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Human or Not? A Problem in Skeletal Identification

Physical anthropologists are frequently called upon by both the general public or law enforcement agencies to identify bones. This is particularly true in a desert region where people while exploring, rock-hunting, or hiking find a "bone" and bring it to the local university or museum for identification.

As a member of the University of Nevada, Las Vegas (UNLV), anthropology faculty, I receive many requests each year for bone identification. Typical was a call received one Sunday excitedly describing an Indian burial which would need immediate protection by archaeologists. Later that day the "bones" were brought to the University Museum by their discoverer. He traveled over 50 miles to submit the bones which he was certain were human and, possibly, of great antiquity. Unfortunately, they proved to be limestone concretions in no way resembling either recent or fossil bone.

A few years ago, one man was so certain that he discovered evidence of Middle Pleistocene man in southern Nevada that he insisted the museum secretary lock the "bones" and accompanying "artifacts" in her desk and give him a receipt until a geologist-palaeontologist, an archaeologist, and I could arrive to examine them. They proved to be rocks of assorted types of no particular uniqueness, except in the eyes of the finder.

For laymen to leap to such conclusions is not unexpected and the consequences are usually harmless. When law enforcement agencies pay consultants to examine "human" bones which ultimately prove to be scraps from a historic garbage dump, the results are expensive, time-consuming, and, if the press is involved, embarrassing. Law enforcement officers generally do not mistake limestone concretions for bone, but nonhuman bone easily can be differentiated from human bone through a modicum of training.

The Criminal Justice or Law Enforcement Program at UNLV

Recently a B.A. program in criminal justice or law enforcement, located in the Department of Sociology, has been established at UNLV. At present the training in forensic anthropology is limited to a two-hour lecture by a physical anthropologist. This consists of a brief survey of bone identification, and differentiation of human from nonhuman bone and other problems of skeletal identification. Although some information may be imparted to the students, no lasting impression will be made from such a brief session with little or no

Presented at the 25th Annual Meeting of the American Academy of Forensic Sciences, Las Vegas, Nev., 20 Feb. 1973. Received for publication 1 May 1974; revised manuscript received 3 July 1974; accepted for publication 5 July 1974.

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examination of actual comparative bone material. To remedy this, more extensive training is desirable.

Participants in the B.A. program and members of law enforcement agencies who are attending supplementary classes at UNLV have requested this training as a workshop, rather than a regular undergraduate course, so that it can be made available to those already in the field of law enforcement. The workshop is designed as an evening course meeting once a week for six weeks, supplemented by a one-day field trip. The details of the design have been established; it remains for law enforcement agencies to express the desire for the course, and programs in law enforcement at various universities to implement it.

Details of the Workshop

This course can be initiated at any university by a physical anthropologist experienced in human osteology and identification, problems peculiar to forensic work. The major part of the course would be a combination of lectures supplemented by laboratory sessions involving the actual handling of the bones of the human skeleton, so that some recognition of anatomical relationships and the variability of human bone material can be achieved. One important section of the course would be devoted to the comparative study of human and nonhuman bones, with emphasis on common domestic and wild species such as dog, deer, bear, sheep and cow bones. Bear may seem an unusual inclusion, but on several occasions bear paws have been misdiagnosed by law enforcement officers as possible human hands or feet. These mistakes occur because the officer fails to observe the number of digits present, and also because in skinning, the claw-bearing terminal phalanges stay with the hide, giving the skinned paw an uncannily humanoid appearance. Training in these matters can cut the costs of law enforcement, as experts would not be needed to identify dog bones or skinned bear paws.

Recovery of Skeletal Evidence

Another aspect of this course would involve training law enforcement officers in certain archaeological techniques useful in the proper documentation and recovery of skeletal evidence which is so often lost in these cases. For example, in a Nevada case a dental plate was found some distance down an arroyo from a partially disturbed human skeleton. The dental plate was identified, but the age of the person for whom it had been made did not match the age of the skeleton. It was finally presumed that the plate belonged to the skeleton and that the skeletal age of the latter was inconsistent with his actual age. The lack of controlled site records or field photographs showing the exact relationship of the dental plate to the skeleton has left some uncertainty in this instance.

In such cases, laying out a 5 by 5-ft grid of the area in which the remains are located can aid in placing all potentially related objects in an exact position relative to the skeleton, as shown in Fig. 1. If a larger section needs covering, a 10 by 10-ft additional grid can be utilized for features lying outside the area requiring detailed examination. All objects found with each unit of the grid are placed in a bag labeled with the grid's designed numbering system (see Fig. 1). This gridding layout is particularly applicable where there is open terrain, but can be modified for use in more thickly overgrown or wooded areas. Assigning a number and a letter to each square of the grid and recording all objects by the grid square or unit in which they were located gives a permanent record of the spatial distribution of bones and artifacts useful in determining their contextual relationships. Also, if the remains are photographed *in situ*, this provides valuable documentation of the find at the time of investigation.

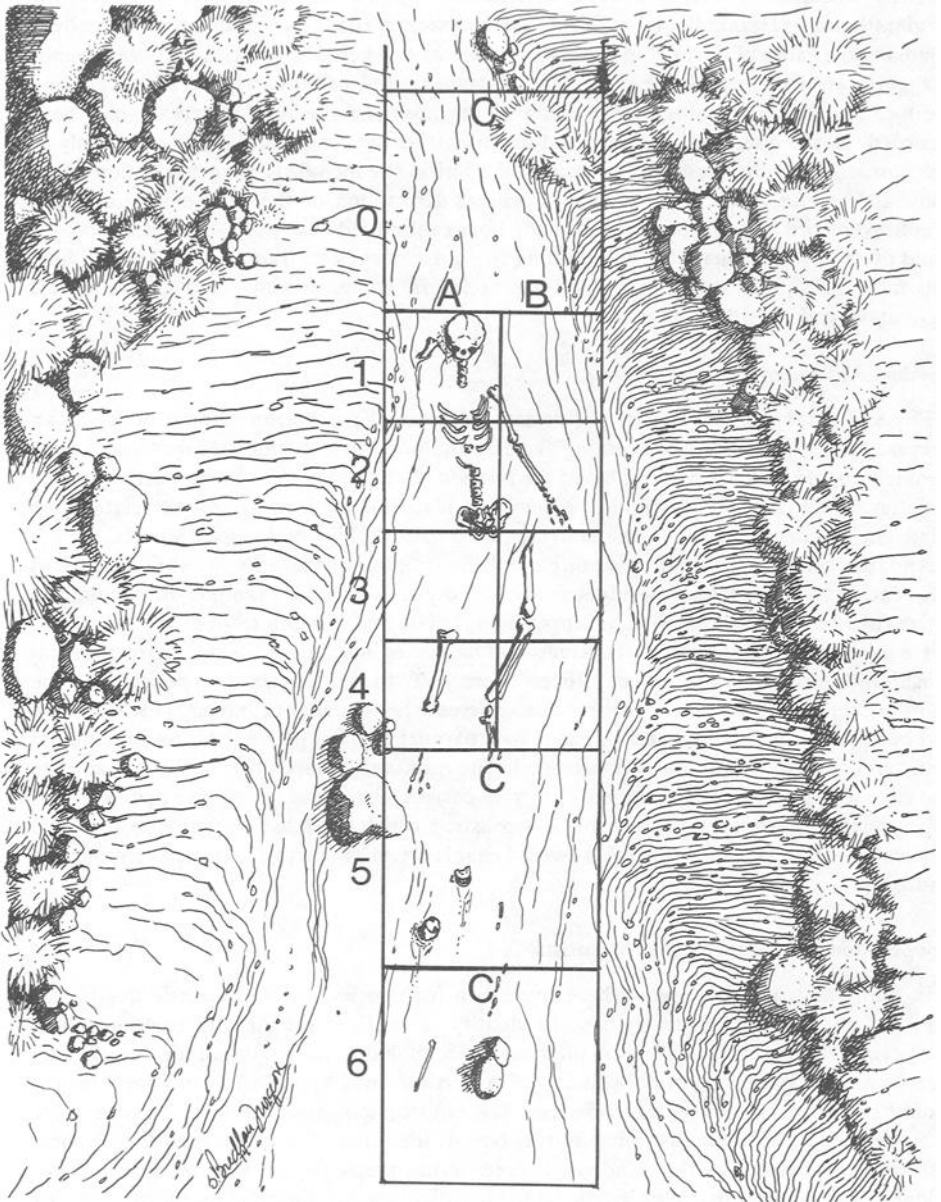


FIG. 1—Method of gridding the location of human skeletal remains.

Observations and photographs of the general terrain in which remains are located, as well as photographs of the body prior to removal, can also aid in the investigation. Within the past year in Clark County, Nevada, the skeletalized remains of a woman were brought to me for identification. Her skull was broken in a way that suggested the bone damage may have been related to the cause of death. Inquiries were made as to where the remains had been found: in rugged terrain near rocks or cliffs, or in an open area? Unfortunately, no data regarding the location of the remains, the position of the body, or the type of terrain had been recorded, so the question is unanswered as to whether this individual died accidentally or was murdered. Archaeological site records of a burial site include the exact situation of the body, the terrain, flora, geology, and a general description of the local environment. A simplified record of this type accompanying bones submitted to the physical anthropologist could often prove invaluable in determining the cause of skeletal trauma. The one-day field trip included in the workshop would be useful in demonstrating such archaeological techniques and recording methods.

Physical Anthropological Techniques

Physical anthropologists learn the correct anatomical position of human bones as an integral part of any course concerning skeletal analysis. This includes recognition of right from left and distal from proximal, and the relation of each bone to adjacent portions of the skeleton. The Frankfort Horizontal, a device to place the skull in its correct relationship relative to its orientation in a living individual, is a basic tool in craniological studies.

Apparently such information is not part of the training of students in other disciplines frequently involved in forensic identification. To cite a specific example, in a homicide where the murdered woman had an upper dental plate and her own teeth in the lower jaw, but a major portion of the soft tissues and bones of her face missing, neither dental consultants nor law enforcement officers were able to reconstruct the position of the mandible relative to the dental plate so as to re-create her facial appearance. This mandible had been set with the horizontal ramus placed parallel to a flat plaster base and the dental plate put on top of it with the teeth occluded. The resultant juxtaposition of the dental plate and mandible with no adjustment for the correct Frankfort plane created a facial appearance of extreme prognathism. A workshop which included information on basic physical anthropological methodology would enable investigators to avoid such errors in the future.

Cooperation Between Forensic Scientists

In many metropolitan areas where there is a high incidence of traumatic death, law enforcement agencies frequently need to identify skeletalized remains. In these instances the agency will usually contact a physical anthropologist as a consultant for skeletal identification. Since the establishment of a section on Physical Anthropology in the American Academy of Forensic Sciences, law enforcement agencies have become more aware of the potential for assistance in this type of identification. At present, the Physical Anthropology Section of the Academy is considering preparing a list of physical anthropologists willing to participate in skeletal identification for forensic purposes. The list could then be made available to law enforcement agencies to inform them of the nearest physical anthropologist who would be interested in acting as a consultant for problems of bone identification.

Despite the availability and cooperation of physical anthropologists, from the problems cited in this discussion and comparable ones considered during Academy meetings, it is

apparent that law enforcement officers could amplify their forensic work through a training workshop or course in skeletal identification and in archaeological techniques of documentation and recovery of data. With such training of law enforcement officers, problems related to skeletal identification, such as many of the current difficulties mentioned here, might be minimized.

It is for these purposes that this workshop or training course has been designed. The physical anthropologist working as a forensic investigator is dependent on the records of the law enforcement agency, since its staff will usually have conducted the recovery of the skeletal remains and have called in the physical anthropologist as a forensic consultant after the bones have been removed from their original positions. Prior knowledge of how to record and photograph relevant materials in their contextual relation to each other and to the terrain will aid immeasurably in reconstructing these associations for the physical anthropologist and other forensic investigators. Training in bone identification, differentiating human from nonhuman bone, and other physical anthropological techniques will not make those participating in the course bone specialists, but should widen the scope of the law enforcement officer in the recognition of different kinds of forensic evidence as relevant to skeletal identification. Cooperation between physical anthropologists and law enforcement agencies can lead to improved programs of training in law enforcement and implement the creation of workshops or seminars for those already working in the field of forensic identification.

Summary

Frequently, bones submitted to physical anthropologists by law enforcement agencies as human prove to be nonhuman. This results in a waste of time, money, and effort of all concerned. A course has been designed that could be offered by a physical anthropologist either as a workshop or as part of a training program for law enforcement officers. This would consist of teaching through lectures and laboratory work the techniques utilized by physical anthropologists to differentiate human from nonhuman bone, the anatomical relationships of bones of the human skeleton, and methods of recording bones and artifacts as they are recovered so that their original positions are documented both in relationship to each other and to the terrain. Training in these techniques would aid forensic investigators and amplify the kinds of information available to physical anthropological consultants asked to identify skeletal remains recovered by members of a law enforcement agency.

Acknowledgment

Thanks are extended to Suzanne Bredlau Turgeon, the artist who provided the illustration for Fig. 1.

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