

**ABSTRACTS of the 7th Annual Meeting of the
Midwest Bioarcheology & Forensic Anthropology Association
University of Missouri, Columbia, Missouri
October 21, 2000**

Abstracts are given in alphabetical order by senior author; all papers are podium presentations unless noted otherwise.

(1) BAKER, Amanda. "Analysis of Human Cremains from the Fox Hollow Farm."

In 1996 and 1997, the University of Indianapolis and local authorities excavated a multiple homicide scene at the Fox Hollow Farm in Westfield, Indiana. The remains of at least five adults were burned and located on a modest, wooded slope just behind the suspect's home. Many of the bones were highly fragmented, although some complete or nearly complete axial and appendicular elements were found. This paper discusses the characteristics of the cremated assemblage, the distribution of the remains via fluvial transport, and possible suspect behavior with respect to the deposition of the remains.

(2) BENEFIEL, Angela. "Fat Embolism: A Complication of Skeletal Trauma." (poster presentation)

Forensic investigation into the cause of death must carefully consider aspects from multiple disciplines. Skeletal trauma, specifically trauma involving the long bones, is well recognized as having a life threatening complication known as fat embolism syndrome. Fat globules are introduced into the circulation where they can impact the vital organs, such as the lungs, kidneys, and brain causing disability and death. The delay between the time of injury and the possible impact of a fat embolism can alter the final opinion regarding cause and manner of death. It is important to fully understand skeletal manifestations for criminal investigations. This poster illustrates the integration of soft tissue pathology and skeletal trauma using a case from Sedgewick County Regional Forensic Science Center.

(3) CARTER, Melinda. "Evaluating Bone Coloration and Taphonomy to Determine Source of Human Skeletal Remains."

In April, 1999, in Banner, Illinois, a cleaning crew found a large metal wash tub filled with human skeletal remains at a residence they were preparing for auction. The bones were immediately turned over to the Fulton County Coroner. Since the owner of the house was deceased, the Coroner contacted the man's son and learned that the bones originally belonged to a local doctor back in the 1950s. Differences in taphonomy suggest that some of the remains were obtained from non-archaeological sources. This paper presents a brief review of the author's analysis of the remains and addresses bone coloration and preservation as clues to source and antiquity.

(4) CUCINA, A. "Linear Enamel Hypoplasia: A Tool to Reconstruct Bio-cultural Evidence of Stress Impact in Archaeological Samples."

The analysis of human dentition has always proved to be a fundamental tool in reconstructing archaeological populations' lifestyles and conditions. Dental enamel, because of its histological structure, permanently records any event affecting its composition, and because of the lack of written sources, it turns to be one of the few indicators of pathological/nutritional evidence during growth. Stressful events, when overcoming the individual's physiological break-point, can affect enamel deposition and calcification. This results in enamel disruption, and formation of transverse lines or grooves of depression, namely the "linear enamel hypoplasias." Its direct association with more than 100 synergetically interacting factors makes enamel hypoplasia a non-specific, systemic indicator of stress.

The present study focuses on a medieval historic sample from downtown Rome (Italy). Its major characteristic is that it is associated with the plague that affected the town, as well as the rest of the country, between A.D. 1476-79. Since all the individuals died because of the plague, it is possible to reconstruct their demographic history and go back to the approximate time they were born. The analysis of linear enamel hypoplasia, which directly witnesses growth-related problems, can help us understand if specific critical periods occurred during the 15th century, particularly when other previous epidemics, historically documented, spread.

Enamel defects were scored on the permanent dentition, with particular attention to anterior teeth which are more susceptible to disruption, particularly the maxillary central incisor and mandibular canine. Defects were scored under proper lighting conditions, with the help of a 4x magnifier. Defect position on the crown was measured with a thin-point digimatic caliper, and measures were converted into age of onset and end of the event. High levels of stress seem to have affected all the individuals throughout the 15th century in downtown Rome. No particular distributions are evident in specific periods, which indicate constant exposure to growth stress during childhood. Despite four epidemics that struck the town before 1476, the analysis of hypoplastic defects shows that the overall living conditions in the town were miserable, as some historic sources report for that particular time.

(5) EMANOVSKY, Paul. "Preliminary Analysis of Culturally-Modified Animal Remains from Tremper Mound." (poster presentation)

During the past three years, the University of Indianapolis has been conducting an in-depth analysis of modified mandibular and maxillary fragments from the "Great Cache" of the Tremper Mound. These artifacts are attributed to the Ohio Hopewellian tradition and comprise the largest known cache of this type. The specimens represent a variety of animal species including bear, mountain lion, bobcat, wolf, and coyote. The cache also included some human remains. Presented here is a comprehensive inventory of the animal remains as well as preliminary descriptions of all taphonomic alterations of the bone and teeth. The hypothesis that elements from certain species were being more heavily modified is explored. Chi-squared analysis suggests that some varieties of modifications differed significantly by species.

(6) HANSON, Angela. "Differential Diagnosis of Infectious Disease in the Orendorf Mississippian Sample." (poster presentation)

Paleopathological research has long provided insight into the lifeways of past individuals. This study is the first systematic study of infectious disease in the Orendorf (A.D. 1150 - 1250) sample, a moderately sized Middle Mississippian population from west-central Illinois. In this examination, the frequency of tuberculosis (TB) and treponematosi s are documented through macroscopic examination of the skeletal remains and a differential diagnosis model. Using the model, two categories of suspicious skeletal lesions are established: those that likely fulfill the diagnostic criteria of TB and treponematosi s (designated "likely") and those that could be the result of the diseases, but are slightly more ambiguous (designated "possible"). Of the 117 adults examined, there are 2 possible cases of TB, 1 likely case of TB, 4 possible cases of treponematosi s, and 3 likely cases of treponematosi s. Analytical difficulties arose in several cases due to incomplete remains and skeletal preservation. The results of this study are the first glimpse into the health of the Orendorf population and may eventually be utilized for future establishment of epidemiological models.

(7) HARPER, Kayne. "Kourion's Amathus Gate Cemetery: Progress of the Skeletal Analysis."

Kourion's Amathus Gate Cemetery (K-AGC), located on the southern coast of Cyprus, is a unique cemetery site representing Roman and late Roman/Christian components. Excavations at K-AGC began in 1995 under the direction of Dr. Danielle Parks. Approximately 106 individuals have been excavated mainly from the late Roman/Christian component and analyzed using standard anthropological techniques. The present paper will give a summary of the skeletal research to date and suggest avenues for future research in the skeletal material of Kourion's Amathus Gate Cemetery.

(8) HILL, Molly, & Christopher SCHMIDT. "Applying Scion Image Imaging Software to Dental Metric Analyses."

Scion Image is an IBM PC compatible program designed for image analysis. This semi-automated software was used in an odontometric study on human molars in search of a viable determinant of two-dimensional occlusal area. Computed diameters were consistent with caliper values, and an outline function in the program proved to be a useful means of finding occlusal area. This software has other analytical capabilities that could be applied in osteological and dental studies. For example, the program contains color contrast and depth perception functions that for us will facilitate future three-dimensional metric studies. This program is free to the public, easy to use, and offers much to the study of human teeth.

(9) JARSKI, Allison, & Peer MOORE-JANSEN. "Cranial Thickness and the Effect of Age, Part II."

Research into identification in skeletal biology commonly focus on the significance of growth, size and shape variation in the human skull. Cranial thickness from radiographic and direct skeletal observation has been among those topics investigated. The present paper reports on updated and expanded research results pertaining to the exploration of sex and age variation of the mature cranial vault. The material under examination includes crania from the Cleveland Museum of Natural History and the Smithsonian Institution, Washington D.C. Our prior reports, limited to Terry Collection crania, illustrated the potential for quantifying sexual dimorphism in cranial thickness. To a lesser degree, our earlier study also noted differences among age groups. The additional measurements

drawn from the Hamann-Todd collection in conjunction with our previously gathered data set from the Terry collection facilitates expansion of the available quantitative data on cranial thickness to better assess inter-group variability between collections and to improve parameters for sex estimation of fragmentary or complete crania.

(10) JOHNSTON, Cheryl, & Steven SYMES. "Studies in Hopewell Cremation Practices: The Raymond Ater Mound."

During Middle Woodland times (100 BC - AD 500) a cultural phenomenon called Hopewell existed in what is now the eastern United States. Physical remains of the Hopewell are concentrated in south central Ohio and include geometric earthworks and mounds as well as numerous cremated and uncremated human interments, many of which are accompanied by finely crafted artifacts made of exotic materials. Recent Hopewellian research has shifted in focus from mortuary studies to studies of settlement and subsistence (Dancey & Pacheco, 1997). However, much remains to be discovered about the Hopewell from their mortuary behavior. Especially neglected have been studies of Hopewellian cremation practices. Previous investigations addressed cremation in the flesh and disarticulated prior to burning (Krogman as cited in Webb & Snow, 1945; Baby, 1954; Webb & Baby, 1957; Konigsberg, 1985). Hopewell cremations have received little attention from physical anthropologists since the 1980s. As part of a larger study of Hopewell cremations from south central Ohio sites, our goal is to apply improved methods developed or refined in the past fifteen years in response to forensic anthropology to cremations from the Raymond Ater Mound, a Hopewellian mound located in Ross County, Ohio. Specifically, the methods of Symes et al. (1999) were applied in an effort to better understand the decompositional state of the corpse at the time of cremation and to evaluate the likelihood that the bodies were disarticulated before cremation. Biological profile data were also collected according to the methods outlined in Buikstra & Ubelaker (1994). The cremation and biological variables will ultimately be used to refine our understanding of Hopewell ritual behavior and social organization.

(11) KIPPER, K.M., & M.D. GLASCOCK. "The Development of a Methodology for Spatial Analysis of Mineral in Human Bone Using High Resolution-Laser Ablation-Inductively Coupled Plasma-Mass Spectrometry (HR-ICP-MS)." (poster presentation)

Presently available data on the elemental and isotopic composition of human bone reports bulk measurements of samples fairly reliably. In certain areas of inquiry, however, researchers would be aided by the addition of spatial resolution to these data. In developing a practical and effective means of sample preparation and standardization for use with HR-ICP-MS, this spatial dimension becomes accessible. Variation in the mineral content of microscopic portions of a single bone could be accurately determined.

The important preliminary phase in this process primarily concerns the development of procedures involved in preparing the specimens for analysis. Taking into account the known sensitivities of the instrument, a simple method of sample preparation and standardization specific to the HR-ICP-MS is being developed for use on both modern and archaeological skeletal materials. Samples of modern ($n = 7$) and archaeological ($n = 8$) bone were prepared with the utmost concern for preventing contamination. By treating all instruments and containers with a chelating agent, contamination during sample preparation is minimized. After freeze-drying the bones, they can be stored in a dessicator until such time that they can be analyzed. Small portions (5-10 μ) of bone are ablated by the laser and the isotopes are separated into a spectrum which is then counted by the mass spectrometer and

compared to the spectra of standards with known composition. A future test of the efficacy of this method is expected to reflect the variable mineralization across a cross-section of bone, and correspond with data from other compositional analytical methods. This approach to spectrometry may offer insight into pathological bone conditions, such as osteoporosis, and may additionally aid in the evaluation of diagenetic changes in archaeological bone. The implications of continued research will be discussed.

(12) KOSTER-HORAN. "Echoes of an Illinois Pioneer Farming Family: The Vandaworkers."

The Vandaworker family established a farmstead at Vandaworkers Corners and achieved a prominent position in the community of Deer Park in Lake County, Illinois. The Vandaworker Cemetery, located behind the farmstead was in use from circa 1840 through 1880. In 1999, MARS, Inc. excavated ten Vandaworker family members; five of which have subsequently been identified. Elaborate coffin adornments coupled with expensive funerary items are suggestive of the high economic status of this rural farming family. The skeletal analysis, revealing a high incidence of cranial and postcranial pathologies as well as a plethora of dental abnormalities depicts a family that although wealthy, possibly engaged in their own farming practices enduring the harsh reality of life on the Illinois prairie.

(13) KROMAN, Anne, Steven SYMES, & David FRAYER. "Another Stab in the Dark: A Re-evaluation of Sharp Trauma."

Even though Bonte (1975) encouraged sharp analysis with new approaches and pattern recognition, it has taken two decades for scientists to continue on that same line of research. It was not until the 1990s that there was a rekindling of interest in sharp trauma. Due to this resurgence, there have been many advancements, both theoretical and technological, in trauma analysis. An exception to the paucity of sharp trauma publications was presented by Frayer and Bridgens (1985) publishing an account of an unsolved knife stab wound case in eastern Kansas. This account goes into great detail and exceptional efforts were used to define direction and description of the knife stab wounds. The comparison re-evaluates the proposed characteristics of the knife used. The characteristics called into question are the length, width, and blade dimensions. With the find of an additional impact site, there is a better representation of the dimensions of the blade presented. Utilizing current technology, the sharp trauma will also be evaluated for a striae analysis. This was not done in the initial analysis, as it was not a standard of the time. In addition to characteristics of the blade used, the impact angles will also be re-evaluated and compared to the first report. With the new impact finds as well as utilization of the most current technology available, a comparison will be made between the interpretation of 1985 and 2000. The similarities and differences will be discussed in detail, as well as the varying methods that were utilized to form both conclusions.

(14) KUBA, Cassandra, & Mary RITKE. "Differences in DNA Preservation between Adult and Subadult Historic Skeletal Remains."

A study was conducted to compare differences in DNA preservation between adult and subadult human skeletal remains. The femora, tibia or humeri of eleven adults and seven subadults from two 19th century cemeteries in Indiana were used. To gauge the quantity and quality of DNA preserved, the study employed slot blot hybridization and the analysis of PCR products using primers for amelogenin and two Short Tandem Repeats. Results indicate that the amount of bone sample used was of more influence than the biological age of the specimen on the success of amplification of the

smaller STR and amelogenin sequences. Biological age of the specimens became a more important factor only in the amplification of higher molecular weight PCR products. These preliminary studies suggest that biological age will not necessarily be a significant predictor of success for amplification of DNA from historic remains.

(15) LEE, Anne, & Cheryl JOHNSTON. "A Forensic Archaeology Case Study of Deeply Buried Human Remains and Unexpected Soft Tissue Preservation."

Anthropologists were contacted in the spring of 1998 by law enforcement agents from a southeastern Ohio county regarding suspected buried human remains on a rural property in their jurisdiction. An informant indicated that the grave of an individual missing for a decade was located on a wooded ridge top to the north of one suspect's residence, although the precise location was uncertain. The informant also suggested that the grave was approximately five feet below the surface with the body being covered with several bags of caustic lime and one-half of a 50 gallon steel barrel before the grave had been filled in with dirt. This information suggested that the perpetrators were "professionals" in the art of making a body disappear. The challenge to the investigators was to actually locate and recover the remains. The first portion of this paper will discuss the archaeological methods used to successfully accomplish this challenge. The second portion of this paper will relay our findings with regards to the human remains present in the burial feature. The large amount of preserved soft tissue was unexpected given the supposed use of caustic lime. Much of the outer layers of soft tissue were preserved on the body, particularly in the region of the upper legs, buttocks, lower back and shoulders. Internal organs and muscle tissue did not preserve for the most part. The soft tissue that was preserved was hard and had formed a shell around the bones. The investigation, however, resolved this inconsistency by showing that agricultural lime, not caustic lime, was used by the perpetrators.

(16) MATTERNES, Hugh. "Comparing Health Among Less-Than-Complete Skeletal Assemblages."

Did Mississippian community health at West Kentucky's Wickliffe Mounds and Tinsley Hill approach the stressed conditions of Central Tennessee's Averbuch assemblage? Long bones were screened for differences in periosteal inflammation. Contrasting preservation, mortuary and recovery practices confounded valid quantification of health responses. To overcome these, a minimum-to-maximum prevalence range was grounded on the response form (present or absent) in each limb third. Assemblages were compared using Relative Risk. Risk ranges indicated whether true health differences existed between assemblages. Similar periostitis prevalences were present at Wickliffe and Averbuch. Tinsley Hill's adults were at greater risk.

(17) MEGYESI, Mary. "Taphonomic Analysis of Punctured Bones from the Ray Site." (poster presentation)

Anthropologists frequently encounter bone that has been modified from its original state through numerous taphonomic factors. It is important to identify the causes of such modifications in order to reconstruct ante-, peri-, and postmortem events. This study focuses on particular modifications (punctures) found on human remains from the late prehistoric Ray Site in southern Indiana. Eleven punctures were found on a total of nine bones. The purpose was to determine if these were created before burial or by later taphonomic forces, including excavation. Analysis of the color, size, shape, and locations of the punctures suggests that some were created prior to burial.

(18) NAWROCKI, Stephen, & Daniel OSBORNE. "Serious Problems in the Estimation of Age from Human Skeletal Remains."

For decades, osteologists have been laboring under the false assumptions that (a) the morphological indicators of increasing age in the skeleton are well understood and (b) that we can accurately determine the age at death of adult skeletal remains on a case-by-case basis. Careful examination of the published data, however, reveals that much more variation exists in each indicator than is generally appreciated, yet osteologists continue to use inappropriately-restrictive error intervals when assigning individual age estimates. We present two specific examples (sternal extremity of the rib and the auricular surface) where properly-constructed error intervals for each phase are so broad that some of their lower boundaries actually extend into the negative range!

(19) NOVAK, Shannon. "Life and Death on a Wagon Train: The 1857 Massacre at Mountain Meadows."

In the summer of 1999, a mass grave from the historic Mountain Meadow Massacre was unearthed in southeastern Utah. The commingled remains of the 1857 massacre victims were excavated using mechanical equipment which further complicated sorting and analysis of the skeletal material. This paper presents the preliminary study of the human remains including antemortem biological findings and perimortem trauma analysis. Finally, the findings of this analysis are used to assess the historic records and public perceptions of the Mountain Meadow Massacre.

(20) PARISH, Joseph. "Stirrup Court 21: The Bones of an Individual Affected with a Neuromuscular Disorder of Unknown Etiology."

In 1982 the remains of 29 individuals were unearthed at the site of the Stirrup Court Cemetery in London, Ontario. These individuals resided in what is suggested to be a 19th century peri-urban community adjacent to the historic township of London. The remains of all individuals were thoroughly documented for the master's thesis of the author (Parish 2000). The remains of burial 21 revealed that this individual was markedly different from his contemporaries in several respects. Upon gross examination, the skeleton contains several obvious and subtle morphologic abnormalities that suggest the existence of a genetic disorder that affected the neuromuscular system at large. In addition, several non-genetic pathological conditions are present. This paper presents the preliminary descriptions of these skeletal abnormalities at the macroscopic level, with photos, and makes suggestions of possible disorders that may have caused this suite of traits. It is suggested that a partial expression of Down's Syndrome is a strong candidate, but further research at the genetic level is currently being undertaken to evaluate this hypothesis. Further suggestions would be appreciated. Historic records research is also discussed. This second line of evidence strongly ensures the identity of the individual based on other adjacent, known individuals and burial customs of Europeans. It also strongly supports the suggestion of an obvious disorder that would have been perceptible by the individual's contemporaries.

Finally, the paper suggests that the mere presence of such individuals in small skeletal collections has a great deal to say about attitudes in the 19th century concerning individuals with severe disorders. These attitudes, and practices based on these attitudes, may differ greatly from practices in the 20th century where institutionalization was the norm. It promotes the stance that investigations in physical anthropology concerning skeletal collections are not limited to quantitative descriptions about

paleopathology but rather can give quite valuable information about the social environment and attitudes at the time period being examined regardless of sample size.

(21) PLOCHOCKI, J.H. "Estimation of Sex from the Adult Human Sacrum." (poster presentation)

An important component of forensic investigations involving human skeletal material is the estimation of sex. The sacrum, although not as reliable as the os coxae and cranium, can provide information concerning the sex of an individual in situations where other skeletal elements are damaged or absent, or where remains are commingled. Several methods of sex estimation from the sacrum have been developed, however these methods require race to be known. Additionally, most of these methods rely on more than five measurements, which may be difficult to apply to fragmentary sacra. The present study generates a discriminant function for sex estimation from five measurements of the sacrum without prior knowledge of race. The sample in this analysis was comprised of 80 sacra from the Hamann-Todd skeletal collection. Forty American black and 40 white sacra were measured, with half from each sex. A discriminant function was produced which yielded an 93% correct classification rate. To further test the function a more conservative "bootstrap" procedure was employed. Following this procedure the classification results remained high.

(22) RITTERSKAMP, Idelle. "Analysis of Cremated Human Dental Remains from an Early Archaic Mortuary Site in Bartholomew County, Indiana."

The study of human dental remains from archaeological contexts often yields a wealth of biological and cultural information about past populations. The cremated dental remains from the McCollough's Run site (12B1036) located in Bartholomew County, Indiana, comprise some of the oldest known human remains ever found in Indiana. A total of 286 tooth fragments was scored by color to attempt to determine whether the remains had been cremated in a fleshed or defleshed (dry) state. Differential tissue thickness between the anterior and posterior portions of the mouth may result in differential burning of teeth between those regions. Results of this study suggest that the remains from the McCollough's Run site were cremated in a fleshed state, consistent with a previous analysis of the skeletal material from the site.

(23) ROBERTS, Metty. "Chemical Analysis of Burned Bone."

This preliminary study used thermogravimetric analysis, inductively coupled plasma analysis, and CHN analysis to establish a sequence of chemical changes that occurs during the process of burning bone. Different elements are lost at different points in the burning sequence, and these changes co-occur with changes in color. These methods may provide opportunities for osteologists to better understand burning and other taphonomic processes, as well as to help forensic anthropologists estimate the postmortem interval.

(24) SAVAGE, Natalie, & Trey BATEY. "An Assessment of Age Determination Techniques in a Fragmentary Subadult Sample." (poster presentation)

The present paper examines methods of skeletal age determination for children using diaphyseal long bone lengths (Johnston 1962, Hoffman 1979), stages of crown and root formation in teeth (Moorrees et al. 1963), and dental eruption (Ubelaker 1978) in a small southwest skeletal sample. The purpose of the investigation is to identify any apparent relationships in growth and development

sequences among different parameters of age. A sample of seven children with available teeth and long bones will be used to devise a sample specific standard. In turn, the standard will be applied to five children, for which only one or the other of these elements is available. The usefulness of the outlined techniques are addressed and the variability of results within the southwest sample are discussed, in an attempt to better understand the limits and benefits of these methods individually and collectively, as applied to other samples.

(25) SCOTT, Tony. "New Beginnings in a Heartening Land: A Preliminary Analysis of Two Historic Burials from the U.S. Midwest."

The present paper describes two historic human burials in contribution to the overall understanding of pioneer lifeways of people in the historic midwest, specifically Kansas. The study of the skeletal remains from historic burials can not only yield insight into the demography, economic and social condition of past populations, but also about health and occupations of early settlers of the mid-nineteenth century prairie. Historic records report an influx into this geographical region of peoples from various social and ethnic and economic backgrounds. The study of individual human skeletal remains can provide answers to the kind of lifestyles and can offer clues about the social and economic standing of individuals in their particular community. This study reports on two historic burials from Mitchell County, Kansas. The skeletal remains are examined, inventoried, reconstructed, and profiled. Using standard osteological techniques, the age, sex, and broad group affiliation is estimated. The examination also includes the reconstruction of stature and skeletal health. Associated funerary remains are used to date the remains and put them into a temporal context.

(26) SMITH, Maria, & N.J. KUEMIN DREWS. "Multiple Cases of Neoplastic Disease from a Single Burial Context."

Most cases of neoplastic disease are initially identified by the macroscopic presence of well-circumscribed multifocal lytic lesions. Radiographic corroboration is essential in order to increase the reliability of the diagnosis. A single case initially assessed as a probable multiple myeloma was identified from the late prehistoric Link site from west central Tennessee. However, a closer look of the mortuary context of this individual revealed the extraordinary circumstance of eight out of thirteen interments of this single mound (19HS6) with the same type of small (4-6 mm) macroscopic and radiographic multifocal lytic lesions. All cases are female with four at least 40+ years of age. Two other burial mounds from the site (21HS6, 67HS6) were macroscopically and radiographically examined for multifocal lesions with negative results. The large number, exclusive female composition and the youth (<40 years of age) of several of the individuals from 19HS6 do not suggest multiple myeloma. Metastatic carcinoma or a granulomatous infection may alternately be responsible. Blastomycosis is known to be endemic in the Tennessee River Valley, however, the virtual absence of reactive bone consistent with infection on the observed cases and the confinement of the pathology to only one of the burial mounds suggests another possibility. Since the independent archaeological assessment of the mortuary treatment suggested extended family interments, this pattern may reflect familial metastatic carcinoma of the breast.

(27) SPARKS, Corey, Nicholas HERRMANN, & Lee MEADOWS JANTZ. "Evidence of Treponematosi s at Mission Nuestra Senora del Refugio (41RF1)." (poster presentation).

Excavations of the Nuestra Senora del Refugio, a Spanish mission (1795 - 1830), by the Center for Archaeological Research at the University of Texas - San Antonio resulted in the recovery of over 150

individuals of Native American, Hispanic, and European ancestry. The historical significance of the Mission Refugio is twofold. First, the site represents the terminus of the Spanish Colonial Mission period in Texas. Second, the primary inhabitants of the mission were Karankawans. This tribe was eradicated along the Texas coast by the mid-nineteenth century. Currently, a team of researchers from the University of Tennessee and the Smithsonian Institution are analyzing these burials. In this paper, we present preliminary data on four individuals exhibiting skeletal and dental modifications possibly attributable to treponematoses. Given the fragmentary nature of the burial sample due to extraneous taphonomic factors, our assessments are preliminary, and we offer differential diagnoses of each individual. However, the pattern of osseous and dental changes is consistent with both endemic (nonvenereal) and congenital treponemal syndromes.

(28) STREETER, Margaret, & Julie FARNUM. "Stress Indicators in a Peruvian Archaeological Sample." (poster presentation)

The skeletal sample from El Brujo, Peru (A.D. 1000) demonstrates low levels of macroscopic stress indicators, such as arthritis and enamel hypoplasias, compared to temporally and geographically similar populations. Radiographs of twelve juvenile tibiae from individuals ranging in age from 0.5 - 4 years reveal the presence of Harris Lines in some of the El Brujo tibiae but there is very poor correlation between the occurrence of Harris Lines and other stress indicators in the same individual. It has been proposed that double zonal osteons are histological correlates of Harris Lines, both being evidence of a resumption of normal bone formation after a period of interrupted bone deposition. Histomorphological examination of diaphyseal thin sections of the twelve radiographed tibiae reveal a very low frequency of double zonal osteons. Radiographic and histomorphological analysis support other developmental evidence of low levels of stress in this prehistoric Peruvian population.

(29) WEDEL, V.L. & Leslie RANKIN-HILL. "The Duke Energy Newcastle Site Burials." (poster presentation)

In early January 2000, archaeologists excavated two burials at the Duke Energy Newcastle site in McClain County, Oklahoma. These burials along with several trash/storage pits, hearths, bison processing areas, and lithic maintenance areas are remnants of a long term occupation Plains village. Radiocarbon dates suggest that the site was occupied from A.D. 750 until 1200. The site appears to be affiliated with the Wichita Tribe of Oklahoma, and thus with tribal permission the remains were studied before re-interment. The remains in Burials 1 and 2 are those of a 26 - 47 year old male and a 35 - 39 year old probable female, respectively. This paper presents the results of the skeletal analyses, along with paleopathology profiles and a 3-D computed tomography (CT) reconstruction of the skull of Burial 1.

(30) WILLIAMS, K.D. "Dental Anthropology at Sa'ad, Jordan."

The rural agricultural site of Sa'ad is located 30 km from the ancient Roman city Jerash in present-day north Jordan. Joint excavations by the University of Arkansas and Yarmouk University have yielded 88 tombs in four necropoli. Human remains were recovered from 56 of these tombs. The main period of occupation is Late Roman/Byzantine based on artifacts and tomb architecture. Due to the fragmentary and commingled nature of the human remains recovered, we are left with dental remains providing the best line of evidence for exploring the health and related nutritional issues of the ancient inhabitants of this site on the outskirts of a major Roman city.

This paper presents the results of the analysis of the teeth excavated at Sa'ad, a portion of a larger analysis of the bioarchaeology of Sa'ad. Data includes information on the minimum number of individuals, caries rates, hypoplasias, and the implications on general health and disease of this population. It specifically addresses the treatment of commingled dental remains and their place in the reconstruction of past life, focusing on data collection and organization within a database. Funding for excavation and analysis was provided by the King Fahd Middle East Studies Program, University of Arkansas, Fayetteville and Yarmouk University, Deanship of Graduate Studies and Institute of Archaeology and Anthropology.

(31) WOLVERTON, Steve. "Ursids, Artifacts, and Caves: Mortality Implications." (poster presentation)

European cave deposits often contain the remains of extinct cave bears (*Ursus spelaeus* and *U. deningeri*) and artifacts or human remains. Two twentieth-century explanations for the apparent association of the remains and artifacts are: (1) late Pleistocene hominids preyed upon the bears, and (2) late Pleistocene hominids and bears occupied the caves at different times thus making the remains and artifacts appear behaviorally associated when they are not. The former option is dismissed in most cases based on taphonomic criteria and ursid mortality data. In caves with multiple entrances - particularly cases where at least one entrance is a vertical shaft comprising a natural trap - another option serves to better explain the presence of ursid remains and artifacts in the same deposits. Ursid bone assemblages created by accidental entrapment of bears in vertical shafts result in a distinctive mortality pattern. This pattern reveals proportionally more prime adult individuals than expected in a living population. A consideration of North American black bear (*U. americanus*) physiology and behavior reveals that this distinctive mortality pattern should be expected from natural trap assemblages. thus, in assemblages from caves with horizontal and vertical entrances, mortality data can be used to decipher whether ursids died from natural hibernation deaths, human predation, or accidental falls through vertical shafts.

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