

# Forensic Anthropology

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Forensic Anthropology may be defined as the application of the principles of skeletal biology to individual, or in some instances large numbers of, otherwise unidentified human remains in a modern or contemporary medico-legal context. Generally the forensic anthropologist is asked to deduce two elementary, but often complex questions - who is it? And, what happened?

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After establishing that the remains under investigation are indeed human, the forensic anthropologist can begin to address the first question. This is accomplished by reconstructing the biological profile of the unknown individual by synthesizing a number of multifaceted and interrelated biological issues before ascertaining the sex, ancestry, age, living stature and any antemortem characteristics from the skeleton. Antemortem characteristics, or individuating traits, would include dental restorations, healed fractures, arthritis, or perhaps some underlying pathological condition that leaves evidence in bone. These features, combined with the basic biological profile, are passed along to the medical examiner, investigator, or law enforcement in order to assist in the identification (i.e., who is it?). The second inquiry may be addressed by a careful examination of the decedent for evidence of perimortem injury or trauma. Perimortem trauma may include patterned fractures from blunt force damage, evidence of gun shot injury, or sharp force defects such as stab or incised wounds.

Furthermore, forensic anthropologists may examine clues found in association with the remains to address such issues as the location of the body, the time since death, and whether or not a body has been moved. Postmortem changes in human remains, often academically referred to as taphonomy, have always been of interest to biological anthropologists in the study of human fossil remains. The process of fossilization can influence the interpretation of the context from which human remains are discovered. In the forensic or contemporary setting such postmortem changes occur more rapidly and might include trauma due to animal predation, insect activity and succession, evidence of bleaching or staining due to corrosives or natural environmental change. Burials, both formal and clandestine, are associated with unique postmortem changes and thus of interest to the forensic anthropologist. The characteristics of these burials may influence interpretations surrounding the circumstances of an individual's death. Research at the University of Tennessee's "Body Farm" has generated both scientific and public interest. The analyses, educational programs, and basic research performed on human remains at this facility have provided a wealth of information on the postmortem interval, or time since death, and have been an invaluable resource for the death investigation community.

The application of human skeletal anatomy to determine identity and prior insults, or injury, is not new. Dr. Thomas Dwight (1843-1911), the anatomist who succeeded Oliver Wendell Holmes, Sr. at Harvard, was perhaps the first to specially address the issue of deriving someone's biological profile from skeletal remains. His scientific research acknowledged the utility of anthropological or more specifically, osteological methods, in a medical-legal context. Dr. Ales Hrdlicka (1869-1943) and T. Dale Stewart (1901-1997), both of the US National Museum of Natural History- Smithsonian Institution, performed osteological examinations of skeletal remains for various state and federal agencies during their tenure. Original research and works by others were collated and presented by Dr. Wilton M. Krogman (1903-1987) in his text, *The Human Skeleton in Forensic Medicine*, 1962. This is the first full-length textbook devoted to forensic applications of skeletal research and formally places the study of human remains within the context of the legal system. Dr. T. Dale Stewart's book, *Essentials of Forensic Anthropology*, 1979 is also noteworthy for its content and the formal use of the term, forensic anthropology in the title. During the 1960's and early 1970's physical anthropologists began attending the American Academy of Forensic Science's annual meeting and became members of the pathology and biology section of the Academy. In 1973, a formal physical anthropology section was formed and a process of certification in forensic anthropology was instituted in 1978.

Contemporary influential forensic anthropologists within the past 30 years include: Drs. William Bass, Ellis Kerley (1924-1998), Clyde Snow, Mildred Trotter (1899-1991), Walter Birkby, George Gill, Stanley Rhine, Jane Buikstra, Sheilagh Brooks, Douglas Ubelaker, Douglas Owsley, and William Maples (1937-1997) to name a few. These individuals have traversed the rivers between academia, research, and public service by training students, conducting scientific inquiries, collecting data, publishing articles and books, while providing osteological analyses to the medico-legal community.

The definition of forensic anthropology nearly always include or incorporates terminology referencing the application of skeletal analysis and interpretation to the medico-legal process or judicial matters. More often than not this involves legal resolution to either the identity of the individual, his or her mechanism of death, or the circumstances surrounding the

death. In most states the appointed medical examiner or investigator determines the prescribed, usually by legal mandate, 'cause of death' and the circumstances surrounding the death, or it's 'manner'. Meanwhile, the forensic anthropologist typically serves as a consultant who works directly with the medical examiner and his or her investigators in the process of identifying the individual, recovering skeletal remains, and providing opinion on the origin of injuries to skeletal tissue. Thus, the anthropologist does not 'determine the cause of death'. Instead, he or she speaks to the mechanism of skeletal injuries which may or may not have contributed to an individual's death, as well as provides evidence pertaining to the circumstances surrounding the death itself.

The elements which constitute a biological profile - sex, age, ancestry, and stature are not determined by mere sleight of hand on the part of the forensic anthropologist. Instead, each is constructed through intensive research and development, both methodologically and technically. Within this sphere there have been many advances in the past several years with the advent of 3-D data collection methods and the associated statistics. A more complete and defensible understanding of the mechanisms of injury due to sharp and blunt force trauma and even gun shot wounds has formed the basis for new research and modeling of human bony tissues. The forensic anthropologist as bio-mechanist is an area within modern skeletal biology that continues to grow and develop.

However, first and foremost, one must not forget that the forensic anthropologist's primary goal is to use his or her scientific and investigative skills to serve the community and its needs. As such, forensic anthropologists have a prominent role not only locally, but globally as well. They have assisted in identifying unknown or unidentified victims of such national tragedies as the Oklahoma City Bombing, World Trade Center disaster, the Thailand Tsunami, Hurricane Katrina, and multiple aircraft incidents worldwide. Moreover, they have played a role in human rights work, assisting in the identification and exhumation of mass graves from around the world. International teams of forensic anthropologists are especially active in South American countries and include; Argentina, Peru, Guatemala, Chile and many others. The effort of non-governmental agencies such as Physicians for Human Rights has been tremendous for their recognition of the critical role anthropologists have in the death investigative process in war crimes and instances of genocide.

The basic educational requirements to be a practicing forensic anthropologist are as follows:

- Earned M.A. and Ph.D. in Physical or Biological Anthropology
- Graduate coursework with specialization in human osteology and identification
- Three years of relevant case experience, including publications of relevant forensic research
- Board Certification (American Board of Forensic Anthropology)

Nearly 80 to 90 percent of all forensic anthropologists are currently employed by either academic or research institutions, including the National Museum of Natural History - Smithsonian Institutions, though some are employed full-time as practicing forensic anthropologists (see JPAC-CIL, OAFME). A few work directly with and for medical examiners and usually perform other duties for that office. There are currently 75 "board certified" forensic anthropologists in the world.

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References and Hyperlinks:

- American Board of Forensic Anthropology: <http://www.csuchico.edu/anth/ABFA>
- Joint Pacific Accounting Command - Central Identification Laboratory: <http://www.jpac.pacom.mil>
- Office of the Armed Forces Medical Examiner: <http://www.afip.org/Departments/oafme/index.html>
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