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Contributions of Ellis R. Kerley to Forensic Anthropology

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ABSTRACT: Ellis R. Kerley (1924 to 1998) represents an important figure in the history of American forensic anthropology. In research, he is best known for pioneering the microscopic approach to the estimation of age at death from human bone. A university professor for 22 years, Kerley also served as Scientific Director of the Army identification laboratory in Hawaii and worked on many forensic cases. He was a leader in the formation of the Physical Anthropology section of the AAFS and the American Board of Forensic Anthropology and held many offices within the AAFS, including President from 1990 to 1991.

KEYWORDS: forensic science, Ellis R. Kerley, history, forensic anthropology

The September 3, 1998 death of Ellis R. Kerley in San Diego, CA, marked the passing of one of forensic anthropology's most prominent and visible members. Ellis Kerley achieved a remarkable international and interdisciplinary reputation through his casework, teaching, administration, research, consultation, and service to the AAFS. This essay explores the depth of those contributions, with special emphasis on areas not discussed by others in this symposium.

Ellis was born September 1, 1924, in Covington, Kentucky (1). Following service as an Army rifleman in Europe and the Pacific during World War II from 1942 to 1945, he returned to his native Kentucky to complete his undergraduate education. He received his Bachelor of Science degree in 1950 from the University of Kentucky, with an emphasis on physical anthropology. At that early point of his career he demonstrated the depth of his scholarly interest by writing to T. D. Stewart (1901 to 1997) of the Smithsonian Institution in Washington, D.C., from the University of Kentucky on March 22, 1950. He requested permission to examine skeletons from the Indian Knoll site of Ohio County, KY, with a special interest in the paramolar cusp and other aspects of dental morphology.

Following receipt of his degree from the University of Kentucky in 1950, he accepted a position as Staff Anthropologist at the Bowman Gray School of Medicine in North Carolina. Working there from 1950 to 1953, Kerley participated in a genetic, serologic, and anthropometric survey of an inbred mountain county population in North Carolina. This appointment complemented his research on skeletal anatomy, providing experience with issues relating to the study of living populations.

On June 30, 1950, Kerley again wrote Stewart at the Smithsonian, offering detail on the nature of his work in North Carolina:

> "I have recently been appointed to the staff of the Bowman Gray School of Medicine to conduct a research project that will involve a detailed anthropometric study of the people of the mountain areas of North Carolina. The anthropometric data to be recorded will include morphological observations and somatotype rating. While I am working in the mountain area, another research team will be working on the same problem in a Northern industrial area. In order to standardize our observations as much as possible, we will be using identical data sheets, color charts, etc.
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> Inasmuch as I am the only anthropologist working from this school, the matter of obtaining charts and equipment pretty well falls on me. We have already obtained most of the instruments and started setting up the program, but I have not as yet located any color charts. I think that it would be wise, also, to familiarize myself with as many previous projects of this type as possible.
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> If you could give me any information as to where I might obtain hair and eye color charts or reprints of similar projects, I would appreciate it greatly.
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> You may remember me as the student from the University of Kentucky, who came to the National Museum this spring to check the dentition of the Indian Knoll skeletons. I still remember my brief but interesting stay there with pleasure" (2).

Following the work in human biology at Bowman Gray School of Medicine, Kerley accepted a position with the Department of the Army, Graves Registration, Central Identification Laboratory in Kokura, Japan. In this position, he acquired valuable experience in the identification of war dead in a military environment. Specifically, the effort concentrated on the identification of decedents from the Korean conflict. This work not only provided Kerley exposure to military procedures of identification and the related scientific issues, but also increased his contact with T. D. Stewart of the Smithsonian. Both Kerley and Stewart worked on the project in Kokura from 1954 to 1955. Although Kerley was involved mostly in identification issues and Stewart was collecting data from identified remains, they undoubtedly interacted extensively in what must have been a powerful educational experience for Kerley. Following Stewart's visit to Kokura, Kerley wrote him on May 16, 1955, indicating he had recently joined the American Association of Physical Anthropologists and had become involved in various

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research projects. This research included investigations of skeletal variation related to age at death and ancestry, experiments with ultra-violet light, and the role of radiographic comparison in identification.

With all of this remarkable professional experience in hand, Kerley enrolled in graduate school at the University of Michigan, specializing in physical anthropology, anatomy, and human genetics. He received his master of science degree in 1956 and his Ph.D. in 1962.

In 1957, he began a long relationship with the Armed Forces Institute of Pathology in Washington, D.C., that further contributed to his career development. Data collected through cooperation with that facility led to his doctoral dissertation "The Microscopic Determination of Age in Human Bone" and contributed to his growing expertise in skeletal pathology.

University Teaching

In 1965, Ellis launched his university teaching career with an appointment at the University of Kentucky in his home state. Two years later, he accepted a position at the University of Kansas, where he taught from 1966 to 1971. In December, 1971, he left Kansas for a similar position at the University of Maryland, where he later served as Chairman of the Department of Anthropology from 1974 to 1978. He stayed at Maryland until 1987, and also served as Visiting Professor of Anatomy at the University of Puerto Rico Medical School from 1980 to 1981 during his sabbatical year. Through his 22 years of university teaching, Ellis used his vast and broad experience to educate scores of students, including many who have made significant contributions to forensic anthropology themselves. Kerley's great knowledge, career experience, organization, and sense of humor made him a superb professor who commanded great respect in the classroom.

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In 1987, Kerley terminated his formal teaching career to return to issues of human identification in a military context. Accepting the position first as a consultant (1987 to 1988) and then Scientific Director (1988 to 1991), Kerley used his experience and contacts to provide leadership to the U.S. Army Central Identification Laboratory in Hawaii. He remained in this position until his retirement in 1991.

Research

Kerley maintained strong research interests throughout his career. Although these interests concentrated in human skeletal biology and forensic anthropology, they ranged broadly within physical anthropology. Topics of his 40 publications include organic structure within fossilized bone (his first published abstract), bone microscopy, paleopathology, general pathology, radiography, histological techniques, hair identification, and diverse issues within forensic anthropology.

Kerley is best known for his contributions to the estimation of age at death through the microscopic examination of cortical bone (Fig. 1). This comprised his doctoral dissertation at the University of Michigan and became the subject of subsequent publications (3–6). Kerley presented, for the first time, a method to estimate age at death from assessment of the amount of primary osteons, secondary osteons, osteon fragments, and circumferential lamellar bone in cross sections of human long bones. The approach has generally been termed "the Kerley technique" and has been used extensively in both forensic anthropology and the more general field of human skeletal biology. Kerley's work in this area has also stimulated considerable additional research attempting to clarify the complexities involved and improve the accuracy (7–19).

FIG. 1—*E.R. Kerley conducting microscopic analysis.*

Kerley's research has been extensively cited and has made significant impact both within physical anthropology and in related disciplines. A computerized search of scientific citations of articles authored by Kerley using the combined databases of SciSearch and Social SciSearch (20) revealed 207 citations of Kerley publications in 147 different citing documents.

Some information on the relative impact of Kerley's various publications is available from study of citations within the SciSearch database. In this search, Kerley publications were cited 151 times by 113 different citing documents. Seventy-two percent of these citations (108 citations) referenced his articles on the microscopic method for estimating age at death. His most frequently cited article (78 citations) was his classic 1965 paper in the *American Journal of Physical Anthropology* on the microscopic determination of age in human bone (3). His second most frequently cited article (24 citations) was his revision of the microscopic method, coauthored with D. H. Ubelaker in 1978 (6). Citations found using the Social SciSearch database revealed a similar pattern.

The growth of Kerley's stature as a research scientist is revealed in an examination of his correspondence with T. D. Stewart. As noted above, in 1950 Kerley had to introduce himself to Stewart as a relatively unknown student from Kentucky. Sixteen years later, when Stewart was planning his classic seminar at the Smithsonian on Personal Identification in Mass Disasters (21), he turned to Ellis Kerley to report on the important section of determination of adult age at death. In his September 30, 1968, letter to Kerley, Stewart wrote: "The Support Services, Department of the Army (formerly the Memorial Division) has contracted with the Smithsonian for an identification seminar to be held within this calendar year. The job of organizing the seminar falls, of course, on my shoulders. It is in this connection that I am writing to you, because you are one of the few real identification experts among the anthropologists. I want to line you up to talk about estimation of skeletal age after the period of epiphyseal closure, say from 30 years onward . . ." (2). Kerley accepted this invitation (Fig. 2) and used Stewart's suggested title "Estimation of Skeletal Age: After About Age 30" (5).

FIG. 2—*E.R. Kerley presenting paper at Smithsonian seminar "Personal Identification in Mass Disasters," December 10, 1968.*

Stewart continued to have high regard for Kerley's scholarship throughout both of their careers. In the late 1970s when the formally retired Stewart wrote his classic text *Essentials of Forensic Anthropology* (22), he chose Ellis R. Kerley, then President of the American Board of Forensic Anthropology, to write the foreword (23).

American Academy of Forensic Sciences

Most historians of American forensic anthropology cite the formation of the Physical Anthropology section of the American Academy of Forensic Sciences as a particularly important and influential development (24–28). With the formation of that section, forensic anthropologists had an annual meeting to attend with a specific focus on their work, and an attractive publication outlet in the *Journal of Forensic Sciences.* Ellis Kerley was not only involved in this development but is widely regarded as its leader. Writing in 1979, Stewart notes, "The term 'forensic anthropology' has come into use very recently, in fact only within the last six years. Before that the contributions of physical anthropologists to this field were automatically classified as medical—most recently as legal or forensic medicine. Although physical anthropology actually has little to do with medicine, and therefore this association appeared anomalous, no thought was given to making a change until 1972 when, under the leadership of Ellis R. Kerley, the physical anthropologists established a Section of their own . . ." (26).

Snow (24) provides a more detailed and colorful account of this event from the point of view of a participant observer:

> "Kerley (42)[29] has documented the establishment of the Forensic [Physical] Anthropology Section but modestly fails to mention his central role in its formation. Prior to 1970, only two physical anthropologists, Krogman and Kerley, had become members of the Academy. . . . At the Academy's annual meeting in Phoenix in 1971, Kerley approached the Executive Committee with a proposal to establish a new section for physical anthropologists. Historically, the Academy has been extremely conservative in its policy toward the formation of new sections, preferring to delay such recognition until the petitioners have firmly demonstrated the scientific value of their discipline in the criminal justice system and have recruited a sufficient number of qualified members to sustain the Academy activities that sectional status implies. Usually this process requires several years of dedicated effort by the petitioners; Kerley did it in about one day. Armed with the assent of the Executive Committee, Kerley encountered me in the hotel restaurant and asked if I would help him initiate an anthropology section. I was not a member of the Academy at this time but, in Arizona on another matter, I had dropped by the meeting more or less out of curiosity. After recruiting me, we went to Kerley's room to plan the operation. At this time, as aircraft accident investigation was part of my assigned duties with the Federal Aviation Administration, I had been issued an FAA telephone credit card to be used in emergencies. After considering the matter over a couple of sips of Kerley's excellent scotch, I decided that this was indeed a dire emergency, and we decided to use the credit card to call physical anthropologists around the country to see if they would support Kerley's proposal by a commitment to join the Academy.
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> By this time it was about 2 PM in Phoenix, so we started making calls to the east coast and worked our way west. While I obtained numbers from information, Kerley made the calls. In many cases, lines were busy or we found that our colleagues had left for the day. Most of those we were able to contact were enthusiastic about the idea. By the time we reached California we had about a dozen solidly committed recruits. At that time, the minimum number of members required to form a new Academy section was ten. The next day, Kerley presented his list of potential members to the Executive Committee (which had probably not expected to hear from him again until about 1975), and approval for the new section was quickly granted. . . ." (24:107–108).

In 1980, Kerley was the first recipient of the Physical Anthropology Section Award (renamed the T. Dale Stewart Award in 1987).

Ellis Kerley served as the first Chairman of the Physical Anthropology Section from 1972 to 1973. He then became the only anthropologist to serve three terms, repeating as Chairman in 1973/74 and 1975/76 (30).

Kerley also was involved in the 1977/78 formation of the American Board of Forensic Anthropology, sponsored by the American Academy of Forensic Sciences. He served as the first President of the Board from 1977 to 1980 and as one of the Directors of the Board from 1983 to 1986. He became the first Diplomate of the Board as well.

More than any other physical anthropologist, Kerley made himself available for service to the American Academy of Forensic

Sciences. He served as Secretary, Board of Trustees (1976 to 1977), and President (1977 to 1980) of the Forensic Science Foundation. He served two terms as Treasurer (1977 to 1979) and Vice President (1974 to 1975, 1979 to 1980) of the American Academy of Forensic Sciences. He was Chairman of the Financial Management Committee from 1974 to 1975, member of the Executive Committee (1972 to 1975; 1984 to 1987), member of the Academic Council (1972, 1973, 1975), and Chairman of the Membership Committee (1979 to 1980). Kerley had been a member of the editorial board of the *Journal of Forensic Sciences* since 1976. He was the only physical anthropologist ever elected President of the Academy (1990 to 1991).

The activity described above led T. D. Stewart in a February 13, 1978 letter to Mildred Trotter to describe Kerley as "a power in the American Academy of Forensic Sciences" (2).

Casework

Throughout his career, Kerley made his expertise available to law enforcement and others on matters within his broad professional training. These matters included the usual individual cases as well as the broad supervision he provided while Scientific Director of the Army identification facility in Hawaii. His casework included such high profile cases as the John F. Kennedy assassination (1978), the Josef Mengele identification in São Paulo, Brazil (1985), the investigation of the MOVE incident victims from Philadelphia (1985), the examination of the Challenger astronauts (1986), and investigations of victims of alleged Bosnia war crimes (1997 to 1998).

Although like many of his anthropologist colleagues, Kerley examined human skeletons, he also offered opinions on human images in photographs. This work included a 1982 comparison of known photographs of Abraham Lincoln to an old daguerreotype thought perhaps to represent Lincoln.

Ellis Kerley was a forensic anthropologist of extraordinarily broad training and experience. Through his many contributions in educating anthropologists and others, research, casework, administration, and leadership in the American Academy of Forensic Sciences, he represents a major figure in the history of American forensic anthropology.

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