

**ABSTRACTS of the 6th Annual Meeting of the
Midwest Bioarcheology & Forensic Anthropology Association
Michigan State University, East Lansing, Michigan
September 25, 1999**

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

(1) CAHUE, Laura, B. ALBRIGHT, Ruben CABRERO CASTRO, & H.P. POLLARD. "What Remains? Elite Burials from Tzintzuntzan, the Capital of the Tarascan State."

When the Spaniards arrived in the New World the Tarascan empire was the second largest in Mesoamerica. They dominated western Mexico and were famous among the Aztec for their military prowess. The Tarascan state developed in the Lake Patzcuaro Basin (LPB) in the modern state of Michoacan in West Mexico during the Late Postclassic (A.D. 900 - 1520). As the Tarascan state was developing, the LPB was unable to produce enough maize to feed its population, bringing into focus the relationship between food availability, health and the development of socially complex societies. In spite of their political and economic power and the opportunity they afford us for the study of human adaptations to insufficient food availability, the Tarascans have not been an important subject of investigation for bioarchaeologists. Most of what is known about the Tarascans is the result of archaeological work at the Tarascan capital, Tzintzuntzan. Ten seasons of excavation and reconstruction at Tzintzuntzan by the Instituto Nacional de Antropologia e Historia (INAH) between 1930 and 1993 have recovered a number of elite burials. Until 1996, when a collaborative project between Cabrera Castro and Cahue was conducted, the human skeletal remains had yet to be inventoried, described and analyzed. In this paper we examine the history of the remains subsequent to excavation, and we present the first description and analysis of the human skeletal remains from these burials.

(2) CHMIDLING, C. "A Study of Celic-Dere, Romania." (poster presentation)

In this study, the remains of four skeletons found in three movilla (burial mounds) at the Iron Age cemetery at Celic-Dere, Romania, were analyzed. The extremely fragmentary nature of the remains necessitated multiple analytical methods, utilizing both macro- and microscopic techniques. Traditional examination of morphological and metric traits, as suggested by Bass, and Buikstra and Ubelaker, in conjunction with histological methods, as suggested by Stout and Paine, were undertaken. Results regarding the approximate age at death, sex, and stature, as well as possible pathologies, are discussed. This study illustrates the value of employing multiple kinds of analyses when working with extremely fragmentary, poorly preserved, skeletal remains.

(3) CLARK, J. "Different Phases of Facial Reconstruction." (poster presentation; abstract not available)

(4) COBB, Dawn. "Such a Lonely Place: Archaeological and Osteological Investigations at Bronson Cemetery (11WI874), Will County, Illinois."

During the summer of 1998, archaeologists and osteologists from the Illinois State Museum excavated a nineteenth-century family cemetery in Will County, Illinois. The cemetery had to be moved in response to expanding gravel quarry operations. The excavations discovered a total of nineteen individuals, five of which were subsequently identified. The coffin hardware was abundant and varied in style, reflecting the changing mourning practices of the mid- to late nineteenth century. Following analysis, the remains and all associated artifacts were reburied in Lockport City Cemetery, Lockport, Illinois.

(5) DOUGHERTY, Sean, & Norman SULLIVAN. "An Old Man with an Old Wound: A Case of Suffering in Old Milwaukee."

The Milwaukee County Institutional Grounds (MCIG) cemetery, historically known as the Poor Farm Cemetery, was in use from 1872 - 1925. Within these grounds the institutionalized, the poor, and the destitute, of Milwaukee County were laid to rest. Burial 7218 is an individual from the MCIG collection currently held at Marquette University. Probably not one of the institutionalized, the 55 - 60 year old robust male holds the scars of a physically rigorous life. Burial 7218 has a healed parry fracture of the left ulna, a badly healed fracture of the right distal fibula, and a healed rib fracture. Vertebral osteophytosis is present throughout the spinal column, but is most severe on the cervical vertebrae. Most striking is the pathology of the proximal third of the right humerus. This proximal third of the humerus exists as a sclerotic, inflamed, asymmetrical mass of bone with areas of porosity and bony protrusions. The epiphysis is no longer attached to the shaft because of this condition, but exists separately as cancerous necrotic bone. A differential diagnosis suggests that the condition of the humerus is the result of an initial trauma, a compound fracture or wound, followed by the onset of an acute osteomyelitic infection. Despite the severe appearance of the pathology, the individual survived the event, as the area, though rugged, is healed. The diagnosis of trauma followed by infection does not seem unlikely given the historical context. The actual traumatic event that caused the pathology cannot be known. However, the possibility is entertained that the injury is the result of a battlefield conflict wound, perhaps received during the Civil War.

(6) DREWS, N.K. "Evidence for Warfare within the Middle Cumberland Phase of the Kentucky Lake and Lake Barkley Reservoirs, Tennessee: An Osteological Analysis."

Warfare studies in the United States have concentrated primarily on late prehistoric Native Americans of the Great Plains. Some of the most notable sites include Crow Creek and Larson in South Dakota where hundreds of individuals were massacred. In the Southeast the late prehistoric sites of Norris Farms #36 cemetery in Illinois and Koger's Island in Alabama have also yielded high frequencies of warfare related trauma (16% and 21% of all skeletons, respectively) (Bridges 1996; Milner et al. 1991). The suite of injuries directly associated with warfare in the Southeast, which can be traced back to the Archaic period, is comprised of scalping, decapitation, embedded projectile points, blunt force trauma, and/or dismembered limbs. In contrast to these sites, the Mississippian period inhabitants of the Kentucky Lake and Lake Barkley Reservoirs, belonging to the Middle Cumberland culture in Tennessee, evidence very little indications of violent trauma. In a sample size of 494 individuals, ages 2 and older, only 12 (2.4%) demonstrate evidence of warfare, including scalping, an embedded projectile point, and healed blunt force trauma. No signs of decapitation or trophy limb-taking exist. Affected individuals include 7 adult males, 2 adult females, 2 adults of

undeterminable sex, and 1 child aged 5.5 - 6.5 years. Previous analysis of Archaic period burials within the Kentucky Lake Reservoir yielded similar frequencies of warfare related trauma (2.3%) (Smith, 1997). Age and sex of victims, mortuary treatment, and type of injuries sustained will be discussed in comparison to other late prehistoric sites of the Southeast, and Archaic data from Kentucky Lake. This study, thus, provides an excellent comparative sample for warfare studies on both a spatial and temporal level.

(7) EMANOVSKY, Paul, & Lilith JUDD. "Forensic Anthropology in Cyprus."

Forensic anthropologists in the United States usually handle cases involving the remains of one or possibly a few individuals. International human rights cases have become more common in the last decade and have allowed forensic experts opportunities to work on large-scale projects, such as mass graves. This past summer, Physicians for Human Rights led a humanitarian mission to excavate and analyze the remains of 200 individuals that died during the 1974 conflict in Cyprus. The excavation of two cemeteries in Nicosia, the capital of the Republic of Cyprus, took approximately 6 weeks. The goal was to positively identify the individuals recovered during excavations as well as individuals previously exhumed in 1981 and buried in a war memorial. This presentation will give an overview of the project and will outline the strategies we used to manage such a large number of skeletons.

(8) FENTON, Todd, Bruce ANDERSON, & David RANKIN. "It's as Easy as Falling Off a Cliff."

This talk chronicles three cases involving individuals who fell off cliffs to their death. The circumstances of recovery, conditions of the remains and descriptions of the skeletal traumata are presented. Reconstructions of the impact sequences are proposed based on the pattern of perimortem fracturing. Finally, the commonalities between the fracture patterns observed in the three cases are discussed.

(9) GABRA, Jennifer, Stephen NAWROCKI, & Mary RITKE. "Extracting DNA from Historic Cemetery Remains."

In February of 1998, our lab conducted an emergency excavation of at least 4 adult individuals from a late 19th century cemetery in Madison County, Indiana. These interments were found eroding from an exposed embankment and significant commingling of the bones had already occurred. We were interested in whether remains from this time period would yield analyzable DNA, and so, six long bone samples were subjected to PCR. Significant quantities of both nuclear and mitochondrial DNA were recovered and amplified, allowing a confirmation of the sex of each individual. Issues of contamination, postmortem taphonomic processes, and collection protocol will be discussed.

(10) GREENE, Tammy. "Linear Enamel Hypoplasias at the Mississippian Ray Site, Warrick County, Indiana."

The Ray site (12W6) is believed to be an early Angel phase mortuary placed over an Emergent Mississippian Yankeetown domestic occupation located in Southern Indiana. The site was excavated in the 1950s and the human remains are now being fully analyzed, for the first time, by our lab. The assemblage contains at least 11 heterogeneous burial clusters, including multiple disarticulated burials, bundle burials and cremations. Dozens of individuals are present. Given that the burial clusters represent an atypical mortuary pattern for a Mississippian population, the current analysis endeavors to

reveal whether or not any of the clusters vary from the others osteologically. This paper examines the occurrence of linear enamel hypoplasias (LEH), a class of enamel defects that includes all deficiencies in enamel thickness presumably resulting from developmental disruption. Controlling for age of occurrence, LEHs are compared within and between the burials in order to determine if LEH frequency is as heterogeneous in expression as the burial practice.

(11) HANSON, Sherry, & Anne GRAUER. "Lytic Lesions Indicating Possible Metastatic Cancer in a Pre-Columbian Skeleton from Canyon de Chelly, Arizona." (poster presentation; for this abstract, see *Papers on Paleopathology* 1999:12, presented at the 26th Annual Meeting of the Paleopathology Association, Columbus OH).

(12) HANSON, Sherry, R.L. TROPEA, & Anne GRAUER. "Excavating Human Skeletal Remains: How did Paul S. Martin Stack Up?"

Paul S. Martin headed extensive archaeological excavations in the southwest United States during the 1930s through the 1970s. His expeditions often recovered human skeletal remains. While many of the specimens were brought to the Field Museum of Natural History in Chicago for study, it is not clear whether or not all the specimens that were excavated are presently curated at the F.M.N.H. This paper examines thirteen of Paul Martin's sites and compares published accounts of burial excavation with inventory and expedition records from the F.M.N.H. The results highlight mid-20th century excavation and curation techniques and biases. This project was supported by NSF Grant No. SBR-9350256.

(13) JUDD, Lilith, & Stephen NAWROCKI. "Variation in Cranial Vault Thickness in a Sample of Modern European-Americans."

The Objective of this study was to determine the effects of age, sex, and hyperostosis frontalis interna (HFI) on cranial vault thickness (CVT). The thickness of the external and internal cortical tables, the diploe, and total thickness was measured from cores extracted from the right and left frontal and parietal eminences of 108 human anatomical cadavers. After cleaning, the cores were examined and measured under a stereoscopic microscope. Results of ANCOVA tests indicate that the presence of HFI and sex have the greatest effects on CVT and that the diploe is the most significantly affected layer of the vault. Age by itself does not strongly influence CVT apart from the effects of HFI.

(14) KOOT, Michael, & Wendy LACKEY. "Regional Variations in Histological Morphology Between Weight-Bearing and Non-Weight-Bearing Bones."

Bone histomorphology has several uses in both forensic anthropology and archaeology. Human histomorphology has long been used for determining age at death in both subfields. Furthermore, histomorphology provides a reliable method for assessing whether skeletal remains, especially fragmentary remains, are human or nonhuman. It has been documented that bone histomorphology within and among species may vary according to the bone's location in the body. In this study, examination and photography of the thin-sections of human, dog, sheep, pygmy goat, pig, horse, and deer, illustrate that the organization of bone differs significantly between weight bearing and non-weight-bearing bones.

(15) KUBA, Cassandra, Stephen NAWROCKI, & Lilith JUDD. "The Ones They Left Behind: Excavation and Analysis of Historical Burials in Downtown Indianapolis."

During the summer of 1998, our lab conducted emergency excavations at two separate 19th century historic cemetery sites in urban Indianapolis, both accidental discoveries made during construction activities. Each site produced about 10 individuals interred in wooden coffins but with little coffin hardware or personal effects. Some of the burials at the Harding Street Site showed signs of prior disturbance by sewer work in the early 20th century. Those at the Henry Street Site are presumably from the old and extensive Greenlawn Cemetery, which was abandoned after "relocation" of the bodies to other city cemeteries in the early part of the 20th century. Analyses of the remains from these sites are complicated by the difficulty of assigning ex-situ remains to the appropriate individual, the lack of headstones and burial records, various waves of urban development and renewal, and the stacking of burials above one another.

(16) OSBORNE, Daniel. "Reconsidering Auricular Surface Morphology as an Indicator of Age at Death." (poster presentation)

Lovejoy et al. (1985) developed a method of age estimation utilizing morphological change of the auricular surface of the ilium. While the original study does successfully seriate age related changes in the auricular surface, it is unclear by what statistical method (and sample size) the age ranges for each serration stage are derived. Furthermore, there is evidence that the method may be too variable to be used as a single estimator of age (Murray & Murray 1991). This is particularly true in cases where other skeletal regions used in age estimation are missing or damaged. As part of an ongoing research project aimed at refining the auricular surface method, data were collected from the University of Tennessee, Knoxville using guidelines set forth by Lovejoy et al. (1985). Issues considered include: (1) the frequency with which a given feature realistically is correlated with age; (2) the applicability of the method across sex; (3) bilateral symmetry (or the lack thereof); and, (4) the possible ways of creating phases that represent the true variability found in auricular surface morphology.

(17) SAUL, Frank, & Julie MATHER SAUL. "Planes, Trains and Fireworks: The Evolving Role of the Forensic Anthropologist in Mass Fatality Incidents."

Prior to 1997, we had never dealt with an airplane crash involving more than four victims (Burlington Air Freight, Toledo, OH, 1992). In January of 1997, as members of a U.S. Public Health Service (USPHS) Disaster Mortuary Operational Response Team (DMORT) we helped sort and identify the remains of the 29 victims of the ComAir 7232 crash (Monroe, MI). Later that year, in August, we were called by DMORT to help identify the 228 victims of the Korean Airlines 801 crash on Guam. More recently (December 1998) as forensic anthropologists with the Lucas County Coroner's Office, we helped sort and identify the remains of seven individuals killed by a fireworks factory explosion in Hillsdale, MI. A few months later (March 1999) we again assisted DMORT with the 11 victims of the Amtrak train-truck collision in Bourbonnais, IL.

All disasters have components that are different and the same, but our exposure to a variety of incidents within two years presented a unique opportunity to examine and contrast the roles of the forensic anthropologist and the forensic pathologist. Our main conclusion is that anthropologists have been under-utilized in the past although they have major roles to play throughout the operation, beginning with the recognition, recovery and plotting-in of remains at the scene followed by

interaction with the pathologists, odontologists, fingerprint specialists, radiologists, etc. as the remains are processed for identification.

Although anthropologists are perhaps best known for their ability to elicit biographic profiles (age, sex, ancestry, stature, etc.) from otherwise unidentifiable remains, they can also play an important role in determining the age of intact remains and in linking disassociated remains as well as separating commingled remains. Many forensic anthropologists are also experienced in making identifications through comparison of antemortem and postmortem radiographs and even antemortem photographs of distinctive body features such as ears. We are pleased to note that DMORT has recognized the potential (and proven) value of anthropology in a number of ways, including the appointment of anthropologists as Commanders of two of the ten Regional Teams.

(18) SAUER, Norman, William LOVIS, & Jennifer FILLION. "The Archaeology and Physical Anthropology of the Laufer Case."

Human remains positively identified as the remains of a missing person, Randy Laufer, were recovered both through inadvertent backhoe excavation and systematic recovery by the MSP Crime Lab and MSU anthropologists. In addition to positive identification, forensic anthropological analysis revealed perimortem and postmortem alteration of the skeleton, including evidence for mutilation and segmentation. Archaeological investigation was employed ex post facto to assess the former position of structures and the most likely location of the burial pit from which the remains were recovered. It was concluded that the burial pit was located in a driveway outside the front door of a former property owner. These combined data were presented in the successful prosecution of John McCrae by the Michigan Department of Attorney General and the Clare County Prosecutor.

(19) SCHMIDT, Christopher. "Dental Anthropology in a Forensic Context."

Historically, human teeth from forensic contexts have been regarded as the domain of the forensic dentist and have been turned over by the forensic anthropologist after only a cursory examination. However, the contributions to dental study that can be made by forensic anthropologists in general, and forensic dental anthropologists in particular, are becoming more appreciated by the odontological community. These contributions are particularly evident when the teeth have been radically altered from their original condition. Forensic dental anthropologists are able to accurately and quickly reconstruct damaged dentitions and, thus, expedite the dental identification process.

(20) SIMMONS, Tal. "Seeing the Forest (And not Missing the Trees): Large Scale International Forensic Missions."

An increasing number of professionals and students in the field of forensic anthropology are becoming involved in international missions of a humanitarian and/or human rights nature. Most who are becoming involved in their first international experience are unprepared for the realities of the situation, and not only those related to emotional distress or physical discomfort. While knowledge of excavation and laboratory analytical techniques used in single case work in the United States is undeniably important, most individuals do not understand the changes necessitated by the large scale of international projects and the sheer volume of human remains. As most projects are operating within extreme time constraints, the crux of the matter is simply this: how can hundreds of human remains be rapidly exhumed and examined, and, how can this be accomplished without compromising complete recovery, accurate documentation, quality and consistency of information collected, etc.?

For many individuals, this type of work requires a difficult adjustment of expectations in addition to being willing to consider where and why compromises must be made. The level and focus of the analysis, too, may be different than that with which some anthropologists are comfortable. Planning is of paramount importance in missions of large scope and there is a steep learning curve. One must recognize that decisions made before the project begins will ultimately dictate what can be done later as well as the utility and quality of the data collected. One example of this is in the seemingly mundane area of "recording form" design. Deciding what information is to be collected and how that information is to be recorded is not self-evident; it will, however, determine one's ability to organize and categorize the data, compute statistics, and provide information to various officials. Most of the design effort is in anticipating what the remains will look like (completeness, injuries, antemortem conditions, etc.) and knowing what you want to do with that information later. Learning from mistakes and making adjustments from one project to the next is vital.

(21) SMITH, Maria. "Mississippian Period Intergroup Violence in East Tennessee: Survey of the Chickamauga Reservoir."

It is apparently axiomatic that the Mississippian Period in the American southeast is associated with an increase in warfare, particularly after A.D. 1250. This assessment is based on the widespread archaeological evidence of site fortification and the skeletal evidence of violent trauma. However, only a few Mississippian sites have published frequencies of the traumatic injury traditionally associated with violence (cranial fractures, inflicted points, scalping, dismemberment, party fractures). There is a critical absence of baseline data against which to measure the high frequencies heretofore reported. Within the Mississippian Period in the Chickamauga Basin of east Tennessee, the Dallas Culture reportedly displaces the Mouse Creek Culture. This may be associated with an increase in violent trauma. The results are contrasted against the published literature as well as the preliminary results from other east and west Tennessee Mississippian sites.

(22) SMORYNSKI, S. "An Investigation of the Late Mississippian Dallas Culture within the Norris and Melton Hill Reservoirs of Eastern Tennessee."

Attention to specific sub-fields of archaeology is important for expanding our knowledge of the past; however, it has created a plethora of unsynthesized data and research projects that lack cohesiveness. Based on archaeological assumption alone, generalizations have been made that Late Mississippian Dallas cultural tradition was characterized by increased battle, political turmoil and population relocation. Generalizations such as these should be stated with caution until comprehensive regional analyses, which include osteological examination, are completed. This investigation of the incidence of warfare in Dallas culture of eastern Tennessee is based on the examination of human skeletal remains from several late Mississippi sites. The osteological evidence of violent trauma among and between populations will be presented in concert with the archaeological evidence previously recorded in site surveys, burial and grave good reports and other literature.

(23) SWEET, Alison, E.A. JUOCYS, T.N. THURMOND, & Anne GRAUER. "Exploring Inter-Observer Error."

Long bones from 20 individuals from the 19th-century Dunning Poorhouse Cemetery were measured to estimate stature. The measurements were analyzed to explore the presence of inter-observer error. The results show that variation in long bone measurements among the three observers were not random. Possible explanations of these results are explored. For example, the manner in

which the bone was held, the type of long bone measured, and the level of experience of each observer were contributing factors to the consistent patterns of inter-observer error. This research has been supported by NSF Grant No. SBR-935026.

(24) THEW, Heather. "The Effects of Lime on the Decomposition Rate of Buried Pigs."

Of the many factors that affect the decomposition of buried remains, one that is particularly pertinent to forensic studies is the inclusions of chemical lime in the burial. A survey of case studies has shown that lime is sometimes placed in the grave by an assailant, presumably to hasten the decay of the victim. This pilot study involved the burial and excavation of six sets of juvenile pig carcasses in northwest Indiana. The pigs were interred in pits of two different depths for either six months or thirty months. One half of the carcasses were covered with lime and the others served as control groups without lime. All of the pits were located in the same area of a fallow farm field, in well-drained, sandy-loam soil. At the time of excavation, the overall state of decomposition was scored for each pig carcass. Preliminary results indicate that the presence of lime in the grave significantly slowed the decomposition of the soft tissues, most likely because the substance dehydrated the remains and reduced access by necrophilous insects.

(25) TRON, Kathleen, & Nancy TATAREK. "Taphonomic Effects of Rodent Urine on Fetal Bone."

Fetal remains were discovered in the crawl space of an old house during to the late 1800's. Approximately 85% of the skeleton, aged at 30 - 36 weeks, were present. A small portion was covered with mummified tissue. Those areas of bone not protected by tissue had an eroded surface texture that resembled a "sea sponge," an effect mirrored on the remaining soft tissue covering the bone. Initial analysis of the bony erosion led to a conclusion of a skeletal pathology; yet, the presence of the same effect on the soft tissue precluded this as a final diagnosis. Based on the chemical analysis, microscopic examination, radiological studies, and physical inspection, a conclusion of taphonomic processes was drawn. There is little information about the effects on the human skeleton of long term exposure to urine. Therefore, via the case study, this paper will examine morphological changes due to rodent urine.

(26) TROPEA, R.L., & Anne GRAUER. "The History of Prehistory: An Analysis of a Skeletal Sample from Cahokia." (poster presentation; for this abstract see the American Journal of Physical Anthropology, Supplement 28:267-268, 1999).

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