



## CRIME SCENE ARCHAEOLOGY: THE ROLE OF ARCHAEOLOGICAL TECHNIQUES IN FORENSIC SETTINGS

*by Kent J. Buehler*

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Turn on your TV any night of the week and you can almost be assured of encountering a program about forensic investigation. The past few years have seen a tremendous increase in public interest, so that this previously little known field is now one of the hottest subjects on television and in movies. Forensic investigation is an extremely wide field. Virtually any area of study can be applied to a legal setting - but a show about forensic accounting might not score too highly in the Nielsen ratings.

So what does forensic investigation have to do with archaeology? The answer is plenty, at least in some circumstances. After all, much of archaeology is detective work of a sort. Both archaeologists and detectives seek to recover physical remains - artifacts for archaeologists, trace evidence for detectives - from which they can derive information. They then use that information to reconstruct the human behavior that once took place at that location, perhaps a prehistoric village for the

archaeologist, a crime scene for the detective. Given this relationship, it is not surprising that the two should come together, for they have one more thing in common --- dead bodies.

Archaeologists have many decades of experience in the careful recovery of human remains and associated materials. Homicide detectives also do this routinely, and when the victim is buried in a clandestine grave, detectives increasingly incorporate archaeological techniques and procedures. The collaboration works both ways. Twenty-odd years ago, when the relationship was in its infancy, it consisted primarily of archaeologists instructing law enforcement agencies (LEAs) in the application of archaeological excavation and recording techniques to crime scenes, mostly buried bodies. As time passed and cooperation between archaeologists and LEAs increased, both sides recognized the need for archaeologists to meet the specific requirements of law enforcement. LEAs

wanted training more structured to their particular needs and archaeologists began to adapt their techniques to meet them. Site survey techniques incorporated data from studies of criminal body disposal. Standard archaeological practices of recording artifact provenience and context were adapted to include the need for unbroken chain of evidence custody. Advances in forensic tool mark identification led to the recognition that evidence of the use for a particular individual tool, say, a shovel, might be preserved in the walls of a grave. The fact that police encounter more surface-scattered human remains than actual burials led to the development of mapping, recording, and recovery techniques oriented to that reality. Archaeologists began to include aspects of other investigative fields such as forensic entomology and forensic botany. They also learned how to fill the role of expert witness in courtrooms.

The Oklahoma Archeological Survey began to offer training in forensic archaeology to Oklahoma LEAs in the early 1980s. The Survey Lab Manager, Kent Buehler, began participating in 1988 and took over teaching the course in 1997. It is part of the Oklahoma City Police Department Technical Investigation School. This month-long school covers all aspects of crime scene investigation including photography, fingerprinting, and even blood spatter analysis. The forensic archaeology segment consists of a day of classroom work and lecture followed by a day of searching for, excavating and recording mock crime scene graves.

In June, 2002, Kent participated as an instructor in a week-long field training program entitled *Crime Scene Archaeology* conducted by the St. Louis office of the FBI. Mike Hochrein, the man in charge of the program, is a formally trained, degreed archaeologist who serves as an FBI Special Agent. As such, he is one of the few trained archaeologists in the country employed full-time in the forensic field. His *Crime Scene Archaeology* training program is one of the most comprehensive available in the U.S. The course was attended by FBI agents and officers from other LEAs from around the country.

The course began with two days and evenings of lectures and demonstrations covering a wide variety of topics. The students were introduced to human osteology, forensic anthropology, forensic taphonomy, case histories of crimes involving buried bodies and surface recoveries, crime scene photography, remote sensing, forensic entomology, and air



Figure 1. A one year old mock grave. Note that the grave has sun; also note the mounded halo of backdirt surrounding the grave, left over from when it was dug.

disaster and arson recovery scenarios. The second evening included outdoor demonstrations of Forward Looking Infrared Radar (FLIR). These devices can be mounted in aircraft and used to rapidly cover a large area, searching for clandestine graves. In the demonstration, a mock grave more than a year old stood out markedly from its surroundings when viewed on a laptop screen connected to the FLIR camera (Figure 1).

The third day, and first day of outdoor exercises, began with instruction in the many ways of mapping surface and subsurface features. Equipment and technique demonstrations included baseline mapping, triangulation, transit mapping, polar coordinate mapping, and use of a total electronic mapping station. The latter was demonstrated by FAA officials who specialize in the recovery of wreckage, human remains, and other evidence from airplane crash scenes. Using the total station, the mapping team shoots in the location of items flagged by search teams. These points are entered into a laptop computer. Using special software, the computer draws the map in real time as the items are mapped. The team photographer shoots digital photographs of the items, which are also entered into the computer. Clicking on the icon on the computer map brings up the photograph and a description of the item. By identifying patterns in the distribution of these articles, crash events can be reconstructed, often providing evidence which aids in determining the cause of the crash. This same procedure can easily be applied to mapping a crime scene. Each

student team was given the opportunity to try their hands at each mapping technique. Demonstrations were also given on the use of cadaver search dogs as well as ground penetrating radar and magnetometers to locate human remains.

Days four and five were devoted to the excavation of the mock crime scene graves. Five graves had been prepared more than a year before the exercise. Anatomically accurate plastic skeletons were used, dressed in clothing and accompanied by a variety of evidence such as rope or duct tape used for binding the victim's hands (Figure 2). Each team of law enforcement students used their training from the previous three days to carefully excavate the body and record all evidence. It was slow, painstaking work. All dirt removed from the graves was screened by team members so that no small objects or pieces of evidence were lost. Everything that appeared to be of any importance was photographed, mapped and recorded prior to being removed. After the body and all associated objects were removed, the grave floors were examined for drying cracks. These cracks form when the moist soil of the grave floor is exposed to the air for an extended period and can persist for a surprising length of time after the grave is occupied and backfilled. Their presence can be evidence of premeditation, an important aspect of homicide cases.

The law enforcement personnel who take the course are exposed to a huge amount of information over the five day period. But not to worry -- they are provided with an 800-page notebook containing everything covered during the class that they can draw upon for future reference. The instruction works both ways. Even though he participated



Figure 1. A mock crime scene grave contains the skeletal remains of the victim.

as an instructor, Kent also gained knowledge he will apply to the forensic archaeology course he teaches through the Oklahoma City Police Department. Forensic archaeology may be little known to the general public, but it is a subfield that is coming into its own. It demonstrates how archaeology is relevant, not just to the past, but to the present as well.

### Newsletter Donations

We greatly appreciate those of you who contributed to make our newsletter more "colorful". Unfortunately, donations for this effort fell far short of what was needed to produce a full color newsletter on a regular basis. I hope you enjoyed the special issue. We will continue to examine means of improving the presentation of the Survey's activities.

*Robert L. Brooks*

### Oklahoma Anthropological Society Fall Dig Scheduled at Plains Village Site in Garvin County

The Oklahoma Anthropological Society (OAS) has arranged for a Fall Dig at a large Plains Village site on a high terrace of the Washita River near Pauls Valley. Richard Drass will direct excavations at 34GV156 over a four day period from October 30 through November 2. Although the site has been known for a long time, there have been no systematic investigations. This spring, terrace erosion exposed a number of pits in the river bank. Charred corn samples from the bank cut pits have been dated, revealing an early Washita River phase occupation. Two samples from widely separated pits yielded identical dates, A.D. 1290 (calibrated). Examination of artifact collections from the village and discussions with several collectors indicated that houses and other features are present on the terrace top. The Fall Dig's objective will be to expose at least part of a structure in this location. We hope to identify a house pattern to compare with those from other villages in the Pauls Valley area. The site's extent along the terrace suggests that other houses are present. Daub and artifact concentrations provide clues to house locations and our excavations should reveal post molds. The site's soil is sandy loams with good preservation of bone and floral remains. Excavated artifacts such as pottery, chipped stone tools and debris, bone tools, and ground stone items will be compared with materials from other villages to identify subsistence patterns, use of lithic

raw materials, and possibly trade or exchange activities.

We are working on access to camping facilities at the Pauls Valley city lake and we expect these will be available. There are hotels nearby in Pauls Valley. We hope to do some preliminary testing and mapping a few days before the Fall Dig. Anyone interested in assisting with this work should contact Richard at the Oklahoma Archeological Survey, 405-325-7211, or email him at [rdraass@ou.edu](mailto:rdraass@ou.edu)

Two OAS Certification Program seminars are scheduled for evenings during the dig. On Friday evening, October 31, "Specialized Techniques: Flintknapping" (S14C) will be offered, and on Saturday evening, November 1, the seminar will be "Public Education" (S16). An extra brownie point will be given to those attending the Friday evening seminar in Halloween costume. Those participating in the flintknapping seminar MUST have protective eyewear. The seminars will be held at the campground and will begin at 7:00 p.m. If you are interested in attending these seminars, contact Lois Albert at the Oklahoma Archeological Survey,

or email her at [lealbert@ou.edu](mailto:lealbert@ou.edu). If enrollment for a seminar reaches it's maximum, there will be a waiting list. Preference for seminar enrollment is given to those in the OAS Certification Program.

Although you must be an OAS member in order to participate in the Fall Activity's dig or seminars, you can join during the Activity. The cost of a basic membership (Active) is \$20/year; other members of your immediate family can become associate members for \$5/year, with a maximum charge of \$10 beyond the initial membership.

*Richard Drass and Lois Albert*

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