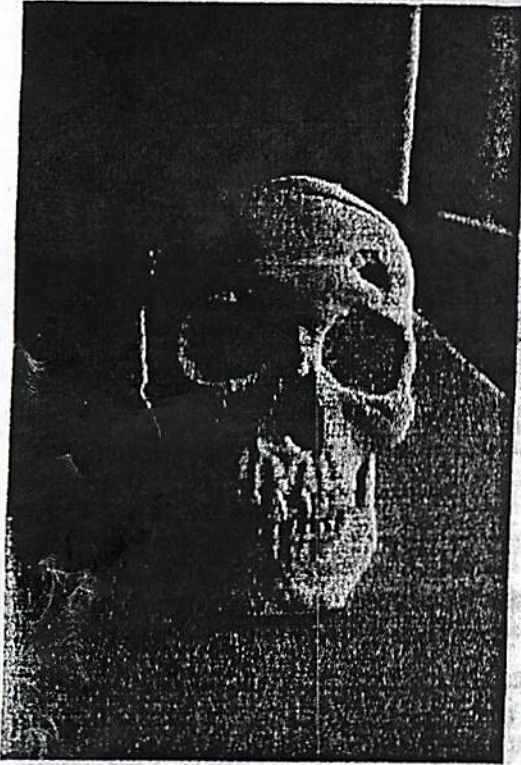


What is forensic anthropology?

by R.W. Steinberg



A skull in the forensic anthropology lab at Texas State

Photo by Jana Birchum

The examination of human skeletal or decomposing remains in a legal setting to establish the identity of unknown individuals and to help determine the cause of death.

What does a forensic anthropologist do?

- Collect human remains at crime scenes
- Prepare bones so they may be examined
- Analyze bones to determine the victim's biological profile
- Identify trauma involved in the cause and manner of death
- Work with forensic odontologists to match dental records
- Testify in court about the victim's identity and/or injuries that might be present

What doesn't a forensic anthropologist do?

- Analyze evidence such as blood spatter, hair and fibers, or ballistics
- Run DNA tests
- Conduct autopsies

When does a forensic anthropologist become involved?

"Forensic anthropologists usually work in three broad categories," said Texas State professor Jerry Melbye. "The first is working on mass disasters where many people are killed in a very short period of time, such as an airplane wreck, riots, or floods. The second broad category is political atrocities, which are those situations in which a government eliminates a segment of its civilian population. The third area is suspicious death, which is where we suspect homicide."

You've just found some bones. Now what?

"One of the first things we are interested in is if the skeleton is human," said Melbye. "Once we establish that, we ask if the collection of bones represents one individual or more. Then we work on the identification of the biological profile. What sex was the person? What was their age at death? Then we determine their height by measuring long bones and applying statistical formula. Then we ask the race of the victim. That is very complicated, but we generally get an idea within a race or two. Another category is antemortem [before death] pathology. If the person had a disease that left marks on a bone or they had a fracture during their life, these can be used to help identify them."

After that comes establishing the positive identification. "The most common is dental records, because almost all of us have been to a dentist and have had X-rays of our mouths. But also DNA is important. Occasionally we get hospital X-rays. With the positive identification, the simple rule is something before death has to match something after death.

"After that area we top it off with perimortem [time of death] pathology. That, of course, is of primary interest to law enforcement, because they use that to determine if a murder has occurred. We look at the fine details of bones; little tiny nicks or scratches can be knife cuts or nicks from a bullet. Basically we deal with blunt-force trauma, sharp-force trauma – saw, axe, knife – and ballistics. Regarding ballistics, with all the types of guns and rifles out there, ammunition that is high power or low power, we have a wide variety."

Do you have a cool lab with lots of high tech gizmos like on TV?

"In the past, the equipment was rather basic," said Melbye. "We have several different kinds of calipers to take measurements. We have big tables. We look at cellular structures of bones with microscopes, because that helps in age determination."

But technology is starting to take over. "We have 3-D digitizers that allow us to touch a bone in one place, then touch it in another; then we have the measurement. It takes out the human error. We have 3-D scanners, so we scan skulls and have a permanent record that can be shown in a court of law, and we can look at it three-dimensionally and spin it around to look at all sides. We have high tech color meters to look at decomposition changes or teeth and bones. Right now, we are working with the Engineering Department at Texas State to scan and make solid prototypes, or copies, of skulls. We are also getting into the area of electron microscopy with help from the Physics Department, which will allow us to look at details like whether certain cut marks may be related to one knife or another."

What about facial reconstructions on skulls?

Melbye says clay modeling on a skull is a popular way to provide facial reconstruction to get the word out to law enforcement or newspapers and television. "It's still one of the better methods, although we are on the edge of technology. There are several scientists, including those in our Engineering Department, who are working on new methods by scanning a skull and letting the computer build the face. This sounds like something that should be pretty straightforward, but as it turns out, it's quite complex. We have been toying with the idea of using computers for this task, but we are still on the edge. There is always going to be an element of art in facial reproduction. Bones don't tell us what an ear looks like. Most of the nose, we cannot tell. We cannot tell facial hair or hairdo, because they're not preserved in bone, and there are no bony clues as to what they may have looked like." – R.U.S.