

Commingled and Disarticulated Human Remains: Working Towards Improved Theory, Method, and Data

Anna J. Osterholtz, Kathryn M. Baustian, and Debra L. Martin (eds.)

New York: Springer, 2013, 285 pp. (hardback), £84.00.

ISBN-13: 9781461475590.

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Commingled skeletal remains can result from combining parts of different individuals within an assemblage. There are many situations where commingled remains can be encountered, such as, and not limited to, prehistoric collections, mass graves, mass disasters, and poorly curated assemblages within museums and universities. The accurate interpretation of skeletal remains is an important step in both bioarchaeological and forensic investigations. So much of paleodemographic and pathological interpretation depends on the overall preservation and completion of human skeletal remains and the establishment of identity in forensic cases.

This book focuses on commingled, disarticulated, disturbed or collective burials. As is often the case with such burials, they can remain understudied due to the challenges they present for analyses and as stated by the editors of this volume 'languish in museums and repositions' (p. 1). This current volume grew out of a conference session at the Society for American Archaeology meeting in 2012. The primary goal of each chapter was to address innovation and applicability in the treatment of commingled and fragmentary assemblages. In the introduction, the editors define the three main types of commingled assemblages. Firstly, long term usage commingled assemblages' results from primary/secondary interments from community groups. These assemblages are those where the deposition of new burials occurs on top of prior interments. Burials decompose naturally and the smaller elements (i.e., hand and foot bones) will fall to the bottom of the tomb. In this type of burial, an equal representation of skeletal elements is present unlike secondary burials where there will be an underrepresentation of such skeletal elements. Secondly, episodic usage commingled assemblages where these types of collections result from mass burial as a result of plague, warfare, raiding, genocide and processed human bone, thus indicating multiple deaths at a single time. Thirdly, lab commingling, which is the artificial process that can occur at any stage of analysis or curation.

This book is divided into three parts: long term usage assemblages, episodic assemblages and caveats and contributions from other disciplines. There is an overall total of 13 chapters, each of which present new analytical and theoretical methods and models for studying and interpreting commingled and disarticulated human remains which may otherwise not fulfil their research potential.

A frequently asked question is 'how many individu-

als are represented?' The answer is not always straightforward, when confronted with commingled remains. In Part One the main focus is on minimum number of individuals (MNI). The opening paper is by Boz and Hager (Making sense of social behaviour from disturbed and commingled skeletons: a case study from Çatalhöyük, Turkey), and they examine the relationship between the living and the dead through an analysis of the location of the burials within intramural spaces by tracing the flow of human bones in and out of graves within the houses over its lifetimes. Due to the nature of the assemblage, two methods of determining MNI were employed—observed MNI to establish the number of complete individuals and disarticulated burials and computerized MNI, using diagnostic zones (DZ) to recognise parts of bone. This is followed by Osterholtz et al. (Commingled human skeletal assemblage: integrative techniques in determination of the MNI/MNE), in which the authors address the determining of MNI at the Bronze Age site of Tell Abraq in the United Arab Emirates (UAE). They developed a method to look at the specific features of human bone that would be involved in disarticulation and dismemberment specifically. The total number of burials was 276—149 of which were adults and 127 non-adults. A high number of pre-term, neonates, and infants (67.6%; n=86) and an underrepresentation of children over 6 years (7.1%; n=9) was reported. Overall, a high number of dense and round bones, such as the talus and patella, and proximal and distal portions of the long bones, were best preserved. There was lack of crania observed at the site, which the authors concluded was due to mortuary rituals. Herrmann and colleagues continued with a discussion on bioarchaeological spatial analysis of the Walter-Noe Cemetery (15G-D56). This study built upon prior work using GIS based approaches incorporating bone colour and visualization within the data, leading to a new approach to the study of mortuary behavior of past populations. The final chapter in Part One is by Bonnie Glencross (Into the kettle: the analysis of commingled remains from southern Ontario). She discusses human skeletal remains from ossuaries in Ontario (AD 1300–1650), and argues that population and individual analysis of human remains are inextricably linked.

Part Two begins with a study by Kendell and Willey on (Crow Creek bone bed commingling: relationship between bone mineral density and minimum number of individuals and its effect on paleodemographic analysis). They discuss

the Crow Creek Site in central South Dakota and the impact that bone mineral density (BMD) has on MNI. Previous work on BMD and this site has been well established, however, in this study non-adult skeletal data is included to investigate the relationship between BMD and element representation. It was noted that for both adults and non-adults diaphyseal ends, the greatest element representation was observed for the proximal femur, distal femur, and proximal tibia. No pattern was observed in the distribution of elements by side for either upper or lower limbs of the child remains, suggesting adult element side differences were due to the removal of forearms for trophies. Next, Osterholtz explores extreme processing (Mancos and Sacred Ridge: the value of comparative studies). She shows that comparative methods for disarticulated assemblages can yield valuable results. Osterholtz continues with a detailed, clearly outlined comparative analysis of elements present at both sites. This is followed by Martin and colleagues with their chapter "Disarticulated and disturbed, processed and eaten?" They discuss three disarticulated assemblages from the La Plata River Valley in New Mexico. They compile a thorough account of the taphonomy and context which highlight the complexities involved in the analysis and interpretation of fragmentary, disarticulated commingled remains and stress the importance of taphonomy and contextual analysis in order to avoid misinterpretation. Duncan and Schwarz follow with a chapter titled "Partible, permeable and relational bodies in a Maya mass grave". They explore spatial distribution of skeletal remains in a postclassic (AD 950–1524) Maya mass grave using Ripley's function to show that bodies were intentionally fragmented and manipulated, on the basis of side and element in a commingled secondary context.

In Part Three, Zejdlik's chapter is "Unmingling commingled museum collections: a photographic method". In their study we are reminded of the value and importance of having access to study human skeletal remains and some of the contributing and limiting factors. Curated skeletal assemblages from around the world over many time periods have contributed to the establishment of standards of modern forensic and bioarchaeological skeletal analysis, however, in recent years there has been increasing concerns with regard to the laws surrounding excavation, retention, and analysis of human remains both in Europe and the Americas, leading to debates on repatriation and reburial. This on a positive note can lead to increased research and publication; however, it can also lead to over use of existing skeletal collections (Roberts 2013; Roberts and Mays 2010). In this chapter the focus is on the use of photography in the study of human remains, which also can have a vital role in the study of other materials such as lithics and ceramics. Here, using the case study of Aztalan, the combination of original site documentation and photographic matching method helped restore the research value of the skeletal collection. Next up is a paper by Fox and Marklein on

"Primary and secondary burials with commingled remains from archaeological contexts in Cyprus, Greece and Turkey". This chapter is based on the lead author's dissertation with further contributions on commingled remains from the Eastern Mediterranean, ranging from the Hellenistic to the late Byzantine periods. In the following chapter, we are given a very detailed review of the bone bed assemblages from Karin B Cave in south west Turkey. Here, Levent Atici presents a multi strand approach to taphonomy at the site. In the next chapter, Cook presents her re-analysis of four bone fragments from Franchthi Cave in Greece. The remains were previously studied by Lawrence Angel. This chapter clearly presents the difficulties encountered in differentiating between human and non-human, particularly so with commingled and fragmentary bone. In the closing chapter, the editors reflect on the importance of studying fragmentary and commingled remains, with hopes that future researchers will consider the value that such assemblages hold.

Throughout this volume, we are reminded of the complexities and challenges facing researchers who study and analyse commingled and disarticulated human and non-human remains. The advancement in computer analysis and alternative techniques from other disciplines, such as chemistry, have greatly enhanced and aided in the development of research aims and objectives with regard to such remains and allow numerous approaches to be made in the study of the behavior of past populations thereby enhancing our knowledge of the societies in which they lived. While these advances offer considerable scope for the future, the employment of simply techniques such as photography should not be overlooked, or its potential value, as demonstrated by Zejdlik in this volume. Also, the integrating of techniques previously used in zooarchaeology has yielded fruitful results. Overall, this volume is a major contribution in this area and builds on the 2008 volume *Recovery, Analysis and Identification of Commingled Human Remains* by Bradley Adams and John Byrd. It will be an added resource to all those who work with human and animal remains in both archaeological and forensic contexts.

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