Human remains from the Tomb of Khety (MMA 508/TT311) in North Asasif

Abstract: The North Asasif Necropolis, adjacent to the New Kingdom temple of Hatshepsut at Deir el Bahari, has been the subject of several excavations over the past century, first by H.E. Winlock in the early 20th century, and since 2013 by the Asasif Project. Most of the tombs in the necropolis are rock-cut tombs of honored officials dating to the Middle Kingdom. One of these officials, named Khety, was buried in a tomb designated by Winlock as MMA 508 (also known as Theban Tomb 311), though the tomb was subsequently reused for another burial (or burials) during the Third Intermediate Period. Though Winlock excavated this tomb in the early 20th century, he left much archaeological material behind, and systematic documentation of this excavation debris by the Asasif Project has yielded a wealth of information. This study focuses specifically on the human remains recovered from MMA 508 during the 2019 season.

Despite the commingled nature of the MMA 508 assemblage, much information has been gleaned from the human remains. The remains of at least twenty individuals, including infants and children as well as adults, were recovered from the tomb debris. Evidence for systemic physiological stress and infection was observed in some of the remains, and both male and female individuals were identified. Various aspects of body treatment testify to the elite status of the individuals interred in this tomb. The relatively high percentage of sub-adult remains may support theories that the tombs in this part of the necropolis were sometimes used as multi-generational family tombs. Further study of the human remains from MMA 508 may shed light on burial practices from the Middle Kingdom and Third Intermediate Period.

Keywords: physical anthropology, Asasif, Middle Kingdom, Khety, rock-cut tomb

Roselyn A. Campbell

Cotsen Institute of Archaeology
at UCLA, Asasif Project

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The Middle Kingdom (about 2055–1650 BC)[1] tombs of the North Asasif necropolis have been the subject of archaeological and egyptological interest for over a century. Herbert E. Winlock was the first to systematically excavate many of these tombs in the early 20th century, on behalf of the Metropolitan Museum of Art in New York (Winlock 1922; 1923; 1942). Like many of his contemporaries, Winlock tended to collect only objects that were considered worthy of museum display, meaning that much archaeological material was discarded or left behind. Excavations of these North Asasif tombs and the debris left by Winlock's excavations have revealed a great deal of information about the creation, decoration, and use of these tombs. The Asasif Project, directed by Patryk Chudzik, has been excavating, documenting, and conserving this area since 2013.

Like so many of the other North Asasif tombs, Tomb MMA 508 (Theban Tomb 311) was originally excavated by Winlock (1923). The debris from Winlock's excavations was dumped on the hillside just outside the tomb entrance, and has been excavated by the Asasif Project over the course of several seasons. The debris contained large numbers of human and animal remains. In 2019, this author began the lengthy process of sorting these remains, creating an inventory of the human remains, and drafting a preliminary assessment of the demographic trends present in this assemblage. This study presents the preliminary results of this partial inventory and discusses potential avenues for future research.

ARCHAEOLOGICAL CONTEXT

The North Asasif necropolis lies just north of, and adjacent to, the later temple of Hatshepsut in the valley known as Deir el-Bahari. Winlock's excavations of the North Asasif Necropolis were conducted over the course of two decades in the early 20th century, and revealed the tombs of many Middle Kingdom officials (Winlock 1922; 1923; 1942). Tomb MMA 508/TT311 was one of these tombs, and was preserved better than many of its neighbors [*Fig. 1* bottom]. Many of the Middle Kingdom tombs were reused during the Third Intermediate Period (1069–664 BC) and the Late Period (664–332 BC), and thus had been disturbed even before they were excavated by Winlock (Winlock 1922; 1923; Chudzik 2016).

Based on the style of decoration of the tomb's chapel, Chudzik (2016; 2018) suggested that the tomb (or at least the chapel) was begun in the 11th Dynasty, early in the reign of Mentuhotep II. The remains of much of the original funerary equipment, including coffin fragments, have been found and collected by the Asasif Project (Chudzik 2016; 2018). The discovery of ushabtis and fragments of cartonnage suggest that this tomb was reused during the Third Intermediate Period (Chudzik 2016).

Like many of the nearby contemporary tombs, MMA 508 was constructed as a funerary complex, with a walled courtyard outside the entrance, a style now

1 All dates derived from Shaw 2004.

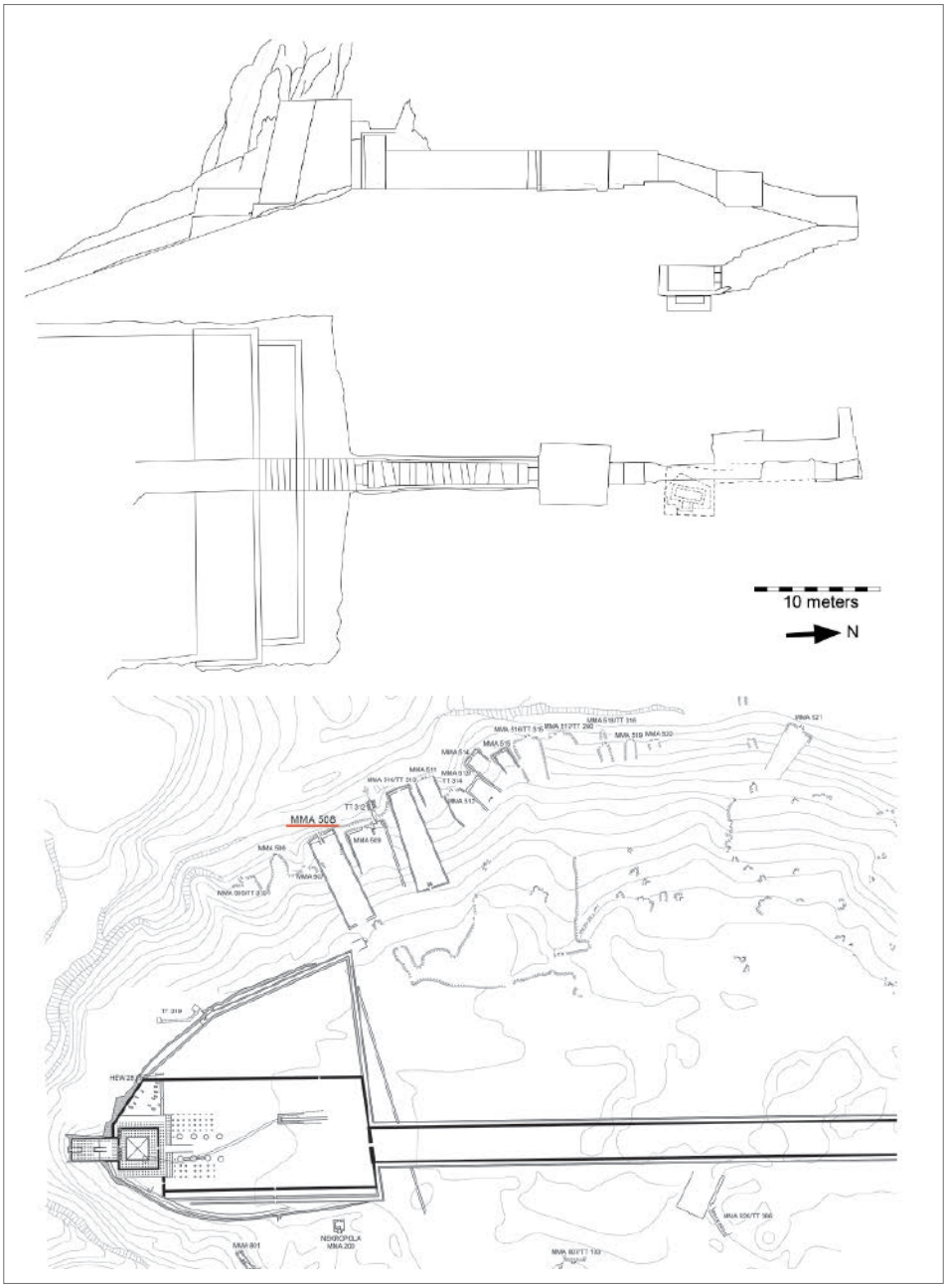

Fig. 1. Tomb MMA 508: plan and section, showing the sloping courtyard on the left side of the image and the tomb corridor with the final burial chamber at a lower level than the other rooms in the tomb; bottom, plan of the North Asasif cemetery showing tomb courtyards and entrances (location of MMA 508 in red, with Hatshepsut's mortuary temple located in the bottom left corner of the image) (After Winlock 1923: 16 | drawing R.A. Campbell; necropolis plan courtesy of P. Chudzik/PCMA UW Asasif Project)

known as Type IIa (Arnold 1971: 43–46; Soliman 2009: 95–108, 191–192; Chudzik 2016; 2018). The tomb entrance opens into a corridor, which leads to a funerary chapel that originally housed an altar and a wooden statue of the deceased, as well as a second wooden statue that may have depicted Khety's wife (Winlock 1923; 1928; 1942; Chudzik 2016; 2018). Behind this funerary chapel, the main corridor continues, leading to two false burial chambers, presumably designed to throw off any potential tomb robbers, and gradually descends to the actual burial chamber, where the sarcophagus was placed in a pit in the floor of the chamber (Winlock 1923; Chudzik 2016; 2018) [*Fig. 1* top]. A detailed description of the tomb's architecture and decoration, as well as images of some of the finds from the tomb, may be found in Chudzik 2016 and 2018.

Unlike some of the other nearby Middle Kingdom tombs, it is possible to identify the original owner of MMA 508, an official named Khety (Chudzik 2016; 2018). It is clear from the tomb's construction and decoration that Khety was of relatively exalted status, as evidenced by an altar of red Aswan granite, a stone that required great effort and expense to obtain, found by Winlock just within the tomb entrance (Winlock 1923; 1942; Chudzik 2016). This altar was carved with Khety's name and titles, as well as the standard offering formula to provide sustenance for his spirit in the afterlife (see Chudzik 2016: 291 for a transcription and translation of Khety's offering formula). In addition to the granite altar, the tomb featured sandstone paving and carved limestone blocks against the original stone walls of the entrance corridor, as well as a limestone sarcophagus (Winlock 1923; Chudzik 2016). Fragments of sandstone blocks painted with a blue background and white stars have also been found, and would have decorated the ceiling (Chudzik 2016). Overall, the impression is that of a well-decorated tomb designed to showcase Khety's high status and access to valuable resources.

The debris from Winlock's excavations was spread along the sloping hillside just outside and below the tomb entrance, a practice that Winlock felt was superior to the previous habit of "heap[ing] up the debris in mounds which completely altered the original plans" of the hillside (Winlock 1923: 12). Though Winlock's disposal of the debris retained "the ancient slopes" (Winlock 1923: 12) and topography of the hillside, it also made subsequent recovery and secure documentation of the material from this debris somewhat challenging. Fortunately for modern excavators, the natural rock formations and topography of this area of the necropolis are such that MMA 508 lies in its own small recess in the cliffs, with natural rock protrusions on either side that separate it somewhat from the neighboring tombs. Careful excavations by the Asasif Project of the debris outside MMA 508 have revealed numerous objects, discarded by Winlock and his team, that can be securely associated with tomb MMA 508. This work has also revealed a large number of animal and human remains.

HUMAN REMAINS

With regard to the osteological remains, the most important task of the 2019 season was to separate the human and faunal

remains from MMA 508 and to get some idea of the preservation and composition of the human remains to inform future study. As expected, the remains are commingled and in various states of preservation, ranging from elements retaining soft tissue and even mummification material (such as linen and resin) to heavily weathered individual bones. Due to the sheer number of remains recovered, it was not possible to inventory and catalogue all of the human remains during the 2019 season. So far more than 300 catalogue entries have been recorded, with a projected total inventory of at least 450 separate entries.

METHODS

The commingled nature of the assemblage required the calculation of the minimum number of individuals (MNI) that could be represented by the extant human remains (Adams and Byrd 2014; Osterholtz, Baustian, and Martin 2014). Methods for calculating this number vary somewhat, but generally focus on identifying unique features of a particular element that would not be duplicated in a single individual (e.g., the distal end of a right femur) (Buikstra and Ubelaker 1994; Knüsel and Outram 2004; Adams and Byrd 2014; Osterholtz, Baustian, and Martin 2014; Osterholtz 2019). This method has the advantage of preventing one individual from being counted more than once, but does tend to underestimate the actual number of individuals present, since unmatched bones may not be accounted for (Adams and Byrd 2008; Osterholtz, Baustian, and Martin 2014).

Due to the large number of remains to be analyzed, sorting and inventory was prioritized over estimation of age and sex. When possible, broad age categories (e.g. adult, juvenile, infant) were assigned according to standard osteological methods of age estimation, including assessment of stages of dental eruption and development and epiphyseal closure of long bones (Buikstra and Ubelaker 1994; Scheuer and Black 2000; Baker, Dupras, and Tocheri 2005). Future work will focus on refining these age estimates (Buikstra and Ubelaker 1994). Ideally population-specific standards would be used to provide more accurate results, but at present such standards only exist for other populations or, in some cases, other time periods in Egypt (namely much later periods), when the composition of the population admixture was very different from that of the Middle Kingdom.

Assessment of morphological features is generally regarded as a more accurate method of age assessment than metrics for juvenile remains (Baker, Dupras, and Tocheri 2005). When classifying sub-adult remains, the age categories put forth by Baker and colleagues (2005) were used here with slight modifications: Fetus/prenate (any infant that is carried less than the full term), perinate (approximately just before to just after birth), infant (birth to one year), child (one year to approximately puberty, around 10–12 years of age), and juvenile (from approximately 10–12 years up to the last fusion of skeletal elements, i.e., the clavicle in the mid-20s). Subadult remains were assigned to these broad categories based on development and

epiphyseal closure of long bones (Baker, Dupras, and Tocheri 2005). While stages of dental eruption tend to be very reliable indicators of age for sub-adult remains, such indicators are not always preserved in the archaeological record, and indeed in the MMA 508 assemblage only a few fragmented examples of deciduous or permanent dentition were found (Hoppa 2000; Baker, Dupras, and Tocheri 2005).

Subadults are very difficult to sex accurately before the onset of puberty (Scheuer and Black 2000; Baker, Dupras, and Tocheri 2005), and thus sex estimation was not conducted on the sub-adult remains in this assemblage. Sex was assessed for adults when identifiable portions of *os coxae* were present with sexually dimorphic features visible (Buikstra and Ubelaker 1994). Macroscopic analysis of sex-specific features of the *os coxae* has the advantage of being broadly applicable to different and diverse populations across time (Buikstra and Ubelaker 1994). In some cases, soft tissue or weathering obscured these features and sex estimation was not possible. Given the fragmented and commingled nature of the remains, other options for sex estimation (such as metric methods) will be explored in future study seasons, particularly as some of these methods are population-specific and thus may yield results with a relatively good rate of accuracy (Marlow 2016; Marlow and Kozieradzka-Ogunmakin 2016).

Evidence of pathological conditions was noted as observed, but a more complete assessment, as well as differential diagnoses, will be addressed in future seasons. Noted pathologies were photographed and the inventory numbers noted for future analysis.

RESULTS

It quickly became clear that numerous individuals are represented in the MMA 508 assemblage. The age of these individuals varies widely, and both males and females are present. Several pathological conditions were noted and are briefly discussed below, as are several features of mummification and burial treatment.

AGE AND SEX DISTRIBUTION

At least five infants of various developmental stages are present, along with four children, three juveniles, and eight adults, bringing the total MNI to 20 [*Table 1*]. It is highly likely that this number will increase once the inventory of human remains from this tomb has been completed.

Table 1. Preliminary age and sex distribution of the human remains from MMA 508

Age category	MNI	Sex
Fetus/Perinate	2	Undetermined
Infant (perinatal to 1 year)	3	Undetermined
Child (1 year to ~12 years)	4	Undetermined
Juvenile (~12 years to approximately ~25 years)	3	Undetermined
Adult (~25 years and up)	8	2 males 2 possible males 2 possible females
Total MNI: 20 individuals		

At least two of the infants are likely prenates, i.e., were born prematurely, while the others appear somewhat older based on the development of the long bones (Baker, Dupras, and Tocheri 2005). The sub-adults range in age from children (between the ages of approximately 1 year until puberty or 10–12 years) to teenagers/young adults (termed "juveniles" here), as assessed by development of skeletal elements and degree of epiphyseal closure (Buikstra and Ubelaker 1994; Scheuer and Black 2000; 2004; Baker, Dupras, and Tocheri 2005). It is clear from the varying lengths of the long bones and different levels of epiphyseal fusion that multiple developmental stages are represented in each category, and future work will focus on providing more precise estimates for the sub-adult remains.

Estimation of age was only broadly possible for the remains of the eight adults. At least one of the adults, represented by a desiccated and fragmentary torso, may be an older adult (i.e., ~40 years of age or older) based on extensive osteophyte formation visible on the vertebral column.

Morphological features of the adult *os coxae* (as well as external genitalia preserved in the soft tissue of one individual) suggest the presence of two males and two possible males, as well as two possible females. The sex of the sub-adults was not assessed in this study for the reasons discussed above.

SELECT PATHOLOGIES

Several pathologies were immediately obvious and were noted. Evidence for osteoarthritis is present in at least two elements, which may or may not derive from the same individual. A fragment of the distal epiphysis of a femur shows evidence of extensive eburnation, caused by complete destruction of the knee cartilage over time and the ensuing bone-on-bone abrasion during everyday movement such as walking (Waldron 2009) [*Fig. 2*]. An adult patella also shows extensive

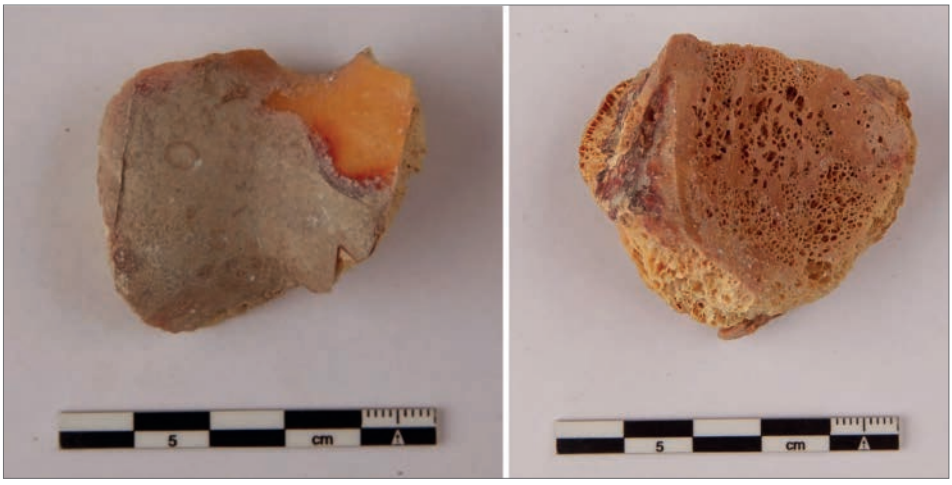

Fig. 2. Examples of eburnation: left, eburnated surface of a distal femur; right, posterior surface of an adult patella (PCMA UW Asasif Project | photos M. Jawornicki, R.A. Campbell)

eburnation on the posterior surfaces, which have worn down to such an extent that the articular surfaces have merged and have been nearly obliterated [see *Fig. 2*].

Osteoarthritis may be caused by a variety of factors, as well as a combination of multiple factors, but at a basic level is due to repetitive movement and strain on a joint (Waldron 2009; 2012). Though often linked to occupation, osteoarthritis may also be linked to previous trauma or another pathology that produced additional strain on a joint, conditions that may be difficult or impossible to observe in fragmented and commingled archaeological assemblages (Waldron 2012).

The mummified lower head, neck, shoulders and vertebral column of one individual shows evidence of bone formation on the anterior right side of the thoracic vertebrae [*Fig. 3* left]. This type of bone formation, particularly when restricted to the right side of the thoracic vertebrae, is caused by ligamentous ossification, and is characteristic of a pathological condition known as DISH (Diffuse Idiopathic Skeletal Hyperostosis) (Maat, Mastwijk, and van der Velde 1995; Reale, Marchi, and Borgognini Tarli 1999; Jankauskas 2003; Ortner 2003; Aufderheide and Rodriguez-Martin 2011; van der Merwe, Maat, and Watt 2012; Holgate and Steyn 2016; Foster et al. 2018).

DISH tends to occur in individuals over the age of 40, and is more common in males than in females (Ortner 2003; Aufderheide and Rodriguez-Martin 2011). Other parts of the skeleton, namely joints, may also be affected, though unilateral bone formation on the right side of the anterior surface of thoracic vertebrae tends to be the most commonly cited evidence for this condition in the paleopathological literature (Bullough 1992; Ortner 2003; Aufderheide and Rodriguez-Martin 2011). DISH is attested in clinical studies of living individuals, and is often asymptomatic (Bullough 1992; Ortner 2003).

Due to the fragmented nature of this individual's remains and the lack of readily identifiable sex characteristics, the sex of this individual was not determined dur-

Fig. 3. Mummified partial torso of an individual missing the chest postmortem, thus revealing the unilateral bone formation on the thoracic vertebrae (detail, right) that is generally associated with DISH (PCMA UW Asasif Project | photos M. Jawornicki)

Fig. 4. Severe pitting as well as reactive bone on a fragment of occipital suggestive of ongoing infection. Morphological features of the visible fracture indicate that it occurred postmortem (PCMA UW Asasif Project | photo R.A. Campbell)

ing the 2019 season. The age of this individual was also difficult to assess given the lack of dentition, the linen obscuring the epiphyseal ends of the humerii, and organic material obscuring any osteophyte formation on the vertebrae which might indicate advanced age (though osteophyte formation may also be due to other factors besides age) (Waldron 2009).

Systemic stress, such as nutritional deficiency, is evident in the presence of both porotic hyperostosis and *cribra orbitalia* in some of the remains (Stuart-Macadam 1985; 1992; Ortner 2003; Waldron 2009). Widening of the

Fig. 5. Gold leaf on dessicated remains of a juvenile: top left, desiccated face with flakes of gold leaf visible on the forehead (top right, detail from red square on the left); bottom, feet of a child, retaining very small flakes of gold leaf (bottom right), applied directly to the skin or perhaps over a very thin layer of resin, rather than on top of layers of linen (PCMA UW Asasif Project | photos M. Jawornicki)

diploic space in cranial bone causes porous defects on the external surface of the cranial vault (porotic hyperostosis) and within the orbital surfaces (*cribra orbitalia*), sometimes co-occurring with new bone formation (Angel 1964; Ortner 2003; Keita and Boyce 2006; Waldron 2009; Goodman et al. 2013). Both manifestations have been linked to chronic iron deficiency (Sandford, van Gerven, and Meglen 1983; Stuart-Macadam 1985; 1992; Ortner 2003; Waldron 2009; Larsen 2015). However, Ortner (2003) suggested that vitamin deficiencies (namely vitamin C and D) or secondary periostitis may also cause such defects, and Larsen (2015) has noted that *cribra orbitalia* may have a different etiology than porotic hyperostosis. Regardless of the proximal cause, the presence of such defects is indicative of systemic stress over an extended period of time. Both conditions are more common in juveniles more than in adults, and the presence of these conditions in adults tends to reflect the long-term effects of stressors during childhood or adolescence (Stuart-Macadam 1992; Larsen 2015).

One fragment of an occipital shows such severe porotic defects that the cause may be systemic infection or disease rather than porotic hyperostosis (Ortner 2003) [*Fig. 4*]. That this infection was in the process of healing at the time of death is evidenced by the smooth margins of the lesions and the bone growth that was beginning to cover some of the perforations at the time of this individual's death.

OTHER OBSERVATIONS

Of particular interest is the presence of very small (1–3 mm) flakes of gold leaf visible on several elements, including a desiccated face of a juvenile and two feet of a child (likely the same child) [*Fig. 5*]. All of these remains are desiccated rather than skeletonized, and retain little evidence of intentional mummification, such as linen, although the presence of the gold flakes suggests that some care was taken with these bodies after death.

The tiny gold flakes appear to have been applied directly to the skin, rather than on top of mummy wrappings, or if the flakes were not applied directly to the skin, the layer between the gold and the skin was extremely thin and is difficult to identify with the naked eye. The unblemished skin around these gold flakes suggests that if additional gold was present, it has probably vanished due to decay or other taphonomic forces rather than intentional forceful removal.

DISCUSSION

The relatively high percentage of infants (25% of the human remains identified thus far) and children (20%) is worthy of some attention. Infant remains are generally less likely to survive in the archaeological record than adult remains for a variety of reasons. The porous nature of infant and juvenile bone makes it less resistant to taphonomic forces, and because the bones are smaller and there is less flesh than on an adult corpse, infant and small child remains are more likely to be scat-

tered by scavengers or looters (Guy, Masset, and Baud 1997; Mays 1998; Morton and Lord 2002; Lewis 2007). Infant and child remains have certainly been found at Egyptian sites (for example at Deir el Medina), but are still less commonly recovered than adult remains (Bruyére 1937; Baker, Dupras, and Tocheri 2005).

Archaeologically, the lack of infant remains on many sites around the world is sometimes also attributed to variation in burial practices between infant or child burials and adults (e.g. a different burial location for younger individuals) (Pearson 2000; Guy, Masset, and Baud 1997; Baker, Dupras, and Tocheri 2005; Crawford and Shepherd 2007; Lewis 2007). Differential treatment in death is frequently related to differential treatment in life, and the high mortality rate of children combined with social ideas about childhood and adulthood, personhood, and the economic and social value of children almost certainly has an impact on the recovery, or lack thereof, of sub-adult remains from archaeological contexts (Crawford 1991; Guy, Masset, and Baud 1997; Kamp 2001; Baker, Dupras, and Tocheri 2005; Crawford and Shepherd 2007; Lewis 2007; Halcrow and Tayles 2008; Thompson, Alfonso-Durruty, and Crandall 2014). In many agricultural societies, children are highly desirable from an economic standpoint as a source of labor, but may also be desired for social or personal reasons (Feucht 1995; Kamp 2001; Verhoeven 2002; Janssen and Janssen 2007; Eyre 2011; MacLeod forthcoming). When infant and child burials are found in Egypt, there is sometimes evidence of care taken with the remains; in the MMA 508 assemblage, the desiccated body of one infant retains fragments of linen used to wrap the body, and flakes of gold present on the feet of a child (see above) suggest attention to burial.

Of course, it should also be noted that the categories used to estimate the chronological age of the individuals discussed here (and indeed all individuals from archaeological contexts) may have little or no relation to culturally-specific ideas about social age, e.g. when an individual is considered an adult rather than a child. Individuals that might be classified as children or juveniles based on skeletal development may have been treated as adults in their own societies, in life and in death, and certainly childbearing seems to have occurred much earlier in most ancient societies than in modern western cultures (Baker, Dupras, and Tocheri 2005). In some cases then, ascribed distinctions between child or juvenile and adult burials should only be undertaken with great care, and with the realization that these categories may not necessarily be consistent with how that individual was viewed in his or her own society.

The flakes of gold leaf on the desiccated remains of at least two individuals, including one juvenile and a child, are certainly indicative of high social status. While gold was frequently used in royal and high status burials due to its association with the flesh of the gods and immortality, usually in such cases the gold was applied to a mummy mask or to the coffin rather than to the human remains themselves (Ikram and Dodson 1998; Ikram 2015). At least one example of a woman's head with similarly applied gold exists in Leiden (C. Greco, personal communica-

tion, August 2020). The gold adhering to the child's foot is particularly intriguing, as it would not have been possible for the child to gain much (if any) status during his or her short life; it is likely to suggest inherited or family status or wealth.

Winlock (1922) believed that the Eleventh Dynasty tombs were used as family tombs, based partly on the design of the tombs and partly on evidence for a similar practice during the Third Intermediate Period. While such a practice is hard to support without DNA evidence (which is not currently possible for remains in- Egypt) or at the very least inscriptional evidence to support such a claim, it is an intriguing possibility, particularly given the age range of the individuals not only in MMA 508 but in other similar, contemporary Middle Kingdom tombs in the North Asasif Necropolis (Campbell 2018). However, it is not clear that the individuals described here all derive from one time period (i.e. either the tomb's original construction in the Middle Kingdom or the later reuse during the Third Intermediate Period). In fact, if all the individuals represented here were intrusive burials dating to the Third Intermediate Period, the age range observed in MMA 508 may simply corroborate other evidence that family burial was practiced during this time, and not necessarily during the Middle Kingdom at all (Winlock 1922). Few of the remains assessed here have retained evidence of mummification techniques, complicating efforts to date the mummies based on evisceration technique (or lack thereof), stylistic choices in wrapping methods, and other diagnostic aspects of the mummification process. Other methods of dating, such as radiocarbon dating, are not currently possible for remains in Egypt. Once the inventory of all the human remains from MMA 508 has been completed, the remains will be studied in greater detail to recover any evidence for the approximate date of these interments

CONCLUSIONS AND FUTURE DIRECTIONS

Despite the commingled nature of the assemblage and differential preservation of the remains, assessment of Winlock's excavation debris from MMA 508 has provided important new insights into the complex and layered history of this tomb. The 2019 season proved particularly fruitful regarding the human remains from this tomb. Though the work is not yet complete, the presence of so many different individuals of varying ages, particularly the relatively high percentage of infants and children, complicates our understanding of the way that this tomb could have been used.

This study has also provided several promising avenues of research. First and foremost, sorting and inventory of these remains must be completed in order to assess the assemblage as a whole. Age-at-death will be estimated more precisely for the remains whenever possible, and the sex of the adult remains will be estimated based on standard osteological methods of macroscopic observation, as well as metric methods when appropriate. A more detailed study of pathologies will also be conducted and differential diagnoses composed when possible. Plans are underway to im-

plement x-rays as a non-invasive method of examining the remains, particularly those which are desiccated or mummified, and it is hoped that much information will be gained from this analysis in future seasons.

Though MMA 508 was disturbed several times and had been previously excavated, the information presented here makes it clear that much information may still be gained from analyzing the remains left behind by intrusive burials, looting, and multiple excavations. The work conducted by the Asasif Project continues to shed light on the North Asasif tombs and funerary beliefs of the Middle Kingdom in Upper Egypt.

Roselyn A. Campbell
https://orcid.org/0000-0001-8936-369X
Cotsen Institute of Archaeology
University of California Los Angeles
Fowler Museum, 308 Charles E Young Dr N,
Los Angeles, CA 9009, USA
roselyncampbell@gmail.com

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