear margins, and they are macroporotic. The articular surface between the manubrium and sternal body have subchondral breakdown. The left and right humeri have osteochondral breakdown at the margin between the capitulum and trochlea, as well as slight lipping around the entire margin of the head. Only one scapula shows signs of change similar to the humuri; there is a spot of osteochondral breakdown on the anterior margin of the left glenoid. The articular surface for the capitate of the left lunate has sharp, deep degeneration such that the entire cortex has been resorbed. No changes are observed on the associated capitate. In the spine, all vertebrae are light in weight. The surfaces of the inferior body of C6 and superior body of C7 are actively degenerating where the margins and annular rings have been resorbed and the surfaces are porous. The anterior surface of the dens and its facet on C1 are macroporotic and degenerating. The only change observable on the thoracic vertebrae includes slight lipping on some of the bodies. This change is also seen in the lumbar, although accompanied by small osteophytic growths. Additionally, there is a bony deposit (6 x 3 mm) on the left superior articular facet of one of the lumbar vertebrae. Because the lumbar are so fragmented, we cannot determine which positional number this facet belongs to.

Skeletal Inventory and Measurements: ST.18.14.12 is approximately 80% complete. The skeleton is in good condition, although almost all elements are fragmented. Missing elements are concentrated in the legs where long bone epiphyses and at least 40% of the diaphyses are missing. Both ossa coxae are extremely fragmented and only have areas of the acetabula, ischia, and iliac crests present. The cranium is highly fragmented although most bones of the vault are present. Hands and feet are largely complete. Only 20% of the sternal body is present, although the manubrium is present and complete. 50-70% of the ribs are present. Please see the skeletal inventory recording forms for a complete list of complete elements for ST.18.14.12. Tables 2 and 3 present the cranial and postcranial measurements available for this individual.

Trait	Measurement (mm)
Maxillo-Alveolar Breadth (MAB)	75*
Upper Facial Breadth (FMB)	103.8*
Biorbital Breadth (EKB)	97.5*
Mastoid Length (MDH)	30
Maximum Ramus Breadth (MRL)	41.4

Table 2: Cranial and mandibular measurements for ST.18.14.12. * indicates measurement was taken at the approximate location due to reconstruction or cracking.

Element	Trait	Left (mm)	Right (mm)
Clavicle	A-P Diam. Midshaft	10.6*	--
	S-I Diam. Midshaft	8.2*	--

Humerus	Epicondylar Breadth	--	59.6
	Vertical Diam. Head	42.2	43.3
	Max. Diam. Midshaft	23.3*	--
	Min. Diam. Midshaft	17.8*	--
Ulna	Min. Circumference	35	--
Femur	Max. Diam. Head	46.4	44.2
	A-P Midshaft Diam.	29.3*	--
	M-L Midshaft Diam.	27.2*	--
	Midshaft Circumference	89*	--
Tibia	Max. Distal Epiph. Breadth	52.2*	--
Calcaneus	Max. Length	75.1	--
Sternum	Max. Breadth 1st	60.3	

Table 3: Postcranial metric data for ST.18.14.12. – indicates that the measurement was not taken on the opposite side due to absence of materials or bony landmarks. * indicates measurement was taken at approximate location due to reconstruction or landmarks could not clearly be observed. Max. = maximum. Min = minimum. S-I = superior-inferior. A-P = anteroposterior. M-L = mediolateral. Epiph = epiphyseal.

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HUMAN REMAINS DOCUMENTATION PACKET

PROVENIENCE

Site Name: BPAAP 298 Saki Tzul **Site No.:** ______

Designation/ID: ST. 18. 14. 12

accession # 2018. 07. 42

Observer(s): E. [illegible] A. O'Donnell **Date:** Feb 2019

BIOLOGICAL PROFILE

MNI: 3 (1 adult, commingled 2nd adult, and commingled juvenile)

Age: 33-56

Sex: male

Ancestry: Native American

FORM LIST (indicate forms used)

- [x] **1 Skeletal Inventory**
- [x] **2a Age and Sex Assessment - Adult**
- [ ] **2b Age Assessment - Juvenile**
- [x] **3a Permanent Dental Inventory/Pathology**
- [ ] **3b Deciduous Dental Inventory/Pathology**
- [x] **4a Dental Morphology - Permanent**
- [ ] **4b Dental Morphology - Deciduous**
- [x] **5a Measurements - Adult**
- [ ] **5b Measurements - Juvenile**
- [ ] **6 Non-Metric Traits**
- [ ] **7 Pathology Checklist**
- [ ] **8 Degenerative Joint Disease**
- [ ] **9 Spinal Osteophytosis**
- [ ] **10 Artificial Cranial Modification**
- [ ] **11 Cremated Remains**
- [ ] **12 Isolated Remains**
- [x] **Skeletal Visual Recording Forms**
- [x] **Additional Forms, Notes, Sketches, Photo Log, etc.**

PRESERVATION

- [x] **Complete skeleton** (>75%)
- [ ] **Partial skeleton** (25-75% present)
- [ ] **Fragmentary skeleton** (<25% present, includes at least one complete element)
- [ ] **Fragments of bone** (small amount of fragmented bone; <<25% is present)
- [ ] **Skull** (only cranial remains present and partially preserved)
- [ ] **Teeth** (only loose teeth are present)
- [ ] **Cremated bone** (burned remains of any quantity; excludes cases of incidental charring of otherwise unburned skeleton)
- [ ] **Soft tissues present**

Describe: Approx. 80% of the skeleton is present, almost all elements are fragmented. Missing elements are concentrated in the [illegible] where long bone midshafts are present and both os coxae are only partially represented.

CONDITION

Yes	No	Unobservable	
X			**Cracking**
X			**Breaks**
	X		**Brittle**
	X		**Exfoliation**
	X		**Warping**
	X		**Cut marks**
	X		**Gnaw marks**
X			**Root or insect damage**
	X		**Staining**
	X		**Soil adhering**

Describe (include severity & elements affected): Bones are very fragmented and light, likely from taphonomic damage. Cortical bone is [illegible] from taphonomy, revealing underlying trabecular or makes it [illegible]. Root damage observable on long bones.

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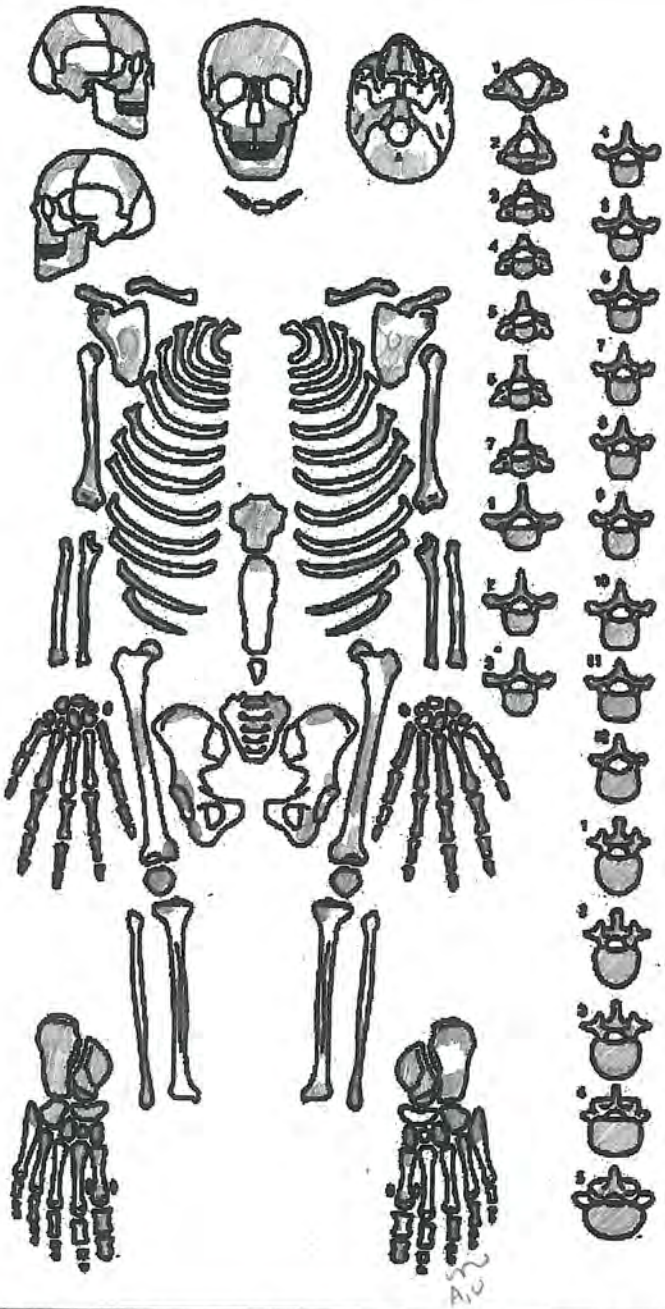
SKELETAL INVENTORY
RECORDING FORM (1)

ST.18.14.12

Fill in skeletal elements present and record notes along side.
Label "U" if unsided, and "A" to denote approximated location.

Right **Left**



Additional observations:

Juvenile L. MC3 commingled with the skeleton, as well as adult prox. 1st pedal phalanx L. mt4, and R. mt2. 3 thoracic vertebra

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SKELETAL INVENTORY RECORDING FORM (1)

Codes:
f = 0-25% present
p = 25-75% present
c = 75-100% present

Provenience: BPAAP 2018 Salt Teal

Designation/ID: ST.18.14.12

L. petrous taken for DNA analysis

CRANIAL	left	right
Frontal	P	C
Parietal	P	P
Occipital	P	P
Temporal	P	C
TMJ	P	P
Mandible	F	P
Zygomatic	F	C
Maxilla	C	P
Nasal	F	C
Lacrimal	F	F
I. N. C.	F	F
Palatine	F	F
Sphenoid	F	F
Ethmoid	–	
Vomer	P	
Hyoid		
Thyroid/Crycoid		
Ossicles		
Unident. Cranial (#):		

teeth	#	cond
Incisors	1	C
Canines	1	C
Premolars	8	C
Molars	7	C
Unidentified Teeth (#):		

AXIAL	#	cond
1st Cervical		C
2nd Cervical		C
3-6 Cervical	3	C
7th Cervical		P
1-9 Thoracic	9	C
10th Thoracic		C
11th Thoracic		P
12th Thoracic		P
1-4 Lumbar		P
5th Lumbar		P
Sacrum	2	P
Coccyx	1	C

	#	cond
Manubrium		C
Sternal Body		P
xiphoid		
Left Ribs	10	P
Right Ribs	6	P
Unidentified Axial (#):		

APPEND.	left	right
Scapula	P	P
glenoid	C	C
Clavicle	C	P
med. epi.	C	–
Ilium	F	F
auricular		–
Pubis		–
symphysis		–
Ischium	P	F
acetabulum	P	P
Patella	C	C
Unidentified Append. (#):		

APPENDICULAR

	left epi-p	left prox	left mid	left dist	left epi-d	right epi-p	right prox	right mid	right dist	right epi-d
Humerus	C	P	C	P	C	C	F	F	C	C
Radius	C	F	F	F	C	P	F	F	–	C
Ulna	C	C	C	C	C	–	F	C	–	–
Femur	C	F	C	F	C	C	–	P	–	F
Tibia	P	F	P	F	C	F	–	P	–	–
Fibula	–	–	F	C	C	–	–	F	F	C

Unidentified Long Bones (#):

EXTREMITIES	#	cond
Scaphoid	2	C
Lunate	2	C
Trapezium	1	C
Trapezoid	2	C
Capitate	2	C
Hamate	2	C
Triquetral	1	C
Pisiform	1	C
Metacarpals	7	C
Prox. Phalanges	10	C
Mid. Phalanges	8	C
Dist. Phalanges	7	C
Sesamoids	Ø	

	#	cond
Calcaneus	2	C
Talus	2	C
Cuboid	2	C
Navicular	2	C
Med. Cuneiform	2	C
Inter. Cuneiform	2	C
Lat. Cuneiform	2	C
Metatarsals	8	C
Prox. Phalanges	9	C
Mid. Phalanges	6	C
Dist. Phalanges	5	C
Sesamoids	1	C
Unident. Extremities (#):		

Notes:

Left foot
calcaneus, talus, medial cuneiform, lateral cuneiform, cuboid, intermediate cuneiform
MT 4, 5, 1, 2
[illegible] 1st phalanx
[illegible]
[illegible] 1st phalanx

Right foot
calcaneus, talus, cuboid, navicular, intermediate, medial, lateral cuneiforms
MT 1, 2, 4, 5
[illegible] phalanges: II
[illegible] phalanges: I
[illegible] phalanges: III

Left hand
capitate, hamate, scaphoid
MC 2-5
prox phalanges: ||||
mid phalanges: ||||
distal phalanges: ||||
lunate, trapezoid

Right Hand
hamate, trapezium, capitate, pisiform, trapezoid, scaphoid, lunate, triquetral
MC 1, 2, 5
prox phalanges: ||||
mid phalanges: ||||
distal phalanges: ||

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[illegible] elements
prox foot phalanges: |||| |
mid foot phalanges: ||||
distal foot phalanges: |
pedal sesamoid: [illegible]
MT |||| [illegible]
[illegible]

Commingled elements
L. MT4
R. MT2
prox 1st pedal phalanx
[illegible] L. MC3
thoracic vertebra

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AGE & SEX ASSESSMENT
ADULT - RECORDING FORM (2a)

Age: ~~35 years~~ 33-56
Sex: male

Provenience: _____
Designation/ID: ST. 18. 14. 12

AGE

PELVIC:		left	right
Pubic Symphysis			
Todd (1-10)		___	___
Suchey-Brooks (1-6)		___	___
Auricular Surface			
Lovejoy et al. (1-8)		___	___

POSTCRANIAL: Epiphyseal Union*			
Clavicle	Sternal epiphysis		___
Vertebral	Cervical	superior	___
Annular		inferior	___
Epiphyses	Thoracic	superior	___
		inferior	___
	Lumbar	superior	___
		inferior	___
Sacrum	S1/S2 fusion		___
Innominate	Iliac crest		___

CRANIAL:	Suture Closure*	
External	1. Midlambdoid	___
Cranial	2. Lambda	___
Vault	3. Obelion	___
	4. Anterior Sagittal	___
	5. Bregma	___
	6. Midcoronal	___
	7. Pterion	___
	8. Sphenofrontal	___
	9. Inf. Sphenotemporal	___
	10. Sup. Sphenotemporal	___
Palatine	11. Incisive Suture	___
	12. Anterior Median	___
	13. Posterior Median	___
	14. Transverse Palatine	___
Internal	15. Sagittal	___
Cranial	16. Left Lambdoid	___
Vault	17. Left Coronal	___

Estimated Age:
Subadult (12-20 years) ___
Young Adult (20-35 years) ___
Middle Adult (35-50 years) X
Old Adult (50+ years) ___

*Suture and Epiphysis Codes:
0 = open
1 = minimal
2 = significant
3 = complete

Observations: Phases 5 & 6 from Iscan & Loth, 1993 ⇒ 33-56 yrs
Breakdown of acromial end of clavicles, and left glenoid; humeral head and distal femur have minor lipping; Verts are light in weight; All these descriptions are consistent with an adult of middle age.

SEX

PELVIC:	left	right
Ventral Arc (1-3)	___	___
Subpubic Concavity (1-3)	___	___
Ischiopubic Ramus Ridge (1-3)	___	___
Greater Sciatic Notch (1-5)	___	___
Preauricular Sulcus (0-4)	___	___

Estimated Sex, Pelvis (1-5): ___ = ___

CRANIAL:	
Nuchal Crest (1-5)	___
Mastoid Process (1-5)	4
Supraorbital Margin (1-5)	3
Glabella (1-5)	3
Mental Eminence (1-5)	___

Estimated Sex, Skull (1-5): 3 = unknown

Observations: Estimated Sex based on size of femoral head (Timonov et al., 2015) indicates this individual is male.

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SKELETAL MEASUREMENT
ADULT - RECORDING FORM (5a)

Record all measurements millimeters.

Provenience: BPAAP 2018 Saki Tzul

Designation/ID: ST. 18. 14. 12

CRANIAL

1. **GOL** Maximum Cranial Length		18. **DKB** Interorbital Breadth	
2. **XCB** Maximum Cranial Breadth		19. **FRC** Frontal Chord	
3. **ZYB** Bizygomatic Breadth		20. **PAC** Parietal Chord	
4. **BBH** Basion-Bregma Height		21. **OCC** Occipital Chord	
5. **BNL** Basion-Nasion Length		22. **FOL** Foramen Magnum Length	
6. **BPL** Basion-Prosthion Length		23. **FOB** Foramen Magnum Breadth	
7. **MAB** Maxillo-Alveolar Breadth	75*	24. **MDH** Mastoid Length	30
8. **MAL** Maxillo-Alveolar Length		25. **GNI** Chin height	
9. **AUB** Biauricular Breadth		26. **HML** Mandibular Body Height	
10. **NPH** Upper Facial Height		27. **TML** Mandibular Body Breadth	
11. **WFB** Minimum Frontal Breadth		28. **GOG** Bigonial Width	
12. **FMB** Upper Facial Breadth	103.8*	29. **CDL** Bicondylar Breadth	
13. **NLH** Nasal height		30. **WRL** Minimum Ramus Breadth	
14. **NLB** Nasal Breadth		31. **MRL** Maximum Ramus Breadth	41.4
15. **OBB** Orbital Breadth		32. **XRL** Maximum Ramus Height	
16. **OBH** Orbital Height		33. **MLT** Mandibular Length	
17. **EKB** Biorbital Breadth	97.5*	34. **MLX** Mandibular Angle	

POSTCRANIAL

	left	right		left	right
35. **Clavicle:** Max. Length	–	–	60. **Femur:** Max. Length	–	–
36. A-P Diam. Midshaft	10.6*	–	61. Bicondylar Length	–	–
37. Sup.-Inf. Diam. Midshaft	8.2*	–	62. Epicondylar Breadth	–	–
38. **Scapula:** Height	–	–	63. Max. Diam. Head	46.4	44.2
39. Breadth	–	–	64. A-P Subtroch. Diam.	–	–
40. **Humerus:** Max. Length	–		65. M-L Subtroch. Diam.	–	–
41. Epicondylar Breadth	–	59.6	66. A-P Midshaft Diam.	29.3*	–
42. Vertical Diam. Head	42.2	43.3	67. M-L Midshaft Diam.	27.2*	–
43. Max. Diam. Midshaft	23.3*	–	68. Midshaft Circumference	89*	–
44. Min. Diam. Midshaft	17.8*	–	69. **Tibia:** Max. Length	–	–
45. **Radius:** Max. Length	–	–	70. Max. Prox.Epiph. Breadth	–	–
46. Ant.-Post. Diam. Midshaft	–	–	71. Max. Distal Epiph. Breadth	52.2*	–
47. Med.-Lat. Diam. Midshaft	–	–	72. Max. Diam. Nutrient For.	–	–
48. **Ulna:** Max. Length	–	–	73. M-L Diam. Nutrient For.	–	–
49. A-P Diameter	–	–	74. Circ. Nutrient Foramen	–	–
50. M-L Diameter	–	–	75. **Fibula:** Max. Length	–	–
51. Physiological Length	–	–	76. Max. Diameter Midshaft	–	–
52. Min. Circumference	35	–	77. **Calcaneus:** Max. Length	75.1	
53. **Sacrum:** Anterior Length	–		78. Middle Breadth	–	–
54. Anterior Superior Breadth	–				
55. Max. Trans. Diam. Base	–		79. **Sternum:** Length Mesostern.	–	
56. **Pelvis:** Height	–	–	80. Max. Breadth 1st	60.3	
57. Iliac Breadth	–	–			
58. Pubis Length	–	–			
59. Ischium Length	–	–			

Pathology notes for ST. 18 14 12

L. tibia: mixed active & healing periosteal reaction at midshaft that circumscribes the bone. Affected area has a concentration of dense woven bone (callus) that is integrating into the cortex. Typical striated bone seen in periosteal reactions on the tibia is concentrated inferiorly.
Vascular impressions in the woven bone

Lytic lesion in prox ant. surface of 1st pro pedal phalanx.

Slight margin breakdown on prox. margin of R. femoral head.

Lumbar verts.
- bony deposit on the left sup art facet of a lumbar (6 x 3 mm).
- slight lipping & osteophytic growths on lumbar bodies.

Thoracic verts: slight lipping on some of the bodies

Cervical verts: inf body of C6 & sup body of C7 are actively degenerating surfaces, where margins and annular rings have resorbed and surfaces are macroporotic
- ant. surface of dens & its facet on C1 are macroporotic and degenerating.

R. ulna: healed reactive bone along the present diaphysis, and it's especially pronounced (ie undulating & thickened) on distal portion (near midshaft) of fragment. Due to fragmentary nature, we can't identify if this is from a fracture or something else.

R humeri: osteochondral breakdown @ margin btwn capitulum and trochlea as well as slight lipping around entire margin of the head.

- glenoid margin (ant.) w/ osteochondral breakdown of

Cranium: healed PH on parietals & occipital

- R clavicles: acromial ends are actively resorbing, surfaces macroporotic & no clear margins

Manubrium & sternal body: art surfaces btwn manubrium & sternal body have subchondral breakdown

- Lunate has sharp, deep degeneration of the art surface for capitate such that entire cortex has been resorbed @ ccm

Body Mass estimation from (L) femoral head breadth

Ruff et al. (2012)	2.8 (46.4) - 66.7	= 63.2 kg
Grine et al (1995)	2.27 (46.4) - 36.5	= 68.8 kg
McHenry (1992)	2.24 (46.4) - 39.9	= 64.03 kg

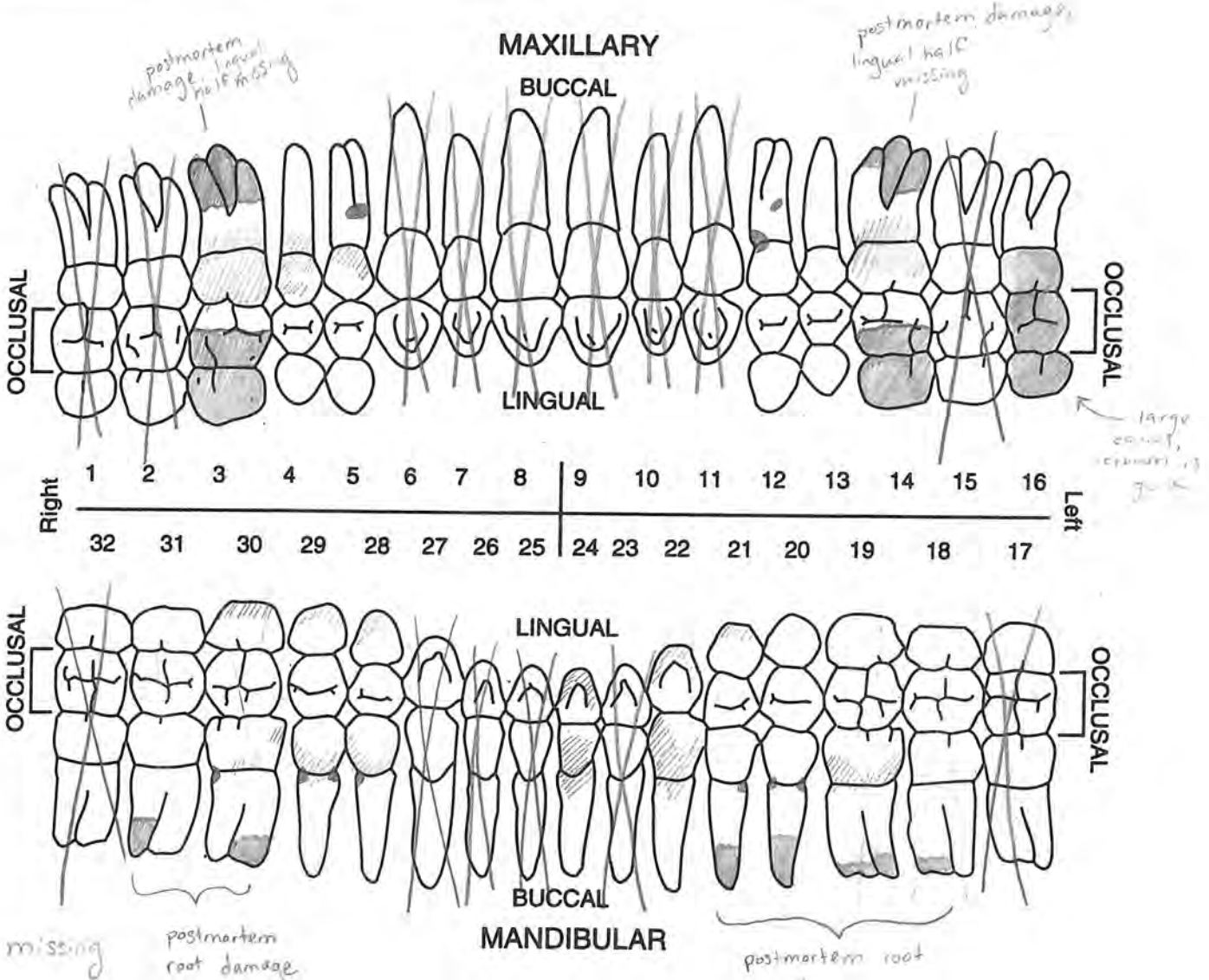
DENTAL INVENTORY
VISUAL RECORDING FORM: PERMANENT DENTITION

Site Name/Number BPAAP / _____ Observer E. Moes

Feature/Burial Number _____ / _____ Date 7/19/19

Burial/Skeleton Number _____ / ST 18 14 12

Present Location of Collection UNM LOHO



X = missing

/// = calculus

● = caries

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DENTAL INVENTORY & PATHOLOGY
PERMANENT - RECORDING FORM (3a)

Mark a dash if not observable

Provenience: _____

Designation/ID: ST. 18.14.12

	Right								Left							
Maxilla	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	M^3	M^2	M^1	PM^2	PM^1	C	I^2	I^1	I^1	I^2	C	PM^1	PM^2	M^1	M^2	M^3
Inventory (1-9)	3	3	7	8	8	3	3	3	3	3	3	8	8	7	3	7
Development (1-14)			14	14	14							14	14	14		14
Caries (1-7)			-	0	5							2,5	0	-		6
Abcesses (1-2)			-	-	-							-	-	-		-
Calculus (1-3)			3	1	1							1	1	-		-
Chipping (#)																
Periodontitis (1-2)																
Attrition Score*				5	4							4	5	-	-	-
Mesio-Buccal (1-10)				*[Attrition scores: I, C, PM (1-8); M (1-10)]												
Mesio-Lingual (1-10)																
Disto-Lingual (1-10)																
Disto-Buccal (1-10)																
M-D diameter (mm)				6.0	7.4							7.3	6.0			-
B-L diameter (mm)				9.7	10.1							9.9	9.5			-
Crown height (mm)																

	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Mandible	M^3	M^2	M^1	PM^2	PM^1	C	I^2	I^1	I^1	I^2	C	PM^1	PM^2	M^1	M^2	M^3
Inventory (1-9)	3	2	2	2	2	3	3	3	2	3	2	2	2	2	2	3
Development (1-14)		14	14	14	14				14		14	14	14	14	14	
Caries (1-7)		4	2,5	2	2				0		0	2	2	0	0	
Abcesses (1-2)		-	-	-	-				-		-	-	-	-	-	
Calculus (1-3)		0	1	2	1				3		2	1	0	1	1	
Chipping (#)																
Periodontitis (1-2)																
Attrition Score*		27	24	5	4				5		3	3	3	27	18	
Mesio-Buccal (1-10)		8	3	*[Attrition scores: I, C, PM (1-8); M (1-10)]										4	3	
Mesio-Lingual (1-10)		8	7											8	6	
Disto-Lingual (1-10)		7	8											8	6	
Disto-Buccal (1-10)		4	6											7	3	
M-D diameter (mm)		10.8	10.6	7.3	7.0				-		7.5	7.2	7.9	10.9	11.5	
B-L diameter (mm)		10.8	11.3	9.1	7.9				-		8.4	8.1	9.0	11.4	11.1	
Crown height (mm)																

Enamel Defects																
Tooth																
Defect No. on Tooth																
Defect Type (1-7)																
Distance from CEJ (mm)																
Color (1-4)																

SPECIMEN NUMBER ST 18.14.12 DATA COLLECTOR E. Moes DATE 7/19/19

COLLECTION BPAAP COLLECTION LOCATION

OTHER IDENTIFIERS/NOTES

TRAIT	UI1		UI2		UC		UP3		UP4		UM1		UM2		UM3	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
Winging																
Diastema																
Labial Curvature																
Double Shoveling																
Shoveling																
Peg/Reduced tooth																0
Congenital Absence																0
Interruption Groove																
Tuberculum Dentale																
Mesial Ridge																
Distal Accessory Ridge																
Accessory Cusps							–	–	–	–						
Distosagittal Ridge							0	0								
Mesial Accessory Ridge							–	–	–	–						
Distal Accessory Ridge							–	–	–	–						
Metacone											–	–				
Hypocone											–	–				
Cusp 5											–	–				
Carabelli's											–	–				
Parastyle											–	–				
Enamel Extension											–	–				

SPECIMEN NUMBER ST.18.14.12 DATA COLLECTOR E. Moen DATE

NOTES

TRAIT	LI1		LI2		LC		LP3		LP4		LM1		LM2		LM3	
	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R
Shoveling	-	.	.	.												
Congenital Absence	0	.													.	.
Peg/Reduced tooth	0	.														
Distal Accessory Ridge					-	.										
Elongated Form							0	0	0	0						
Premolar Complexity							3	-	1	3						
Anterior Fovea											-	-				
Deflecting Wrinkle											-	-				
Groove Pattern											-	-	-	-	.	.
Cusp Number											4	4	5	5	.	.
Protostylid											0	0	0	0	.	.
Trigonid Crest											-	-	-	-	.	.
Cusp 5											0	0	-	-	.	.
Cusp 6											0	0	0	0	.	.
Cusp 7											0	0	0	0	.	.
Enamel Extension											-	1	0	0	.	.

RARE TRAITS

Talon tooth

Mesial Bending

Tri-cusped Premolar

Odontome

Enamel Pearl

Supernumerary

Other Observations

BPAAP 2017: ST.18.13.23
Accession #2018.07.43

Emily Moes
February 2019

Summary: ST.18.13.23 is a middle-old adult Native American (possible) female. Approximately 40% of the skeleton is present, poorly preserved, and is very fragmented. It is most notably affected by soil adherence. The soil layer is thickest on the long bones and cranium. This individual has pathological changes consistent with porotic hyperostosis, as well as degenerative joint disease and spinal osteophytosis.

Burial Context: This is a primary burial in a simple grave where the individual was placed in a tightly flexed position, with the knees to the chest, and ankles next to the pelvis. The right arm was extended across the body such that the hand was by the pelvis, under the left arm. The left arm was flexed with the hand by the cranium. The individual was buried on a northeast-southwest axis with the head in the northeast, facing west. Grave cut was shallow cuts into a clay layer. There were neither any associated grave goods nor stone coverings.

Age Estimation: Due to the poor preservation conditions of the remains and lack of elements typically used for age estimation, ST.18.13.23 can only be determined as an adult, likely middle to old in age. All observable epiphyses are fused indicating development was complete. Based on osteophytic lipping and joint degeneration in the vertebrae, humerus, and scapula, this individual is likely a middle to old adult since these changes can be attributed to age and/or activity patterns.

Sex Estimation: ST.18.13.23 is possibly female. Features used by Buikstra and Ubelaker (1994) for sex estimation are unobservable in this individual (with the exception of the supraorbital margin score of 3, which is ambiguous); therefore, sex is based on two available postcranial metrics. The epicondylar breadth of the right humerus is 52.6 mm which is feminine according to Iscan et al. (1998). Also, the maximum diameter of the left femoral head is 41 mm, which is feminine based on Milner and Boldsen (2012). Despite these results, sex estimation for ST.18.13.23 is considered “possible female” since both references are based on modern samples from East Asia and the United States respectively. Additionally, initial sex estimation while this individual was *in situ* was male, although the excavators did not list what features this is based on.

Stature: Stature was not estimated for this individual due to the fragmentary condition of the remains.

Body Mass: Body mass is estimated to be 51.94 - 56.57 kg. The left femoral head breadth, 41 mm, was used following three common methods for body mass estimation. Table 1 depicts the method and associated mass estimate.

Method	Mass Estimate (kg)
McHenry (1992)	51.94
Grine et al. (1995)	56.57
Ruff et al. (2012)	53.58

Table 1: Body mass estimation (kg) based on three methods using the femoral head breadth.

Population Affinity: This individual is Native American based on the burial location in a rock shelter in Belize and relative dating before European contact.

Dental Analysis: Dental analysis was not performed since only one tooth is present: a canine. All other teeth are missing, with no associated alveolar bone since neither the maxilla nor mandible are present.

Skeletal Pathology: Pathological changes observed in ST.18.13.23 are primarily associated with spinal osteophytosis and degenerative joint disease. This individual likely also had healed porotic hyperostosis given the diploic expansion, but extensive soil adherence prevents observation of the ectocranial surface. Below are detailed descriptions of the affected elements.

The left and right humeri have subchondral breakdown on the margin between trochlea and capitulum (left: 16 x 9 mm; right: 19.6 x 12 mm; AP x ML). A left 3-9 rib head has slight lipping and macroporotic changes covering the surface. The right inferior articular facet of T12 is macroporotic. Lumbar vertebrae L1, L3, and L4 have moderate to severe lipping on the superior and inferior margins of the bodies. This is especially pronounced on L4 such that the annular ring has completely resorbed. The posterior margin of the glenoid fossa on the right scapula is actively resorbing, affecting 2.4 - 4 mm of the rim. In the cranium, there is diploic expansion on the parietal bones. Diploe is macroporotic and spongy in appearance; it is approximately 25% thicker than normal. The inner and our tables of the cranium are significantly thinned.

Skeletal Inventory: The skeleton is approximately 40% complete and is very fragmented. Most long bones are represented, but other present elements are limited to some cranial vault fragments, eight carpals, nine metacarpals, 11 tarsals, five metatarsals, few phalanges, eight vertebrae, and the os coxae. Almost all present bones are cracked and broken. Please see the skeletal inventory recording forms for a full list. Only three measurements could be taken for this individual; they are listed in Table 2. The most prominent taphonomic feature is the extensive soil adhesion on most elements. This layer of soil is especially thick on the long bones and cranium.

Trait	Measurement (mm)
R. Humerus: Epicondylar Breadth	52.6
L. Femur: Max. Diameter of the Head	41*
L. Tibia: Max. Epiphyseal Breadth	46.3

Table 2: Metric data available for ST.18.13.23. * indicates measurement was taken at the approximate location.

References:

Buikstra JE, and Ubelaker DH. 1994. Standards for Data Collection from Human Skeletal Remains. Arkansas Archaeological Survey Research Series No. 44. Fayetteville: Arkansas Archaeological Survey.

Iscan MY, Loth SR, King CA, Shihai D, and Yoshino M. 1998. Sexual dimorphism in the humerus; a comparative analysis of Chinese, and Thais. Forensic Science International. 98(1-2):17-29.

Milner GR, and Boldsen JL. 2012. Humeral and femoral head diameters in recent white American Skeletons. Journal of Forensic Sciences. 57(1): 35-40.

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ARIZONA STATE MUSEUM
HUMAN REMAINS DOCUMENTATION PACKET

PROVENIENCE

Site Name: Sak. Tzu | **Site No.:**

Designation/ID: ST.18.13.23

accession # 2018 07 43

Observer(s): E. Moes **Date:** Feb 2019

BIOLOGICAL PROFILE

MNI: 1

Age: middle - old adult

Sex: possible female

Ancestry: Native American

FORM LIST (indicate forms used)

- [X] 1 Skeletal Inventory
- [ ] 2a Age and Sex Assessment - Adult
- [ ] 2b Age Assessment - Juvenile
- [ ] 3a Permanent Dental Inventory/Pathology
- [ ] 3b Deciduous Dental Inventory/Pathology
- [ ] 4a Dental Morphology - Permanent
- [ ] 4b Dental Morphology - Deciduous
- [ ] 5a Measurements - Adult
- [ ] 5b Measurements - Juvenile
- [ ] 6 Non-Metric Traits
- [ ] 7 Pathology Checklist
- [ ] 8 Degenerative Joint Disease
- [ ] 9 Spinal Osteophytosis
- [ ] 10 Artificial Cranial Modification
- [ ] 11 Cremated Remains
- [ ] 12 Isolated Remains
- [X] Skeletal Visual Recording Forms
- [X] Additional Forms, Notes, Sketches, Photo Log, etc.

PRESERVATION

- [ ] **Complete skeleton** (>75%)
- [X] **Partial skeleton** (25-75% present)
- [ ] **Fragmentary skeleton** (<25% present, includes at least one complete element)
- [ ] **Fragments of bone** (small amount of fragmented bone; <<25% is present)
- [ ] **Skull** (only cranial remains present and partially preserved)
- [ ] **Teeth** (only loose teeth are present)
- [ ] **Cremated bone** (burned remains of any quantity; excludes cases of incidental charring of otherwise unburned skeleton)
- [ ] **Soft tissues present**

Describe: Skeleton is only ~40-50% complete and is very fragmented. Most long bones are represented. Some cranial vault fragments, carpals, tarsals, vertebrae and pelvic fragments are present.

CONDITION

Yes	No	Unobservable	
[X]	[ ]	[ ]	Cracking
[X]	[ ]	[ ]	Breaks
[ ]	[X]	[ ]	Brittle
[ ]	[X]	[ ]	Exfoliation
[ ]	[X]	[ ]	Warping
[ ]	[ ]	[X]	Cut marks
[ ]	[ ]	[X]	Gnaw marks
[X]	[ ]	[ ]	Root or insect damage
[ ]	[X]	[ ]	Staining
[X]	[ ]	[ ]	Soil adhering

Describe (include severity & elements affected): Almost all present elements are cracked and broken. The most prominent observation of this skeleton is the extensive soil adhering on most elements. Adherence level is especially thick on the [illegible]

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SKELETAL INVENTORY RECORDING FORM (1)

Codes:
f = 1-25% present
p = 25-75% present
c = 75-100% present

Provenience: BPAAP 2018 Sol. Tell Unit 13 C23

Designation/ID: ST.18 13.23

CRANIAL	left	right
Frontal		F
Parietal		
Occipital		
Temporal	P	F
TMJ	–	
Mandible		
Zygomatic		C
Maxilla		F
Nasal		C
Lacrimal		
I. N. C.		
Palatine		
Sphenoid		
Ethmoid		
Vomer		
Hyoid		
Thyroid/Crycoid		
Ossicles		
Unident. Cranial (#):		

teeth	#	cond
Incisors		
Canines	1	C
Premolars		
Molars		
Unidentified Teeth (#):		

AXIAL	#	cond
1st Cervical		
2nd Cervical		
3-6 Cervical		
7th Cervical		
1-9 Thoracic	2	P
10th Thoracic		
11th Thoracic		
12th Thoracic		P
1-4 Lumbar	3	C
5th Lumbar		F
Sacrum	3	F
Coccyx		

	#	cond
Manubrium		
Sternal Body		
xiphoid		
Left Ribs	5	P
Right Ribs	3	P
Unidentified Axial (#):		

APPEND.	left	right
Scapula	F	P
glenoid	–	C
Clavicle		–
med. epi.		C
Ilium	F	P
auricular	P	C
Pubis	–	–
symphysis	–	–
Ischium	F	P
acetabulum	P	C
Patella	C	C
Unidentified Append. (#):		

APPENDICULAR

	left epi-p	left prox	left mid	left dist	left epi-d	right epi-p	right prox	right mid	right dist	right epi-d
Humerus	–	P	C	C	P	–		F	F	C
Radius	C	–	–	–	–	C	F	–	–	C
Ulna	C	C	C	–	–	C	C	P	F	–
Femur	P	F	P	F	F	F	P	P	P	P
Tibia	F	P	P	F	C	F	F	P	P	P
Fibula	F	F	F	F	C	P	P	P	P	C

Unidentified Long Bones (#):

EXTREMITIES	#	cond
Scaphoid	1	C
Lunate	1	C
Trapezium	1	C
Trapezoid	1	C
Capitate	2	C
Hamate	1	C
Triquetral	1	C
Pisiform	Ø	
Metacarpals	9	C
Prox. Phalanges	7	C
Mid. Phalanges	7	C
Dist. Phalanges	5	C
Sesamoids	Ø	

	#	cond
Calcaneus	1	C
Talus	2	C
Cuboid	1	C
Navicular	1	C
Med. Cuneiform	1	C
Inter. Cuneiform	1	C
Lat. Cuneiform	2	C
Metatarsals	8	P-C
Prox. Phalanges	2	C
Mid. Phalanges	Ø	
Dist. Phalanges	Ø	
Sesamoids		
Unident. Extremities (#):		

Notes:

L foot
MT 1, 5

foot
T 2-4

L hand
MC 1-5
lunate, capitate, hamate, trapezium

R hand
scaphoid, triquetral, capitate, trapezoid
MC 2, 3, 4, 5
mid phalanges 2

†This form includes information derived from Buikstra and Ubelaker (1994), *Standards for Data Collection from Human Skeletal Remains*, Arkansas Archeological Survey, and is used with permission of the publisher.

Unsided Elements
prox hand phalanges
MT heads

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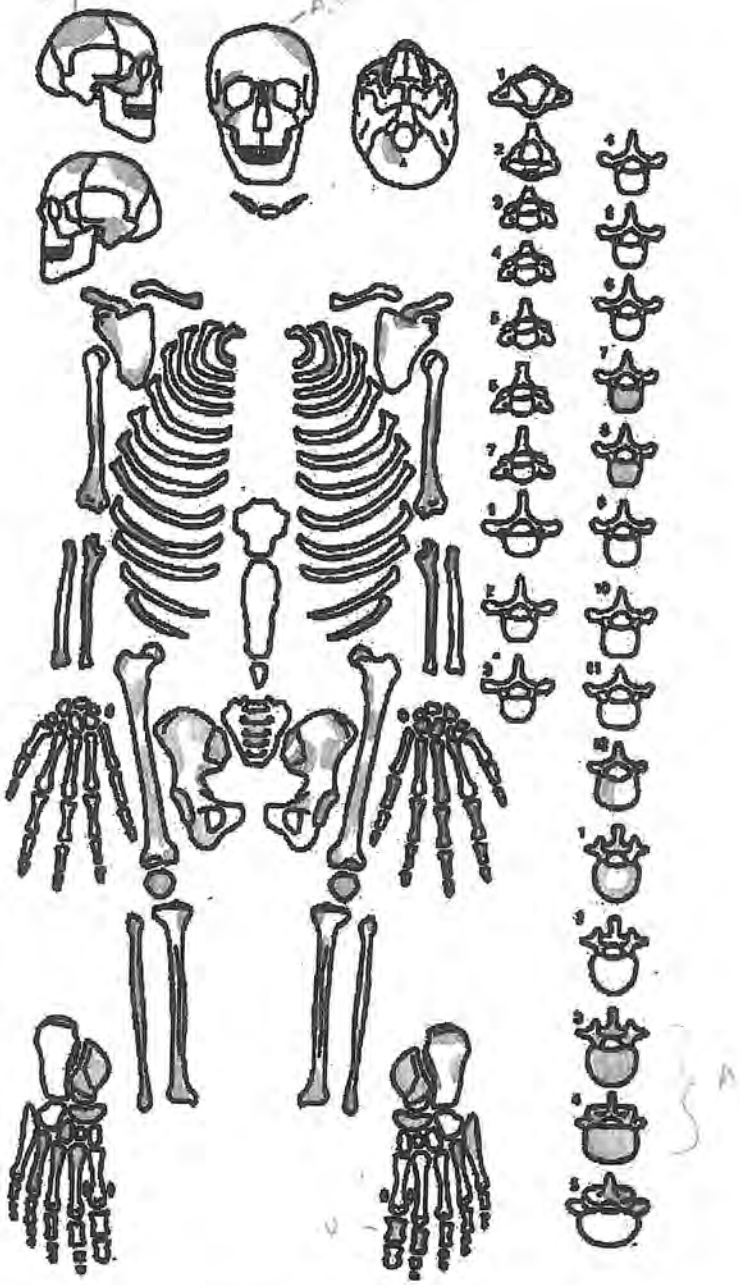
SKELETAL INVENTORY
RECORDING FORM (1)

ST. 18. 13. 23
Accession 2018 07.43

Fill in skeletal elements present and record notes along side. Label "U" if unsided and "A" to denote approximated location.

Right **Left**



Additional observations:

†This form includes information derived from Buikstra and Ubelaker (1994), *Standards for Data Collection from Human Skeletal Remains*, Arkansas Archeological Survey, and is used with permission of the publisher.

Pathology notes

L. humerus subchondral breakdown on margin [illegible] tulum. 16 x 9 mm (AP x ML)
R. humerus also has this path. change on the dist. art surface measuring 19.6 x 12 mm

A 3-9 Left rib head has slight lipping and macroporosity across the surface

L1, L3, & L4 have moderate to severe lipping on the sup & inf. margins of the bodies. This is especially pronounced on L4 such that the annular rings have displaced.

Right inf. art facet of T12 is macroporotic.

R. scapular entire post. margin of the glenoid fossa is macroporotic and degenerating, affecting ~24-41 mm rim

Diploic expansion on parietal elements. Diploe is macroporotic and spongy, and is ~25% thicker than normal. The inner and outer tables are significantly thinned.

Metrics

Only post cranial measurements available for ST.18.13.23

R. humerus epicondylar breadth: 52.6 mm - femur based on Iscan et al. 1998
L. femur max. diameter of head: 41* mm - femur based on Milner & Boldsen, 2011
L. tibia max. distal epiphyseal breadth: 46.3 mm

Body mass

Ruff et al. 2012	2.18 (41) - 35.8	= 53.58 kg
Grine et al. 1995	2.27 (41) - 36.5	= 56.57 kg
McHenry 1992	2.24 (41) - 39.9	= 51.94 kg

Sex estimation: Supraorbital margin score = 3
⇒ ambiguous

BPAAP 2018, Saki Tzul, ST.18.11.5
Accession #: 2018.07.35
Emily Moes, Alexis O'Donnell
March 2019

Summary: ST.18.11.5 is a primary interment of an old adult female Native American. Approximately 80% of the skeleton is present. Almost all elements are fragmented. The thorax is especially affected since the sternum is missing, and there are neither few vertebral bodies nor sternal ribs ends. Taphonomic damage is observable throughout the skeleton, especially by water/root/insect damage. This has caused the cortical bone has been worn or eaten away on many parts of the skeleton. The cranium is mostly affected by soil adherence. This individual has pathological changes consistent with systemic disturbance, nonspecific infection, and joint degeneration, and cranial modification.

Minimum number of individuals for this burial is 2. Details of this report refer to an adult skeleton, but there are also elements of a comingled second adult (mature left second metatarsal). This was likely found loose in the fill since there is no evidence of ST.18.11.5 cutting into other nearby burials.

Burial Context: This individual was buried in a prone position on an east-west axis with the head in the east, turned slightly and facing south. Legs are tightly flexed at the knees such that the feet are on the pelvis. The left arm is extended with the hand under the left hip. The right arm is flexed at the elbow with the hand near the face. The spine is extended.

Age Estimation: We estimate this individual to be 62-66 years of age. The only standard age estimation technique given by Buikstra and Ubelaker (1994) that we were able to use is using the Lovejoy and colleagues' auricular surface. This gave an estimate of 45-49 years. However, we place more emphasis on newer methods that have shown higher accuracy rates for older individuals (Godde and Hens, 2012; Mulhern and Jones, 2005). Using the auricular surface, we estimate ST.18.11.5 is 66 years (Buckberry and Chamberlain, 2002). Using transition analysis (Milner and Boldsen, 2016), we estimate the age around 62 years.

Sex Estimation: The estimated sex of this individual is female. Table 1 shows the scores for the sex-diagnostic traits of the pelvis and cranium (Buikstra and Ubelaker, 1994).

Pelvis	Left Score	Right Score	**Cranium**	Score
Ventral Arc	2	1	**Nuchal Crest**	1
Subpubic Concavity	1	1	**Mastoid Process**	1
Ischiopubic Ramus Ridge	1	1	**Supraorbital Margin**	3
Greater Sciatic Notch	-	-	**Glabella**	2
Preauricular Sulcus	2	2	**Mental Eminence**	--
Estimated Sex	1 = Female			2 = Female

Table 1: Sex estimation scores from the pelvis and cranium (1 = female condition; 5 = male condition).

Stature: This individual is estimated to be 142-150 cm in height. Stature was estimated based on Genoves's (1967) regression using maximum femoral length (37.2 cm).

Body Mass: Body mass is estimated to be 46.1-50.6 kg. The left femoral head breadth, 38.4 mm, was used following three common methods for body mass estimation. Table 2 depicts the method and

associated mass estimate. Auerbach and Ruff (2004) suggest that for smaller individuals, McHenry's method of body mass estimation is more accurate.

Method	Mass Estimate (kg)
McHenry (1992)	46.1
Grine et al. (1995)	50.6
Ruff et al. (2012)	47.9

Table 2: Body mass estimation (kg) based on three methods using the femoral head breadth.

Population Affinity: This individual is Native American based on the location of its burial in a rock shelter in Belize, and carbon dating to 1235 ± 15 BP.

Dental Analysis:
Dental Inventory:
Teeth present: ULC, ULP3, UPL4, LRI2, LRC, LRP3, LRP4
Teeth missing (no alveolus): URM3, URM2, URM1, URP4, URP3, URC, URI2, URI1, ULI1, ULM1, ULM2, ULM3
Teeth missing (antemortem): LLM3, LLM2, LLM1, LLP4, LLP3, LLC, LLI2, LLI1, LRI1, LRM1, LRM2, LRM3

Dental Pathology: Dental development is complete. Postmortem taphonomic processes have damaged the outer-most surface of the enamel of LRI2, and LRP4, as well as the roots of LRC, LRP3, and LRP4. Caries are only present on the maxillary teeth. Interproximal caries are present on the maxillary premolars; a root caries is on ULP3; there is a caries at the labial CEJ of ULC. Very little dental calculus is present, but can be seen on ULC and LRP3. Dental attrition scores range from 3 to 5 on all teeth. There are no observable patterns of wear. Enamel defects are only observable on the canines. The LRC has one linear enamel hypoplasia (LEH) 3.3mm from the CEJ, and the ULC has two LEH which cannot be measured relative to the CEJ due to a caries at the labial CEJ.

Dental Morphology: Few morphological characteristics are scoreable for this individual due to the number of missing teeth. In the maxilla: tuberculum dentale ULC (0); accessory cusps ULP3 (0), ULP4 (0); distosagittal ridge ULP3 (0); mesial accessory ridge ULP3 (0), ULP4 (0); distal accessory ridge ULP3 (0), ULP4 (3). Morphology scores based on Edgar (2017).

Pathology:
Overview: ST.18.11.5 shows pathological changes consistent with systemic disturbance, infection, trauma, joint degeneration, and tabular cranial modification. Systemic disturbance is evident in healed porotic hyperostosis and LEH in two canines (above). The tibiae and right femur show evidence of infection as they have periosteal reactions on their diaphyses. There is a fracture on a lower thoracic vertebra, and joint degeneration is especially prevalent in the lower spine, although there is evidence for this in most joint throughout the skeleton.

Cranium: The parietals and occipital exhibit evidence of healed porotic hyperostosis near the lambdoidal suture. The cranium also has artificial cranial modification. (This was discovered after EM reconstructed the cranial vault using Elmer's glue, which is water soluble.) Modification is tabular, with deformation present on the posterior and anterior aspects, with bilobate expansion of the parietals. Pressure was located at lambda (perpendicular to the transverse plane) and near the frontal boss. Taphonomic damage has rendered pad impressions unobservable. However, it is notable that binding impressions

are not visible anywhere on the cranium, and there is no bregmatic elevation. Modification is symmetrical.

Vertebrae and Thorax: The superior articular surface of C1 has subchondral bone exposure of an area 7 mm in diameter. The right superior articular facet of T11 has an actively healing transverse fracture at the center of its surface. The (likely) associated inferior articular facets of T10 have extensive lipping with active resorption at their centers. Lipping is more pronounced and is accompanied by more extensive porosity on the left side. The associated facet on T11 is unobservable.

There is a moderate amount of lipping on the superior articular facets of all lumbar vertebrae. L5 has extensive lipping on both inferior articular facets such that the surface areas are approximately double their normal size. There is a moderate amount of lipping on the anterior margins of the bodies of L4 and L5. The sacrum has extensive lipping on the superior articular facets. Additionally, although the sacrum is affected by taphonomic damage and fragmenting, it is noticeably light in weight; the exposed trabeculae and cortex is thin. Sacral foramina are wide with resorbing margins, which is especially prevalent on the anterior surface.

All rib heads have a small amount of lipping. An upper left rib has a well-healed fracture at the costal angle; the callus is completed integrated into the cortex. The fracture is instead indicated by the expanded cortex inferior-superior, and thicker anterior-posterior width. The right first rib has an incomplete bridge on the sternal end (Barnes, 2012).

Legs: The medial articular facet of the left patella has subchondral breakdown. The affected area is 7 mm in diameter, near the superior margin. The right fibula has healed periosteal reaction at midshaft. In the same location, the left fibula as mixed healing and active periosteal reaction.

The left femoral head has slight lipping on the posterior margin. There is mixed active and healing reactive bone on the distal diaphysis of the right femur. Both the left and right tibiae diaphyses have healed periosteal reaction along their lengths.

All articular facets of the left and right feet have slight to moderate lipping. The left and right metatarsals 1-3 have flattened areas of slowly resorbing bone on the dorsal surfaces, just proximal to the heads. The left and right MT5 have no evidence of this, and the left MT4 is broken at the distal end. Additionally, a fifth proximal phalanx has an accessory distal facet, but it is not surrounded by any changes to the normal distal articular surface; therefore, this is not indicative of polydactyly, but rather it could be due to variation in the insertion site for a tendon. Because the phalanx cannot be sided, I cannot determine if the facet is on the lateral or media surface.

Arms: The right humerus has a mixed active and healing periosteal reaction at midshaft. Both radii have slight lipping on their articular surfaces. The posterior aspect of the neck of the left radius has a complex reaction where there is new porous (but not woven) bone growth with a lytic reaction affecting it. The right carpals have actively resorbing bone on the non-articular surfaces around the facets.

Skeletal Inventory and Measurements: ST.18.11.5 is approximately 80% complete. The skeleton is in good condition, although most elements are fragmented. The thorax is especially affected; few vertebral bodies are present. The cranium, ribs, and left os coxa are extremely fragmented. The sternum was not recovered. Please see the skeletal inventory recording forms for a complete list of complete elements

for ST.18.11.5. Tables 3 and 4 present the mandibular and postcranial measurements available for this individual.

Trait	Measurement (mm)
Mastoid Length	27.6
Mandibular Body Height	15.5
Mandibular Body Breadth	12.1
Bigonial Width	98*
Minimum Ramus Breadth	32.9
Mandibular Length	77*

Table 3: Mandibular measurements for ST.18.11.5. * indicates measurement was taken at the approximate location due to reconstruction or cracking. Please note that the mandible has extensive alveolar resorption.

Element	Trait	Left (mm)	Right (mm)
Clavicle	Max. Length	-	120.8
	A-P Diam. Midshaft	9.1	8.7
	S-I Diam. Midshaft	7	7
Humerus	Max. Diam. Midshaft	18.8*	19*
	Min. Diam. Midshaft	14*	13.3*
Radius	Max. Length	197	-
	A-P Diam. Midshaft	10.3	11.3*
	M-L Diam. Midshaft	12.1	13.8*
Ulna	Max. Length	216	-
	A-P Diameter	11	12.3*
	M-L Diameter	13.5	10.6*
	Physiological Length	189	-
	Min. Circumference	35	-
Pelvis	Ischium Length	-	75.6
Femur	Max. Length	372	-
	Bicondylar Length	371	-
	Epicondylar Breadth	66.3	-
	Max. Diam. Head	38.4	37.6
	A-P Subtroch. Diam.	22.3	24
	M-L Subtoch. Diam.	25.4	27.5
	A-P Midshaft Diam.	23.6	-
	M-L Midshaft Diam.	23.1	-
	Midshaft Circumference	72	-
Tibia	Max. Length	304	-
	Max. Prox. Epiphyseal Breadth	63.1	-
	Max. Dist. Epiphyseal Breadth	40.2	38.7
	Max. Diam. Nutrient Foramen	30.5	29.6
	M-L Diam. Nutrient Foramen	22.6	20.2
	Circ. Nutrient Foramen	80	79
Fibula	Max. Length	297	299
	Max. Diam. Midshaft	14.5	15.3

Calcaneus	Max. Length	58.9	60.5
	Middle Breadth	36.6	38.5

Table 4: Postcranial metric data for ST.18.11.5. – indicates that the measurement was not taken on the opposite side due to absence of materials or bony landmarks. * indicates measurement was taken at approximate location due to reconstruction or landmarks could not clearly be observed. Max. = maximum. Min = minimum. S-I = superior-inferior. A-P = anteroposterior. M-L = mediolateral. Epiph = epiphyseal.

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617.

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ARIZONA STATE MUSEUM
HUMAN REMAINS DOCUMENTATION PACKET

PROVENIENCE

Site Name: Sak. Tzal BPAAP 2018 **Site No.:**

Designation/ID: ST. 18 11 5

accession # 2018.07.35

Observer(s): E. Moes, A. O'Donnell **Date:** March 2019

BIOLOGICAL PROFILE

MNI: 2 (1 primary, 1 comingled)

Age: 62-66 yrs

Sex: female

Ancestry: Native American

FORM LIST (indicate forms used)

- [X] 1 Skeletal Inventory
- [X] 2a Age and Sex Assessment - Adult
- [ ] 2b Age Assessment - Juvenile
- [X] 3a Permanent Dental Inventory/Pathology
- [ ] 3b Deciduous Dental Inventory/Pathology
- [X] 4a Dental Morphology - Permanent
- [ ] 4b Dental Morphology - Deciduous
- [X] 5a Measurements - Adult
- [ ] 5b Measurements - Juvenile
- [ ] 6 Non-Metric Traits
- [X] 7 Pathology Checklist
- [ ] 8 Degenerative Joint Disease
- [ ] 9 Spinal Osteophytosis
- [X] 10 Artificial Cranial Modification
- [ ] 11 Cremated Remains
- [ ] 12 Isolated Remains
- [X] Skeletal Visual Recording Forms
- [X] Additional Forms, Notes, Sketches, Photo Log, etc.

PRESERVATION

- [X] **Complete skeleton** (>75%)
- [ ] **Partial skeleton** (25-75% present)
- [ ] **Fragmentary skeleton** (<25% present, includes at least one complete element)
- [ ] **Fragments of bone** (small amount of fragmented bone; <<25% is present)
- [ ] **Skull** (only cranial remains present and partially preserved)
- [ ] **Teeth** (only loose teeth are present)
- [ ] **Cremated bone** (burned remains of any quantity; excludes cases of incidental charring of otherwise unburned skeleton)
- [ ] **Soft tissues present**

Describe: Approx 80% of skeleton is present. Most elements are fragmented in some way. Thorax is especially affected. Few vertebral bodies are present.

CONDITION

Yes	No	Unobservable	
[X]	[ ]	[ ]	Cracking
[X]	[ ]	[ ]	Breaks
[ ]	[X]	[ ]	Brittle
[ ]	[X]	[ ]	Exfoliation
[ ]	[X]	[ ]	Warping
[ ]	[X]	[ ]	Cut marks
[X]	[ ]	[ ]	Gnaw marks
[X]	[ ]	[ ]	Root or insect damage
[ ]	[X]	[ ]	Staining
[X]	[ ]	[ ]	Soil adhering

Describe (include severity & elements affected): Taphonomic damage observable throughout, especially by water/root/insect damage where the outer layer of the cortical bone has been worn/eaten away on many parts of the skeleton. Cranium is most affected by soil adherence.

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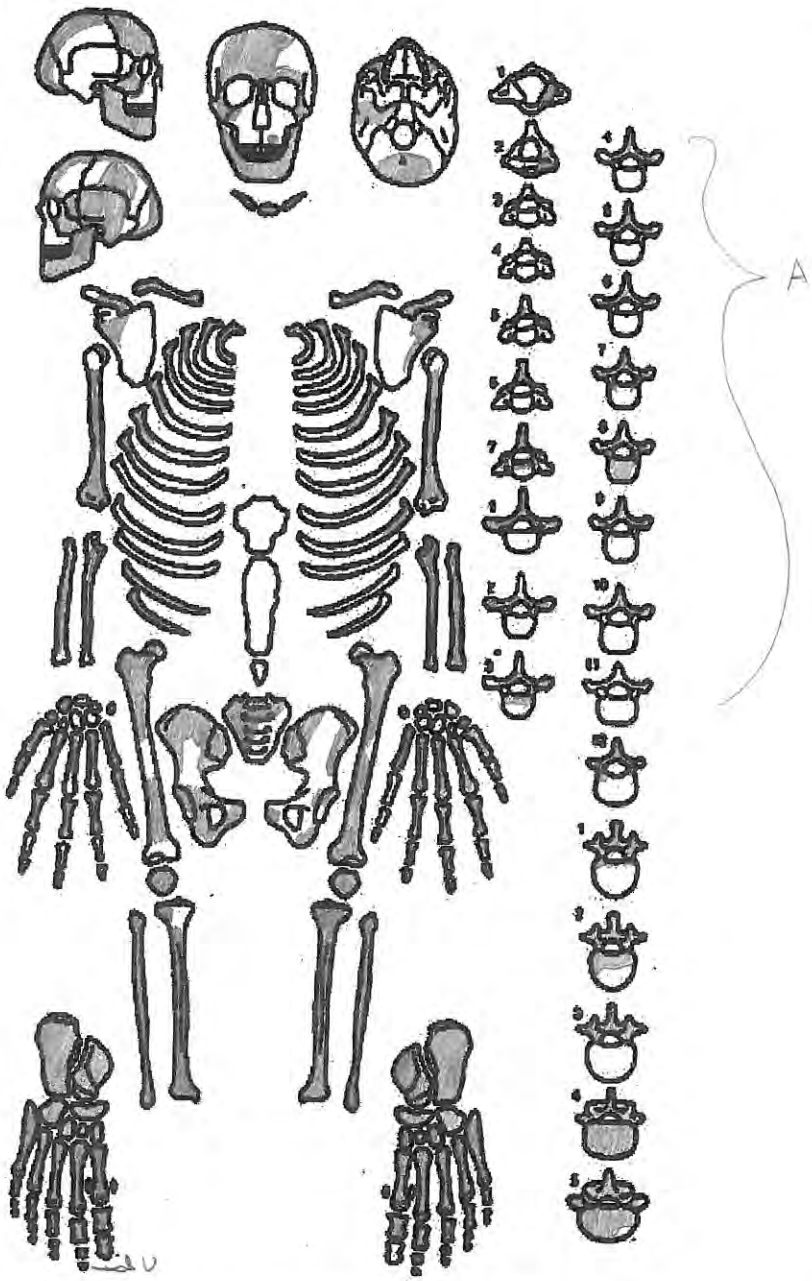
SKELETAL INVENTORY
RECORDING FORM (1)

ST.15.11.5

Fill in skeletal elements present and record notes along side.
Label "U" if unsided, and "A" to denote approximated location.

Right **Left**



Additional observations:

†This form includes information derived from Buikstra and Ubelaker (1994), *Standards for Data Collection from Human Skeletal Remains*, Arkansas Archeological Survey, and is used with permission of the publisher.

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SKELETAL INVENTORY
RECORDING FORM (1)

Codes:
f = 1-25% present
p = 25-75% present
c = 75-100% present

Provenience: _____

Designation/ID: ST. 18. 11. 5

CRANIAL	left	right
Frontal	P	C
Parietal	P	P
Occipital	P	P
Temporal	C	
TMJ	C	
Mandible	C	C
Zygomatic	C	C
Maxilla	F	
Nasal		
Lacrimal		
I. N. C.		
Palatine		
Sphenoid	P	
Ethmoid		
Vomer		
Hyoid		
Thyroid/Crycoid		
Ossicles		
Unident. Cranial (#):		

teeth	#	cond
Incisors	2	C
Canines	1	C
Premolars	4	C
Molars	–	–
Unidentified Teeth (#):		

AXIAL	#	cond
1st Cervical		F
2nd Cervical		F
3-6 Cervical	2	F
7th Cervical		P
1-9 Thoracic		
10th Thoracic	10	F-P
11th Thoracic		
12th Thoracic		P
1-4 Lumbar	4	P
5th Lumbar		C
Sacrum	4	C-F
Coccyx	1	C

Manubrium		
Sternal Body		
xiphoid		
Left Ribs	9	P-C
Right Ribs	9	P-C
Unidentified Axial (#):		

APPEND.	left	right
Scapula	P	P
glenoid	C	P
Clavicle	C	C
med. epi.	–	C
Ilium	P	P
auricular	C	C
Pubis	C	P
symphysis	C	P
Ischium	C	F
acetabulum	C	C
Patella	C	C
Unidentified Append. (#):		

APPENDICULAR

	left epi-p	left /prox	left /mid	left /dist	left /epi-d	right epi-p	right /prox	right /mid	right /dist	right /epi-d
Humerus	F	P	C	C	–	P	C	C	C	C
Radius	C	C	C	C	C	C	C	C	P	–
Ulna	C	C	C	C	C	–	C	C	P	–
Femur	C	C	C	C	C	C	C	F	C	–
Tibia	C	C	C	C	C	F	C	C	C	C
Fibula	C	C	C	C	C	C	C	C	C	C

Unidentified Long Bones (#): _____

EXTREMITIES	#	cond
Scaphoid	1	C
Lunate	–	
Trapezium	2	C
Trapezoid	–	
Capitate	–	
Hamate	1	C
Triquetral	–	
Pisiform	1	C
Metacarpals	10	P-C
Prox. Phalanges	9	C
Mid. Phalanges	8	C
Dist. Phalanges	4	C
Sesamoids		

	#	cond
Calcaneus	2	C
Talus	2	C
Cuboid	2	C
Navicular	2	C
Med. Cuneiform	2	C
Inter. Cuneiform	2	C
Lat. Cuneiform	2	C
Metatarsals	10	C
Prox. Phalanges	10	C
Mid. Phalanges		
Dist. Phalanges	2	C
Sesamoids	2	C
Unident. Extremities (#):		

Notes:
Commingled L MT 2 of 2nd person

Left foot
calcaneus, talus, navicular, cuboid, medial, intermediate, lateral cuneiforms
MT 1-5

Right foot
calcaneus, talus, navicular, cuboid, medial, intermediate, lateral cuneiforms
MT 1-5

L. hand
trapezium
MC 1-5
prox phalanges: III
mid phalanges: II
distal phalanges: II
pisiform, hamate

R. hand
scaphoid, trapezium
MC 1-5 (P)
prox phalanges: III
mid phalanges: III

†This form includes information derived from Buikstra and Ubelaker (1994), *Standards for Data Collection from Human Skeletal Remains*, Arkansas Archeological Survey, and is used with permission of the publisher.

Unsided Pedal elements
prox phalanges: LM LMT
dist phalanges
sesamoids: II

Unsided manual elements
mid phalanges: II
dist. phalanges: II

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AGE & SEX ASSESSMENT
ADULT - RECORDING FORM (2a)

Age: _____
Sex: _____

Provenience: _____

Designation/ID: ST. 18. 11. 5

AGE

PELVIC:		left	right
Pubic Symphysis			
Todd (1-10)		\	\
Suchey-Brooks (1-6)		\	\
Auricular Surface			
Lovejoy et al. (1-8)		6 (45-49)	6

POSTCRANIAL: Epiphyseal Union*			
Clavicle	Sternal epiphysis		___
Vertebral Annular Epiphyses	Cervical	superior	___
		inferior	___
	Thoracic	superior	___
		inferior	___
	Lumbar	superior	___
		inferior	___
Sacrum	S1/S2 fusion		___
Innominate	Iliac crest		___

complete

CRANIAL:	Suture Closure*	
External Cranial Vault	1. Midlambdoid	___
	2. Lambda	___
	3. Obelion	___
	4. Anterior Sagittal	___
	5. Bregma	___
	6. Midcoronal	___
	7. Pterion	___
	8. Sphenofrontal	___
	9. Inf. Sphenotemporal	___
	10. Sup. Sphenotemporal	___
Palatine	11. Incisive Suture	___
	12. Anterior Median	___
	13. Posterior Median	___
	14. Transverse Palatine	___
Internal Cranial Vault	15. Sagittal	___
	16. Left Lambdoid	___
	17. Left Coronal	___

Estimated Age:

Subadult (12-20 years)	___
Young Adult (20-35 years)	___
Middle Adult (35-50 years)	___
Old Adult (50+ years)	X

Suture and Epiphysis Codes:
0 = open
1 = minimal
2 = significant
3 = complete

Observations: Buikstra & Chamberlain 2005 mean age 66 yrs.
Trans. Am Analysis: 62.4 yrs

SEX

PELVIC:	left	right
Ventral Arc (1-3)	2	1
Subpubic Concavity (1-3)	1	1
Ischiopubic Ramus Ridge (1-3)	1	1
Greater Sciatic Notch (1-5)	—	—
Preauricular Sulcus (0-4)	2	2

Estimated Sex, Pelvis (1-5): 1 = female

CRANIAL:	
Nuchal Crest (1-5)	1
Mastoid Process (1-5)	1
Supraorbital Margin (1-5)	3
Glabella (1-5)	2
Mental Eminence (1-5)	—

Estimated Sex, Skull (1-5): 2 = female

Observations:

Buckberry and Chamberlain, 2002

Age Estimation from the auricular surface

	Left	Right
Transverse organization	4	4
Surface texture	4	4
Microporosity	3	3
Macroporosity	2	3
Apical changes	2	2
	15	16

⇒ Age stage VI

mean age 66 (± 11.88)

Stature Estimation for females (cm)

Genovés, 1967

femur only: $2.59\,(37.2) + 49.742 \pm 3.816 = 146 \pm 3.82$ cm

tibia only: $2.72\,(30.4) + 63.781 \pm 3.513 = 146.5 \pm 3.51$ cm

all bones: $8.66\,(19.7)_{\text{radius}} - 7.37\,(21.6)_{\text{ulna}} + 1.25\,(30.4)_{\text{tibia}} - 0.93\,(37.2)_{\text{femur}} + 96.674 \pm 2.812$

$= 111.49$ missing bone

Body mass estimation for females (kg)

FHB = 38.4 mm

McHenry 1992	2.24(FHB) − 39.9	= 46.1
Grine et al 1995	2.27 (FHB) − 36.5	= 50.6
Ruff et al 2012	2.18(FHB) − 35.8	= 47.9

Transition Analysis Scoring

Case/Site/Collection: BPAAP 2018 **ID:** ST. 18.11.5

Observer: E. Moes Date: 07 / 2 / 2019

Cranial Sutures	**Left**	**Right**
Coronal Pterica	- 1 2 3 4 5	- 1 2 3 4 5
Sagittal Obelica (midline)	- 1 2 3 4 5	
Lambdoidal Asterica	- 1 2 3 4 5	- 1 2 3 4 5
Interpalatine (midline)	- 1 3 4 5	
Zygomaticomaxillary	- 1 2 3 4 5	- 1 2 3 4 5

Pubic Symphysis	**Left**	**Right**
Symphyseal Relief	- 1 2 3 4 5 6	- 1 2 3 4 5 6
Symphyseal Texture	- 1 2 3 4	- 1 2 3 4
Superior Apex	- 1 2 3 4	- 1 2 3 4
Ventral Symphyseal Margin	- 1 2 3 4 5 6 7	- 1 2 3 4 5 6 7
Dorsal Symphyseal Margin	- 1 2 3 4 5	- 1 2 3 4 5

Iliac Auricular Surface	**Left**	**Right**
Superior Demiface Topography	- 1 2 3	- 1 2 3
Inferior Demiface Topography	- 1 2 3	- 1 2 3
Superior Surface Morphology	- 1 2 3 4 5	- 1 2 3 4 5
Middle Surface Morphology	- 1 2 3 4 5	- 1 2 3 4 5
Inferior Surface Morphology	- 1 2 3 4 5	- 1 2 3 4 5
Inferior Surface Texture	- 1 2 3	- 1 2 3
Superior Posterior Iliac Exostoses	- 1 2 3 4 5 6	- 1 2 3 4 5 6
Inferior Posterior Iliac Exostoses	- 1 2 3 4 5 6	- 1 2 3 4 5 6
Posterior Exostoses	- 1 2 3	- 1 2 3

Codes: - (Missing or Not Observable), 1-7 (defined in Transition Analysis manual)

corrected: pt estimate	62.4	(38.9 82)	
uncorrected:	58.2	(37.7, 80.7)	p=0.16
pubic symph:	41.8	(25.8, 74.4)	p = 0.51
Auricular surf.:	70.1	(43.2, 96.7)	p=0.79

TA Form version 3.1

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SKELETAL MEASUREMENT
ADULT - RECORDING FORM (5a)

Record all measurements millimeters.

Provenience: _____

Designation/ID: ST. 18.11.5

CRANIAL

1. **GOL** Maximum Cranial Length		18. **DKB** Interorbital Breadth	
2. **XCB** Maximum Cranial Breadth		19. **FRC** Frontal Chord	
3. **ZYB** Bizygomatic Breadth		20. **PAC** Parietal Chord	
4. **BBH** Basion-Bregma Height		21. **OCC** Occipital Chord	
5. **BNL** Basion-Nasion Length		22. **FOL** Foramen Magnum Length	
6. **BPL** Basion-Prosthion Length		23. **FOB** Foramen Magnum Breadth	
7. **MAB** Maxillo-Alveolar Breadth		24. **MDH** Mastoid Length	27.6
8. **MAL** Maxillo-Alveolar Length		25. **GNI** Chin height	–
9. **AUB** Biauricular Breadth		26. **HML** Mandibular Body Height	15.5
10. **NPH** Upper Facial Height		27. **TML** Mandibular Body Breadth	12.1
11. **WFB** Minimum Frontal Breadth		28. **GOG** Bigonial Width	98*
12. **FMB** Upper Facial Breadth		29. **CDL** Bicondylar Breadth	–
13. **NLH** Nasal height		30. **WRL** Minimum Ramus Breadth	32.9
14. **NLB** Nasal Breadth		31. **MRL** Maximum Ramus Breadth	–
15. **OBB** Orbital Breadth		32. **XRL** Maximum Ramus Height	–
16. **OBH** Orbital Height		33. **MLT** Mandibular Length	77*
17. **EKB** Biorbital Breadth		34. **MLX** Mandibular Angle	–

extensive alveolar resorption

POSTCRANIAL

	left	right		left	right
35. **Clavicle:** Max. Length	–	120.8	60. **Femur:** Max. Length	372	–
36. A-P Diam. Midshaft	9.1	8.7	61. Bicondylar Length	371	–
37. Sup.-Inf. Diam. Midshaft	7	7	62. Epicondylar Breadth	66.3	–
38. **Scapula:** Height	–	–	63. Max. Diam. Head	38.4	37.6
39. Breadth	–	–	64. A-P Subtroch. Diam.	22.3	24
40. **Humerus:** Max. Length	–	–	65. M-L Subtroch. Diam.	25.4	27.5
41. Epicondylar Breadth	–	–	66. A-P Midshaft Diam.	23.6	–
42. Vertical Diam. Head	–	–	67. M-L Midshaft Diam.	23.1	–
43. Max. Diam. Midshaft	18.8*	19*	68. Midshaft Circumference	72	–
44. Min. Diam. Midshaft	14*	13.3*	69. **Tibia:** Max. Length	304	–
45. **Radius:** Max. Length	197	–	70. Max. Prox.Epiph. Breadth	63.1	–
46. Ant.-Post. Diam. Midshaft	10.3	11.3*	71. Max. Distal Epiph. Breadth	40.2	38.7
47. Med.-Lat. Diam. Midshaft	12.1	13.8*	72. Max. Diam. Nutrient For.	30.5	29.6
48. **Ulna:** Max. Length	216		73. M-L Diam. Nutrient For.	22.6	20.2
49. A-P Diameter	11	12.3*	74. Circ. Nutrient Foramen	80	79
50. M-L Diameter	13.5	10.6*	75. **Fibula:** Max. Length	297	299
51. Physiological Length	189	–	76. Max. Diameter Midshaft	14.5	15.3
52. Min. Circumference	35	–	77. **Calcaneus:** Max. Length	58.9	60.5
53. **Sacrum:** Anterior Length	–		78. Middle Breadth	36.6	38.5
54. Anterior Superior Breadth	–				
55. Max. Trans. Diam. Base	–		79. **Sternum:** Length Mesostern.		
56. **Pelvis:** Height	–	–	80. Max. Breadth 1st		
57. Iliac Breadth	–	–			
58. Pubis Length	–	–			
59. Ischium Length	–	75.6			

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PATHOLOGY CHECKLIST
RECORDING FORM (7)

Provenience: _____

Designation/ID: ST. 18. II. 5

CRANIAL	present	absent	unobs.
Porotic hyperostosis	X		
Cribra orbitalia			X
Premature synostosis		X	
Osteomas		X	
Periosteal reactions		X	
Lytic reactions	X		
Proliferative reactions		X	
Trauma		X	
Cultural modifications	X		

AXIAL	present	absent	unobs.
Ankylosis		X	
Arch defects		X	
Compression fractures		X	
Schmorl's nodes		X	
Periosteal reactions		X	
Lytic reactions		X	
Osteoporosis		X	
Trauma	X		
Reaction on pleural aspect of ribs		X	
Accessory facets		X	

APPENDICULAR	present	absent	unobs.
Periosteal reaction	X		
Lytic reactions	X		
Proliferative reactions		X	
Osteoporosis		X	
Trauma		X	
Cultural modifications		X	
Osteomyelitis		X	
Exostoses		X	
Accessory facets		X	

EXTREMITIES	present	absent	unobs.
Lytic reactions		X	
Proliferative reactions		X	
Periosteal reactions		X	
Trauma		X	
Exostoses		X	
Accessory facets		X	

Observations (describe pathology in detail and use individual element visual recording forms to illustrate morphology and extent):

†This form includes information derived from Buikstra and Ubelaker (1994), *Standards for Data Collection from Human Skeletal Remains*, Arkansas Archeological Survey, and is used with permission of the publisher.

Pathology Notes

- **Sacrum**: extensive lipping on superior art. facets. Although affected by taph. damage and fragmenting, sacrum is light in weight. Exposed trabeculae and cortex is thin. Sacral foramina are wide with resorbing margins, especially prevalent on anterior surface. Moderate lipping on the ant. margins of L4 $ L5 bodies.
- Subchondral exposure of a 7 mm diameter area on the sup. surface of C1.
- Moderate lipping of superior articular facets of all <u>lumbar verts</u>. L5 has extensive lipping on both inf. art. facets such that the surface areas are approx. double what would be normally.
- Right sup. art. facet of T11 has an actively healing transverse fx at the center of its surface. The (likely) associated inferior articular facets of T10 have extensive lipping with active resorption (microporosity) at their centers. Lipping is more pronounced and with more extensive porosity on the left side. It's associated facet on T11 is unobservable.
- Rib heads have trace-slight amt of lipping. An upper left rib has a well-healed fx at the costal angle. Callus is completely integrated into the cortex, evidence of fx is the expanded bone inf $ sup as well as thicker a-p width compared to the surrounding bone.
- Right rib 1 has an incomplete bridge on the sternal end (Barnes, Atlas of Dvmtl Field Anomalies ...)
- Healed periosteal reaction at midshaft on the right fibula. Mix periosteal reaction on left fibula.
- Subchondral breakdown on the medial art. facet of the left patella. Affected area is 7mm in diameter, near the superior margin.
- Mixed active and healing periosteal reactive bone at midshaft on the right humerus.
- Slight lipping on the articular surfaces of both radii.
- Posterior aspect of the neck of the left radius has a complex reaction where there is new, porous (not woven) bone growth with a lytic reaction affecting it.
- healed PH on parietals and occipital (near lambdoidal suture)
- cranial mod, see attachment
- lytic lesion with rounded edges $ a smooth floor, 8.1 x 6.1 mm (SI AP)
- all articular facets of the right foot have slight to ~~severe~~ moderate lipping.
- Left $ right MTs 1-3 have flattened, slowly resorptive areas on the dorsal surfaces, just prox. to heads. ~~likely from erosive OA. (?)~~ ?
- active resorption on R. carpals on non-articular surfaces around facets.
- healed P.R. along length of L$R. tibiae diaphysis
- slight-mod. lipping on facets of L. foot
- slight lipping on posterior margin of L. femoral head
- active $ healing P.R. on distal R. femoral shaft
- accessory distal facet on a 5th proximal pedal phalanx, but without any changes to normal distal articular surface ≠ polydactyly

MT5 no evidence
L. MT4 broken.
~~would need x-rays to confirm~~

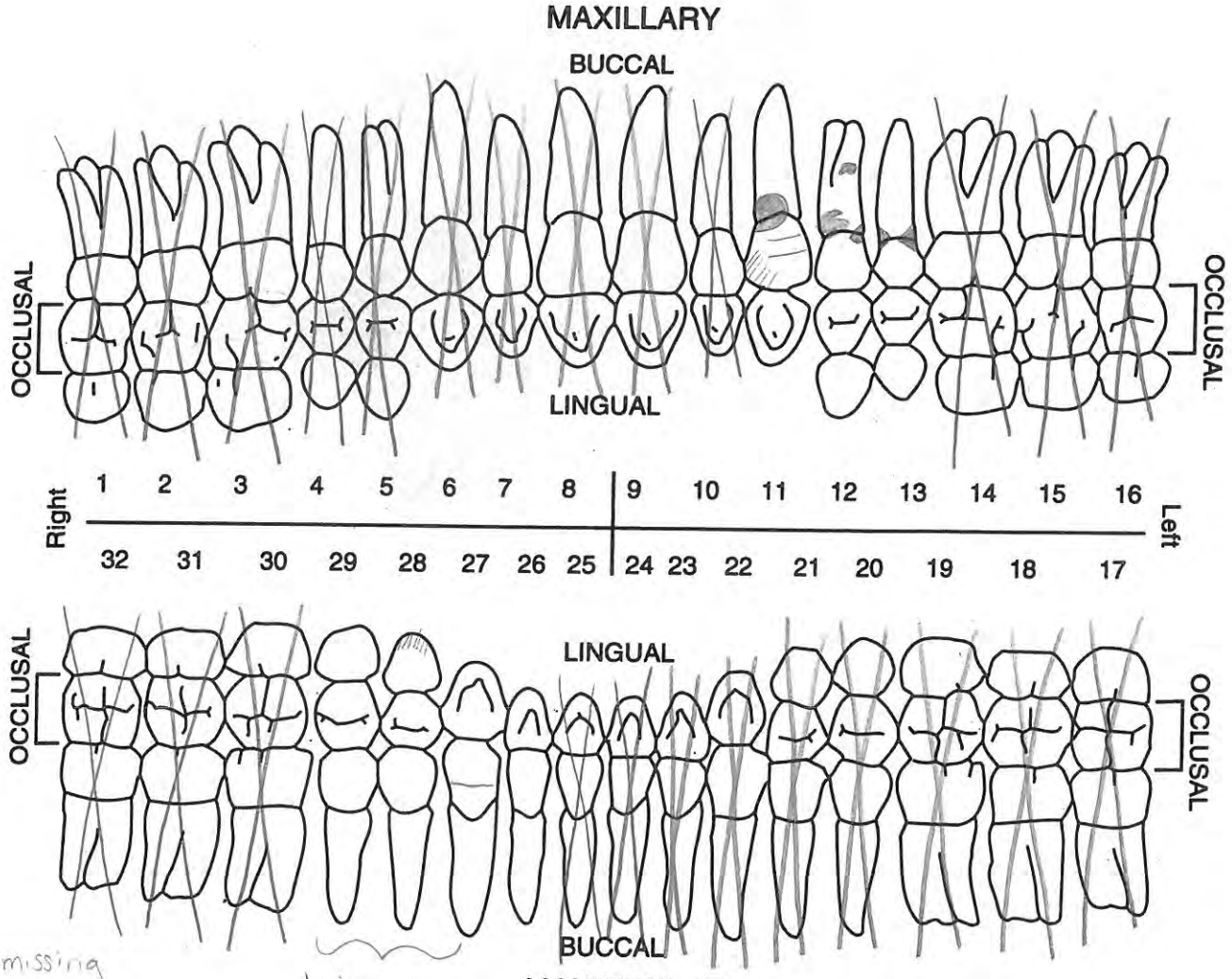
DENTAL INVENTORY
VISUAL RECORDING FORM: PERMANENT DENTITION

Site Name/Number BPAAP / _____ Observer E Moes

Feature/Burial Number _____ / _____ Date 7/22/19

Burial/Skeleton Number _____ / ST 18.11.5

Present Location of Collection UNM LOHO



X = missing

• = caries

/// = caries

— = enamel hypoplasia

taphonomic damage / wear on roots

taphonomic damage to outer-most surface of enamel

CHAPTER 5: Attachment 14a

Extensive periodontal disease observable in the mandible. Alveolus for mandibular posterior teeth (except right premolars) completely resorbed

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DENTAL INVENTORY & PATHOLOGY
PERMANENT - RECORDING FORM (3a)

Mark a dash if not observable

Provenience: _____

Designation/ID: ST.18.11.5

Maxilla	Right 1	2	3	4	5	6	7	8	Left 9	10	11	12	13	14	15	16
	M^3	M^2	M^1	PM^2	PM^1	C	I^2	I^1	I^1	I^2	C	PM^1	PM^2	M^1	M^2	M^3
Inventory (1-9)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Development (1-14)											14	14	14			
Caries (1-7)											4	5,2	2			
Abcesses (1-2)											–	–	–			
Calculus (1-3)											1	0	0			
Chipping (#)																
Periodontitis (1-2)																
Attrition Score*											4	4	3			
Mesio-Buccal (1-10)				*[Attrition scores: I, C, PM (1-8); M (1-10)]												
Mesio-Lingual (1-10)																
Disto-Lingual (1-10)																
Disto-Buccal (1-10)																
M-D diameter (mm)											7.8	6.6	5.4			
B-L diameter (mm)											7.9	9.3	8.8			
Crown height (mm)																

Mandible	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
	M^3	M^2	M^1	PM^2	PM^1	C	I^2	I^1	I^1	I^2	C	PM^1	PM^2	M^1	M^2	M^3
Inventory (1-9)	4	4	4	2	2	2	2	4	4	4	4	4	4	4	4	4
Development (1-14)				14	14	14	14									
Caries (1-7)				0	0		0									
Abcesses (1-2)				–	–	–	0									
Calculus (1-3)				–	2	0	–									
Chipping (#)																
Periodontitis (1-2)																
Attrition Score*				4	5	3	5									
Mesio-Buccal (1-10)				*[Attrition scores: I, C, PM (1-8); M (1-10)]												
Mesio-Lingual (1-10)																
Disto-Lingual (1-10)																
Disto-Buccal (1-10)																
M-D diameter (mm)				–	6.2	6.4	–									
B-L diameter (mm)				–	7.5	7.3	–									
Crown height (mm)																

Enamel Defects																
Tooth	RC*	LC*	LC*													
Defect No. on Tooth	1	1	2													
Defect Type (1-7)	1	1	1													
Distance from CEJ (mm)	3.3	–	–													
Color (1-4)	2	2	2													

distance not measurable due to caries @ labial CEJ

SPECIMEN NUMBER ST 18.11.5 DATA COLLECTOR E. Moes DATE 7/22/19

NOTES

TRAIT	LI1		LI2		LC		LP3		LP4		LM1		LM2		LM3	
	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R
Shoveling			0													
Congenital Absence																
Peg/Reduced tooth																
Distal Accessory Ridge						0										
Elongated Form								0		0						
Premolar Complexity								1								
Anterior Fovea																
Deflecting Wrinkle																
Groove Pattern																
Cusp Number																
Protostylid																
Trigonid Crest																
Cusp 5																
Cusp 6																
Cusp 7																
Enamel Extension																

RARE TRAITS

Talon tooth _____

Mesial Bending _____

Tri-cusped Premolar _____

Odontome _____

Enamel Pearl _____

Supernumerary _____

Other Observations

_____

_____

SPECIMEN NUMBER ST.18.11.5 DATA COLLECTOR E. Moes DATE 7/22/19

COLLECTION BPAAP COLLECTION LOCATION UNM LOHO

OTHER IDENTIFIERS/NOTES

TRAIT	UI1		UI2		UC		UP3		UP4		UM1		UM2		UM3	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
Winging																
Diastema																
Labial Curvature																
Double Shoveling																
Shoveling						–										
Peg/Reduced tooth																
Congenital Absence																
Interruption Groove																
Tuberculum Dentale						0										
Mesial Ridge						–										
Distal Accessory Ridge						–										
Accessory Cusps								0		0						
Distosagittal Ridge								0								
Mesial Accessory Ridge								0		0						
Distal Accessory Ridge								0		3						
Metacone																
Hypocone																
Cusp 5																
Carabelli's																
Parastyle																
Enamel Extension																

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ARTIFICIAL CRANIAL MODIFICATION RECORDING FORM (10)

Provenience: _____

Designation/ID: ST.18.11.5

ARTIFICIAL CRANIAL MODIFICATION: 1
1. Tabular
2. Circumferential
3. Other (describe)

Description:

POSTERIOR ASPECT

Deformation present: 1
1. Yes
2. No

Pressure centered at: 1
1. Lambda
2. Squamous portion of occipital
3. Below inion

Plane of pressure: 1
(relation to transverse plane)
1. Perpendicular (90°)
2. Obtuse (>90°)

Any of the following present? none
1. Sagittal elevation
2. Lambdic elevation
3. Lambdic depression

Pad impressions: unobservable
0. No pad impressions
1. One pad
2. Two pads
3. More than two pads

Pad location: –
1. Midline
2. Symmetrically lateral to midline
3. Asymmetrically left
4. Asymmetrically right

Pad shape: –
1. Circular or oval
2. Donut-shaped
3. Triangular
4. Irregular form

Impression of bindings visible: 2
1. Yes (describe below)
2. No

+ bilobate expansion

ANTERIOR ASPECT

Cranial deformation present: 1
1. Yes
2. No

Pad location: 2
1. High, near coronal suture
2. Low, near or below frontal boss

Symmetrical reshaping? 1
1. Yes
2. No, right side more deformed
3. No, left side more deformed

Bregmatic elevation? 2
1. Yes
2. No

Pad impressions: unobs.
0. No pad impressions
1. One pad
2. Two pads

Pad location: unobs
1. Midline
2. Symmetrically lateral to midline
3. Asymmetrically left
4. Asymmetrically right

Pad shape: unobservable
1. Circular or oval
2. Donut-shaped
3. Triangular
4. Irregular form

Impression of bindings visible: 2
1. Yes (describe below)
2. No

Post-coronal depression present? 2
1. Yes
2. No