

Evolution of the relationship of forensic anthropology with physical anthropology and forensic pathology: A North American perspective

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Forensic anthropology represents the application of methodology in physical anthropology to medico-legal problems. Usually forensic anthropological analysis involves the study of human skeletal remains, although on occasion non-human remains and issues involving soft tissue are included. Analysis includes differentiating human material from that of non-humans, estimation of age at death, sex, ancestry, living stature and post-mortem interval, assessment of taphonomic factors, evidence of foul play, antemortem trauma and any other details that may assist identification. The goals are primarily two fold: to contribute to positive identification and to assess what happened to the individual, including the detection of evidence of foul play.

The work of forensic anthropology is usually conducted in the laboratory of the anthropologist. Remains are recovered, ideally with the assistance of a trained forensic anthropologist, and brought to the laboratory for analysis. The forensic anthropologist conducts the analysis, consulting scientific literature and comparative collections as needed. In cases of mass disasters, complex cases of multiple individuals or those involving extensive soft tissue, analysis usually is conducted in a facility other than that of the anthropologist, often involving teams of specialists working together. The anthropologist may write an independent report to be considered later with the reports of others or the anthropologist's opinions may be incorporated into the reports of others. This variation reflects the variety of situations involving forensic anthropologists and the complex network of specialized professionals who focus on modern forensic cases.

Considerable variation exists today in the types of cases that forensic anthropologists are consulted on and their working relationships with forensic pathologists, odontologists, and recovery specialists. Some variation also exists in the manner in which this work is regarded by colleagues in anthropology who are not involved in forensic endeavors. As a result, students interested in a career in forensic anthropology have choices to make regarding training and educational institutions. These choices center either on a track in forensic science, including anthropology or one within an anthropology curriculum with some training in forensic science. Those who choose the former position themselves to land jobs in laboratories focusing on case analysis. The more traditional anthropology route heads toward a PhD in anthropology with involvement in forensic anthropology.

Roots

The history of forensic anthropology activity can be traced back to early anatomists who were consulted on forensic issues because of their knowledge of human variation and anatomical detail. An example is the 1849 Parkman murder at Harvard University in Boston, Massachusetts (Stewart, 1979a). The victim had been mutilated, partially burned and deposited in one of the university latrines. A university professor familiar with skeletal anatomy was consulted to testify on the identification of the bone fragments.

A similar case about 50 years later in Chicago involved a murder at a local sausage factory (Stewart, 1978). Small bone fragments of what were believed to be the victim were found within one of the vats used in sausage production. A local anthropologist, George A. Dorsey was brought in to testify about the identity of the fragments. Although the defendant was convicted, Dorsey's identification of the fragments was contested by an anatomist called by the defense. Dorsey was criticized publicly regarding his testimony and subsequently declined further involvement in forensic issues.

Academic momentum in the development of forensic anthropology began with the activity of key figures in American physical anthropology, Aleš Hrdlička (1869–1943), Wilton Krogman and T.D. Stewart (1901–1997). Aleš Hrdlička immigrated to the United States with his family in 1881. After receiving his medical degree in 1892, he worked in private practice and then received additional medical training at the New York Homeopathic Medical College. Following positions at the New York Pathological Institute (1896/7–1899) and the American Museum of Natural History (1899–1902) he worked as Curator of Physical Anthropology at the Smithsonian Institution in Washington D.C. from 1903 until his retirement in 1943. Hrdlička acknowledged that he had received "medico-legal instruction" as part of his training (Ubelaker, 1999). This apparently relates to his 1896 studies in Paris when he visited the criminology laboratory of Alphonse Bertillon (1853–1914) and was exposed to the use of anthropometric measurements and observations for human identification. Much of Hrdlička's early research and professional activity focused on the possible biological basis of abnormal behavior, including insanity and criminal activity.

Hrdlička acknowledged the influence of the Italian Cesare Lombroso (1835–1909) as he investigated these issues mostly through anthropometry but also including autopsy. The 1920 edition of his book on anthropometry includes a section on techniques to estimate attributes of an individual from skeletal remains. The 1939 edition of this book contains an augmented section on forensic issues, recognizing the growing attention on this applied area. By 1922, he acknowledged that anthropologists were still mostly physicians, emphasizing the close relationship between medicine, anatomy and the nascent field of physical anthropology.

Hrdlička's involvement with legal proceedings related to his profession began in 1896 with his testimony in a jury trial on epilepsy and insanity issues. In 1910, he offered a key opinion on a skeletal forensic case in Argentina. He became involved in legal issues in 1914 regarding the ancestry of individuals involved in litigation concerning the Chippewa Indians in Minnesota. By 1936, the Federal Bureau of Investigation in Washington D.C. had recognized his credentials and he subsequently assisted the Bureau on many occasions (Ubelaker, 1999).

In 1939, the same year that the new addition of Hrdlička's "Practical Anthropometry" presented guidelines for skeletal forensic analysis, Wilton Krogman published "A Guide to the Identification of Human Skeletal Material" in the FBI Law Enforcement Bulletin. Krogman's publication is widely recognized as bringing the attention of the law enforcement community to this emerging field. As with Hrdlička's publication, it also served to show the academic community in physical anthropology and related areas the importance of this applied area. Krogman followed up this contribution with a key text in 1962 "The Human Skeleton in Forensic Medicine" which with T.D. Stewart's 1970 and 1979a volumes established forensic anthropology as an applied subfield of physical anthropology. Like Hrdlička, Stewart (1901–1997) had been trained in medicine (M.D. degree from Johns Hopkins in 1931). Krogman however, was a PhD and initiated the separation of activity in forensic anthropology from that of forensic pathology and related areas of medicine.

With the development of physical anthropology as a distinct discipline, American forensic anthropology gradually shifted away from being an area of forensic medicine or forensic pathology toward becoming the applied area of human skeletal biology within physical anthropology. T. D. Stewart and Mildred Trotter quietly led this transition through a series of research articles devoted specifically to issues relating to forensic anthropology (Stewart, 1948, 1951a, b, 1953, 1954a, b, c, 1958, 1959, 1961, 1962; McKern and Stewart, 1957; Stewart and Trotter, 1954, 1955; Trotter, 1970; Trotter and Gleser, 1951, 1952, 1958). Although the term "forensic anthropology" had been coined previously in Germany by Ilse Swidetsky, the field rapidly gained momentum in the United States. Although key research in the area of human identification had been conducted early on in Europe, especially France (Stewart, 1979a, 1979b, 1982), European forensic anthropology remained primarily within the medical community, reflecting differences in anthropological training between Europe and the Americas.

In North America, forensic anthropology gradually worked its way into skeletal biology graduate training in key institutions. A leader in such training was William M. Bass III who taught at the University of Kansas and subsequently at the University of Tennessee. Bass had received his PhD at the University of Pennsylvania and both Krogman and Stewart had been members of his dissertation committee. Like most skeletal biologists of his time and today, his interests included study of remains recovered from archeological contexts. However, like many of his colleagues, his interests gradually shifted toward the challenges and rewards of forensic anthropology. Joined at the University of Kansas by Ellis R. Kerley and Thomas McKern and at the University of Tennessee by Richard Jantz and others, he has been involved in the training of many forensic anthropologists practicing today in North America. While forensic anthropology was incorporated readily into the curricula of the Universities of Kansas, Tennessee and others, additional departments remained reluctant. However, the trend toward inclusion of forensic applications in anthropology departments continues to grow in response to strong student interest and the growing recognition of the importance of this area of anthropology.

In 1972, 14 forensic anthropologists succeeded in forming a section of Physical Anthropology within the American Academy of Forensic Sciences. Prior to that time, forensic anthropologists involved with the organization had the options of joining the general section or the pathology/biology section. The new section offered forensic anthropologists an annual meeting to attend focusing on their interests. Membership grew steadily to 334 in 2006. Publication of research in forensic anthropology began to shift toward the "Journal of Forensic Sciences". Research and cases presented at the annual meeting have stimulated activity in forensic anthropology and increased professionalization of the discipline.

In 1978, key members of the Physical Anthropology section formed the American Board of Forensic Anthropology, an organization offering certification in forensic anthropology for residents of the United States and Canada. "Diplomate" status requires experience with casework and successful completion of a written and practical examination. The initial list of eight "certified" anthropologists has grown to sixty-one in 2005 recognizing both the growing involvement of physical anthropologists in forensic matters and the importance of certification to demonstrate legitimacy in the legal arena.

A major byproduct of activity of anthropologists in the American Academy of Forensic Sciences (AAFS) has been recognition and awareness of their skills and interests by members of other sections of the Academy (Pathology/Biology; Odontology, General, Jurisprudence, Toxicology, and Criminalistics). In 1990, forensic anthropologist Ellis R. Kerley was elected President of the Academy (Ubelaker, 2001) and anthropologists William M. Bass III, Michael Finnegan and Clyde C. Snow have been formally recognized as AAFS Distinguished Fellows. Regular interaction in the Association has contributed to the acceptance of forensic anthropology as a normal part of the investigative process. In North America, anthropologists now routinely participate in all aspects of the forensic analysis of skeletonized human remains and related problems. Some

anthropologists continue to work out of their university and museum laboratories; others are integrated into offices of death investigation, medical examiner autopsy teams, mass disaster investigations and recovery teams.

The academic line between forensic anthropology and forensic pathology usually is the presence of soft tissue. The boundary with forensic odontology involves the presence of restorations. Academic interests within these fields overlap somewhat (both odontologists and anthropologists have expertise in dental anatomy, dental variation and age estimation from dental structure) but in general the expertise is complementary and functional.

This organizational history contrasts somewhat with developments in Europe. Although important key research in forensic science and forensic anthropology was conducted in Europe, especially France and Germany, much of the anthropological investigative effort has remained the responsibility of the medical community. This reflects distinct education emphases within European medicine and anthropology as well as the structure of medico-legal investigation in many European countries. In some European countries, physicians have developed a specialty on anthropological issues and largely are responsible for those types of cases. In others, anthropologists are consulted on recovery issues calling for archeological techniques but not in the actual analysis of the remains. In contrast, anthropologists in Portugal and Germany have been involved in all aspects of analysis and have been integrated into the investigative protocol.

Historically, an annual training workshop in forensic anthropology was offered at the Smithsonian Institution in Washington D.C. This workshop was initially organized as a two week experience by J. Lawrence Angel of the Smithsonian Institution. I continued to offer the workshop following his death but changed the format to one week and to include outside lecturers. In 1992, I offered the course in France in collaboration with French pathologist Eric Baccino, then of Brest. Subsequently, we have offered this course in Europe every other year. In 2003, veterans of this course organized the Forensic Anthropological Society of Europe (FASE) in conjunction with the International Academy of Legal Medicine (IALM). A training course, structured on the concept of the Smithsonian workshop is offered every other year in conjunction with the meeting of the IALM. In 2005, this new organization lists 39 members from nine countries and offers considerable potential to galvanize professionalisation of forensic anthropology in Europe.

Where we are today

Forensic anthropology has emerged as a rigorous subdiscipline of physical anthropology that routinely makes key contributions to medico-legal investigation throughout the world. Research directed toward problems specifically related to forensic applications continues to improve methodology in all areas of the science. Public and student interest in forensic anthropology is at record levels. Novels in bookstores and television broadcasting routinely bring the

science to the forefront of public attention. Clearly, forensic anthropology has matured into a complex, frequently interdisciplinary endeavor that continues to show considerable growth potential.

The future

The trajectory of interest and activity in forensic anthropology shows no sign of abatement. All indicators suggest that the growing numbers of forensic anthropologists around the world will continue to be accompanied by augmented research on forensic topics, breakthroughs in methodology and increased employment opportunities. Key developments in this growth likely will be increased recognition and respect for this endeavor in departments of anthropology, medical examiners' offices, other teaching institutions and agencies involved in the recovery and identification of human remains. Forensic anthropology is here to stay and can only improve with the increasing activity and exposure.

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Forensic anthropology is rooted in the work of some of the earliest physical anthropologists in America. This is because forensic anthropology is an applied branch in physical anthropology and the academic lineages traced in this paper begin in physical anthropology well before forensic anthropology is established as a discipline. In fact, much of the research conducted by members of my academic genealogy is found in traditional areas of study in physical anthropology such as human growth and development, physiological adaptation, anthropometry, and biomechanics (Snow 1982). Anthropology in a forensic context. Tal Simmons and William D. Haglund. 6.1 Background. Eric Stover and a team of forensic scientists from the American Association for the Advancement of Science (AAAS), who began the exhumation of mass graves in a search for the disappeared. in. A sample of the use of forensic archaeology es~lminescscavations carried out by experts provided by the PHK (Connor and Scott 2001). Connor and Scott discuss the Killuye (Rwanda) case in sollie detail. Other chapters in tlie sanie volume (Stover and Ryan 2001; Connor and Scott 2001) briefly ~ i ~ c n t i ocnases in the former Yugoslavia. DESCRIPTION Forensic Anthropology serves as a graduate level text for those studying and teaching forensic anthropology, as well as an excellent reference for forensic anthropologistsâ€™ libraries or use in their casework. Coverage includes taphonomy, recovery and analysis, identification, statistical interpretation, and professional issues. The second edition of this advanced reference documents the development of the entire human skeleton from early embryonic life to adulthood, providing a reference point for many disciplines, including anatomy, osteology, archaeology, orthopedics, and forensic anthropology, to name a few. 441 Osteology and Forensic Anthropology Spring of even years. 4(3-2) P: ANP 202 or ANP 340 or CJ 210 or ISS 220. Human bone and skeletal biology and analysis. Methods of forensic anthropology. Analysis of skeletal remains, forensic pathology, and forensic arc-haeology. 442 Genes and Diversity Fall of odd years. 3(3-0) P: ANP 101 or ANP 202 or BS 110 or LBS 144 or ISS 220. Characteristics and processes of North American archaeology on a regional level. Economic, social, political and technological change through time. 453 Mesoamerican Archaeology Fall of odd years.