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Anna J. Osterholtz *Editor*

Theoretical Approaches to Analysis and Interpretation of Commingled Human Remains

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For the ladies of the Perpetual Porch

Foreword

Working with human remains is fraught with ethical and methodological considerations that push researchers to contextualize their studies with as much information as possible. When human remains are relatively undisturbed and the bones map well onto the original location and position of the body, there is a wealth of contextual information that can be used to reconstruct the identity of the person and to make meaning out of the circumstances that may have led to death.

The studies in this volume do not have easy access to contextual information because the bodies of the deceased have been disturbed both culturally and/or naturally and the remaining bones no longer are part of their original context. The human remains in these studies are variously commingled, disarticulated, modified, broken, burned, fragmentary, and often isolated from their original context. This represents bioarchaeology as the most challenging kind that relies on empirical data sets that are less than perfect. The extraordinary thing about this collection of papers is that all the authors use state-of-the-art methodologies to situate and reconstruct the original contexts and further, they all do so within richly configured theoretical contexts.

The foundational work for this volume began with a previously edited volume (Osterholtz et al. 2014) that focused on best practices in the analysis of commingled and disarticulated remains. This volume builds on that one by utilizing the methods outlined in the former volume, but now focusing on the use of social theory to provide more robust interpretations of these challenging and often understudied collections. These studies bridge social theory with bioarchaeology in ways that are innovative yet sensitive to the challenges and problems of working with incomplete data sets. All these chapters consciously use social theory to expand our understanding of social life and human behavior at multiple and dimensional levels. Culture change, climate change, power, inequality, class, gender, ethnicity, identity, and materiality are all approached in various chapters using a wide variety of theoretical frameworks that best fits the data at hand.

Engagement with theory in each of these chapters means that the authors have approached the meanings, values, intentions, beliefs and ideas about human behavior though the lens of available mortuary practices, and information on demography and pathology. This is a relatively new arena for study. This volume supplies a kind

of road map for others working with imperfect collections who wish to expand their studies well beyond description of the bones. For example, some of the studies focused on the socially created institutions, events and symbolic objects that animated how the lines between life and death were often blurred or reimagined as derived from the mortuary practices. The agency of human factors in creating the mortuary contexts discussed in these chapters is highlighted as a way to think about the interaction of the living and the dead.

In these studies, methodology, social theory, and data are tethered. Data without theory has limited explanatory power and is difficult to generalize about meaning beyond a local context. Theory in these chapters has aided in making sense of the data in a broader context. These studies attest to the value of carefully collected empirical observations and robust data sets as the baseline for building interpretations that are enhanced with the use of social theory.

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About the Editor

Anna J. Osterholtz has recently completed her PhD at the University of Nevada, Las Vegas focusing on social change, migration, and identity during the Bronze Age on Cyprus. Her primary research interests center around commingled and fragmentary assemblages of human remains and the unique stories they tell. She has active research projects in the Americas, Europe, the Middle East, and the Mediterranean.

Chapter 1
Introduction

Debra Martin and Anna J. Osterholtz

Bones Do Not Speak for Themselves

This volume grew out of an organized symposium at the 2014 Society for American Archaeology meetings in Austin, Texas, which focused on the application of social theory to assemblages consisting of fragmentary and commingled human remains. Too often, these assemblages (which can present analytical and methodological challenges) are overlooked in bioarchaeology and at best they are described. The contributions to this volume provide ways to go beyond description into the application of social theory to facilitate providing conclusions that are more interpretive. The case studies provide excellent examples of how interpretively rich these assemblages can be when placed within a framework where ideas about social relations or cultural processes complement bioarchaeological data and archaeological reconstruction. As Sofaer (2006, p. 33) noted, "human remains are frequently seen as products sourced from excavations, the recording and reports passed on as commodities through a system of commercial contract, thereby ensuring the place of bioarchaeology at the bottom of the interpretive tree." This statement has been even more true of those assemblages that comprised fragmentary, modified, burned, disarticulated, and commingled remains.

These contributions are a very good indication of how far bioarchaeology has come as a subdiscipline within biological anthropology. Martin et al. (2013) present a model for bioarchaeology that necessitates a theoretical model from the outset of analysis. This approach invites researchers to article *why* we want to analyze human remains and *how* we intend to use the products of those analyses. This is integral to modern bioarchology. Bioarchaeology is almost always focused upon how indi-

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viduals interacted both with each other and their environments, how they died, and how the living interacted with them after death.

The focus of this volume is not on the methodology used for the analyses, although each chapter provides a short background about the methodological approaches used. The previous volume (Osterholtz et al. 2014) was primarily focused on the importance of methodology and served as a catalyst for this one, which is focused on how commingled assemblages can be used to make meaning. How can commingled assemblages be used to answer social questions and to investigate human interactions?

The original Latin derivation of the word *theory* means to contemplate the cosmos and to reflect on why things in society are the way they are; in essence, it is a way of explaining the visible world. Schiffer has written extensively about the use of social theory in archaeology and he notes that it helps archaeologists to get at the *how* and *why* questions for their data sets (e.g., 1987, 1995, 2000). In the contributions to this volume, the *how* and *why* questions are answered by using social theory. Moving from individual (skeletal), community-based, and regional-level analyses, interpretations of human behavior emerge for each case study.

No Single Paradigm

Human behavior is rarely explained by examination of action through a single lens. The contributions to this volume show that with a melding and blending of theoretical lenses, a more complex and nuanced view of the processes that created these assemblage emerges. The use of theoretical frameworks allows for a robust view of behavior. It is the goal of this volume to highlight different theoretical approaches and to show the benefit moving beyond description into cultural processes. The chapters in this volume address a wide range of issues, from identity and agency, to materiality, subjectivities, and violence.

As Parker Pearson (1999, p. 3) has noted, “the dead don’t bury themselves.” The interaction between the living and the dead has been used for millennia as a mechanism for identity formation. Essentially how the dead are treated reveals much about the living. Identity can be a fuzzy concept in anthropology and can be explored through multiple lenses and at different scales. Commingled assemblages can make estimation of relatedness difficult; at the same time, issues of tomb inclusion become very important to the concepts of group identity and cohesiveness. In a sense, the individual disappears from a commingled or collective context and all that is left is a group identity based on the association with the place of burial.

On a regional scale, Osterholtz (this volume, Chap. 3) shows how the inclusion of new burials in old spaces and the association between burial location and administrative structures on Cyprus were used to solidify social and economic control and used as a mechanism for the creation of new lineages with populations during the Bronze Age. Marklein and Fox (this volume, Chap. 9) address the issue of biological relatedness specifically and look into the ways in which the living tended to the dead in a collective burial. Baustian and Anderson (this volume, Chap. 10) examine

the use of nonmetric traits as a mechanism for genetic relatedness as a mechanism for the discussion of larger social issues such as endogamous marriage and family relationships in Bronze Age UAE.

On a community level, Jenkins (this volume, Chap. 8) examines group identity for the Iroquois through the manipulation of the dead. Bone objects were created, positions, repositioned, and utilized in specific contexts that communicated community ideas about debt, wealth, and identity. Panakhyo and Jacobi (this volume, Chap. 5) also examine Copena mortuary practices as a marker of identity. Epstein and Toyne (this volume, Chap. 6) use elements of landscape theory to examine identity. Body partibility is used as a way to make meaning of the modified bones; bones of former prisoners were transformed into a partiable body that could be socially circulated by others, providing the *how* and *why* of these body parts and the power they exerted in various social contexts. Beck (this volume, Chap. 4) focused on age-based identities, examining the mortuary treatment of children along the same lines as adults and the implications of these actions for the larger community.

Haddow and colleagues (this volume, Chap. 2) use 3D modelling and analysis of burn patterns to discuss building abandonment in association with the death of important individuals as part of the mortuary ritual and larger community processes, an excellent example of postmortem agency as the dead continue to exert influence and demand actions that are both regenerative and transformative.

Killoran and colleagues (this volume, Chapter 11) also examine issues of embodiment and postmortem agency with more modern assemblages from the American South. Particularly, the assemblages they are interested in are result of mental hospital patient death and include the burials of people with low socioeconomic status. Their postmortem agency is therefore limited as they were marginalized in life and their links to the living were more difficult to maintain.

Osterholtz (this volume, Chap. 7) examines the role of social control and performance through the analysis of the Sacred Ridge assemblage, combining elements of Galtung's and Farmer's concepts of structural violence with Whitehead's performative theory; explaining the *how* and *why* of killing and processing of a large group of individuals would have been socially important.

Tung (this volume, Chap. 12) provides concluding thoughts and ideas for new directions in the study of commingled human remains. Commingled assemblages are common yet rarely used in large integrated research projects. Drawing on the best practices presented in the sister companion to this volume (Osterholtz et al. 2014), it is clear that much more attention should be paid to the excavation, curation, and analysis of human remains that are fragmentary and commingled. There is ample evidence presented here to demonstrate the utility of doing so.

Summary

The contributions to this volume reveal the dead to have complex and layered lives as gendered, as agents, as symbols, and as forces in shaping and reifying identity. Theoretical approaches are used with great care and deep knowledge of their utility

to the case studies showing that one theory does not apply to all studies. The theoretical approaches chosen by the authors reflect the research questions being asked. The contributions here provide multiple avenues for the examination of social structure, interaction, and the development of group identity. Innovative methodologies are necessary for the inclusion of commingled assemblages into larger understandings of social processes. The case studies presented in this volume show how theory can change, evolve, and be mixed to provide a rich understanding of the past.

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Chapter 2
A Tale of Two Platforms: Commingled Remains and the Life-Course of Houses at Neolithic Çatalhöyük

Scott D. Haddow, Joshua W. Sadvari, Christopher J. Knüsel and Rémi Hadad

Introduction

The Neolithic site of Çatalhöyük is located in south-central Turkey (Fig. 2.1) and dates from roughly 7100 to 6000 cal BC (Bayliss et al. 2015). It is well-known for its large size, densely packed mudbrick houses, elaborate symbolic assemblages, and subfloor burial practices (Hodder 1996, 2000, 2013a, 2013b; Mellaart 1967). Beginning with James Mellaart's work in the 1960s and continuing with Ian Hodder's current excavation project begun in the mid-1990s, the site has been crucial for the study of early settled life in the Neolithic of Central Anatolia, specifically, and the wider Near East, in general. The human remains excavated at Çatalhöyük comprise one of the largest Neolithic skeletal samples in the Near East and provide great insight into the lives of Çatalhöyük's inhabitants, their social structure, and their mortuary customs (Andrews et al. 2005; Boz and Hager 2013; Hillson

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Fig. 2.1 Map of Turkey showing location of Çatalhöyük

et al. 2013; Larsen et al. 2013, 2015; Molleson et al. 2005; Nakamura and Meskell 2013; Pilloud and Larsen 2011).

In this chapter, we seek to build upon Boz and Hager's (2014) discussion of the nature of commingled remains at Çatalhöyük by focusing on two skeletal assemblages found within adjacent platforms in Building 52, a house currently being excavated in the North Area of the Neolithic East Mound. The two assemblages exhibit various degrees of commingling and represent the outcome of divergent mortuary practices: one characterized by long-term, successive inhumations and the other by a single interment episode consisting of multiple individuals—a rare occurrence at the site (see Osterholtz et al. 2014: Figure 1 for definition of terms). Our aim is to demonstrate the relationship between these skeletal assemblages (and the once-living individuals they embodied) and the occupational history and abandonment of Building 52 and, in so doing, contribute to the understanding of the broader social and ritual implications of mortuary practices at Çatalhöyük.

Mortuary Practices at Neolithic Çatalhöyük

The overwhelming majority of burials at Çatalhöyük occur within houses, primarily underneath the northern and eastern platforms of the central room, although neonate and infant burials are found in more variable locations within the house (Andrews et al. 2005; Boz and Hager 2013). In contrast to the interpretations of James Mellaart in the 1960s (1962, 1963, 1964, 1966, 1967), the current excavations at Çatalhöyük have shown the majority of burials to be the result of primary inhumations rather than secondary deposition following defleshing (Andrews et al. 2005; Boz and Hager 2013, 2014). Along with the often extremely tight flexion of articulated skeletons found under house floors, Mellaart (1962, 1963, 1967) interpreted the presence of

disarticulated and commingled remains as evidence for secondary burial practices involving the exposure and excarnation of bodies prior to intramural burial. We now recognize that, in the majority of cases, this commingling of skeletal remains is the result of successive primary interments under house platforms, as evidenced by the presence of smaller elements such as hand and foot bones that are typically absent from secondary burials (see Boz and Hager 2014, Table 1 for a full description of the burial deposition categories used at Çatalhöyük). In some cases, however, subfloor primary burials are targeted in order to facilitate the recovery of particular skeletal elements—typically the cranium and mandible (Andrews et al. 2005; Boz and Hager 2013, 2014)—which are then reburied at some later date. This reburial of skeletal elements, often accompanying a primary interment, constitutes a secondary burial, defined here as the *intentional* redeposition of skeletons or skeletal elements originally interred in another location (cf. Duday 2006; Knüsel 2014). The most conspicuous example of this practice at Çatalhöyük is the primary burial of an adult female cradling a plastered cranium and mandible in her upper limbs (Boz and Hager 2013; Sadarangani 2014). Loose crania and other skeletal elements are often recovered within the subfloor grave fills of primary burials at Çatalhöyük, but it is often difficult to determine whether they represent an intentional secondary redeposition or an unintended consequence of disturbances of earlier primary burials by later ones. As a result of these highly diverse mortuary behaviors, the commingling of skeletal remains at Çatalhöyük is extremely common (Fig. 2.2). Deducing the intentionality behind

Fig. 2.2 Example of commingling of skeletal remains found at Çatalhöyük. (Photo by Jason Quinlan, Çatalhöyük Research Project)

these occurrences and distinguishing between what are essentially equifinal processes in the archaeological record requires careful attention to the stratigraphic relationships between burial sequences and grave fills as well as meticulous osteological analysis[1] in order to reassociate loose skeletal elements.

Building 52

Building 52 is located on the northern promontory of Çatalhöyük's East Mound (Fig. 2.3). Artifact typologies, specifically the chipped stone and ceramic assemblages, as well as stratigraphic associations date the building to the "classic" middle period of the site's occupation (Mellaart's Level VI and Hodder's Level North G), *ca.* 6500 calBC (Farid 2014b). The house appears to have come into existence when the abutting walls of two separate buildings were knocked down in order to form a single house structure (Farid 2014a). As a result, Building 52 is somewhat idiosyncratic in terms of size and spatial organization, although its general layout at the end of its occupation is for the most part consistent with the typical house style of the "classic" period. It consisted primarily of a large central room (Space 94) and several smaller peripheral rooms dedicated to storage and other activities to its north, south, and west (Fig. 2.4). While Spaces 91/92, 93, and 255 appear to be the result of a process of internal segmentation, Spaces 90, 290, and 291 may be illustrative of the expansion of this building into the surrounding external areas during different phases of construction and occupation.

Based on previous dendrochronological and C14 analyses, the average house at Çatalhöyük was occupied for 50–100 years (Cessford et al. 2005). Microstratigraphic analyses of wall plaster layers at Çatalhöyük indicate that replastering events likely occurred on an annual basis and were tied to some form of seasonal activity (Matthews 2005c). Thus, a section of wall plaster recovered from Building 52 with 67 layers (Twiss et al. 2008) may provide a tentative use-life estimate of nearly 70 years. The occupation of Building 52 ends in a dramatic closure event characterized by an intentional fire that burned most intensely in the central area of Space 94 (Fig. 2.5) and along its party wall with Space 93 (Harrison et al. 2013; Tringham 2013; Twiss et al. 2008).

The two platforms discussed here are located in a northern alcove (Fig. 2.6) within the large central room (Space 94). Both belong to the final phase of occupation of the building. During this phase, the height of each platform was raised several times and their surfaces were replastered. Unusually, the platform surfaces were alternately painted red at different stages in their use-life (although this does not appear

[1] Adult skeletal age-at-death estimates presented in this paper are based primarily on the morphological changes observed in the *os pubis* (Brooks and Suchey 1990) and auricular surface of the *os ilium* (Lovejoy et al. 1985). In the absence of the *os coxae*, adult age is estimated via occlusal dental wear (Brothwell 1981). Subadult age estimates are based primarily on dental development (Ubelaker 1989). In the absence of dentition, subadult age is estimated using diaphyseal shaft length measurements (Maresh 1970; Schaefer et al. 2009). Adult sex estimation is based on the evaluation of sexually dimorphic features of the pelvis, cranium, and mandible (Buikstra and Ubelaker 1994).

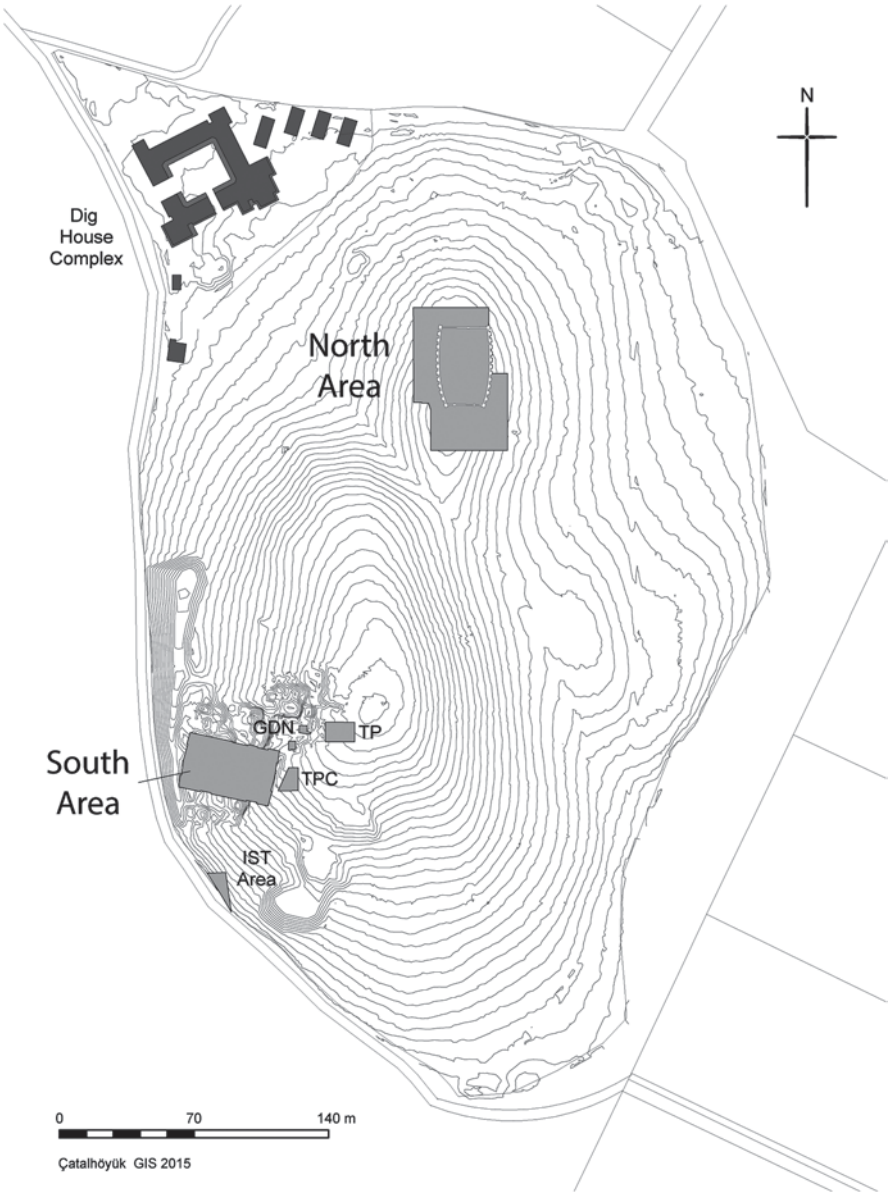

Fig. 2.3 Plan of the Neolithic East Mound at Çatalhöyük. (Plan produced by Camilla Mazzucato, Çatalhöyük Research Project) *IST* Istanbul University excavation area; *TPC* Team Poznań Connect excavation area; *TP* Team Poznań excavation area; *GDN* Gdansk excavation area

to correspond with burial activities). The northwest platform has a slightly larger surface area than its counterpart to the east and was more affected by the burning of the building since it is closer to the origin of the fire. The only other burials found to date in Building 52 include a child aged 4 years (+/− 1 year) at death (F.7334)

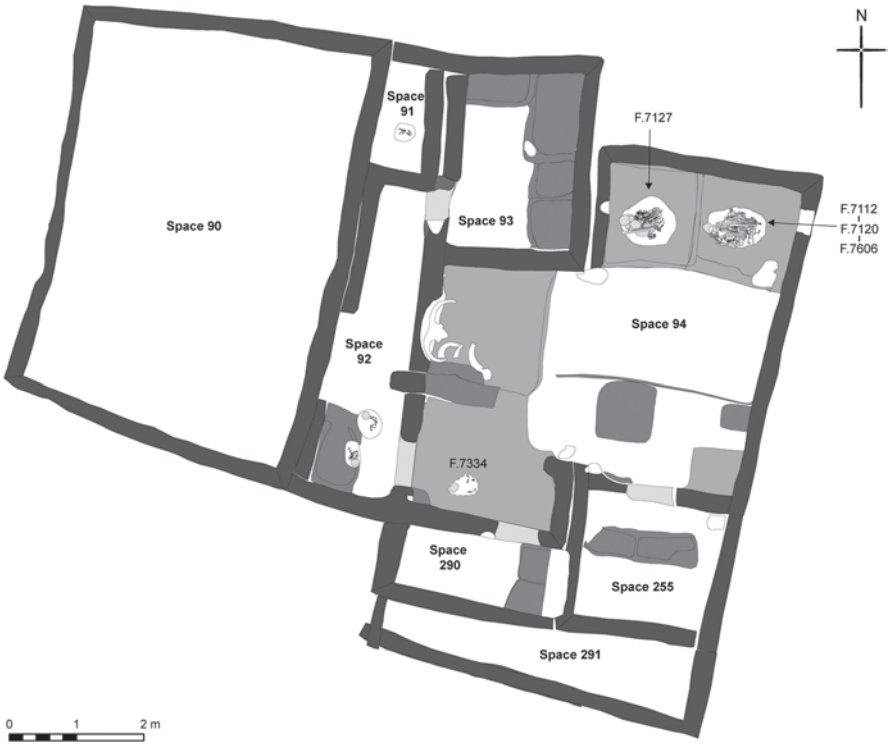

Fig. 2.4 Plan of Building 52. (Plan produced by Camilla Mazzucato, Çatalhöyük Research Project)

recovered from an infilling deposit used to raise a platform surface in the southwest corner of Space 94, and three neonates found in the side rooms to the west of the central room (Farid 2014a; Tung 2014). While the northeast platform has now been fully excavated, the earliest phases of the house are still being excavated, and it is possible that earlier burials will be uncovered.

The Northeast Platform

The skeletal remains of at least five individuals (three adults and two subadults), representing at least three separate burial events, were recovered from the northeast platform (Knüsel et al. 2013a).These three interments occur at distinct phases in the use-life of the northeast platform, during which the height of the platform was successively raised. The uppermost (last) burial in the sequence (F.7112) is that of a middle adult female (Sk.20655), 35–49 years of age at death, placed in a tightly flexed supine position and leaning slightly to her left with the head to the west and feet to the east (Fig. 2.7). Phytolith bands running across the ankles, right proximal

Fig. 2.5 Building 52 *(looking north)* showing area of burning in central room (Space 94). (Photo by Jason Quinlan)

Fig. 2.6 3D reconstruction of the northwest and northeast platforms prior to excavation

femur, and left ilium suggest that the body was tightly bound with reed cordage when it was placed in the grave. Despite being the final and most shallow interment within this platform, this individual appears to have been unaffected by the fire that consumed Building 52. No heat-related color changes are apparent on the bones, and no traces of carbonized soft tissue were found within the endocranium or anywhere else on the skeleton (as has been found in other subfloor burials within

Fig. 2.7 Northeast platform burial F.7112: middle adult female (Sk.20655). The loose adult male cranium and mandible (Sk.20661) was recovered in the grave fill immediately to the south of the adult female (not shown here)

burnt houses at Çatalhöyük), suggesting that this individual was buried long before the fire took place and with sufficient time for full decomposition of the soft tissues of the body. A disarticulated cranium and mandible belonging to a possible young adult male (Sk.20661), 20–34 years of age at death, were also found within the grave fill of this burial.

Located immediately below burial F.7112 was the primary inhumation (F.7120) of a middle adult male (Sk.30522) aged 35–49 years at death and an infant (Sk.30523) aged 2 years (+/− 8 months) at death (Fig. 2.8). This burial was cut into an earlier surface of the platform. Both of these individuals appear to have been buried in a single event. The adult was placed on his back in a tightly flexed position and oriented with the head to the west and the feet to the east. The infant, tightly flexed on its right side, was placed directly above the torso of the adult. While the remains of the lower lying adult male were undisturbed, the remains of the infant were disturbed and partially disarticulated by the grave cut for burial F.7112 described above. Three rows of small stone disc beads in various colors were found on the abdomen of the infant along with an additional string of similar beads around the left ankle. In addition, traces of red pigment were observed on the frontal bone

Fig. 2.8 Northeast platform burial F.7120: middle adult male *Sk.30522*, infant *Sk.30523,* and disarticulated child cranium and mandible *Sk.30521*

and two green stone beads (possibly serpentinite) were also found, one on either side of the temporal area of the cranium. The disarticulated remains of a fifth individual were found within the lower grave fill of the grave cut. This individual is represented by the cranium and mandible of a child (Sk.30521) aged 8 years (+/−2 years) at death. A set of disarticulated tibiae and humeri, along with a femur, likely belong to the same individual.

Burial F.7606 (Fig. 2.9), located immediately below burial F.7120, represents the earliest interment in the northeast platform burial sequence (Haddow et al. 2014; Tung 2014); in fact, it appears to immediately predate the construction of this platform, for which it may have been a foundation deposit, and was cut into an older platform belonging to an earlier phase of Building 52. The grave cut contained the primary disturbed skeleton of a young adult male (Sk.21526) aged 20–34 years at death and the disarticulated infracranial remains of a child (Sk.21525) aged 7–8 years at death found scattered throughout the grave fill. The young adult male was placed on his left side in a flexed position, with the head oriented to the west and the feet to the east. The cranium and mandible of this individual were missing, although all of the cervical vertebrae were recovered. It appears that the cranium and mandible were removed during the subsequent interment of the middle adult male (Sk.21526) and infant (Sk.21525) in F.7120.

Based on developmental similarities (i.e., dental development and diaphyseal lengths), the disarticulated child skull (e.g., cranium and mandible; Sk.30521) and disarticulated infracranial remains found in the grave fill of F.7120 were associated in the lab with the subadult remains found loose in the grave fill of earlier burial

Fig. 2.9 Northeast platform burial F.7606: young adult male *Sk.21526* and disarticulated remains of child *Sk.21525*

F.7606. It is also likely that the loose adult cranium and mandible (Sk.20661) found in the grave fill of the latest burial F.7112 may belong to Sk.21526, from F.7606, as several loose teeth found in the grave fill of F.7606 appear to fit the maxillary tooth sockets of Sk.20661. The occurrence of loose subadult remains from a single individual within two separate burial features has two potential explanations: (1) the skeletal remains of the child (Sk.30521 = Sk.21525) represent an earlier primary burial predating this platform and belonging to the preceding phase, which was then completely disturbed by the subsequent burial of the young adult male (Sk.21526). In this scenario, the original grave cut was completely obliterated by the grave cut for Sk.21526 and the bones of the child were redeposited with the grave fill of the young adult male; or (2) the disarticulated subadult remains represent a secondary deposit placed in the grave F.7606 at the same time as the primary burial of the young adult male (Sk.21526). The latter scenario appears more likely, however, as there is no trace of an earlier grave cut for the child, nor were any of its bones found in a primary *in situ* position, as is the case with the majority of disturbed burials at

Çatalhöyük (Boz and Hager 2013, 2014). In both scenarios, it appears that the grave cut for the subsequent interment event, F.7120, dislodged the cranium and mandible of the primary young adult male along with a large amount of the disarticulated child skeleton, including the cranium and mandible. The bones of the child were then redeposited in the grave fill of F.7120—with special care taken to place the cranium and mandible alongside that of the middle adult male (Sk.30522). Meanwhile, the young adult male cranium and mandible (Sk.20661) likely belonging to Sk.21526 appear to have been retained for some time before being reburied with the final interment (F.7112) in the platform.

The analysis and interpretation of the burial sequence in the northeast platform was greatly assisted by the use of 3D photogrammetry techniques which allowed us to produce individual 3D models taken at multiple stages of the excavation process. These individual 3D models are combined and georeferenced, enabling more accurate reconstruction of the sequence of events by virtually re-excavating the platform. This method of 3D burial recording has been developed at Çatalhöyük since 2012 (Berggren et al. 2015; Forte 2014).

The Northwest Platform

In contrast to the burial sequence in the adjacent northeast platform, only one interment, burial F.7127, was found within the northwestern platform. This highly unusual burial contained the primary inhumation of a middle adult male (Sk.30514), aged 35–49 years at death, and the remains of at least eight subadult individuals in various states of articulation. The upper layer of the grave fill contained large amounts of loose, disarticulated subadult bone (Fig. 2.10). Based on previous experience, we initially believed these represented loose bones from earlier burials within this platform. However, no earlier grave cuts or disturbed burials were found in the northwest platform and despite the various states of articulation seen in the subadult remains, it is clear that all of these individuals were interred in a single event. The adult male was the first individual to be placed in the grave cut (Fig. 2.11), in a supine and flexed position with the head to the west and feet to the east, and the subadults were placed on top of his body. Carbonized brain tissue was recovered from within the cranial vault of the adult male, and the bones ranged in color from yellowish-orange to grayish-brown as a result of heat transference through the platform during the fire that consumed Building 52. Two large red-painted mollusc shells were placed beside the right knee of the adult; the internal shell surfaces contained a brownish organic material. A small, shiny, flat piece of metallic mineral (likely hematite), roughly 20 mm × 15 mm and perforated at one end, was recovered from the grave fill just below the cranium of Sk.30514 and may have been worn as a pendant.

The first subadult to be placed in the grave cut with the adult male was a child (Sk.30524) aged 4 years (+/− 1 year) at death (see Fig. 2.11). The body, placed on the left upper arm of the adult male, appears to have been at least partially decomposed

Fig. 2.10 Northwest platform burial F.7127 showing upper fill of grave with loose subadult bones and crania

Fig. 2.11 Northwest platform burial F.7127 showing adult male *Sk.30514* and partial remains of child *Sk.30524* above the left upper arm of the adult

Fig. 2.12 Northwest platform burial F.7127 showing child *Sk.30513* placed on top of adult male *Sk.30514*

at the time of burial, as the skeleton was not completely articulated and certain elements, such as those of the right upper limb and the left *os coxae* were missing. The next subadult to be placed in the grave was a child (Sk.30513) aged 3 years (+/− 1 year) at death (Fig. 2.12). The occipital of this child was in direct contact with the frontal bone of the adult male, and a relatively well-preserved circular wooden object, possibly a bowl, was placed on top of the cranium. This individual was missing the left upper limb, as well as the left tibia and fibula. As with the adult male, carbonized brain tissue was recovered from the endocranium of this child, and the bones exhibited heat-related color changes. An infant (Sk.30511) aged 6 months (+/− 3 months) at death (Fig. 2.13) was placed on top of this child along the northern wall of the grave cut, with a large amount of well-preserved linen textile separating the two bodies. Carbonized brain tissue was recovered from the endocranium, and additional carbonized soft tissue was found in the abdominal region. The bones from the infant's upper body were orange-brown in color, while the bones of the lower body were blackened and partially calcined, likely due to the proximity of this burial to the platform surface. Unlike the other subadults, this individual was fully articulated and largely complete.

The partially complete remains of a child (Sk.30510) aged 4 years (+/− 1 year) at death (see Fig. 2.13) were recovered just to the south of the infant and child previously described. Only the axial skeleton of this individual was in articulation, and the bones of the upper and lower limbs were dispersed in the upper grave fill. Given this partially articulated state, it would appear that this child was in an advanced

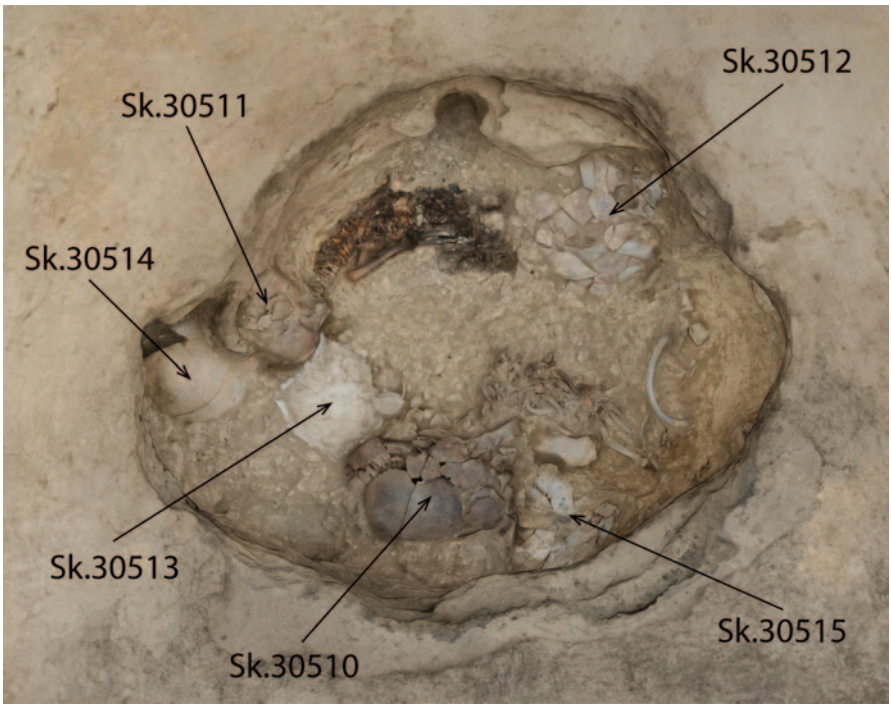

Fig. 2.13 Northwest platform burial F.7127 showing the position of individuals *Sk.30510*, *Sk.30511, Sk.30512,* and *Sk.30515* in upper grave fill

stage of decomposition at the time of burial. Traces of textile cordage were found running from the top of the cranium to the underside of the mandible, possibly as a means of binding these elements together when they were in a fleshed state. Only a small amount of carbonized brain tissue was recovered from the endocranium.

An isolated cranium of a child (Sk.30512) aged 4 years (+/− 1 year) at death (see Fig. 2.13) was recovered in the northeast corner of the grave cut. Unlike the others in this burial, the cranium of this child was crushed flat and shattered, with all single-rooted teeth missing postmortem. Without soft tissue to support it, the cranial vault collapsed under the weight of the overlying grave fill, and only a very small amount of carbonized brain tissue was recovered. This suggests that the cranium was completely skeletonized when it was deposited and may have been retrieved from a primary interment in another location before being redeposited here. A partial cranium and mandible of a 5-year-old (+/− 16 months) child (Sk.30515; see Fig. 2.13) were also recovered from the fill against the south wall of the grave cut. No brain tissue was recovered from this individual. Once the adult male and partially articulated subadults were placed in the grave, a layer of loose subadult bones was deposited above them before the grave cut was finally sealed with clean soil.

While defining the bottom of the grave cut after the human remains had been removed, a complete marble “bracelet” was found close to a rodent burrow along

the north wall of the grave cut. It was not directly associated with any particular skeleton, but may have been moved from its original location by rodent activity. However, while bioturbation of skeletal elements due to rodent activity often occurs at Çatalhöyük, there is no indication that burrowing is responsible for the disarticulation and commingling of the subadult remains in burial F.7127.

In attempting to associate the loose, disarticulated bones recovered from the grave fill with the partially articulated subadults described previously, it became apparent that there may be at least two additional subadults interred within this burial feature; these are represented by two sets of right and left femora and several bones of the upper limb whose shaft length measurements provide age estimates that are at least 2 years younger than any of the partially articulated skeletons. Further analysis is required, but this would bring the total of subadults interred with the adult male to eight, with only one being fully articulated (and thus having only recently died) when they were buried in the platform. The others appear to have died much earlier and partially decomposed elsewhere, having either been kept aside or retrieved from another burial (or burials) before being interred with the adult male. The incomplete skeletal representation of many of the subadults and the recovery of little or no carbonized brain tissue from the crania of these partially disarticulated individuals, in comparison to the adult male and articulated subadults, strengthens the interpretation that these individuals represent secondary depositions. As such, they may be more aptly thought of as grave inclusions meant to accompany the interment of the adult.

Discussion: The Life-Course of Houses at Çatalhöyük

The settlement pattern at Çatalhöyük is characterized by a lack of monumental architecture and large public spaces; instead, there is an emphasis on spatial continuity in house construction over time, a phenomenon which has been interpreted here and elsewhere in the Neolithic Near East as relating to the reproduction and differentiation of household ties through the creation, maintenance, and transmission of social memory (Baird 2006; Hodder 2006, 2014; Kuijt 2001; Tringham 2000). While this propensity for building continuity declines somewhat in the upper levels at Çatalhöyük (Düring and Marciniak 2006; Marciniak et al. 2015), the house remains the focal point not only for domestic activities such as food processing/storage and craft production, but also for cyclical and periodic ritual activity, which can be seen in the richly symbolic, layered, and repainted wall paintings, animal installations, and subfloor burials (Czeszewska 2014; Hodder 1999, 2014; Hodder and Cessford 2004; Last 1998). In this way, the construction, occupation, adornment, transformation, and eventual abandonment of houses reflect and are entangled with the life-courses of the individuals associated with them, encompassing the myriad social and biological transitions that occur between birth and death (Carsten and Hugh-Jones 1995; Gilchrist 2000; Hodder 2012; Parker Pearson and Richards 1994). By analyzing the manner in which the two sets of commingled remains from

the northeast and northwest platforms were deposited, we can demonstrate how each assemblage reflects distinctive mortuary behaviors, each corresponding to particular ways of entangling individuals (or parts of individuals) within Building 52 at different stages in its life-course.

House Life: Occupation

As the excavation of Building 52 is ongoing and the earliest levels of the house have yet to be reached, we must confine our discussion here to the latest occupation phases. Nevertheless, we can still see in the construction sequence of the northeast platform how successive burials are associated with distinct stages of the life-course of the building. Compared with the northwest platform, which is lower in height, each primary interment in the northeast platform is separated by subsequent elevations and replasterings of the platform surface. These events may be related to seasonal rituals, and there is increasing evidence at Çatalhöyük that subfloor interments themselves may have occurred at prescribed intervals, perhaps annually (Matthews 2005a; Fairbairn et al. 2005). The previously described burial of a 4-year-old child in an infill layer separating two platform surfaces in the southwest corner of Building 52 is equally suggestive of ritualized periodicity - a way of marking transitions in the life-course of household members and the house itself.

The orientations of the subsequent adult inhumations in the northeast platform mirror the orientation of the earliest burial (buried supinely/slightly on the left side, head to the west, and feet to the east). The orientation of the adult male in the adjacent northwest platform is strikingly similar as well. This is reminiscent of other spatially repetitive/cyclical practices at Çatalhöyük such as the recurrence of wall paintings in the same location (Czeszewska 2014), the replastering of platforms, and the consistent reiteration of house footprints within successive building sequences. It is symptomatic of a preoccupation with continuity, tradition, and memory (Hodder 2006; Hodder and Cessford 2004).

This fixation on repetition and a desire to maintain generational continuity is even more evident in the retrieval, circulation, and redeposition of bones observed over the course of successive interments in the northeast platform, an intentional process that resulted in crania and other skeletal elements from two individuals being channeled upwards through the burial sequence. If this stratigraphic interpretation is correct, it would represent further evidence of the cyclical nature of human bone retrieval within houses and house sequences observed less clearly elsewhere at Çatalhöyük (Regan 2014; Boz and Hager 2013). In this case, the grave cut for the second burial (F.7120) in the northeast platform (that of the middle adult male (Sk.30522) and infant (Sk.30523)) disturbs the earlier burial (F.7606) of the young adult male (Sk.21526) and the disarticulated remains of the child (Sk.21525). The cranium and mandible of both individuals (along with a number of infracranial bones belonging to the child) were removed at this stage, but the remains of

the child were immediately redeposited in the grave fill of the middle adult male (Sk.30522) and infant (Sk.30523) burial (F.7120). The cranium and mandible of the young adult male (Sk.21526), however, were retained, perhaps displayed for a time within the house or elsewhere. The cycle ends when the cranium and mandible were finally reburied with the last interment in the northeast platform (F.7112). It would seem, then, that the cranium and mandible of the young adult male (Sk.21526) were intentionally targeted for retrieval at the time of the interment of Sk.30522 and Sk.30523 (F.7120); if the disturbance of the earlier burial was unintended, the skulls (crania and mandibulae) of both individuals would simply have been redeposited in the grave fill of F.7120, as is often the case with intercutting burials at Çatalhöyük. Instead, only the skull (cranium and mandible) and bones of the child (Sk.30521) were returned immediately, implying that the grave-diggers were not interested in them. There is clear evidence elsewhere at Çatalhöyük that earlier graves were intentionally targeted for cranial retrieval (Andrews et al. 2005; Haddow & Knüsel, in review; Knüsel et al. 2013b). The retrieval, curation, and redeposition of crania were common occurrences at Çatalhöyük, as they were elsewhere in the Neolithic Near East (Benz 2010; Bienart 1991; Kuijt 1996, 2000; Stordeur and Khawam 2007). The practice has often been interpreted as a form of ancestor veneration (e.g., Cauvin 1978; Goren et al. 2001; Kenyon 1956), or more recently as a means by which social memory and identity within and between households were reproduced and renegotiated over time (Bonogofksy 2003, 2005; Kuijt 2008; Özbek 2009; Verhoeven 2002). In Building 52, the retrieval and eventual reburial of the cranium and mandible from an individual associated with a much earlier occupation phase is consistent with such interpretations. It strongly links this individual with the history of this particular platform, and the manipulation of his body with two different stages in the life-course of the building.

Given the lack of carbonized soft tissue recovered from the adult female skeleton (Sk.20655), the final burial in the northeast platform (F.7112) must have occurred well before the conflagration that ended the occupation of Building 52. Furthermore, the platform was replastered several times after the last interment. It seems, then, that the inclusion of the young adult cranium and mandible with this burial is associated with the end of the use of the northeast platform for burials.

House Death: Abandonment

At Çatalhöyük, the practice of house closure appears to occur on a house-by-house basis and is typically marked by the removal of the roof and the stripping of internal support beams followed by the knocking down of the walls and the infilling of the internal house space; the subsequent house is usually built directly above the previous building footprint, although in some cases the shell of the old house appears to have been left open for some time and was gradually infilled as the result of midden accumulation or other outdoor activities (Farid 2007, 2014a; Matthews 2005a;

Russell et al. 2014). In addition to these actions, other behaviors thought to be more in the realm of ritual and symbolic behavior have been observed in the closure of particular houses. These behaviors include the dismantling of architectural installations, deposition of particular, "characterful" objects, and intentional burning, all of which can be observed in the closure of Building 52 (Carter 2011; Carter and Milić 2013; Farid 2014a; Russell et al. 2014; Twiss et al. 2008). In terms of architectural installations, a cattle bucranium was inserted in a niche in the western area of Space 94, next to a small bench into which three cattle horns were embedded. Although this installation is close to the origin of the fire, it was not damaged by the conflagration, and was probably insulated from it. At least 13 additional horn cores and a fragmented cattle cranium were piled on top of the bucranium before the closure of the house. Near this installation, a ground stone bowl, polisher, handstone, and quern were placed on the floor of Space 94. A few pieces of obsidian, including six projectile points, were also found on the floor, which was otherwise completely cleared. In the adjacent storage area, Space 93, each of the bins contained obsidian tools, many of them "characterful" objects such as projectile points and large flakes and bifaces (Carter and Milić 2013; Carter 2011). As obsidian tools are rarely recovered from storage bins at the site, this is an unusual location suggestive of intentional placement. Evidence for the intentionality of the fire that ended the occupation of Building 52 comes in various forms, as elucidated through a forensic analysis of house fires at Çatalhöyük. According to Harrison et al. (2013), the fire that consumed Building 52 was characterized by a fuel-controlled, long-duration, smoldering combustion, and it is the lengthy duration of the fire rather than its peak temperature that would account for the heat transference that led to the carbonization of soft tissue and discoloration of bone seen in the skeletal remains below the northwest platform. These characteristics also correspond with an open combustion incapable of further lateral spread due to heat loss upwards, indicating that the fire was allowed to vent into the open air. This suggests that the roof of the structure was purposefully dismantled in preparation for the fire and indicates a deliberate act of building closure through arson.

It should be noted, however, that house burning (intentional or not) at Çatalhöyük is an uncommon occurrence (Hodder's excavations have documented eight burnt houses out of 110 houses uncovered to date) and the phenomenon appears to be confined to the middle occupation levels (Mellaart's Level VI/Hodder's Level North G/South N-O; Cessford and Near 2005; Mellaart 1964, 1966; Tringham 2013). The practice of building closure by fire is attested at other Neolithic sites elsewhere in the Near East such as Çayönü in Turkey (Le Mort et al. 2000; Özdoğan and Özdoğan 1998), Arpachiyah in Iraq (Campbell 2000), Tell Sabi Abyad (Akkermans et al. 2012; Verhoeven 2000), and Jerf el Ahmar (Stordeur 2000) in Syria as well as in the Balkan region of southeast Europe (Stevanović 1997). Tringham (2005:108) contends that such behavior represents a traumatic act that "ensure(s) a continuous place (as I would argue), to create social memory, to strengthen identity of community, and incorporate social reproduction." As such, the deliberate closure and abandonment of houses is seen as a symbolically powerful act, potentially linked to a rupture in

the social fabric which binds members of a household (Stevanović 1997). Tringham (2005) suggests that, in the Balkans at least, these events may have coincided with the death of a significant individual, although such individuals appear to have been buried elsewhere.

It has been suggested elsewhere that because nearly every completely excavated building at Çatalhöyük contains burials, their occurrence is of limited value in explaining variations in closure practices (Russell et al. 2014). While the presence or absence of burials alone may not add much to discussions of building closure events in general, the house-specific details of individual burials—particularly the final interment(s)—may have far greater interpretive potential than previously realized. The collective burial (F.7127) of an adult male with several subadults in various states of articulation in the northwest platform of Building 52 is a rarity at the site; the vast majority of primary burials at Çatalhöyük consist of single inhumations (Boz and Hager 2013). The relative abundance of carbonized brain and other soft tissues recovered from the complete and fully articulated skeletons of the adult male and infant suggests that the fire occurred not very long after their deaths and interment in the platform. Additionally, the surface of the platform in which these individuals were placed was not replastered, as is typical of subfloor burials occurring in houses which continued to be occupied. We argue, then, that the timing of this collective burial is directly associated with the decision to terminate the occupation of Building 52, perhaps because the death of the adult male (and/or the infant) necessitated the closure of the house, or, more provocatively, the closure of the house necessitated the deaths of these individuals. While the occurrence of ritualized killing has previously been offered as an explanation for the high number of neonates and infants within the Çatalhöyük skeletal assemblage (Moses 2008, 2012), these numbers are consistent with the mortality profiles reported for many underdeveloped countries (Hillson et al. 2013:358). Furthermore, the lack of completeness and the various states of disarticulation of the other subadults suggest that they had been dead for some time and kept aside or taken from other burial locations for the occasion of the house closure.

The construction of a smaller and much shorter-lived structure (Building 51) within the burnt shell of Building 52 provides further evidence of the importance of continuity of place at Çatalhöyük. While the interior of Building 51 contains the northern alcove in which the northeast and northwest platforms were located (Farid 2014a), the areas associated with the cattle bucrania and horn installations were not utilized - nor were the auxiliary spaces associated with the deposition of "characterful" objects. Additionally, no further burials occurred during the short lifespan of Building 51. Perhaps this provides some indication that with the end of the life-course of Building 52 and the very unusual burial associated with it, the symbolic social capital accumulated within a house (which made Building 52 one of the larger, more elaborate buildings at Çatalhöyük) could have been relocated or lost entirely, necessitating the ritualized and ceremonial (in the spectacle of the burning over a protracted period of time) "death" of the building (Tringham 2005, 2013).

Conclusions

Commingled skeletal remains are commonly encountered under house platforms at Çatalhöyük, but their pervasiveness often obscures the variety of behaviors that led to their variable expression in the archaeological record. The predominant burial location beneath platforms thus disguises what are much more variable skeletal dispositions that relate to both the intentions of the buriers but also to the variable states of the corpse prior to deposition (cf. Andrews and Bello 2006). In the example of Building 52, we have shown how two very different commingled skeletal assemblages are associated with different phases in the life-course of the house and different ways of entangling individuals within it.

As evident in the northeast platform, as well as in that the southwest corner of Building 52, it would appear that primary interments are associated with the seasonal rhythms of renovation, replastering, and other architectural modifications to the house. Some of these modifications may have been practical in nature, although the inhabitants of Çatalhöyük likely did not distinguish between ritual and mundane practices (Hodder and Cessford 2004; Last 1998). In the course of successive burials in the northeast platform, crania and other skeletal elements were disturbed, removed, retained, and eventually redeposited. The northeast platform thus provides a good example of the link between the cyclical manipulation of particular human remains and the rhythms of house occupation and transformation.

With the archaeological evidence indicating that the interment of the adult male and the remains of at least eight subadults in the northwest platform was one of the very last events to occur before the fire was set, Building 52 also provides unique evidence for substantiating the idea that the death of a particular individual (or the particular death of an individual) may be one of the potential catalysts for the closure and abandonment of houses at Çatalhöyük. However, while the destruction and renewal of buildings is a recurrent feature throughout the 1100-year occupation of the site, the specific manner in which houses were closed is highly variable and the motives behind such practices are often difficult to discern. Despite a remarkable level of consistency in terms of spatial organization and mortuary practices at Çatalhöyük, it is clear that at the household level, there are variations in the seemingly uniform cultural practices that occurred. Building 52 illustrates this through the link between a complex multiple burial in its northwest platform and the end of the life-course of the house via a rare and spectacular burning event which ruptured the spatial (and perhaps social) continuity of the building sequence.

At Çatalhöyük, where evidence of monumental architecture and large communal spaces and structures is lacking, the house formed the center of both the domestic and ritual spheres of life. The example of Building 52 demonstrates that the life-course of houses and the individuals associated with them were deeply intertwined and, moreover, can be seen to be part of a shared biography that was achieved through the periodic and episodic embedding of bodies—whole or in part—within them. In so doing, the social and biological vicissitudes of life for the Neolithic inhabitants of Çatalhöyük—birth, changes in status, demographic crises, death, the unification/dissolution of lineages, etc.—were inscribed in the architectural record of their buildings.

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Chapter 3
Bodies in Motion: Identity and Migration in Cyprus During the Bronze Age

Anna J. Osterholtz

Introduction

The analysis of human remains from the Bronze Age in Cyprus offers insights into underlying issues of social change and identity formation. The analysis briefly described here is the culmination of the examination of several thousand human bone fragments from over 100 individuals from the eastern Mediterranean island of Cyprus, spanning over 1000 years of human habitation. These data are gathered primarily from fragmentary and commingled bone assemblages from sites throughout the island. During that time, political, economic, and cultural change defined Cyprus. From the early Prehistoric Bronze Age (PreBA, 2400–1700 BC) through the late Protohistoric Bronze Age (ProBA, 1700–1150 BC), periods of agricultural intensification, the rise of copper production, and the increasing prominence of Cyprus within the larger regional trading sphere created challenges for the population. Groups migrated to Cyprus in both the PreBA and ProBA, increasing the population size and increasing social tensions, termed scalar stress (Friesen 1999). This research examines how health and other biological indicators of stress resulted from these cultural changes. Issues of colonization, migration, agricultural intensification, and responses to external influences such as trade are explored through biological and archaeological data.

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Bodies in Motion: Landscape Theory Applied to Biocultural Change

Social theory is used here to amplify the interpretations that result from analysis of data. Data, by themselves, are not useful in explaining social change. They must be placed within a larger framework. Archaeologically, landscape theory is prominent in modern archaeological research on Cyprus, specifically, landscape as applied to constructed space. Fisher (2007, 2009a, b) used the concepts of restrictive space to argue for the creation of social space and negotiation of social hierarchy. This use of landscape theory postulates that the built landscape is integral in socialization and memory-making (Ashmore 2004). Specifically, Ashmore (2004, p. 264) sees the movement of individuals across the landscape as important, stating "…monuments and movement can channel access to spectacles of sound or light, manifestations of the sacred…." The use of similar landscape theory here examines the ideas of placement of the body within the social landscape as a mechanism for identity formation. Given the relative consistency of trauma rates throughout periods of social change (the early PreBA and the ProBA), some mechanisms appear to have been in place that prohibited increased rates of violence, contrary to what is seen in postcolonial populations around the world. One such mechanism may have been the increased importance of communal ritual, revolving around the burial and interment.

The movement of burials into the living spaces and their association with places of political and economic importance (e.g., Building X at Kalavasos *Ayios Dhimitrios*) brings legitimacy (i.e., the right to control) to those enterprises through an association with ancestral groups. Ashmore (2004, p. 265) describes this process as the power of landscape to "create memories about the proper manner of articulating the living and the dead." This combines elements of ancestor veneration (e.g., Antonaccio 1995), politicization of the dead (Pérez 2006), landscape and restricted space (Fisher 2007, 2009a, b), identity theory (Joyce 2005), materiality (Sofaer 2006), and aspects of violence theory (Derriennic 1972; Parsons 2007). In combining these theoretical frameworks, the physical body must remain central to the discussion. It must be examined synergistically, as both a physical and cultural object, and cannot be separated into the physical and social without losing some of the meaning (Sofaer 2006). For example, the body is the focus of power, the manipulation and negotiation of social space, and the creation of permanent hierarchy.

The nature of the body is constantly changing. Borić and Robb (2008) see this as processuality of bodily configurations. They see the body as shifting and unstable. Embodiment, as discussed by Borić and Robb, includes aspects of gender and performative theory. It essentially means that the physical body takes on a life of its own and means something other than as an identity for the deceased individual. This is particularly true of commingled and fragmentary remains. Duncan and Schwarz (2014) examined bodies in terms of fragmentation. While fragmentation may occur through a variety of methods, it can be useful for interpretation of the assemblages. They argue that in fragmentary and commingled assemblages, it is the

conglomerated whole that becomes analytically and culturally important. It is not possible to examine the individual, but it is possible to examine the social processes that make the assemblage important.

Thomas and Tilley (1993, p. 270), in examining commingled assemblages from Brittany, look at the artistic representation of collective burials as the "social whole, the body of the social collectivity, into which individual egos have merged." They see the use of human body parts in collective burial as similar to art, conveying social meaning, particularly illustrating liminality (an in-between period of transformation). Archaeologically, the body is a signifier of social processes. What is buried with the body says a great deal about the relationship between the living and the dead. As Sofaer (2006, p. xv) says, "[t]he materiality of the body forms a common axis between the body and objects, placing the body within the sphere of archaeological investigation."

The majority of the human skeletal remains used in this work are from commingled contexts. These are identified as collective burials (containing more than one individual), indicating long-term usage of a tomb, sometimes over multiple generations (Osterholtz et al. 2014). Collective burials serve several social functions. One such function is that of social currency (Baustian et al. 2014). Sofaer (2006, p. 20) notes that the body can be "flagged as a highly visible social resource that could be appropriated to act as a focus for the communication of intended meanings related to social perception of the deceased by others." Multiple or collective burials act as a way of solidifying group identity, particularly in agricultural communities (Cauwe 2001). Keswani (2004) ties collective tombs on Cyprus to the maintenance of tradition during economic change. The relationship with the dead and the houses of the dead (tombs) and the living form a basis for community, and can be used to cement social ties or assert economic rights over specific resources or land (Keswani 2004; Saxe 1970).

Reuse of the tomb space by later groups or the construction of new tombs on top of previous cemetery space can be seen as a co-optation of the location by a new group or lineage. These bodies take on social importance and can be seen as relational bodies. Relational bodies are those bodies that are defined by their relationships with other people and objects (Duncan and Schwarz 2014). Building on this concept, Fowler (2008) looks at bodies as fractal, indicating that the bodies are integral, somewhere between separate individuals and the larger community. They can be seen as a culmination of the contributions from the ancestors, both male and female. The body of the deceased embodies the *process* of becoming an ancestor.

The decisions regarding the location and composition of tombs as well as the reuse of tomb and cemetery space and the inclusion of grave goods included in the assemblages is essentially used as a mechanism for the creation of social hierarchy. Social hierarchy implies the maintenance of social control. Fisher (2007) examined the use of space as a mechanism for social interaction through the use of restricted space in the ProBA. This is also a mechanism for the negotiation of social control. Social control must be maintained in order to organize labor. Architecture, tomb construction, and the reuse of tomb spaces may be seen as mechanisms of social control.

Hybridization, Migration, and the Diffusion of Innovation

Hybridization and migration as theoretical frameworks for archaeology grew out of postcolonial theory. Postcolonial theory is an umbrella concept that grew out of a response to colonialism and seeks to examine interaction from the perspective of both the colonized and the colonizers. Using this theoretical lens, it is possible to do away with the dichotomous colonized/colonizer approach and instead examine social interactions (Voskos and Knapp 2008). This model allows for fluidity in the concept of identity, particularly important when examining the very intricately involved eastern Mediterranean. Voskos and Knapp note that archaeologically hybridization of cultural traits can be identified, particularly for ProBA Cyprus.

Postcolonial theory has always been contentious and carries with it some identified criticisms. These include the tendency to subjectivize political struggles by reduction of these struggles to psychic tensions, the avoidance of political economic models, an avoidance of the binarism of colonialism itself (the colonized and the colonizers), a commonwealth-centered approach neglecting non-European colonial interaction, and a failure to take ecological and climate change into account (Stam and Shohat 2012). Despite these hurdles, the application of postcolonial theory can allow for the more holistic examination of cultural exchange and interplay.

The hybridization of populations containing both newcomers and existing groups requires there to be significant previous contact for a smooth transition to a new, conglomerated society. Stevens et al. (2014, p. 1738), in an examination of modern Greek and Turkish Cypriot interactions, note that "national identifications and the constructed physical and cultural boundaries change according to social context." Identification of the *other* is accomplished based on the following characteristics: (1) their ideological content (fixed ideologies regarding supremacy), (2) the relational orientation (either self-assessment or comparative), and (3) the importance of national and/or ethnic identity for the individual (Stevens et al. 2014). The concept of the *other* allows for identification of *us* versus *them*, and it allows for the creation of group identity by exclusion (Rappa 1999; case studies in Schmidt and Schröder 2001). What, then, occurs when there is no clear distinction of *us* and *them?*

It is possible that social remittances are at play in integration and hybridization. Typically, migration theory is more concerned with economics than with social interaction. As Levitt and Lamba-Nieves (2010, p. 2) note, "Migrants carry ideas, practices and narratives which enable mobility and different forms of membership and belonging." Migrants bring their skill sets from their place of origin to a new location. If they stay in contact with their places of origin, they also transmit cultural information in a backward manner. In this way, cultural exchange occurs in a continual feedback loop. For individuals residing in trading communities, sending messages and ideas throughout the Mediterranean would have been accomplished along with the dissemination of goods such as olive oil and copper, beginning in the PreBA. As with the study of identity discussed above, migration studies are varied and should be examined within a defined cultural construct. As Mains et al. (2013, p. 138) note:

> Instead of thinking of movements as arrows across maps, lines are deemed intellectually, historically, and archaeologically more appropriate. Lines do not determine boundedness of the communities from which folks came; or those to which folks are moving. Instead lines acknowledge the circulation, movement and cultural transfer have been integral to human populations, their cultures and society.

Again, the interconnectedness of both the place of origin and new home are linked through contact and communication in a reciprocal network (see also Vertovec 2001). Migrants may "link their cross-cutting belongingness with complex attachments and multiple allegiances to issues, peoples, places and traditions beyond the boundaries of their resident nation-states" (Çaglar 2001, p. 610). As Cyprus continued to be a trading partner to the rest of the eastern Mediterranean and Anatolian and Levantine mainland, it is likely that cultural contact was extensive, facilitated by migrants acting in a hybridized Cypriot society. In discussing mobility studies, identity can be seen as a product of social interaction rather than fixed relationships to territory (Glick Schiller and Salazar 2012).

According to Levitt and Lamba-Nieves (2010), studies of gender, class stratification, religion, and political impacts all vary depending on the groups studied. Lutz (2010) examined the role of gender in migration studies and found that gendered labor requires a different level of analysis based on the type of research questions asked. On one level (their macro-level), migrants are typically found in gender-specific professions. On a meso-level, these professions may make different demands on workers. Agricultural workers are seasonal, whereas domestic work is year-round, for example. A meso-level of analysis also looks at gendered models of care and family organization as well as networks and the ability for social mobility. On a micro-level, individuals and positions are at play. This level of analysis looks at the individual worker and the balance between the place of origin and a new homeland. Archaeologically, we tend to operate on meso- and macro-levels of analysis. Gendered work patterns can therefore be examined in light of migration as well. On Cyprus, there is a general tendency to assume gendered work in the production of ceramics and textiles (e.g., Crewe 2012).

Castles (2010) presents a new model for the analysis of migration. He argues that a general theory of migration, as an outgrowth of modern industrial society, is not possible. Part of the reason behind this is that migration has complex and diverse underpinnings. People may migrate for issues relating to livelihood, political, economic, or social factors (Collinson 2009). Instead, theoretical growth can be found in linking migration to issues of social change and transformation. Social transformation occurs through migration, often resulting in relationships of power and inequality (Castles 2010). Castles (2010, p. 1576) defines this as "a fundamental shift in the way society is organised that goes beyond the continual process of incremental social change that are always at work." In essence, this provides a punctuation to the constant rate of social change that is expected to occur. Migration is integral to discussions of social change and transformation and needs to be viewed within specific cultural contexts. As noted by Van Hear (2010, p. 1532), migration and transformation examine the relations "between time and space, between dynamics or processes and outcomes, and between structure and agency. Mediating

agents and transitions need also to be accounted for, as do intersections among class, gender, generations, ethnicity and other social cleavages."

Mains et al. (2013) argue that postcolonial theory and migration theory should be examined in concert since the "bodies of those postcolonial migrants continue to provide a daily reminder of the spaces and practices of colonial pasts and the necessity for a critical understanding of the postcolonial present (and future)." Postcolonial theory challenges the dichotomy of *here* and *there*, instead "points to the political possibility of recognizing a shared postcolonial terrain" (p. 133). This allows for the identification of hybridity within modern constructs. There is no reason that the concept of hybridity cannot be extended into the past (e.g., Voskos and Knapp 2008).

Any discussion of hybridization or blending of multiple cultures into a new coherent one must provide a mechanism for change to occur. One such method is the diffusion of innovations theory. Rogers (1995, p. 11) defines diffusion as the "process by which an innovation is communicated through certain channels over time amongst members of a social system." Innovations can be either material (such as the increased use of the potter's wheel or the redesign of a plough) to ideas or practices (such as the introduction of new religious practices or mortuary rituals). The introduction of innovative technology or practices occurs through a staged process. This begins with the diffusion of knowledge of technologies or practices and a cost-benefit analysis to adopting the innovation. Modification of the new technology or practice may occur through this process to make it satisfactory to the social system as a whole. The cost-benefit analysis weighs potential benefits of adoption versus those of the current practice.

Adoption may be tempered by various cultural factors, including social structure. Henrich (2001) notes that in prestige-biased transmission of cultural traits, high-status individuals adopt innovations and are followed by lower-status individuals within society. Baustian and Falvey (2013) also argue that individuals or households in situational hierarchies may have a similar effect, suggesting that the hierarchy need not be a permanent state. In this way, social status may be gained in a temporary fashion that may help lead to permanent hierarchy. In Cyprus, improved smelting or farming activities that may have evolved through a situational hierarchy may have become institutionalized when these individuals gained significant wealth or prestige through innovation.

Urbanization

Anwar (2014, p. 26) notes that postcolonial analyses of urban spaces should be acknowledged. "The city is a place where politics of identity restructure urban processes in distinct ways." Anwar notes that the concepts of identity and difference are important to the analysis of urban environments through a postcolonial lens. Anwar's focus is on modern constructions in Southeast Asia, but her research can shed light on the rise of urbanization at the end of the Late Bronze Age (LBA) on

Cyprus as well. "The politics of place and the politics of identity and difference are co-constitutive, a terrain on which claims of 'origin' and strategies of fixing identities becomes important for marginalized groups (Jacobs, 1996)" (Anwar 2014, pp. 25–26). Entrepreneurship is an important element to these new constructions. Economic opportunities exist for both the previous and new inhabitants of a city. In a place like Cyprus, where urban centers were developing at the same time as groups were migrating to the island, this co-occurrence could have allowed for the construction of both new urban spaces and new urbanized identities without the culture shock usually accompanying migratory events.

Cultural Continuity: Adding Another Line of Evidence to the Interpretive Picture

Examination of commingled and fragmentary remains can present analytical challenges, but a great deal can be learned from their use. In addition to their inherent data potential to understand health and disease in the past, the examination of commingled burials as a social process illuminates ideas about collective kin, the importance of land tenure, and social use of both the body and the landscape. They also provide interesting and exciting mechanisms for looking at social cohesion and prompt the reworking and combination of theoretical models. Looking at the body as a material object that can be manipulated both physically and socially is just one aspect. Commingled and fragmentary assemblages, especially on an island like Cyprus with marginal skeletal preservation, can often provide an important line of evidence for the examination of migration patterns, identity, and the negotiation of social space.

Cyprus and the Mediterranean in the Bronze Age

Cyprus has always held a strategic position within the Mediterranean. Janes (2010, p. 144) describes the island as a "stepping stone," forming a stopping point for trade routes going east from Southwest Asia, north from Egypt, and west from Greece and Crete as early as the Middle Cypriot period.

It is impossible to discuss any one part of the Mediterranean without respect to interaction with other parts of the Mediterranean and without respect to trade (e.g., Knapp 1990; Muhley et al. 1988; Sherratt and Sherratt 1993). Discussions of political complexity also center on access to trade goods as well. Knapp (1990) details how various researchers discuss interconnections from various view points and notes that any direct association between trade and urbanism is overly simplistic.

The geography of the Mediterranean basin allowed for great interconnectivity from the Paleolithic onward. The Mediterranean itself is known for having very little tidal activity, allowing for currents to provide significant navigational aids.

As DiBenedetto and Simmons (in Simmons 2014, p. 49) note, deep sea currents flow counterclockwise, "following the North African coast eastward from Gibralter, turning north by the Levantine coast and going around Cyprus up the Turkish coast, and counterclockwise around the Black Sea." This would have put Cyprus directly in the path of any navigation and trade route relying on currents.

Geography and cultural differences must be taken into account while discussing trade in the Mediterranean during the Bronze Age. Trade within this region involves the interaction of multiple cultures, from Egypt to Sardinia, from the Levant to Crete. These are very different cultures; it is quite possible that, for some of these cultures, access to external trade routes was very important for the maintenance of hierarchy such as the trade relationship between elites that held control over trade routes (e.g., Kelder 2009).

Broodbank (2013) argues that Cyprus was buffered from larger cultural breakdown at the beginning of the PreBA by its relative isolation in the eastern Mediterranean. As discussed above, copper provided an entrance into the larger trading network for Cyprus. Broodbank (2013, p. 373) describes the eastern Mediterranean of the third millennium BC as "a theatre of interaction." Goods and skilled craftspeople likely moved between islands for a multitude of reasons. A constant in trade was the long-distance exchange of metals and metal goods. Textiles were likely also important, but leave few archaeological traces. Evidence of dye workshops and molluscs known to produce purple dye have been found throughout the Aegean (Broodbank 2013) and at Hala Sultan Tekke (Karageorghis 1976).

There are two time periods where population increases are inferred from the archaeological record (the PreBA 1 and ProBA 1). These population increases tend to occur with concurrent social change and increasing hierarchy and complexity in the mortuary program. Population increases for both of these time frames has typically been attributed to the arrival of newcomers onto the island, either as refugees (fleeing the breakdown of the society in the western part of the Eastern Mediterranean) or as colonizers. The nature of the newcomers has significant effects on the health status of both the indigenous Cypriots and the newcomers.

Central to discussions of cultural change and complexity is the Vasilikos Valley, a central valley with access to both copper resources in the Troodos Mountains and coastal access for trade (Fig. 1.1). This valley was chosen as it had representative skeletal samples from the PreBA through the ProBA and access to important agricultural land and commodities (primarily copper). The skeletal assemblages from three sites within the valley were well excavated and present a longitudinal record of biological responses to social change. These sites are compared with three other sites from around the island to look for regional variation. Though preservation of the materials is sometimes marginal, data gathered from multiple lines of evidence tell a story of continuous adaptation and change through time.

One major question at the heart of this research is the nature of population movement onto the island in the early PreBA and ProBA. Various scholars have hypothesized that colonization occurred during this time frame to explain the introduction of new cultural elements (discussed further below). The nature of these new cultural innovations would impact health and robusticity of the island, depending on

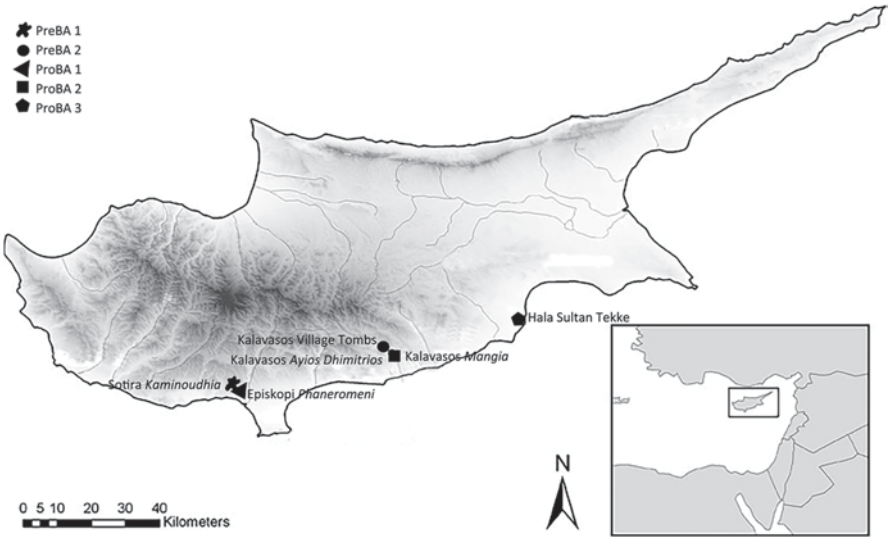

Fig. 1.1 Map of Cyprus with sites discussed in the text

whether the action was colonization versus migration. Did the local Cypriot population integrate with newcomers or were they culturally dominated by the newcomers? Health profiles of indigenous groups who have undergone a colonizing event (i.e., the arrival of a new group with enforced cultural change) show definite signs of poorer childhood nutrition as well as increased rates of violence. This analysis looked at the frequency and timing of childhood stress indicators as well as the incidence of cranial depression trauma as indicators of the use of violence and social control as indicators of enforced social change (Table 1.1).

Table 1.1 Chronology of the Bronze Age and sites discussed within the text

Period	Phase/culture	Dates (Cal BC)	Associated sites
Prehistoric Bronze Age (PreBA) I	Philia "Phase"	2400/2350–2250	Sotira-*Kaminoudhia*
	Early Cypriot I–II	2250–2000	Sotira-*Kaminoudhia*
			Kalavasos Village Tombs
	Early Cypriot II–III		Kalavasos Village Tombs
PreBA II	Early Cypriot III–Middle Cypriot (MC) I–II	2000–1750/1700	Sotira-*Kaminoudhia*
			Kalavasos Village Tombs
Protohistoric Bronze Age (ProBA)	MC III–Late Cypriot (LC) IIIA	1750/1700–1050	Kalavasos Village Tombs
ProBA I	MC III–LC I	1700–1450	Episkopi-*Phaneromeni*
			Kalavasos Village Tombs
ProBA II	LC IIA–LC IIC early	1450–1300	Kalavasos-*Ayios Dhimitrios*
			Kalavasos-*Mangia*
			Kalavasos Village Tombs
ProBA III	LC IIC late–LC IIIA	1300–1125/1100	Kalavasos-*Ayios Dhimitrios*
			Hala Sultan Tekke

Firstly, though, how do we measure identity through material remains? How do we say that a specific material culture is *Cypriot* versus *Minoan*? Frankel sees these pieces of material culture as evidence of *habitus*, the combined aspects of material cultural and beliefs that make up an individual's social identity (or ethnicity, in his verbiage). If social identity is indeed indicated by the goods left behind, then differences in the material culture found during this period indicate a change in social identity.

In the case of PreBA 1 Cyprus, Frankel believes this change in social identity stems from the arrival on the island of Anatolians, based on similarities between the new material culture and that found on the mainland at about the same time. He sees this as a long-term process, with cultural contact extending from the Chalcolithic. Chalcolithic Anatolians were exploring Cyprus and ultimately by the PreBA, were comfortable enough to settle in relatively large numbers. This settlement phase is visible, in this model, as the Philia phase of the PreBA. In some areas on the island, this phase overlaps with the Chalcolithic. For Frankel, this indicates the presence of two distinct groups on the island. By the end of the Philia phase, the newcomers had integrated into the larger society, and the *habitus* that they brought with them became the dominant cultural model (Frankel 2000).

A second model argues for hybridization between migrants (as opposed to colonizers) and local Cypriots to form a new social identity. Colonization is a process where social change is mandated by an arriving group upon the local inhabitants, but migration is a blending experience. Migrants tend to adapt their cultural practices to incorporate large aspects of the local population that they have joined while still maintaining a link to where they came from. This model sees both the migrants and the indigenous population as active agents who may view the interaction with a variety of reactions, including acceptance, ambiguity, or hostility (Steel 2013). This still results in a new social identity based on a blending of what was "home" and what is new (Papastergiadis 2005).

Knapp (2013) favors this explanation. Hybridization as an archaeological model is an outgrowth of postcolonial theory (Voskos and Knapp 2008) and one that seeks to explain mortuary tradition as an "amalgamation" of "materialities" (Knapp 2012, p. 32); in other words, a blending of material cultures that is strictly neither. By using a hybridization model, "any group engaged in transcultural entanglements contributes to the shaping of a hybridized culture. Such encounters typically result in new social and material realities—the emergence of third-space phenomena—forged by different customs, objects, values and traditions" (Knapp 2012, p. 33).

As applied archaeologically to Cyprus, Voskos and Knapp (2008) believe that a blending of local and nonlocal (foreign) cultural attributes are combined to form a uniquely postcolonial Iron Age Cypriot identity that is better known through written sources. In other words, Bronze Age Eteocypriots, Mycenaeans, and Anatolians were all placed in a large cultural blender, from which poured the Iron Age Cyprus social identity. Knapp (2008, 2013) sees signs of hybridization in the archaeological record, including the mixture or blending of iconography and vessel form. Also important for the identification of hybridization are the find-spots of these mixed

forms. Contextually, mixed forms from Late Bronze and Early Iron Age sites tend to be found in every-day contexts, indicating that they were not signs of increased status. Daily contact with foreign groups would have been a normal aspect of life as navigability within the Mediterranean was relatively easy (Boardman 2001). This generally high level of contact would create conditions conducive to a condition that Sommer (2007, p. 100) has described as "pre-colonization." In his work, Sommer does not draw a clear distinction between migration and colonization, and so this can be viewed as a belief that familiarity with other groups will increase the susceptibility of one group to new ideas or immigrants from another.

It is with the arrival of new populations that the burial program begins to become more complex and less individually based. In the earlier portions of the PreBA, single interements are more common, but by the beginning of the ProBA, multiple interments indicating long-term tomb usage and containing the remains of both sexes and multiple age classes are the norm (Osterholtz 2015). Possible reasons for this change are tied together with the formation of new identities and new claims to resources and trade routes discussed above.

In any analysis of commingled and fragmentary remains, the individual is usually not identifiable, leading to a discussion of population-level health, stress, and materiality. Each element becomes a distinct line of evidence. These lines are then combined to form a more complete picture. As an example, consider the dentition from the assemblages included in this analysis. For some teeth, especially those where identification was less precise (i.e., a tooth could only be identified as an upper molar), certain variables can still be scored, such as the presence of dental defects reflecting childhood stress, the presence of carious lesions, and the degree of wear. For other analyses, such as the age of onset of stress incident for dental defects, the tooth had to be identified, and so the sample for these analyses was smaller. Yet, both provide different levels of data that when combined, allow for the identification of the overall rates of dental defects as well as their timing. This allowed for the identification of changing social practices involving weaning. Individuals with a lower age of first stress incident died younger, suggesting that individuals experiencing significant stress early in life are more prone to additional stress, pathology, and have a shortened life expectancy. This concept of "damaged goods" has been noted in other populations (Armelagos et al. 2009), and so it is not surprising to see this pattern expressed here as well. Unfortunately, the nature of the assemblage precludes comparison of dental defect rates for individuals to rates of porotic hyperostosis or postcranial pathology rates. Younger age at death, however, is certainly suggestive of increased susceptibility to stress (Armelagos et al. 2009).

The comparison of age at stress incident across time periods may be used to examine approximate weaning age since this time is known to cause significant stress in the infant or young child. This may be related to large-scale social changes that have been noted in the architecture, subsistence, and living patterns for the entire island. This pattern culminates with an average age of first insult of slightly over 4 years of age for Hala Sultan Tekke, an important coastal site dating to the ProBA 3 period. This later age of insult may be due to later weaning and increased birth

interval between births, but given the incomplete recovery and retention of early excavations, many of which dealt with sites in this period, the relationship between social changes and dental defects are not clear. Earlier periods exhibit a slightly lower weaning age, consistent with interpretations of decreased interbirth interval co-occuring with intensification of agriculture (Armelagos et al. 1991) (which was occurring in the PreBA 1 and PreBA 2 periods).

The regional patterning that begins to emerge in the ProBA 2 period (with lower ages of stress incident occurring at the Vasilikos Valley sites compared to Hala Sultan Tekke) may be indicative of different regional strategies related to subsistence. Hala Sultan Tekke was a prominent trading community on the coast with ties to both the Levant and Egypt, while Kalavasos *Ayios Dhimitrios* and Kalavasos *Mangia* were both more inland and more closely linked to olive oil production, agriculture, and possibly copper manufacture.

Through the examination of even a single indicator, the presence and timing of stress incidents that leave their mark on the dentition, we can see both continuity and change within the bioarchaeological record. This provides an additional line of evidence for a hybridization model as the rapid decreases in overall dental health would be suggestive of a reaction to a colonization event.

Performance and the Relationship Between the Living and the Dead

The movement of tombs from outside the community to intramural spaces in the ProBA indicates a change in the role that the dead play in society. The linking of tomb space to administrative centers suggest the dead remained important for the legitimation of power and the formulation and maintenance of social relationships and hierarchies. The body can be seen as manipulatable, a form of social currency that can be used both ritually and politically. The interplay of mortuary ritual occurring near administrative structures indicates that performative elements were likely important to the maintenance of social hierarchy. Spectacle and the use of space are believed to have been important for the development of Cypriot identity and social structure (Fisher 2006, 2007, 2009a, b). The elaborate funerary assemblages visible throughout the Bronze Age in Cyprus are indicative of the importance of funerary ritual as well.

While ritual does not necessitate a performance, the location of the tombs in intramural spaces is suggestive of a performative element. In this view, the body is seen as a material object that can be used and shaped as needed to negotiate power relationships. Through performance surrounding the dead, including the addition of new individuals into the existing tomb space or the reuse of tomb space by later lineages as a mechanism for establishing fictive kin or legitimizing a new hierarchy, the body is used to cement and reinforce relationships.

Conclusions

Some general conclusions can be drawn from the data used in the overall analysis (Osterholtz 2015). First, there is no statistical difference in any of the identifiable groups examined (age at death, sex, regional, or temporal affiliation) in the presence of general childhood stress as evidenced by dental and osseous lesions (for a discussion of the osseous lesions, see Osterholtz 2015). Dentition shows a subtle change in weaning age toward the later periods, but all time periods exhibit similar amounts and degrees of expression of stress in subadults.

Second, there are no visible regional differences in health profiles. All periods show a consistent pattern in osseous indicators of stress. Subadults died while lesions were in an active or healing phase, whereas adults showed a pattern of healed lesions for postcranial and cranial indicators of stress (cribra orbitalia and porotic hyperostosis). This indicates that juveniles were subject to episodes of stress and that individuals who survived to adulthood were likely subjected to similar stress.

Taken together, these results are consistent with a model of migration and cultural integration throughout the time frame examined. Good's (2008) edited volume looks at the effect of postcolonial social structure in modern settings. This focus allowed for examination of physical and psychological impacts of colonialism through ethnographic research. In the introduction to this work, Good et al. (2008, pp. 14–15) argue that any discussion of postcolonial theory must not overlook elements of postcolonial interaction that not overtly stated, "…that which is unspeakable and unspoken, to that which appears at the margins of normal speech and everyday presentations of self, manifest in the Imaginary, in dissociated spaces…" The application of postcolonial theory to archaeological and bioarchaeological studies does exactly this, particularly in societies lacking a written language. Expressions of social hierarchy (or the lack thereof) are expressed in the bones and architecture used to interpret culture change. In the case of Cyprus, we see architectural changes as well as movements of individuals towards the coasts, but we do not see substantial health differences between the two areas. There are some social changes evident, such as the relatively younger age of onset for developmental defects in the teeth during later periods, indicating a change in child-rearing tactics.

The lack of skeletal indicators of social upheaval argues that the integration of individuals and groups from off-island was a relatively smooth transition. Likely, Cypriots were familiar with these groups from generations of trading and so their movement onto the island that had incorporated elements of their cultures (including religious elements, architectural elements, and trade goods) made for a smooth combination of external and internal to form a uniquely postcolonial Cyprus.

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Chapter 4
Part of the Family: Age, Identity, and Burial in Copper Age Iberia

Jess Beck

Introduction: Why Do Anthropologists Dislike Children?

Though the maxim is that "children should be *seen* and not heard," in anthropology in general, and archaeology in particular, they are often invisible altogether. The field of anthropology has demonstrated "an enduring aversion" to the younger members of society (Hirschfeld 2002, p. 615), and archaeologists have also neglected the study of children and their significant cultural, social, and economic contributions to daily life in prehistory (Lillehammer 1989; Kamp 2001). This omission is particularly troubling because of the overarching importance of children in contemporary and ethnohistorically known cultures—as Hirschfeld underscores, "children are meaningful creatures in virtually all societies" (2002, p. 613). The lack of anthropological attention to children is attributable to a number of different factors, including a perceived lack of social importance, the paucity of children's material culture in the archaeological record, and even their "intrinsic dullness" (Hirschfeld 2002, p. 613; Kamp 2001). Additionally, low rates of infant mortality in contemporary Western societies may be partially to blame, for this demographic effect "make[s] the concept of child death a relatively isolated occurrence…that is not typically woven into the thread of everyday life, or research concerns" (Waterman and Thomas 2011, p. 178). The historical dearth of archaeological analyses incorporating children underscores a significant evidentiary gap in our approach to the past, one that assumes an even greater importance in the study of commingled burials, as estimations of age are one of the primary forms of evidence recoverable from such inhumations. However, a recent focus on the treatment of subadults in archaeology (Moore and Scott 1998; Lewis 2007; Sánchez Romero 2010) and especially their importance in Iberian Late Prehistory (Waterman and Thomas 2011; Cunha et al.

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In Press) demonstrates the increasing attention paid to the role of children in our understanding of the past.

Previous Archaeological Approaches to Childhood and Children

Lillehammer has made the useful distinction between direct and indirect evidence of childhood in the archaeological record. Direct evidence implies the existence of physically discernible traces of children, as in the case of skeletal remains and burials, or even, in one notably unique Mesolithic preservational context, marks from a child's teeth on a piece of resin (1989, p. 99). Indirect evidence, in contrast, comprises objects made by, for, or about children and is often predominant in the archaeological literature. Classical archaeologists begin with the written record, exploring preserved texts for evidence of the role of children in society, and also rely on iconographic depictions of subadult individuals, either on ceramic vessels or represented as figurines (Moore 2009; Muskett 2008). For earlier prehistoric periods, archaeologists have recommended the use of experimental archaeology to establish patterns of craftsmanship that allow for the identification of novice learners, whether by measuring the breadth of thumbs relative to bipolar cores (Lillehammer 1989), or by measuring the ridge breadth of the fingerprints preserved on figurines and clay vessels (Kamp et al. 1999). Lillehammer (1989) has also emphasized the utility of toys for delineating the boundaries of childhood in the Scandinavian archaeological record, detailing the presence of diverse objects like rattles, bird whistles, human and animal figurines, miniaturized cookware, and fishing implements as signatures of the presence of children, and traces of such material culture are just beginning to be recovered for Late Prehistoric Iberia (Nájera Colino et al. 2006). However, the identification of toys as such can be difficult (Kamp 2001). It is telling that in Mycenaean Greek archaeology the recognition of small vessels like *choes* as specifically related to childhood rites of passage is partially dependent on textual information (Muskett 2008). Similarly, the recognition of amulets as a potentially important signature of childhood social transformations in the same cultural context was largely the result of iconographic representations preserved on pottery vessels.

Archaeological interpretations of childhood that rely on direct evidence are often aided by the differential location or distinct mortuary treatment of subadult burials relative to adult burials (Moore 2009; Scott 1991; Skeates 1991). In chronological and geographic contexts where individual burials are more common than collective burials, the differential location of the interments of subadults can be informative about their role in society. Such practices are documented for both contemporary and prehistoric societies. In the Yunnan province of China, the bodies of infants and fetuses are often interred underneath footpaths or nestled in the crooks of trees. These burial locations ensure that the tread of human feet or the actions of scavenging birds will disperse the infant souls, preventing them from returning to haunt their mother's womb (Mueggler 2001). Similarly, analyses of Romano-British in-

fant and neonate burials have demonstrated that individuals in these age categories were deliberately excluded from formal cemetery contexts, and were instead interred in domestic or settlement contexts, particularly in hearths, hypocausts, or bathhouses. The abundant textual evidence of Romano-British ritual and religious beliefs allowed archaeologists to postulate that such differential treatment was the result of the transitional ontological status of young children; their liminality between the physical and spiritual worlds necessitated their differential location "closer to home" (Moore 2009, p. 45). Similarly, archaeologists working in prehistoric mortuary contexts have used the mortuary treatment of subadults to hypothesize differences in their social role and identity, as in the child-specific cremations in the caves of Neolithic Italy (Skeates 1991).

Lillehammer has noted that "The most appropriate basis for an interpretation [of the prehistoric child's world] is the skeletal remains of children" (1989, p. 95). However, the interpretative process becomes more complicated when remains are commingled. Despite the abundance of skeletal elements present in commingled burials, the spatial concentration and admixture that characterize such interments make it difficult to identify differential locational treatment of subadults. Similarly, many of the lines of indirect evidence that archaeologists have relied on to draw conclusions about the lives of prehistoric children, like grave inclusions, toys, or child-sized tools and implements, are lacking in commingled contexts. Accordingly, in order to understand the relevance of children in commingled mortuary contexts, and to develop hypotheses about their social roles and identities, archaeologists working with commingled remains must come up with new strategies for maximizing the information recoverable from this form of direct evidence.

Children in Late Prehistoric Iberia

Establishing new bioarchaeological strategies for identifying children and delineating their social role is particularly important for Late Prehistoric Iberian contexts, where subadults make up 10–58 % of the minimum number of individuals (MNI) at most mortuary sites (Gibaja et al. 2010; Waterman and Thomas 2011; Lechuga Chica et al. 2014; Cunha et al. In Press). Starting in the Neolithic, Iberian populations began burying their dead communally in natural features such as caves and rock shelters. Research on Neolithic Portugal has suggested that in such burials, subadult bones are typically mixed with and given similar treatment to adult bones, and subadults comprise 30% of the burial MNI in Late Prehistoric sites along the Atlantic Coast (Waterman and Thomas 2011, pp. 169–170). While many features of this collective mortuary program were maintained during the subsequent Chalcolithic period, to date little research has been conducted on the degree to which subadults were also included in these later-period inhumations. Because the Iberian Copper Age was characterized by a higher degree of political centralization, agricultural intensification, and population aggregation than the Neolithic, it is important to understand how such factors affected the symbolizing of community and individual

identity. Were children incorporated into communal burials in the Neolithic, but excluded during later periods? Is there differential representation of certain age groups in the Copper Age relative to that in the Neolithic? Or is there a considerable degree of continuity in the approach to childhood burials over the course of Iberian Late Prehistory, despite the significant social and cultural shifts that occurred during this period? By incorporating MNI estimates and the level and patterning of dental and skeletal completion, this analysis will draw upon bioarchaeological methods to shed light on the answers to these intriguing questions.

The Iberian Copper Age (c. 3200–2250 BC)

The Late Neolithic record (c. 4400–3800 BC) is scarce for Spain (Díaz-Andreu 1995; Forenbaher 1999; Gilman 2001), but evidence suggests that agricultural production intensified with the advent of the Copper Age (c. 3200–2250 BC). One of the most marked changes at the turn of the third millennium is the appearance of large-scale, permanent, and often fortified settlements on the landscape. These new settlement patterns occur in conjunction with increasing evidence for craft specialization, metallurgical production, megalithic funerary monuments, the development of wealth differentials in grave goods, long-distance procurement of exotic materials, and the circulation of luxury goods (Chapman 1990, 2003, 2008; Garcia Sanjuán and Murillo-Barroso 2013; García Sanjuán et al. 2013; Gilman 1987, 2001; Nocete 2005; Schumacher 2012; Vicent García 1995)—hallmarks of developing social and economic complexity that appear across the Iberian Peninsula.

Population aggregations and changes in social complexity during the third millennium BC have multiple causes. Most research has focused on the development of systems of irrigation and water control (Chapman 1978; Gilman and Thornes 1985), the concentration of agricultural surplus in a system of staple finance (Díaz-Andreu 1995; Gilman 1987), the conversion of surplus into valuables or exotic products of long-distance trade (Díaz-Andreu 1995; Gilman 1987), the increasingly intense cultivation of cereals and livestock (Mathers 1984a), the exploitation of domesticates for their secondary products (Sherratt 1983; Harrison 1985; Vicent García 1995), and the production and incorporation of new metallurgical products and luxury goods into systems of exchange controlled by elites (Nocete 2006; Nocete et al. 2005, 2008, 2010). Whatever the catalyst for complexity, it is widely agreed that the Copper Age system underwent a radical reorganization during the final centuries of the third millennium, with the decline or abandonment of sites that had previously been centers of activity, fissioning of populations, and a general collapse of inter-settlement organization (Díaz-del-Río 2004a, 2004b; García Sanjuán and Murillo-Barroso 2013; Nocete et al. 2010).

Economic and political systems are not the only social processes that experienced sweeping changes over the course of the third millennium. Iberian mortuary practices during Late Prehistory underwent a series of significant transformations, from communal deposits in pits, caves, and megalithic chambered tombs to inhu-

mations that were structurally simpler but emphasized individual identity through the use of more elaborate grave goods and spatial segregation (Díaz-del-Río 2006; Forenbaher 1999; Gilman 2001; Mathers 1984a, b). During the Neolithic (c. 5500–3300 BC) and Copper Age (c. 3200–2250 BC), individuals of both sexes and all ages were buried communally in artificial caves or rock shelters with utilitarian grave goods such as pottery or stone tools, a tradition that was elaborated over time through the use of megalithic tombs that required communal labor for their construction (Díaz-del-Río 2006; García Sanjuán 2006). During the Bronze Age, (c. 2250–1550 BC) the incorporation of greater numbers of luxury and symbolic goods into specific graves and the increased number of individual child burials attest to the growing emphasis on social inequality and the identity of *individuals*, rather than sodalities or lineages (Lull 2000; Mathers 1984a). This later period witnesses the rise of subfloor household burials, a trend believed to signify the growing importance of the nuclear family at the expense of the clan or extended family (Lull 2000; Lull et al. 2005; García Sanjuán 2006). Funerary practices do vary regionally during the Bronze Age, with less elaborate domestic inhumations characteristic of central Iberia and the inclusion of exotics more common in in the southeast. However, the gradual replacement of large-scale communal tombs by individual containers or small pit burials suggests a decreased amount of community investment in mortuary practices at the regional level, while the standardization of grave goods and tomb form is indicative of the existence of widely recognized symbolic framework with which to signal social differentiation (Mathers 1984b; García Sanjuán 2006).

Marroquíes Bajos

At 113 ha, Marroquíes Bajos is one of the largest sites known for the Iberian Copper Age (Zafra et al. 1999; Díaz-del-Río 2004b; Fig. 4.1). This settlement provides an excellent backdrop against which to explore the treatment and representation of subadults during the third millennium BC, because it is a "mega-village" or "matrix village" site, a novel form of large-scale aggregation with evidence of fortifications or communal labor that is typical of the Copper Age (c. 3200–2250 BC; Fig. 4.2). The new lifestyle at such large-scale centers was characterized by increasing archaeological evidence for managerial hierarchies and brought with it difficult new demands, like navigating complex interpersonal relationships, establishing property ownership, and organizing labor. Understanding the degree to which children were incorporated into the mortuary population at these matrix settlements, and evaluating whether they received the same form of mortuary treatment as adults, reveals whether the inclusive approach to community identity characteristic of the earlier Neolithic period (c. 5500–3300 BC) was still important at such novel, large-scale communities, and also illuminates the degree to which age was an important qualification for community membership.

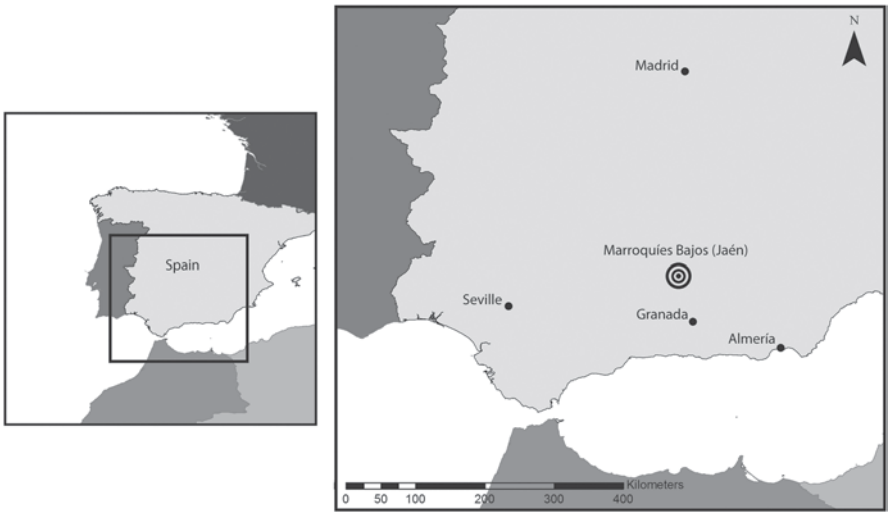

Fig. 4.1 Location of Marroquíes Bajos

Marroquíes Bajos is demarcated by five concentric ditches and an adobe wall surrounding the fourth ditch, with a postulated spatial division between the residential component of the site and outlying storage and fields (Zafra et al. 1999; Fig. 4.2). To date, the overarching chronology for Marroquíes Bajos is based on dates from archaeological features, and suggests an initial foundation of the settlement in the first half of the third millennium, substantial investments of communal labor in the multiple ditch and wall system starting circa 2450 BC, and a dramatic decrease in human activity at around 2000 BC. A gradual shift in domestic architecture from functionally differentiated dwellings grouped around central plazas after 2450 cal BC to multiple domestic complexes bordered by stone walls after 2200 cal BC is also documented archaeologically (Cámara Serrano et al. 2012, 2013; Díaz-del-Río 2004b; Zafra et al. 1999).

Though archaeologists have distinguished between necropolises (N) and *fosas comunes*, or mass graves (F), salvage excavations suggest at least four spatially segregated mortuary tracks, as described in the regional site reports provided by the Provincial Department of Culture (Espantaléon 1957, 1960; Pellicer 1968; Serrano Peña 2000; García Cuevas 2005; Manzano Castillo and Martínez Ocaña 2001; Pérez Martínez 2005; Sánchez et al. 2005; Crespo Kayser et al. 2009 García Cuevas et al. 2012; Cámara Serrano et al. 2013).

1. Commingled and secondary inhumations in discrete mortuary structures (N2)
2. Large collective deposits in pits lacking discrete structures (F1, F2, F3)
3. Multiple individual inhumations in discrete mortuary structures (N1, N3)
4. The burial of a large number of individuals in an expansive artificial cave located outside of the enclosure system (N4)

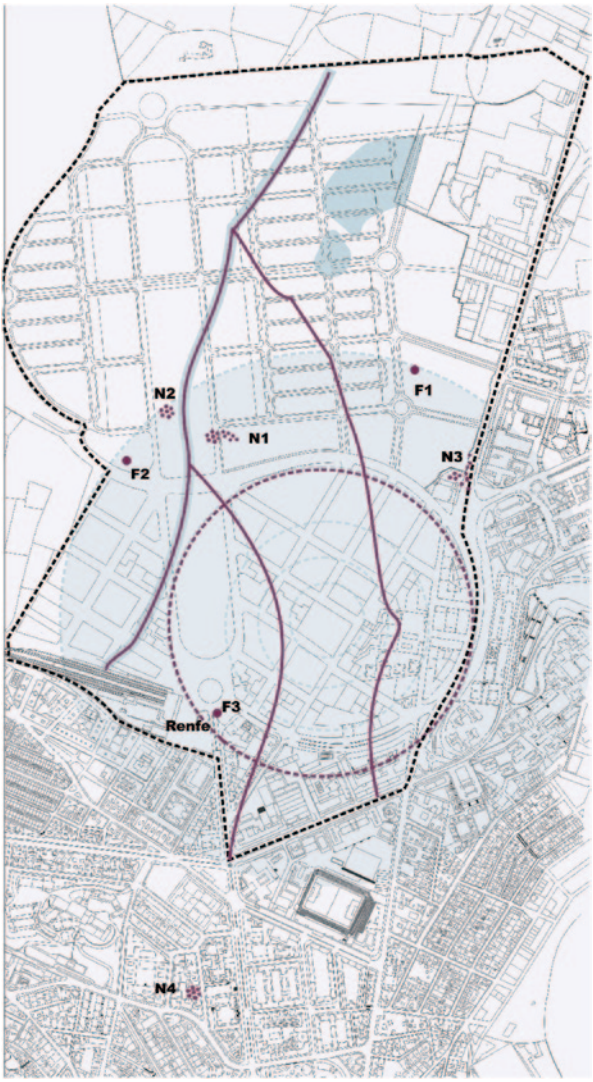

Fig. 4.2 Extent of Marroquíes Bajos and location of mortuary areas. Football field in *bottom right corner* demonstrates the scale of the settlement. *Dark lines* indicate prehistoric waterways, *dotted lines* indicate the extent of the salvage excavations and concentric dotted lines indicate the extent of the wall-ditch system. (Map courtesy of Narciso Zafra de la Torre, Provincial Department of Culture, Jaén)

Two of these mortuary areas have been analyzed previously. F1 has been dated to the second half of the third millennium (Sánchez et al. 2005) and this burial contained the remains of four adult males and at least one subadult with an estimated age of 12–16 years. The mortuary population of N3 was much larger, with over 204 individuals of both sexes and all age categories represented. Most of the mortuary structures in this necropolis appeared to cluster between 2531 and 2132 cal BC (Cámara Serrano et al. 2012, p. 84).

Previous Research and Guidelines for MNI Estimates

In keeping with national archaeological guidelines, all human remains from Marroquíes Bajos are curated by the Museum of Jaén. Within the past decade, both N3 and F1 have been analyzed by Spanish bioarchaeologists, producing MNI estimates of 204 and 5 individuals, respectively (Cámara Serrano et al. 2013; Sánchez et al. 2005). In 2013 and 2014, new data were collected on two previously unstudied mortuary areas, N1 and N2. Categorical age ranges for individuals interred in these newly studied necropolises were explicitly defined to be comparable to Cámara Serrano et al.'s 2013 analysis of N3. Individuals were assigned to age categories: preterm infant (<0 years), child (0–6.9 years), juvenile (7–12.9 years), adolescent (13–20.0 years), and adult (20+years; Cámara Serrano et al. 2013, p. 54). The term "subadult" refers more generally to individuals less than 18–20 years of age-at-death and includes the preterm infant–adolescent ranges. An age range, rather than a point-estimate, is used to define this category because rigorous assessments of age using the skeleton always produce age ranges rather than exact estimates. To prevent individual age estimates from overlapping multiple analytical categories, the midpoint of each estimated age range was used to determine the categorical age of all subadult individuals from N1 and N2. For the purposes of this analysis, any individual with an age range midpoint that was greater than 20 years was placed in the "adult" category.

New Research: N1 and N2

N1 is a Copper Age necropolis situated between the fourth and fifth ditch of Marroquíes Bajos, in the northwest quadrant of the settlement. Salvage-excavated in 1998 and 1999, this mortuary area was characterized by a mixture of primary and secondary individual burials interred in six different mortuary structures. Funerary ritual emphasized the burial of multiple individuals in the same structure, though one structure (structure 22), housed only one burial. Detailed hand-drawn site maps document 46 human burials in six different structures, but ten of these inhumations could not be located in the collections at the Museum of Jaén, likely a result of the decade and a half hiatus between excavation and analysis and the immense volume of salvage-excavated material curated in Spanish museum collections.

The human remains for N1 included an additional 21 bags provenienced to three of the structures, labeled simply "loose bones." When possible, likely associations were made between loose remains and recorded burials, with reference to age estimates, mapped depictions of individuals, and principles of anatomical overlap. It also became apparent that three burials depicted on the site maps actually each contained the jumbled remains of two individuals. Thus, even taking into account the additional loose bones, skeletal data are only available for 42/52 individuals. It is therefore important to acknowledge that the resultant analysis represents an 80%

sample of the documented mortuary population for this necropolis. A full bioarchaeological analysis, assessing skeletal completion, age, sex, and pathology, was conducted for all 42 individuals that could be located in museum collections.

At N1, the site maps also made it possible to make informed decisions as to whether individual burials were *primary* or *secondary*. Burials depicted with a high degree of anatomical articulation and a large number of bones present were considered *primary*. Burials of jumbled elements without any discernible patterns of articulation, or isolated burials of crania and clusters of long bones, were considered *secondary*. These initial qualitative assignations were subsequently bolstered by the bioarchaeological analysis. The 21 burials designated *primary* were on average 41% complete, with 21 teeth per individual. The 18 burials designated *secondary* were on average 16% complete, with 7 teeth per individual.

N2 is a Copper Age necropolis located inside the fifth wall of the settlement. Salvage excavations in 2006 revealed five discrete mortuary structures, as well as one cranium that was excavated out of a wall-cut transecting the settlement's fifth ditch. Descriptions in site reports, photographs of the excavation contexts, and the condition of the remains themselves indicate that these inhumations were extremely fragmentary and commingled in situ. Because it was impossible for excavators to identify discrete individuals in the field given the fragile condition of the remains, all osteological materials within a given structure were stored together in museum collections. By treating each mortuary structure as a baseline unit of analysis, MNI estimates, skeletal completion data, and dental data were collected for the entire necropolis, revealing that at least 33 individuals were interred at this mortuary locale.

Representation of Subadults

The combined analyses of N1, N2, N3, and F1 demonstrate that subadults make up 25−32% of the mortuary population at Marroquíes Bajos; on average, they comprise a little less than one third (30%) of the individuals buried in a given mortuary area (Table 4.1). None of the mortuary areas deviate significantly from an approximate ratio of 30% subadult to 70% adult ($\chi^2 = 1.060$, $3df$, $0.90 < p < 0.100$). This initial analysis suggests that the proportional representation of subadults at Marroquíes Bajos is commensurate with other Late Prehistoric sites in Iberia (Waterman and Thomas 2011; Lechuga Chica et al. 2014; Cunha et al. In Press). What is particularly striking is that young children, older children, and adolescents consistently comprise between 20 and 30% of the mortuary population, regardless of the mortuary treatment at hand (Fig. 4.3). The comparable representation of subadults in mass graves (F1), multiple discrete inhumations (N1 and N3), and commingled deposits (N2) indicates that the groups that buried their dead in these mortuary areas all acknowledged children, juveniles, and adolescents as members of their community or lineage, despite their youth.

Table 4.1 Minimum number of individuals (MNI) by age category (in years), N1–3 and F1 at Marroquíes Bajos

Mortuary area	Preterm infants (<0)	Child (0–6.9)	Juvenile (7–12.9)	Adolescent (13–19.9)	Adult 20+	Total pop.	% MNI subadult
N1 sample	0	9	0	2	31	42	0.26
N2	0	4	3	1	25	33	0.24
N3	4	34	18	7	134	197	0.32
F1	0	0	0	1	3	4	0.25
Total	4	47	21	11	193	276	0.30

Dental Preservation of Adults and Subadults

In addition to the proportional representation of subadults in the mortuary population, another line of evidence available to archaeologists interested in the treatment of younger members of society is anatomical representation. There is a large body of research devoted to establishing the relationship between the anatomical representation of assemblages of human remains and the likely mortuary treatment individuals received at death (O'Shea and Bridges 1989; Roksandic 2002; Larsson 2003; Outram et al. 2005; Stodder 2005; Beckett and Robb 2006; Lieverse et al. 2006; Redfern 2008). Primary inhumations, secondary burials, and mass graves all produce different preservational signatures, which can be used to identify the mortuary program pursued by a community (Table 4.2). For example, one taphonomic signature of secondary burial occurs when lower numbers of teeth are observed than expected (Roksandic 2002). Examining the number of teeth preserved relative

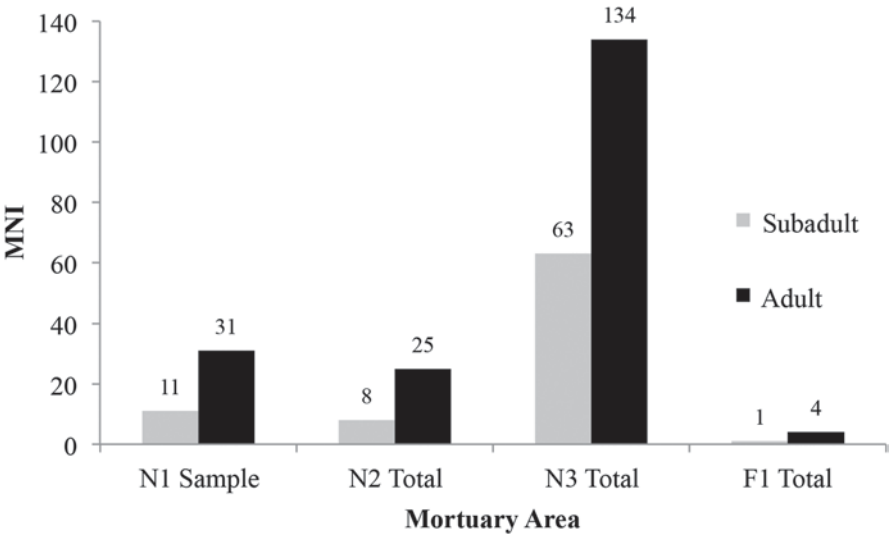

Fig. 4.3 Adult and subadult minimum number of individuals *(MNI)* at Marroquíes Bajos

Table 4.2 Taphonomic indicators of different mortuary tracks

Type of burial	Taphonomic indicators
Ossuaries (diachronous and synchronous depositions)	*If diachronic*: uniformity in the degree of decomposition (Roksandic 2002)
	If synchronic: variable patterning in anatomical connections, related to differing degrees of decomposition (Roksandic 2002).
	Sorting, elements grouped and spatially segregated from other elements (Olson 1966; Larsson 2003)
	Large but fragile bones (e.g., scapulae, pelves) should be well represented (Beckett and Robb 2006)
	Small and fragile bones (e.g., carpals, tarsals) will likely be missing (Beckett and Robb 2006)
Excarnation by exposure	Evidence of gnawing, cutmarks, and dry bone fractures, weathering or burning (Olson 1966; Redfern 2008)
	Archaeological evidence of exposure platforms and/or pits containing disarticulated human remains
	Patterning or differential representation relative to known sequences of disarticulation (e.g., cranium first, legs last; Redfern 2008)
Primary burials	Higher completeness, virtually all bones present (Roksandic 2002; Beckett and Robb 2006; Lieverse et al. 2006)
	Presence of small bones (Reilly 2003)
	High articulation—fully or partially articulated individuals present, with both persistent and nonpersistent articulations present (Roksandic 2002; Reilly 2003; Lieverse et al. 2006)
Secondary burials	Lower completeness and articulation, remains "disorganized" (Olson1966; Lieverse et al. 2006)
	Sorting of human bones (Olson 1966)
	Lower number of small bones observed (e.g., vertebrae, phalanges,) than expected (Olson 1966; Roksandic 2002)
	Long bones and ribs heavily outnumbered tabular bones such as pelves and scapulae (Olson 1966)
	Weathering or burning may indicate processing or exposure for excarnation (Olson 1966)
	Underrepresentation of normally well-preserved elements (Roksandic 2002)
	Lower levels of dental completion than expected (teeth susceptible to falling out of the alveoli after the decay of the periodontal ligament; Roksandic 2002)
Synchronous primary burials (mass graves)	Partial or full articulation of individuals (Outram et al. 2005)
	Evidence of trauma (Outram et al. 2005)
	Bioarchaeological signatures of (i) epidemics, (ii) massacres, or (iii) ritual suicides of elite households (Roksandic 2002)

to the adult and subadult MNI at a site provides one means of establishing whether subadults were treated differently than adults—if, for example, children preferentially received primary burial in contexts where the adult signature suggests secondary burial, or vice versa.

Dentition at N1 was well preserved, with 435 teeth associated with adult individuals, 12 loose permanent teeth that were associated broadly with analyzed adults, and 133 teeth associated with subadult individuals. In contrast, dental preservation was markedly poorer at N2, with only 186 permanent teeth, 16 developing permanent teeth, and 1 deciduous tooth preserved for the entire necropolis.

Calculating Expected Counts for Dentition

Expected counts for adult dentition were calculated by multiplying the adult MNI by 32 (the number of permanent teeth for an individual with all three molars erupted)[1] and then reducing the value with reference to the frequency of antemortem tooth loss within the necropolis. Expected counts for subadult dentition were calculated by matching the midpoint estimated age of individuals to the corresponding age in Ubelaker's chart documenting the sequence of formation and eruption of teeth (Ubelaker 1989, Fig. 71). Because of interindividual variability in rates of dental attrition, it was not possible to confidently associate permanent loose teeth with subadult individuals. Accordingly, only expected counts for deciduous and developing permanent teeth were used when examining dental preservation for the N1 and N2 subadults, and the two adolescents (13.31, 14.15) who were old enough to have only their permanent dentition were removed from the analysis.

Results of Dental Completion Analyses

The results of the dental completion analyses highlight the higher levels of completion at N1 relative to N2 regardless of age, and the higher levels of completion for burials identified as primary relative to burials identified as secondary. N1 adults preserved nearly half of their expected dentition (447/923 teeth), while N2 adults preserved only 27% (186/696 teeth). Similarly, N1 subadults preserved 43% of their expected dentition (120/280 teeth), while N2 subadults preserved only 15% (17/112 teeth). Lower preservation of subadult teeth, even in cases of primary burial, is to be expected given the smaller size and less robust nature of deciduous and developing permanent dentition.

[1] Third molars are occasionally agenetic (Lavelle et al. 1970), which means that adult individuals can have between 28 and 32 teeth. Future research will calculate the frequency of third molar agenesis within the Marroquíes Bajos tooth populations by comparing dental eruption to age estimates based on dental attrition, in order to further refine expected counts for adult dentition.

Patterning in Dental Preservation

The pattern of dental preservation produced by secondary burials is particularly distinguished by the absence of the anterior dentition, as the incisors are most susceptible to disarticulation from the alveolar processes after the decay of the periodontal ligament (Haglund 1997). The preservation of incisors at N1 and N2 replicates the overall preservational patterns for dentition more generally. While the mortuary sample at N2 represents almost 80% of the mortuary sample at N1 (33 individuals at N2 relative to 42 individuals at N1), the dentition from N2 preserves only 31% of the incisors represented at N1 (37 incisors at N2 relative to 119 incisors at N1). Focusing solely on the sample of N1 incisors that could be associated with interments identified as either primary or secondary burials ($n=106$) reveals that three quarters of the incisors (80/106) can be provenienced to primary burials, while only one quarter of the incisors (26/106) came from secondary burial contexts.

This pattern persists when the sample of *only* developing permanent and deciduous subadult incisors is examined. The mortuary sample of subadults at N2 represents 73% of the mortuary sample of subadults at N1 (8 subadults at N2 vs. 11 subadults at N1), but the subadult dentition from N2 preserves only 5% of the incisors represented at N1 (1 subadult incisor at N2 versus 20 subadult incisors at N1). Of the subadult incisors from N1, 11 (55%) are from primary burials, and 9 (45%) are from secondary inhumations. This sample is too small to subject to chi-square analysis, but the patterning is clear across both necropolises—regardless of age, the mortuary population at N1 preserves a far greater proportion of its incisors relative to MNI than does N2, particularly the primary burials from N1. Importantly, subadult dental signatures tend to track the adult dental signatures from the same mortuary context—where completion is low for adults, it is also low for subadults, and vice versa.

Skeletal Completion

Analyzing the degree of skeletal completion at a given necropolis provides another method by which to investigate the mortuary treatment of subadults versus that of adults. Examining the observed number of bones relative to the expected number of bones based on the MNI, for both adults and subadults, can reveal whether or not they were treated in a similar manner.

To start, the expected minimum number of elements (MNE) was calculated by estimating the number of bones in a complete individual skeleton with reference to the recording system used during analysis. A modified version of Knüsel and Outram (2004) was used to record completion for all elements. This system excludes delicate intracranial bones such as the vomer, ethmoid, and miniscule bones like the auditory ossicles. The hyoid, coccyx, and non-patellar sesamoid bones were also excluded from this analysis as these were rarely recovered at either mortuary

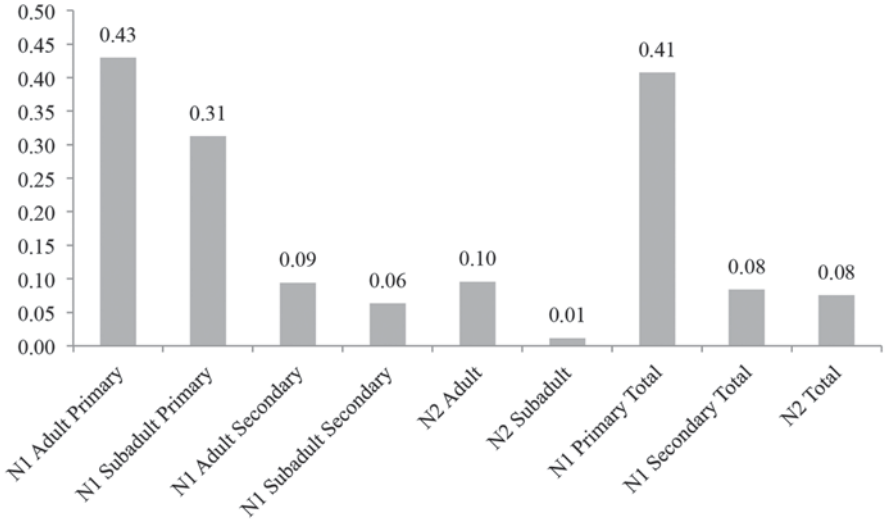

Fig. 4.4 Percentage of expected minimum number of elements (MNE) observed for each mortuary sample

area. This produced a final count of 192 bones per individual. This value was then multiplied by the mortuary area MNI in order to produce an expected count. For example, one complete individual has a total of six arm bones (humerus, ulna, and radius from both sides). If the MNI for a given mortuary area was ten, then the expected count for arm bones would be 60.

Finally, subadults have a greater number of individual components of elements than adults due to the developmental patterning of ossification. However, for the purposes of this analysis, the same expected MNE estimate was used for adults and subadults because (i) at N2 so few subadult bones were recovered that all epiphyses were identifiable and counted towards the MNE for a given anatomical region, and (ii) at N1 most elements were associated with specific individuals, so epiphyses could often be refit to, or associated with, long bone diaphyses and thus did not artificially inflate the observed MNE.

The comparison between observed MNE counts and expected MNE counts immediately revealed the completion gap between primary and secondary burials. Primary burials at N1 preserve 41 % of their expected MNE, while secondary burials at N1 preserve only 8 %, aligning exactly with the 8 % level of preservation at N2. Though subadult levels of completion always fell below adult levels of completion, this pattern was likely a result of the increased difficulty of retrieving smaller and more fragile subadult bones more prone to taphonomic destruction and loss during excavation (Manifold 2010). Importantly, the patterning of subadult levels of completion mimics the adult levels—for the subadults, primary burials from N1 come closest to reaching their expected MNE (31 %), followed by secondary burials from N1 (9 %), while burials from N2 show the lowest levels of completion for any sample (1 %; Fig. 4.4).

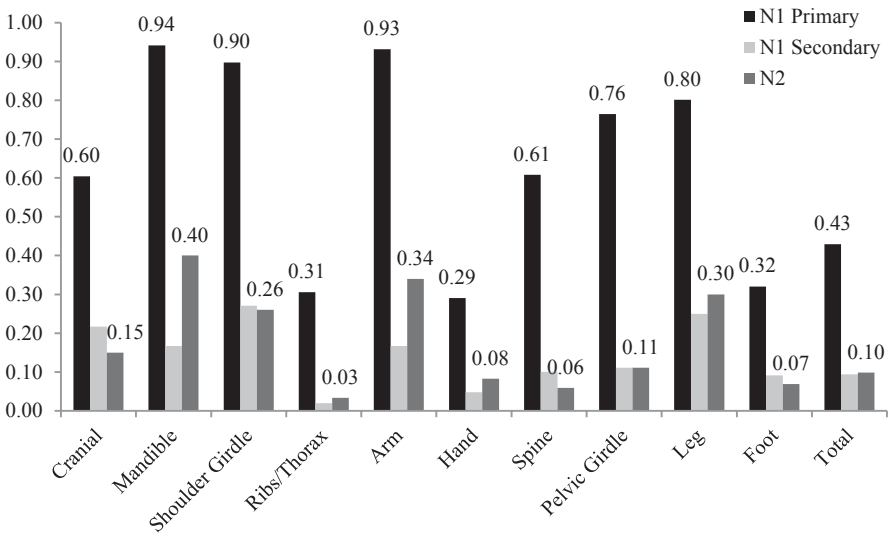

Fig. 4.5 Percentage of expected anatomical representation in adult burials from N1 and N2

Anatomical Representation of Adults and Subadults

A final strategy that can be used to establish whether subadults were granted the same mortuary treatment as adults is by examining the types of elements preserved for each age category. Do observed patterns in anatomical representation hold for both subadults and adults, or are adults' bodies treated differently than those of children and adolescents? Similarly, is the assemblage at one or both of the necropolises dominated by a certain kind of element? For example, ossuaries in protohistoric North America, where individuals are subject to multistage mortuary processing, show assemblages dominated by crania and limb bones (Olson 1966; O'Shea and Bridges 1989). In contrast, primary depositions are expected to show a more even distribution of skeletal elements, regardless of element size (Roksandic 2002; Beckett and Robb 2006; Lieverse et al. 2006).

All elements analyzed were assigned to an anatomical region, and adults were examined separately from subadults in order to parse out the anatomical signatures of primary and secondary interment. For both secondary adult burials at N1 and N2 adult burials, large appendicular bones and the skull showed the highest levels of preservation, while the bones of the hands, feet, ribs, and spine showed the lowest levels of preservation (Fig. 4.5). For primary adult burials from N1, large appendicular bones and mandibles were also well preserved, and cranial, spinal, and pelvic elements were found in greater abundance than in secondary interments. Importantly, though bones of the hands, feet, and ribs were poorly preserved relative to other categories of remains, nearly one third of the bones expected for these regions were still recovered—a far cry from the < 10 % levels of preservation in the secondary adult burials at N1 and N2. In sum, the sharpest contrast between the pri-

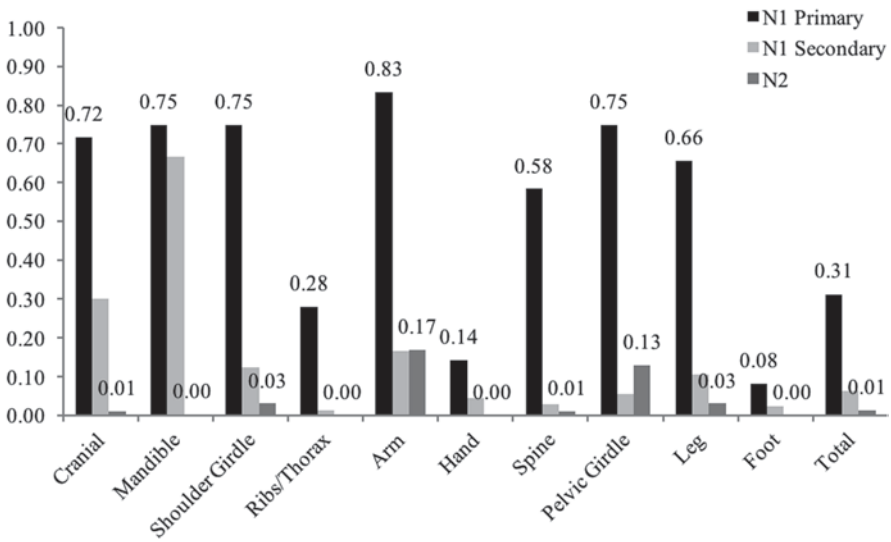

Fig. 4.6 Percentage of expected anatomical representation in subadult burials from N1 and N2

mary and secondary adult interments is that the smallest and most fragile bones in the body—specifically vertebrae, ribs, and bones of the hands and feet—appear in far greater numbers in primary inhumations, with each of those anatomical regions achieving approximately 30 % or greater of expected MNE levels.

A similar pattern prevails within the subadult sample (Fig. 4.6). Secondary subadult burials from N1 show the highest levels of completion for the skull, arm, and shoulder girdle, and the lowest levels of preservation for the spine, foot, and ribs. N2 subadults show the highest representation of elements from the arm, shoulder girdle, leg, and pelvic girdle, while demonstrating a complete absence of mandibles, bones of the hands and feet, and ribs. While primary subadult burials from N1 follow a broadly comparable pattern of preservation in which the skull and limb bones are the most likely elements to be observed, these individuals show a 55–57 % higher greater representation of the vertebrae, a 27–28 % higher representation of ribs, a 10–14 % higher representation of hand bones, and a 6–8 % higher representation of foot bones than the secondary burial samples.

The presence of skulls and limb bones and the absence of smaller bones of the hands, feet, ribs, and spine is a pattern of preservation that has been observed for subadults in other archaeological contexts (Manifold 2010). The ubiquity of this pattern and its replication at Marroquíes Bajos suggest that subadult anatomical representation at the site is related to taphonomic and methodological factors, rather than deliberate prehistoric cultural selection or exclusion of elements. Additionally, the anatomical composition of the subadult assemblage is similar to that documented for adults at Marroquíes Bajos, in which primary interments are also more likely to include higher numbers of vertebrae, ribs, and bones of the hands and feet.

Spatial Organization and Material Culture

It is particularly striking that at each necropolis, the analyzed subadult inhumations were concentrated in the structures with the greatest number of burials—structures 13 and 14 at N1 and structures 43, 44, and 45 at N2. An examination of the site maps for N1 reveals that one of the missing burials from structure 26 (26.03) is represented as being far smaller than surrounding individuals and is buried in the same flexed position typical of N1 subadult burials. If 26.03 is also a subadult, this represents a third instance of this pattern in this necropolis.

Additionally, subadults are never the sole occupants of mortuary structures—the individual burial from N1 (22.01) and the individual cranium from N2 (Corte 47) are both adults. Research at partially contemporaneous sites in the Upper Guadalquivir region suggests that this may be a regional trend. Venta del Rapa, only 20 km away from Marroquíes Bajos, is a Late Copper Age village dated to 2350–2000 cal BC. Its necropolis contains three mortuary structures in which 61 individuals are interred, and subadults are interred in the two mortuary structures (structure 125 and structure 301) that house the greatest number of burials (Lechuga Chica et al. 2014).

Finally, the two structures that house all of the analyzed subadult burials from N1 also house relatively complete animal burials. Though a more detailed analysis of the material culture accompanying the interments is necessary, some of the wealthiest grave goods from N2, like the bronze halberd with rivets and at least five bone awls (*punzones*), come from structure 44 and structure 45, where the majority of the subadults are interred. Of the two interments at N2 lacking subadults, structure 39 had no grave goods, and cut 47 only produced a small lithic and a fragment of worked bone.

Discussion

Marroquíes Bajos represents a unique instance of early population aggregation at a new type of large-scale center, so it is important to explore whether people at this settlement were replicating earlier forms of Iberian funerary practices or were using new types of mortuary practices to integrate their larger and more diverse community. This "macro-village" also presents a key opportunity to explore the treatment of subadult remains during the Iberian Copper Age because the site has multiple different mortuary contexts, making it possible to establish the degree to which both the incorporation and representation of subadults varied relative to funerary treatment.

The results of this analysis suggest that, in spite of the unique organizational features that establish Marroquíes Bajos as one of a handful of large-scale enclosure sites in southern Spain, subadults *still* comprise an average 27 % of the population in any mortuary area, a proportion comparable to other Neolithic (c. 5500–3300 BC) and Copper Age sites (Cunha et al. In Press; Waterman and Thomas 2011; Lechuga Chica et al. 2014). In addition to their commensurate inclusion in all mortuary areas

at Marroquíes Bajos, subadults received similar mortuary treatment to adults wherever they were buried. At N1, there are both primary and secondary adult burials, and the dental and skeletal evidence suggests that subadults also received both types of mortuary treatment. For this necropolis, 39 individual interments could be designated either primary or secondary with reference to site maps and bioarchaeological analysis; 58% ($n=17$) of adult inhumations were primary, while 41% ($n=12$) of adult inhumations were secondary. The proportionality is comparable for N1 subadults, with 40% ($n=4$) primary burials and 60% ($n=6$) secondary burials. Though the N1 subadult sample is skewed slightly towards secondary burials, this trend may be the result of small sample size rather than prehistoric cultural practice. At N2, where secondary burials with extremely low levels of completion were the standard for adult remains, such interments were also standard for subadult remains. Regional archaeologists have suggested that secondary burials represent the final step in a multistage processing program, and if this is the case, it is clear that subadult inhumations were subject to the same multistage program as adults.

Subadult burials were generally less complete than adult burials. This pattern is likely attributable to the increased taphonomic destruction of subadult remains and the increased possibility of bypassing smaller and more delicate subadult bones during excavation, rather than the result of deliberate ritual choices made by the community at Marroquíes Bajos. Preliminary analyses of anatomical patterning suggest that the lower number of subadult remains relative to adult remains is not due to preferential burial of only specific types of elements (e.g., the deliberate inclusion of only subadult crania). Instead, subadult levels of skeletal completion and anatomical representation generally mimic the signature for adults accorded the same type of burial. N1 primary burials of *both* adults and subadults show the greatest levels of skeletal and dental completion for the sample, though subadults achieved a slightly lower percentage of the expected MNE than adults (Figs. 4.5 and 4.6). In contrast, the preponderance of skull and limb bones and the paucity of smaller bones of the hands, feet, torso, and spine in secondary subadult burials at N1 and N2 tracks the anatomical pattern of adult secondary burials at those necropolises. The composition of the secondary subadult burials also reflects a recurring anatomical pattern observed for subadult assemblages at other archaeological contexts (Manifold 2010). The predominance of larger limb bones and crania and the absence of smaller and more delicate elements in this subset of subadult burials can thus be tied both to the prehistoric practice of secondary burial and the intervening effects of several millennia of taphonomic destruction.

Despite its novel status as a large-scale settlement, the treatment of subadults at Marroquíes Bajos closely parallels their treatment at far smaller Late Prehistoric mortuary sites dating to the fourth through second millennium BC. However, there is some ambiguity in the literature as to the degree to which the youngest members of society were included in Late Prehistoric interments. (Cunha et al. In Press). osteological survey of subadults from multiple Late Prehistoric sites in Iberia indicates that individuals under 1 year of age were present, (though how *many* infants were present is unclear); in contrast, Waterman and Thomas (2011) have argued that infants are underrepresented at Late Prehistoric sites along the Atlantic Coast of

Table 4.3 Age estimates for N1 and N2 subadults

Necropolis	Structure	Individual ID	Age (years)	Midpoint age (years)
N1	14	4	1.8-3	2.4
N2	44	E	1.5–3.5	2.5
N1	14	2.1	2-3.25	2.6
N1	13	14	3–6	4.5
N1	13	206	3–6	4.5
N1	13	31.2	5–6	5.5
N1	14	12	4.5–6.5	5.5
N1	14	21.2	3–8	5.5
N1	13	21	3–7	5.7
N1	14	2.2	5–7	6.0
N2	45	H	4–8	6.0
N2	41	A	5.5-7	6.3
N2	43	C	5.5-8	6.8
N2	45	G	7–15	11.0
N2	43	B	8-16.5	12.3
N2	44	D	7–18	12.5
N1	13	31.1	14–16.5	15.3
N2	45	F	12–21	16.5
N1	14	15	16–19	17.5

Portugal. When the individual age ranges of subadults from Marroquíes Bajos are examined, the site population follows the pattern observed along the Atlantic Coast; individuals with a midpoint age of <3 years make up only 15% of the subadult mortuary sample for N1 and N2 (Table 4.3).

The absence of the remains of the youngest members of society from mortuary contexts is a phenomenon frequently documented in both archaeology and ethnography. A number of factors contribute to the differential treatment of children, including the unique social or symbolic status of infants (Kamp 2001; Moore 2009; Scott 1991), and the use of liminal ceremonies to delineate the status of subadults (Muskett 2008). For example, Mycenaean communities held two ceremonies in the first 10 days of a child's life, one held on the fifth day after birth, when it was decided the child should be reared, and a naming ceremony held on the tenth day after the child was born, when the child was considered likely to survive (Muskett 2008, p. 46). In Romano-British contexts, infant burials were spatially segregated from the burials of older adults and children because the very young were considered "transitional beings" that were unable to pass into the underworld (Moore 2009, p. 45). Waterman and Thomas have argued that similar processes may have taken place in the Late Neolithic Portuguese Estremadura (c. 3500–2500 BC), where infants were not accorded the same burial rites as children and young adults (2011, p. 170). The absence of infants at N1 and N2 lends further support to Waterman and Thomas' hypotheses and suggests that the distinct ontological status of infants may have been maintained in Iberia throughout the Late Prehistoric period.

Though sample sizes are small, additional evidence for the different treatment of younger children can be found in the demography and spatial organization of N1 and N2. Both younger and older subadults were accorded the full sweep of primary and secondary treatments, but it is intriguing that subadults were always buried in structures *together* with adult individuals. Structures or areas with single inhumations were reserved solely for adults. This distinction suggests that while subadult bodies were processed in the same way as adult bodies, the locations where they could be interred were constrained. Younger individuals were clearly important members of the Marroquíes Bajos community, and time and energy were invested in their mortuary treatment. However, it may be that for subadults, particularly children and juveniles, their membership in a lineage or social group was a more powerful component of their social identity than their individual identity based on their accomplishments and relationship with other members of the settlement.

The differential treatment of younger and older subadults may also provide an indication of age-related beliefs about "personhood" comparable to the Romano-British context. In many cultures, being treated as a "person" is contingent on successfully navigating specific social or biological rites of passage (e.g., baby teeth, menarche, education, or apprenticeship) that infants are too young to access. Ethnohistoric and archaeological evidence attests to different ontological conceptualizations of young infants, and resultant differential mortuary treatment of infants relative to older children and adults, particularly in areas where infant mortality is high (Scheper-Hughes 1992; Harlow et al. 2008). Future research that assesses the mortality profile at Marroquíes Bajos and other matrix village sites could shed light on the possibility that infants were not eligible for the same suite of mortuary treatments as other individuals due to their younger age. Similarly, the presence of older subadults solely in communal mortuary contexts suggests that children and juveniles could not be buried on their own; perhaps, for cosmological or ritual reasons they needed to be surrounded by members of their social group for protection or comfort. A more detailed examination of Late Prehistoric mortuary sites dedicated to assessing the co-occurrence of subadult interments with adult burials has the potential to identify whether this is a recurring pattern, and at what cultural or biological developmental stage this form of treatment became unnecessary.

Single primary inhumations may also have been more ritually or energetically expensive to prepare, and thus reserved for older members of society who had more time to develop strong socioeconomic relationships in their community, a pattern which has been argued both for human societies generally (Binford 1971) and specifically for subadults in Iberia (Waterman and Thomas 2011). It should be noted that the single cranium in cut 47 was a younger adult estimated to be between 18 and 25 years of age based on third molar development. While adults were defined as individuals over 20 years of age for this analysis, this distinction was made specifically so that the sample could compare to earlier work at N3. It is possible that older adolescents (e.g., 16 years+) could have been accorded adult status due to their productive and reproductive capacity. Further examinations of the Iberian record, specifically targeting single burials of adolescents may shed further light on

such categorical designations, and allow bioarchaeologists to unpack at what age or developmental period the status distinction of "adult" was achieved.

Finally, the burial of subadults in mortuary contexts that also house expensive grave goods like animal sacrifices or well-crafted weapons and personal accessories makes it possible that the wealth of the social unit responsible for interring individuals may have played a role in whether younger individuals were likely to be buried. If a mortuary deposition was a ritual demanding time, energy, and contributions of material wealth, it is possible that not all social units could afford to bury their youngest members. Contrasting the quantity and quality of grave goods and faunal inclusions, relative to data about the age of interred individuals, for a wider variety of Copper Age sites could shed further light on these intriguing patterns.

Importantly, the new demographic data from Marroquíes Bajos parallel recent findings from other regional settlements, particularly the partially contemporaneous small village site of Venta del Rapa (2350–2000 cal BC), only 20 km distant. At Venta del Rapa, 5/18 (28%) of subadults were children (0–7 years), and 12/18 (66%) were juveniles (7–12 years; Lechuga Chica et al. 2014). This suggests that at both larger and smaller regional settlements, >80% of subadult inhumations are either children or juveniles (0–12 years of age). At Marroquíes Bajos, the greatest spike in subadult burials occurs for older children between 4 and 7 years of age, who comprise over half of the subadult mortuary population at N1 and N2. At N3, the majority of subadult burials (34/60 or 54%) are also children, though precise age estimates for these individuals are not discussed (Cámara Serrano et al. 2013). The preponderance of older children in the subadult sample for N1 and N2 is intriguing as these individuals are too old to fall prey to the typical hazards that beset infants and toddlers in traditional agricultural and pastoral communities, such as the loss of passive immunity associated with weaning (Jason et al. 1984; Pearson et al. 2010). However, the increased number of burials during older childhood at Marroquíes Bajos may be attributable to a number of similar health-related factors including increased morbidity or increased fertility of regional populations after the onset of agriculture. First, increased mobility, independence from familial supervision, and initial contributions to agropastoral labor efforts could have heightened the potential for severe injury for children in this age range. To this day, younger children are assigned productive tasks in both agricultural and pastoral societies (Stinson 1980; Strassman 2011), and it is likely children's capacity for domestic labor was similarly exploited by sedentary prehistoric communities. Waterman and Thomas have previously made this argument for the Atlantic Coast, noting that over time children would have been an "increasingly valuable source of labor," contributing to tasks ranging from harvesting plant resources, to herding livestock, to clearing agricultural fields (2011, p. 171). Severe injuries and deaths related to these new labor pursuits could thus explain the larger cohort of 4–7-year-old individuals. A second possible contribution to this phenomenon could be related to the decreased inter-birth intervals and subsequent increases in fertility that are well-documented for populations transitioning to more sedentary ways of life. Future research in Iberia examining chronological and spatial variability in the size of the

mortuary cohort of older children could help to ascertain whether this is a regional phenomenon associated with the onset of farming.

The impressive spatial scale, more complex internal organization, and significant labor investment in site architecture at Marroquíes Bajos suggest that a degree of social restructuring was necessary to found the first "matrix villages" in southern Iberia. At one end of the spectrum, such settlements may be evidence of opportunistic individuals or social groups capitalizing on the constraints of sedentism by exploiting available community labor. Conversely, the development of communal social mechanisms for promoting the logistical organization necessary to marshal and deploy labor efforts may have been key. Either way, if contributions to or control of productive labor provided the social and economic foundation for the establishment of large-scale villages, the inability of subadults to make significant contributions to labor efforts could lead them to be excluded from mortuary contexts and de-emphasized within the larger social sphere.

The present bioarchaeological analyses shed light on this dilemma. The mortuary record at Marroquíes Bajos suggests that life did not change drastically for individuals living in this large-scale settlement. Instead, the inhabitants of this "mega-village" buried their dead in inclusive communal interments that incorporated even very young members of society. The pattern of interment precisely replicates mortuary practices in existence since the Late Neolithic (c. 4400–3800 BC), when subadult remains were given similar mortuary treatments to adults, and buried together with adult remains. The maintenance of such an inclusive approach suggests that accruing social importance was a process independent of the new forms of productive labor investment in large-scale site architecture. Instead, the presence of younger children in burials with wealthier grave goods suggests that an individual's social status, and any subsequent investment in their mortuary treatment, was likely related to their membership in social groups or lineages, a scenario which supports previous hypotheses concerning the maintenance and collapse of these early centers (Díaz-del-Río 2004b; 2011). The inclusion of subadults in communal mortuary contexts also emphasizes the importance of younger individuals in the development and maintenance of such lineage identities. After infancy, every individual was treated as a part of a cohesive social unit, and membership likely played a large role in treatment during life as well as treatment after death. The simultaneously pervasive and inclusive nature of these social groups, and their incorporation of almost all members of the Marroquíes Bajos community, may help to explain how significant investments of labor were marshaled and deployed at this third-millennium center.

Analyses of the material culture accompanying these burials are still ongoing, but differences in the quantity and quality of artifacts interred within structures suggest variability in the economic capacities of the social groups interring individuals. For children, juveniles, and adolescents, the wealth of their encompassing social unit, rather than age-related definitions of personhood, appear to have been the primary factor affecting their inclusion in mortuary contexts. This patterning suggests that membership in social lineages or sodalities, rather than individual contributions to productive labor was the defining factor that underlay the development and expression of community identities at these new matrix village sites.

Conclusions

A spate of recent research has begun to address the presence of children in the prehistoric archaeological record (Moore 2009; Muskett 2008; Kamp 2001; Kamp et al. 1999; Scott 1991; Skeates 1991; Waterman and Thomas 2011). However, many of the strategies commonly employed by archaeologists interested in childhood—the differential location of child burials relative to adult inhumations, the recovery of material culture specific to children, or iconographic representations of subadults—are less accessible to archaeologists working in commingled burial contexts. Despite differences in the nature of the available evidence, there are several strategies that bioarchaeologists can adopt that are informative about the likely role and treatment of children in prehistoric communities.

Studies of anatomical representation provide one means of assessing whether the burial treatment of adults and subadults was similar as they allow us to ask whether adult and subadult bodies were granted the same mortuary treatment after death. A focus on age, combining age estimates and the proportional representation of different age categories, is another strategy for determining when in life certain types of social roles were achieved. As Waterman and Thomas (2011) have outlined in their insightful study of childhood burials in Late Neolithic Portugal (c. 3500–2500 BC), the absence of certain age groups like infants and young children can be used as a basis to understand the age at which "personhood" was likely acquired. Similarly, the complete absence of subadult remains from many Italian Neolithic mortuary sites from the sixth through fourth millennium BC has been used to hypothesize that children were accorded a status and social role distinct from that of adults (Skeates 1991). Finally, in contexts with sufficiently high preservation and precise spatial documentation, the placement and location of subadult remains within commingled burials themselves can be informative (Fitzpatrick and Nelson 2011).

Investigating the status of children using prehistoric commingled burials is a daunting task. However, the use of bioarchaeological analyses designed to evaluate patterning in fragmentary and commingled remains has the potential to shed light on whether children were treated as distinct social beings or as full members of the local community. A focus on subadult burials at Marroquíes Bajos reveals that in spite of the novel demands of living in an aggregated settlement, the inhabitants of this large-scale enclosure site maintained continuity with a traditional Iberian mortuary program emphasizing the inclusion of subadults. With the exception of infants, similar mortuary treatments were extended to both adults and subadults of all ages, indicating that children and adolescents were still woven into the social fabric of these matrix village sites. In the case of Marroquíes Bajos, combining the commingled evidence with regional research and bioarchaeological methods reveals that even at new kinds of concentrated settlements, children were accepted as important members of society and were treated as "part of the family" from a very young age.

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Chapter 5
Limited Circumstances: Creating a Better Understanding of Prehistoric Peoples Through the Reanalysis of Collections of Commingled Human Remains

Maria Panakhyo and Keith Jacobi

Situations involving commingled human remains are often complex, and the condition of the assemblage is compounded by variable skeletal preservation and the state of the recovery site. With such inherent variation, each situation involving intermixed individuals is unique and shapes the foundations for how a researcher can approach an excavation or museum-collection-based study. For instance, when confronted with commingled human remains in a contemporary archaeological context, taphonomic processes and associated material objects are of vital importance in forensic efforts to separate the commingled individuals into discrete entities for both identification purposes and return to the next of kin. While the temporal nature of forensic cases of commingled human remains is regulated by medicolegal procedures, prehistoric and historic studies of commingling are not situated in the same framework.

In response to the temporal nature of bioarchaeological studies, investigations involving commingled individuals are driven by the theoretical objectives of the researcher and an overarching interest in developing a more well-rounded understanding of prehistoric peoples. With these goals in mind, researchers of commingled human remains face their own set of challenges. Time is a crucial component to take into consideration when working with commingled human remains. Prehistoric skeletal remains are subject to a much greater duration in which taphonomic processes can cause bone dispersion over a geographic area, deterioration of bone to the point of fragmentation, and intermixing of the interred individuals. Alongside natural processes, commingling can be inadvertently compounded during the

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excavation and curation processes. Osterholtz and colleagues (2014a) note in their edited volume on commingled and disarticulated remains that commingled assemblages typically fall into three categories: (1) long-term use, (2) episodic use, and (3) lab commingling. These classifications take into consideration the events that occur during and around the time of interment as well as the research activities which can contribute to the commingled nature of the assemblage. Although many challenges exist when working with commingled assemblages, bioarchaeologists are still able to obtain information from these situations (see case studies in this volume, in Osterholtz et al. 2014b and Adams and Byrd 2008).

In this chapter, bioarchaeological methods in skeletal and paleopathological analysis are used to demonstrate the applicability of social theory to the study of commingled assemblages and to gain a better perspective of a community unit found in northern and central Alabama during the Middle Woodland period (A.D. 1–500). The curated collection of commingled human remains excavated from the Lewis Jones Cave Ossuary (1Sc42) is not only representative of what archaeologists refer to as the Copena Mortuary Complex in northern and central Alabama, but it also provides an opportunity to explore the social dimensions of community life during the Middle Woodland period from the perspective of human biology. Research of the mid-south region and the Copena Mortuary Complex indicates that small, localized groups shared mortuary traits in the form of mound construction and cave ossuaries (Walthall 1980). While burial mounds offer insight into the mortuary practices and the inclusion of burial goods (Cole 1981), the relatively few known cave ossuaries in northern and central Alabama have been noted to contain commingled, disarticulated, and fragmented human bone assemblages caused by either looting and/or natural environmental processes (Walthall and DeJarnette 1974). By revisiting the curated Lewis Jones Cave Ossuary assemblage, further insight will be provided on the community unit based upon analysis of the paleodemographics and pathological conditions of the individuals once interred within the burial site.

Theoretical Outlook

In bioarchaeological studies, researchers have gradually shifted from compiling osteological reports to the implementation of varying dimensions of social theory in order to obtain more meaningful results from the study of human remains. The emerging objectives of social bioarchaeology focus on answering questions about how biological distinctions found during osteological analyses may influence or impact our understandings of social domains. Trends in bioarchaeological research include questions about age (Sofaer 2011), sex (Hollimon 2011), violence (Martin et al. 2012), childhood (Thompson et al. 2014), disabilities (Cook et al. 2014), and identity (Stojanowski 2009; Stojanowski 2010), to name a few. These seemingly broad categories are often reflected in the scope of the researcher's project and specific question(s) being asked.

In regards to the concept of identity and, more specifically, identity at the community level, bioarchaeological studies are often framed around questions of ethnicity and ethnogenesis (e.g., Knudson and Stojanowski 2009). Tackling such inquiries with prehistoric and historic populations necessitates regional studies often involving analyses of bone or dental morphological differences as indications of genetic variation (Knudson and Stojanowski 2009; Knudson and Stojanowski 2008). In one such study, Stojanowski (2009, 2010) collected dental measurements from pre- and post-contact Native American groups in Florida to demonstrate the Seminole ethnogenesis that stemmed from colonial contact. In order to address the question of ethnicity formation, his study involved both temporally and geographically known samples as well as viable dentition for metric data collection. Stojanowski's results demonstrate the depth to which bioarchaeological studies can be applied to learning about community-level identity.

Likewise, in Beck's (1995) study of Copena burial patterns along the Tennessee River, she is able to demonstrate potential ethnic diversity within the region by examination of excavation records. Beck (1995) utilizes Tennessee Valley Authority (TVA) basin survey records of burial goods and traits to suggest an east to west ethnic difference within the region. For her study, the archaeological context and burial goods provide a means of developing a better understanding of the communities using Copena mortuary practices in the interment of their dead within burial mounds.

The question then becomes, what can be said about community identity within the context of commingled human remains? How can a research question about the lived experiences of a community be answered with a limited archaeological context? So, what can be said for commingled assemblages and the communities which they represent?

In lieu of conducting region-wide analyses or attempting to answer larger questions about the ethnicity of Copena-related communities, this study seeks to provide a baseline for looking at community identity within curated assemblages of commingled human remains. Here, community identity is formed by delving into the paleodemographic and pathological data of a localized population engaging in regionally shared mortuary practices. While the paleodemographic data provides further insight into the overarching mortuary behaviors, pathological information alludes to social life in terms of lived experiences, health patterns, subsistence practices, and social interactions. This study of community identity focuses on a singular community unit, as represented by the individuals interred within the Lewis Jones Cave Ossuary, to develop a closer understanding of the shared, lived experiences of the individuals within the community. This approach has two additional advantages. First, nondestructive techniques are used in analysis. Second, new data is retrieved by revisiting a curated assemblage of commingled remains that had been understudied due to the remains being commingled. By taking such an approach with the Lewis Jones Cave Ossuary assemblage, this study provides a starting point for learning about the potential similarities found between small, Middle Woodland period communities located in North and Central Alabama.

The Archaeological Record As It Stands

Large-scale archaeological excavations conducted by the TVA and Works Progress Administration (WPA) during the 1930s and 1940s established the foundations for Copena research. Early publications on the archaeological surveys along the Tennessee River and its tributaries (see Webb and Wilder 1951; Webb and DeJarnette 1942; Webb 1939) provided a list of Copena diagnostic traits which were then used to identify Copena burial mounds, cave ossuaries, and Copena villages throughout the Tennessee Valley. Such diagnostic traits included the presence of copper objects, galena deposits, marine shells, burial furniture, extended burials, foreign clay, and stone artifacts, to name a few (Walthall 1973; Webb 1939). The diversity of the burial goods and burial treatments provided archaeologists with insight into the mortuary complex as a whole and the prehistoric Native American groups that used these burial practices.

A prominent distinction within the Copena Mortuary Complex was the inclusion of local and nonlocal burial goods (Walthall and DeJarnette 1974). In Walthall's (1973) compilation of known Copena sites from the TVA/WPA surveys and subsequent excavations, he draws attention to the diversity of the origins of burial goods recovered from Copena mound and cave sites. Seeman's (1979) analysis of worked objects and raw materials indicates copper was likely traded from the Great Lakes region and galena possibly came from Missouri. The exotic nature of Copena burial goods could indicate an association with the trade and exchange network often referred to as the *Hopewell Interaction Sphere* (Knight 1990; Seeman 1979). Seeman (1979) describes the exchange system as a widespread network, wherein raw materials and goods are moved throughout what is now the Midwest and Southeastern USA.

In addition to the burial artifacts, Copena burial treatments have also been associated with cultures from outside of the Tennessee Valley. Excavations of Copena mounds, and to some extent Copena cave ossuaries, indicated that some individuals had more elaborate burial treatments than others (Walthall 1973; Walthall 1980). In these elaborate burials, a body would be placed in a clay- or bark-lined pit which could also include burial goods and/or clay burial furniture (e.g., headrests). Variations in burial treatment would often include secondary interments, cremations, partial skeletal remains, and relatively few burial goods (Walthall 1973). Due to the similarities in body treatments, people using Copena mortuary practices were once thought to be associated with the Adena, and possibly the Ohio Hopewell (Webb and Snow 1974; Walthall 1980; Walthall and DeJarnette 1974). While the concept of Adena population migration has potential, the prevailing hypothesis is that local groups within the Tennessee Valley adopted and adapted mortuary ideologies which were passed along through interactions with groups from neighboring areas (Faulkner 1970; Knight 1990).

Although early studies of the Copena Mortuary Complex would suggest a strong similarity between Copena sites based on mortuary trait recognition, research has shown variation between the groups using these mortuary practices and within the

practices themselves (Beck 1995; Cole 1981). Knight's (1990) revisit to the Walling site and Cole's (1981) evaluation of the Murphy Hill site build upon the notion introduced by Faulkner (1970) and Walthall (1973) of small, kin-based communities in the Tennessee Valley using similar mortuary practices for the interment of their dead. Artifact analysis suggests that these small communities across the region were variable in the inclusion of burial goods (Cole 1981; Goad 1980). Beck's (1995) regional analysis of Copena burial goods distribution across the Tennessee Valley not only supports the notion of localized communities but also indicates there were ethnic differences between the eastern and western portions of the region.

Prior research on the Copena Mortuary Complex and the communities involved with these practices has been directed toward analysis of burial goods and artifacts recovered from Copena village and burial sites. Webb and his collaborators only briefly mention body orientation or demographic estimations in the TVA basin survey publications (Webb and Wilder 1951; Webb and DeJarnette 1942; Webb 1939). In regards to the Lewis Jones Cave Ossuary assemblage specifically, only Kenneth Turner has studied the skeletal remains. He used temporal bone traits to determine biological relatedness between different temporally and geographically located groups in Alabama (Turner 1980). After Turner's study, the Lewis Jones Cave Ossuary assemblage was analyzed and recorded per Native American Graves Protection and Repatriation Act (NAGPRA) standards in the 1990s. Apart from these previous studies, little is known about the health and lived experiences of the groups using Copena mortuary practices.

Lewis Jones Cave Ossuary (1Sc42)

In the summer of 1977, construction crews working on a golf course near the border of St. Clair and Etowah Counties in Alabama exposed an entrance to a limestone cave (Figs. 5.1 and 5.2; Bryant 1980). St. Clair County law enforcement was called to the site when human bones were found scattered in the cave entrance (Brogdon 1977). Soon after the discovery, authorities consulted Kenneth Turner, a physical anthropologist at the University of Alabama, who identified the skeletal material as prehistoric Native American remains.

Immediate salvage excavation was required, as rumor of the Native American cave site drew the attention of looters and vandals (Bryant 1980). News reports (Brogdon 1977) and accounts from volunteers indicated vandals had maliciously broken skeletal remains within the cave and stole untold remains and burial goods from the site. Within days of the vandals entering the cave, Turner organized a team of volunteer archaeologists and students to map and excavate the skeletal remains as quickly as possible in order to prevent further destruction. The excavation effort yielded skeletal remains and burial goods, and partial plan view and elevation maps were made of the cave ossuary. Additionally, photographs of the cave were taken, and Turner made personal notes about the excavation.

Fig. 5.1 Entrance to the Lewis Jones Cave Ossuary (1977). Photographer unknown. Property of the Laboratory of Human Osteology, University of Alabama Museums, Tuscaloosa, Alabama

Excavation maps and curation records indicate that the skeletal remains were concentrated in low-elevation areas (Futato, personal communication 2013). These concentrations of bone were thought to be attributed to the nearby Canoe Creek draining water through the cave and moving the skeletal remains in the process (Brogdon 1977). Research into the fluvial transport of human remains supports the notion of variable bone shape and density causing inconsistent bone transportation throughout a site (Boaz and Behrensmeyer 1976). Fluvial taphonomy can include full body, articulated units, and isolated bone transport (Evans 2013). In addition to fluvial disturbances, taphonomic processes, such as animal scavenging, heavily contribute to the displacement of skeletal remains from primary interments. As a part of the natural decomposition and fossilization process, carnivores and rodents of various taxa can disperse skeletal remains over a wide range depending upon the environmental context (Haglund 1997; Pokines 2013). Alongside scattering, scavengers contribute to bone breakage and fragmentation. Here, a combination of the cave environment, interment time, and taphonomic processes produced highly fragmented and poorly preserved skeletal material.

Additional concentrations of skeletal material in the Lewis Jones Cave Ossuary were located and led the archaeologists to establish excavation units in the readily accessible areas of the cave. Records from the excavation indicate that there were

Fig. 5.2 A map of Alabama indicating the location of St. Clair and Etowah Counties. Compliments of the University of Alabama's Cartography Reseach Laboratory

concentrations of skeletal remains in what was referred to as the "backroom," "frontroom," and "crawlspace." In addition to excavation units, surface collections took place in accessible areas of the cave ossuary. At the close of the excavation period, the skeletal remains were processed and curated at the University of Alabama's Human Osteology Laboratory. Turner's analysis of the Lewis Jones Cave Ossuary skeletal remains indicated that the site is consistent with Copena mortuary practices (Turner 1980) and is one the few Copena sites located in north-central Alabama.

Analysis

This analysis utilizes data derived from a larger study of the Lewis Jones Cave Ossuary assemblage (Panakhyo 2013) to demonstrate the depth to which information about lived experiences can be gained from curated collections of commingled human remains. In order to study the skeletal assemblage for evidence of lived experiences, multiple methods were first employed to sort the large quantity of commingled human remains. These methods involved determining the minimum number of individuals and rearticulating as many individuals as possible. Upon completion of sorting and rearticulating the commingled assemblage, an extensive analysis was conducted on the skeletal remains focusing on indicators of assemblage paleodemographics, pathological lesions, and traumatic incidences. Attention to these areas of analysis was the subsequent focus of this study and the means to building a better picture of the lived experiences of the individuals represented by the Lewis Jones Cave Ossuary assemblage.

Sorting

Baseline analysis of approximately 1300 bone elements in the assemblage resulted in a minimum number of individuals (MNI) of approximately 62 individuals based upon non-repeating right femora (Panakhyo 2013). Non-repetition was ascertained by only including femora with over 25% completion and if that bone could not be re-articulated with any other fragments in the collection. Due to the poor preservation and high bone fragmentation of nearly all skeletal remains, re-association of bone elements into separate individuals was not possible beyond the pair-matching of nearly complete femora.

In an attempt to pair-match likely femora, comparisons were conducted using both osteometrics and morphological characteristics. Metric comparison involved a recording of all standardized dimensions for femora found in Buikstra and Ubelaker's (1994) *Standards for Data Collection from Human Skeletal Remains*. Potential pair-matches were determined by first calculating an intra-observer error range (1 mm) of the most common femoral dimension and then using this range to ascertain possible bilateral matches. Comparisons of the subtrochanteric dimensions

(medial to lateral and anterior to posterior) indicated 20 potential matches (Panakhyo 2013). These matches are provisional as there were only two measurements of the femur that could be used to incorporate the most femora for comparison due to bone deterioration.

Examination of physical attributes proved to be a strong tool in pair-matching femora. Following Church and Burgett's (1996) approach of utilizing physical characteristics as variables for separating individuals, a table was made using descriptive variables (e.g., age, sex, fusion, bone architecture, etc.) as a basis for comparison. Sorting the assemblage by age allowed for the immediate separation of subadult and adult skeletal remains. Analysis of bone architecture provided multiple lines of evidence to pair-match commingled femora. Traits within this variable included the presence of a third trochanter, midshaft curvature, muscle attachment at the linea aspera, and curvature of the subtrochanter. While variables pertaining to bone morphology and structure provided assistance in determining potential matches, physical characteristics such as staining and weathering were less valuable as fragmentation and differential environmental exposure prevented symmetrical bone deterioration. Comparison based upon observation of physical characteristics resulted in potentially six pair-matched femora (Panakhyo 2013). These potential pairs were consistent with the osteometric comparisons taken during a separate portion of the larger research project.

Skeletal Analysis

In order to explore the lived experiences of the individuals represented by the assemblage, skeletal analysis was focused on examination of the paleodemographic and health profiles. For this study, paleodemographic variables included age and sex estimations. While there are methods for stature estimation of prehistoric Native American populations (Auerbach and Ruff 2010), the necessary measurements were not available due to preservation of the skeletal remains. With the high degree of fragmentation throughout the assemblage, paleodemographic information was limited to crania, mandibles, os coxae, and nearly complete long bones. Age estimations were accomplished with an analysis of developmental and degenerative stages, and sex estimations were achieved through the examination of markers indicative of sex differences.

Likewise, all bone elements large enough for identification were analyzed for any observable abnormalities, pathological lesions, and traumatic injuries as components of the community health profile. Each observation was recorded for placement, general morphology, and any evidence of healing or ossification. What immediately became apparent during analysis of the assemblage was the reoccurrence of several distinctive health conditions.

Analysis of the partial crania and loose temporal bones presented many cases of abnormal bone growths in the external auditory meatus, otherwise known as external auditory exostoses. These bone growths emerge from the walls of the external

auditory meatus and range in size from small, elevated bone lesions to near complete obstructions of the meatus. Furthermore, external auditory exostoses are most often bilateral unlike unilateral osteomas and can occur as single or multiple lesions within one meatus (Özbek 2012; Kennedy 1986; Crowe et al. 2010). In terms of soft tissue and auditory capacity, clinical literature (Kroon et al. 2002) indicates that external auditory exostoses tend to be asymptomatic but can be associated with hearing loss and infection (otitis interna). In a bioarchaeological context, the prevalence of external auditory exostoses in skeletal remains has more implications for understanding lived experiences and activities partaken in life.

In addition to observing the presence of external auditory exostosis, notes were taken on the observable pathological lesions found in the assemblage. Analysis of pathological lesions is often a difficult task as disease can manifest within the human skeletal system in different ways. This variation is, in part, not only due to the reactive nature of bone tissue when presented with infectious agents but also due to the variability in periosteal reaction over the course of a disease progression (Ortner 2003). What may initially manifest as a localized periosteal reaction can change dramatically over time or develop in other locations in an individual's body as the disease progresses into more advanced stages. The diagnosis of pathological lesions is exacerbated by the preservation of prehistoric skeletal remains. Bone destruction, due to environmental conditions and animal gnawing, can obscure lesions or lead to tenuous diagnoses. In taking preservation into consideration, diagnosis of pathological lesions was limited to diseases with distinctive lesions and characteristics that are widely recognized within paleopathological literature (Ortner 2003; Aufderheide and Rodríguez-Martin 2011). In-depth analysis of the more recognizable cases of periosteal reaction indicated a strong presence of treponemal infection.

Recognizable diagnostic traits for treponematosis, also referred to as treponemal infection, most often involve the cranium and limb bones (Aufderheide and Rodríguez-Martin 2011; Ortner 2003). Cranial diagnostic traits can include gummatous lesions that are most often found on the frontal and parietal bones. Lesions of this nature can occur as separate or clustered depressions that are created by necrotic activity (Ortner 2003). Hackett (1981) describes caries sicca, a more characteristic trait of treponematosis, as nodule-like formations created by cycles of bone destruction and remodeling. Additional diagnostic traits found in the cranium can include remodeling of the bones forming the nasal aperture and palate (Hutchinson 2002; Ortner 2003). Postcranial diagnostic traits are most often found in the limb bones and are profoundly recognizable in the tibia (Ortner 2003). Different forms of treponemal infection can manifest as gummatous or non-gummatous osteoperiostitis, meaning there can be both bone destruction and bone formation on the tibia (Aufderheide and Rodríguez-Martin 2011). A recognizable trait of treponemal infection is saber shin or curvature to the tibial diaphysis. Saber shin can be classified as true bowing (when the bone is actually curved) or pseudobowing (non-gummatous lesions creating a bowing shape) (Ortner 2003). These diagnostic traits, specifically caries sicca and saber shin, were observed and described during analysis of the commingled assemblage.

In addition to analysis of the bone elements, observations were taken of the in situ and loose teeth associated with the commingled assemblage. The study of teeth,

even when they are not in situ, can provide insight into dietary patterns and oral health. Dietary patterns are often suggested by the degree and pattern of dental wear. According to Scott and Turner (1988), occlusal wear derives from attrition and abrasion from contact with hard food stuffs and/or objects. While attrition can occur with the natural occlusion of tooth surfaces, abrasive contact with hard or rough objects can lead to the flattening or beveled/angular depletion of the tooth enamel (Hillson 1996). Additionally, oral health and diet are often studied from the presence and prevalence of pathological lesions such as dental caries and periapical abscesses. Where dental caries are demineralized pits formed by localized bacterial buildup, periapical abscesses are pathological lesions extending beyond the enamel and pulp cavity to affect the surrounding bone (Scott and Turner 1988). Macroscopic analysis of dental wear and the estimation of pathological lesions within the population provided a means to discussing tentative dietary patterns for the individuals represented by the commingled assemblage.

Analysis of traumatic injuries consisted of examination of the bone elements for evidence of perimortem injuries or antemortem healing at the fracture or impact sites. Evidence of traumatic injuries was most observable in bone elements that exhibited callus formation at the fracture or impact sites. A callus is evidence for healing at an injury site as the bone formation bridges and reconnects the fractured areas (Ortner 2003). In terms of describing traumatic injuries, Lovell (1997) notes how injuries can be classified as fractures or dislocations based on their characteristics. Within these categories are further descriptive distinctions about the traumatic injury (e.g., fracture type). The notation of callus formations and injury characteristics are important to the analysis of the commingled assemblage, because they provide indications of the mechanisms of injury and if the injured individuals had time to heal afterward.

Analysis of the assemblage also included the observation and notation of dental modifications. Such modifications made during life are intriguing as they are unique to the individual and reflect either cultural conceptions of the body or habitual activities (Alt and Pichler 1998). In regards to dental modification description, Alt and Pichler (1998) argue that there are two classifications for modifications: passive and active. The distinction between the two terms is the intent behind the modification. Where passive modifications occur as an accidental result of habitual action, active modifications are intentionally made (Alt and Pichler 1998). Both incidences of dental modification provide a way of hypothesizing about cultural perceptions of the body and/or habitual activities.

Results

For the paleodemographic profile, sex estimation of the partial cranial vaults indicated there were a minimum of ten females and 16 males buried in the cave ossuary. The estimations of males and females had to be determined by examination of partial cranial remains because there were few surviving os coxae with sex characteristics. In addition, postcranial bones presented a similar situation in which features

or measurements used for sex estimation were not representative of a large portion of the assemblage or the features were simply not preserved (e.g., femoral head, humeral head, and glenoid fossa of the scapulae to name a few).

An age group distribution was estimated from a reevaluation of the collected data. The assemblage contains at least three infants (approximately 1 year), five subadults (under 14 years), and adults of varying age. The three infants are evidenced by medial portions of mandibles with unknown provenience within the ossuary. Likewise, the subadults are presented by non-repeating, partial tibiae. The lack of complete ossification and fusion of epiphyseal ends suggests these subadults were near or under the age of 14 years old (Schaefer et al. 2009). The adult skeletal remains range in age from individuals with recent complete ossification of cranial sutures to adults with complete suture obliteration likely indicating a person of old age.

Analysis of articulated and partial temporal bones from the assemblage suggests a notable presence of external auditory exostoses. Examination of partial cranial vaults with at least one articulated temporal bone indicate that there are a minimum of ten individuals, or 16% of the estimated population ($n=62$ individuals), with at least one irregular bone growth in the external auditory meatus. This percentage is likely a low estimate as there are other non-articulated, partial temporal bones in the commingled assemblage that have evidence of an external auditory exostosis, but these remains cannot be designated as a single individual. The inability to refit partial, non-articulated temporal bones was attributed to the poor preservation of the cranial remains. If one were to broaden the calculation to include all temporal bones as independent occurrences, there is a prevalence of 18% within the assemblage. This percentage inflates the occurrence of external auditory exostosis as it does not account for the occurrence of bilateral exostoses in a single individual.

During analysis of the Lewis Jones Cave Ossuary assemblage, evidence for treponemal infection was found on one cranial vault and multiple tibiae. The cranial vault consisted of the frontal and parietal bones of an adult of unknown age and sex. The treponematosis is evidenced by a cluster of depressions and sclerotic bone isolated to the frontal bone. Beyond this one example of caries sicca, evidence for treponematosis in this assemblage is concentrated in the tibiae. There are seven left and four right adult tibiae with saber shin. All of the tibiae are of unknown sex. If one were to include tibiae with severe periosteal reaction, then there are an additional three tibiae (two left and one right) that are potential examples of treponematosis. Tibiae with this type of reactive bone exhibit remodeling along the anterior crest which is suggestive of non-gummatous lesions, but this finding cannot be confirmed as treponematosis because there are no other supportive indicators.

Macroscopic examination of teeth still rooted in the maxilla and mandible as well as loose teeth recovered from surface collections show occlusal wear, carious lesions, and periapical abscesses. In most cases occlusal wear consisted of cusp attrition, but there are some instances of the occlusal surfaces being worn to pulp cavity exposure. The occurrence of heavy dental wear was found in both in situ and loose teeth. Alternatively, there are relatively few examples of carious lesions within the dental assemblage. Amongst the loose and in situ molars, there are 25–30

cases of carious lesions. These lesions range from the initial pit formation to visible destruction of the crown enamel. This number of dental caries is not particularly high when taking into consideration the estimated total population, antemortem and postmortem loss, and excavation recovery. In addition to the presence of caries, examination of the maxillae and mandibles indicated incidences ($n=6$) of periapical abscess, wherein bacterial growth has accumulated near the apex of the root and created a hole in the alveolar bone (Scott and Turner 1988).

Further analysis of the physical attributes indicated very little evidence of traumatic injury. Within the commingled assemblage, there are two healed long bone fractures and a partially healed depression fracture. The humerus of an adult of unknown sex has periosteal reaction around the location of a healed fracture in the distal portion of the diaphysis. Additionally, the left ulna of an adult of unknown sex retains a callus at the fracture site. In both cases the type of fracture and mechanism was not readily apparent due to bone tissue surrounding the fracture site. What these two cases do indicate is that both individuals, if the long bones belong to separate individuals, had time to heal after the injury. Likewise, an adult male with a robust bone structure had a depression fracture on his left parietal with a corresponding callus on the endocranium. While a depression fracture to the cranium is more suggestive of inflicted interpersonal trauma, there is no additional supportive evidence for violence on the cranium or, for that matter, in the entire assemblage.

Analysis of a particularly well-preserved juvenile cranium provides evidence of work-related activity. This juvenile's age was estimated to be 8–10 years old based upon tooth development and eruption of the maxillary and mandibular dentition. The skull, while nearly complete, was recovered during excavation in a fragmented state. Curation efforts during the excavation and analysis in 1977 included artificial reassembly/refitting, which allowed for the observance of an irregular dental wear pattern by Kenneth Turner (Bryant 1980). Both the left, central maxillary incisor and mandibular incisor have notched grooves in the incisal edges. When the edges meet, they form an oval opening indicating an irregular wear pattern.

Discussion

Paleodemographics

Paleodemographic analysis of the Lewis Jones Cave Ossuary assemblage reveals that males and females as well as individuals of all ages were interred within the cave ossuary. The inclusion of a widely diverse population, in terms of sex and age, suggests intentional incorporation of group members within the burial site. Furthermore, the 1977 excavation records and the present reanalysis indicate evidence of primary burials and cremated remains. Reevaluation and digitization of the 116R3 excavation unit map indicates a possible adult male (represented by an articulated right leg) and subadult (pair-matched femora) were oriented next to one another in

situ (Panakhyo and Funkhouser 2013). Potentially cremated remains, in the form of burnt bone fragments, were found during reanalysis of the assemblage. Even though the Lewis Jones Cave Ossuary assemblage has limited information in regards to interment context, the mortuary treatments and practices found in this cave burial lend support to the ideas of social organization developed in previous Copena studies (described below).

Archaeological investigations of Copena burial mounds suggest groups utilizing Copena mortuary practices were localized communities that potentially had a combination of egalitarian and structured social organization (Cole 1981; Goad 1980). Studying burial goods in the mortuary context led Gloria Cole (1981) to hypothesize that variation in burial good distribution within the Murphy Hill site in Marshall County, Alabama, indicates that people constructing and using the burial mound had a ranked social system between groups. This type of organization involved differential burial goods and was illustrated by the variation found between burial groups. In a similar hypothesis, Sharon Goad's (1980) study of the burial treatment and grave good variations found at both the Robinson site in Morgan County and the Alexander mound in Lawrence County, Alabama led her to the conclusion that communities using these burial sites had segmented tribes with egalitarian organization and prestige positions within society.

Hypotheses developed in these studies demonstrate some of the possibilities for interpreting the diversity in burial demographics and mortuary treatments. The inclusion of males and females, and individuals of all ages, could indicate that the community using the Lewis Jones Cave Ossuary had some form of an egalitarian social organization. Walthall's (1980) overview of Copena burial mounds and cave ossuaries is in line with the concept of egalitarian communities constructing and using the burial sites. While burial groupings could not be readily observed in the commingled assemblage, the hypothesis of an egalitarian society using the same burial site could explain the diverse paleodemographics. This hypothesis may further be supported with the concept of caves as sacred spaces, wherein cave systems are used and reused as interment places (Claassen 2012). As the paleodemographic profile of the Lewis Jones Cave Ossuary offers suggestions of community social organization, pathological findings also yield evidence of lived experiences.

Auditory Exostosis

The presence of external auditory exostoses in the Lewis Jones Cave Ossuary commingled assemblage provides insight into the environmental conditions that confronted these during life. Studies of prehistoric populations often indicate a co-occurrence of external auditory exostosis and engagement in cold-water activities (Kennedy 1986; Crowe et al. 2010). Modern clinical studies indicate that external auditory exostosis is a "reactive condition secondary to multiple cold-water immersions or recurrent otitis externa" (Yadav et al. 2008, p. 2). Kennedy's (1986) study of geographically distinctive archaeological sites indicate that latitude position and

water temperature have strong implications for the frequency of external auditory exostoses. Amongst the sites with higher frequencies of external auditory exostoses, many of them included populations in coastal areas where resources were obtained through diving or geographic areas where riverine freshwater sources were exploited. However, Hutchinson (2002, pp. 150–151), in his examination of Late Prehistoric North Carolina, found that there was "no difference in frequency between inner- and outer-coast populations."

Studies of external auditory exostosis in prehistoric populations have been supported by clinical research involving patients who developed auricular lesions after long-term participation in cold-water activities (Sheard and Doherty 2008). Contemporary cold-water activities that are associated with the formation of external auditory exostoses include diving and surfing, hence the moniker, *surfer's ear*. The consensus within clinical literature (Deleyiannis et al. 1996; Kroon et al. 2002; Sheard and Doherty 2008) is of an association between an individual's time spent participating in cold-water activities, the range in water temperature, and the gradual development of a lesion. This interaction between environmental and activity variables corresponds with the propensity for external auditory exostoses to develop in adults as the lesions slowly manifest under the stress of repeated water exposure (Özbek 2012). Hutchinson and colleagues (1997) and Hutchinson (2002) indicate that ear infection (otitis externa) is a chief causative player in the formation of external auditory exostoses along with cold-water activities.

In addition to the environmental conditions associated with external auditory exostoses, intrapopulation frequency variation between males and females has been attributed to occupational differences. Kennedy (1986) and Crowe et al. (2010) have suggested that higher frequencies or total prevalence of external auditory exostosis within either male or female subpopulations indicates a group charged with activities near or in cold bodies of water. In regards to the Lewis Jones Cave Ossuary assemblage, the crania with preserved sex characteristics and at least one temporal bone with external auditory exostosis do not indicate a sex-based distribution. Two crania out of ten are probable females with at least one external auditory exostosis. The occurrence of external auditory exostosis in both males and females suggests there was most likely not a sex-based difference in resource gathering.

The overall presence of external auditory exostosis in this assemblage provides evidence that some individuals within this population were utilizing the waterways of northern and central Alabama in some way. Based upon prior Copena studies (Walthall 1973; Walthall 1980), exposure could have been due to waterway usage for trade routes, interpopulation interaction, and/or food and resource procurement. It is possible this community used the nearby Coosa River for marine life gathering and access to larger waterways. Validity of such an assumption depends upon the analysis of Copena village sites within proximity to the Lewis Jones Cave Ossuary. These village sites would provide additional environmental and social information that could support the suggestion of repeated cold-water exposure combined with ear infection causing the prevalence of external auditory exostoses in the individuals from this Middle Woodland community.

Treponemal Infection

An exploration of the presence of treponemal infectious lesions has implications for understanding the lived experiences of prehistoric communities. This presence of disease speaks to a community's shifting lifestyles in terms of settlement and subsistence patterns. Published bioarchaeological studies (Powell and Cook 2005) focusing on both paleopathology and regional population diversity provide the groundwork for discussing how treponemal infection is important to exploring the community represented by the Lewis Jones Cave Ossuary assemblage.

Powell and Cook's (2005) compilation of regionally based studies on the manifestation and prevalence of treponemal infection in North America provides a great deal of insight into understanding the importance of treponematosis. By guiding the research objectives with questions about diagnostic traits and population distribution, Powell and Cook were able to synthesize the information and develop overarching conclusions based upon findings across both temporal and spatial bioarchaeological studies. Of particular interest is the tentative relationship between the prevalence of treponemal infection and subsistence and settlement patterns. According to their synthesis, the rate of treponemal infection nearly doubles (5.8–9.0%) between the time of migratory, hunter-gatherer groups and the growth of sedentary lifestyles in some regions of North America (Powell and Cook 2005, p. 466).

Powell and coworkers (Powell et al. 2005) specifically discuss the presence of an endemic treponemal disease and venereal syphilis in the prehistoric central southern USA. Based on their examination of skeletal remains, there is no convincing evidence for venereal syphilis, but there is evidence for an endemic treponematosis especially from the Late Woodland period through Mississippian period. There are cultural features drawn from Swanton (1946) that (Powell et al. 2005) discuss as potential influences in the transmission of treponematosis in prehistoric times. Such cultural features include the sharing of domestic tools and spaces. Communal utensils or close proximity to individuals with open sores could have helped with the transmission of treponemes from one person to another. Furthermore, any medicines used would not heal the infection but might treat the symptoms (Powell et al. 2005). In the eighteenth century, John Lawson, an English explorer, visited the Santee Indians along the Carolina coast and described what may be the result of endemic treponemal infection or some other ailment as it manifested itself in the legs: "they have a sort of rheumatism or burning of the limbs, which tortures them grievously, at which time their legs are so hot, that they employ the young people continually to pour water down them" (Lawson (1709, p 223) as quoted in Powell et al. 2005). Individuals interred at the Lewis Jones Cave Ossuary do exhibit the postcranial pathology of treponemal infection, but we have possible factors such as communal tools, living proximity, and medicinal remedies to provide potential insight into the lived experiences.

Smith and Betsinger (2013) assessed the relationship between disease prevalence and sedentism in Late Woodland and Late Mississippian sites located in Eastern Tennessee. The differences in disease between phases indicate a similar result

to Powell and Cook's (2005) synthesis, wherein a tentative connection was made between increased evidence of treponemal infection and more sedentary lifestyles (Smith and Betsinger 2013). The provisional nature of these findings stems from the inherent differentiation of skeletal preservation between time periods and assemblages. While challenges exist in making a direct comparison between disease prevalence and sedentism, the underlying connection between changes in epidemiology and living style is important to interpreting the Lewis Jones Cave Ossuary findings.

The prevalence of treponemal lesions in the Lewis Jones Cave Ossuary assemblage, and thus its presence in the archaeological record of Copena sites, suggests the possibility of a population in transition to a sedentary settlement pattern. Knowledge of the few Copena villages and occupation sites support the possibility for partial sedentism for the cultivation and procurement of food resources (Walthall 1980), but the extent to which this occurred within the community using the Lewis Jones Cave Ossuary is unknown until further archaeological studies of Copena occupation sites in northern and central Alabama.

Dentition

Dental wear, carious lesions, and periapical abscesses found in the commingled assemblage provide valuable information about the health and diet of the individuals from this community. Continual wear to the point of pulp cavity exposure, as found in some of the loose and in situ teeth in the Lewis Jones Cave Ossuary assemblage, suggests recurrent mastication of hard, dietary goods. Although this pattern of advanced dental wear is inconsistent across all of the macroscopically observed dentition, it is possible that the individuals within this population consumed a mixed diet that may have included some hard and abrasive food items.

The presence of dental lesions in the form of caries and abscesses informs us about the oral health and food eaten by the individuals within this population. A slight presence of carious lesions within the population (25–30 posterior teeth from a population of at least 62 individuals) indicates the potential for food consumption with higher carbohydrates but not necessarily a dietary subsistence wholly dependent upon maize agriculture. As with carious lesions, periapical abscesses have been associated with changes in subsistence and dietary consumption patterns, e.g., the transition to agricultural-based societies (Scott and Turner 1988). Our macroscopic analysis of the loose teeth as well as those present in situ within the skeletal remains suggests that while dental caries and abscesses are present in the individuals from the Lewis Jones Cave Ossuary, there is neither a strict hunter-gatherer nor agricultural pattern to the dental caries or abscesses. There is evidence, however, that some individuals endured some extensive dental caries and were chronically bothered by abscesses that affected the alveolar bone. Findings such as these concur with Copena village site archaeological findings in that individuals were not necessarily dependent upon one source of food for subsistence but used multiple food sources that were readily available and accessible (Walthall 1980).

Traumatic Injuries

While pathological lesions have helped us hypothesize about the social and environmental conditions under which the individuals in the Lewis Jones Cave Ossuary lived, skeletal evidence for traumatic injury also provides insight into life within this prehistoric community. Analysis of the commingled assemblage resulted in the uncovering of two incidences of long bone fractures and one depression fracture in an adult male's skull. All three instances show evidence of ossification and callus formation, thus these individuals had time to heal after their injuries. The minimal evidence for interpersonal trauma tends to support an interpretation of a community with little conflict or violence. Although this supposition may hold for the Lewis Jones Cave Ossuary assemblage, further analysis of neighboring areas in the region is needed for more inclusive regional-level studies.

Activity-Based Modification

The cave assemblage has one case which may be classified as Alt and Pichler's (1998) passive modification. The skull of a subadult approximately 8–10 years of age at the time of death shows signs of corresponding notches in the incisal edges of the mandibular and maxillary central left incisors. Previous studies of dental modifications (Capasso et al. 1999; Schulz 1977) suggest that the notches may stem from the individual using their anterior teeth during a specific activity, namely textile production. Continual use of the incisors as tools to hold and possibly manipulate fibers would have acted as an abrasive surface for the gradual, irregular wear of the occlusal surfaces.

Conclusion and Future Research

Even with the highly commingled state of the Lewis Jones Cave Ossuary assemblage, there is a great deal of information that can be learned about the group's social context and community identity by studying the skeletal remains. The ability to develop hypotheses and learn from a commingled assemblage stems not only from sorting the skeletal remains but by also taking an in-depth look into what the skeletal material indicates about the lived experiences of the population and what can be contextualized within prior bioarchaeological studies and the archaeological record.

The community represented by the Lewis Jones Cave Ossuary assemblage of commingled human remains included individuals of both sexes and all ages within the same burial location. The inclusion of the excavation maps and records during reanalysis indicated that individuals were interred with different mortuary treatments including primary burials and cremations. In terms of lived experiences, analysis

of the bone elements within the assemblage suggests some individuals were using waterways for resource procurement and/or travel. The presence of lesions typically associated with treponemal infection, and to some extent the variation found in the dentition, alludes to a population in a stage between extremes of hunter-gather and agriculturally based subsistence patterns. In terms of social interactions, there is little to no evidence of interpersonal conflict. The few instances of trauma indicate the injuries had time to heal before the individuals' deaths. Analysis of this commingled assemblage beyond inventories and catalogues tells of a community not only practicing regionally based mortuary practices but also encountering the effects of living and thriving in a challenging natural environment.

As this study focuses on a single community, the next step for Copena research is to see if these findings are similar across other known Copena burial sites and skeletal assemblages. Due to the nature of Copena sites and excavations during the 1930s and 1940s, this endeavor will involve revisiting other curated collections of Copena-associated remains that have not been repatriated. While commingling is certainly a potential challenge, particularly with other cave ossuaries, there is still a great deal of information that can be found in returning to and reanalyzing curated collections. If this pattern of subsistence, health, and mortuary behavior reflected within the human remains is consistent across the analysis of other cave sites, we will gain a better idea of life in northern and central Alabama from over 1500 years ago.

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Chapter 6
When Space Is Limited: A Spatial Exploration of Pre-Hispanic Chachapoya Mortuary and Ritual Microlandscape

Lori Epstein and J. Marla Toyne

> *The province of Chachapoyas contains buildings of stone, of a conical shape, supporting large unwieldy busts. They are situated on the declivities of mountains, and in spots so inaccessible, that, in their construction, both the materials and the workmen must have been lowered down by means of strong cordage. They appear to have been the mausolea of certain caciques or principal people, who, being desirous to perpetuate their memory, endeavored not only to secure these monuments from the ravages of time by forming them of the most durable substance, but also from the rude attacks of men, by placing them, where the precipice would prevent his approach. (Skinner 1805, p. 14)*

Introduction

The living make choices about where and how to dispose the bodies of their deceased family or community members. There are many ways to treat the dead but significant research suggests that each is socially meaningful and analyses of mortuary practices can be used to reconstruct those beliefs (e.g., Ashmore and Geller 2005; Parker Pearson 1993; Pader 1982). The process of caring for the dead within the scope of the pre-Hispanic Andes involves several key theoretical components that together help to define how these practices manifest in the physical landscape: The notion of the group versus the individual, social memory and its relationship to

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the landscape, as well as the common Andean practice of ancestor veneration. The creation and maintenance of group and individual identity within a society influences the ways in which the living perceives and cares for their dead, and both can create and result from practiced events. Moreover, the maintenance of the group in society is permeated by the construct of social memory, a source of knowledge that demonstrates how a group experiences its surroundings (Fentress and Wickham 1992). In many Andean societies, the dead exist as an extension of the living, therefore how they as a community are cared for can reflect both the societies' perception of identity as well as express their collective experiences (Buikstra 1995; Allen 2002; Bastien 1995). In this chapter, we explore these concepts among the pre-Hispanic Chachapoya, focusing our analysis on three collective mortuary contexts from the archaeological complex of La Petaca: a natural burial cave and two large tombs *(chullpas)*. By comparing natural and created burial spaces, we explore the formation processes of these mortuary samples and reconstruct how the spatial location and confines influenced aspects of the funerary process.

Unfortunately, human remains in archaeological contexts are subject to complex taphonomic processes including commingling, which can complicate the interpretation of the original intentions of social actors placing the dead into tombs. These complications are often compounded in secondary deposits that have been affected by looting and postdepositional disturbances (Ubelaker and Rife 2008). In order to better explore mortuary practices in contexts that have been disturbed, and the skeletal remains commingled, this chapter relies upon a bioarchaeological approach that employs spatial modeling as well as paleodemographic analysis of the completeness and representativeness of the remains. The minimum number of individuals (MNI) and bone representation index (BRI) allow us to explore the social (intentional) placement (manipulation) of bodies within specific spaces when combined with spatial estimates. This analysis demonstrates that even highly commingled remained reveal social action and how these spaces were the locus of a social practice likely linked to the creation of community.

The pre-Hispanic Chachapoya occupied a region in the northeastern Andean highlands during the Late Intermediate Period (LIP) from approximately AD 800 until the Inca invasion during the Late Horizon (LH) (~AD 1470; Church and von Hagen 2008). Increasing research exploring Chachapoya mortuary practices (Guillén 2002; Guillén 2003; Kauffmann Doig and Ligabue 2003; Nystrom et al. 2010; Crandall 2012; von Hagen 2002; Ruiz Estrada 2009) has identified a significant amount of variation in burial constructions and locations. Burials are both complex and simple, as well as highly visible and alternatively inaccessible. The Chachapoya built individualized anthropomorphic sarcophagi, large collective mausoleums (or *chullpas,* as eluded to by Skinner in the quote above) as well as placing the dead in natural caverns. Yet, the significance of this variation within such a fairly small region remains elusive. Moreover, the practices and rituals involved in the mummification process and manipulation and deposition of human remains additionally require further investigation. By exploring the placement of the individual within mortuary spaces as well as the ways in which variation can reflect the creation of group experiences or connections with the dead, this chapter discusses the integral role identity and the cohesion of a collective group with shared history and memories

plays in the formation and maintenance of mortuary ritual. The purpose of this study is to describe mortuary practices at a specific burial cave (SUP-CF01) from the Chachapoya mortuary complex of La Petaca in order to explore the placement of the dead in natural spaces as opposed to those constructed by the living. This chapter discusses reconstructions of how individuals were deposited in this cave context, and how this impacts our analysis of social identity within the burial contexts of the ancient Chachapoya. The utilization of natural spaces for the purpose of burial practices is not unique to the Chachapoya (i.e., other Andean populations such as the Inca; Verano 2003; Kurin 2012), but the diversity of mortuary forms, and the overt visibility within the landscape, make this context a remarkable opportunity to explore the transformation of social identity and relationships of the dead.

Theoretical Background

Mortuary practices are a common feature in the archaeological landscape; however, they are complex contexts that evoke the multifaceted relationship between the living and the dead (Dillehay 1995; Rakita et al. 2005; Fitzsimmons and Shimada 2015; Chapman et al. 1981). Specifically in Andean archaeology, evidence suggests consistent patterns in mortuary contexts that embody a close relationship between the living, their ancestors, the *ayllu*[1] (local kin group or community) and their physical landscape (Salomon 1995; Salomon 2015; Isbell 1997). An analysis of the pre-Hispanic Chachapoya mortuary complex La Petaca illustrates the interrelatedness and complexity of these concepts that manifested in the physical creation and interaction within this visually striking funerary complex. We focus on three major theoretical concepts that influence discussions of commingled deposits, particularly in the ancient Andean landscape: group identity (including a discussion of practice theory), collective memory, and ancestral veneration.

Group Identity and the Individual

It is important to clearly differentiate between group and individual identity while discussing Andean mortuary practices; however, the group can be difficult to classify as in many cases there can be several definitions of a "group" (Emerson 1962; Wolf 1956). These definitions can range from the family, to the community, or other defined social units depending on the studied population. In these terms, the group is larger than the self, but inclusive of others, thus in mortuary treatment the group is often given primacy over the individual (Cannon 2002).

[1] *Ayllu* as defined by Isbell (1997, pp. 98–99) as "a group of people who shared a resource attributed to a founder or ancestor and whose members could therefore be ranked in accord with the idiom of kinship when the founder was employed as a common ancestor."

Practice theory is integral to the analysis of community identity with respect to mortuary practices, as it explores the recursive relationship between social structure and human agency. According to Ortner (2006), practice theory explores the relationship between individual human action and global entity, or in many cases, the established social system accepted by society (a large group of individuals tied together by shared beliefs or ideology). One important contribution of practice theory to the interpretation of archaeological contexts, which is particularly applicable to Chachapoya mortuary studies, is that practice theory provides a reinterpretation of culture (Ortner 2006). No longer does culture necessarily define people, but instead people define culture through intentionally attributing meaning to specific aspects of their lives. Bourdieu (1977), one of the major proponents of practice theory, developed the concept of *habitus* as a way to define a set of practices and habits that a collective group or an individual partake in on a regular basis, such as burial of the dead. Later work by Giddens (1979) also viewed social structure as the product of both material and symbolic dimensions in his work on structuration; however, unlike Bourdieu, Giddens proposed that actors are reflexive and have the ability to reflect on their actions. This reflexivity is an essential and transformative component to social processes (Giddens 1979). Therefore, practiced actions by a group can contribute to collective decision-making about burial treatment (Metcalf and Huntington 1991; Chesson 2001).

Additionally, the concept of the individual can also play a significant role in the interpretation and analysis of mortuary practices, as archaeology often assumes that the presence of a body serves as the unity and individuality of a person (Sofaer 2006). The concept of the individual becomes complicated, however, when remains are in a commingled and fragmented state, such as in many group burials. In their skeletal form, skeletal elements are no longer representative of a single cohesive physical body, or the previously existing "person" (Fowler 2004), but instead are a collection of separate elements that could hold multiple meanings, and these meanings are often unique to the population they are from (Busby 1997; Cannon 2002). The body becomes pieces or fragments of the previous whole and its meaning may be transformed (Duncan and Schwarcz 2014).

Wagner (1991) proposes the concept of fractal bodies as a way to acknowledge that bodies play an integral role in the archaeological record even when they are no longer considered to be separate individuals. Fowler (2008; 2004) illustrates the importance of the group in mortuary practices by describing the fractal body as a potentially nested accumulation of ancestors where a singular human body is considered to be part of a greater whole. Among the ancient Maya of Mesoamerica, Geller's (2012) multiscalar study suggests that the careful curation of body parts in addition to an extended veneration over multiple generations may have intentionally produced "dividual" persons. This concept of group identity is particularly applicable to Andean societies such as the Chachapoya whose mortuary practices used both individual and collective tombs where skeletonized remains could become disarticulated and mixed, although no archaeologist has specifically explored these constructions of body and social identity (Gerdau-Radonic 2008).

Social Memory and the Landscape

The abstract nature of social memory results in a concept that is difficult to define in a given arena for it encompasses several types of knowledge and is created and maintained by a community through collective and individual ritual action (Cannon 2002; Fentress and Wickham 1992). Here we use social memory to mean an "expression of collective experience [which] identifies a group, giving it a sense of its past and defining its aspirations for the future" (Fentress and Wickham 1992, pp. 25–26). This concept becomes maintained through ritual actions, which can take the form of ceremonies or mortuary practices during which the remembrance of individuals become relevant and meaningful to all in the group (Cannon 2002). Social memory is a valuable framework for reconstructing mortuary practices and also can be used to generate connections between burials and the broader landscapes (both physical and social). The landscape can become a focus and deposit of collective social memory, which is continuously shaped by life experiences (Silverman and Small 2002), providing a physical location where individuals and societies can visually display their cultural or social history (Knapp and Ashmore 1999). Even though the presence of the dead obviously plays a large role in the mortuary landscape, it is during the ritual use of space that it becomes the focus of collective memory, but not necessarily of those that were buried (Cannon 2002). These physical markers of social memory reflect a continuous and transformative process, demonstrating that the living experienced a dynamic relationship with the dead.

It is becoming more common in archaeological practice to focus on the visual and spatial nature of funerary monuments, incorporating the role that performance and landscape play in the construction and preservation of collective memory, cultural identity, and affiliation (Knapp and Ashmore 1999). Embedded within communities, collective memory can manifest itself as concepts of mythology and memories of burial grounds, meeting places, mountains, valleys, and more, which are reflections of not only landscape, but also social organization and the life history of living within the landscape (Knapp and Ashmore 1999). This being said, social memory cannot be considered stagnant. It is renewed through practiced rituals that link the past, present, and future, and continuously transform through time. Visual features in the landscape, whether natural or human-made become loci of community or individual action. Cemeteries are places that are visited repeatedly by community members as the dead die and their bodies accumulate. Thus, cemeteries become places of repeated social action and through ritual become shared experiences and the location of burial grounds is, therefore, highly socially defined. However, cross-culturally we can see cemeteries may be highly visible and easily accessible, or they may be controlled and restricted spaces (Silverman and Small 2002); there may be a close connection between the living and dead or there may be an explicit separation. This may depend on the role that the dead are believed to have played in the lives of their descendants.

Ancestor Veneration

Ancestor veneration in the Andes is a form of mortuary ritual found frequently in agricultural communities who depend on high levels of cooperation and group cohesion (Mantha 2009). Rituals that emphasize honoring a common ancestor perpetuate individual and collective identities, as they are based on the participant's common ancestry (biological or social kin-based family lineages), and result in a shared sense of common identity among many descendants (Mantha 2009). According to the Andean ethnohistorical record, ancestors were believed to have a power they could exert in the physical world, and this power could either benefit the living community or result in specific types of disasters (Duviols 1978; Gose 1994; Rowe 1995; Duviols 1986). Under these conditions, it was very important for Andean societies to honor and care for their dead (Duviols 1979; Mantha 2009; Lau 2004; Doyle 1988). Therefore, the pre-Hispanic Andean mortuary landscape reflects an active community of ancestors that existed as an extension of the living and required constant care and attention, as illustrated by Pablo Jose de Arriaga (1968 [1621]) in his descriptions of the populations of Peru:

> They are persuaded that the dead feel, eat, and drink, and only with great pain can they be buried and bound to the earth. In their *machays* [burial caves] and burial places in the fields, where they are not interred, but placed in a small hollow or cave or little house, they have more rest.

This process of ancestor veneration was reflected in ceremonies, which brought offerings to the dead, as well as curation and manipulation of their bodies (or parts). These activities can be identified in mortuary practices and the material culture within the mortuary landscape.

Group identity, ancestor veneration, and social memory are not, by any means, mutually exclusive. Ethnohistoric documentation from the sixteenth century describes a strong relationship between mortuary monuments, ancestral veneration, and *ayllu* social organization, with particular emphasis placed on the role of the mummy (ancestor's body) as the focus for the production and reproduction of *ayllu* culture and ideology (Isbell 1997). Isbell (1997) argues that ancestor worship propagated the social structure and organization of the *ayllu* during the latter half of the Early Intermediate Period (AD 200), and more often than not, the locations of mortuary structures enhanced an active relationship between the living community and their active ancestors. Physical manifestations of the collective and group identity in the form of mortuary practices maintain social memory through shared community experience, thereby preserving the social system of the *ayllu* as historically and geographically situated lineages (Moore 2004).

Chachapoya Mortuary Practices

Geographically, this chapter focuses on the Chachapoyas region of Peru, on the northeastern slopes of the Andean cordillera, an area of approximately 25,000 m^2 that is defined as a crossroads between the western Andes and the eastern lowlands.

While archaeological evidence indicates that this region may have been inhabited intermittently as far back as 12,000 BP, we are focused on the Chachapoya occupation that emerged approximately around AD 200–500 and its cultural fluorescence around AD 900–1470 (Church and von Hagen 2008). Archaeological settlements typically were established between 2500 and 3500 m.a.s.l. in semiarid environments or conversely in lower eastern slopes encompassed in tropical forests (Church and Von Hagen 2008). During the middle of the Early Intermediate Period, dramatic changes in pottery techniques indicate an expanding cultural sphere of interaction (Church and Von Hagen 2008), and suggest sustained trade alliances across the Marañon Valley to the coastal cultures and an active Amazonian–Andean exchange. The height of Chachapoya monumental construction appears to have begun during the mid-Middle Horizon, around AD 800 (Ruiz Estrada 1972). During the LIP around AD 1000 there is a marked increase in population and settlement expansion, as well as artistic development (Church and von Hagen 2008). Chachapoya culture, many hamlets, villages, fortified urban complexes, and cliff tombs date to this time period. While circular constructions (residences) are not unique in the Andean region, they tend to distinguish Chachapoya "classic" construction phase. The LH AD 1470–1535 was a time of population expansion and increased complexity in mortuary construction linked to the arrival of the Inca (Nystrom 2009).

Chachapoya mortuary behavior was diverse, with evidence of human burial within caves, groups of individual anthropomorphic sarcophagi, and *chullpas,* as well as within subterranean chambers in residential structures and in walls surrounding monumental centers, like Kuelap (Nystrom et al. 2010; Ruiz Estrada 2009; Toyne and Narváez Vargas 2014). Diversity within these mortuary contexts is vast, where *chullpas* range in form, size, and location, and anthropomorphic sarcophagi vary significantly in size and complexity of embellishment (Kauffmann Doig and Ligabue 2003; Gil 1936; Langlois 1934). Body processing of deceased individuals is observed in several Chachapoya mortuary contexts, which may have included some form of mummification and a secondary internment of skeletal material (Kauffmann Doig 2009; Morales 2002; von Hagen 2002). Although forms and processes of body preparation vary between and within sites (further indication of the diversity of Chachapoya mortuary ritual), individuals were most commonly placed in a tightly flexed seated position, wrapped in vegetal fiber cords and woven textiles (Guillén 2004; Nystrom et al. 2010).

Continued access to mortuary space appears to be important to Chachapoya mortuary behavior (Urton 2001; Guillén 2002; Buikstra and Nystrom 2003). Evidence of *khipus*[2] and mummy textiles that had been rewrapped at Laguna de los Cóndores indicates repeated and extended interaction between the living and the dead (Urton and Brezine 2005; Urton 2004; Guillén 2002; Guillén 2003). Researchers have cited sociopolitical or economic differences for the diversity of these mortuary rituals (Kauffmann Doig and Ligabue 2003), assuming a correlation between energy expenditure and social status. Some ethnohistoric sources reference this relationship, citing the cliff structures as the locations "where they placed their most important dead" (Espinoza Soriano 1967); however, researchers have not yet clarified

[2] *Khipus* as defined by Urton and Brezin (2005) are knotted-string devices that were used for bureaucratic recording and communication in the Inca Empire.

if distinctions in mortuary ritual reflect actual socioeconomic differences, chronological change, or intra-regional variation. The currently understood diversity in Chachapoya mortuary ritual appears consistent with self-expressions of group identity, where the visibility of these complexes would serve as beacons across the landscape of land ownership and the boundaries of group occupation (Crandall 2012).

While there is evidence to suggest the living visited the dead, mortuary contexts were not always located within or even adjacent to living communities. Instead, they were far from residential areas, and more often than not in areas difficult to access. Mortuary remains, whether individual or collective tombs, appear to have been constructed in public and prominent locations in the landscape (i.e., the sarcophagi of Karajia and mausoleums of Revash), most likely in order to create active relationships across the physical landscape between the dead and living. Often grouped together, they appear to be communities of ancestors. This would suggest that the Chachapoya may have constructed tombs to visually and physically engage with their ancestors in a form of veneration. Viewshed analysis (analysis of areas visible from a specific location) of Chachapoya mortuary sites by Crandall (2012) hypothesized that, while there was a separation between the spaces of the deceased ancestors and the spaces of the living, households may have existed within line of sight of their ancestors. More importantly, many of these cemeteries were intentionally constructed on high cliff ledges in areas inaccessible today, yet were clearly visited and revisited in the past.

In addition to constructed mortuary contexts (tombs and sarcophagi), natural spaces such as caves and crevices were also used for the dead. Human skeletal remains, complete and fragmentary, have been found in a range of natural rock apertures of a range of sizes and shapes including small animal-sized dens to extensive and deep cave systems (Fabre et al. 2008). In some cases only isolated skeletal remains are found but in others there is evidence of human intervention, including sarcophagi, body preparation, offerings, and feasting rituals (on the basis of quantities and types of ceramic vessels; Ruiz Estrada 2008; Knutson 2006). The difference between these two locations, natural and human-made, has never been explored bioarchaeologically to determine if there are differences in the lives (social experiences) of those interred in each.

La Petaca: The Site and Setting

The mortuary complex of La Petaca is located within the district of Leymebamba, approximately 14.5 km south of the modern town of Leymebamba, and situated on the west bank of the San Miguel *quebrada,* near the juncture with the Rio Tambillo to the north (Fig. 6.1). Located within a region of ecological diversity and topographical extremes, La Petaca is situated within a distinctive microclimate. At an altitude of ~3400 m.a.s.l, the region is influenced by heavy rainfall, consistent annual temperatures around 15 °C, and the rugged terrain is densely covered by small brush, trees, and thick grasslands (Schjellerup et al. 2003). The mortuary complex

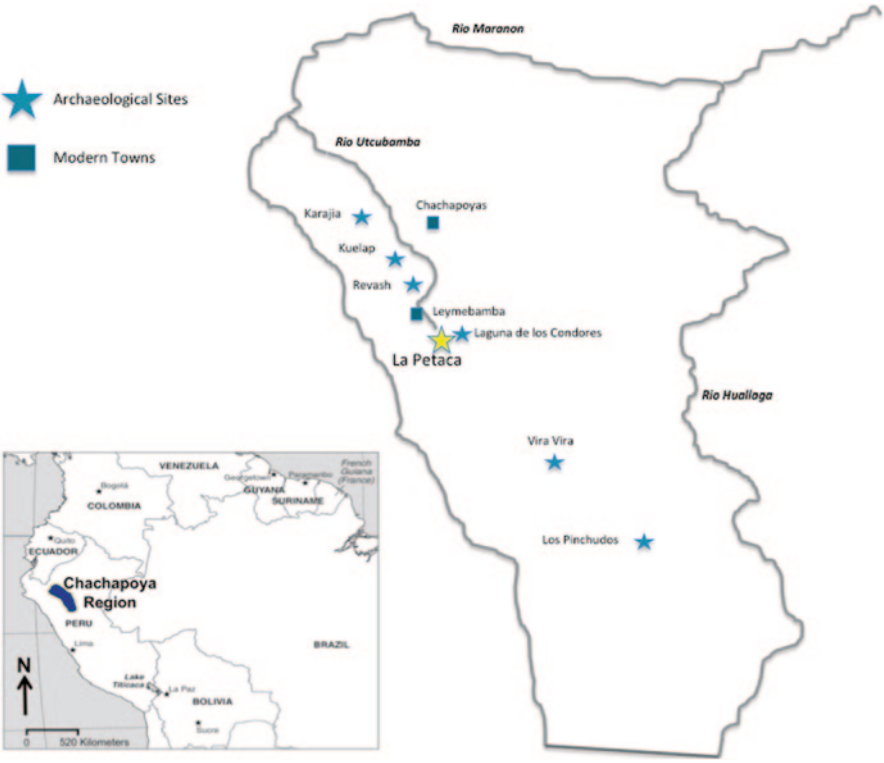

Fig. 6.1 Map identifying the location of Chachapoyas region in the Central Andes of Peru

is located across an extensive exposed-rock escarpment, composed primarily of sedimentary limestone and sandstone layers (Fig. 6.2). Due to a natural undercutting of the cliff face, the concave shape of the wall prevents vegetation from growing directly on or around the structures and creates a dry overhang that protects the archaeological remains from rain. Over 120 mortuary contexts constructed of locally quarried stone are located along the narrow ledges of its wide expanse, approximately 270 m north-south and 100 m in height from a defined lower ledge. For research purposes, the space was divided into three major sectors of archaeological remains separated by natural features, identified as North (NORTE), Superior (SUP), and South (SUR).

The majority of the human-made stuctures identified were incomplete remnants of the narrow rectangular platform bases that would have supported an enclosed and roofed stonechamber with a narrow rectangular access. These mortuary structures are significantly different in construction than Chachapoya houses for the living, which were almost always circular construction built of stone blocks and plaster (Schjellerup 1997; Crandall 2012). There were also smaller honeycomb-shaped chamber tombs, as well as modified natural caves and overhangs present at La

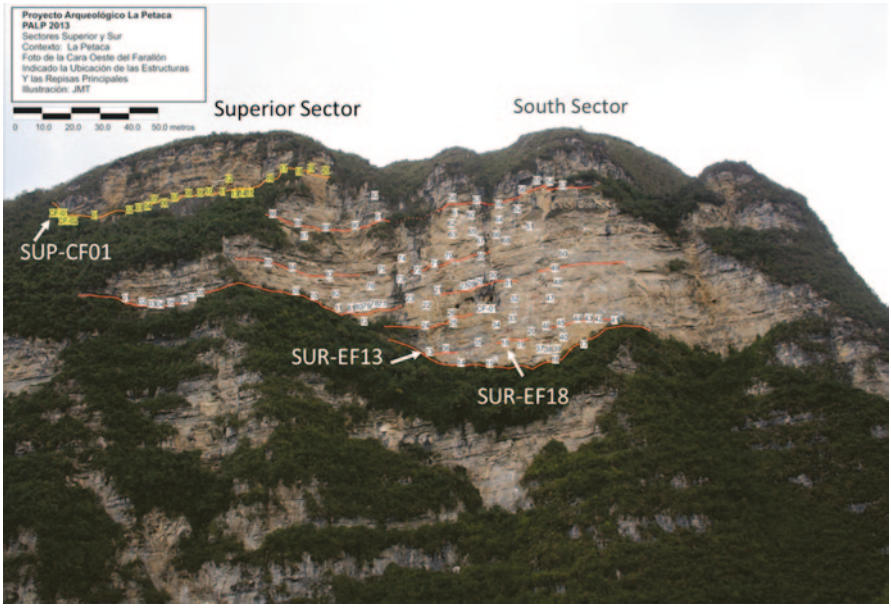

Fig. 6.2 Photo of façade of the La Petaca mortuary complex indicating mortuary structures; *arrow* identifies where SUP-CF01 burial cave and SUR-EF13 and SUR-EF18 tombs are located

Petaca. Many of the mausoleums held scattered human remains, with the majority of the remaining materials greatly disturbed and disarticulated.

The South sector is approximately 200 × 70 m of exposed unvegetated rock, and a series of six large horizontal ledges support the remains of at least 97 constructions in various states of preservation (Fig. 6.2). The ledges are natural formations but have been systematically altered in ancient times to allow access for burial constructions. These structures include walkways, solid platform bases, and small stone chamber tombs that contained various types of cultural material including human and animal skeletal remains, ceramics, gourds, lithics, and textiles. Yet again, despite the difficult accessibility that neccessitated the use of safety harness and rope systems, many of the contexts were completely disturbed with material remains scattered. Looting that is encouraged by the modern illicit antiquities market has contributed to the ongoing destruction of ancient funerary contexts. This was preceded by historical *Extirpacion* campaigns in the seventeenth century to extract and destroy the osteological contents of Andean funerary spaces as a means of punishing indigenous peoples by destroying the sacred remains of ancestors (Gerdau-Radonic and Herrera 2010). These historical processes have greatly compromised the original distribution of remains within these contexts. As most structures were completely in ruins, time only permitted the detailed analysis of six buildings and three natural spaces. Three mortuary structures were well preserved and their original form included two stories, with a façade plastered and painted with a red panel above a white panel. The use of red and white paint is common to other Chachapoya mortuary sites such as Revash and nearby Laguna de los Condores (Kauffmann

Fig. 6.3 **a** and **b** Photograph of burial structures SUR-EF13 (view from the north on natural ledge) and SUR-EF18 (view of looted second-story chamber from the south with anthropomorphic figures on wall)

Doig and Ligabue 2003). Two structures (SUR-EF13 and SUR-EF18) are described below as part of this study.

One rectangular mortuary structure designated SUR-EF13 is located centrally along the second ledge of the South sector (Figs. 6.2 and 6.3a) on a fairly wide natural ledge that was easy to access. The walls that remain are almost 1 m tall and indicate that the original rectangular stone and mortared building would have been approximately 3.1 m long and 1.8 m wide. Human skeletal remains were recovered from this context (some of which was articulated with mummified soft tissue present), in addition to numerous fragments of textiles, cotton material, and fiber cordage, and a small amount of animal bone; however, the material contents of SUR-EF13 were extensively disturbed and the structure mostly destroyed. This smaller structure was not very visible from a distance, but its location on a lower wider ledge made it fairly easy to access compared to other structures.

A second rectangular structure located in La Petaca's south sector designated SUR-EF18 was located high on the vertical wall on a narrow natural ledge only accessible via a rope system (Figs. 6.2 and 6.3b). The ruined second-story chamber measured approximately 3 m in length and 1.3 m in width, with remaining walls measuring approximately 40 cm in height. Human skeletal remains were located in

Fig. 6.4 Photograph from the entrance of SUP-CF1-01 prior to excavation

the upper chamber, however while the lower chamber was intact, it was completely empty. The building was constructed of cut sandstone blocks and both chambers had small entrances (40 × 60 cm) in the northern wall. Approximately 1 m above the remains of the structure was a painting of three anthropomorphic figures in bright red mineral paint and a stylized sun decorated in red and white paint. Primarily human bone with some faunal skeletal material was recovered, and there was evidence of taphonomic disturbance from sun exposure and animal activity. The human skeletal remains recovered from this context were articulated and complete. This structure was difficult to reach without a rope and harness system but was clearly identifiable from a distance due to the bright contrast of the red paint on the natural rock surface.

The superior section is much smaller, approximately 70 × 25 m (in a vertical plane) and consists of one long horizontal ledge that measures approximately 100 m in length and supports approximately 21 separate mortuary structures in various stages of deterioration (Fig. 6.2). The majority of structures identified were remnants of open chamber structures but without platform bases. One natural rock overhang designated SUP-CF01 was located at the northern-most end of this upper ledge and contained a dense deposit of commingled human skeletal remains (Fig. 6.4). The context was fairly small and had an irregular triangular shape, with floor dimensions approximately 3 m at its widest across the entrance of the cave, and 3 m at its longest, from the entrance to the back chamber of the cave (Fig. 6.5). The entrance of SUP-CF01 averaged 1 m in height, and opened up into a back chamber that measured an average height of 2 m. The cavern was generally humid and the soil damp, where a notably loose soil matrix covered some of the remains,

Fig. 6.5 Plan illustration of SUP-CF1-01 mapping the density of skeletal remains

most likely a natural byproduct of geological and taphonomic factors. This thin soil matrix facilitated extensive root growth throughout the context. Material recovered from SUP-CF01 was overwhelmingly human bone, with only a small amount of animal bone, mate (gourd bowls), and few ceramic fragments also collected. Generally speaking, this cave was easy to reach following a natural ledge but from across the quebrada was not necessarily clearly visible to the naked eye.

All structures with preserved open chambers were large enough to allow an archaeologist to enter in a crouched position, but not standing up, and housed the remains of multiple individuals. Generally, the size of the structure conformed to the natural width of the ledge, not more than approximately 80–100 cm in width. The skeletal remains were occasionally covered by desiccated tissues and fragments of textiles, natural cotton, and cordage in several mortuary contexts at La Petaca indicate that some if not all of these individuals were once complete and likely mummified, either naturally or intentionally.

While preliminary, the chronology of the site is impressive. Unfortunately, there was poor ceramic representation and fragments were only consistent with local Chachapoya domestic ware, ollas (cooking pots), jarras (jugs), and cuencas (bowls). The absence of diagnostic LH Inca ceramics does not mean that they were not present but it is suggestive. The radiocarbon dating from burial structure SUP-EF13 provided an early LIP date for construction of the tomb (Cal AD 900–1030, 2 sigma, BETA 369482), while a southern cave produced an LH date (Cal AD 1420–1460, 2 sigma, BETA 369479). These dates suggest the site was used for a period of almost 600 years. The burial cave SUP-CF01 produced a date from human remains of Cal AD 1190–1270 (2 sigma, BETA 369478), which places its function as a mortuary deposit during the middle of the site's use. However, a single date does not allow us to understand long-term use of a single location and further chronological work needs to be developed.

Based on the earlier sections, discussion of Chachapoya mortuary practices, and the site description of La Petaca, this chapter next utilizes bioarchaeological methods in order to determine who and how many individuals were deposited in SUP-CF01. Following those analyses, this project will then explore these data to discuss how this context may have been created and used, and how this relates to the construction and maintenance of group identity and social memory.

Quantification and Spatial Modeling Methods

Simply put, the goals of this project were to determine who was buried in this context, and how they were deposited. Bioarchaeological approaches allow us to determine the age and sex of individuals, and in some cases, the methods of deposition. Commingled remains like those found at La Petaca create unique problems for traditional bioarchaeological analysis. Because of the disturbance and commingling of the human skeletal remains from La Petaca, it was essential to estimate the MNI recovered in each mortuary context, and how their distribution reflects the taphonomic processes associated with creating that space. The calculation of MNI for this project was straightforward: By estimating a total count of each element that was 50% complete and larger (minimum number of elements; MNE), which was then separated into left (L) and right (R) sides. The largest number was taken as the MNI estimate [Max (L, R)] (White 1953; Adams and Konigsberg 2008).

A secondary component to the analysis of SUP-CF01 was an estimation of a BRI in order to explore the presence and absence of certain bone categories (Bello et al. 2006; Dodson and Wexler 1979). Every effort was made to recover as much material as possible but a sampling strategy was required due to time constraints. Therefore, there will be innate differences in frequency and MNI estimations between skeletal elements (Bello et al. 2006). However, while there will be a random assortment of missing elements, patterning of emphasized elements or an absence of element categories can contribute interpretive information about the creation of the deposit and the relative completeness of the individuals contained within. This method was calculated using the ratio between the number of bones excavated and

the number of bones that should have been present based on the calculated MNI (most common bone present in the assemblage for subadult and adult individuals), and followed the equation: $BRI = 100 \times \sum(N_{observed}/N_{expected})$.

In addition to an analysis of the skeletal remains recovered, this project also paid great attention to the spaces that were chosen for internment. Burial spaces included both built tomb constructions and natural caves. Since the most tombs were almost completely emptied postmortemly, we focused this research on the natural caves where skeletal remains were abundant and used constructed spaces as a means for comparison. In the case of SUP-CF01, there was a large amount of remains recovered from a relatively small space; therefore, this project incorporated an analysis of the area necessary to house the estimated MNI by gauging the space available in the natural cave context as well as approximating the space an average complete adult and juvenile individual (or a combination of both) would take up seated in an upright seated flexed position. The area of an average adult was calculated by measuring an averaged size living human, seated in the flexed position, and recording the sitting height, maximum width of the horizontal plane, and maximum length of the transverse plane with a hard meter stick, all measurements recorded in centimeter. These three dimensions were then multiplied, which provided an estimation of the average area of an adult individual. To account for the juveniles represented in this context, the aforementioned estimation was halved to represent an average juvenile individual, aged 6–10 years. In order to estimate the inside chamber/space of the cave itself, total station points and hand measurements were imported into the 3D GIS software Arcscene. The tool 3D editor was activated to connect each point in order to form an approximate 3D polygon of the cave. The cave dimensions were calculated by using the measure tool in Arcscene to measure the average area of the 3D polygon. The area of constructed contexts was estimated differently, due to the disturbed nature of the structures. A two-dimensional area of the platform bases was calculated with simple length and width estimations, which were then multiplied by the existing vertical height.

Quantification and Representation of Individuals Present and Space Allocation

Minimum Number of Individuals (MNI)

The natural mortuary cave of SUP-CF01 housed a great deal of skeletal material ($n = 8245$). MNI estimated a total of 55 individuals present in this sample including 43 adults and 12 juveniles (Table 6.1). MNI of adults were based on the distal portion of the left tibia, right humeral shaft, and right femur. While long bones provided the largest MNI, several smaller elements estimated a similar MNI, as exampled by the right patella, right talus, right calcaneus, and right clavicle. In addition, small tarsals also provided similar MNIs, as exampled by the left cuboid and right navicular. However, there was a significant range of MNIs, some small carpal and tarsal

Table 6.1 Summary MNI of SUP-CF01 ($n=55$)

Element	Side	Juvenile estimate	Side	Adult estimate	Total estimate
SUP-CF01					
Carpal	*UNK lunate*	1	*Left/right lunate*	28	**29**
Cranium	*N/A*	6	*N/A*	28	**34**
Clavicle	*Left*	9	*Right*	41	**50**
Radius	*Left and right*	5	*Left*	33	**38**
Femur	*Right*	10	*Left*	43	**53**
Fibula	*Right*	4	*Right*	34	**38**
Humerus	*Right*	12	*Right*	43	**55**
Metacarpal	*#3 left*	3	*#2 right*	40	**43**
Metatarsal	*#3 left*	2	*#1 & 5 right*	34	**36**
Os coxa	*Right*	6	*Right*	36	**42**
Patella	*Left*	2	*Right*	42	**44**
Sacrum	*N/A*	5	*N/A*	29	**34**
Scapula	*Left*	8	*Right*	33	**41**
Sternum	*N/A*	7	*N/A*	31	**38**
Tarsal	*Right*	5	*Right*	42	**47**
Tibia	*Left*	6	*Left*	43	**49**
Ulna	*Right*	8	*Right*	40	**48**

MNI minimum number of individuals *UNK* unknown

elements also provided the lowest MNI such as the left trapezoid, right triquetral, and left second cuneiform (Table 6.1). Similar to adult MNIs, long bones consistently had high MNIs for subadults. While the humerus provided the highest MNI of 12, the right femur provided an MNI of 10, and the left femur and left clavicle provided an MNI of 9. Juvenile patella, fibula, and calcaneus provided the lowest MNI, 2, 4, and 4, respectively. Of the skeletal elements recovered from SUP-CF01, there was a noticeably large presence of small bones including carpals, tarsals, metacarpals, and metatarsals especially in the lower excavation level (Table 6.1).

Comparatively, the constructed mortuary spaces house significantly less skeletal material (i.e., SUR-EF13 ($n=381$) and SUR-EF18 ($n=92$)) clearly due to extensive looting. The MNI of seven individuals deposited in SUR-EF13 is based on cranial elements, the right clavicle, femur, humerus, right scapula, and right tibia (Tables 6.2 and 6.3). While representativeness was consistent at five adults and one juvenile, significant differences in size and sex suggest a minimum of six adult individuals. One male was almost completely articulated with mummified soft tissue (Fig. 6.6). Juvenile elements were poorly represented, with only one left tibia, one left ischium, and one left fibula recovered. A minimum of eight individuals were deposited in SUR-EF18 based on cranial elements. There was a poor representation of postcranial elements, providing much lower MNIs for both large elements such as the femur, radius, tibia, and humerus, as well as small elements such as carpals and tarsals (Tables 6.2 and 6.3). One adult individual and one adolescent were almost completely reconstructed, and the elements collected were primarily complete.

Table 6.2 SUR-EF13 ($n=6$)

Element	Side	Juvenile estimate	Side	Adult estimate	Total estimate
SUR-EF13					
Carpal	*N/A*	0	*Left/right*	1	**1**
Cranium	*N/A*	0	*N/A*	5	**5**
Clavicle	*N/A*	0	*Right*	5	**5**
Radius	*N/A*	0	*Left/right*	2	**2**
Femur	*N/A*	0	*Left*	5	**5**
Fibula	*Left*	1	*Left*	3	**4**
Humerus	*N/A*	0	*Right*	5	**5**
Metacarpal	*N/A*	0	*#4 & 5 left*	1	**1**
Metatarsal	*N/A*	0	*#1 left*	1	**1**
Os coxa	*Left*	1	*Right*	3	**4**
Patella	*N/A*	0	*Left*	2	**2**
Sacrum	*N/A*	0	*N/A*	2	**2**
Scapula	*N/A*	0	*Right*	5	**5**
Sternum	*N/A*	0	*N/A*	2	**2**
Tarsal	*N/A*	1	*Left/right*	3	**4**
Tibia	*Left*	1	*Left*	4	**5**
Ulna	*N/A*	0	*Left*	3	**3**

Table 6.3 Summary MNI of SUR-EF18 ($n=8$)

Element	Side	Juvenile estimate	Side	Adult estimate	Total estimate
SUR-EF18					
Carpal	*N/A*	0	*Left/right*	1	**1**
Cranium	*N/A*	4	*N/A*	4	**8**
Clavicle	*Left/right*	1	*Left/right*	1	**2**
Radius	*Left/right*	1	*Left/right*	1	**2**
Femur	*Left/right*	1	*Left/right*	1	**2**
Fibula	*Left/right*	1	*Left/right*	1	**2**
Humerus	*Left*	1	*Left/right*	1	**2**
Metacarpal	*N/A*	0	*Left/right*	1	**1**
Metatarsal	*Left/right*	1	*Left/right*	1	**2**
Os coxa	*Left/right*	1	*Left/right*	1	**2**
Patella	*N/A*	0	*N/A*	0	**0**
Sacrum	*N/A*	1	*N/A*	1	**2**
Scapula	*N/A*	0	*Left/right*	1	**1**
Sternum	*N/A*	0	*N/A*	1	**1**
Tarsal	*Left/right*	1	*Left/right*	1	**2**
Tibia	*Left/right*	1	*Left/right*	1	**2**
Ulna	*N/A*	0	*Right*	2	**2**

MNI minimum number of individuals

Fig. 6.6 Photograph of almost complete mostly mummified adult male individual from SUR-EF13

Demographic Profile

Cranial and pelvic elements recovered from cave SUP-CF01 indicate that of the elements collected, there was a wide range of ages and both sexes present. Age estimates based on pubic symphysis and auricular surfaces of the os coxa for adult elements as well as epiphyseal fusion and dental eruption for juvenile elements (Buikstra and Ubelaker 1994) estimate the presence of at least two infants, three young children, four older children, four adolescent individuals, eleven young-adult, twelve middle-adult, and nine older-adult individuals (Table 6.4). Estimations of sex were more difficult due to the commingled nature of the remains, however, based on skeletal characteristics of the os coxa and crania (see Buikstra and Ubelaker 1994 for detailed methodology), there were an estimated 18 adult females and 17 adult males included in this mortuary practice (Table 6.4). This small sample of ossa coxae and crania cannot be considered representative of the entire sample collected from SUP-CF01, as many elements were fragmented, and morphological characteristics reflective of sex and age were unavailable for identification in many cases; however, this initial analysis indicates that both males and females of all age categories were present in the assemblage, but infants and small children were significantly underrepresented.

Of the skeletal remains collected from structure SUR-EF13, the cranial and pelvic elements indicate that there was also a range of ages and sexes present (Table 6.4). Estimations of sex indicate that there were probably three adult males and three adult females deposited in this space (Table 6.2). Comparatively, of the skeletal

Table 6.4 Age and sex distribution for SUP-CF01 ($n = 55$)

	Juveniles	Young adults	Middle adults	Older adults	Indeterminate "adult"	Total
	0–15 years	16–35 years	36–50 years	50+ years		
SUP-CF01						
Male	0	7	5	4	1	**17**
Female	0	5	7	5	1	**18**
Indet.	12	2	2	0	4	**20**
Total	**12**	**14**	**14**	**9**	**6**	**55**
SUR-EF13						
Male	0	1	0	0	2	**3**
Female	0	0	0	0	3	**3**
Indet.	1	0	0	0	0	**1**
Total	**1**	**1**	**0**	**0**	**5**	**7**
SUR-EF18						
Male	0	1	1	0	0	**2**
Female	0	0	1	0	0	**1**
Indet.	4	0	0	0	1	**5**
Total	**4**	**1**	**2**	**0**	**1**	**8**

remains collected from structure SUR-EF18, the cranial and pelvic elements indicate that there was a range of ages and sexes present. Age at death estimations based similarly on epiphyseal fusion and dental eruption rates estimate the presence of at least one new born, one infant, one young child, and one adolescent, as well as one young adult, two middle adult and one indeterminate adult (Table 6.4). Estimations of sex indicated that there were at least two adult males and one adult female incorporated in this mortuary context.

Element Representativeness

BRI was also calculated for the sampled remains by estimating the ratio of bone elements that should be present according to the MNI (which would be shown in this figure as 100%) in comparison to the number that was actually recovered. The BRI demonstrates that from SUP-CF01 there was a noticeably large presence of small bones including tarsals, metacarpals, and metatarsals (Fig. 6.7). The large frequency of smaller elements such as hand and foot bones indicates many individuals were probably complete skeletons at the time of deposition and likely completely articulated. This suggests that this context was a primary deposition site, where complete bodies were buried. Removal of the skull and larger elements such as the femur and tibia are also common indicators of a secondary context (Roksandic 2002); however, in this context, larger elements including the tibia, femur, and humerus provided the highest MNI estimations of this context, further contradicting that this deposit was secondary in nature (Fig. 6.7).

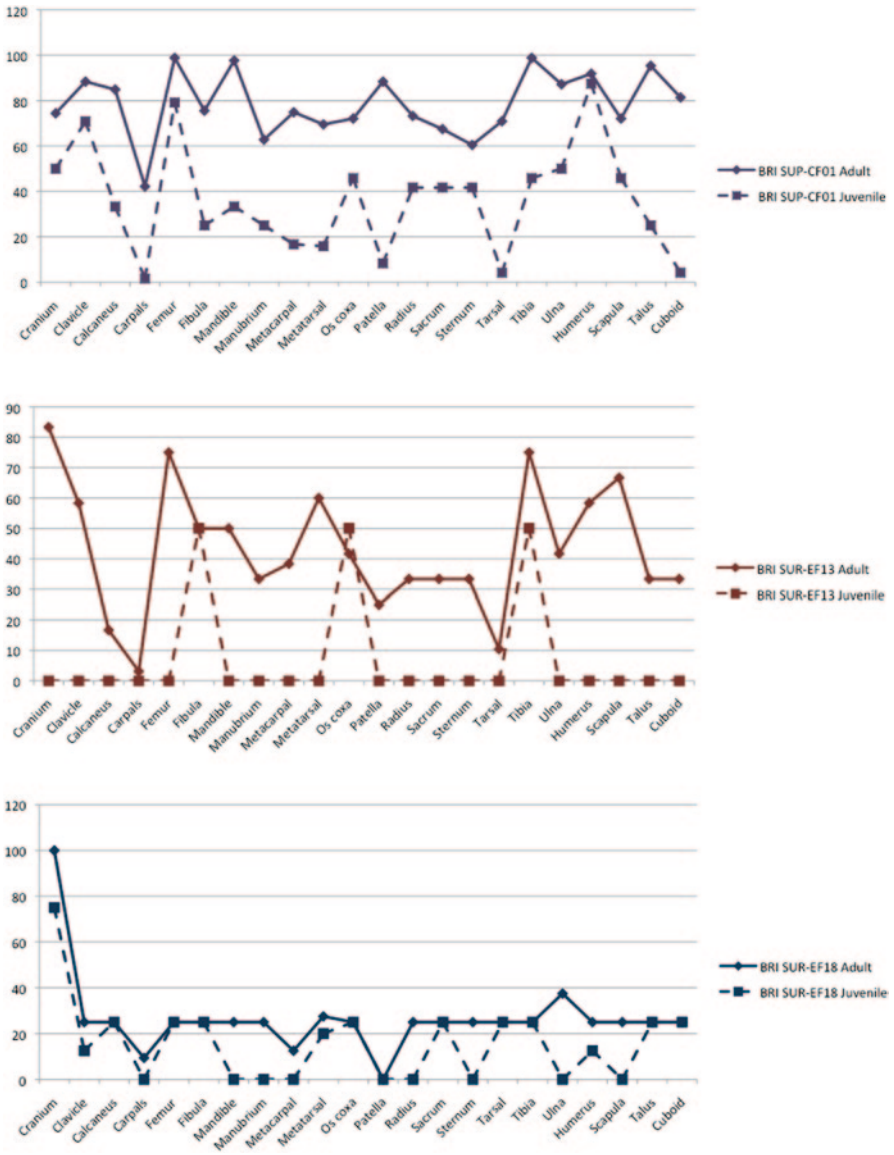

Fig. 6.7 Summary BRI of skeletal elements from SUP-CF01, SUR-EF13, and SUR-EF18. *BRI* bone representation index

Comparatively, BRI of SUR-EF13 demonstrates a much higher frequency of adult long bones than smaller elements such as carpals and tarsals. Juvenile elements were limited to three elements; therefore, the BRI demonstrates that there was an absence of any smaller elements, and that this individual was only partially represented by one fibula, one portion of the os coxa, and one tibia. However, based on the presence of an almost completely articulated individual, this was also likely

a primary burial context. BRI of SUR-EF18 reveals that there was a noticeably reduced frequency of most elements other than the cranium for both adult and juvenile individuals. Notably, the presence of all postcranial remains was less than 40 %, but this deposit, unlikely to have been secondary in nature due to the articulation and mummified nature of the remains that were collected, was clearly heavily disturbed.

Spatial Allocation

In order to explore questions concerning how these contexts were created, this project modeled the relative spatial dimensions of SUP-CF01 to understand the carrying capacity for burial remains. It can be assumed that the bodies would have been placed in the traditional Chachapoya seated flexed position. The high presence of small elements indicate that these remains were most likely complete at the time of deposition; therefore, this model assumes that the deceased individual was complete and full fleshed, wrapped in at least a basic shroud textile with an average standing height of 167 cm for adult males, or 147 cm for adult females. If prepared into a tightly flexed seated position, an average 80 cm sitting height is estimated. On average, an adult would take up an approximate area of 161,000 cm^3 and an average child around 6–10 years old would take up approximately 77,500 cm^3. The cave in its entirety is approximately 5,430,000 cm^3. With these estimated dimensions, the space available in SUP-CF01 could potentially house, on average, 33 fleshed adults seated in the flexed position, which is significantly less than the minimum number of adult and juvenile individuals estimated to have been deposited in SUP-CF01 (Fig. 6.8a). Even if mixed between a range of juvenile and adult ages, the estimated

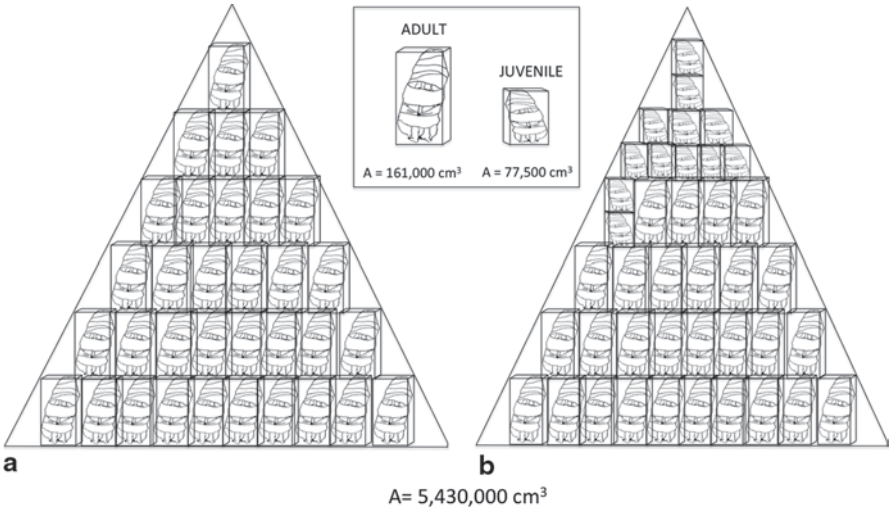

Fig. 6.8 **a** and **b** Spatial Model illustrating the number of individuals that could have been deposited in this cave context according to the calculated spatial dimensions of the cave and adult (161,000 cm^3) and juvenile complete bodies (77,500 cm^3; $n = 55$)

space available in the cave was insufficient, only allowing space for 12 juveniles and 28 adult individuals (Fig 6.8b). In order to house the complete and articulated estimated 43 adults and 12 juveniles at one time, the available space would have needed to total around 7,900,000 cm^3, indicating that a single group burial event would not have been possible. Nor is there sufficient space for the accumulation of this number of complete individuals suggesting there was some process of fragmentation or removal of remains to accommodate new burial additions.

The inner chamber of structure SUR-EF13 in its entirety is estimated to be 2,856,000 cm^3. Based on the preceding measurement, the space of this building could have housed potentially 17 adults seated in the flexed position, which is significantly greater than the MNI recovered archaeologically from this space. The estimated six adults and one juvenile would have taken up approximately one third of the space, allowing for several more individuals to have been deposited in this mausoleum. Comparatively, the upper chamber of the constructed SUR-EF18 is approximately 512,000 cm^3. With this estimated interior dimension, SUR-EF18 could have housed potentially three adults seated in the flexed position, less than the minimum number of four adults and four juveniles estimated from the recovered skeletal material. These data indicate, similar to SUP-CF01, that a singular group burial event in SUR-EF18 would not have been possible.

Discussion

La Petaca is an incredible archaeological complex and this preliminary analysis of a select number of mortuary features provides us with valuable insight into the nature of Chachapoya funerary practices. With an estimated total of approximately 120 structures housed in this complex, the size and complexity of the use of vertical space indicates that it may have been used over a long period of time. Preliminary radiocarbon dating indicates that the site was in use from approximately AD 900–1500; however, it is unclear if there was significant change over time in the functionality of the space or in the type and style of architectural constructions used for burials. This bioarchaeological and spatial study of these burial spaces at present clearly demonstrates that the mortuary structures of La Petaca housed the remains of multiple individuals and most contexts were likely used over an extended period. The natural and constructed contexts analyzed here do not contain enough space available for a single burial deposit of all individuals; rather bodies were interred either in smaller groups or individually over time. With the skeletal remains representing so many individuals deposited in this location, we return to our initial question of *how* they were deposited. This chapter presented several theoretical concepts that together, when considered in context with the data presented here, speak to the possible mortuary practices included in this remarkable archaeological complex.

The size of the La Petaca complex suggests it was the catchment cemetery for a large regional community, and it is possible that many families buried their dead here. Demographic analysis of the sampled remains further indicates that all

members of the community were included in this mortuary complex regardless of age or sex—not just a select group. The variation in architectural elaboration may reflect lineage-based social differences but whether these are of a hierarchical, heterarchical, or even chronological nature remains to be determined. MNI analysis of both the natural and constructed spaces indicates that males, females, and individuals of all ages were included in these mortuary contexts. While there was a larger paleodemographic range in the natural context, even the constructed mortuary spaces, which had significantly fewer individuals deposited in the space, had a range of juvenile and adult ages as well as relatively equal representations of both males and females. It was interesting that the BRI indicated that the individuals deposited in cave SUP-CF01 were relatively complete, despite the completely skeletonized, fragmented, and disturbed nature of the remains, suggesting it was used as a primary burial context. Conversely, the skeletal remains recovered from the constructed context were in good condition, relatively complete and articulated elements, with desiccated tissues present on several of the remains; however, the MNI estimation was not supported by complete individuals. Therefore, it appears that different postdepositional factors affected natural and constructed mortuary spaces. It is possible looting or the historical *Extirpacion* campaigns may have contributed to these results or selective removal of remains, or perhaps portions of remains were intentionally removed to make room for additional individuals.

Chachapoya mortuary practices often resulted in the creation of new bodies and new communities by gathering the dead in a specific space, and anthropomorphizing features of this context (Crandall 2012; Buikstra and Nystrom 2003; Nystrom et al. 2010). Data gathered from the La Petaca project indicate both the presence of the individual and the "dividual," however emphasize the importance of the collective in mortuary treatment. These were not individual burials, rather each context discussed held the remains of multiple individuals deposited in a way that created and highlighted a communal identity. The skeletonized nature of the remains excavated from SUP-CF01 emphasizes the fractal nature of the human body in its skeletal form. Without some type of wrapping or other treatment of the remains postmortem, adding additional bodies to these contexts resulted in the commingling of remains, which could suggest that this commingling was an intentional byproduct of these mortuary practices. If so, that indicates that the group identity was given primacy over the individual. While the remains recovered from the constructed contexts were better articulated and significantly less commingled, group burials of multiple individuals of various ages within these spaces also suggest that persons become part of a communal identity after death. The practiced events of visiting and depositing additional individuals in these contexts over time strengthens the communal identity of the living society, and in the case of the Chachapoya, reinforcing the *ayllu* structure. The notion of identity is never stagnant; it is shaped by the day-to-day events, practices, and rituals experienced by the living throughout the generations.

The gradual accumulation and construction of mortuary contexts across this exposed escarpment as preliminary radiocarbon dates indicate, suggest regular revisitation to this space, if only to deposit new individuals into the mausoleums and

caves or to reaffirm the living populations relationship with their ancestors during specific ritual events. This indicates that the commingling process was a result of a natural or culturally constituted accumulation of the dead into these small spaces. As most individuals do not naturally die at the exact same time, the tombs were most likely revisited and filled when necessary. However, it is impossible to rule out specifically timed events or ceremonies when the living would have communed with the dead. Through these events that become formalized with practice and repetition, social memory would become ingrained within the body of the deceased, creating and maintaining a communal identity (c.f. Metcalf and Huntington (1991) example of the Berwan culture in Borneo). These bodies become agents of memory for those individuals that revisit and reuse this space, and who participate in new mortuary practices and the deposition of bodies into new mortuary space. In the Andean region, bodies are commonly ascribed with their own form of social agency, and it is argued that they embody and become expressions of institutional power (c.f. Robb 2004). By the practiced revisitation and deposition of new internments, these activities shape the mortuary landscape and become expressions of social memory and visual monuments to shared collective identity. Practiced revisitation of certain ancestors perpetuates the *ayllu* social structure, maintaining a society based on lineage-based kin relationships and reciprocity with familial ancestors directly tied to features of the landscape.

The presence of food offerings, interpreted from the recovery of complete ceramics and animal remains, are not expected to be naturally occurring in tombs. This suggests offerings were made during and after "burial" as part of an ongoing mortuary process providing necessary "resources" for the dead who were perceived to require these sustenance items. For those that used La Petaca as a final resting place for their deceased, the dead were an active community that existed as an extension of the living. As past studies have shown, these rituals are often found in societies with high levels of group cohesion, and contribute to a strong sense of group identity (Mantha 2009). The presence of ancestor veneration at La Petaca signals that the Chachapoya had a strong sense of group identity during life, which is reflected in their treatment of individuals after death. Data presented in this chapter reinforce the notion that a strong sense of group identity influenced the mortuary practices of the Chachapoya, and often resulted in visual expressions of group identity with mortuary practices that emphasize visibility within the landscape.

Conclusions

Paleodemographic analysis of the disturbed commingled contexts SUP-CF01, SUR-EF13, and SUR-EF18 provided a basis with which we could spatially explore the ways cave and mausoleums had been used as a mortuary space at La Petaca. In turn, this chapter demonstrated that despite the disturbed and commingled nature of these mortuary contexts, through careful paleodemographic and spatial analysis, theoretical questions of social identity and memory can be explored. After a review

of the data presented here, it appears that the concepts of group identity, perpetuation of social memory, and the practice of ancestor veneration each played an integral role in the formation and maintenance of La Petaca as a mortuary complex. The locations of the cave and constructed contexts within the landscape, the methods of body deposition and likely revisitation, and their place within the larger mortuary context of La Petaca all suggest that community was important to the Chachapoya society, and mortuary contexts played a key role in the maintenance and strengthening of that identity. The contexts surveyed at La Petaca are in no way final, permanent, or complete burials. They are placed in locations and ways such that the structures can be seen from a distance and directly be visited again, touched and the materials within be moved. These spaces were utilized, time and time again, maintaining kin and familial relationships, and perpetuating the social memory of these commingled group deposits through a visual monument in the cultural landscape.

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Chapter 7
Patterned Processing as Performative Violence

Anna J. Osterholtz

Site Background, Analytical Methodology, and the Sample

The site of Sacred Ridge is located near Durango, Colorado. It is a Pueblo I site radiocarbon dated to AD 700–900. The site consists of several clusters of structures along hilltops, believed by the excavators to have a special ritual significance. Central to this interpretation are the presence of a large "community-level ritual structure" (Potter and Chuipka 2010, p. 512), early tower kiva, palisade, and very large amounts of groundstone possibly indicating regional feasting activities (Potter and Chuipka 2007, 2010). The site was excavated by SWCA Environmental Consultants as part of the Animas-La Plata project preparatory to the construction of Lake Nighthorse. Two structures of interest to this massacre are Features 104 and 58, where approximately 15,000 human bone fragments were excavated from two pit structures. Feature 104 is a pit structure approximately 6.0×5.2 m with a depth of approximately 1.8 m. This is the only pit structure with a bifurcated vent. Over 12,000 human bone fragments were found within the fill and on the floor of the structure. Feature 58 is another pit structure, measuring 7.9×6.8 m with a bench on three sides. Potter and Chuipka (2010) interpret this as a domestic structure used to process the human remains that were then carried downhill and deposited in Feature 104. Together these two structures had a total of 14,883 fragments of human bone. Artifacts consisting of ceramic vessels, flaked stone, and ground stone all tested positive for both human hemoglobin (blood residue) and myoglobin (muscle tissue residue) in both pit structures (Marlar 2010). The site appears to have been abandoned around AD 810, with the massacre of at least 33 people being one of the last-dated events to have occurred at the site.

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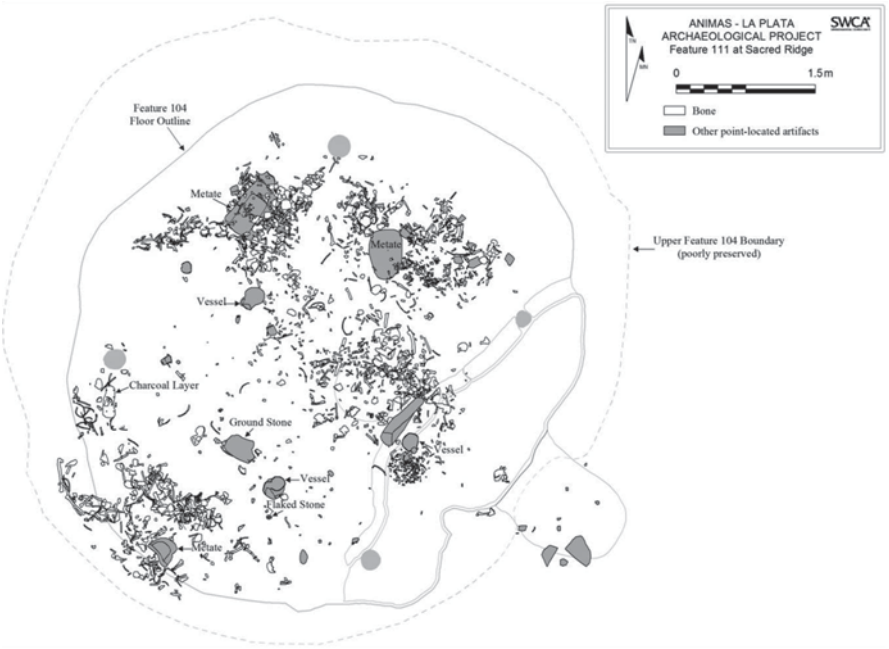

Fig. 7.1 Map of Feature 104, showing overall deposition of fragments within the pit structure

Bone fragments were analyzed over a 3-year period using a phased approach involving fragment identification, refitting analysis, and taphonomic analysis of the conjoins (for a thorough explanation of the methodology used, please consult Osterholtz and Stodder 2010; Stodder and Osterholtz 2010; Stodder et al. 2010).

The identification of specific individuals was not possible due to the extreme degree of commingling, but element-specific analyses were completed. Of the 33 individuals represented, at least ten males and seven females could be identified morphologically. Age at death ranged from infant to adult, but fine age at death estimates were not possible due to a lack of features available for scoring, that is, there were no pubic symphyses recovered.

Perimortem trauma was identified on every part of the body, from the top of the head to the sole of the foot. There is no visible patterning in age or sex with regard to degree or type of processing. Additionally, there is no spatial patterning visible in the deposition of fragments. Over 9000 point locations were taken with a total station in order to create a detailed map of the assemblage within Feature 104 (Fig. 7.1); as is clear from the figure, there is no clustering of elements, clustering by sex, or clustering by age. This assemblage is an excellent example of extreme processing (along the lines of Kuckelman et al. 2000; Turner and Turner 1999), and because of the detail-oriented mapping, excavation, and analysis conducted, it allows us to begin to look at how individuals were processed and how they were deposited.

Cranial Processing at Sacred Ridge

Consistent patterning is present on the cranial elements, regardless of age or sex of the individual. In general, fewer tool marks and less extensive fracturing are visible on juvenile remains, but this can be explained anatomically. In children, when the skull is still forming and sutures have not united, fractures will tend to follow along sutural lines (Galloway 1999); extensive blunt force trauma may not be needed to implement cranial fragmentation if this was the goal of processing.

Fracture and Fragmentation

Face

Facial bones were universally fractured. The association of facial bone to the cranial vault was not possible, but occasionally a mandible could be associated with a temporal if there was sufficiently unique morphology in the temporomandibular joint (TMJ). Separation of the face from the cranial vault indicates a very high degree of fragmentation. Fractures to the face are most commonly the result of interpersonal trauma (Galloway 1999; Kontio et al. 2005; Novak 2007). In the Sacred Ridge assemblage numerous identified fractures were found. Among these are fractures consistent with blunt force trauma to the front and sides of the face, based on the presence of multiple LeFort fractures, ablation fractures, and tripod fractures (Galloway 1999). On some conjoins it was clear that processing went beyond the initial fragmentation and separation of the face and the vault. SKU-091, a 12–18-year-old adolescent of indeterminate sex, exhibited crushing on the internal aspect of the nasal aperture; this could only have been accomplished via extensive fracture to the maxilla after the maxilla was separated from the rest of the cranium (Fig. 7.2).

Fig. 7.2 SKU-091, showing crushing on the internal aspect of the nasal aperture

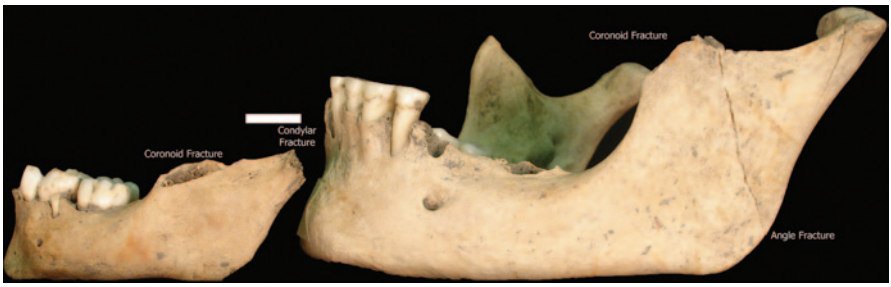

Fig. 7.3 Adult and child mandibles, showing multiple mandibular fracture types

Mandibles were extensively and consistently processed as well, including cut marks to attachment sites for the masseter, buccinator, platysma, depressor labii inferioris, and mentalis muscles. The mandible contains marks similar to those described by Frison (1971) for the removal of antelope mandibles in order to access the tongue. Essentially, the musculature and connective tissues are cut and the mandible is wrenched away from the skull, leading to angular, condylar, and coronoid process fractures, all of which are abundant in the Sacred Ridge assemblage (Fig. 7.3). Mandibular symphysis fractures are also common, and likely the result of direct blows delivered to the mandible with large amounts of force (Fig. 7.4, Fig. 7.10). Galloway (1999) cites that in individuals with intact dentition and soft tissue present, forces between 184 and 750 pounds of pressure are necessary to cause this type of fracturing. It is not clear if the fractures to the mandibular symphysis occurred before or after the removal of the mandible from the rest of the cranium.

Vault and Basicranium

A great amount of energy was expended in reconstructing cranial vault in order to examine fracture patterning and tool marks extending across multiple fragments.

Fig. 7.4 SKU-063, symphyseal fracture

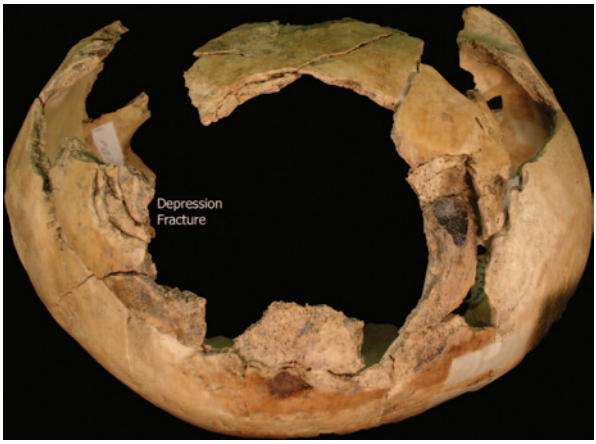

Fig. 7.5 SKU-024, blunt force trauma on the cranial vault

Most of the reconstructed cranial vault conjoins (and some unassociated fragments) exhibited large blunt force traumas. These usually occurred on the right side; these are considered to be perimortem due to the vault release and characteristic fracture patterning. Probable impact sites can be inferred based on the location and nature of the fracture lines. Fracturing due to blunt force trauma tends to result in ring fractures that intersect. Fractures subsequent to the first fracture cannot cross the existing fracture line, and so the area of impact can be inferred based on the intersection of fracture lines (Fig. 7.5).

Fracturing to the occipital is very consistent. Most adult occipitals are lacking the posterior rim of the foramen magnum. Most have perimortem fracturing at the inferior nuchal line or inferior to the inferior nuchal line, with no portion of the foramen magnum is present. This fracturing is consistent with blows to the back of the head best described by Ta'ala et al. (2008, p. 196) in association with the Khmer Rouge:

> This execution method employed the application of massive force directed at the inferior squamous portion of the occipital, often resulting in an extensively fractured cranial base. Although, structurally, this area is strongly buttressed, sufficiently forceful blows to this area can easily result in death, because the proximity of the cerebellum, the brainstem, and the spinal cord….

Damage resulting from this method includes fracturing to the squamous portion of the occipital, with the fracture margins exhibiting internal beveling, radiating fractures terminating at or arcing around the foramen magnum, and partial detachment of the cranial base (Ta'ala et al. 2008). The fracturing at Sacred Ridge could be the result of a similar execution method, or could be the result of processing to remove the head from the rest of the body; it is unclear (Fig. 7.6).

Fig. 7.6 SKU-031, occipital fracturing consistent with blunt force trauma

Tool Marks

Face

Tool marks on the face are clustered around anatomical features. Multiple skulls show signs of scaliping and soft tissue removal. Parasagittal cut marks and scrape marks were common on the forehead. The forehead was a common site for impacts, as evidenced by percussive pitting and associated striae and scrapemarks (Fig. 7.7). The zygomatic processes of the frontal were common sites for scrape marks, possibly related to the scrapemarks also found on the frontal processes of the zygomatic bones. These may not be the result of direct trauma, but may be the result of the

Fig. 7.7 SKU-002, showing impacts and tool marks on the frontal

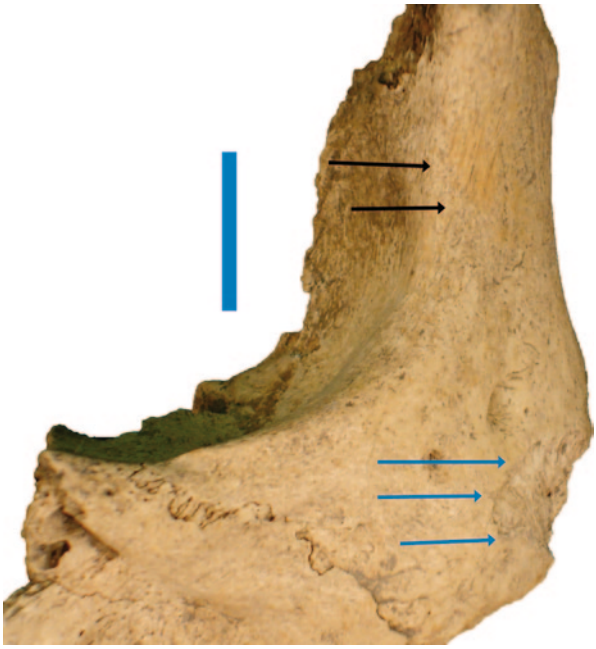

Fig. 7.8 SKU-063, closeup of zygomatic, toolmarks *(black arrows)* and peeling associated with the removal of the buccinators muscle *(blue arrows)*

skull being rested upon these relatively flat surfaces during processing and fracturing of the vault. Scrapemarks that follow the curve of the orbit, however, are more likely to be the result of direct trauma such as eye-gouging or scraping the floor of the orbit. Additional tool marks and peeling on the inferior surface of the zygomatic process of the maxilla may have been related to severing the buccinators muscle to aid in removing the jaw (Fig. 7.8).

Tool marks on the mandible are located on or near muscle attachment sites, and are therefore likely present as processing marks in order to remove the musculature to allow for the removal of the mandible. Additional tool marks present on the mandible may be related to the removal of the lips, as they are confined to the attachments for the depressor labii inferioris and mentalis muscles.

Vault and Basicranium

Soft tissue on the superior cranium is limited to the galea aponeurotica, a layer of tendinous connective tissue bridging the skull between the occipitalis and frontalis muscles. This aponeurosis contains Sharpey's fibers that orient to the skull at all angles, so removal of this aponeurosis may have necessitated cut and scrapemarks with multiple orientations (Fig. 7.9). The lateral vault is occupied by the temporalis muscle; in robust individuals, this muscle may become quite large and difficult to remove, necessitating multiple scrapes and cuts to the bone. The inferior portion of the lateral vault, consisting of the temporal bone, contains attachment sites for the

Fig. 7.9 SKU-213, tool marks to the superior cranial vault and along the temporal line

auricularis muscle group and the sternocleidomastoid muscle. While the squamous of the temporal is thin and easily fractured, the mastoid is robust. Two groups of tool marks are visible on mastoid processes at Sacred Ridge; vertically and transversely oriented. Transverse tool marks are likely caused during severing of the sternocleidomastoid muscles; vertically oriented tool marks are more difficult to explain but may be caused during removal of the ears.

Burning

Burning patterns are also consistent on cranial conjoins, and focused on the endocranial surfaces, except where the pattern of differential burning is evident. This is a pattern of refitting fragments into conjoins where the fragments exhibited different degrees of burning. This allowed for a reconstruction of the order of events that occurred during the processing, with burning occurring prior to and after fragmentation (Fig. 7.10). Mottling may indicate that some soft tissue was present on the bone during burning, most likely in the form of small pieces of adhering connective tissue.

Face

Consistent with White's analysis of Mancos (1992), the most outward projecting parts of the face are those that exhibited burning. Additionally, numerous facial bones exhibited assymmetrical burning, with usually the right side more burned

Fig. 7.10 SKU-061, showing assymetrical burning and mental eminence fracture

than the left. This burning, particularly on the mandible may have been part of the processing preparatory to the removal of the mandible to burn away or loosen some of the soft tissue attachments before cutting and wrenching the mandible from the face (Fig. 7.10).

Vault and Basicranium

Two patterns are present on the cranial vault. The most common was substantial burning on the right parietal and portion of the frontal squama, with lessening degrees of burning radiating from a central darker spot (Fig. 7.11). The second pattern

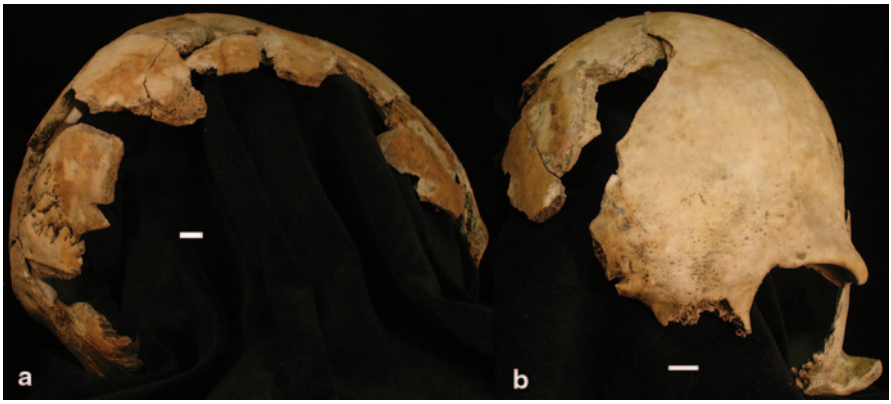

Fig. 7.11 SKU-188, showing characteristic burning patterns. **a** right lateral view, **b** anterior view

is that of differential burning. This pattern is the one formed when fragments with differing degrees of burning refitted together.

Interpretation of Patterned Processing

Taken together, the processing described above is consistent and paints a picture of how an indivudal was processed, regardless of age or sex. Processing appears to have begun with the removal of soft tissue such as scalping, ear and lip removal, and the removal of large amounts of cranial musculature. Burning may have occurred by placing the mostly defleshed skull in a fire or on hot coals, thus creating the intense burning in one location and lighter charring elsewhere. After a time in exposure to fire, blunt force trauma was inflicted on the side of the cranium, usually the right side. The consistency in location of the blunt force trauma suggests that the crania were essentially lined up and blows delivered in succession. Mandibles were removed either before these blows or after, this is difficult to determine, but the mandible may have acted as a stabilizing structure during the blows to the side of the cranium. At some point, the mandibles were removed. Facial trauma such as tripod fractures and LeFort fractures are consistent with interpersonal trauma and may have been the result of perimortem beatings. Or the facial fracturing may have been a part of the processing that occurred in order to completely remove the individuality of the victims during the massacre. After fragmentation, some fragments were allowed to continue being exposed to high temperatures. At some point, site clearing activities were initiated, and the fragments (many dime-sized) were collected and deposited in Feature 104.

Violence As Social Communication

The purpose of the chapter is to examine the role of performance in violent interaction. Violence should be viewed as a form of social communication which acts to cement social groups (Krohn-Hansen 1994; Rappa 1999; Schröder and Schmidt 2001). Violence when viewed as social communication requires a language in which to transmit information. In massacre settings such as that at Sacred Ridge, this communication is systematic processing of individuals. This systematic processing can be interpreted as performance, where the same action is repeated again and again by multiple individuals or actors.

The nature of performance has been studied by multiple scholars with multiple foci. Performance is used here within a ritually violent setting to create and reinforce a group identity. Performing the same task over and over again is often used to indoctrinate individuals and to reinforce group identity. Osterholtz and Harrod (2013) examined the role of identity formation in terms of practice and performance with military training and indoctrination. Cross culturally, the development of routine and rituals such as drilling, training, and rigid, repetitious ceremony were instrumental to forming a cohesive military unit. This creates a new type of collec-

tive kin, where individuals see the group as more important than any one individual. Drill and ceremony are performances.

In the case of Sacred Ridge, the actors in this performance are the violent aggressors, the victims, and the witnesses. The easiest group to identify are, of course, the victims. They are quantifiable and visible in the archaeological assemblage. We can discuss the damage to their remains, and begin to see their relationship to the witnesses and the aggressors. Aggressors are visible only through the actions that created the assemblage. We can identify clinical fracture types typically associated with blunt force trauma and interpersonal violence and we can see the processing of the remains. As the dead do not bury themselves (Parker Pearson 1999), so too the victims do not process their own remains. Who the aggressors are, however, is unclear. As noted by Tung (2014), the agressors are transformed through their performance as well. They may have gained new social status or relegated to the margins of society, two statuses that may not be mutually exclusive. Boas (1967), for example, noted that while men who achieved status through violence were highly valued, they were seen as marginal within society. They were both important *and* socially isolated from mainstream society.

The witness group is the hardest to identify, but they are the focus of the activity being conducted. Witnesses may include those who will ultimately be part of the victim group who are forced to watch and hear their community members tortured and killed. But they may also be members of the community not subjected to violence (instituting a measure of social control over them by the aggressors). This is a common tactic in numerous parts of the world, and forms the basis of totalitarian regimes throughout time. This is the ability to either inflict pain or to take pain away. In my mind, it is the ability to not cause pain that is more important. We go to great lengths to keep children or those we love away from pain, and so to have a social power who can withdraw pain as an option would be a great social motivator to follow orders or submit to a social system. In an analysis of 35 different archaeological and ethnographic case studies, Kantner (1999) found that one of the primary motivations for the infliction of trauma was the subordination of a group in 23 of the 35 case studies examined. Finally, the witnesses may be made up of initiate members of the aggressor group or those who are interested in gaining or maintaining their standing within the aggressor group. By contritubing to the performace, these actors cement their social standing and reinforce their group cohesiveness by creating an *other*.

Performance in this case is identified by the systematic nature of the damage to the skeletal elements. This chapter (presentation) focuses on the cranial elements, but the postcranial elements all exhibit the same sort of uniform damage regardless of age or sex of the individual being processed (e.g. Osterholtz 2012, 2013, 2014).

Politicization of the Dead

It is impossible not to look at an assemblage like Sacred Ridge not see the dehumanization of the victims. By the end of the processing and deposition, these would not

have been identifiable as human, let alone as individuals or families. Added to this were the inclusion of four dogs that were similarly processed and placed into Feature 104 (Stodder et al. 2010). But as Perez notes, violence should never be reduced to mere physicality when interpreting its social use. As he states (2006, p. 112):

> Warfare and violence are not merely reactions to set of external variables but rather are encoded with intricate cultural meaning. To ignore these cultural expressions or, worse yet, suggest they do not exist, minimizes our understanding of violence as a complex expression of cultural performance…. This is because violent acts often exemplify intricate social and cultural dimensions and are frequently themselves defined by these same social contexts.

Performative acts involving the processing of the dead serve a mechanism for creating and renegotiating group identity. In socially sanctioned violence:

> … the corpse is seen as a transitional object between life and death for both the perpetrated and victims, it sends a powerful message when it is ritually destroyed or mutilated. The physical and psychological impact of this type of cultural performance is staggering. This type of violence creates a "spectacle" in which the display of the remains demonstrates the power and strength of the victors and the vanquished group's mortality and creates massive psychological trauma that impacts the survivors. This is accomplished through the transformation of young healthy men, women and children into an unrecognizable mass of body parts. (Pérez 2006, p. 115)

Building on this concept of the use of the body to create social control, I argue that this relationship of power and control is directed toward the witnesses to the acts. The minimum number of individuals (MNI) of 33 is not sufficiently large to explain all the habitation at the site of Sacred Ridge, and so community members not involved with the massacre likely witnessed either the act itself or saw the aftermath and deposition. Processing the bodies is not only a tremendously performative act, but it also removes the ability of survivors to perform normal burial rites (Pérez 2006). In examining perimortem trauma in the Andes, Tung (2014, p. 447) notes that high amounts of processing can be seen as "highly tactile engagement with the bodies, treating them as objects to be cut, smashed, defleshed, and demuscled…. As the physical persons were erased, parts of their identity (and their primary agency) were also erased. On a larger scale, physical erasure of individuals contributed to community and social erasure, as well as some reformulation of the community, both imagined and otherwise." This separates the victims from society in a way that transcends time. This separation of the victims from those given a normal burial continued through to the repatriation of these individuals, who were repatriated in a different and in their commingled state.

Conclusion

Radiocarbon dates from the processed assemblage at Sacred Ridge provide the last dates for occupation from the site, meaning the site was abandoned after this massacre. This chapter has shown that processing of the crania at Sacred Ridge was patterned and consistent without regard to age or sex of the victims. The identities

of the victims were completely destroyed through processing and commingling, and their disposal in a common burial. The patterned nature of this processing is a performative act.

When one looks at the intersection of performance and violence, the body does become a transformative object, tying all those who contribute to the violence and those who witness the violence together. This processing (violence), in effect creates and cements a relationship between the two groups.

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Chapter 8
Contexts, Needs, and Social Messaging: Situating Iroquoian Human Bone Artifacts in Southern Ontario, Canada

Tara Jenkins

Introduction

On Southern Ontario Iroquoian sites, fragmentary human skeletal remains, also referred to as "scattered" human bone, have been recovered in village middens, public areas, and interior house refuse pits (Williamson 2007). Fragmentation is by definition breaking a bone into parts (Osterholtz et al. 2014, p. 8). Scattered human bone (SHB) is a result of intentional fragmentation caused by processing, frequently severe, making identification of the skeletal elements difficult. This paper focuses on intentionally modified SHB that was made into objects through acts of extreme processing involving shaping, polishing, drilling, and decorating.

The presence of SHB and human bone artifacts in Ontario's archaeological record shows, regardless of cultural affiliation, that there were cultural processes in place that resulted in a widespread practice (Birch 2010; Cooper 1984; Williamson 2007). Human bone artifacts have been perceived as linked to warfare, as they are commonly categorized as trophies from the body parts of captives (Hurlbut 2000; Williamson 2007). This thought stems from the reflection that interpersonal conflict and prisoner capture and sacrifice increased in the later part of the Late Woodland period (AD 900–1650), especially in the mid-fifteenth century, coinciding with the increased occurrence of SHB in the Ontario archaeological record (Birch 2010; Williamson 2007). Some human bones were disconnected from their corpse and from burial in typical mortuary contexts, and primarily discarded in village refuse. Regardless of how we classify their recovery contexts, the intentional fragmentation and modification of the human bone point to additional mortuary processes whereby certain categories of people did not receive customary burials because of circumstances in their lives or deaths (Weiss-Krejci 2011).

In this chapter, human bone artifacts are situated in culture by using theoretical frameworks (i.e., body partibility and politicization of the dead) in order to explain

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how fragments of human bone came to be comingled with other material culture in refuse by reassembling the human bone artifact back to the individual. Body parts of prisoners became artifacts. At capture, the prisoner became aligned with a new social identity and was regarded as a highly divisible body. The separated body part became a trophy which generated authority for its maker and served as the ultimate debt repayment. This implies that after the bone was separated from the body, it lost its link to the individual and took on a new role in Iroquoian material culture as an object used for ritual to shape future events.

Method

In order to situate human bone artifacts in culture, it was important to identify the recovery contexts of the artifacts in order to search for temporal and spatial trends and provide insight into cultural processes responsible for their disposal. This involved a comprehensive review of published and unpublished archaeological literature in search of data concerning human bone artifacts. The inventory, presented in Table 8.1, includes provenience data and descriptive attributes that indicate cultural modification, rather than change resulting from taphonomical processes. In order to provide greater interpretative value and highlight spatial trends, two case studies of coterminous Iroquoian village sites, Keffer (ancestral Wendat) and Lawson (ancestral Attawandaron) were employed. Some factors limited my research. For the most part, access to the human bone artifacts was prohibited for direct study. Documentation suggests archaeologists recognized such objects as early as 1886 in Ontario (Boyle 1888). However, these early discovered human bone artifacts were housed in private and public collections and provenience was never recorded. Therefore, these items have not been included in this study. Lastly, the study results are limited since few published reports are available regarding sites dating between the thirteenth and fifteenth centuries other than those of ancestral Wendat. Therefore, there will be some unpublished sources I have overlooked.

Chronological–Cultural Background

The purpose of this section is to establish the venue in which the archaeological data regarding human bone artifacts is observed, thus providing a basis necessary to firmly root them within the context of past Iroquoian societies in Ontario.

During the Early (AD 900−1300) and Middle (AD 1300−1400) Iroquoian periods in Ontario, there is little evidence of warfare (Birch 2010). Before AD 1300, Iroquoians lived in semisedentary base settlements or villages about 0.4 ha in size with 100–150 inhabitants, usually occupying five–six longhouses (Birch 2010; Pihl et al. 2008; Warrick 2008; Warrick 2013; Williamson 1990). Structurally, village defense was weak since single row palisades have been interpreted as fences, and

Table 8.1 Human bone artifact inventory in Southern Ontario, Canada

Site name	Site type	Date (AD) and affinity	Provenience	Element	Inferred artifact type	Manufacturing details	Literature reference (P.C.: personal communication)
1.Porteous	Village (0.61 ha)	ca 700 Transitional woodland	a) Not specified—in village area	Fibula	Not speculated	Ground and polished	Burns 1977; Cooper 1984; Dodd et al. 1990; Noble and Kenyon 1972; Stothers 1977
			b) Pit	Piece of skull	Not speculated	Exhibits polishing	
2. Praying mantis	Village (0.23 ha)	ca 900 EOI	a) Comingled burial 2 (in house)	Middle-aged male mandible	Mask?	Rami cut off, cut marks and striations, five holes (one punched, four drilled)	Pearce 2008–2009; Pearce P.C. 2011
3. Uren	Village (1.1 ha)	1250–1300 MOI	a) Surface—in village area	Subadult parietal	Gorget	Several perforations	Cooper 1984; Dodd et al. 1990; Williamson 2007; Wintemberg 1928; Wright 1986
4. Moatfield	Village (0.8 ha)	1250–1300 MOI	a) Sweat lodge (feature 1)	Right parietal (youth) (fragment 1)	Rattle	Prominent bossing, edges ground and polished, two drilled perforations near edge—holes align with fragment 2	Williamson et al. 2003
			b) Sweat lodge (feature 1)	Left parietal (youth) (fragment 2)	Rattle	Broken differently—more extant than fragment 1, three pieces mended, two perforations, broken surface near drill hole, smoothed and polished, holes drilled endo- and ectocranial	
5. Crawford Lake	Village (1.6 ha)	1350–1400 MOI	a) Sweat lodge	Parietal nearly complete	Rattle	Seven perforations, part of the edge was beveled	Anderson 2009; Dodd et al. 1990; Esler 1998; Finlayson 1998; Finlayson and Byrne 1975
			b) Not speculated—in village area	Phalange	Not speculated	No description	

Table 8.1 (continued)

Site name	Site type	Date (AD) and affinity	Provenience	Element	Inferred artifact type	Manufacturing details	Literature reference (P.C.: personal communication)
6. Robb	Village (2 ha)	1350–1400 MOI	a) Midden 2, L1	Parietal fragment	Gorget	Polished, two drilled holes, incised lines/cut marks on ectocranial surface	ASI 2010; Birch 2010; Birch and Williamson 2013; Williamson, P.C. 2014
			b) Midden topsoil	Parietal fragment	Not speculated	All surfaces slightly polished, fine striations, top surface has two globular marks, one round mark and two linear marks, edge rounded and smooth, one partially drilled hole	
			c) Midden topsoil	Parietal fragment	Not speculated	All surfaces slightly polished, fine striations, one possible incised line/cut mark on top surface, lip rounded and smoothed and polished, broken/snap along the valley of the incised line/cut mark	
7. Pound	Village	1400–1450 LOI, Anc. Attawandaron	a) Likely midden	Left parietal fragment	Not speculated	Perforated and smoothed	Anderson 2009; Kapches, P.C. 2011; Spence, P.C. 2011; Williamson 2007; Williamson P.C. 2013
8. Webb	Village	1400–1450 LOI, Anc. Wendat	a) Longhouse 2 or 3	Parietal	Rattle	All surfaces highly polished, particularly on the inside, presumably from stone used in rattle	Harper 1952
9. Joseph Picard	Village (1.5 ha)	1400–1450 LOI, Anc. Wendat	a) Midden area, end of house 4	Ulna	Awl?	Proximal end, polished, sharpened distal end	Williamson, P.C. 2013

Table 8.1 (continued)

Site name	Site type	Date (AD) and affinity	Provenience	Element	Inferred artifact type	Manufacturing details	Literature reference (P.C.: personal communication)
10. Jarrett-Lahmer	Village (1 ha)	1480–1500 LOI, Anc. Wendat	a) Midden-test units on SW slope	Likely parietal fragment	Rattle	Beveled ground edges	ASI 2001; Williamson, P.C. 2011
11. Winking Bull	Village (0.8 ha)	1450–1500 LOI, Anc. Attawandaron	a) Midden	Adult phalange	Not speculated	Exterior surface polished, proximal articular facet ground down, a drilled hole had been started at the proximal articular surface along long axis of the element	Esler 1998; Finlayson 1998; Williamson and Veilleux 2005
			b) Midden	Skull cap	Rattle	Beveled edge, polished exterior surface, one incomplete perforation on exterior surface	
12. McNair	Village (1 ha)	1450–1475 LOI, Anc. Wendat	a) Midden 1	Parietal fragment (two pieces mend)	Rattle	Beveled edge, polished exterior surface, one incomplete perforation on the exterior surface	ASI 2012
13. Paddison-Bellwood	Village	1400–1500 LOI, Anc. Tionnontaté	a) Not specified—in village area	Right parietal fragment	Rattle/ Gorget	Broken after modifications, highly polished exterior with two complete and one incomplete perforations, scratches on exterior but no pattern	Garrad (n.d.)

Table 8.1 (continued)

Site name	Site type	Date (AD) and affinity	Provenience	Element	Inferred artifact type	Manufacturing details	Literature reference (P.C.: personal communication)
14. Draper	Village (1.2 ha–3.4 ha)	1450–1475 LOI, Anc. Wendat	a) Midden 51	Cranial fragment	Rattle	One unfinished perforation, scratching interior surface—likely result of item on an abrasive surface while perforation was being made	Birch 2010; Cooper 1984; Ferguson 1979; Forest 2010 Digital catalogue (1975, 1978 excavations) courtesy of Museum of Ontario Archaeology, Jan., 2015
			b) Longhouse 6	Cranial fragment	Rattle	Grinding to a beveled edge, thermal alteration occurred after modified	
			c) Midden 52	Parietal fragment	Rattle	Cut edge, highly polished exterior surface	
			d) Midden 67	Right parietal complete	Rattle	Cut marks, apex formed by intersection of coronal and sagittal sutures broken off to round it, no polish	
			e) Midden 67	Parietal fragment	Rattle	Cut marks along edge, one edge scraped smooth; light polishing on exterior surface	
			f) Longhouse 2	Cranial	Rattle	Perforated, highly polished	
15. Downsview	Village (<2 ha)	1450–1500 LOI, Anc. Wendat	a) Midden	Mandible	Pendant	Carved, ramus removed from a point just back from the third molars, all the teeth are intact in excellent condition, lower portion of mandible cut away revealing the alveolar sockets	Emerson 1954; Williamson 2007; Williamson, P.C. 2013

Table 8.1 (continued)

Site name	Site type	Date (AD) and affinity	Provenience	Element	Inferred artifact type	Manufacturing details	Literature reference (P.C.: personal communication)
16. Bosomworth	Village (1.6 ha)	1450–1500 LOI, Anc. Wendat	a) Midden	Parietal fragment	Rattle	One perforation, hole worn both sides, beveled edge, polished exterior and interior, drill hole adjacent to edge, some flake scars along edge	Emerson 1959; Noble 1974; http://anthropology.utoronto.ca/ exhibit/bosomworth.htm
17. Spang	Village (3.4 ha)	1475–1500 LOI, Anc. Wendat	a) Midden or test trench in village	Parietal	Gorget	One edge smoothed and worn	Birch and Williamson 2013; Carter 1981; Cooper 1984
			b) Not specified—in village area	Likely cranial	Bracelet or armlet	Tapered and curved in outline, a small gouged out perforation is found along the narrow unbroken edge, decoration -small incisions set within parallel lines found along both edges and in the center is a an S-shaped pattern	
18. Keffer	Village (1.2 ha)	1475–1500 LOI, Anc. Wendat	a) Midden 72 (365–485:25, 0–68 cm)	Adult right parietal (A and B mended)	Gorget	A: edges were intentionally flaked to create a curving edge, crack along edge suggesting was in process of manufacturing, angled rims B: worked edge, localized area of smoking—probably related to production, angled rims such as seen at Lawson	Rainey 2002; Williamson, P.C,.2011; Digital catalogue courtesy of Dr. David Smith, Dec 9, 2013
			b) Midden 57 (110−095:11, 20–30 cm)	Subadult parietal	Gorget	Cut marks, parallel striations on ecto- and endocranial surfaces, scrape marks, two drilled holes and polished edge, smoked evenly all surfaces	

Table 8.1 (continued)

Site name	Site type	Date (AD) and affinity	Provenience	Element	Inferred artifact type	Manufacturing details	Literature reference (P.C.: personal communication)
			c) Midden 60 (100–100:24, 10–20 cm)	Adult parietal	Gorget	Worked edge, cut marks, scraping, localized smoking, one suspension hole—drilled from exterior	
			d) Midden 71 (370–520:14, 0–34 cm)	Adult right parietal nearly complete	Gorget	Four drilled holes around circumference, cut marks and scraping present ectocranially with few endocranially	
			e) House 4 (505–555, in a feature with 11 other fragment human remains	Calcaneus	Function unknown	Medial and lateral processes and posterior tali articular surface are missing, hole present through the anterior part-orientated laterally, hole created by punching action, the small crack likely occurred when bone was fresh otherwise would have shattered	
			f) Midden 61 (485−470:7, 26–55 cm)	Subadult parietal (three pieces mend)	Gorget	Worked edge, cut marks and scrap marks on ectocranial surface, smoking on worked edge	
			g) Midden 65 (420–575:12, 20–44 cm)	Adult right parietal	Gorget	Cut marks on ectocranial and endocranial surfaces, localized smoking on ectocranial surface, suture edge worked, brown stain on external surface with cracking	
			h) Midden 65 (395–565, in a feature)	Adult right parietal nearly complete	Gorget	Edges intentionally flaked to result in curved edge, cracked in manufacture (indicates polish and grinding occur after flaking edges for shape)	

Table 8.1 (continued)

Site name	Site type	Date (AD) and affinity	Provenience	Element	Inferred artifact type	Manufacturing details	Literature reference (P.C.: personal communication)
			i) Midden 61 (90–115:17, 27–37 cm)	Adult parietal	Gorget	Thick parietal, smoked, polished edge, cut marks, two drilled holes	
			j) House 9 (465–525) (refuse pit along west wall of house)	Adult parietal incomplete	Gorget	Cut marks near worked edge ectocranially and tool marks endocranially that are parallel to worked edge	
19. Lawson	Village (2.2 ha)	1475–1500 LOI, Anc. Attawandaron	a) Midden 12 (425–525:1, 40–50 cm) (Catalogue 2002–7150) Midden 12 (425–520:10, 30–40 cm) (Catalogue 2002–4013)	Adult parietal fragment (two pieces mended)	Gorget	Two drill holes—exterior and interior drilling, decorative lines incised on surface, heavily polished both sides, edge ground square, breakage along meningeal artery	Anderson 2009; Cooper 1984; Fontaine 2004; Pearce P.C,.2011; Wintemberg 1921–1923, 1939
			b) Midden 12 (425–520:10, 30–40 cm) (Catalogue 2002–4046)	Adult parietal fragment	Gorget	One drill hole, lines incised on surface, edge ground square, smoked	
			c) Midden 12 (425–520:25, 0–10 cm) (Catalogue 208022)	Adult? parietal fragment	Gorget	Two drilled holes remain, very thin, edge ground square	

Table 8.1 (continued)

Site name	Site type	Date (AD) and affinity	Provenience	Element	Inferred artifact type	Manufacturing details	Literature reference (P.C.: personal communication)
			d) Feature 7—longhouse 18 and 19 (480–535:7, 40–44 cm) (Catalogue 870407)	Subadult parietal fragment	Gorget	Four holes remain, thin, heavy polish on exterior, edge ground square	
			e) Longhouse feature (485−475:23,0–10 cm)	Skull-12 pieces	Gorget	No description	
			f) Refuse 25 (Catalogue 19636)	Left tibia	Mallet/ Scraper	Both ends shaved off/flat, worked	
			g) Refuse 9 (and general digging refuse 10) (Catalogue 18226)	Four skull fragments (mend)	Not speculated	Polished on the inside	
			h) Refuse 9 (and general digging refuse 10)	Left ramus of mandible	Not speculated	Articular condyle hacked off, edge coronoid smoothed and whole surface polished	
			i) Refuse 12 (Catalogue 18650)	Adult left parietal nearly complete	Gorget	Multiple scraping marks on exterior, bearing faintly a large cross (x) on one side (sunburst pattern?), edges left in rough broken condition	
			j) Refuse 12 (Catalogue 18338)	One long bone	Not speculated	Polished shaft—recovered with other unmodified long bones	

Table 8.1 (continued)

Site name	Site type	Date (AD) and affinity	Provenience	Element	Inferred artifact type	Manufacturing details	Literature reference (P.C.: personal communication)
			k) Refuse 12 (Catalogue 18337)	Occipital bone	Not speculated	Polished and worn from use	
			l) Refuse 26 (Catalogue 19702)	Adult right parietal nearly complete	Gorget or pendant	One drilled hole, two broken drilled holes, heavily polished both sides, scratches, 50% of edge ground flat and square, some edge unaltered with trace of cranial sutures	
			m) Refuse 10 (Catalogue 18234)	Subadult left parietal fragment	Gorget	Two partial drilled holes, incised reticulate design on the convex side, thin, edge ground square	
			n) Likely refuse 13 (Catalogue 18846)	Adult fibula	Awl	Heavy polish, one end ground down, fracture along shaft occurred prior to polishing	
			o) Refuse 13 (Catalogue 18863)	Piece of skull fragment	Gorget	Unfinished	
			p) Area "A"-grave pit area (Sonely)	Subadult parietal complete	Gorget	Five perforations (1 partial) on edge with incised reticulate design on convex side, no attempt to smooth or obliterate arterial grooves, convex side smoothed and highly polished, edges polished	
			q) Area "A"-grave pit area (Sonely)	Parietal complete	Gorget	Six perforations showing wear on edges, highly polished both sides, drilled from both interior and exterior, edges ground square	

Table 8.1 (continued)

Site name	Site type	Date (AD) and affinity	Provenience	Element	Inferred artifact type	Manufacturing details	Literature reference (P.C.: personal communication)
			r) Area "A"-grave pit area (Sonely)	Two cranial	Not speculated	Modified	
			s) Area "A"-grave pit area (Sonely)	Two fibula	Drum-sticks	Shafts polished, articular ends battered and broken	
			t) Not specified—in village area	Right tibia	Not speculated	Anterior and posterior cutting and grinding to a bevel; beveling of medial malleolus	Cooper 1984; Wintemberg 1936
			u) Refuse context (recovered by Wilfred Jury)	Left femur	Not speculated	Posterior and anterior ends are cut and ground, greater trochanter and lesser obliterated by grinding, bone broken halfway down shaft for a sharp end	
			v) Not specified—in village area	Humerus	Not speculated	Lower part of shaft polished	
			w) Not specified—in village area	Right ramus of mandible	Not speculated	Polished	
			x) Not specified—in village area	Phalange	Not speculated	Two holes drilled through center	Williamson 2007
20. Clearville	Village	Late fifteenth to early sixteenth Century. LOI, Anc. Attawandaron	a) Block 48, Sect. 1-in village	Skull nearly complete	Gorget	No description	Cooper 1984; Jury 1941; Pearce, P.C. 2011; Williamson and Veilleux 2005

Table 8.1 (continued)

Site name	Site type	Date (AD) and affinity	Provenience	Element	Inferred artifact type	Manufacturing details	Literature reference (P.C.: personal communication)
			b) Block 57, Sect. 1—in village	Parietal nearly complete	Gorget	Decorated—incised sunbursts and headless stick figure—margins ground smooth and beveled, biconical holes drilled along margin, polished	
			c) Not specified—in village area	Ulna	Punch	Distal end removed, sharpened	
21. Parsons	Village (2.4 −3.4 ha)	1450–1500 LOI, Anc. Wendat	a) Midden area (unit 1 South—levels 3–5)	Skull	Gorget	Edge rounded off	Morrison 1979; Robertson et al. 1998
			b) Longhouse (Unit 3)	Skull fragment	Gorget	Small holes drilled through	
			c) Longhouse (Unit 3)	Skull fragment	Gorget	Small holes drilled through	
			d) Midden (Unit 5 SE Area)	Skull cap complete	Gorget	Two holes drilled near edges	
			e) Longhouse (level 6, center of house, Unit 5 NW Area)	Skull cap complete	Gorget	Two holes drilled near edges	
			f) Not specified—in village area	Skull cap	Not speculated	Modified	Williamson 2007

Table 8.1 (continued)

Site name	Site type	Date (AD) and affinity	Provenience	Element	Inferred artifact type	Manufacturing details	Literature reference (P.C.: personal communication)
22. Beeton	Village (1 ha)	1450–1500 LOI, Anc. Attawandaron	a) Not specified—in village area	Frontal (includes orbit)	Rattle or pendant	Modified, unfinished, polishing on endocranial surface	Cooper 1984; Williamson 2007; Williamson, P.C. 2013
			b) Not specified—in village area	Frontal (posterior portion)	Rattle or pendant	Modified, unfinished, small individual, cut marks	
23. Raymond Reid	Village (0.6 ha)	1450–1500 LOI, Anc. Attawandaron	a) Not specified—in village area	Skull fragment	Rattle	No description	Fitzgerald 1984; Williamson, P.C. 2014
24. Ivan-Elliott	Village (2.5 ha)	1400–1500 LOI, Anc. Attawandaron	a) Not specified—in village area	Skull cap	Rattle	No description	Allen 2007; Cooper 1984; Fitzgerald 1990
25. Lite	Village (3 ha)	ca 1500 LOI, Anc. Wendat	a) Midden	Parietal	Gorget	Two holes, decorated with V-shaped gouged line to form a triangle motif with three similar gouged lines parallel to the vertical edge of the triangle, a similar line crosses the dome, edge cut and ground, exterior not highly polished	Pendergast 1972
			b) Midden	Parietal fragment	Gorget	Two holes on circumference of item, edge ground into shape, exterior not highly polished	
			c) Midden	Parietal	Gorget	Highly polished exterior, single curved incised line which is approximately concentric with the outer edge	
			d) Midden	Skull fragment	Not speculated	Ground flat on one edge	

Table 8.1 (continued)

Site name	Site type	Date (AD) and affinity	Provenience	Element	Inferred artifact type	Manufacturing details	Literature reference (P.C.: personal communication)
26. McKenzie—Woodbridge	Village (2 ha)	1500–1550 LOI, Anc. Wendat	a) Likely midden	Parietal incomplete	Gorget	Three perforations, one partial perforation, edges beveled, deep scraping along margin by broken hole, lightly polished exterior	Emerson 1954; Johnson 1978; Saunders 1986
27. Seed (or Seed-Barker)	Village (2 ha)	1500–1550 LOI, Anc. Wendat	a) Not specified—in village area	Skull cap	Not speculated	Modified	Burgar 1995; Williamson 2007
28. Campbell	Village (size unknown)	1500–1550 LOI, Anc. Attawandaron	a) Midden	Right ulna	Puncher or dagger	Distal end removed of the cortical bone on the medial side has been ground to a very sharp point, high degree of polishing, although striations of manufacturing are still visible, no cut marks present on the surface, no sign of grinding or polishing, transverse break suggests damage	Finlayson 1998
			b) Midden?	Skull	Rattle	No description	
29. Ratcliff(e)/Baker Hill	Village (2.8 ha)	1550–1580 LOI, Anc. Wendat	a) Surface—in village	Circular portion skull	Trophy	Seven perforations	Adam and Mulvany 1885; Birch and Williamson 2013
30. Sidey-Mackay	Village (2.2 ha)	1595–1616 LOI, Tionnontaté	a) Not specified—in village area	Left ulna	Ceremonial awl	20 mm long, proximal end and adjoining shaft, olecranon process is broken off, proximal end and shaft display cut marks from severing joints and defleshing, distal end sharpened	Garrad 2003; Garrad 2010; Hamalainen 1999; Wintemberg 1946
31. Christianson	Village	1615–1632 LOI, Attawandaron	a) Hearth/Refuse	Right ulna	Bead	Tubular, transverse incising	Cooper 1984; Fitzgerald 1982a; Fitzgerald 1982b

Table 8.1 (continued)

Site name	Site type	Date (AD) and affinity	Provenience	Element	Inferred artifact type	Manufacturing details	Literature reference (P.C.: personal communication)
32. Melville	Village (4.8 ha)	1600–1630 LOI, Tionnontaté (post-European contact)	a) Midden 2 (unit over top—S area)	Parietal	Gorget	Two perforations	Cooper 1984; Fox 1979; Garrad 1978; Garrad 2003; Garrad 2010
33. Walker	Village (4 ha)	ca. 1640 LOI, Attawandaron (post-European contact)	a) Not specified—in village area	Parietal nearly complete	Rattle	Edges smoothed and beveled— 11 perforations	Wright 1977; Wright 1981
				Parietal	Gorget	Highly polished with smoothed and beveled edge, single drill hole, fine line incising encircles the central and lateral margins	
34. Dwyer	Ossuary	1632–1651 LOI, Attawandaron (post-European contact)	a) Burial (Boyle)	Skull	Gorget	Worked	Fitzgerald 1982a; Ridley 1961
			b) Smith collection—lower section	Skull incomplete	Gorget/ Rattle	Worked, two perforations	
			c) Smith collection	Skull	Gorget	Worked (may be mended with b.)	
			d) Dwyer collection	Oval skull complete	Adornment	Seven perforations bored from inside	Boyle 1888
35. Hamilton	Village	1638–1650 LOI, Attawandaron (post-European contact)	a) Not specified—in village area	Skull	Gorget	No description	Lennox 1977; Prevec and Noble 1983
			b) Not specified—in village area	Skull	Rattle	No description	

villages were commonly situated on low ground near watercourses (Birch 2010). That said, the earliest known human bone artifacts date to AD 700 suggesting violent conflict may have been present in the transition into Early Iroquoian times, albeit at a small scale or less archaeologically visible (Birch 2010) or they had a different meaning at the time. It is also thought that since archaeological evidence of conflict is not prevalent, SHB in villages was a result of certain "unimportant" elements that were not collected during processing for secondary reburial (Spence 1994, p. 15).

After about AD 1300, base settlements amalgamated to form larger villages of approximately 1.5 ha (Warrick 2008). Basically, longhouse size doubled and village area size tripled to accommodate 400–600 people (Warrick 2000, 2013). By this time, Iroquoian society had evolved to have a fully developed horticultural system, and large year-round-occupied villages (Birch and Williamson 2013). Within the village, settlement patterns changed with the sedentary lifestyle. For example, middens appeared and were tied to particular longhouse groups indicating a new way had been established for the disposal of refuse (Dodd et al. 1990; Spence 2013; Warrick 2000). Villages established loose political networks as regional clusters of settlements formed (Williamson 2012). However, there was still not a great increase in concern for defense since most villages still lacked palisades and village locations were commonly situated on low ground near watercourses, still not highly defendable locations (Birch 2010). There is no indication of military alliances but some archaeologists have considered that this period of initial community coalescence witnessed a rise in conflict given the slight increase in the number of sites with SHB recovered in middens, although frequency remained low (Cooper 1984; Birch 2010).

About AD 1450, a period of community coalescence resulted in well-designed and strategically placed fortified communities (Birch and Williamson 2013). Population grew significantly and the number of villages tripled (Birch 2012) leading to shifts in settlement patterns and distribution. The concentration of village sites and their large size is postulated as evidence of the origins of tribes or nations (Warrick 2013). Northern Iroquoian nations, situated in modern-day Southern Ontario, were distributed in seven clusters of ancestral Wendat (Huron) sites, seven groups of ancestral Attawandaron (Neutral) sites, and a small ancestral Tionnontaté (Petun) group that was closely related to the Wendat (Warrick 2013; Williamson 2012). Other northern Iroquoian groups include the Iroquois of Central New York State, the Erie of Western New York and St. Lawrence Iroquoians along the St. Lawrence River Valley. There were differences between ancestral Wendat and Attawandaron communities with regard to settlement patterns and some facets of material culture; in fact, the languages spoken by each were slightly different (Tooker 1964). Indirect evidence of conflict is illustrated by the siting of villages at the top of slopes and away from watercourses. Palisade complexes, with multiple rows and earthworks, now acted as defensive barriers and were present on most sites (Birch and Williamson 2013). At both ancestral Wendat and Attawandaron sites, there is a striking escalation in the number of sites with SHB and the number of elements represented (Cooper 1984). Often charred, hundreds of fragments of human bone were disposed

of in middens in the late fifteenth century (Birch and Williamson 2013). Explanation for this pattern has been based on seventeenth century ethnography which indicates that war captives were tortured, executed, disarticulated, and their body parts severed (Chacon and Dye 2007; Cooper 1984).

War was not waged for resources or territory until the mid-seventeenth century. Ethno-historical sources suggest that most fifteenth and sixteenth century warfare was to avenge the lost members of one's descent group by killing or capturing the group members responsible for the deaths (Robb 2008; Williamson 2007). It was a collective responsibility to avenge the misdeeds (Mensforth 2007). There were motivations for participating in raids and battles. Captive-taking was central to war and improved male status (Birch 2010). The warrior would search for prestige. Perhaps, violent encounters would be something sought rather than avoided (Nielsen and Walker 2009). Joseph-François Lafitau (1974 [1681–1746]), a French Jesuit missionary, noted that as captives were being escorted into the village, they were chanting with a turtle rattle in hand and were made to dance until their fate was decided. The treatment of the prisoner was linked to village negotiations, previous family losses, and behavior of the prisoner. A prisoner was adopted by a descent group who decided whether to sacrifice the captive or not (Williamson 2007). As part of the ritual act all participants performed; warriors remained brave, the audience had no pity, and the tortured was expected to remain composed (Knowles 1940).

In 1608−1612, Samuel de Champlain, a French explorer, witnessed the entrails of prisoners thrown in the lake; the arms, legs, and the head were cut off and scattered in different directions, the scalp was kept, and the heart cut into pieces and eaten (Biggar 1922–1936, Vol. 2). Champlain also saw heads taken as trophies (Grant 1907). Champlain in 1619 reported prisoner torture was a normal practice among the Wendat (Robb 2008), which underscores the archaeological evidence for preexisting conditions for violence in Iroquoian culture before European contact. Similar descriptions made by the Jesuit missionaries describe the capture of a prisoner as "Having arrived at the village, …begins to torment him from the sole of the feet even to the crown of the head, with firebrands, with hot cinders, piercing his feet and his hands with reeds or with sharp iron… they remove the scalp…After death, they cut the body to pieces…" (Thwaites 1896–1901, Vol. 18, pp. 31–34). Upon dismemberment, body parts were given to various individuals (Thwaites 1896–1901, Vol. 5, Vol. 18). Gabriel Sagard (1939 [1632]), a French missionary, witnessed the enemy shot dead with arrows and the head taken away.

From the Lawson site in Southern Ontario, 88% of the SHBs were cranial and long bone fragments (Fontaine 2004), which as just discussed, probably represent the detached body parts of prisoners. Surprisingly, and despite a rich record of the torture and distribution of prisoner body parts, no direct ethnographic account could be found regarding the manufacture or the use of human bone objects. Typical northern Iroquoian mortuary programs consisted of primary burial at death followed by later disinterment to a secondary burial location such as an ossuary for ancestral Wendat and a cemetery for the ancestral Attawandaron, where the cemetery contained individual, small, and large group burials. Burial programs included the belief that each individual had two souls (Trigger 1976). The Huron believed souls

were immortal as one soul remained with the bones until secondary burial, while the other departed for the *Land of the Souls* (Trigger 1976). Some villagers did not receive secondary burial. For example, the Jesuits document infants, children, and the elderly were unable to make the trip to the *Land of the Souls* and were more likely to remain buried in the village (Thwaites 1896–1901, Vol. 13). However, these village burials do not account for SHB.

In the sixteenth century, large villages continued to be defensively situated and heavily palisaded but contained less SHB in non-burial contexts than the preceding period, perhaps suggesting a decline in violent conflict after the initial period of community coalescence (Birch 2010). By 1650, the Wendat and Attawandaron were dispersed from Ontario.

This general reconstruction of local precontact sequences demonstrates the complex and variable regional processes of cultural change. It is evident that for Iroquoians, the sense of community identity was rapidly transforming between AD 1300 and 1600, including geographic movement, reorganization of the village plan, and a dramatic change in political and sociocultural practices (Birch 2012). Each regional cluster was developing its own identity, with some commonality in religious and cosmological beliefs, even though social structures varied.

The Archaeological Record

Site Distribution

The artifact inventory was assembled based on intentional modifications that involved drilling, edge modification (reshaping), incising (decoration), and polishing. The human bone artifact inventory is available with references in Table 8.1. The Southern Ontario archaeological record consists of a total of 98 human bone artifacts from 35 sites dating between AD 700 and 1650 (Fig. 8.2). Roughly 88.6% were recovered from sites that date between AD 1300 and 1650 and 65.7% were found in sites that date between AD 1450 and 1500 (Table 8.2). Therefore, the occurrence of human bone artifacts in the Southern Ontario archaeological record peaked significantly in the later portion of the fifteenth century (Fig. 8.1). A few artifacts are found after this period until the dispersal of Ontario Iroquoians in the mid-seventeenth century.

The temporality and spatial distributions of the sites suggest that the occurrence of these artifacts is indicative of a rare but geographically widespread shared cultural practice that existed throughout the precontact and early historic Iroquoian occupation of Southern Ontario.

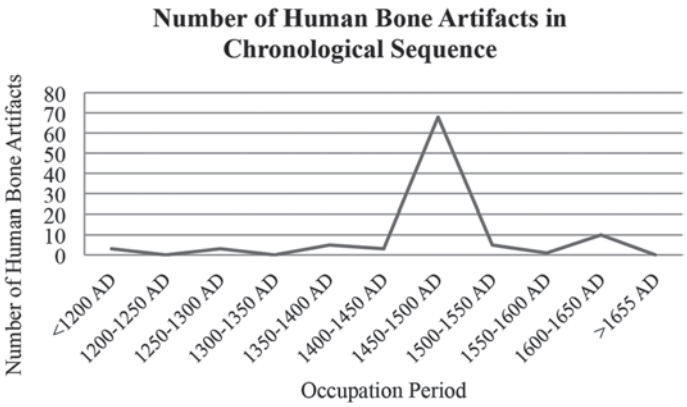

Fig. 8.1 Graph showing the peak in human bone artifacts recovered in the late fifteenth century

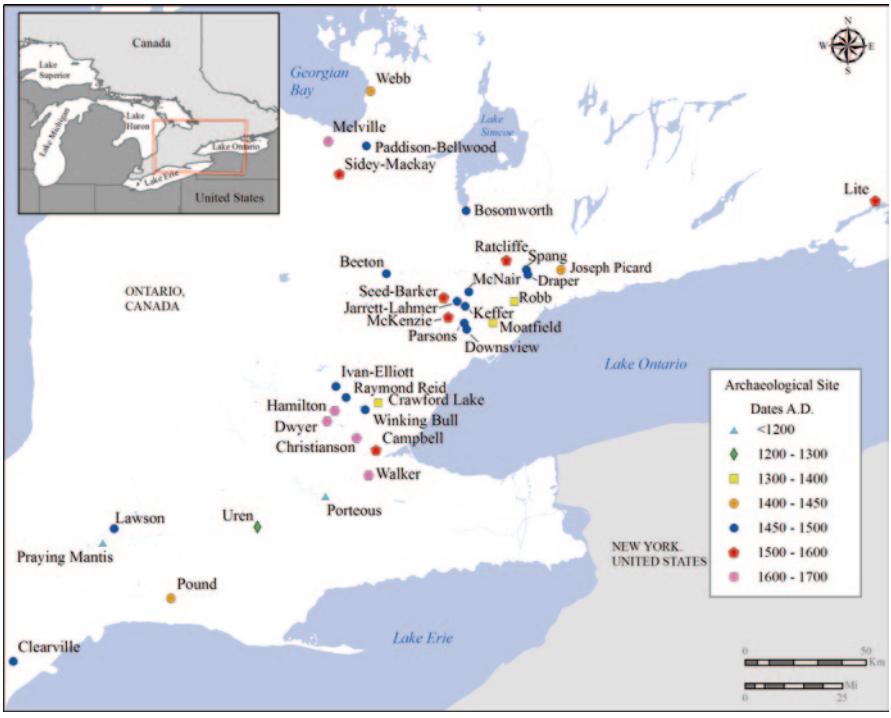

Fig. 8.2 Sites containing human bone artifacts in Southern Ontario illustrating a geographically widespread shared cultural practice. (Map courtesy of Archaeological Services Inc.)

Table 8.2 Cultural-historic sequence and human bone artifact occurrence

Stage	Number of sites	Percentage
Transitional woodland (prior AD 900)	1	2.86
Early Iroquoian (AD 900–1300)	3	8.57
Middle Iroquoian (AD 1300–1400)	2	5.71
Late Iroquoian (AD 1400–1600)	23	65.71
Late Iroquoian, post-European contact (AD 1600–1650)	6	17.14
Post-European contact (+AD 1650)	0	0
Total	*35*	*99.99*

The Elements

Of the 98 artifacts, 52 (53%) were recovered in village middens or exterior longhouse refuse pits; 11 (11.2%) in human burial contexts; ten (10.2%) in interior longhouse refuse pits; and three ($n=3$%) in sweat lodges. Twenty-three human bone artifacts (23%) were not specified to provenience but were recovered within the boundary of the village. Their frequency on sites ranges from 1 to 26. The most common element represented in the archaeological record is portions of human skull accounting for 77.6% ($n=76$) of the artifact assemblage. The remaining human bone artifacts were manufactured from long bones ($n=14$), the mandible ($n=4$), phalanges ($n=3$), and one calcaneus (Fig. 8.3).

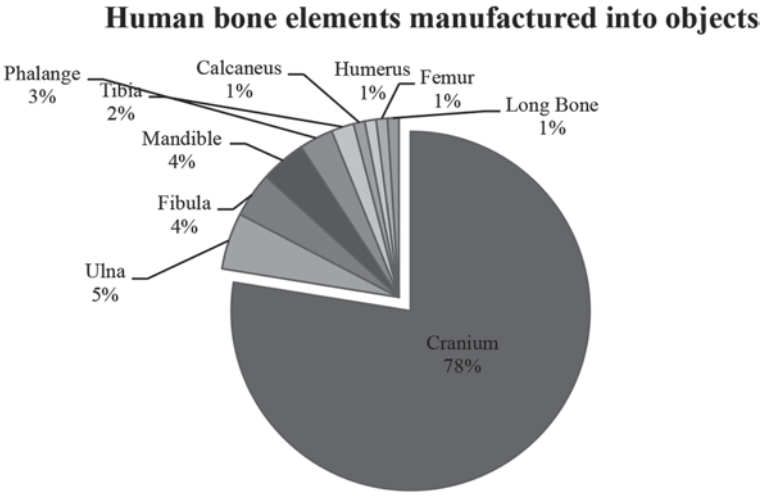

Fig. 8.3 Pie chart illustrating the cranium as the most preferred human element for object production

Fig. 8.4 Human parietal rattle, Clearville Site. (Photo by Archaeological Services Inc., with permission from the Museum of Ontario Archaeology)

The Cranium

The earliest recorded modified cranium was deposited in a pit feature within Porteous village (ca. AD 700). The most recent was found in the mid-seventeenth century Attawandaron Dwyer ossuary. A total of 76 cranium artifacts were found in 29 of the 35 archaeological sites making the cranium the preferred human element for object production. Of the cranium artifacts, 62 were associated with a specific provenience (more specific than "the village area") and approximately 43 (69.4 % of the known proveniences) were recovered in village middens. Other cranium artifacts were recovered in interior longhouse refuse pits ($n = 9$, 14.5 %), a single ossuary ($n = 4$, 7.1 %) and three in sweat lodges (5.3 %).

Forty-two or 55.3 % of the cranium artifacts were specified as being manufactured from the parietal bone, two (2.6 %) from the frontal bone, and one (1.3 %) from the occipital bone. The remaining 31 (40.8 %) cranium artifacts were described generally as skull cap or cranial fragments. Most of the cranium artifacts that were assigned an age category came from the Keffer and Lawson sites, both of which were subjected to a detailed bioarchaeological analysis that focused on SHB (Fontaine 2004; Rainey 2002). Of the 42 parietals, 13 were identified as adults, six as subadults, and two as youths. Therefore, 72 % of the cranium artifacts were not identified to an age category. Of the parietals that could be attributed to the right or left side of the cranium, only a slight preference was given to right parietals, indicating there may not have been an overall preference over which side of the skull was selected. All 76 cranium artifacts had been removed from the skull; none exhibited prominent diagnostic traits of sex; therefore, none were designated to either male or female.

One artifact from the fifteenth century ancestral Wendat Spang village site was identified as a possible human cranial element manufactured into an armlet or bracelet. The fragment contained a single perforation and was decorated with incised lines. Thirteen (17%) of the cranium artifacts were not assigned an inferred function. The remaining 81.6% of cranium artifacts ($n=62$) were interpreted by researchers as gorgets, pendants, or rattles. These artifacts have drilled perforations that range in number from 1 to 11, most often drilled from the endocranial surface. Often the term "pendant" is used when there is a singly drilled hole at the margin in order to suspend the object from the neck (Ellis 2002). Gorgets tend to have one or more holes in the center of the objects (Ellis 2002). Although manufactured in similar fashion as gorgets, the attributed name of rattle is most often used when there are multiple perforations around the periphery of the object (Cooper 1984). These rattles were formed into a circular shape most often by grinding, smoothing, and beveling the edges to form an edge thus allowing the two portions to fit together (Williamson 2007), a phenomenon noted in this inventory. Beveled edges were noted in a number of analyses that would have formed a flat surface necessary for binding the parietals against one another (e.g., Clearville, Jarrett-Lahmer, Draper, Bosomworth, McKenzie, and Walker sites). At the Moatfield village site (ca. AD 1300), archaeologists found two parietal halves from two individuals in close proximity and interpreted them as a rattle, since the holes aligned when put together (Williamson et al. 2003). At the Walker site (ca. AD 1640), one human skull artifact was interpreted as a rattle because it had 11 perforations while another human skull artifact was interpreted as a gorget because it was decorated by incising, and highly polished with a single drill hole interpreted as a suspension hole (Wright 1977).

Typically, the parietal artifacts would have been manufactured by removing the triangular section adjacent to the squamosal suture, thus forming the rough circular shape. It was necessary to modify the parietal after death while the bone was still fresh; otherwise the material would have cracked or splintered (Williamson et al. 2003). Olsen (1979) suggests the craftsperson would have cleaned and removed tissue but could have still worked with the bone even after a year if it were soaked in water and not allowed to dry out. Rainey's (2002) analysis of SHB at the Keffer site (AD 1475–1500) suggests that some of the human bone rattles did crack in manufacturing and were discarded because of that. Some of the cranium fragments in this sample were recorded as having scrapes, unfinished perforations, scratches, and tool marks along the edges which may be interpreted as unfinished products (e.g., Draper and Lawson sites).

In general, the literature indicates 44 of the 76 cranium artifacts provide detail on their recovery condition. Based on this detail, cranium artifacts were recorded as fragments ($n=27$), incomplete and nearly complete ($n=11$), and complete ($n=6$). Of these artifacts with specific provenience data, nearly complete or incomplete cranium artifacts were recovered in middens ($n=5$), in an interior longhouse refuse feature ($n=1$), a sweat lodge ($n=1$), and in an ossuary ($n=1$). Fragments were found in middens ($n=18$), in interior longhouses refuse features ($n=3$), and in sweat lodges ($n=2$). Six sites document specimens as complete. Complete cranium artifacts were recovered in interior longhouse features ($n=2$), village grave areas ($n=2$), in an ossuary ($n=1$), and in a midden ($n=1$). Without a bioarchaeologi-

cal analysis the assessment of completeness is subject to interpretation since some that are noted as nearly complete or complete have evidence of cut marks, cracks, breaks, or missing portions that compromise their complete form. The two parietal artifacts found paired in a sweat lodge (Moatfield site) may have been placed there with care, although they were broken items so their disposal may have taken place after the sweat lodge was abandoned. The provenience data shows that the final deposition of human cranium artifacts did not undergo a regulated practice of purposeful breaking prior to disposal since completeness varied and artifacts were recovered in different contexts. Therefore, disposal of such items was not strictly controlled. More detailed disposal patterns will be examined in the case studies that follow.

Long Bones

Fourteen modified human long bone artifacts from seven village sites accounted for 16.3 % of the total human bone artifact inventory. The earliest long bone was within the village at the Porteous site, ca. AD 700, and the most recent long bone was recovered at the historic Attawandaron Christianson village site, ca. 1615–1632. One specimen was not identified to a specific element but was described as having a polished shaft (Lawson site). All long bones were recovered within the village or in midden contexts. Compared to the human skull in artifact production, it seems long bones were modified for multiple uses, but were the only human bone elements selected for manufacturing of utilitarian items. None of the long bone artifacts were bracketed into a specific sex category. Only one long bone was designated as from an adult.

Six long bone artifacts were fashioned from upper limbs, including five made from ulnas, the second most commonly used element to fashion human bone artifacts. Four of the five ulnas from the Sidey-Mackay, Joseph Picard, Clearville, and Campbell sites had their distal ends sharpened into a point. They were interpreted as awls, punches, or daggers. The fifth ulna, interpreted as a bead, had been fashioned into a tube by having both ends removed and decorative incising added (Christianson site). A humerus was also found that was described as having the lower end of its shaft polished (Lawson site).

In total, seven lower limb human bone artifacts were recovered. Four fibulae were recovered from two village sites (Porteous and Lawson sites). They were described as exhibiting ground and polished ends while the other two exhibited battered ends. The functions of the fibulae at the Lawson site were interpreted as utilitarian items (awl-like) and ceremonial objects (drumsticks). Two tibiae were present (Lawson site) and one was described as having its ends shaved off, suggesting it may have functioned as a mallet. One femur was recovered and was described as having its posterior and anterior ends cut off and ground, its greater trochanter and lesser obliterated by grinding, and its shaft broken halfway down to form a sharp end (Lawson site).

Mandibles

Four modified mandibles were present in the assemblages from three archaeological sites; Praying Mantis, Downsview, and Lawson. The earliest was a mandible of a middle-aged male recovered from a secondary burial at the Praying Mantis site (ca. AD 900). Two mandible artifacts were recovered from the ancestral Attawandaron Lawson village site dating AD 1475−1500. The third from the Lawson site was recovered from a midden. The forth was recovered from a midden in the ancestral Wendat Downsview village site, dating to AD 1450−1500. No mandible artifacts have been recovered that date past the fifteenth century. Modification to the mandibles varies: one was carved and perforated with the rami removed, and another carved with both the right and left rami smoothed and polished. The carved ramus from the Downsview site was the only mandible given an inferred function—a pendant.

Phalanges

Phalange artifacts were recovered from the fourteenth century at the Winking Bull and Crawford Lake village sites ($n=2$). The Winking Bull phalange was recovered from a midden and the phalange from Crawford Lake from within the village area. Manufacturing details were described for the Winking Bull phalange as including polishing, grinding of the proximal articular facet, and an incomplete drilled hole at the proximal articular surface along the long axis of the element. The last phalange artifact was recovered in the village area of the late fifteenth century ancestral Attawandaron Lawson village site ($n=1$). This specimen displayed two holes drilled through the center. Human finger bones were also collected in the nineteenth century by Wintemberg (1899) at a village assumed to be ancestral Wendat. These phalange artifacts were excluded from this inventory since the location of the village was only roughly specified in Ontario. Wintemberg (1899) recorded that the phalange artifacts were sawed in two and perforated at both ends. Although not inferred by Wintemberg, it is possible that the drilling modifications were made to form beads.

Calcaneus

One calcaneus artifact was recovered from the Keffer site (AD 1475−1500) in an interior longhouse feature containing other disarticulated fragment human remains. The medial and lateral processes and posterior talus articular surface are missing. A hole is present through the anterior part, orientated laterally, and was likely caused by a punching action. A small crack is evident which possibly occurred when the bone was fresh, otherwise it would have shattered. No other modified calcaneus has been recorded in Ontario literature.

Summary

For centuries, human bone manufactured into objects were disposed within the village outside the typical Iroquoian mortuary program. Situating human bone artifacts in the Ontario archaeological record demonstrates a broad geographical and temporal distribution that reveals a rare but shared cultural tradition. Specific exploration into the function of these human bone objects is not conclusive. The data suggests that there were no standard designs or age categories, but preference was given to disposal in refuse.

Contextualizing Human Bone Artifacts

The purpose of the following case studies is to examine the recovery contexts in which human bone artifacts were found in order to add insight into how they were perceived by the people they were associated with and how they operated in the past.

The Keffer Site

The Keffer site is a coalescent ancestral Wendat village occupied AD 1475−1500 located near Toronto, Ontario, Canada. The site is not located on even topography, but on two separate elevations, referred to by researchers as low and high town. The southern portion of the village is more elevated on a plateau with steep banks extending down to the Don River. The northern portion is located lower in a small valley (Smith 1985), and is not in a strategic location for defense (Smith 1986–1987).

The settlement pattern suggests the village expanded to accommodate a large influx of people. After expansion a double palisade enclosed approximately 744 people (Smith 1991), in an area roughly 1.2 ha in size. From longhouses and middens, the Keffer village had roughly 803 SHB fragments (695 in middens and 108 in longhouses) (Rainey 2002). Every midden on the site contained SHB suggesting that inhabitants from each longhouse were involved in the processes responsible for their deposition (Rainey 2002, p. 168). The SHB in middens accounts for at least 14 adults, including 8 males, 5 females, 1 of unknown sex, and 6 subadults (Fontaine 2004). Ceramic analysis suggests that all middens began in the first occupation, and continued in use during the expansion (Smith 1991). Parietals were the most numerous elements of fragment bone across the site ($n = 144$, 21 %) (Rainey 2002). Of the 803 SHB fragments, 9 (1.3 %) were modified into objects of use by using 8 parietals and 1 culturally modified calcaneus (Fig. 8.5). Demographic detail implies that adult and subadult parietals were selected for artifact production. All were right parietals suggesting there was a preference as to side. Seven parietal artifacts were found in six different middens. The remaining parietal artifact and calcaneus were recovered from interior longhouse features.

Fig. 8.5 Settlement plan map of the ancestral Wendat Keffer site (AD 1475−1500) (Rainey 2002) and human bone artifact distribution. (Adapted with permission from the Museum of Ontario Archaeology)

Human bone artifacts at the Keffer site were deposited broken in middens associated with certain longhouses and within the longhouses in refuse. The middens containing human bone artifacts are not in the center of the village but are on the perimeter or outside the single palisade, and primarily within the boundaries of

the expanded village. Human bone artifacts also correlated to deposits of the highest frequency of fragmentary human skeletal remains. Table 8.3 summarizes data extracted from the original Keffer site catalogue, placing the human bone artifacts in context. Of the known stratigraphy, all human bone artifacts were recovered in the second stratum of middens comprised of ashy deposits. Often these episodes, as seen in the three strata, were caused by settlement change or a change in disposal pattern resulting from change in social organization (Smith 1991). Stratum two contains thin layers unlike the other two layers, indicating multiple deposits made. Ash layers may have been redeposited from interior hearths and from other activities that occurred within longhouses. There is no evidence of in situ fires suggesting fragmentation of the human bone artifacts had occurred away from the midden. The fragmentation and comingling with other organic and inorganic refuse suggests the human bone was discarded the same as other unwanted items.

The Lawson Site

Lawson is a coalescent ancestral Attawandaron village occupied AD 1475−1500 located in London, Ontario, Canada. While contemporary with Keffer, it represents a different cultural group. The village was located atop a 14 m high plateau at the meeting of two major water courses, Medway River and Snake Creek (Anderson 2009). Excavations show the village was originally 1.4 ha and at some point earthworks and palisades were dismantled to expand. After expansion, it was about 2.02 ha in size (Anderson 2009), and was inhabited by 1400–1500 people (Pearce 1996). Unlike Keffer, the site is located on even topography, and is considered one of the paramount defensive locations in the region. To fortify its natural defensive location, it was enhanced by earthworks and 2–4 rows of palisade. At some point the village amplified its defense by adding a six row maze palisade, two look-out platforms, and two earthworks and other ditching features (Pearce 1996).

Fontaine (2004) conducted a bioarchaeological analysis of 973 (count after refitting) SHB recovered at Lawson. Almost half of the assemblage consisted of cranial and mandibular fragments, the parietal being the most frequent cranial element. SHB was found throughout the site, but with a higher frequency in the initial core settlement. It is estimated that SHB accounted for at least 20 adults, including 8 males, 2 females, and 14 subadults, including 1 infant, 1 young child, 5 older children, 4 adolescents, and 3 older subadults (ages 16–20) (Fontaine 2004).

Of the 973 SHB fragments, 26 (2.7%) were human bone artifacts (see Table 8.1). This collection of elements is the most diverse recovered to date, for the reason that the Lawson site has been more extensively excavated than most other contemporary villages. Of these, nine artifacts were manufactured from the parietal, three from fibulas, two from tibias, one occipital, one humerus, one femur, one phalange, two rami from the mandible, one long bone, and the remainder from unspecified portions of the skull. Of the parietal skull artifacts, the assemblage includes several more specifically specified as adults ($n=5$) and subadults ($n=3$). The parietal artifacts consist of right and left parietals suggesting there was not a preference as to side.

Table 8.3 Human bone artifacts found in the Keffer site

Provenience	Human element and inferred function	Scattered human bone (SHB) in provenience (from Rainey 2002)	Other artifacts discarded with the human bone artifact—in the same unit and layer
Midden 57 (110−095:11, 20–30 cm) northern edge, 2nd stratum, in grey/ash soil mix	Subadult parietal (rattle)	162 SHB—2 subadult, 3 adult; includes 28 parietal fragments with the majority clustered in the 2nd stratum -one parietal with blunt force trauma, peri-mortem trauma to an older male mandible (hack), possibly male with deep slice in sacrum	Ceramic sherds, pipe bowl fragment, one non-chert detritus, nine faunal remains, charcoal
Midden 61 (90–115:17, 27–37 cm) southern edge, 2nd stratum	Adult parietal (rattle)	17 SHB—1 adult, 1 subadult	72 ceramic sherds, pipe bowl fragment, 13 faunal fragments, bone bead
Midden 61 (485−470:7, 26–55 cm) western edge, 2nd stratum	Subadult parietal (rattle)		Scraper, drill, core, chipping detritus, celt, rubbing stone, 11 bone beads, 716 faunal fragments
Midden 60 (100–100:24, 10–20 cm) northern edge, 2nd stratum, in brown/black or grey ash mix	Adult parietal (rattle)	86 SHB—3 adults, 1 subadult; 48 adult cranial, 29 adult post-cranial, and 9 subadult bones; includes 21 parietal fragments	Four ceramic body sherds, a few faunal remains
Midden 65 (420–575:12, 20–44 cm) northeastern end, 2nd stratum, at least four layers of ash	Adult right parietal (rattle)	215 SHB—7 adults, 2 subadults (at least 1 male, 3 females, 1 infant, and 1 older child); includes 91 cranial, of that 17 parietals—SHB clustered in northeast and the southwest of the midden in 2nd stratum—parietal with blunt force trauma—occipital with percussion pit	Ceramic sherds, two pipe bowl fragments, one lithic flake, one bone awl, eight faunal fragments, some floral
Midden 65 (395–565, in a feature) southwestern end, 2nd stratum	Adult right parietal (rattle)		Over 200 ceramic sherds, bone harpoon, some faunal
Midden 72 (365–485:25, 0–68 cm) south end	Adult right parietal (rattle)	33 SHB—1 older subadult or small adult; includes 30 cranial, of that 17 parietals	Ceramic sherds, faunal and chipping detritus
Longhouse 9 feature (465–525)	Adult parietal (rattle)	Three cranial—one individual (not including the human skull rattle)	Ceramic sherds, few faunal remains

Table 8.3 (continued)

Provenience	Human element and inferred function	Scattered human bone (SHB) in provenience (from Rainey 2002)	Other artifacts discarded with the human bone artifact—in the same unit and layer
Longhouse 4 feature (505–555)	Calcaneus (unknown)	Calcaneus found with 11 other fragments of human bone and associated with burials -in house 4 a rib was recovered with a notch from a forceful blow	A substantial quantity of ceramic, pipe bowl fragment, a few lithic flakes, faunal remains, some charcoal
Midden 71 (370–520:14, 0–34 cm) upper stratum	Adult right parietal (rattle)	Eight SHB—one subadult, one adult; includes six cranial, of that three parietals	Ceramic, lithic flakes, bone bead, a few floral and faunal fragments

Of the 26, only 6 human bone artifacts had accessible catalogue information providing unit and subunit provenience information which allowed for placement in a more specific location on the site map. Nine artifacts were mapped according to their general provenience and 11 elements were recovered in unspecified locations within the village (Fig. 8.6). It is clear that not every major midden contained

Fig. 8.6 Settlement plan map of the ancestral Attawandaron Lawson site (AD 1475–1500) (Anderson 2009; Fontaine 2004; Wintemberg 1939) and human bone artifact distribution. (Adapted with permission from the Museum of Ontario Archaeology)

Table 8.4 Human bone artifacts found in a Lawson site midden

Midden 12	Human element and inferred function	Scattered human bone (SHB) in Midden 12 (Fontaine 2004)	Other artifacts buried with the human bone artifact (within unit and layer)
a) Midden 12 (425–525:1, 40–50 cm)	Adult parietal fragment (mends with b) (gorget)	From LMA excavations: 25 adult SHB, 1 subadult SHB—includes one ulna with evidence of sharp force trauma From Wintemberg excavations: 80+SHB	303 faunal bone fragments, 45 carbonized plant remains, 94 lithic chipping detritus, 3 utilized flakes, 1 projectile point preform, 1 pipe stem fragment, 20 ceramic sherds
b) Midden 12 (425–520:10, 30–40 cm)	Adult parietal fragment (mends with a) (gorget)		One modified deer phalange, 1 non-chert detritus, 35 faunal bone fragments
c) Midden 12 (425–520:10, 30–40 cm)	Adult parietal fragment (gorget)		One biface, 3 lithic chipping detritus, 15 ceramic sherds, 1 faunal bone awl, 55 faunal bone fragments
d) Midden 12 (425–520:25, 0–10 cm)	Adult? parietal fragment (gorget)		Thirty-two ceramic sherds, 280 carbonized plant remains, 81 faunal bone fragments, 48 lithic chipping detritus

human bone artifacts. Approximately 50% ($n=12$) of the artifacts were recovered in the area of Midden 12, at the center of the initial core settlement. Each unit in Midden 12 was hand-dug in 10 cm increments yielding four parietal artifacts in three of the four layers, including two mending fragments from two separate layers (Table 8.4). The Midden 12 area also contained the highest concentration of SHB (Fontaine 2004). The area surrounding the midden may have served as a central plaza for social activities. Therefore, the midden was likely communal. Another six human bone artifacts were recovered in 1921 by the early twentieth century excavator, Sonely, who unearthed grave pits in an area of the site labeled as Area A (Fontaine 2004). It can be speculated that these could relate to another central area of the site, possibly associated with a different cluster of longhouses. There were four parietal artifacts from Midden 12 with available catalogue information collected with fragments of broken longhouse items and food waste (Table 8.4). It is possible that household refuse was disposed in a central area, as opposed to each longhouse having its own associated midden.

In the village expansion area, which employed a finer excavation method, no human bone artifacts were recorded in middens. None were recovered in what researchers have referred to as "special purpose" longhouses (Anderson 2009, p. 69), as could be expected. For example, House 8 contained unmodified SHB, ash and fired soil, bark, and basket debris, but lacked typical household debris. Similarly, House 6 had a low ratio of refuse pits and contained special function artifacts such as turtle shell and bear bone rattles. Despite this, the production of human bone artifacts at Lawson, likely did occur after expansion because they were recovered

in the upper stratum of middens (Midden 12) and outside the initial core settlement. For example, one human bone artifact, coded in the catalogue as a human skull gorget, was recovered in 1983 in Longhouse 12 from unit 485−475, subunit 23 that overlapped a refuse pit identified on Wintemberg's 1939 field map. This artifact was excavated by the London Museum of Archaeology in an area block which contained a high frequency of SHB (Fontaine 2004). The catalogue shows that the skull gorget was from the top layer (0–10 cm) of the unit. It was broken into 12 pieces and was also buried with 3 pieces of ceramic, 2 lithic flakes, and other charcoal and plant materials.

Keffer and Lawson Site Comparison

The case studies of the Keffer and Lawson human bone artifacts do reveal some noteworthy patterning. Human skull artifacts from both sites are similar in circular form and in the number of drilled perforations, which suggest every object was uniquely fashioned by a craftsperson.

At Keffer, unlike Lawson, parietal artifacts consist of all right parietals suggesting there may have been a preference as to side. Comparatively, Lawson contained a much higher frequency of scattered parietals, mandibles, and long bone elements (Fontaine 2004) as well as a higher proportion of human bone artifacts. This could be attributed to Lawson's larger village size. Since human bone artifacts were recovered from both sites with everyday items, these items may have originated within the longhouse, which could explain their absence in some middens. At both sites, it is certain that not every major midden contained human bone artifacts. At Lawson, unlike Keffer, approximately 50% ($n=12$) of the human bone artifacts recovered were from the center of the initial core settlement, indicating disposal could be a reflection of a civic planning difference. It is not possible without a further detailed cultural material analysis to understand why, at Keffer, most human bone artifacts were found in the expansion area, while at Lawson, they were found in the initial core settlement.

Most importantly, even though the Keffer and Lawson sites were two distinct communities with two distinct cultural histories (ancestral Huron and ancestral Neutral), the detailed examination of the two sites resulted in observations of a number of commonalities. For example, no special treatment was afforded broken adult and subadult human bone artifacts for at their final deposition they were comingled with other material culture and were positively correlated with clusters of disposed fragmentary human skeletal remains. Consequently, both the Wendat and the Attawandaron communities shared a common body-centered cultural practice that led to the disposal of intentionally modified human skeletal remains in refuse, outside the perceived normal burial programs (Robb 2008).

Discussion

Human bone artifacts were manufactured in Southern Ontario for almost 1000 years although they were most prevalent in the latter half of the fifteenth century on northern Iroquoian sites. Situating human bone artifacts in the Ontario archaeological record demonstrates a broad geographical distribution that reveals a rare but shared cultural tradition. The skull, primarily the parietal bone, the mandible, and other long bones must have had special significance not shared with other body parts since they were specifically selected for object production. Studying human bone artifacts in context addresses questions of why human body parts were chosen for object production, how they were used, and why the objects were disposed of in non-burial contexts.

Victims of War

Six human bone artifacts dating prior to AD 1300 were recovered in Southern Ontario. One was recovered from a comingled longhouse burial (Praying Mantis site), two from a village sweat lodge (Moatfield site) and three in unknown proveniences within the villages of Porteous and Uren. Given this small inventory, it may be that human bone artifacts had a different meaning prior to AD 1300 in that they may have been placed as offerings with regard to more sacred contexts (i.e., burials and sweat lodges). The frequency of human bone artifacts on Ontario Iroquoian sites increases after AD 1300, and peaks between AD 1450 and 1500. Close to 82% of human bone artifacts where provenience was recorded were disposed in refuse locations in and outside longhouses. The Lawson and Keffer case studies reveal they were broken and thrown into refuse with other everyday items; an action not likely acceptable if the bones were those of ancestors.

Since ethnography of "abnormal" deaths of ancestors does not account for the presence of SHB on Iroquoian sites (Ramsden 1978), the bone is probably relatable to the ethnography of torture in Iroquoian culture (Robb 2008). Iroquoian prisoner torture involved a broad modality of body practices including inflicting pain and removing and circulating bodily matter (Robb 2008). Since prisoners were not afforded primary or secondary burial, and since case studies reveal SHB was comingled in refuse with broken human bone objects, then it is most plausible that human bone objects, especially in the late fifteenth century, were the body parts of prisoners. The manufacture of human bone objects can therefore be categorized as trophies from the body parts of prisoners (Hurlbut 2000; Williamson 2007). Thus, selected and disconnected body parts found in northern Iroquoian village sites are likely evidence of a complex sociocultural response to revenge wars.

Setting the Stage

Mensforth (2007) observed that occurrences of human trophy-taking behaviors happen most frequently in societies that engage in reciprocal revenge wars. Raids and battles were self-perpetuating ritual performances which played an institutional part in northern Iroquoian life (Trigger 1967). Violent acts may not have been perceived to be totally hostile by the participants and may have been needed to regain and maintain balance and harmony in the village (Tung 2012). Violence was used to legitimize and promote social control and economic stability (Pérez 2012). As Champlain reported in 1619, it was a performance where all had to play a role—the audience, the torturers, and the victims (Knowles 1940; Fig. 8.7). The symbolic structure of this type of revenge warfare creates connections of exchange with specific motivation and rituals for all its participants (Whitehead 2004). For example, if the enemy died bravely, by singing his war song and not shedding a tear, bravery was noted and often his blood was drunk in order for his bravery to be absorbed

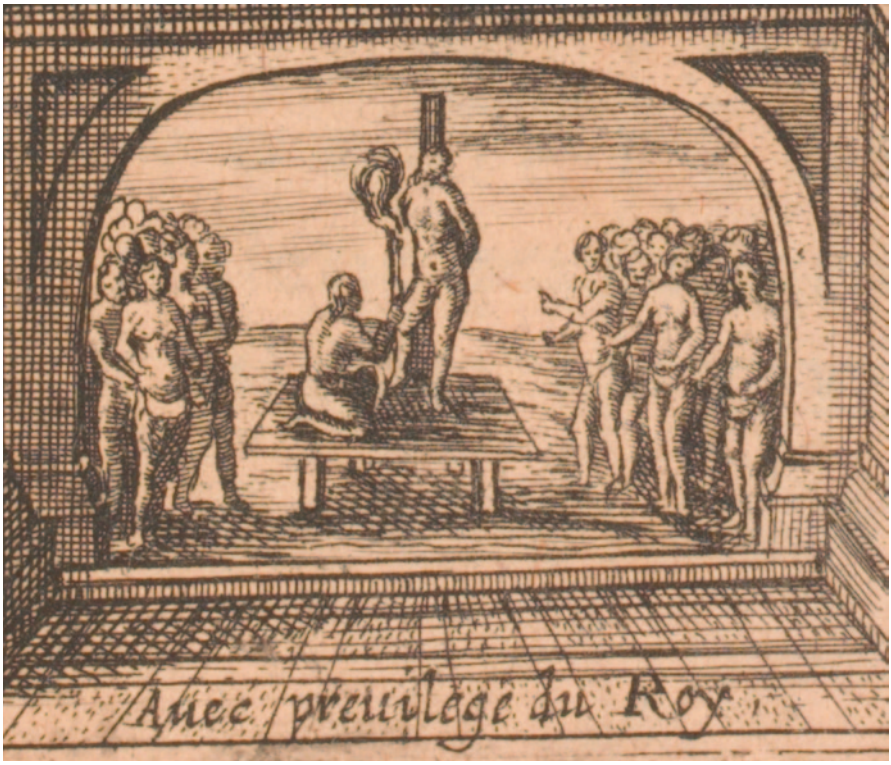

Fig. 8.7 Champlain's sketch of a 1619 scene of Iroquoian torture depicting his view of torture as a performance set on a stage (an engraving that forms part of the title vignette for Champlain's 1619 *Voyages et descovvertvresfaitesen la Novvelle France, depuisl'année 1615. iusques à la fin de l'année 1618*)

(Robb 2008). It was a challenging performance for the victim to bear torture bravely where pain was a test of fortitude (Robb 2008). Captive taking and revenge killing were accepted by the community as part of the war ritual and provided an explanation for certain behaviors (Stewart and Strathern 2002). Possessing a slain enemy's body part may have been seen by some members of the village as an attempt to assert some degree of control over high fear levels and anxiety that accompany revenge warfare (Mensforth 2007). This can explain the marked escalation of human bone objects in the Ontario archaeological record during times of conflict at the initial period of community coalescence in the late fifteenth century (Birch 2010).

Human body mutilations were acts designed to disable the body and soul of the victim or in some cases disable the descent group (Mensforth 2007). An attack on the prisoner's body can be seen as damage to the social body (Tung 2012). Therefore, the human body part became a social message (Hatch 2012), and took on a new social identity enabling it to be socially circulated (Fowler 2004). Death by violence may have been imminent for all members of society (Mensforth 2007), which may account for the human bone objects of the young at Keffer and Lawson sites. There was, likely, a great psychological impact on those that witnessed the dismemberment of prisoners whereby the emotional meaning of the violence combined with the social positioning of the participants created a scene where the actions of the prisoners and the victimizers were culturally produced (Whitehead 2004). Once the staging for the torture performance was set, the body of the prisoner, aligned with a new social identity, was seen as a highly divisible body representing the tribe from which it came (Geller 2004).

Body Partibility

Before a person was captured, the human bone had no importance other than to the individual in which it resided (Lock 2002). This means that the prisoner's body at capture was immediately transformed from a whole body into a partible body and was seen as highly divisible by its capturers. Long before prisoners were killed, they underwent a social death, a separation from their status, freedom, and family—whatever was left belonged to the victor. Fowler (2004, p. 96) refers to whole bodies where detachment of a body part is permitted as "partible" bodies. Partibility involves not only relationships between people but also relationships between things, places, and the cosmos (Fowler 2004). The Jesuits noted that upon the death of a prisoner the soul was expelled by the villagers (Thwaites 1896–1901, Vol. 39). Once that was done, the body part was ready for detachment and defleshing. For the human bone to be worth value in the community, it had to be further transformed into an object, a thing in itself entirely differentiated from whom it came (Lock 2002). It may be that the body part became an abstract part of the whole body—such as the act of scalping noted in Iroquoian ethnography (Blomster 2011; Hall 1997). The Clearville site human skull rattle depicted an incised image of a headless figure which acted as a reference to the individual's body (Fig. 8.4). Despite this uniquely

decorated skull rattle, human bones processed into objects were not likely to memorialize the individual, such as expected in ancestor veneration (Geller 2012), but were objects entirely separated from the individual in order to serve a special purpose (Geller 2012). Therefore, as a divisible body, the bone of a prisoner may have lost its link to that individual and taken on a new role in Iroquoian material culture.

Prisoners As Debt Repayment

The very knowledge that an object is created from a prisoner creates a relationship between the living and the dead—the source of the bone is remembered to be human which is linked to the value of the object (Fitzsimmons 2011). Even if a utilitarian tool such as an awl or a punch was made from human bone rather than animal bone, it was more likely viewed as more special at the time of manufacture (Fitzsimmons 2011) and during its use. Intentionally modified human bones took on a new social identity in material culture and became socially circulated ritual objects with valuable social currency because they communicated with the living to influence the thoughts and actions of others (Fowler 2004, Gell 1992; Sofaer 2006).

In Mesoamerica from CE 600–1521 human bone objects served as authoritative symbols of power and legitimization. Primarily skulls and long bones, especially the femur, were modified, elaborated into art, and used in performative displays (Blomster 2011). These too, were often buried in non-burial contexts (Weiss-Krejci 2011). Therefore, it is plausible that in Iroquoian society human body parts were used to legitimize warfare and were a materialization of victory (Blomster 2011). Human bone objects may have been used to mobilize and distribute roles, and invent others to play the roles. Therefore, in thinking that the human body is a social construct, body parts were utilized and manipulated to signify relationships and meanings among the living (Blomster 2011). Since prisoners were taken to pay societal debts, the human bone object must have served as the ultimate debt repayment. This means an individual person was reconfigured, a part extracted, and given to whom it was owed (Fowler 2004). Thus, the political quality of the body became more important than the individual and served as a metaphor for social and political conditions (Weiss-Krejci 2010).

As a prisoner, the body is an offering and a body part is further utilized and manipulated to serve in the vitality of the living (Blomster 2011; Chase and Chase 2011). The taking of heads and other trophies in Iroquoian culture was seen as a form of soul capture and contributed to the society that held them (Engelbrecht 2003; Hall 1997). Perhaps wearing a human bone object displayed competency in battle (Fitzsimmons 2011). As Champlain noted regarding drinking the blood of brave prisoners in the performance of torture, the power of the human bone object may have been absorbed by the wearer, giving strength. On the other hand, the possession of the prisoner's body part may have also represented a victory for the entire group (Mensforth 2007), hence this may be why such human bone artifacts are rare in the Ontario archaeological record. The politicization of the dead is based on

the corpse as a transitional object for the victors (Robben 2000). Political violence is manifested through the annihilation of the dead. Disarticulation and mutilation symbolized political dismemberment of the prisoner reinforcing the dominant ideology of the victors (Pérez 2012), and is done in such a way as to make a statement through a spectacle. The killing of young and old and reducing to them to an unrecognizable mass has a huge physiological impact. Dividing the prisoner's body into parts symbolizes the political dismemberment of the enemy. The complete destruction of the human remains symbolizes an undisputed success of the victors (Pérez 2012). Therefore, when viewed in this context, heroic achievements can be seen in the Ontario archaeological record by the presence of the adult and subadult SHBs and culturally modified fragments of bone in refuse contexts.

Performance

Once debt was repaid, an audience was likely needed to maximize the human bone object's symbolic power (Andrushko 2011). The human bone may have been used as a powerful ritual object which may have acted in ceremonies in advance of sending off a war party (Williamson and Veilleux 2005). They were crafted to be ritual objects with effective agency used to shape future events (Tung 2012). The objects were created by an actor and performed as actors in order to repair social stability in an Iroquoian community. At detachment, the parted bone moved away from being viewed as a biological object. If we can consider human bone as material with its own physical properties, then we can remove the distinction between the inanimate object and the animate subject (Sofaer 2006). Regardless of the object's raw material, all material in Iroquoian culture was considered animate (Wright 2009). Latour (1999) argues when a human and an object come together neither one nor the other is the actor. A new actor is created and it is harmful to separate the technical from the social. Knappet (2005, p. 29) states that objects have the ability to "act back" and affect human thought, and that all objects are actually alive. Human skull rattles, for example, were dissociated from the whole body and the individual, and became social objects as repositories for potent and powerful forces (Fowler 2004; Geller 2004). They represent powerful ritual objects for connecting the living to the supernatural rather than reflecting the individual from whom they came. As ritual objects they bestow upon their handlers authority and legitimacy (Tung 2012). The materiality of the human bone artifact, especially the skull rattle, could have acted as a conduit for transactions between this world and the next (Meskell 2004). Therefore, a human bone object, such as a rattle used by the living, came alive in the hands of the holder, and the rattle became a participant in the performance of the Iroquoian revenge rituals. The act of creating human bone objects is one part in the cultural performance of warfare (Whitehead 2005).

The Closing Act

The artifact inventory indicates that control over things may have extended to the intentional breakage of human bone objects. Middens and refuse pits are closed contexts. Fragments of human bone objects in middens promote the phenomenon that a missing part is a good indication of deliberate breakage, and were not likely accidental (Chapman and Gaydarska 2007). Iroquoian human bone objects, once broken, may no longer have been able to connect the living to the supernatural world. Their object souls must have been released through the act of breaking since Iroquoians viewed objects as alive—hence their ability to act on the world (Wright 2009). To bury the human bone object in refuse, especially broken, represents the destruction of the powers rendering the objects useless to the living and the dead (Blomster 2011).

Purposeful fragmentation of human bone objects moved the human bone into another relationship—one with other material media (Duncan and Schwarcz 2014) that allowed burial with other objects. Fragmentation occurs when the human bone object breaks and becomes non-individualized and its breakage represents a loss of social power. Once broken, it is transformed into a decontextualized object where its previous history is erased. When human bone objects broke they were commingled in middens with other broken objects and melded into a collective unit. The Keffer and Lawson case studies confirm that human bone objects were deposited with other fragmentary human bones, fragments of ceramic vessels, lithic tools and detritus, food wastes, and other ceremonial/ritual items such as bone beads and smoking pipes. This can be described as agglomeration (Duncan and Schwarcz 2014) whereby the human bone object no longer transmits its social identity. A human bone artifact in refuse implies the sacrificial act was complete, denotes the ritual retirement act of forgetting and makes a statement that revenge was accomplished. The complete destruction of human bone objects symbolizes the undisputed success of the victors. Their disposal symbolizes the political dismemberment of the enemy. As archaeologists, we should view human bone artifact as fragments of mementos of events that played a significant role in the politicized and ritualized act of Iroquoian warfare.

Conclusion

The outcome of the search of archaeological literature resulted in an inventory of 98 human bone artifacts. In this study I have projected understandings of historic period practices back to the past, however, it seems some elements of ritual and ideologies do have temporal depth. Although much remains unknown about human bone objects in Iroquoian culture, theoretically framing these objects helps provide an explanation as to why certain categories of people did not receive customary

Iroquoian burial. It seems Iroquoians spent time transforming people into ritual objects created to firstly avenge wrong doings and then to act as mediators for supernatural assistance in warfare, which for archaeologists provides tangible evidence of objects that played an active role in binding group identity and accentuating social memory (Andrushko 2011; Eckhardt and Williams 2003).

The investigation of the artifacts and their contexts of deposition and use creates an awareness that it is important to understand the nature of the society that produced the deposits and their beliefs related to the body, to death, and to burial (Weiss-Krejci 2011). Understanding settlement patterns can be significant to comprehending how people ordered objects and how artifacts related to their recovery contexts. How bodies are processed, hidden, and displayed can be used as a point of departure for examining forms of violence that produced death (Pérez 2012). A broader study should consider the chronological and spatial patterning of human bone objects since, for example, human skull parietal artifacts have been recovered in areas such as the St. Lawrence River Valley in Ontario, Canada (Wintemberg 1936) and New York State (Wray et al. 1987).

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Chapter 9
In morbo et in morto: Transforming Age and Identity Within the Mortuary Context of Oymaağaç Höyük, Northern Turkey

Kathryn E. Marklein and Sherry C. Fox

In the first courts and entrances of Hell/Sorrows and vengeful Cares on couches lie;/ There sad Old Age abides, Diseases pale,/ And Fear, and Hunger, temptress to all crime;/ Want, base and vile, and, two dread shapes to see,/ Bondage and Death
Virgil, Aeneid, Book VI. 274–277 (trans. Williams 1910)

From Stygian darkness launched into the light/ Comes raging pale Tisiphone; she drives/ Disease and fear before her, day by day/ Still rearing higher that all-devouring head
Virgil, Georgics, Book III. 511 (trans. Greenough 1900)

Introduction

In his evocative personifications of *Morbus*, Virgil captures the threatening and destructive characterization of disease in Roman times. Disease was a deadly force, escorting victims to the vestibule of the Underworld and lingering on the shore as souls made their final journey with Charon. Throughout the Roman Empire, rural and urban conditions invited and sustained zoonotic, parasitic, and pathogenic diseases (Sallares 1991; Scheidel 2001): tuberculosis, malaria, salmonella, and typhoid, among others. Annually, endemic (and epidemic) diseases claimed the majority of lives of Romans across the empire. Such high mortality from disease contextualizes

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Virgil's literary portrayals of *Morbus*: it was an omnipresent being to which communities actively responded or proactively avoided. Nevertheless, in a world without antiviral/antibacterial medication or sanitation standards and programs, disease assumed power over society (Hays 1998). While aristocratic and merchant elites had the ability to flee to the country to avoid epidemics or recuperate from failing health, lower socioeconomic groups had neither the resources nor time to prevent disease transmission or succumbence. Therefore, in periods of epidemic disease, the majority of populations could only react to *Morbus*. Their reaction took on the form of their treatment and disposal of the deceased; how communities altered their traditional burial practices informs us about the transformative capacity of disease on past sociocultural and demographic landscapes (Harding 1989; Longrigg 1980).

This chapter addresses the transformative power of disease and mass death on a rural population in northern Turkey.[1] Excavations of the necropolis at Oymaağaç Höyük exposed several mass graves dated to the second and third centuries CE. Preliminary osteological investigations have revealed no perimortem trauma, thereby implicating pathogenic disease, famine, or natural disaster as the primary contributing factor to this massive death episode. Based on the historical and grave context (see below), epidemic disease is posited as the most probable explanation for these mass interment events. The mass graves postdate Roman multigenerational[2] burials at Oymaağaç, which represent local, traditional burial practices. Oymaağaç, therefore, provides an archaeological case study population on which to test a community's response to mass death. This study compares demographic profiles between mass and multigenerational graves to determine whether an environment of mass mortality (vs. attritional population death) led to significant changes in burial tradition. Specifically, the distributions of adults and juveniles between graves are observed and interpreted within the scope of personhood to better understand how childhood identities were represented and regenerated under normal and massive mortality conditions.

Mass Burial and Mortuary Archaeology

Episodic mass burials are generally outcomes of violence or epidemics/pandemics (Haglund 2002; Sorg and Haglund 2002). While research in mass graves initially fell within the realm of forensic anthropology, more and more discoveries of archaeological mass graves have brought this mortuary practice within the scope of bioarchaeology, specifically studies of commingled remains (e.g., Adams and Byrd 2008; Osterholtz et al. 2014). The historical, political, and sociocultural contexts in which mass burials occur inevitably provide information about variable communal

[1] The authors thank the organizer of the Society for American Archaeology (SAA) symposium from which this volume was conceived, Anna Osterholtz, and the discussants, Debra Martin and Tiffiny Tung, whose comments and insights were invaluable for the recreation of this paper.

[2] Graves have been categorized loosely as multigenerational when there is evidence that the grave was reopened over several generations. This terminology intends to highlight the fact that not only are many generations of individuals represented within these graves but that these graves were utilized for many decades and generations of the community.

responses to sudden death. In situations of violence, where the interred bodies sustain evidence of perimortem trauma and mortal lesions, circumstances may differ in burial intentionality. For example, modern mass graves, which hold the remains of victims of wars, genocide, or intercommunal skirmishes, represent expedient means of burying hundreds or thousands of individuals (Haglund et al. 2001; Schmitt 2002). In these circumstances, burial is not an act of reverence or honor given to the deceased but a necessity to rapidly conceal mass atrocities (Haglund 2002). By contrast, battlefield graves across history, from Medieval York (Fiorato et al. 2000; Sutherland 2011) to nineteenth-century Montana (Battle of Little Bighorn, (Hoig 1976), demonstrate actions taken by survivors to ensure burial (however unceremonial or untraditional) of their dead companions. In situations where no survivors remain, the victors in battle may assume or reject the charge of burial of their defeated enemies. After the infamous slaughter of three Roman legions in the Battle of Teutoburg Forest (9 CE), German warriors sacrificed captured centurions and tribunes and left the bodies of Roman soldiers exposed to the weather and scavengers before disposing of remains en masse in the nearby basin (Wells 2003). Finally, mass burial deposition attributable to violent death may not be associated with more nuanced forms of interpopulation conflict, wherein selective execution of individuals evinces sacrificial mortuary traditions. At the late prehistoric site of Cahokia, for instance, Mound 72 contained mass graves with exclusively female skeletal remains, which, according to skeletal remains and ethnohistorical information, were postulated to be captive victims of sacrifice (Fowler et al. 1999). Sacrificial rituals eventuating in massive burials often convey demonstrations of local or individual political power (Childe 1945; Sugiyama 1989; White et al. 2002) or evocations of cosmological powers on behalf of the dead and living (Parker Pearson 1999).

Although violent circumstances may explain mass burial events, alternative reasons include famine, natural disaster, and epidemic disease besieging a population. As famine, natural disaster, and epidemic disease rarely present skeletally, however, archaeologists and anthropologists employ historical context and demographic models to better elucidate the causes for such high episodic mortalities. Utilizing historical documentation and reports in tandem with bioarchaeological evidence, Connell and colleagues (2012) proposed that the mass burial pit at St. Mary Spital, once associated with the Black Death or Great Famine, was the direct result of famine and pestilence brought about by a thirteenth-century cataclysmic volcanic eruption. In response to the high death toll among the urban poor, the local London community dug and expanded the burial pit to accommodate the rising number of bodies; these measures intended to mitigate the effects of further contagion and pestilence brought about by the exposed, decomposing dead (Connell et al. 2012). Similar responses have been enacted following natural disaster events. After the South Asian tsunami disaster of 2004, unidentified bodies in Indonesia and Sri Lanka were interred in mass graves, the largest of which contained 60,000–70,000 individuals. Despite some cultural resistance to this disposal decision (e.g., individuals denied appropriate ceremonial burial), insufficient numbers of refrigeration facilities, to house and preserve bodies indefinitely, necessitated immediate burial (Perera 2005; Morgan et al. 2006). Such immediate and urgent reactions to mass death have also occurred throughout history within the context of epidemic dis-

ease—namely, during the Plague of Athens, Antonine Plague, and recurring Medieval plague outbreaks—when communities adopted untraditional burial practices to accommodate the catastrophic mortality rates (Gowland and Chamberlain 2005; Harding 2002; Littman and Littman 1973).

Mass Burial in Roman Mortuary Tradition

During the Bronze Age (c. 1800–1200 BCE) across the eastern Mediterranean and Black Sea landscapes, "the deceased" were typically interred cumulatively within extramural communal barrows or tombs (de Polignac 1984, 1995; Hood 1960; Morris 1987). In the succeeding Iron Age, the practice of burying multiple individuals within a singular grave continued, although overall reductions in grave size limited the number of individuals who could be inhumed within the burial space (Fagerström 1988). By the end of the Iron Age, imposing earthen mortuary architecture, such as tumuli and kurgans, was abandoned as populations congregated and concentrated around nucleated settlements (Gesell et al. 1990). Settlements expanded and evoked new territorial prominence and authority over Iron Age landscapes, while monumental Bronze Age grave mounds faded from living memory. Monumental, communal mortuary culture diminished in scale to more individualized, kin-centered burial traditions. Kurgan, tholos, and tumulus graves, which typified prehistoric burial traditions, were exceptional to the later historic periods (Morris 1992; Mylonas 1948). For example, the Classical (fifth century BCE) tumulus commemorating and containing the remains of the Greek war dead from the legendary battle at Marathon stands to this day as one of the latest allusions to precedent epic, Homeric burial traditions. By the Classical and Roman periods, Bronze Age tumulus mounds and comparable Anatolian höyüks (hills) were reclaimed, rather than newly created, by local populations as necropolitical realties (Goldman 2001). While multi-individual burials were often inserted into mounds, it was never to the grand extent of previous multigenerational communal graves of prehistory.

In the Roman period, mass burials were alluded to in Varro's *De Lingua Latina* as a practice of disposal for the urban poor. Italian archaeologist Rodolfo Lanciani argued the discovery of such pits *(puticuli)* under the Esquiline Hill in Rome during late nineteenth-century excavations, though such claims have been overthrown in recent years (Laciani 1897 (1900)). Although increases in mortality associated with urbanization inevitably led to spatial burial pressures, recent work in Italy mortuary archaeology proposed that so-called mass burial pits were not typical means of interment and that even the Roman poor made concessions to ensure proper burial (Graham 2006). To this extent, the enactment of mass burial practices in Roman times represented a deviation from established customs and evoked episodes of sudden communal disaster. Under such circumstances, burial decisions conducted by the survivors had the transformative potential to redefine individual and group identities (Pearson 1999). Urgency of disposal precludes social stratification in burial, therein equalizing marginalized or powerless groups, such as slaves, women, and children, with sociopolitically privileged elites.

Children and Roman Mortuary Archaeology

In a centenary review of the journal *American Anthropologist*, Schwartzman (2001) evaluated the prevalence and context of children within cultural, physical, and archaeological studies of anthropology. Among the 3493 articles, only 137 (3.9%) referenced or addressed topics of children and childhood (Schwartzman 2001). A similar statistical overview of *American Antiquity* articles by Roveland (Roveland 2001) yielded comparable results. Children were an oversight in anthropology until the 1970s, when research began emphasizing childhood socialization within specific sociocultural and political environments (Roveland 2001). It was gradually realized that the formative childhood years—when children are groomed to be constructive, integrative members of society—could provide invaluable information about cultural mores and expectations in past populations (Baxter 2005; Sofaer Derevenski 2000). The archaeology of children addresses the identity and role of children within their family and broader society, therein enhancing perceptions of adulthood and personhood in past populations (Kamp 2001).

Past burial traditions provide salient lines of evidence for contextualizing and defining perceived social identities of children. When a child dies, his or her living social identity may be manipulated through burial into an entirely different identity to benefit the soul of the dead or status of the living relatives (Fowler 2004; Kamp 2001; Pearson 1999). Evolutionarily, children are invaluable vessels of genetic and cultural information (Chamberlain 2000; Saxe 1970) and therefore the responsibility and insurance of their biological family (Binford 1971). This fundamental social and genetic reality emphasizes the roles of children as foundational and legitimizing members of a family. Until a Greek or Roman wife bore her first child, her position in the household was tentative. A child was the fulfillment of the Classical family, and his or her presence (1) legitimized a new wife's status as mother and domestic caretaker and (2) guaranteed a father an heir to his name and possessions after death (Demand 1994; Pomeroy 1975). In this respect, in Classical and Roman periods, children conferred as much power on their family as was conferred upon them by their families.

Despite the essential role children filled in Roman family and society, nonadults did not always receive the same funerary and burial rites conferred upon men and women (Carroll 2011; Norman 2003; Rawson 2003). During this period, children were regarded as marginal members in society, *sub*adults in development (Wiedemann 1989). At the Italian core of the Roman Empire and across the imperial frontier, infants and children were interred in areas within community necropoleis, apart from the adults, or in specifically defined cemeteries for nonadults (Carroll 2011; Moliner et al. 2003). Similar patterns of juvenile exclusion have been consistently referred to throughout prehistoric and classical archaeology (Baker et al. 2005; Morris 1987; Morris 1992). In the Early to Middle Bronze Age (1800–1600 BCE) cemetery at Mokrin, Serbia, Rega (Rega 1997) observed a dearth in infant burials, as neonates and younger children were instead interred beneath the floors of settlement houses. Such deliberate separation of adults and juveniles was practiced in Geometric Athens (900−700 BCE), where child burials

were distributed intramurally in grave plots and domestic spaces apart from adult cemeteries, which were located outside or close to the city walls (Cavanagh 1996; Morris 1989; Whitley 1991). These burial disparities lead to speculations of personhood and the time at which children became effective agents within their past social environs (Rega 1997).

The Case Study of Oymaağaç, Turkey

Oymaağaç Köyü is located in the modern day Black Sea region of northern Turkey (Fig. 9.1). At the edge of the village, Oymaağaç Höyük stands prominently within the valley. As the purported cult center of the weather god, Nerik, Oymaağaç held a prominent position at the northern extent of the Hittite Empire (Czichon and Klinger 2005). History after the dissolution of the Hittite Empire was largely quiescent until the eighth and seventh centuries BCE, when Greek colonial interests directed toward the Pontus Euxenios, establishing capital centers in coastal cities such as Sinope (Sinop) and Amisos (Samsun). Although the Pontic hinterland was not settled with *coloniae*, Greek culture invariably permeated the inland landscape via trade and political interactions (Madsen 2009). Eventually, these rich lands of the Pontic hinterland were absorbed into the Achaemenid Empire during the Classical period (fifth and fourth centuries BCE). In 281 BCE, Mithridates II founded

Fig. 9.1 Location of Oymaağaç-Nerik and Vezirköprü (Neoklaudiopolis), relative to modern and ancient port cities of Sinop (Sinope) and Samsun (Amisos/Amisus) in northern Turkey and relative to the Roman Empire in 117 CE *(inset)*

the Kingdom of Pontus, which lasted over two centuries until Roman annexation of the region under Pompey the Great in 63 BCE (Anderson 1900; Fletcher 1939; Magie 1950). The geopolitical program Pompey enacted in the Pontus consolidated the landscape under regional city powers. For the Phazemon Valley, in which Oymaağaç is located, local communities were united under the jurisdiction of a newly established regional center, Neapolis (later Neoklaudiopolis). Situated along the prominent east–west trade route, the Pontic Way *(Pontica Via)*, Neoklaudiopolis developed the economy to finance public building works, reflective of a "Romanized" border town (Bekker-Nielsen 2013; Munro 1901).

Albeit rural to Neoklaudiopolis, Oymaağaç was in continuous dialogue with the regional center and, by association, with the broader Roman world. Artifactual finds from Oymaağaç—fibulae and rings—attest to this trade communication (Hnila 2014). Concurrent with the transmission of goods to and through Oymaağaç during the Roman period was the transmission of people, ideas, and pathogens. The latter of these "artifacts of trade," pathogens, has taken on especial significance within the necropolis at Oymaağaç. Amidst the 53 graves excavated up to the 2014 field season, at least five show evidence of singular mass burial events. Preliminary anthropological observation of the bones has shown no evidence of perimortem skeletal trauma within any of these mass graves, precluding intercommunal conflict as a cause for this devastating population loss (Fox and Marklein 2014). Therefore, the present hypothesis for this episodic mass death is that either a viral pathogen (i.e., one that did not manifest skeletally) or severe famine struck the rural community around the late second-early third century CE. Based upon the dates of these mass graves (gleaned through associated grave goods and ^{14}C radiocarbon dating), which fall within the recorded periods of the original and subsequent onsets of the Antonine Plague (Littman and Littman 1973; Sabbatani and Fiorino 2009), we are inclined to support the former theory of a pathogenic agent. Presently, ancient deoxyribonucleic acid (aDNA) from the dental pulp of eleven individuals is being analyzed for remnant pathogen DNA, which may conclusively elucidate the circumstances of these mass burials.

Maintaining Burial Practices at Oymaağaç: Mortuary Evidence

Since the inaugural excavation season in 2007, archaeologists have encountered and exposed burials from the Iron to Late Roman/Byzantine periods (c. 1100 BCE–800 CE) at Oymaağaç. The changing cultural landscape of this community is apparent through the transforming burial schemes. Iron Age single-flexed inhumation burials contrast with the later Roman cist and pit graves, which contain multiple individual inhumations. Within the highest burial stratum, Byzantine graves veer from multiple-individual graves and communal tombs, instead redirecting mortuary focus toward the individual with single-person tile *(tegula)* inhumations. While the Iron and Byzantine burials provide compelling information about the Oymaağaç

community during these respective periods, this chapter mentions them solely to chronologically contextualize the Roman period (2nd–4th c. CE) graves, which are the central concern of this case study.

Excavations thus far have revealed at least 12 multiple episodic or mass interment graves across the höyük. Eight of these graves are presented in this study. Graves were designated as multigenerational (multiple depositional events) according to the distribution of skeletons and skeletal elements: those skeletons occupying the upper strata of the grave are articulated, while individuals interred during earlier depositional events are partially articulated with associated elements spread around the axial skeleton (Fig. 9.2). Considering the orientation of bodies, alignment of skeletal elements, and general overlap of the skeletons, four of the graves have been characterized as mass graves. Closely positioned, discrete skeletons exhibit similar states of preservation, indicating that individuals within these graves were interred within short succession of one another (Sorg and Haglund 2002; Adams and Byrd 2014). Multigenerational and mass graves have been dated through sparse artifactual goods to the late second century. However, two contextual details suggest that the mass graves succeeded the multigenerational burials. First is the utilization of cist graves for mass burial events. Of the four mass burials examined in this study, two (7384:009 and 7385:018) are within stone cist graves. Across the cemetery, cist graves vary in their finished state: several exhibit the roughened texture of their original stone, while others maintain the remnants of elaborate plaster lining. Regardless, these structures do not represent an architecture of complete expedience; it would have required considerable manpower and time to move the lining stones (Hnila 2014). All four of the multigenerational burials in the present

Fig. 9.2 Commingled state of skeletal remains within multigenerational grave 7484.020. The distribution of long bones and axial elements suggests that successive interments followed the east–west orientation of earlier buried individuals

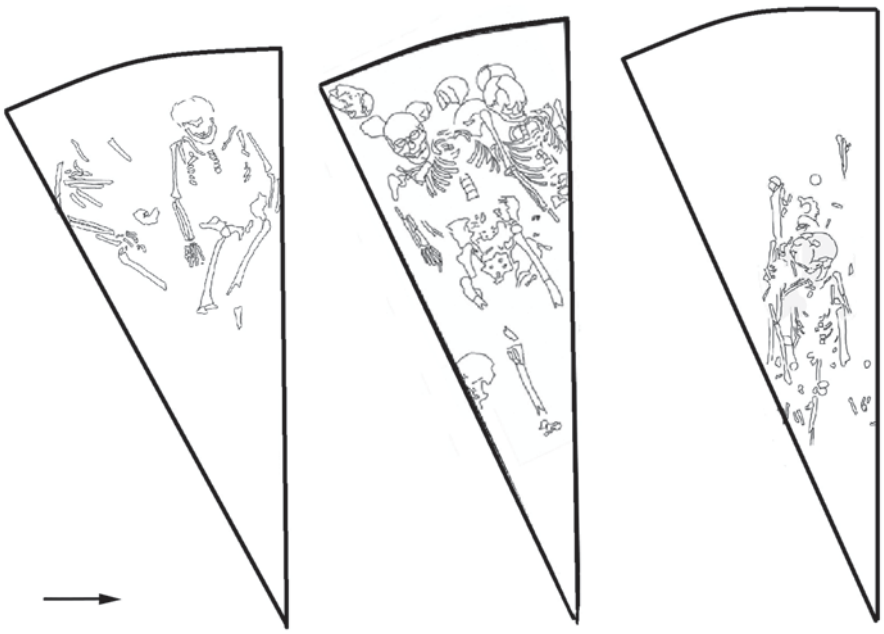

Fig. 9.3 Grave 7384.009 multiple burial events. The earliest event *(left)* includes two juveniles interred at different times, the mass burial event *(center)* demonstrates the careful alignment of bodies in relation to each other and the previous interment, and the final burial episode *(right)* maintains the east–west orientation of bodies, but the dispersal of skeletal elements indicates multiple inhumations

study belong to cist graves, demonstrating an established mortuary tradition for the local community. The two mass burials associated with cist graves cut into this tradition, presumably because of the urgency to dispose of bodies. Further evidence of the later date for these mass burials is presented in 7384:009. This grave is divided into a tripartite depositional sequence: the lowest stratum includes two juveniles, the middle stratum 16 adults and three juveniles, and the highest stratum one adult and four juveniles (Fig. 9.3). The burial phases of this grave convey a change in interment practice; the 7384:009 tomb was reclaimed during the second phase to accommodate bodies from this local catastrophic event.

However, the number of cist graves at the time of the mass population death was not sufficient to house all the dead at Oymaağaç, as evinced by the preponderance of pit graves (Table 9.1). This burial alternative suggests that circumstances resulting in the mass death of this local community were likely unanticipated and did not allow adequate time for the populace to build additional permanent grave structures. Despite the change in overall grave architecture—material and dimensions—between cists and pits, there is still evidence to suggest that traditional burial patterns were not abandoned at Oymaağaç, despite the urgency of burial. First, the obvious observation is the presence of mass burial individuals within the necropolis. Past

Table 9.1 Depositional, structural, and spatial information for graves discussed in this chapter

	Deposition		Grave type	Orientation
7384.009	Primary inhumation	Mass burial	Cist	SW–NE
7484.020	Primary inhumation	Multigenerational burial	Cist	SW–NE
7484.021	Primary inhumation	Multigenerational burial	Cist	W–E
7385.002	Primary inhumation	Mass burial	Pit	W–E
7585.010	Primary inhumation	Multigenerational burial	Cist	SW–NE
7385.018	Primary inhumation	Mass burial	Cist	SW–NE
7385.019	Primary inhumation	Mass burial	Pit	SW–NE
7586.033–7686.033	Primary inhumation	Multigenerational burial	Cist	W–E

instances of mass death, especially under epidemic conditions, often result in the spatial separation of the victims from traditional burial zones (Harding 2002; Hays 1998; Longrigg 1980): the living wish to contain and prevent *miasma* from affecting the living population. Therefore, by burying the victims of the local catastrophe at Oymaağaç, the community demonstrated accordance and maintenance of burial tradition. Further adherence to burial customs during mass death was demonstrated by grave and body orientation. Orientation of the pit graves falls consistently within the south–west/north–east direction, like many of the cist graves, with some outliers orientating more west–east (Fig. 9.4). Arguably these burial continuities suggest that the community at Oymaağaç, albeit exposed to epidemic insults, did not entirely abandon its traditional mortuary practices for an alternative burial agenda.

Transforming Burial Practices at Oymaağaç: Skeletal Evidence

The skeletal remains from eight of the Roman period graves have been preliminarily analyzed to establish age-at-death distributions for this rural population. Four graves, based on previously stated criteria, are categorized as multigenerational burials and four as mass burials. The demographic composition of the multigenerational burials typifies the traditional, selective burial practices for the community, but they do not represent the typical death rates. By contrast, the mass graves capture a time when burial was presumably a matter of pragmatic urgency before a matter of tradition. Therefore, we have compared the demographic profiles within grave types and between grave types to determine whether burial patterns were maintained from a period of attritional death to a period of mass death.

Human skeletal remains were divided into adult and juvenile age classifications, according to Roman cultural context (Carroll 2011; Revell 2005). “Subadult” connotes skeletally immature individuals as lesser in their developmental stage than fully matured adults (Lewis 2007). Therefore, this study employed the terminological nomenclature of “juvenile” and “adult” to generally categorize individuals with age estimates below and above 16 biological years, respectively. Adult ages at death

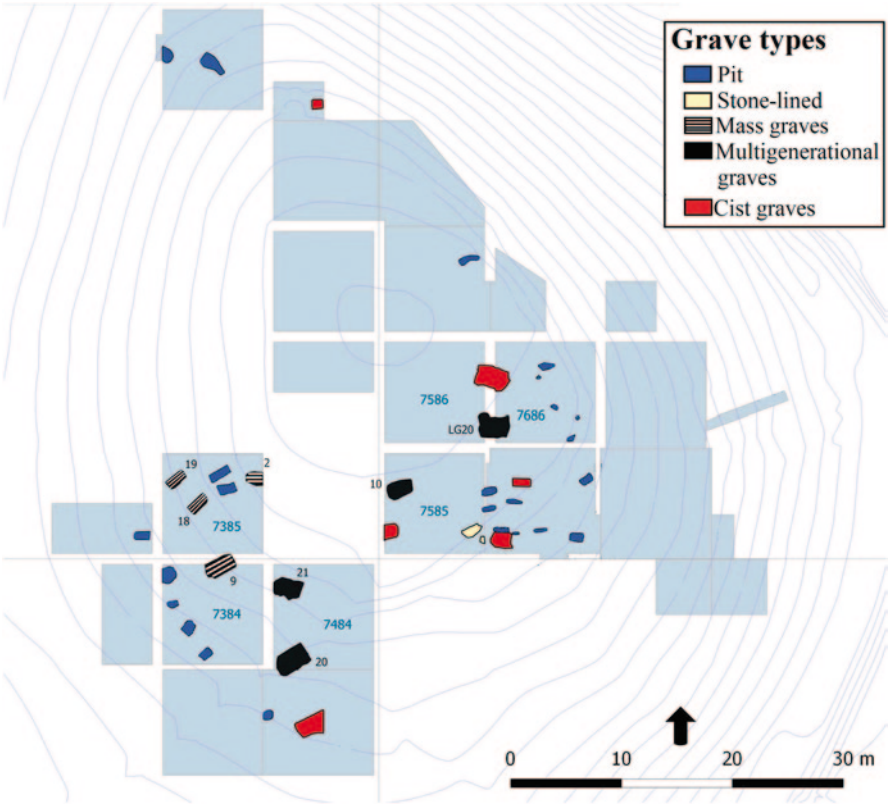

Fig. 9.4 Layout of Oymaağaç necropolis with grave types demarcated. Mass and multigenerational graves examined within this study appear in *black* and *black-and-white stripes*. It should be noted that six mass and multigenerational graves are characteristic cist burials, although not highlighted in *red*, and two mass and multigenerational graves are pits (otherwise symbolized in *blue*). (Adapted with permission from Pavol Hnila)

were estimated according to the collected methodology for postcranial elements outlined in *Standards for the Collection of Data from Human Skeletal Remains* (Buikstra and Ubelaker 1994): pubic symphysis (Todd 1921; Brooks 1990), iliac auricular surface (Lovejoy 1985), and sternal rib ends (Işcan and Loth 1986).

Juvenile age estimates were established according to postcranial epiphyseal fusion and dental development and eruption (Buikstra and Ubelaker 1994; Ubelaker 1989). For this study, juvenile age estimates fell within one of three ranges: 0–5 years, 6–10 years, and 11–15 years. As this study focuses on the relationship between adult and juvenile burials, differences in adult sex distributions between multigenerational and mass graves were not analyzed as variables. Instead, the adult counts within graves were compared broadly with juvenile counts and more exacting with specific juvenile age categories (Table 9.2). Under the circumstances of 7384.009, where multiple strata were identified, only individuals directly associated with the mass burial event were included in the analysis.

Table 9.2 Count and percentage distribution of juveniles (15 years and under) and adults (over 15 years) within mass and multigenerational graves

		Juveniles						Adults		Total
		0–5 years		6–10 years		11–15 years		Over 15 years		
		n	%	*n*	%	*n*	%	*n*	%	*n*
Mass graves	7384.009	2	11.0	0	0.0	1	5.3	16	84.0	19
	7385.002	4	22.0	2	11.0	1	5.6	11	61.0	18
	7385.018	1	4.2	5	21.0	1	4.2	17	71.0	24
	7385.019	0	0.0	0	0.0	0	0.0	10	100.0	10
	Total	*7*	*10.0*	*7*	*10.0*	*3*	*4.2*	*54*	*76.0*	*71*
Multigenerational grave	7484.020	3	11.0	0	0.0	1	3.7	23	85.0	27
	7484.021	0	0.0	0	0.0	1	3.6	27	96.0	28
	7585.010	4	13.0	1	3.1	2	6.3	25	78.0	32
	7586.033-7686.033	0	0.0	1	5.0	0	0.0	19	95.0	20
	Total	*7*	*6.5*	*2*	*1.9*	*4*	*3.7*	*94*	*87.9*	*107*

Distribution of Juveniles and Adults in Mass and Multigenerational Burials

The first mass grave, 7384.009, had the lowest minimum number of individuals: 17 adults and seven subadults. Regarding the subadult distribution, all ages, from infant to young adolescent (11–15 years), were identified among the remains, and the greatest proportion of children was between birth and 10 years of age at death. The next mass grave, 7385.002, displayed a higher proportion of juveniles to adults, 7 to 11. Among juveniles, the majority interred within this mass grave were infants (under 3 years). These infant remains were accompanied by two young children (6–10 years) and one adolescent. The second cist grave, 7835.018, associated with a mass burial presented a general demographic profile comparable to the previous graves, that is, greater adult representation. In total, 17 adults were documented relative to seven juveniles. Juveniles buried in 7385.018 primarily included 6-to-10-year-olds. One infant and one adolescent were also documented. The final mass grave pit, 7385.019, was unlike the other mass burials in its demographic composition. In this shallow pit, ten individuals were identified, but no remains within this grave were attributable to a juvenile.

Multigenerational grave 7484.020 contained the remains of 23 adults and four juveniles. Three of the four juveniles observed within this grave died within the first 5 years of life. The final juvenile was aged to adolescent years. Human skeletal remains from 7484.021 represented 27 adults and one adolescent juvenile. Among the multigenerational graves at Oymaağaç, 7585.010 exhibited the largest proportion of juvenile to adult remains: seven juveniles to 25 adults. Juvenile remains within this grave conveyed disproportionate age representations; over half of the interred juveniles died before 5 years. One juvenile died in early childhood, around 9 years, while two juveniles survived until adolescent years. Similar to 7484.021,

grave 7586.033-7686.033 (LG20) exhibited a general dearth in juvenile skeletal remains relative to adult representation. Overall, 20 individuals were inventoried within this tomb, of which 19 were adults. The singular juvenile was aged through dental development to 8 (+/− 2) years.

Chi-square tests were performed on these data to determine whether significant differences in burial demographics existed within or between multigenerational and mass graves.

First, demographic profiles were performed within multigenerational graves to determine whether a standard burial practice for adults and juveniles existed for this community. Results indicated no significant differences in the percentages of juveniles and adults ($\chi^2 = 6.46$, $p > 0.05$). On average, 87.9% of individuals within multigenerational graves were adults, while the remaining 12.1% were juveniles. When the adult and three juvenile age categories were compared, none of the graves showed a significantly different distribution of infants, children, or adolescents ($\chi^2 = 10.1$, $p > 0.10$). Mass burials also exhibited a similar nonsignificant relationship between adult and overall juvenile counts ($\chi^2 = 6.83$ $p > 0.05$) and adult and juvenile subgroup counts ($\chi^2 = 12.5$ $p > 0.10$) among the four graves observed.

However, when the two burial typologies were concurrently tested, a statistically significantly higher representation of juveniles was apparent between the four mass graves and the four multigenerational graves at Oymaağaç (Table 9.2; Figs. 9.5 and 9.6). Approximately 24.2% of individuals interred within the mass

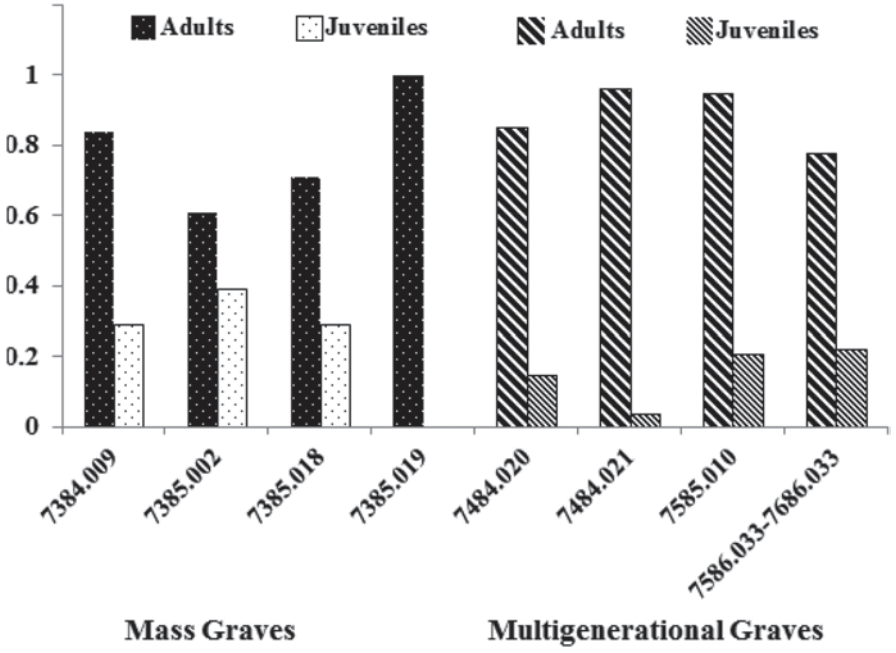

Fig. 9.5 Proportional distribution of adults and juveniles within mass and multigenerational graves

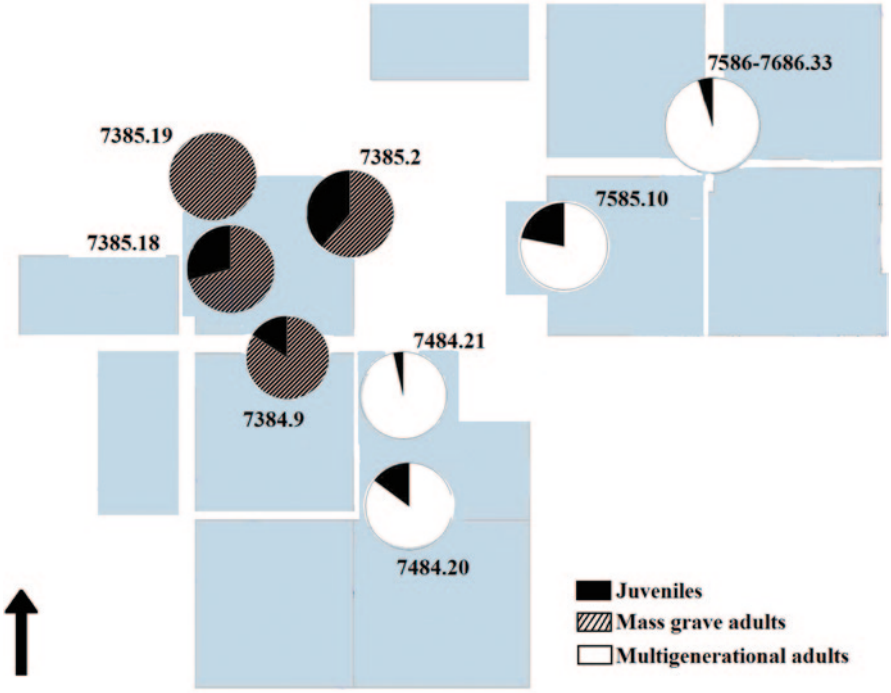

Fig. 9.6 Areal representation and spatial relationship of adult–juvenile proportions between mass and multigenerational graves. Demographic proportions are reflected in *pie charts*. No immediate pattern in juvenile distribution appears within this area. (Adapted with permission from Pavol Hnila)

graves were juveniles in contrast to only 12% of individuals within multigenerational graves. When specific juvenile age ranges were compared between mass and multigenerational graves, no significance was found, although a consistently higher proportion of individuals in each juvenile category was observed within the mass burials: 10.0 versus 6.5% (0–5 years), 10.0 versus 1.9% (6–10 years), and 4.2 versus 3.7% (11–15 years). While diagenetic factors may explain variation in juvenile distribution, this possibility is improbable for the Oymaağaç graves under study (Baker et al. 2005; Lewis 2007). First, the burial environments for two mass graves (7384.009 and 7385.018) and all multigenerational graves are similar, cist graves. Therefore, diagenetic conditions should be comparable between these graves. This hypothesis was confirmed when the number of identifiable fragments were compared between graves; fragment counts were relatively similar between these burials. Where diagenesis may have altered individual juvenile counts would have been in the pit graves, wherein skeletons were directly exposed to soil and consequently less buffered from decompositional weathering and microbial scavenging. These grave conditions may have resulted in lower juvenile skeletal preservation, thereby underestimating the actual number of juveniles in 7384.009 and 7385.018.

Transformative Power of Disease

Preliminary analyses of mass and multigenerational graves at Oymaağaç-Höyük demonstrate a significant change in interment practices of juveniles following mass population death, while burial orientation and body treatment suggest maintenance of local mortuary tradition. Writing of mass burials associated with plague in England, Gittings (Gittings 1984) described epidemic events in history as times in which communities may or may not demonstrate their commitment to conventional burial rites and customs. Within the setting of Roman period Oymaağaç, the community has proved its resolve in upholding the earlier burial tradition. Individuals within mass graves were deposited carefully row upon row, three to four individuals abreast. As with the multigenerational burials, all bodies were supine and aligned southwest to northeast. Even in the shallow pit at Oymaağaç, 7385.019, individuals were placed in a manner not unlike their multigenerational predecessors, supine in the southeast–northwest direction. This careful placement of bodies at Oymaağaç contrasts with the haphazard deposition of bodies at a contemporary Roman period mass grave in Gloucester, UK (Simmonds et al. 2008). Under these circumstances of mass death, a shallow pit was dug at Gloucester into which corpses were strewn across the grave floor, with no apparent effort to align bodies to one another or a cosmologically fixed point; many skeletons were prone on the earth with appendages spread away from the axial skeleton (Simmonds et al. 2008).

This adherence to mortuary tradition in the face of mass death has been reported on populations throughout history (Schats et al. 2014; Shoesmith and Stone 1995). When Medieval London was beset with the impending Black Death, burial grounds were expanded and hundreds of additional graves made in preparation for the high and immediate mortality (Gowland and Chamberlain 2005). These pragmatic measures allotted a considerable proportion of the population the burial rites, which may have otherwise been denied them due to the short incubation of *Yersinia pestis* and the overwhelming demand for burial space. However, when the disease struck the city, the number of graves was insufficient to hold the dead and dying. Consequently, mass burial pits were dug and quickly filled (Slack 1988; Hawkins 1990). Forced to abandon burial traditions in lieu of the plague, the people of London sought to sequester the infected, unclean dead from the surviving population expediently and pragmatically. The city no longer had the labor, space, or time to bury the dead in individual graves; some histories recount individuals burying relatives in the family gardens (Slack 1988). By contrast, accounts of one of the subsequent resurgences of the plague in London attest to instances when burial requests, location, and rites were fulfilled (Harding 1989).

During Classical and Roman periods, epidemic disease demonstrated profound power over the mortuary actions of communities (Hays 2005; Longrigg 1980; Papagrigorakis et al. 2006; Simmonds et al. 2008). Amid the Peloponnesian War, Athens was struck and decimated by a virulent pathogen, which killed approximately one third of the population. Bound within the walls under threat of war and unable to remove the bodies far from the city, many residents buried their dead in mass graves

within the *Demosion Sema* (public burial ground). Although a burial tradition of the Geometric period, cremation was reintroduced into burial preferences during this time to dispose of contagious corpses (Kurtz and Boardman 1971; Garland 1985; Watts 1999). According to Longrigg (1980), the plague's true power and terror were realized when individuals were forced to lay aside conventional funerary rites and burial practices for more immediate disposal alternatives. Ancient Greeks viewed traditional burial as an undeniable right, and those individuals who denied such burial to friends and relatives would suffer the offenses of the gods (Garland 1985). Greek historian and survivor of the plague, Thucydides, described the degenerative state to which the plague had reduced Athenians, tossing corpses upon corpses on already burning pyres (Thucydides, *History of the Peloponnesian War* II.52).

No such extreme conditions characterized the mass grave circumstances at Oymaağaç. The conventional burial suite for adults—primary inhumation, supine positioning, and mass interment—was maintained from multigenerational to mass graves. Where deviations from mortuary tradition did occur, involved the distribution of children. Between the antecedent multigenerational and subsequent mass graves, a significant increase in juvenile skeletal representation was documented, 12 to 24%. The disproportion of juvenile to adult burials at Oymaağaç, under normal circumstances of death, coincides with mortuary practices observed throughout Roman history and eastern Mediterranean prehistory and history (Carroll 2011; Morris 1989; Houby-Nielsen 2000; Smith and Kahila 1992; Sourvinou-Inwood 1983). This separation has been acknowledged and interpreted in past and present populations in variable ways: children were not regarded as true people and members of a society and so had to be buried away from the community; children had apotropaic powers and were, thusly, buried in locations where they might protect the community; children epitomized human purity and incorruptibility, so they were segregated from the corruptive, experienced adult members of society; or high childhood mortality did not afford full, traditional burial rites (Baxter 2005; Kamp 2001; Rega 1997).

At Oymaağaç, it is difficult to assign one of these explanations to the general dearth in juveniles observed in multigenerational graves. However, the change in juvenile interment from multigenerational to mass grave periods demonstrates a profound transformation from the traditional burial protocol and with it a transformation in the traditional relationship between the living and the dead (Bendann 2007; Parker Pearson 1999; Tarlow and Nilsson Stutz 2013). When mass death struck Oymaağaç, the projected social identities of children and adults were disrupted and transformed through burial. The need to have the deceased within the community buried and physically removed from the living world outweighed burial convention (i.e., separation of adults and juveniles). By removing the spatial division between age groups and placing more children together with adults in a grave, the living community did not present juveniles as underdeveloped subadults or marginalized members of society but reaffirmed the crucial relationship between adults and juveniles (Crawford 2007; Mizoguchi 2000).

Conclusion: Burying Tradition

Epidemic diseases have been transformative agents throughout human history from prehistory into modern postvaccination times. Mortuary archaeology approaches this concept of commitment, maintenance, and protection of burial customs through comparisons of depositional decisions during periods of attritional and catastrophic death. Despite the overwhelming importance of funerary and interment rites in Classical and Roman periods, archaeological and textual evidence of mass death episodes have shown *miasma* (pollution) and fear of *miasma* to hold greater, transformative power over ancient populations than normative burial praxis (Papagrigorakis et al. 2006; Toynbee 1971). The case study at Oymaağaç displays how such periods of massive death may lead to significant changes in traditional burial practices; while the rural community upheld customs in body orientation and positioning, juveniles, who were otherwise minimally represented in earlier multiple interment graves, were incorporated at a higher proportion into the later mass burials. Ultimately, these alterations to established mortuary customs reveal how past communities, confronted by widespread population death, renegotiate and recreate sociocultural identities through reactive burial practice.

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Chapter 10
Linking Health and Marriage Practices Among Commingled Assemblages: A Case Study from Bronze Age Tell Abraq, UAE

Kathryn Baustian and Cheryl Anderson

Introduction

This research was undertaken in an attempt to better understand the social processes influencing rates of morbidity and mortality for a Bronze Age community from the Arabian Peninsula. The skeletal and mortuary data from a commingled tomb are used to demonstrate the utility of such complex assemblages in theorizing social processes such as marriage practices. In this study, we combine data on subadult morbidity and mortality with new information potentially suggesting population homogeneity based on developmental anomalies in some adult second cervical (C2) vertebrae. The contribution of this second line of evidence may further support previous hypotheses that consanguinity was a cultural practice in this Bronze Age community and that this practice may have negatively impacted the health of some individuals. This case study hopes to contribute to a growing literature focusing on complex, commingled assemblages and how careful analyses of these data sets can provide important information for addressing anthropological questions.

Tell Abraq

The ancient site of Tell Abraq is located in the United Arab Emirates near the coast of the Arabian Gulf. The site straddles the border of two emirates: Umm al-Qaiwain and Sharjah (Potts 2000b). Although the site is presently located a few kilometers from the waterfront, sea levels during the site's occupation would have placed the

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Fig. 10.1 Two-chambered mortuary tomb at Tell Abraq

community within much closer proximity to the coast, perhaps only a few hundred meters (Potts 1989). This close access to the coast would have provided excellent opportunities for seafaring and extraction of marine resources. Archaeological findings from several seasons of excavation at Tell Abraq have provided many artifacts and ecofacts that have proven this to be true (Potts 2000a).

Inhabited from the late Bronze Age (approximately 2300BC) to the Iron Age (approximately 200BC), the community at Tell Abraq occupied palm frond huts and maintained a water well at the center of a large fortress-like tower (Potts 2001, 1990). The tower, the largest to have been discovered in the region at 40 m in diameter, may have also served as the residence of the political leaders of the community (Potts 2001). Excavations of the site also revealed a large circular tomb, the only mortuary feature to be discovered at the site.

The tomb at Tell Abraq measured 6 m in diameter and was constructed of worked limestone ashlar blocks and beach rock (Potts 2000b, 1993a, 2001). Its interior featured two chambers which were separated by a stone wall (see Fig. 10.1). The design of this structure is consistent with the Umm an-Nar style prominent during the late third millennium BC. This style of mortuary architecture features aboveground, circular, multichamber structures made of stone (Frifelt 1991). Tomb sizes range from 4 to 12 m in diameter (Frifelt 1975).

Use of the Tell Abraq mortuary tomb dates to the late Bronze Age (2200–2000BC) (Potts 2000b, 2003). During the 200 years of use, the bodies of the dead were continually interred in the two chambers. Access to each of the chambers was through a single, removable stone entrance. The dead were likely placed near the entrance to the chamber next to or on top of the remains of individuals interred there prior to them. After the soft tissue had decayed, the skeletal elements left were able to shift within the chamber as additional bodies were placed in the tomb. The result of

years of frequent addition of bodies contributed to admixture or commingling of the dead and a loss of individual identities. The commingled mass of bone, sediment, and grave goods thus presented a challenging feature for excavators over four field seasons. Analysis and sorting of the skeletal assemblage has revealed at least 276 adults (Osterholtz et al. 2014) and 127 subadults (Baustian 2010) for a minimum of 403 individuals buried over the 200-year use of the tomb. All skeletal elements are representative of all ages and both sexes in the assemblage, thus indicating that this tomb served as the resting place for everyone in the community (Osterholtz et al. 2014). Furthermore, the lack of looting of the structure suggests that all interred in the tomb were still present at the time of excavation.

Subadult Health

Materials and Methods

The subadult skeletal assemblage from the Tell Abraq tomb was sorted and stored by elements, separate from the adult elements. The most numerous elements for subadults (ages ranging from infants to teenagers) were the femur and tibia. Proximal right femora were most represented in the sample and totaled 127 individuals (Baustian 2010). Age estimation of each femur was accomplished first through a seriation by size and then via morphological and metric comparison to samples with known ages. Using metric measurement of maximum length of the femur, subadults represented in the assemblage were aged by comparing lengths to modern reference populations (Baker et al. 2005; Fazekas and Kosa 1978; Scheuer et al. 1980; Anderson et al. 1964; Gindhart 1973; Jeanty 1983). While modern populations are not ideal for comparison to skeletal elements representing a population 4000 years older and from a region thousands of miles away, no alternative was available. For incomplete femora whose maximum length could not be measured, morphological development was assessed and incorporated into the seriation of all subadults.

Health of the subadults in the tomb was assessed through macroscopic observation of pathological conditions, particularly periosteal reactions that might indicate trauma or infection. Use of the femur in this study is beneficial because pathological conditions can easily be recognized on long bones. For example, femora, along with tibiae, display much higher frequencies of infectious reactions than any other area of the skeleton (Mensforth et al. 1978; Ortner 2003). Endemic infections and everyday communicable diseases such as *staphylococcus* and *streptococcus* will show up on the surface of long bones as a periosteal inflammation (Ortner and Putschar 1981). Additionally, because growth and development of the femur is well understood, any deviations from typical patterns can be observed and investigated (Anderson et al. 1964; Fazekas and Kosa 1978; Garn 1970; Gindhart 1973; Jeanty 1983; Scheuer et al. 1980). Both periosteal reactions and growth of cortical bone (reported as percent cortical area (PCA)) were examined for the Tell Abraq subadult sample to assess overall health status.

Table 10.1 Subadult age representation from right proximal femora. (Modified from Baustian 2010)

Age group	*n*	Percent (%) of subadult sample
Preterm	28	22.0
Neonate	12	9.4
1 month–1 year	46	36.2
2–5 years	32	25.2
6–18 years	9	7.1

Results—Minimum Number of Individuals (MNI) and Health

The demographic assessment of the subadult skeletal sample is presented in Table 10.1. Seriation of proximal femora by size suggested that most subadults died at young ages. Metric measurements demonstrated that 22% ($n=28$) of the subadult femora were aged as preterm, meaning that they were either small for their gestational age or born prematurely (e.g., before 40 weeks gestation had completed). An additional 9.4% ($n=12$) of the sample died as neonates (1–30 days old) and those that did not survive more than approximately 1 year comprised another 36.2% ($n=46$). What the demographic data indicate is that survival of infants and perhaps even the ability to be carried to term in pregnancy was impacted by some factor that resulted in high rates of infant morbidity and mortality. Furthermore, subadults who survived their earliest years of life were more likely to survive to adulthood (Baustian and Martin 2010).

Baustian's (2010) analysis of disease processes revealed that approximately 41% (36/87) of subadults exhibited periosteal reactions indicative of infectious disease. Preterm infants in particular had a high rate of affliction at 23%. Older subadults between the ages of 6 and 18 years, however, did not seem to have succumbed to illness that resulted in periosteal reactions. Alternatively, those children may have died quickly from intense disease processes that did not permit periosteal inflammation to occur prior to death.

Regardless of the presence of periosteal inflammation, analysis of growth of cortical bone revealed that disease processes or other factors were not so severe that normal bone development was hampered (Baustian 2010). PCA was found to be above 70% for most subadults, which is consistent with normal growth and health (Garn 1970; VanGerven et al. 1985). These results suggest that most subadults were not ill to the extent that bone growth was severely disrupted.

Second Cervical Vertebrae

An analysis focused on the Tell Abraq adult C2 vertebrae was performed after possible anomalies were observed on some of these bones. In the Tell Abraq assemblage, a total of 175 adult C2 vertebrae were sufficiently complete to be recorded

for presence or absence of the dens. This analysis included macroscopic observation and the use of a hand magnifying lens. Instances where postmortem damage could not be excluded as the reason for loss of the dens were not counted as "absent," so this is a conservative estimate that only considers clear examples of loss, absence, or nonunion of the dens during the lives of these individuals.

C2 Results

Of the 175 C2 vertebrae, 7 (4%) were missing the dens possibly due to a developmental anomaly that resulted either from nonunion of the dens to the body of C2 (os odontoideum or ossiculum terminale) or agenesis of the dens (Fig. 10.2). Afflicted individuals may have had symptoms that included neck pain, headaches, neck instability, and spinal cord injury (e.g., see Bajaj et al. 2010; Zhang et al. 2010). In one recent medical study, Bajaj and colleagues (2010) present a modern case of a congenital agenesis of the dens which resulted in "atlantoaxial dislocation" and caused headaches and weakness in the limbs.

Causes for the absence of the dens include congenital agenesis or nonunion but it could also possibly result from antemortem trauma. There is some debate in the medical literature about what causes nonunion of the dens (os odontoideum) with some researchers arguing that at least some cases are developmental in origin (e.g., see Kirlew et al. 1993) and others suggesting that these are often the result of inju-

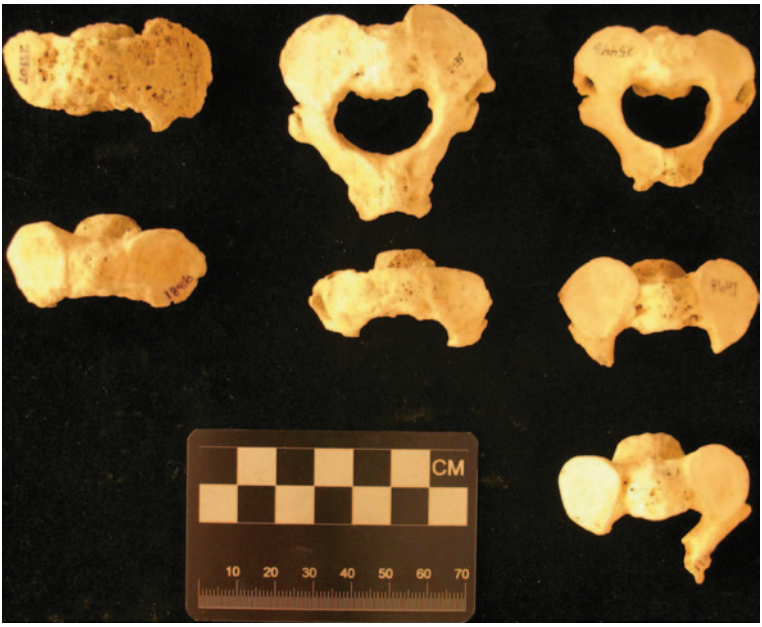

Fig. 10.2 Second cervical vertebrae without the dens

ries (e.g., see Fielding et al. 1980). Zhang and colleagues (2010) note that os odontoideum can result either from a congenital anomaly or trauma, which complicates interpretations of this condition in the past. However, many researchers support the hypothesis that os odontoideum can be acquired (Kirlew et al. 1993), and Kirlew and colleagues (1993) present evidence for a congenital etiology with the case of two identical twins both exhibiting this condition. Developmental anomalies affecting the dens are rare (Bajaj et al. 2010; Barnes 2012a). Furthermore, in the case of traumatic injuries to the cervical spine, dens fractures are relatively common (Ryan and Henderson 1992). However, it seems unusual that such a high percentage of this sample would have this condition if it was a result of neck trauma.

While there is relatively little paleopathological literature focusing on dens anomalies, research by Barnes (2012a, b) has documented the morphology of these different types of rare congenital dens defects. She argues that developmental disorders are more common in the vertebral column than in the rest of the skeleton (Barnes 2012b). She distinguishes between several types of dens defects that are relevant to this study: (1) Type I dens defect (os odontoideum) where the dens develops but does not fuse to the body of C2; (2) Type II dens defect (ossiculum terminale) where the tip of the dens develops but does not unite with the rest of the dens; (3) Type III where the base of the dens does not ossify; (4) Type IV or agenesis of the tip of the dens; and (5) Type V where the entire dens does not develop at all (Barnes 2012a). Aufderheide and Rodriguez-Martin (1998) also discuss congenital absence of the dens, which they define as "an uncommon condition that results from the failure of the three centers of ossification of the odontoid process of the axis (C2 vertebra)" (Aufderheide and Rodriguez-Martin 1998:61) and mention other congenital anomalies including os odontoideum. It is difficult to establish whether these individuals from Tell Abraq developed a dens that did not fuse to the rest of C2 or whether the dens never developed at all. While no example of any separate, unfused dens was observed during the analysis, it is possible that the commingled nature of these remains complicates our ability to locate these features. During an investigation of the first cervical vertebrae (C1), no C1 was found to be lacking an articular facet for the dens, which would support nonunion, but the sample size for C1 was smaller than C2 vertebrae. It is also possible that they have not been identified because the dens never developed in these individuals. If these individuals did develop a dens that never fused, then they are more likely to represent cases of os odontoideum, and not ossiculum terminale, due to the fact that no partial dens is present in any of the seven cases from Tell Abraq.

The combination of evidence from the medical literature for a congenital etiology in at least some cases and morphological characteristics observed on these C2 vertebrae lead us to suggest that these seven cases may be consistent with a genetic origin such as congenital agenesis or nonunion (os odontoideum). As a rare condition, the frequency of this anomaly was unexpected in the Tell Abraq assemblage. There are very few bioarchaeological examples that have been published (e.g., see Curate 2008; Holck 2007) and as far as we are aware, no other known bioarchaeological samples have been identified with as many affected individuals. This led to further consideration of alternative cultural factors contributing to such a high prevalence.

Discussion

In consideration of the morbidity evidence at Tell Abraq, the observation of such a high mortality rate for very young infants is interesting since illness can only likely be attributed to about half of these individuals. For the others who died then, what factors might explain their deaths so early in life? Furthermore, are the numerous preterm infants in the assemblage representative of cultural or environmental processes that contributed to poor pregnancy outcomes? This research takes an alternative approach to understand these mortality and morbidity frequencies and incorporates a biocultural perspective so that a more nuanced interpretation of the people of Tell Abraq can take place.

In theorizing about the social processes that underlie biological characteristics of skeletal populations, this project was able to include a great deal of information about cultural practices that may have had a significant impact on biology. One such cultural practice is consanguineous marriage. Much of Southwest Asia, particularly around the Arabian Gulf, has a long cultural history of consanguinity in marriage patterns, meaning that unions were commonly made between closely related individuals, typically first cousins (Al-Gazali et al. 2005; al Khabori and Patton 2008; Bristol-Rhys 2007). This practice is still common in the region today among many Arab countries and serves as a tool of economic stabilization and security among families (Bener et al. 1996; Al-Gazali et al. 2005; Rajab and Patton 2000). Males maintain property and family wealth so consanguineous marriages permit it to remain within the same bloodlines.

Young females can also be placed in arranged marriages (Bener et al. 1996), which can lead to problems with pregnancy before reproductive maturity. Both consanguinity and early marriage can contribute to the rates of mortality and congenital defects (Al-Gazali et al. 2005; al Khabori and Patton 2008). Genetic relatedness has also contributed to increased infantile death and low birth weight (Magnus et al. 1985; Stoltenberg et al. 1999). If the people of Tell Abraq participated in this type of union, these factors could be highly significant for understanding the patterns of infant mortality and congenital defects like agenesis of the dens.

A Consideration of Ideology: Lamashtu

In order to form a more in-depth understanding of the cultural factors surrounding higher mortality and rates of congenital anomalies at Tell Abraq, an investigation into the ideology of the region was undertaken. Theorizing the bioarchaeological data from this viewpoint also permits an exploration of the local perceptions of illness and death among infants and children and can further expand the understanding of cultural practice for the people of Tell Abraq. The proximity of Tell Abraq to trade routes certainly connected this community to outsiders whose ideas and cultural practices may have eventually been shared. Artifacts found in the mortuary

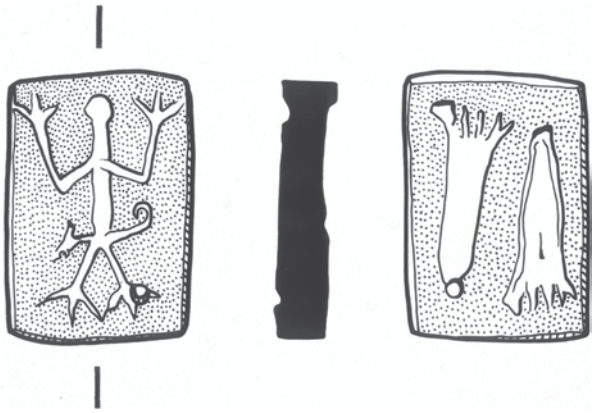

Fig. 10.3 Sketch of an amulet from Tell Abraq with possible depiction of Lamashtu. (Potts et al. 2013)

tomb and around the site demonstrate close relations with Mesopotamia and Babylonia (Potts 1993b; Potts 2001).

One ideological tradition pertaining to health and medicine originates in Babylonia. Within Babylonian perceptions of medicine, a demon goddess known as Lamashtu preyed upon unborn and newborn children (Farber 2007). Lamashtu was thus perceived as a factor in death of infants in the region. Protection against Lamashtu came from amulets often worn by pregnant women (Abusch and Schwemer 2010).

Lamashtu is suspected as a feature of the ideology at Tell Abraq because of the discovery of two small pendants with her possible depiction (Fig. 10.3; Potts et al. 2013). These pendants are similar to plaques, amulets, and figurines that have been associated with protection against her powers. The pendants at Tell Abraq may therefore represent efforts of the population to combat Lamashtu and the death of young children.

Lamashtu provides insight into the social experience of morbidity and early death in the ancient Near East. How would a community such as Tell Abraq experience frequent miscarriage and neonatal death? Social concepts associated with illness and death can profoundly affect identities, the political economy, and the persistence of cultural behaviors. Especially for miscarriages or spontaneous abortions, and for those infants who demonstrated no evidence of illness, disease ideology provides an expedient explanation. But to what end? Faced with high preterm and infant mortality, likely due to cultural practices such as consanguinity and early marriage as well as endemic malaria, infectious disease, and maternal health, being able to attribute these deaths to the power of demons and witches provides a way of essentially reifying the patriarchal status quo. Attributing poor maternal outcome

and infant death to demons instead of the political–economic structures and kinship patterns (i.e., consanguineous marriage) that favor males in land tenure and other privileges essentially maintains gendered inequality.

Miscarriage and infant death caused by the interference of demons like Lamashtu also may support social institutions that underlie gender differences and inequality. Further, these concepts associated with illness and death can create female identities that are akin to blaming the victim. Although Lamashtu is powerful, some women will escape her clutches due to being older, healthier, or having better access to resources.

Disease ideology surrounding pregnancy and infant well-being in this case essentially blames the victims (both mother and fetus/infant) for not living the moral life and having the fortitude to repudiate the forces of Lamashtu. Thus, disease ideology creates subordinate categories of females among other females, as well as keeping males in positions of power and wealth as facilitated through arranged early marriages to first cousins.

Social Theory: Structural Violence

One way that institutionalized inequalities present in societies have been theorized is through the lens of structural violence. Structural violence can be defined as a form of violence that is systematically applied by everyone in a society. Studies of structural violence are ultimately trying to understand the social structures that lead to oppression and inequalities in a society (Farmer 2004). In this theoretical model, inequalities are viewed as a form of violence because they are embodied in individuals through disease, early death, and other forms of bodily harm. For example, aspects of a society such as racism, poverty, and gender inequality may be examined in the way they are embodied by individuals (Farmer 2003).

Recently, this concept of structural violence has been applied to bioarchaeological assemblages in order to examine and theorize health disparities in the past. Klaus (2012) argues that cultural stressors are an important aspect of structural violence as these control an individual's ability to access resources, safe drinking water, and sufficient living conditions. Unequal access to these resources can have biological effects, including a less effective immune system. This can lead to biological disruptions, such as growth disruption and higher morbidity (Klaus 2012). In his discussion of the application of structural violence theory in bioarchaeological contexts, Klaus (2012) cautions that it is important to avoid viewing the victims of structural violence as passive individuals without agency. This is because even the oppressed will exercise their agency whenever possible (Klaus 2012).

Structural violence theory may also potentially provide insight into the lives of women at Bronze Age Tell Abraq. In this case, gender inequality combined with consanguineous unions may have been embodied by some individuals through poor infant health and the development of rare congenital anomalies. Through this theo-

retical approach, it is possible to consider the way that the political and economic structures that were likely present at Bronze Age Tell Abraq may be considered a type of violence enacted by society, and as a whole had biological consequences for some members of this group.

Conclusions

The data from the subadult sample and the adult C2 vertebrae are important for contributing to our understanding of social processes that affected health at Tell Abraq as multiple lines of evidence are provided. Particularly because this is a commingled assemblage, it is important to consider multiple indicators whenever possible. In this case, the addition of data from the C2 vertebrae supports previous interpretations about the potential factors contributing to high subadult morbidity and mortality.

Both paleopathological and clinical findings, as well as social processes such as marriage patterns, reveal underlying relationships that are relevant to interpreting the commingled skeletal assemblage at Tell Abraq. Preterm and infant death as well as congenital agenesis or nonunion of the dens are potentially related in that first cousin marriages, young wives, and early first pregnancies all can lead to miscarriages and infant mortality. While we previously only theorized about consanguinity (Baustian 2010), this study of congenital anomalies on the C2 has provided an additional line of evidence to bolster our hypotheses about the deleterious effects of arranged marriage and consanguinity on infant mortality in prehistory. This is important as single bone analyses can be limiting and many indicators are essential for substantial interpretations.

Utilizing multiple lines of evidence to reconstruct both biological factors as well as social processes in the past can expand our ability to connect different kinds of data sets. Theorizing about the significance of consanguineous unions in a society that was likely patriarchal permits consideration of social roles of reproductive aged women. In this case, applying a structural violence theoretical model allows for consideration of how unequal cultural practices may be embodied through poor health outcomes for some individuals in a society. This study also demonstrates that through a combination of research approaches, it is possible to investigate social practices even among challenging commingled assemblages. Social theory aids in providing a framework for interpreting the empirical data.

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Chapter 11
Cemetery Preservation and Beautification of Death: Investigations of Unmarked Early to Mid-Nineteenth-Century Burial Grounds in Central Kentucky

Peter Killoran, David Pollack, Stuart Nealis and Emily Rinker

Introduction

In this chapter, we examine the processes that led to the commingling of human remains in urban and rural burial grounds. We view burial grounds as places on the landscape where family members buried their dead. The owners of these localities did not keep formal records and often these burial grounds were poorly documented. In contrast to burial grounds, cemeteries keep records of who is interred within their boundaries, and there is an assumption that someone will maintain the grave in perpetuity. Cemeteries in a social context maintain individuality and a place of remembrance in ways that burial grounds do not (Rugg 2000). Reuse of early to mid-nineteenth-century burial grounds for other than their intended purposes, may reflect different attitudes about death. Today people think of cemeteries as the final resting places of their ancestors and if not viewed as sacred places, they are at least considered to be deserving of a certain amount of civic respect. The status of cemeteries as park-like areas, where there is some contestation of social status in

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monumentality is more typical of the Postbellum (1865–1914) and subsequent eras than the Antebellum (1812–1861) period, the focus of this chapter (Francaviglia 1971; Strange 2003).

During the Antebellum period, burial grounds may not have been viewed in the same way as we do cemeteries today. In the past they may simply have been seen as places where the dead were interred, tended to for a short period of time, and then forgotten (Rugg 2000; Schantz 2013). As such, the long-term upkeep and maintenance of burial grounds may not have been an important social consideration for the living. It is not until the late 1840s/early 1850s that a pattern of park-like or what is sometimes termed "rural" cemeteries emerge in Kentucky and elsewhere. The development of these well-landscaped and enduring cemeteries has led to a focus on the Postbellum beautification of death movement, with less attention paid to more informal Antebellum period burial grounds (LeeDecker 2009). With the redevelopment of inner cities and increased urban sprawl, neglected and abandoned burial grounds have begun to receive more attention from historical and bioarchaeologists (Heilen 2012; Lillie and Mack 2015; Peter et al. 2000).

In the central Kentucky region, within urban contexts prior to the creation of perpetual care cemeteries in the mid-1840s, the dead were interred in family/neighborhood burial grounds or church graveyards. Individual graves within these localities may have been maintained by family members for an unspecified amount of time, but as they and other relatives moved away and the land changed hands, those left to care for it may have had little or no connection to those interred within it. In time, subsequent owners of urban burial grounds may in fact have come to see them as a nuisance, resulting in a lack of upkeep and in many cases the relocating of grave markers (LeeDecker 2009; Lillie and Mack 2015).

In rural areas, the family members and the enslaved were often interred near domestic residences. Family members maintained these burial grounds, and often retained ownership of it when they sold the family farm. In other instances, they did not. But in all cases, the burial ground was usually marked with formal and informal headstones. As the years passed, the headstones of those that the property owner had no connection to often became a nuisance and something that had to be plowed around. This often led farmers to remove the markers and repurpose the land for agricultural activities (LeeDecker 2009; Lillie and Mack 2015).

In both urban and rural contexts, changes in land ownership frequently led to a disconnection between those who owned the burial ground and those interred within it (Lillie and Mack 2015). As properties continued to change hands, owners were even further removed from the burial ground, often to the point of not even knowing that one was located on their property. Even when the original family retained ownership of the burial ground, this information was often not incorporated into subsequent deeds (Stottman 2009). In urban areas, buildings and parking lots were constructed over them (Pollack et al. 2009), they were incorporated into parks (Stottman 2011), or in the case of Eastern State Hospital a pleasure garden (Pollack and Worne 2014). In rural localities, with the removal of the headstones, family burial grounds were often incorporated into agricultural fields (Pollack et al. 2011b). The end result being that by the mid-twentieth century for all intents and purposes, many of these urban and rural burial grounds had been lost to history.

As noted by Milward (1989) in his history of the Lexington Cemetery, by the 1840s:

> First hill, the burial ground of the pioneer settlement of Lexington, was rarely maintained properly and had little or no space left. The old Maxwell graveyard on Bolivar Street had been desecrated by the town workhouse and the poorhouse, and many of its graves had been dug up. The Episcopal Cemetery was small, as was the adjacent Catholic Cemetery, and nearly all of its lots were sold … People were coming to a realization that family graveyards on farms and even in the town itself were not satisfactory, for property often was sold. Too, there was growing concern that burial of the dead in town created a menace to public health, contaminating wells and springs. http://www.lexcem.org/index.php/2012-12-26-14-45-57/cemetery-history/1848-1860 (accessed April 25, 2015).

Thus, part of the rationale for creating perpetual care park-like cemeteries was that the deceased were often left behind when families eventually decided to sell their land, leaving no one responsible for maintaining urban and rural burial grounds. The development of modern cemeteries and the passage of new cemeteries laws, result from health concerns in crowded residential areas with corpses being present nearby (LeeDecker 2009; Lillie and Mack 2015).

Over the last 20 years, the authors have been involved with numerous burial grounds that were rediscovered during construction projects (Favret 2006; Favret 2008; Killoran et al. 1997; Killoran and Helm 2004; Killoran et al. 2001; O'Malley et al. 2004; Pollack and Worne 2014; Pollack et al. 2011b; Pollack et al. 2009; Schlarb et al. 2004; Stottman and Pollack 2009). The construction activities themselves often resulted in the commingling of human remains, but in urban contexts, we have noted that much of the commingling occurred prior to our involvement (see also Sirriani and Higgins 1995; Spencer-Wood 2001; Perrelli and Hartner 2014; Lillie and Mack 2015; Phillips 1997; Grauer et al. 1998).

In this chapter, we examine two large urban burial grounds and one rural family burial ground with a focus on what led to the commingling of human remains, and how this informs our interpretations of mid-nineteenth-century mortuary patterns (Fig. 11.1). Of the two urban burials grounds, one was used by the enslaved, freed

Fig. 11.1 Kentucky map showing location of burial grounds

Table 11.1 Burial ground history, demographics, and commingling

Old Frankfort	Eastern State Hospital	Kentucky Horse Park
In use from 1810 to 1860	In use from 1839 to 1861	In use from 1800 to 1860
Minimum of 242 individuals	Minimum of 185 individuals	Minimum of 34 individuals
Predates and overlaps with 1845 establishment of Frankfort's first perpetual care cemetery	Predates and overlaps with 1848 establishment of Lexington's first perpetual care cemetery	Predates and overlaps with 1848 establishment of Lexington's first perpetual care cemetery
Neighborhood burial ground—enslaved and working poor	Institutional burial ground—diverse socioeconomic backgrounds	Family and enslaved burial ground
Diverse ethnicity, age range, and sex distribution	Primarily adults—males outnumber females 2 to 1	Diverse ethnicity, age range, and sex distribution
Individual graves	Individual and mass graves	Individual graves
Use of stone and brick to line and cover grave shafts	No evidence of grave linings or covers	No evidence of grave linings or covers
Interment most likely done by family and friends, neighbors	Interment likely done by staff	Interment most likely done by family
Commingling results from late nineteenth- and late twentieth-century construction activities	Commingling results from mid-nineteenth-century single and mass graves truncating earlier burials	Commingling results from a mid-nineteenth-century grave disturbing an earlier grave and twentieth-century construction activities
Fragmentation resulted in higher time investment in refitting	Fragmentation resulted in higher time investment in refitting	Fragmentation resulted in higher time investment in refitting
Good spatial control and recovery technique allowed re-individualization	Good spatial control and recovery technique allowed re-individualization	Good spatial control and recovery technique allowed re-individualization
Underlying cause of damage to burial ground was it fell into disuse in early 1860s	Underlying cause of damage to burial ground was truncating of earlier graves prior to 1861	Underlying cause of damage to burial ground was it fell into disuse in early 1860s
Lack of connection of Lusher and subsequent landowners with those interred in burial ground	Lack of connection between the staff and those buried in burial ground	Lack of connection between subsequent landowners with those interred in burial ground

slaves, and a poor to lower middle-class neighborhood (Old Frankfort Cemetery), and the other to inter those who died at a mental institution (Eastern State Hospital Cemetery) (Table 11.1). For comparison, we also looked at the Kentucky Horse Park Cemetery, a rural family burial ground (as these sites have the word "cemetery" in their name we have continued to refer them as such, though they should technically be seen as burial grounds.)

Methodology

The large number of commingled remains recovered from the Old Frankfort burial ground, led the lead author to develop guidelines for the Kentucky Heritage Council (State Historic Preservation Office) for the documentation of human remains. Using Buikstra and Ubelaker's (Buikstra and Ubelaker 1994) *Standards for Data Collection from Human Skeletal Remains,* and with the assistance of Sean Philips and Melissa Zebecki, a commingled spreadsheet was developed. Within this spreadsheet, individual bone fragments that were duplicated, fragmented, or otherwise not matching (wrong size, color, shape, and weathering) from the same context were coded separately and given the same burial number with the addition of a letter designation (Buikstra and Ubelaker 1994; ADBOU 2011). These commingled remains were then grouped as individuals based on refits, size, shape, sex, age, and coloration. Field notes and photographs also were consulted to identify individuals (Zejdlik 2014). The same methods were used to analyze the Eastern State Hospital and Horse Park data. The treatment of the Eastern State Hospital remains differed only in that the data also was entered into Osteoware.

For all three burial grounds, the minimum number of individuals (MNI) was calculated by taking the number of identified grave shafts and articulated burials, and then examining the remaining commingled remains. As additional individuals were identified, a lettering system was developed for those remains that were found near or within a particular grave shaft. Those individuals not associated with a specific grave shaft were assigned their own unique number. Both the Old Frankfort and Eastern State Hospital burial grounds had a small number of fragmentary remains that could not be matched or refitted. These remains were not included in the final MNI. Unlike the commingled situations described by Osterholtz and colleagues (Osterholtz et al. 2014; Osterholtz 2014) for Tell Abraq and Sacred Ridge where new and innovative methods were used to document the MNI and minimum number of elements (MNE), the methods outlined by Buikstra and Ubelaker (Buikstra and Ubelaker 1994) appear to be adequate for the burial grounds examined in this chapter.

The same documentation methods were used to analyze the human remains recovered from the three burial grounds (Killoran et al. 2008; Worne et al. 2014; Pollack et al. 2011a). Skeletal documentation can be used as indicators of socioeconomic status (SES) and health of a population (Goodman 1984; Goodman and Leatherman 1998). This information could inform us about lifestyle and the hardships faced by those interred in each burial ground and allow for inferences to be made concerning the processes that led to the commingling of human remains. In the following sections, we will focus on three areas of analysis: stature, pathologies of the bone and teeth, and isotopic data.

Stature was examined by using regression analysis on available measurable long bones. The femur and tibia were preferred for determination of height. If the femur or tibia were not available, long bones of the upper arm were used. The data then were entered into Fordisc to determine stature (Jantz and Ousley 2005).

Pathologies were recorded in categories as in *Standards*: abnormal shape, abnormal size, abnormal bone formation, abnormal bone loss, fractures and dislocations, porotic hyperstosis, and arthritis. In addition, data were collected on the number and the frequency of hypoplasias on the teeth (Buikstra and Ubelaker 1994). All were visual observations based on descriptions in standards supplemented with information from Ortner (Ortner 2003). The abnormal measures are indicative of either metabolic or infectious processes. Fractures and dislocations, and arthritis are indicators of hard labor or violence. Porotic hyperostosis and enamel hypolasias are indicators of either poor nutrition or other stressors (Goodman et al. 1980; Goodman 1984). Some of the fractures and dislocations might be indicative of treatment of the body after death.

Carbon isotope ($\delta^{13}C$) ratios were obtained for all three burial grounds (Rinker and Romanek 2014; Schurr 2008). By measuring carbon isotope ($\delta^{13}C$) ratios in bone, it is possible to make inferences concerning the types of foods that were being consumed. Through photosynthesis by plants, the ^{13}C concentration in organisms increases compared to source carbon from C_3 and C_4 plants (Schoeninger and Moore 1992). C_3 plants include wheat, rice, all root crops, legumes, vegetables, nuts, honey, seed crops, and a variety of fruits, most of which are found in temperate regions like Kentucky and the interior of the southeastern USA (Ambrose 1993; Buikstra and Cook 1980). C_4 plants have ^{13}C values from −15 to −10‰ with a mean of 12.5‰ (Buikstra and Cook 1980; Turner 2002) and include plants such as sorghum, millets, maize, and sugarcane (Ambrose 1993).

Old Frankfort

This burial ground was located to the north of downtown Frankfort, Kentucky (Fig. 11.1) near the base of Blanton's Hill and adjacent to an area known as "Crawfish Bottoms," which was eventually shortened to the Craw. Located on marginal land, the Craw contained slave cabins, low-income housing, taverns, gambling dens, and houses of ill repute. Individuals appear to have been interred in this burial ground as early as 1810. The general reputation of the Craw was as a "den of iniquity" or a "hotbed of vice and corruption populated by a rough class of people, who didn't mind killing or being killed" (Kramer 1986, p. 365). While stories abound of the Craw's lawlessness, the majority of the inhabitants were hardworking, law-abiding, and taxpaying citizens. Late nineteenth-century city directories list occupations, such as teachers, waiters, porters, drivers, general laborers, and even a few policemen (Boyd 2003, p. 7). The burial ground served as the final resting place for enslaved and freed African Americans, and poor to lower middle-class European Americans. Unlike the nearby Thornhill burial ground where the remains of more affluent members of the community were relocated to a mid-1840s perpetual care cemetery, only a few of the individuals interred in the Old Frankfort burial ground were relocated.

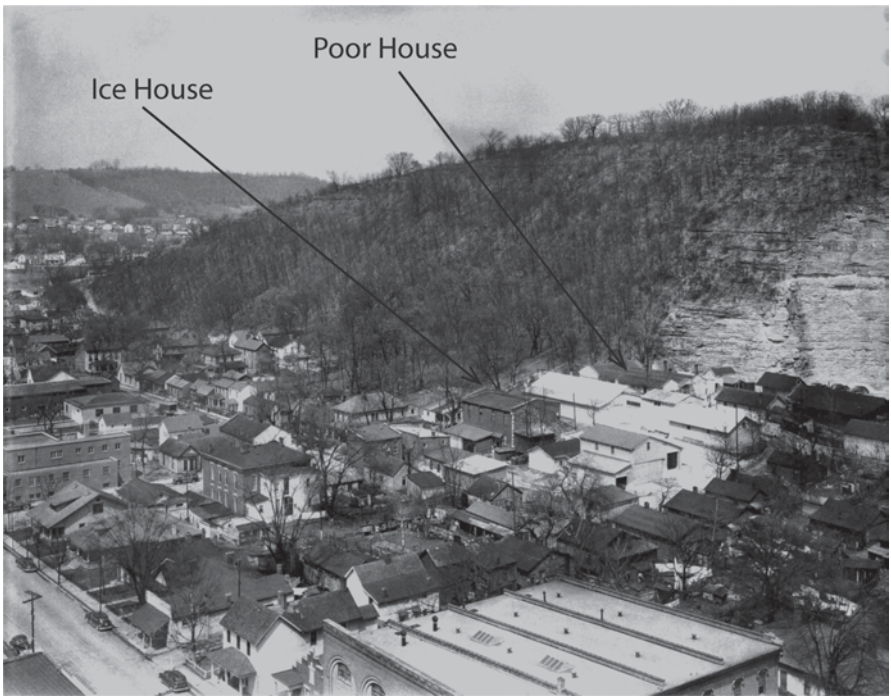

Fig. 11.2 Development over the Old Frankfort cemetery

By the early 1860s, the Old Frankfort burial ground is reported to have been overgrown and no longer in use. Shortly thereafter, in the mid-1860s, Sigmond Luscher purchased the land that contained the burial ground. He constructed a brewery and several residences adjacent to it, and a large icehouse in the center of the burial ground. Later in 1875, a poor house was built over a part of the burial ground, and eventually the graves were covered with other buildings and fill. By the 1950s, there are businesses and a surrounding neighborhood where once had been a large neighborhood burial ground (Fig. 11.2).

Within the burial grounds, graves appear to be tightly clustered and there is evidence of the stacking of graves. But during the burial grounds use there is little evidence of a later interment disturbing an earlier grave. Almost all of the commingling of human remains occurs after 1860, beginning with the construction of Sigmund Luscher's icehouse which truncated a large number of graves. In 2002, during the construction of a new government building the burial ground was rediscovered, which resulted in the commingling of additional human remains (Fig. 11.3; Pollack et al. 2009).

The Old Frankfort burial grounds contained the remains of at least 242 enslaved and freed African Americans, and poor to lower middle-class European Americans (Pollack et al. 2009). It was an integrated burial ground with those of a slightly higher SES being interred in the upper section regardless of biological affiliation

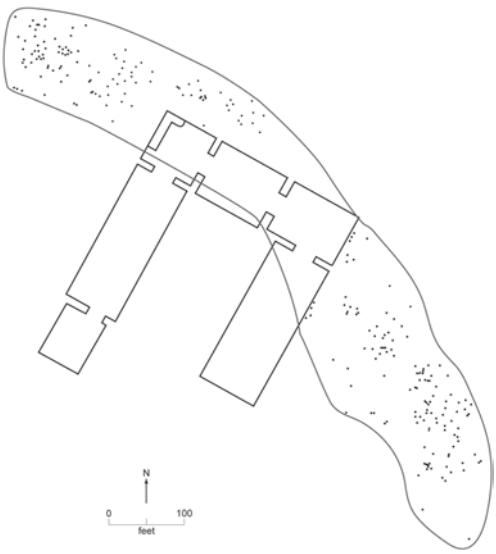

Fig. 11.3 Map of the Old Frankfort Cemetery showing disturbance by Luscher's Brewery

(Fig. 11.3). Most of the grave shafts were rectangular in shape and about one quarter had been lined with limestone slabs or bricks, with several also being capped with large limestone slabs. Everyone was laid to rest in a coffin. Most of the coffins were plain wooden boxes made from eastern red cedar or cherry (Rossen 2008). Hexagonal examples were the most common, followed by rectangular ones. Locally produced coffins were held together with nails and screws. Because many different sizes of nails were used, it appears that the coffins were not mass produced, but instead were made by family and friends, or by local furniture and cabinetmakers. Several coffins had extras such as coffin linings as evidenced by tacks, and cotton or velveteen cloth lining, and a few had brass handles (Miller 2007, 2008).

Clothing related items were associated with 155 individuals (Miller 2007, 2008; Pollack et al. 2009). The men were interred wearing pants and shirts, and the women dresses or shifts. Many individuals were wrapped in shrouds. Jewelry in the form of necklaces and wedding bands were found with several individuals, and coins had been placed over the eyes of a few persons (Miller 2007; Pollack et al. 2009).

The bioarchaeological data indicate that individuals interred in the Old Frankfort burial ground suffered maladies common among pre-antibiotic nineteenth-century agricultural societies where malnutrition, poor sanitation, and infectious disease were common. But even by nineteenth-century standards, this burial population suffered a great deal of nutritional stress. For instance, children were short in stature for their age, were weaned at a very early age, and their onset of hypoplasias were much earlier than has been documented for other burial populations (Steckel 1987; Steckel 1995; Steckel and Rose, 2002; Steegmann 1985, 1986; Steegmann and Haseley 1988; Steegmann 1991; Pollack et al. 2009). The data in Table 11.2 show old Frankfort males and females being comparable with the other cemeteries. If these data are broken down by biological affinity, the African males are comparable to the European males (170.5 vs. 171 cm, respectively); but the African females were shorter than the

Table 11.2 Comparative stature of other sites in surrounding area

Site	Male stature	S.D.	Female stature	S.D.	Source
ESH (KY)	170.2 (n=38)	6.4	161.5 (n=16)	8.4	Worne et al. (2014)
Horse Park (KY)	169.6 (n=13)	7.4	163.7 (n=6)	7.1	Pollack et al. (2011)
Old Frankfort (KY)	171.0 (n=67)	6.6	162.6 (n=52)	6.6	Killoran et al (2008)
Avondale (GA)	169.0 (n=7)		159.0 (n=4)		Matternes et al. (2012)
Voegtly (PA)	170.0 (n=32)	5.1	160.2(n=14)	3.8	Ubelaker and Jones (2003)
Highland Park (NY)	172.6 (n=84)	5.5	160.0 (n=59)	6.0	Steegman (1991)
US Average (1850)	171.0	–	–	–	Steckel (1995)

S.D. standard deviation

European females (161.25 vs. 167.3 cm, respectively) (Killoran and Favret 2008). Thus, children and African females women appear to have experienced more nutritional stress than men. Nutritional stress is also reflected in the carbon isotope data, which point to a heavy reliance of corn-based products (Table 11.2) (Schurr 2008).

All of the individuals interred within this burial ground exhibited pathologies in the form of infections represented by abnormal shape, size, bone loss and abnormal bone formation, and almost half of the adults exhibit arthritis and three had porotic hyperstosis. Except for two children, all of the individuals who had dentition exhibited dental hypoplasias, some even exhibited them on posterior teeth indicating a lifetime of nutritional or other types of stress (Pollack et al. 2009). The overall health of the population suggests that individuals suffered from nutritional deficiencies during their early years likely caused by the synergistic effects of infection and low-nutrient, high corn-based diets (Schurr 2008). These dietary deficiencies coupled with poor sanitation reflected the SES of those who lived near and utilized the Old Frankfort burial grounds.

Eastern State Hospital

The corner stone of Fayette Hospital was laid in 1816. At that time, the hospital was situated along the northeastern edge of Lexington (Fig. 11.1). The hospital was taken over by the Commonwealth of Kentucky in 1822 and was opened as the Lunatic Asylum of Kentucky in 1824. By 1839, a burial ground had been established along the northwestern edge of the hospital's property. Hospital residents were interred there until 1861, when a burial ground was established on newly acquired lands to the north of the hospital. At that time, the earlier burial ground was covered with fill and relandscaped as a woman's pleasure garden (Fig. 11.4; Hudson and O'Malley 2014). By the mid-twentieth century, a road had been placed over the burial ground and the surrounding area consisted of a mowed lawn. As a result of these landscape modifications, there was nothing on the surface to indicate that several hundred people had been interred in this area from 1839 to 1861, nor were there any records concerning who had been interred in this burial ground (Fig. 11.5). In 2005, this nineteenth-century burial ground was rediscovered during the laying of a new waterline. Additional graves were documented in 2011, in

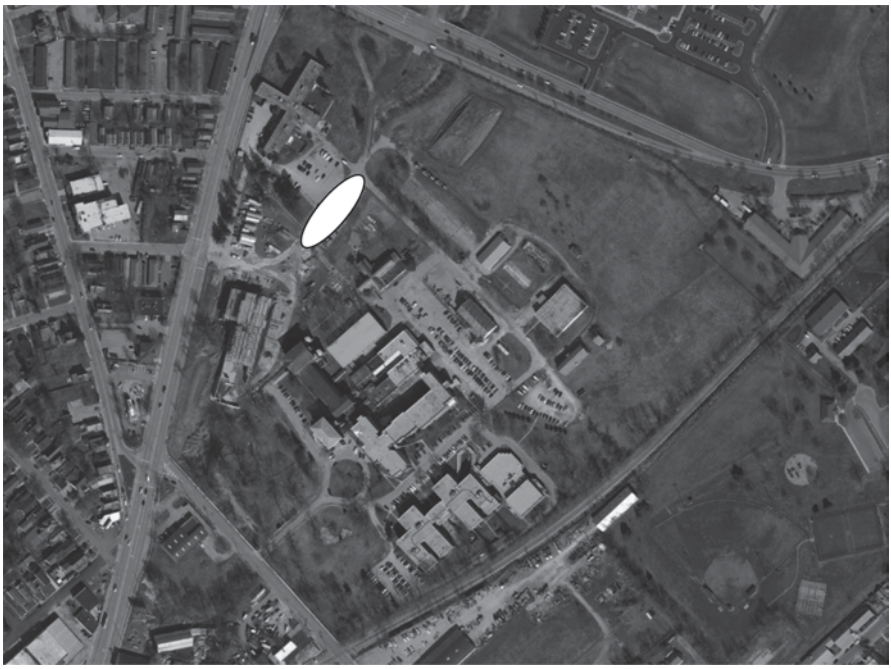

Fig. 11.4 Aerial view of Eastern State Hospital burial ground

advance of the construction of a new classroom building for Bluegrass Technical College. A portion of the burial ground remains as green space (Pollack and Worne 2014; Favret 2006).

During its long history, people of all socioeconomic backgrounds resided at Eastern State Hospital. More affluent individuals had larger rooms with more windows (Favret 2006; Pollack and Worne 2014). The residents of this hospital came from various social and economic backgrounds, and were brought to the hospital from counties throughout the state. Others came from nearby states, such as Tennessee and North Carolina (Hudson and O'Malley 2014).

The excavated portion of the Eastern State Hospital burial ground contained a minimum of 186 individuals. At death, the residents of Eastern State Hospital regardless of SES appear to have been treated in a manner similar to those interred in other mid-nineteenth-century urban burial grounds. The deceased were carefully laid to rest in hexagonal wooden coffins with their arms placed in the appropriate position pursuant to family, cultural, or religious traditions. Men were buried wearing shirts, jackets, and pants, and women wearing dresses and shifts. As was the norm of the time, non-clothing related objects, such as hair combs and necklaces, were found with just a few individuals (McBride and Westermont 2014).

Almost half of those who died at the hospital between 1839 and 1861 were interred in the Eastern State Hospital burial ground (Pollack and Worne 2014; White 1984). This burial population differs from that of a family or neighborhood burial ground in that infants and children are absent, and juveniles account for only 5% of

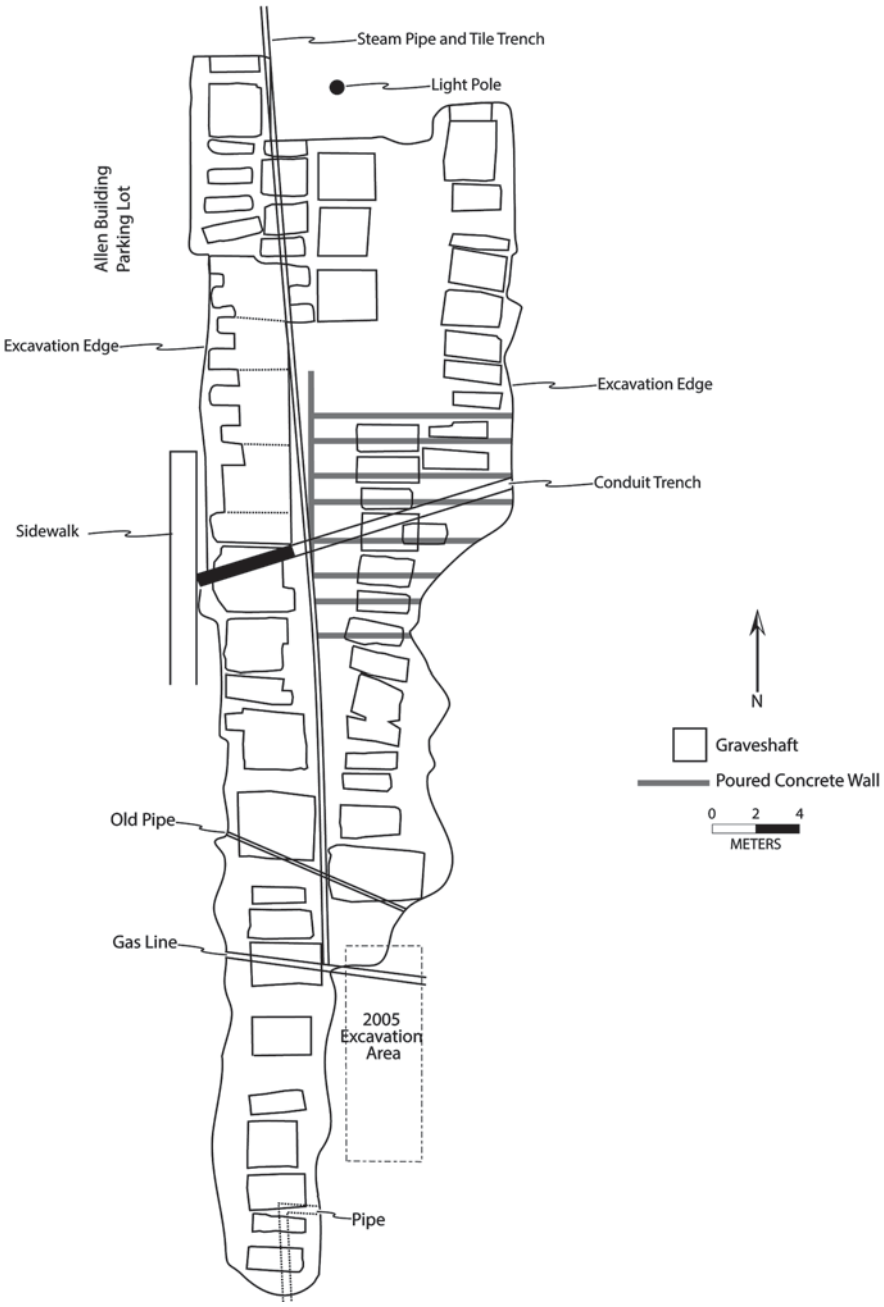

Fig. 11.5 Eastern State Cemetery showing burials and pipelines

Fig. 11.6 Plan view showing single (in white) and mass (in black) graves

the burials. Within the recovered sample, almost 60% were male and 40% female. Many of those interred within this burial ground died as a result of cholera, which struck Lexington and the hospital particularly hard in 1849 and 1850. During this 2-year period, 215 residents are reported to have died (Worne et al. 2014). The burial ground consisted of five irregular rows that included both single ($n=62$) and mass graves ($n=28$, containing 97 individuals; Fig. 11.6). The latter contained from two to ten coffins. Both single and mass graves truncated earlier graves, resulting in the commingling of human remains.

With respect to stature, average male height is similar to that noted for the Horse Park, but somewhat shorter than noted for the Old Frankfort burial ground (Table 11.3). On the other hand, females interred within the Eastern State Hospital burial ground are on average 2 cm shorter than women interred in the other two burial grounds. But their average height is similar to women interred within contemporary burial grounds in Georgia, Pennsylvania, and New York (Table 11.3).

Table 11.3 $\delta^{13}C$ ranges and means between regional cemetery samples

Cemetery	Low (‰)	Mean (‰)	High (‰)	Range (‰)
Eastern State Hospital ($n=83$)	−22.6	−16.2	−11.5	11.1
Old Frankfort ($n=119$)	−20.5	−13.3	−9.2	11.3
Vardeman ($n=34$)	−15.9	−13.1	−9.0	6.9
Horse Park ($n=29$)	−17.1	−14.2	−10.7	6.4

Evidence of physical anomalies not usually prevalent in nineteenth-century burial grounds are the large number individuals that exhibit bruxism and teeth grinding, and poor dental health that may have been a result of the use of mercury (calomel) in medical treatments (Wetzel 2014). The presence of restraining garments, and the binding of legs and arms also may reflect some of the mental disorders from which patients suffered (McBride and Westermont 2014).

As with Old Frankfort burial ground, the bioarchaeological data indicate that individuals interred in the Eastern State Hospital burial ground suffered maladies common among pre-antibiotic nineteenth-century societies where malnutrition, poor sanitation, and infectious disease were common (Steckel and Rose 2002; Goodman 1984). Instances of enamel hypoplasia (Wetzel 2014), porotic hyperostosis, and cribra orbitalia (Worne et al. 2014) indicate many individuals suffered from nutritional deficiencies during their early years, likely caused by the synergistic effects of infection and low-nutrient, high corn- or potato-based diets (Table 11.2). These deficiencies coupled with poor sanitation often made people susceptible to infectious diseases, such as respiratory infections and sinusitis. The onset of any of these infections could have begun before these individuals entered the hospital, or been contracted once admitted (Pollack and Worne 2014; Favret 2006).

In many ways the lives of those interred within the Eastern State Hospital burial ground parallel those of the general communities that they resided in, as most undertook a considerable amount of hard labor before and after they entered the hospital. It differs, however, with respect to the diet they consumed. Overall, the residents of Eastern State Hospital consumed a more diverse diet relative to those interred at the Old Frankfort and Horse Park burial grounds (Table 11.2; Rinker and Romanek 2014). In fact, nearly one quarter of the Horse Park population consumed no corn-based products, compared to only about 5% of the Old Frankfort population.

Horse Park

This rural burial ground is situated to the north of Lexington on a ridge above Cane Creek (Fig. 11.1). It was rediscovered during construction of a new arena at the Kentucky Horse Park. When the property was purchased by the Commonwealth

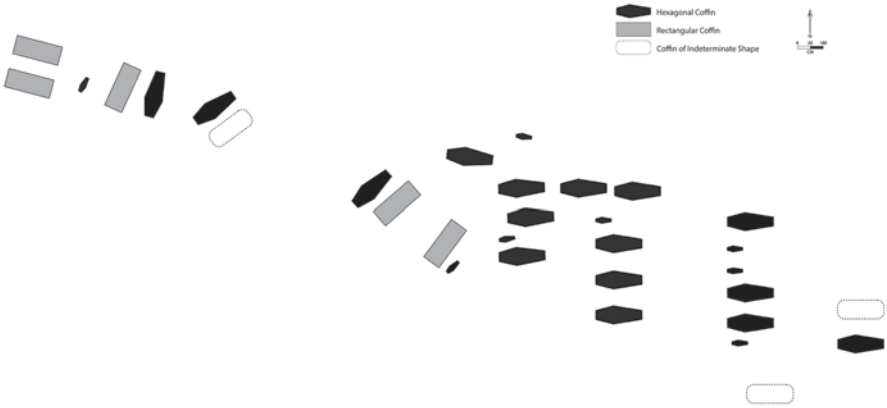

Fig. 11.7 Distribution of Horse Park burials

in the mid-1970s, it was being used to pasture horses (Pollack et al. 2011b). At that time, Park officials were aware of a small Graves family burial ground, with a few markers and a small fence, that was located about 100 m downslope from the proposed arena, but they knew nothing about a larger Graves family burial ground. Excavation of the larger burial ground revealed that it consisted of 33 graves that contained the remains of 34 individuals (two individuals commingled in one grave) (Fig. 11.7). Infants, children, adolescents, and adults of European American and African American descent were interred in this burial ground. One individual had been impacted in the late twentieth century by the construction of a waterline.

Regardless of biological affiliation, each individual was placed in a plain wood coffin constructed with hand-wrought or machine-cut nails and screws. Analysis of the coffin hardware and artifacts (buttons, pins, and fabric) found in association with each burial indicates that everyone died sometime between 1800 and 1860. The primary differences documented in the mortuary treatment of African American and European American graves were placement and orientation of the grave shaft. With one exception, the African American graves were placed in the northern portion with a northwest–southeast orientation and European American graves the southern portion of the burial ground with a west–east orientation (Fig. 11.7)

The Horse Park's demographic profile is similar to that of Old Frankfort burial grounds, with the primary difference being that it contained a slightly higher percentage of juveniles and a slightly lower percentage of children. On average adult stature for the Horse Park Cemetery population is 169.7 cm, with adult males having a mean height of 169.6 cm and adult females a mean height of 163.7 cm (Table 11.3). Within the Horse Park population, European Americans tend to be taller than African Americans, 169.4 and 162.4 cm, respectively. This suggests that the African American population likely experienced more nutritional stress during their formative years (Steckel 1987; Tanner 1981).

Adult pathologies observed consisted of abnormal bone shape indicative of infection or anemia and bone loss resultant due to an infection. Porotic hyperstosis was observed in a child. Interpersonal violence (15% of the adults) is represented by a European American male who had fractures in his cranium due to a blow to the head; an African American male with a puncture through the scapula that probably resulted in his death; and an African American male whose shoulders had been dislocated.

In general, the teeth of most individuals had been heavily worn, which made it difficult if not impossible to identify hypoplasias, which were clearly evident in the dentition of just two individuals. At the Horse Park burial ground, a slightly higher percentage of the population consumed a more diverse diet than those interred within the Old Frankfort burial ground, but this is still a much lower percentage than documented at Eastern State Hospital (Table 11.2). A heavy reliance on corn-based products coupled with the presence of anemia, abnormal bone size, and porotic hyperstosis is suggestive of widespread nutritional deficiencies within this burial population. The demographic profile also suggests a harsher life with more pathologies and lower longevity for the enslaved African Americans (Pollack et al. 2011b).

Discussion

What led to the commingling of human remains within these burial grounds and to several hundred graves being lost to history? We would argue that three overarching factors contributed to what was documented in the archaeological record: (1) SES of the dead; (2) social values and attitudes toward the dead; and (3) a lack of social connection between the living and the dead.

Socioeconomic Status of the Dead

Certainly the histories of the Old Frankfort and Eastern State Hospital burial grounds are in part products of the social and economic status of those interred within them (Table 11.1). In the case of the Old Frankfort burial ground, the fact that those interred within it were primarily enslaved and freed African Americans, and poor to lower middle-class European Americans certainly contributed to its being lost to history. Given their SES within the community, the descendants of those interred within this burial ground would have had little or no political clout, nor would they have had the resources to relocate a loved one's remains to a perpetual care cemetery. Likewise, most of those interred within the Eastern State Hospital burial grounds were not Lexington residents, having been brought to the hospital from surrounding counties and other states. As a result, those interred within both burial grounds were very quickly rendered socially and physically invisible (Foucault 1980; Nobles 2000; Killoran et al. 2001).

In a related idea as to why burial grounds were often forgotten and the remains of those interred within it left to be disturbed and commingled is that the poor and mental ill were often subjected to a pattern of structural violence, both in life and death (Nystrom 2014). Nystrom argues the pattern of structural violence that result in health disparities follow these individuals into death resulting in disembodiment and differential treatment of the dead. To examine this issue, Nystrom looked at autopsies from an archaeological perspective, and concluded that the poor and disenfranchised were subjected to more autopsies than those of a higher SES. Four examples of autopsies included in Nystrom's study were from the Old Frankfort ($n=2$) and the Eastern State Hospital ($n=2$) burial grounds. The large number of individuals with filling within the Eastern State Hospital population also may be indicative of structural violence toward the mentally ill as it probably reflects experimentation by dentists from nearby Transylvania University (Wetzel 2014). Patient treatments at the hospital that included implementation of Benjamin Rush's theories on bleeding and use of calomel, also may be the result of structural violence (Hudson and O'Malley 2014; Favret 2006). Use of calomel may have contributed to the overall poor dental health of the hospital's residents and mercury poisoning.

Another example of structural violence based on socioeconomic class is a Chinese immigrant cemetery in Nevada, where Harrod et al. (2013) argue that these immigrants were subjected to hard labor, racially based violence, and poor living conditions that were normalized within the local community. Within this community, people were essentially being abused and worked to death. Everyone interred within the Old Frankfort burial ground appears to have experienced a great deal of hard labor. But within the Old Frankfort burial population African American women, who appear to have been undernourished relative to European American women and men regardless of biological affiliation, experienced the greatest normalization of structural violence. This may have been due to the fact that their economic value was much lower than that of enslaved African American men, who could be loaned out.

The cholera epidemics that central Kentucky and Lexington experienced in the mid-nineteenth century likely resulted in the dead's quick interment in the Eastern State Hospital burial ground. Hastily dug mass graves may represent concerns over contagion (Durban 2012). Certainly these health conditions and the social status of the hospital's patients contributed to their remains being commingled, and the burial ground being quickly forgotten when this portion of the hospital grounds was transformed into a pleasure garden for the well-being of patients. Since this was a rapid transformation, hospital residents at the time may have known that the garden had been placed over a few several hundred graves.

That almost half of those interred within the Horse Park Cemetery were enslaved African Americans, this may be a contributing factor to its being lost to history, though the same argument cannot be made for the remaining graves consisting of family interments. Thus, unlike the Old Frankfort and the Eastern State Hospital burial grounds, the SES of those interred in the Horse Park Cemetery may not have played a significant role in this burial grounds history.

Attitudes Toward the Dead

In addition to the social, economic, and political status of the dead, early to mid-nineteenth-century attitudes toward the deceased may have been a contributing factor in these burial grounds being lost to history and the commingling of human remains. Simply put, prior to the beautification of death movement, attitudes toward death may have been more pragmatic. This was particularly evident in urban areas where space was limited. For instance, in southern Europe, particularly in Italy where graves were reused, after a short period of time the remains of those who had been previously interred in a grave were collected and placed into a loculo or an ossuary (Goody and Poppi 1994). The reverence for the dead in this region stemmed mainly from the Christian idea of resurrection and the need to pray for the deceased soul's entrance into heaven (Goody and Poppi 1994, p. 171). Relatives still cared for the relocated remains, but they just did so at another location. The remains of those for which there were no longer relatives residing nearby were initially placed in a common charnel house and then transferred to an ossuary. Elsewhere in England, burial space could be bought and resold, depending on one's financial situation and mobility. As noted by Strange (2003, pp. 147–148), "for those who interred the dead in what was, essentially, a second-hand burial space, access to the rites of mourning associated with private burial outweighed the lack of exclusive grave ownership." There was also a strong desire on the part of families to have a "decent" funeral. This was in part grounded in "a desire to care for the corpse, to claim an identity for the dead, and to negotiate grief through familiar customs of mourning" (Strange 2003, p. 147).

In the USA, a variety of attitudes effect choices concerning the treatment of the dead and "it would be a mistake to assume a single set of attitudes or beliefs about death that permeated all classes and regions" (Leedecker 2009, p. 142). For instance, during the nineteenth century, some favored equality in graves resulting in less elaborate stones and sparse grave treatments (Goody and Poppi 1994, p. 169). The goal was to bury the dead and the families were not as concerned with maintaining burial grounds (Goody and Poppi 1994, pp. 171–173; Lillie and Mack 2015). Likewise, with high death rates and short life expectancies many individuals may have viewed death as a reunion with God and family as promised by their faith (Schantz 2013). The enlightenment also may have contributed to less attention being paid to the maintenance of burial grounds. As the population became more secular and trusting in science, and the institutions of the state exercised more control over the ownership of the body, families may have come to believe that their responsibilities ended once the dead were interred in the ground and following an appropriate period of mourning (Goody and Poppi 1994; Rugg 2000, p. 269; Strange 2003, p. 144). In a similar vein, among some religions there is a belief that the soul is released from the body when decomposition leaves the bones devoid of flesh. The remnant skeletal elements no longer represent the individual, but represent the collective bones of ancestors (Fox and Marklein 2014, p. 195). This goes along with the Protestant reformations rejection of Catholic ideas of purgatory, whereby the actions of the living

could save the souls of the dead (Goody and Poppi 1994, p. 167). From these various perspectives, many individuals may have come to believe that once the soul had been released and flesh had left the body, what remained was no longer a person.

If these notions were commonplace in the central Kentucky region during the nineteenth century, the relatives of those interred at the Old Frankfort burial ground may have been more concerned with having a proper funeral and mourning the dead, then they were with the long-term maintenance of the grave markers and grounds. It is also possible that subsequent developers, such as Luscher, may not have thought that they were disturbing earlier burials, as the remains no longer represented a person. Even up to the late 1980s, in many states it was legal to disturb graves once they were defleshed, since they were no longer thought to be associated with the individual who had been interred in the grave.

Likewise, hospital staff may have been more concerned with offering patients a proper burial than they were with the long-term care of earlier graves. The staff took the time to prepare each individual at death in much the same manner as those interred in contemporary cemeteries. They showed them respect at death. But as time passed, and as the cholera deaths mounted they may have been more concerned with getting the dead in the ground, and less concerned if doing so impacted earlier graves (Durban 2012).

Mid-nineteenth-century attitudes toward death do not appear to have contributed to the Horse Park Cemetery being lost to history. Most likely farming activity resulted in the removal of grave markers and the burial ground being converted to an agricultural field/pasture.

Lack of Connectedness

A lack of connectedness between the dead and the living may have contributed to the commingling of human remains at both urban and rural burial grounds, regardless of the social, political, and economic status of the deceased or attitudes toward death. Simon Luscher, a Swiss immigrant, had no connection to those interred on his property when he constructed his new brewery in the middle of this burial ground. Likewise, in 1875, when city officials were looking for a place to construct a poorhouse, a lack of connectedness led them to place it over earlier graves, though it is not clear if they were aware of the burial ground's existence. The subsequent later development of housing and community infrastructure by others who had no knowledge of the former burial grounds existence led to additional disturbance of graves and the commingling of human remains. Unfortunately, Luscher is not that different from a late twentieth-/early twenty-first-century developer who disturbs a burial ground/cemetery that he or she has no connection too, and fails to stop and report it. Such practices have led to many municipalities requiring developers to do their due diligence prior to initiating earthmoving activities (Boone County Zoning Regulations: Cemeteries). In fact, the second author had an occasion to visit a locality that was reported to contain graves. When told that the property he had

purchased contained a rural family burial ground, the developer refused to believe it even when he was standing next to a fallen headstone. It was not until he realized that the headstone had marked the grave of someone he was related to that his attitude changed. Once he felt a connection to those interred within the burial ground, he quickly agreed to preserve, restore, and protect the burial ground.

Likewise, at Eastern State Hospital, the staff had little or no direct connection to those interred within the burial ground. This logic could be extended to the placement of the pleasure gardens over a few hundred graves.

The Horse Park burial ground represents another case study in how a lack of interconnectedness can lead to a burial ground being lost to history. In the 1970s, when the property that contained this burial ground was acquired by the Commonwealth of Kentucky, all of the grave markers had been removed. This stands in sharp contrast to the nearby subsequent Graves family burial ground with its formal headstones and fence. The location of the two burial grounds may have contributed to how they were treated. The earlier burial ground is located near the crest of an open field, while the later burial ground is located in a low-lying area near an intermittent drainage. It is quite likely that the Graves family marked both sets of interments, but when the land changed hands, the burial ground associated with good agricultural soils may have become a nuisance to subsequent farmers. Their lack of connectedness to those interred within the burial ground may have led them to move the stones and plow over the graves. When the land was acquired by the Commonwealth of Kentucky, all evidence of the earlier burial ground had been removed from the cultural landscape. The later Graves burial ground placement in a low-lying area may have contributed to its long-term protection, as there would be little economic gain from the relocation of these markers.

Conclusions

An examination of two urban and one rural burial ground has led to the identification of commonalities and differences in the factors that contributed to the disturbance of earlier graves and the commingling of human remains. What these three burial grounds share in common, is a lack of connectedness between the living and the dead. When Luscher moved to Frankfort and constructed his brewery, he had no prior relationship with anyone interred within the Old Frankfort burial ground, nor did the farmer who removed the headstones/markers from the Horse Park burial ground. While the staff at Eastern State Hospital would have had some connection to those interred there, it would have been limited in nature and not familial.

Socioeconomic and Antebellum attitudes toward the dead do not appear to have contributed to the commingling of human remains at the Horse Park burial ground, but led to the commingling of remains at the other two cemeteries. Those interred in both cemeteries would have had a low social and economic status, based on biological affiliation, mental health, and access to resources. Likewise, within urban settings it appears that once a certain amount of time had passed, it was acceptable to

reuse grave space or repurposing the land (e.g., brewery and pleasure garden). The individuals interred within the Old Frankfort and the Eastern States burial grounds were likely invisible in life and made more so in death becoming part of the landscape and lost to history.

Acknowledgements The list of those people to whom we are indebted is long, and begins with our editor Anna Osterholtz, comments from Tiffany Tung and Debra Martin. The archaeologists at the Kentucky Archaeological Survey (KAS) make this all possible. Heather Worne and Gregg Maggard provided indispensable help with the Eastern States project. Kentucky Finance Administration provided funding for the excavation and analysis.

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Chapter 12
Commingled Bodies and Mixed and Communal Identities

Tiffiny A. Tung

Introduction

Let us just say it: We would all rather have complete, intact skeletons to analyze, and the sample sizes would be so huge that no reviewer could ever criticize our proposal or article on that particular detail. We envision deep insights about human society and the human condition emanating from those incredibly complete skeletons, and we imagine those richly textured narratives that we could write about a person and their community from 5000 years ago, if only there were complete skeletons and lots of them. But this is rarely the case; instead archaeology sites often yield commingled and fragmentary human skeletons. There are what the mourners left behind, what nature did not dissolve, what developers did not destroy, what looters did not loot, what wars did not ravage, what archaeologists have uncovered, what descendants have requested or approved for study,[1] and what curators have opted to save. This often results in bony fragments of history and a tenacious group of bioarchaeologists examining them to tell the tale of lives once lived and societies once cultivated. The preceding chapters are a good example of that deep curiosity about ancient lives and the detailed, meticulous analyses that are necessary to understand the wide array of cultural norms, the arc of human health, nutrition, and disease, and the embodied ways that we perform our social longing and cultural belonging. At the heart of it, bioarchaeologists are anthropologists who want to learn about and explain the human condition, particularly in the context of those who lived decades, centuries, or millennia before us.

The themes of inquiry embraced by bioarchaeologists are wide and could include such things as food consumption patterns and what that reveals about how

[1] And in which important ethical guidelines have been followed to ensure that descendent communities have a full and authoritative voice in the process.

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resources were distributed and/or how that affected nutritional health; how people marked their bodies as a reflection and generator of social identity; the deadly consequences of political struggle and who was targeted in those conflicts; the criteria for being perceived as a person and a member of a community; cultural practices and how that might hinder or enhance the spread of disease, among many other aspects of what it means to be human and part of a community. Incredibly, bioarchaeology has the means to address those and other issues through the analysis of the human skeleton, insights that are enhanced even further with archaeological and environmental contexts and theoretical perspectives that provide expectations and a means for explaining particular human behaviors and health outcomes. As this volume shows, even in cases where only commingled and sometimes highly fragmented remains are available for study, these and other anthropological questions can be addressed with success.

The History and Future of Analyzing Commingled Skeletons

Before bioarchaeology was recognized as a subfield of anthropology, western researchers had published descriptions of mostly intact mummies and skeletons, focusing on the exotic or the diseased, while commingled human remains went largely unanalyzed unless it had a special pathology. Of particular interest to European scholars were the intact, wrapped mummies from Egypt (Blumenbach 1794; Granville 1825) or those from royal or elaborate tombs across the globe. In the rare cases in which mummy or skeletal fragments were analyzed, the work was done primarily to document particular diseases, such as schistomiasis (Ruffer 1910) and tuberculosis (Cave 1939). Those studies laid the essential foundation for paleopathology and bioarchaeology, and as the field has developed our research programs have expanded to inquire about population health, requiring larger samples of skeletons—and not just those with obvious lesions. Nonetheless, researchers still tended to focus on the intact, complete skeletons. Commingled remains, particularly those that were fragmentary, were ignored and left sitting in storage boxes; other times they were simply thrown out. Exceptions to this practice could be seen at archaeology sites with massacre victims, as in the case of Crow Creek and the 486 individuals that were massacred and dismembered there, resulting in several large pits filled with commingled skeletal elements. Numerous studies were published on this skeletal population (Gregg et al. 1981; Zimmerman et al. 1981a, b; Willey and Emerson 1993; Zimmerman and Bradley 1993; Willey et al. 1997; Zimmerman 1997 and many others), but again, the focus was on the unusual or the sensational. Ordinarily, the "healthy" skeletons were overlooked in favor of those with unique pathologies, and commingled and fragmented remains were left in situ, or if removed they were mostly ignored. Fortunately, our discipline has been maturing, and researchers have recognized the importance of using insights from various theoretical perspectives to frame new research questions and to conduct analyses of commingled human

remains. This recognition of the immense knowledge to be gained by analyzing commingled and fragmentary skeletal elements is providing a richer and more nuanced understanding of ancient lifeways and morbidity profiles of all segments of societies. It also diminishes biased health profiles in which large segments of populations are excluded from analysis simply because they were interred in ossuaries or disturbed by looters or natural processes.

This newfound focus is a welcome one; it requires better analytical skills (and tenacity) to identify and examine small fragments of bone, and the commingled nature of a sample tends to promote better framing of research questions because mere descriptions of mixed, fragmented bones will not suffice, nor will they serve our attempts to better understand the health profiles and lifeways of ancient human societies. Thus, this volume that situates theoretical insights from anthropology and the social sciences at the forefront of analysis of commingled skeletons shows the potential of those forgotten, commingled bones and brings us closer to achieving a more richly contextualized bioarchaeology.

Many of the chapters in this volume articulated an anthropological question about the ancient community under study and presented specific data that aided in addressing the issue. For example, the chapters engaged such themes as how the construction of particular marriage practices in the Bronze Age Arabian Peninsula may have had negative effects on biological health status, an observation that the authors suggest is an example of structural violence in which a cultural institution (arranged marriages, particularly of young adolescent girls married off to consanguines) affects their health and that of their offspring (Baustian and Anderson, this volume). A couple of chapters examined mortuary treatment of infants and children to explore how childhood was constructed and perceived, concepts that authors traced to the construction of personhood (Marklein and Fox, this volume; Beck, this volume). Bodies and body parts were also examined as integral and tangible components for demonstrating control over enemies, as in the case of the Iroquoian war trophies fashioned out of body parts (Jenkins, this volume), a topic that has been extensively discussed by others as well (Trigger 1969; Trigger 1985; Robb 2008; Traphagan 2008). Osterholtz (Chap. 7, this volume) explicates the role of violence as a means for communication even further, discussing how at the site of Sacred Ridge in Colorado, the process of massacring and dismembering bodies was a form of social communication that aided in creating and reinforcing group identity. Community identity could be generated in other ways too, as Epstein and Toyne (this volume) demonstrate. They examined how the careful selection of burial place in precarious cliff faces and the treatment of the dead exemplify the practice theory perspective in which those ongoing actions (in this case, the mortuary activities) foster the construction of group identity in the Chachapoyas region of the Peruvian Andes. Somewhat relatedly, an analysis of how social ties were created and maintained within a community could be seen in the work at Çatalhöyük, in which the authors examined how bodies and domestic spaces were entangled in the ongoing production of domestic and ritual life (Haddow et al., this volume). One final study drew on insights from postcolonial theory and from studies of migration to clarify interactions between Cypriotes and others in Bronze Age Cyprus, conclud-

ing that the migrant communities were not colonizers, and that both the locals and the migrants experienced similar childhood health profiles, an observation that suggests that there was cultural integration between the various groups living on the island (Osterholtz, Chap. 3, this volume). In all, we see a plethora of examples that illustrate how the analysis of commingled and often fragmentary remains is a worthwhile pursuit, particularly when those detailed observations are enriched with theoretical insights from the social sciences more broadly.

Commingling the Community

Although the mixing of numerous human skeletons makes it impossible to accurately reconstruct individuals (unless they are of markedly different ages), there are many analytical techniques that still permit bioarchaeologists to conduct individual osteobiographies, while also exploring community health and how the individual compares to the larger social group. Many of the studies in this volume demonstrate this point, and looking forward, I can see many opportunities in which deep insights about past populations can be gained, even when skeletons are commingled and fragmented. For example, in cases where crania cannot be affiliated with postcrania, a study of cranial trauma, cranial modification, and/or cranial trepanation can provide opportunities to pose focused research questions that are informed by particular theoretical approaches.

As a case in point, analysis of cranial trauma among commingled skeletons from the sites of Conchopata (Tung 2012) and Huari (Tung 2014b) in the Peruvian Central Highlands employed a practice theory perspective (Bourdieu 1977), evaluating how the actions of warriors (and the creation of a warrior class), as well as the celebration of their violent activities contributed to the likelihood that a community might engage in war. Further drawing from structuration theory (Giddens 1984), the process was seen as recursive, and warfare thus simultaneously created the need for a warrior class, while the presence of a warrior class made the option of engaging in war more tenable (Tung 2014b). The interpretation of the data generated from those commingled bones was deeply informed by those theoretical perspectives and by the larger cultural context that was made available by the excellent analyses of iconography, architecture, site layout, chronology, diet and foodways, and production activities at those Wari sites (Bencic 2000; Finucane et al. 2006; Isbell 2004, 2007; Isbell and Cook 2002; Ketteman 2002; Ochatoma and Cabrera; 2002; Ochatoma 2007; Wolff 2012). Other studies in the Andes have similarly analyzed commingled remains, evaluating how the corporal performance of identity (cranial modification) might be affected by intense interaction with a powerful neighboring state (i.e., Tiwanaku) (Torres-Rouff 2002), while other studies have probed how the practice of warfare may have generated new medical procedures, or at least the vast improvement of them, as in Kurin's (2012, 2013) study of trepanation among Chanka crania from central Peru. I cite these studies as examples because bioarchaeological research in the Andes is notorious for having to deal with commingled

or incomplete remains—much of it resulting from prehistoric, early colonial, and modern disturbances or looting. However, through collaborations with archaeologists and a willingness to plumb ethnographies and texts on social theory, focused research questions can take shape when only mixed and incomplete skeletons exist. Subsequently, the rich data sets, when screened through particular theoretical perspectives and comparative studies, provide expectations that can lead to rich, meaningful interpretations by the bioarchaeologists, rather than appendices of data (Buikstra 1991) that are often synthesized and interpreted by the site archaeologist (Sofaer 2006).

Having an archaeologist offer up a grand synthesis is obviously not necessarily a bad thing (Sofaer 2006), and there have been superb synthetic works by archaeologists who have deftly integrated osteological data, among many other categories of data, in order to create richly textured narratives about ancient populations. Nonetheless, I think much is to be gained from bioarchaeological investigations aimed at articulating deep and detailed narratives, and those will require analyses of both the complete skeletons and commingled, fragmentary skeletons. Further, if bioarchaeologists are to consider the larger social forces shaping the health and lifeways of the people we study, bioarchaeologists must be deeply engaged with the research produced by our archaeology colleagues and keenly aware of the theoretical insights that allow us to articulate how (pre)historic societies shaped the individual and how the individual shaped society. It is the bioarchaeologist's profound understanding of the local culture history and social context from whence the skeletons came, combined with an arsenal of theoretical perspectives (sometimes contradictory ones), which allows hypotheses to be constructed and tested, expectations to be articulated, data to be collected, and interpretations to be posited.

Not Commingling Sex and Gender

Working with commingled remains, however, is not always easy. The commingling certainly limits our ability to address particular questions and frame them theoretically. For example, postcrania can be quite difficult to assess for sex identification, and without the associated pelvis, as is often the case with commingled samples, questions about differences in health among those estimated to be skeletally male and female go unanswered. This can lead to challenges in articulating how a past society constructed, cultivated, and performed gender. Because bioarchaeologists agree that we should make an analytical distinction between sex and gender (Walker and Cook 1998), we often use skeletal sex as the starting point for discussions about the construction of gender norms and gender identity. Thus, the inability to categorize a skeleton as male or female can be frustrating. And this is still the case even with bioarchaeologists who are attuned to theoretical insights from scholars like Butler (2006) and Fausto-Sterling (2005) and their argument that biological sex is a social construct, similar to how gender is a social construct.

Many of us recognize our role in (sometimes unintentionally) reifying the seeming stability of the binary sex categories with each os coxae that we observe for a subpubic concavity and ventral arc. But because we recognize that "sex has a material reality" (Sofaer 2006, p. 96) and because we tend to use skeletal sex designations as a starting point for documenting and understanding how this aspect of one's identity might structure health status and many other life qualities, this does not suggest that bioarchaeologists are biological determinists who assume that biological sex is purely prediscursive. Indeed, Sofaer (2006) and Geller (2008) have tackled this issue head on, building on previous scholarship about the semantics and analytical categories of sex and gender (Armelagos 1998; Walker and Cook 1998) and reminding us to be wary of assumptions that identifying skeletal sex means we have documented and explained the process of learning and performing gender (also see Joyce 2000). It is a long, analytical, and theoretically challenging process to go from estimating skeletal sex to understanding past constructions and performances of gender, but bioarchaeologists are trying. This is in large part because gender and other aspects of identity are performed through the body, and this is the primary locus of analysis for all bioarchaeologists.

Thus, queries into the historicity, cultural contingency, and fluidity of gender must also include attempts to analyze both intact and commingled remains in their archaeological contexts because how males, females, the a-sexed, the non-sexed, children, and others were treated in death can reveal deep insights into how mourners and others perceived them in life; each death provides an opportunity to instruct others on appropriate ways of being. Furthermore, the skeletal markers of life (e.g., body modifications, lesions, isotopes that reveal diet and origin, etc.) can sometimes be interpreted as cultural instructions regarding how gender was constructed. For example, in cases where skeletal sex can be estimated,[2] we can delve into questions about gender performance (Butler 2006) and explore how repetitive actions (e.g., processing reeds with teeth for producing basketry or grinding plants on a quern) might have marked the body physically, creating a gendered (and classed) body within the larger community. This marking and making of the gendered body enables researchers to identify and understand how mundane acts can create and enforce social norms about particular ways of being. With every basket produced, for example, a woman might further normalize notions about what it means for women to be productive members of society; this gender performance is for themselves, for others, and for the next generation in that it tends to reify the individual's and society's idea about what is appropriate behavior or suitable tasks for a particular segment of the community. Those cultivated ways of being, however, are obviously not always related to gender, and it is the challenging task of the bioarchaeologist to untangle and offer interpretations about those distinctions and the intersectionality of gender with the many other attributes that constitute an individual in society.

[2] Yes, I am still a practioner of using skeletal sex as a fulcrum for discussions of gender, but I can envision other scenarios in which patterns of behavior are documented without any initial reference to skeletal sex. Depending on the richness of the archaeological and ethnographic contexts, an analysis of gender norms and gendered identity and how they may have been cultivated and performed could be posited.

The Body As Extended Artifact

Commingled human remains also offer an opportunity to rethink how people and dead bodies can extend or break down social relations. In the same way that objects, or more specifically the agency of objects (Latour 2005), can be seen as a way to make social ties more durable, the corpse and isolated body parts can also serve in this capacity (Tung 2014a). Haddow et al. (this volume) reflect this sentiment in their study of burials in platforms in houses at Çatalhöyük, showing how the house, the corpse, and the living were all tied together in the ongoing reproduction of community life. The analysis of commingled remains often reveals those kinds of entanglements between people, objects, and the living and the dead. Those theoretical and practical insights could not be achieved if we simply ignored the commingled and broken bones and focused solely on the intact, complete skeletons. This is especially the case when bodies are intentionally fragmented as part of the process of making cultural objects that reinforce preexisting notions about what should be done to particular kinds of bodies and who in society has the authority to transform them. Jenkins' chapter (this volume) presents an example of this kind of intentional transformation in which she describes the various cases in which prisoners were transformed into war trophies by Iroquoian warriors. I see this act, in which a new kind of object is created from a once sentient being, as a means for extending particular social identities and social relations. As Latour (2005) reminds us, social interactions can be fleeting, so we need objects to carry them forth and make those social ties more durable. Body parts from the dead in particular may be one of the most powerful objects for establishing and enhancing those social and political connections (Tung 2014a). Those corpses and corporal objects do the important work of forming and performing identities and of reinforcing social ties (antagonistic, agreeable, or other) between individuals and various groups of people.

Conclusion

As the chapters in this volume show, the study of commingled and fragmented human remains has much to contribute to our understanding of (pre)historic societies and of ancient health and lifeways. But those insights are really only amplified when incomplete bodies and bone fragments are also examined, and when they are analyzed through theoretical lenses that attempt to explain, clarify, and explicate the human condition, both biologically and socially. The contributions in this volume demonstrate this point, though it is clear that no single theoretical framework could possibly address and explain the various research questions posed by the authors. The palette of social theories (and critiques of them), ranging from postcolonial theory to feminist theories, to gender theories, to practice theory, to entanglement and object agency theories, and theories about personhood, are all discussed in this volume with varying degrees of accuracy, intensity, and complexity, but they all

reveal an important turn in our field in which bioarchaeologists are embracing social theoretical perspectives that should elevate the discipline and facilitate more articulate and nuanced explanations about ancient human populations.

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Erratum to: Contexts, Needs, and Social Messaging: Situating Iroquoian Human Bone Artifacts in Southern Ontario, Canada

Tara Jenkins

Erratum to:

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The Publisher regrets that in chapter 8, there is an error in figure 8.5 and figure 8.6. The archaeological site maps are switched, figure 8.5 is actually 8.6 and Figure 8.6 is actually 8.5. The captions are in the correct place.

The online version of the original chapter can be found under http://dx.doi.org/10.1007/978-3-319-22554-8_8

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