

Adams BA. Forensic Anthropology. New York, NY: Infobase Publishing, 2007.

Introduction to Forensic Anthropology



On the 4th of July in 2005, a couple was walking along an access road on Randall's Island in New York City. The man observed a bone near the side of the road and playfully tossed it at his girlfriend. They then became concerned that the bone might actually be human and called the police. Detectives from the New York City Police Department and investigators from the Office of Chief Medical Examiner responded to the scene and noticed other bones scattered in the area that they believed to be human. At this point, the location was treated as a crime scene and a call went out for anthropological assistance. It became of critical importance to determine first, if the bones were indeed human, and second, if they were of **medicolegal** significance, that is, if they might be part of a recent crime or missing person case.

The analysis of human skeletal remains within the medicolegal context is called **forensic anthropology**, and those who practice it are forensic anthropologists. Large cities such as New York City may have a forensic anthropologist on staff who works for the medical examiner's office. In other cases, a forensic anthropologist may work at a university and serve as a consultant on call for various agencies.

Once the forensic anthropologist arrived on the Randall's Island scene, it was immediately determined that the bones were indeed human. Forensic anthropologists are familiar with every feature of the human skeleton, the range of variation between individuals, and the differences between human and nonhuman bones. When bones are complete, the task of determining whether they are human is relatively simple. When the bones are fragmentary, however, it can be a much more challenging task. In this case, both intact and fragmentary bones were observed, some on the surface and some slightly buried. To complicate matters, there were also bones in the vicinity that were identified as nonhuman. The human bones were associated with rubble such as bricks, concrete, metal, and charcoal, which suggested everything was secondarily deposited from another location. In an undisturbed (or primary) burial, the bones would still have been **articulated**. This means that the anatomical location of the bare bones would be exactly the same as when flesh was present. In this case, the lack of articulation was a clear indication that the person (or persons) represented by the bones did not die at this specific location, but the remains were transported there after death and decomposition (i.e., secondarily).

In order to document the location of the bones and any associated evidence (such as clothing), a sketch map was made of the area. Standard archaeological equipment, including shovels and trowels, was used to excavate the site thoroughly. During excavation, all dirt was placed through wire mesh sifting screens in order to recover small items, such as teeth, that might not be readily apparent. This process is exactly the same as a small archaeological excavation that might be undertaken on a prehistoric site. After the recovery effort was complete, the bones were transported to the Office of Chief Medical Examiner in Manhattan for anthropological analysis.

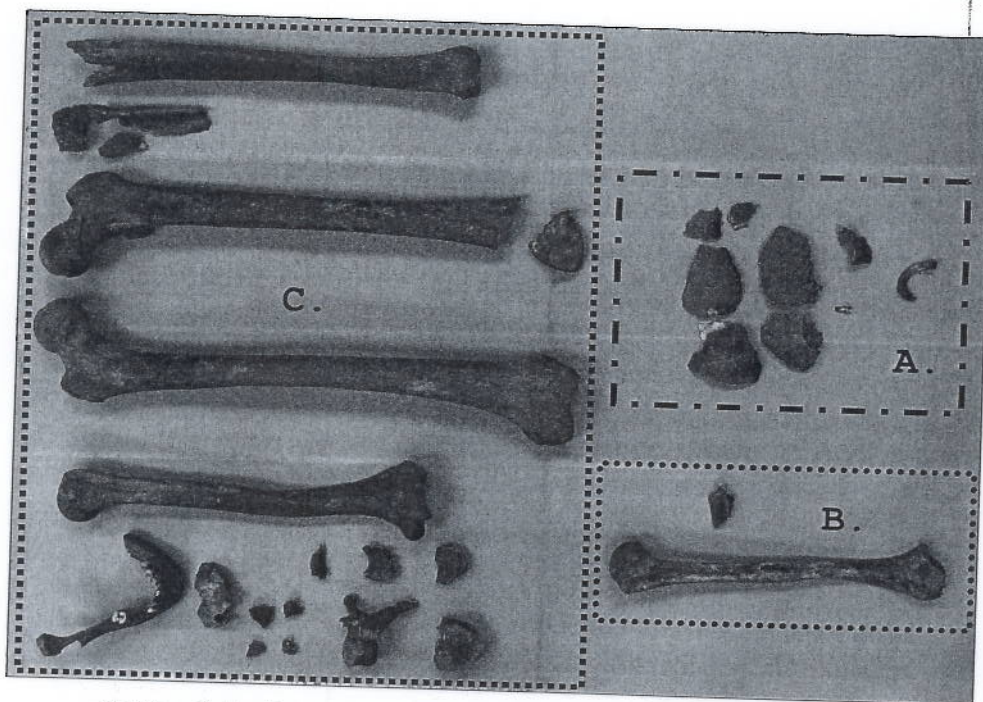


FIGURE 1.1 Bones and teeth discovered on Randall's Island in New York City are arranged into groups according to age (*A = child; B = adolescent; C = adult*).

Figure 1.1 shows the human bones recovered from the site at Randall's Island. To the untrained eye, it may be difficult to state conclusively that these bones are even human. Even to someone familiar with the human skeleton, the bones may appear consistent with one very incomplete and fragmentary skeleton at first glance. A closer analysis of the bones and teeth reveals that there is much more to the story. For example, there are duplicated portions of two right tibiae (shin bones), indicating that more than one person is represented. There are also skeletal and dental indicators that show people of different ages and sizes are represented. This is an example of **commingling**. Commingling means that the bones of more than one individual are mixed together in the

same context. In this instance, analysis revealed that there were bones and teeth from a child around 3 years old, the bones of a teenager around 16 years old, and the bones of at least two adults. The **minimum number of individuals (MNI)** is an indicator of the least number of individuals found at a site; in this case, a minimum of four people are represented by the remains. The condition of the bones indicated that they were quite old. Some of these indicators included the complete lack of soft tissue and decompositional odor. The bones were also very dark brown in color and had deterioration of the cortical, or exterior, surface, suggesting that they had been buried for an extended period of time. Another critical clue to consider was the context of their discovery, in which the bones were mixed in with construction debris. There was no sign of any kind of trauma to the bones, only damage that occurred **postmortem**, or after death.

Taken as a whole, the evidence in this case strongly suggested that the bones and teeth originated from a disturbed cemetery, one probably impacted during a construction project, and that construction debris associated with the project was dumped on Randall's Island. These findings were obviously of great importance, since law enforcement officials were then notified that this was not a crime scene involving a multiple homicide or missing persons case. The remains were determined to be not of medicolegal significance, a report of findings was generated, and the case was closed.

OVERVIEW OF FORENSIC ANTHROPOLOGY

Forensic anthropology is a component of **physical anthropology**, the study of human populations from a biological and evolutionary perspective. Physical anthropology is itself a subdiscipline of anthropology, the study of human beings, both their physical characteristics and the nonbiological

characteristics that are collectively called culture. Forensic anthropology uses the methods and goals of physical anthropology to study questions of medicolegal significance. In doing this, forensic anthropologists often work with pathologists, homicide detectives, and dental specialists called **forensic odontologists** to identify a decedent, the time of death, and any evidence of foul play.

This book will focus specifically on the applied science of forensic anthropology and provide a general introduction to the many facets of a forensic anthropologist's job. The job of a forensic anthropologist may start at the scene of a crime and involve the recovery of remains using archaeological techniques. To this end, forensic anthropologists need to be able to "read" the soil and recognize subtle signals that may be indicative of a secret or clandestine burial. Once discovered, meticulous recovery techniques must be used to excavate a buried body in order to ensure that the location is documented and that no evidence is lost. Once the bones are back at the laboratory, the forensic anthropologist uses his or her detailed knowledge of the anatomy and biology of the human skeleton to glean clues that can be used to tell about the person during his or her life and after his or her death. Was the person male or female? How old was the person when he or she died? How tall was the person? Did he or she suffer from any disease or past injury? What was the person's race or ancestry? How did he or she die?

The field of forensic anthropology is relatively new. The American Academy of Forensic Sciences (AAFS), which is the premiere forensic organization in the United States, traces its beginnings to 1948.¹ The AAFS is composed of forensic scientists from numerous specialties (e.g., pathology/biology, criminalistics, odontology, and toxicology) and has been publishing leading scientific research papers in its journal, the *Journal of Forensic Sciences*, since 1956.² In 1972, physical anthropology became a recognized section within the AAFS, and in 1978, the American

Board of Forensic Anthropology was created to certify forensic anthropologists.³

Many credit W.M. Krogman's "Guide to the Identification of Human Skeletal Material," which appeared in a 1939 FBI Law

Subdisciplines of Anthropology

Anthropology is a diverse field of study that includes many specialties, or subdisciplines, that usually fall under the areas of cultural anthropology, archaeology, linguistics, or physical anthropology. The one thing that all anthropologists have in common is that they are interested in the study of human beings. Cultural anthropologists are interested in societies and tend to focus their studies on the lives and social practices of contemporary peoples. Archaeologists, on the other hand, use clues contained in evidence that is buried in the ground to understand past cultures. Linguists study the history and structure of language. Physical anthropologists study human variation, often with a keen interest in evolutionary history. A major component of physical anthropology is the study of the human skeleton, or **human osteology**. Experts in the study of the human skeleton, human osteologists, may apply their skills to the fossilized remains of ancestral humans (paleo-anthropology), the study of populations through their dead (biological anthropology or paleodemography), or the analysis of human remains within the medicolegal context (forensic anthropology). Regardless of whether the skeleton is fossilized, prehistoric, historic, or modern, many of the goals of an osteological analysis are the same: to reconstruct as much as possible about a person's life from a thorough examination of his or her bones after death.

Enforcement Bulletin, as the start of the modern era of forensic anthropology. This work took the field of physical anthropology and applied the techniques to the forensic context, specifically, the medicolegal identification of individuals from their skeletal remains. Dr. Krogman's work was the first to be written by an anthropologist specifically for law enforcement, and it marked an important step in the establishment of forensic anthropology in the United States. In his paper, Dr. Krogman outlined how the main components of the biological profile (age, race, sex, and stature) are determined from bones. His paper was the main reference source for many years until he published his classic book *The Human Skeleton in Forensic Medicine* in 1962, which was the first major textbook in forensic anthropology.

Forensic anthropology is a very specialized field, but it can be critical in the resolution of some of the most challenging medicolegal cases. This book will detail many of the skills that a trained forensic anthropologist brings to an investigation. Chapter 2 will begin with a basic overview of the key terminology used by forensic anthropologists and will present some job opportunities and applications within the field. Chapter 3 will present some of the techniques and procedures used in the search and recovery of human remains. Chapters 4 and 5 will cover the portion of a forensic anthropologist's analysis relating to the biological profile: the determination of age, race/ancestry, sex, and height from the skeleton. Chapter 6 will highlight the interpretation of bone trauma, in addition to addressing decomposition rates and the determination of time since death. Chapter 7 will explore some analytical challenges, specifically those relating to species identification, fragmentation, and commingling. Chapter 8 will close the book by discussing how a positive identification of a missing individual can be achieved.