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Review Article: Bioarchaeology

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changes through time is found in the summary chapter of the book.

These six new books show a trend, a need, and a fundamental question. There is a strong interest in geoarchaeology among archaeologists. The books reviewed here are mostly written and edited by geologists and targeted for the archaeologist. Where are the textbooks that outline the basic techniques and questions of archaeology that are targeted for the geologist? Can geoarchaeology ever really

get beyond one discipline delivering to the other, so as to become truly interdisciplinary?

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Bioarchaeology

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BIOARCHAEOLOGY: INTERPRETING BEHAVIOR FROM THE HUMAN SKELETON, by *Clark Spencer Larsen*. (Cambridge Studies in Biological Anthropology 21.) Pp. xii + 461, figs. 59, tables 16. Cambridge University Press, New York 1997. \$85. ISBN 0-521-49641-1.

THE ARCHAEOLOGY OF HUMAN BONES, by *Simon Mays*. Pp. xiii + 242, figs. 120, tables 22. Routledge, London 1998. \$32.99. ISBN 0-415-17407-4.

SKELETONS AND SOCIAL COMPOSITION: BAHRAIN 300 B.C.—A.D. 250, by *Judith Littleton*. (*BAR-IS* 703.) Pp. x + 154, pls. 6, figs. 39, maps 2, tables 64. Archaeopress, Oxford 1998. £27. ISBN 0-86054-886-4.

TROUBLED TIMES: VIOLENCE AND WARFARE IN THE PAST, edited by *Debra L. Martin* and *David W. Frayer*. (*War and Society* 3.) Pp. xxv + 376, pls. 32, figs. 51, tables 27. Gordon and Breach, Amsterdam 1997. \$29. ISBN 90-5699-534-0.

MATERIAL HARM. ARCHAEOLOGICAL STUDIES OF WAR AND VIOLENCE, edited by *John Carman*. Pp. x + 246, figs. 63, plans 2, tables 2. Cruithne Glasgow 1997. \$32. ISBN 1-873448-10-4.

THE CAMBRIDGE ENCYCLOPEDIA OF HUMAN PALEOPATHOLOGY, by *Arthur C. Aufderheide* and *Conrado Rodríguez-Martín*. Pp. xviii + 478, pls. 283, figs. 17, tables 9. Cambridge University Press, Cambridge 1998. \$100. ISBN 0-521-55203-6.

MUMMIES, DISEASE AND ANCIENT CULTURES², edited by *Aidan Cockburn*, *Eve Cockburn*, and *Theodore A. Reyman*. Pp. xxii + 402, figs. 146, tables 23. Cambridge University Press, Cambridge 1998. \$29.95. ISBN 0-521-58954-1.

During the past quarter century, human skeletal studies in the Mediterranean area, where most of my own work has concentrated, have become effectively integrated into broad archaeological research. Scholars increasingly value the interpretive potential provided by studies of human and other organic remains for a viable reconstruction and understanding of past behaviors and the cultural history of this region. The sophisticated excavators with whom I worked decades ago have now been joined by most of the archaeological community in their concern for the recovery, curation, and analysis of human skeletal remains, and in using the perspectives of cultural anthropology. The once common but generally incomprehensible skeletal reports that appeared as independent and unintegrated appendices have been replaced by synthetic analyses. Now these data are often used by excavators as a primary basis for interpreting mortuary programs, as well as other aspects of life in ancient communities. Age and sex analyses remain the fundamental goals of most skeletal studies, but, when integrated with data from archaeological contexts, bones can also tell us a great deal about specific individuals and the societies in which they lived. Interdisciplinary collaboration increasingly clarifies our views of past societies. The impressive results of several studies, such as A.M. Bietti Sestieri, *Iron Age Community of Osteria dell'Osa: Study of Sociopolitical Development in Central Tyrrhenian Italy* (Cambridge 1992), have encouraged excavators to call on ever greater numbers of specialists, resulting in a vast increase in the quality of publications using this approach.

The seven volumes reviewed here reflect the extent to which skeletal studies have developed as a point of departure for the investigation of archaeological problems. While none of these works specifically focuses on the classical world, each offers something of importance to all archaeologists. Two of these volumes provide overviews of the field of bioarchaeology, and a third presents a detailed study of human remains from excavations in Bahrain. A pair of edited volumes offers insights into human behavior by examining past acts of violence as seen in the skeletal record. The last two volumes reviewed deal with paleopathology and mummies—topics of interest to readers who can marvel at how our species survived before the advent of modern medicine.

Bioarchaeology, C.S. Larsen's important contribution to the field, emphasizes studies of pathologies and injuries.

Beginning with the general effects of stress on human development, Larsen goes on to review dental, periodontal, and other infectious problems that leave their traces on bones and teeth. He then reviews skeletal evidence for injuries and violent death, a subject to which we will return. Chapters 5 and 6, on human activity patterns and structural adaptations, are followed by a chapter focusing on craniofacial adaptations. Summaries of isotopic and elemental signatures of diet and nutrition, notes on tracing genetic relationships, and some brief comments concerning changes and challenges in bioarchaeology complete the volume. The 89 pages of references reflect the careful documentation that makes this book important to all specialists. It should be added to all library collections for the light that it sheds on the field.

Larsen's two brief citations of DNA analysis do not reflect the state of the art, but this should not be seen as a failing. Although the public hears a great deal about DNA analysis, employed almost daily in various forensic studies, the recovery of DNA from ancient bone and its use in answering the basic questions of population dynamics are just beginning to have an impact on the field. Studies incorporating DNA and related aspects of human biology appear with increasing frequency in the anthropological journals. Within a few years, this line of research will become a mainstay of the profession, but for now old-fashioned bone work involving macroscopic evaluation remains the basis for most human skeletal studies.

One of my many reasons for recommending Simon Mays's clearly written *The Archaeology of Human Bones* is its inclusion of an impressive and current discussion of studies of DNA from ancient bone. This brief but excellent introduction should be read by archaeologists who know nothing about human remains in order to gain a good understanding of the range of information that bone specialists can provide. This volume also should be considered seriously by anyone teaching an introductory course in human biology. The text is extremely well linked to the book's many illustrations, and useful references abound.

Mays begins with a basic description of bones and teeth. The second chapter, "The Nature of an Archaeological Human Bone Assemblage," summarizes information describing which bones tend to survive under relatively good conditions. This chapter might benefit from a brief discussion of human and other activities that create the taphonomic jigsaw-puzzles commonly presented to specialists, just to let readers know that the inhumations so well illustrated (figs. 2.2, 2.4) are not what normally appears at an archaeological site. Mays offers basic summaries of the process of determining age and sex, on the uses of metric and nonmetric variation, and on observing bone and dental diseases. Chemical analysis of bone and DNA studies are the foci of chapters 9 and 10. The final chapter deals with cremations, a subset of mortuary activities that restricts, but does not eliminate, the potential for productive analysis.

Skeletons from two cemeteries on Bahrain are the subject of J. Littleton's monograph. The evolution of her theoretical model (2) and a review of the cultural context on Bahrain Island open this study. Included are chapters providing basic skeletal data (age, sex, pathologies). Chapter 10 attempts to describe what it was like to grow up on Bahrain during the period from 300 B.C. to A.D. 250, followed

by a half-page conclusion. While the goals of this work are noble, readers will find themselves swimming in unedited masses of numbers and seas filled with grammatical whirlpools. Pages of statistics are provided, but no simple listing of what constitutes a "tomb" or a "chamber" and how many individuals were in each. Littleton's description of the lives of these ancient Bahraini may be an accurate reconstruction, but the work is marred by the poor presentation of data. The benefits of rapid and extensive publication through the BAR series here is offset by minimal editorial oversight.

An important part of Littleton's work is her clear statement regarding the potential destructiveness to the skeletal record of archaeological recovery itself. She points out (23) that the time allotted to the recovery of skeletons, the personnel involved, and the aims of the excavations are all factors contributing to the success or failure of skeletal recovery. Her estimate that up to 50% of the information available when skeletons are identified in the ground is lost by the time the bones reach the laboratory is remarkably similar to my own. Excavators need to be provided with information that helps them to recover skeletal materials more efficiently, and in turn need information useful in their reconstruction of culture history.

The editors of *Troubled Times* correctly note that modern urban violence, with which we are all too familiar, has a long and varied history. Violence can be found in all parts of the world and at all times. These papers, from a 1992 American Anthropological Association symposium (in Washington, D.C.), try to flesh out the ethnographic record with direct skeletal evidence for violence. The contributors' goal was to formulate theories of conflict and violence from recent data, and to compare these data with evidence for violence as it existed in preindustrial societies.

C. Ember and M. Ember examine ethnographically known cases of violence, from war and other contexts, as recorded in the Human Relations Area Files. This survey of the literature is followed by three papers discussing patterns of violence against women in three cultures from ancient North America: R.G. Wilkerson's for prehistoric Michigan, D. Martin's from the precontact American Southwest, and P.M. Lambert's from California's south coast. John Robb (ch. 5) shifts the focus to Europe in "Violence and Gender in Early Italy." He examines several types of trauma identified in skeletons from excavations at the site of Pontecagnano with the goal of identifying gender correlations. Other authors survey the world literature for wife-beating, review the bone data from a Mesolithic-period massacre in Bavaria, evaluate skeletal evidence for human sacrifice and cannibalism in Mexico, and find skeletal indications for warfare in Archaic period Tennessee. The evolution of warfare on America's Northwest Coast from 3,000 B.C. to modern times, and important data interpreted as evidence for warfare between Mesolithic farmers and traditional foragers in northwestern Europe are also reviewed. Brian Ferguson wraps up *Troubled Times* with an excellent overview of these important papers, but with full recognition of the limited extent of the evidence from which conclusions have been drawn.

John Carman, the editor of *Material Harm*, also provides a long introduction to the subject of violence, focusing primarily on war in its modern forms. This volume differs

from *Troubled Times* in that few of its papers are derived specifically from the skeletal evidence. Since the basic skeletal evidence is often subject to multiple interpretations, J. Wakely's consideration of how to distinguish violent from nonviolent etiologies relating to skull injuries provides an important opening chapter. J.M. Filer's examination of ancient Egyptian and Nubian skeletons for direct information regarding "violence" also offers useful cautions. L.J. Zimmerman's study of the Crow Creek massacre is an excellent summary of classic publications related to an ancient conflict between Native American groups in South Dakota.

Material Harm then shifts from examining skeletal evidence for violence to studies of contexts within which violence might be expected. Irish Bronze Age swords may be far more plentiful than the osteological evidence for any damage that they may have done. Bridgford's excellent survey of these weapons, used for self-defence as well as for war, needs serious consideration of status variables and other possible uses. Other studies deal with Chalcolithic hillforts throughout the western Mediterranean, and an intrusive Viking boat-burial on the Isle of Man (ca. A.D. 900), which are interpreted as reflecting a violent expression of a "negotiation or discourse" between populations (141). One may also interpret the placement of later burials over, or into, earlier interments a normal and common reuse of a cemetery, and not necessarily intended to make any political statement. Archaeological and documentary research provide T. Way with evidence for violence possibly related to the formation and use of "parks" in England during the late Middle Ages. M. Nikolaidou and D. Kokkinidou suggest that gender is the most important variable in their study of violence as seen in Late Minoan iconography. P. Beavitt examines the relationship between warfare and the spread of agriculture in Borneo, a subject parallel to Keeley's paper in *Troubled Times*. In the concluding chapter, Carman reviews the archaeological evidence for violence, its various levels, and aspects which may be involved in medical procedures that are traumatic, but not "violent" (227).

The role of paleopathology in contemporary archaeology remains open to discussion. Despite considerable popular interest, research often focuses on individuals and their specific disorders, rather than on what those ailments may tell us about a person's role, or how diseases or infirmities relate to the society as a whole. The sufferings endured by the ancients may be fascinating, as is the knowledge that their diseases were shared by all classes of each society, but what do they actually tell us about those societies? How, in fact, does paleopathology relate to academic discourse?

The profusely illustrated and clearly written *Cambridge Encyclopedia of Human Paleopathology* provides a means by which scholars may compare cases with useful summaries from the literature. Included in the various "parts" are a history of paleopathology and important data on a wide range of subjects, including pseudopathology, traumatic conditions, congenital anomalies, circulatory disorders, disorders of infectious origin, and skeletal dysplasias. Part 14, "Diseases of the Dentition," contributed by O. Langsjoen, is followed by a concluding section on miscellaneous conditions.

Impressive as it is, this Cambridge Encyclopedia is far

from offering an exhaustive review of the work available within the field. Individual pathologies are not uniformly presented, and inconsistencies tend to reflect some of the basic problems of differential diagnosis. Many entries are not listed in the index. A traditional anatomical emphasis is supplemented by studies of conditions related to plague, cholera, and other diseases that may leave no evidence aside from possible traces of the DNA of the pathogens themselves. No clear reference is made to the general impact of DNA studies on this field.

Despite the difficulties of making differential diagnoses using the rarely complete skeletal record in the evaluation of paleopathologies, studies of ancient disease have evolved enormously during the past 30 years. Conferences and specialized journals have led to increasing agreement in diagnosis. Digitized illustrations now improve data dissemination, and, when added to future DNA studies, our understanding of this aspect of the past will develop even more rapidly.

The second edition of *Mummies, Disease and Ancient Cultures* has expanded from the original 243 pages (in 1980) and now includes the work of nearly twice as many authors. The clear illustrations also represent a significant improvement. The six chapters of Part I deal entirely with Egyptian mummies. Four chapters in Part II discuss mummies known from North and South America. This is the most expanded part of this edition, perhaps offering the most significant contributions. John Verano's impressive review of diseases identified in Andean mummies merits special note. The five contributions in Part III relate to mummies from other parts of the world, many of them from quite surprising locations. The section on the Mawangtui-type cadavers in China by Peng and Wu is a welcome new addition. The final section recounts the many new investigative techniques employed in mummy studies, including non-intrusive procedures. Good coverage is given to DNA studies, with Nielsen and Thuesen's section on "Paleogenetics" providing a well-written summary.

The efforts of two new authors in producing a completely new version of James Harris's earlier work ("Dental Health in Ancient Egypt") have not resolved several problems. The wire dental appliance in their fig. 3.6a (printed upside down) is here given a very early date, whereas the earlier publication noted the Roman-period disturbances that certainly introduced this material into an early context. All of the wire prostheses are relatively late (M.J. Becker, *Berytus* 42 [1995/6] 71-102). No citation is provided for an interesting appliance depicted in fig. 3.6b. (p. 67). John Nunn's important *Ancient Egyptian Medicine* (Norman, Oklahoma 1996), cited in the previous chapter, is not noted here, and phytolith-induced dental wear is not discussed. The brief final chapter reviews seven "conditions" of unknown or hereditary origins. The last of these—the presence of "Harris lines," often suspected to result from arrested growth—is very clearly treated. Since Harris lines often are used as "stress" indicators, this review questioning their etiology is an important contribution to this volume.

This review of these seven works can neither provide sufficient commentary on each nor do justice to the efforts of individual contributors to the edited volumes. All these contributions reflect both the enhanced ability of the field archaeologist to interpret finds, as well as signaling the ex-

tent to which bioarchaeology has enriched the discipline. While data on age and sex may help us to reconstruct the use of mortuary areas, and population dynamics often can be inferred, most of these studies take us far beyond these basics, enabling us to gain greater depth of focus in our view of ancient societies. Note should be made that many unusual situations—such as specialized burial areas, age at which children become adults, differential burial treatments, and a host of other cultural factors that can be detected only through the skeletal record—have not been included in these volumes. Thus these works only suggest the considerable range of possibilities now

available to archaeologists who wish to maximize their use of the skeletal record. They provide a view of the enormous progress that has been made in using human bones in archaeological interpretation. Indeed, human skeletal studies offer an area of research with great potential that can be expanded in ways that are well represented by these volumes.

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The Roman Army and Fleet in War and Peace

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LA HIÉRARCHIE (RANGORDNUNG) DE L'ARMÉE ROMAINE SOUS LE HAUT-EMPIRE: ACTES DU CONGRÈS DE LYON (15–18 SEPTEMBRE 1994), edited by *Yann Le Bohec*. (De l'archéologie à l'histoire.) Pp. 480, figs. 70. De Boccard, Paris 1995. FF 250. ISBN 2-7018-0094-3; ISSN 1157-3872.

THE ROMAN AND BYZANTINE ARMY IN THE EAST: PROCEEDINGS OF A COLLOQUIUM HELD AT THE JAGIELLONIAN UNIVERSITY, KRAKÓW IN SEPTEMBER 1992, edited by *E. Dabrowa*. Pp. 311, pls. 17, figs. 29. Instytut Historii, Uniwersytet Jagielloński, and Enigma Press, Kraków 1994. \$36.00. ISBN 83-233-0750-4.

THE ROMAN ARMY IN THE EAST, edited by *David L. Kennedy*. (*JRA* Suppl. 18.) Pp. 320, figs. 18, plans 34, maps 19, tables 13. *Journal of Roman Archaeology*, Ann Arbor 1996. \$89.50 (subscribers \$59.50). ISBN 1-887829-18-0, ISSN 1063-4304.

THE ROMAN ARMY AT WAR 100 B.C.–A.D. 200, by *Adrian Keith Goldsworthy*. (Oxford Classical Monographs.) Pp. xiv + 311, figs. 11, maps 2, tables 5. Clarendon, Oxford 1996. \$72. ISBN 0-19-815057-1.

FRONTIERS OF THE ROMAN EMPIRE, by *Hugh Elton*. Pp. ix + 150, figs. 17, tables 4. Indiana University Press, Bloomington and Indianapolis 1996. \$29.95. ISBN 0-253-33111-0.

THE LATE ROMAN ARMY, by *Pat Southern* and *Karen R. Dixon*. Pp. xvii + 206, pls. 19, figs. 83. Yale University Press, New Haven and London 1996. \$30. ISBN 0-300-06843-3.

LES FORCES NAVALES DU BAS DANUBE ET DE LA MER NOIRE AUX I^{er}–VI^e SIÈCLES, by *Octavian Bounegru* and *Mihail Zahariade*. (Colloquia Pontica 2.) Pp. xii + 124, figs. 30, maps 2. Oxbow Books, Oxford 1996. \$33. ISBN 0-900188-17-1.

GREEK AND ROMAN OARED WARSHIPS: 399–30 B.C., by *J.S. Morrison*, with contributions by *J.F. Coates*. (Oxbow Monograph 62.) Pp. xviii + 403, figs. xii + 85, plans 7, maps 19. Oxbow Books, Oxford 1996. \$120. ISBN 0-900188-07-4.

Modern scholarship on the Roman army originates in German: Mommsen, as always, led the way, the work of the Reichslimeskommission setting new standards of excavation and publication, while von Domaszewski and Ritterling laid the foundations on which all subsequent scholarship has built. Ritterling's article *legio*, for the period from Augustus to Diocletian, published in the *Realencyclopädie* in 1924 (*RE* XII, 1211–1829) remains an indispensable work of reference. Eric Birley, himself the leading authority in his own generation on the Roman army, says in his foreword to the revised edition of von Domaszewski's *Die Rangordnung des römischen Heeres* (first published 1908; 2nd edition, revised and augmented by Brian Dobson, Köln/Graz 1967), "Indeed, there are few works on any branch or aspect of the Roman armed forces or of the upper strata of the administration of the Roman Empire, published since 1908, which do not presuppose, to a greater or lesser extent, familiarity with Domaszewski's monograph . . . it is still an essential springboard from which further advances can be made."

Although the army has always attracted devoted attention from archaeologists and epigraphers concerned with military installations and military prosopography, they tend to form their own small world. Excavation reports are often tucked away in local journals, and other army studies appear in the *Limes-Congress* volumes or other collections of a specialized nature that mainstream historians may overlook. Although, as Goldsworthy points out in one of