

BOOK REVIEW

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A Review of *Essentials of Forensic Anthropology: Especially as Developed in the United States*

REFERENCE: Stewart, T. D., *Essentials of Forensic Anthropology: Especially as Developed in the United States*, Charles C Thomas, Publisher, Springfield, Ill., 1979, 320 pages, \$27.00 (cloth).

Since 1971 forensic anthropology, a branch of biological anthropology, has become an established discipline within the American Academy of Forensic Sciences. Since its establishment the field has developed in two directions: the *identification of group biology* of remains in question and the *identification of personal biology*, the second type of identification being relatively new. Comparison of the present volume with previous publications on forensic anthropology, for example, *The Human Skeleton in Forensic Medicine* (1962) by Wilton M. Krogman (Springfield: Charles C Thomas), clearly indicates these developments.

Dr. T. Dale Stewart is one of the most accomplished physical (skeletal) anthropologists. It is the reader's expectation that a book by him must be of high quality. As Ellis R. Kerley (the most instrumental person in the establishment of the field in the Academy) points out in the Foreword to the book, the author has been a leader in the discipline of forensic anthropology for more than three decades.

This book has a multifaceted purpose. As the author of the Foreword points out, it "fills the long standing need for a comprehensive and up-to-date discussion of forensic anthropology" (p. vii) by summarizing "the entire field and its methodology" (p. viii). As indicated in the subtitle, Stewart deals with the subject "especially as developed in the United States," with an emphasis on the history of the field. According to the author, this history starts with Thomas Dwight's (1843-1911) prize-winning publication entitled *The Identification of the Human Skeleton* (1878). Stewart further considers Dwight as "*the father of forensic anthropology in the United States*" (p. xii).

Essentials of Forensic Anthropology is composed of 14 chapters divided into three sections: Section I, Preliminary Considerations (Chapters 1 through 6); Section II, General Skeletal Traits (Chapters 7 through 12); and Section III, Specific Skeletal Traits (Chapters 13 and 14). Section I includes areas that are least traditional to physical anthropologists. In this section, the history of the field is divided into two periods, before and after 1939, the date of publication of Krogman's *Guide to the Identification of Human Skeletal Material*.

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The role of expert witnesses (administration of the oath, qualification of the witness, dismissal of the witness, testimony, cross-examination, and redirect examination) in court is described in some detail with examples. Also, suggestions are made on how to handle skeletal remains.

In Chapter 3, it is suggested that a forensic anthropologist must avoid pre-examination bias by saying, "Don't tell me what you think the remains are, because that will give me a bias, and I want to be able to handle the remains as an unknown!" (p. 32). Several other important points are made in this chapter. The author advises forensic pathologists to let the forensic anthropologist examine remains before associated soft tissue is cleaned from the bones to allow, for example, determination of time since death. The same procedure will also avoid cut marks made during the maceration.

Nonhuman bones, commingled remains, and burned bones are the subjects of Chapters 4 and 5. Chapter 6, the last of Section I, deals with causes of death and time since death, the latter discourse indicating that there are many variables affecting the rate of decomposition and, consequently, estimation of time since death. However, attention must be paid to the environment of the remains (for example, temperature, wind, microorganisms, macroorganisms, plants, and vegetation) because within two weeks virtually complete skeletonization can occur. Causes of death are explained in terms of detecting trauma, such as "signs of blows" (p. 76) and fractures of hyoid bone and ossified thyroid cartilage.

Traditional physical anthropological methods of sex determination, estimation of age and stature, estimation of body weight, attribution of race, and indication of handedness are the subjects of Section II. In the introduction to this Section, the author emphasizes that these skeletal characteristics are "general" (p. 83) in nature "in the sense that each of them does no more than assign the individual to a class within the population at large" (p. 83). In other words, this type of identification, which may be called *identification of group biology*, is based on large population samples. Two important large samples—the Terry Collection and the Todd Collection—are the bases of most studies on American forensic anthropology. Sex determination is, in general, based on pelvic morphology and the relative robustness of the skull. To these Stewart adds long bones, sternum, clavicle, scapula, sacrum, tarsal bones, and teeth. To morphological differences, metrical and statistical (discriminant function analysis) methods are added to determine sex. Age estimation covers the entire life span, that is, from fetal stage to "old" age. For earlier age groups, lengths of long bones are used as rough estimates of age. For older groups, dental formation and eruption, epiphyseal union, sutural closure, pubic metamorphosis in both sexes, osteophytotic changes in the vertebrae, and relationships of biological aging to alterations in cancellous tissue and to changes in the quantity of the Haversian and non-Haversian microstructures are summarized as parameters of age estimation.

Two things, however, should be added to Section II: the importance of the forensic anthropologist's personal experience and the dates of publications of studies mentioned. Personal experience takes into account not only the knowledge gathered from research results but also knowledge of the general health status of the remains and health- or disease-related changes affecting estimation of age. The second point takes into account secular growth. For example, both skeletal collections mentioned above are composed of individuals of the lower socioeconomic class. Also, secular growth changes within the last three decades may shift the statistical means. In other words, studies done in the 1950s or earlier may need to be updated, especially with respect to age estimation.

Stature estimation is primarily based on regression formulas. These formulas incorporate measurements of the long bones of both upper and lower extremities. In addition to statistical procedures, an anatomical method of stature estimation is reintroduced. This method involves measuring bones of the axial skeleton and the lower extremities, either by laying out these bones and measuring their entire length or by measuring individual bones

and then summing for total length dimensions. Naturally, the second method requires an almost complete skeleton. Another interesting aspect of this section is estimation of body weight. The reliability of this method is questioned, especially as the method does not take into account obese individuals. It is also a time-consuming method. It should be noted that body weight can also be estimated by linear measurements of some of the long bones (see I. Schwidetsky, *American Journal of Physical Anthropology*, Vol. 45, 1976, pp. 605-611).

Skeletal racial differences are dealt with in Chapter 11. The term "race" is used as "locally understood" (p. 227), that is, "Mongoloid, Caucasoid, and Negroid." However, only those racial groups living in the United States are emphasized. The author emphasizes that, because of interracial mixture, the racial identification of skeletal remains is not always certain and that classifications of human populations based on anthropometric dimensions and indices lack utility because of both the wide range of variation within racial groups and the overlapping between racial groups. However, in spite of these difficulties, the author presents both morphologically distinguishing features and statistically discriminating formulas for racial identification of skeletal remains.

Although handedness is a secondary characteristic for identification, it can serve several functions after the individual identification is made. One of these functions can be another factor leading toward positive identification. Handedness can also differentiate an individual by way of showing that usage of the left or right hand exceeded normal usage. Thus, the result may suggest a possible occupation.

Indications of handedness are based on anatomical and metrical differences between the sides of the body. Anatomical asymmetry is observed in size differences between right and left cerebellar bulges of the occipital bone and the formation of a bevelled margin on the dorsal aspect of the glenoid cavity. To these, arthritic development at the elbow joint is also added. Anthropometric means include metrical differences between corresponding long bones and the difference between angles of the glenoid cavity. Both of these measurements correlate positively with the handedness of the individual, that is, longer bone and wider angle are usually indicators of the hand habitually used.

The last section, "Specific Skeletal Traits," deals with what the reviewer considers *identification of personal biology*. This aspect of identification is perhaps the only area in which our knowledge is either deficient or not shared effectively. Each individual, no matter what his general biological status, is unique. This uniqueness is easily observed in living individuals. However, it can also be claimed that skeletal remains display this uniqueness. The important problem to be solved is understanding the relationship of skeletal traits to the person who was once alive. Before the establishment of forensic anthropology, physical anthropologists had no means of testing the accuracy of their observations. But, today, practicing forensic anthropologists must be accumulating very valuable data toward solving this problem. This issue is especially important for positive identification when evidence such as a dental chart or fingerprints is lacking. This volume is perhaps the first book that deals with the identification of personal biology. The author uses some of the available literature, most of which is relatively old, to illustrate the importance of this matter in forensic anthropology. Some examples of positive identification are given, including matching of a "living" picture with that of a skull, matching X-rays taken at the time of previous bone surgery with those of a bone, and cranial and postcranial bone pathology and trauma.

Facial reconstruction is the essence of the last chapter. In the forensic anthropological literature, only one case is presented in which identification of the victim has been made. Attempts are still made in this endeavor via several approaches, most common of these being a two-dimensional drawing of either or both facial and profile views and three-dimensional reconstruction using clay or clay-like substances. In both of these techniques, as presented in the book, understanding of facial skeletal anatomy and of dimensional and morphological relationships between soft tissue and the underlying bone structure is a necessary require-

ment. Even though these factors are well known, some conjecture is involved, such as fatness of the face, shape of the nose or nose tip, and hair form, shape, and density. Of course one would never know if the person had a scar on his face unless it affected the bones.

The book under review is, in fact, a needed one for those of us in forensic sciences. In comparison with the previous book mentioned (Krogman, 1962), it brings together many new ideas and reviews the new developments. It also gives a formal shape to the field of forensic anthropology. The most important part of the book is the first section, emphasizing education for forensic anthropologists in court settings (not usually learned from regular university courses in anthropology). The chapter, "Traits Peculiar to the Individual," opens up a new practical research dimension, though this chapter needs improvement. A lack of published literature may be the reason why this chapter is not adequate. In addition, a suggestion should be made to forensic anthropologists to form a close working relationship with law enforcement officers and medical examiners. For practical purposes, skeletal remains after examination should be kept in a place that a forensic anthropologist has easy access to in case a question arises that can be answered only by referring to the skeleton again.

In summary, this easy-to-read book is highly recommendable for students of physical anthropology who have taken courses in human osteology, osteometry, and human growth and development. Forensic anthropologists should profit from the book because it is written by a person who has high skills gained through experience and research.