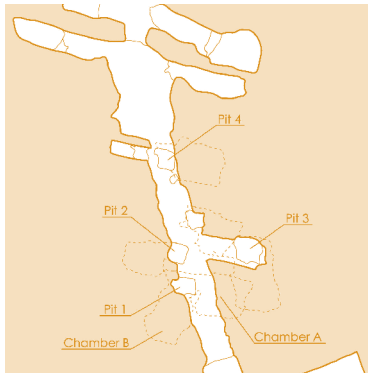
The human remains from MMA 514 in North Asasif



Abstract: The tombs of the North Asasif Necropolis have been the subject of archaeological excavations for more than a century. Mainly dating to the Middle Kingdom, the majority of these tombs were excavated for the Metropolitan Museum by H.E. Winlock in the early 20th century. In many cases, a significant amount of archaeological debris has been left behind, including detritus from the original use of the tombs in the Middle Kingdom and material from the Third Intermediate Period, when many of these tombs were reused. One of these tombs, MMA 514, was reused at least twice, and has yielded a wealth of leftover material, including a significant number of human remains. A Polish team from the University of Warsaw has been working at the site since 2013. The human remains have been fragmented, damaged, and scattered by centuries of looting, as well as by Winlock's excavations, but some information may still be gathered from these remains. Over the course of two field seasons, an inventory of the human remains was conducted, the results of which are presented here. All age ranges are present in the human remains, and both males and females are represented.

Key words: physical anthropology; Asasif; Middle Kingdom; Third Intermediate Period; rock-cut tomb

Located adjacent to the later, and more famous, Temple of Hatshepsut at Deir el-Bahari in southern Egypt, the North Asasif Necropolis comprises numerous tombs of Middle Kingdom officials [*Fig. 1* inset]. Many of these tombs were reused after the original interment, especially during the Third Intermediate Period (Chudzik 2018).

Roselyn A. Campbell

Getty Research Institute

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Though most of the tombs in the North Asasif Necropolis were excavated by Herbert E. Winlock in the early 20th century, he left a great deal of material behind, and thus much information has been gained by recent cleaning and re-excavation of these tombs and the surrounding areas by the Polish Asasif Project.

ARCHAEOLOGICAL CONTEXT

The discovery and early excavation of MMA 514 by Winlock have been described in greater detail in previous publications (Winlock 1922; 1923; Campbell 2018). After its discovery, probably between 1921 and 1923, the tomb was excavated by Winlock on behalf of the Metropolitan Museum of Art in New York (Winlock 1922; 1923). While some of the more complete objects were retained by that museum, a great deal of material that was considered less interesting

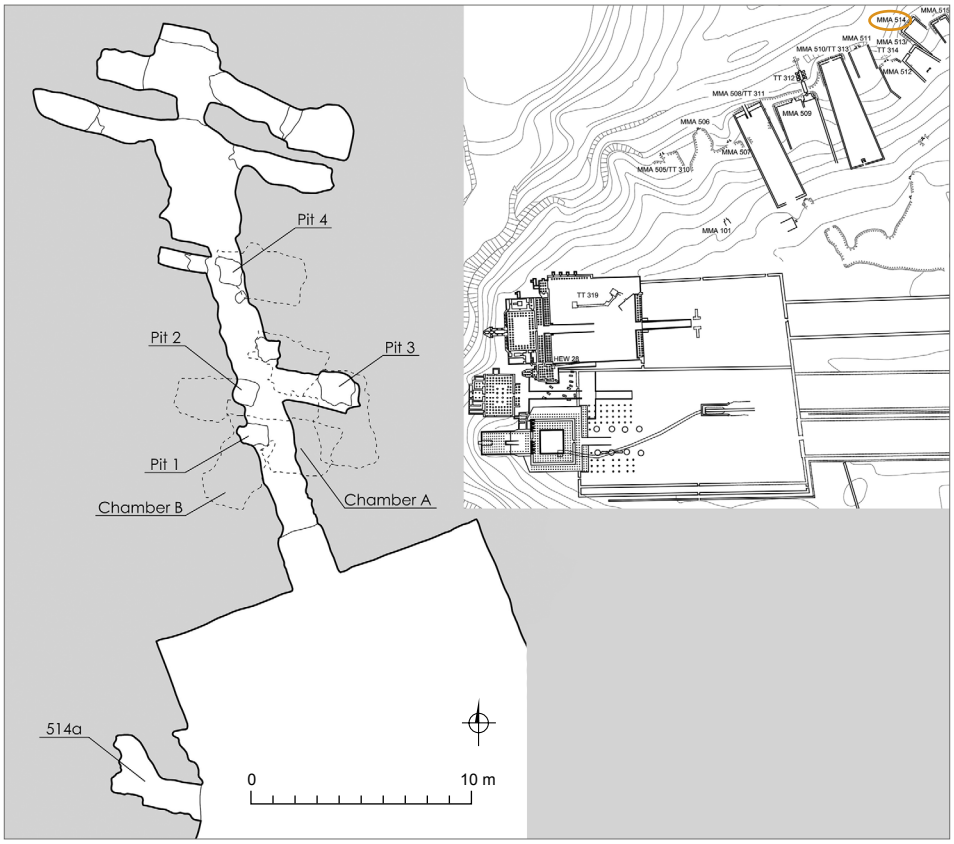

Fig. 1. Plan of the tomb MMA 514 showing an arrangement of the intrusive pit-tombs within the entrance passageway; inset, plan of the North Asasif Necropolis, showing the tomb courtyards and the location of tomb MMA 514. The Temple of Hatshepsut is located in the bottom left of the image. (PCMA UW Asasif Project/drawing K. Andraka)

or desirable was left behind both within the tomb and mixed with the excavation debris . From 2013 to 2016, the Asasif Project cleaned and re-excavated the debris left behind by Winlock, both in the tomb courtyard as well as the tomb itself. From this debris, it is possible to determine that MMA 514 was reused at least twice in antiquity after its initial construction in the Middle Kingdom: once in the early Eighteenth Dynasty for a single burial, perhaps entailing the cutting of a side shaft, and again for multiple burials in the Third Intermediate Period (Chudzik 2017; 2018; Campbell 2018).

The architectural details of MMA 514 have been discussed in greater detail elsewhere (Campbell 2018; Chudzik 2018). Broadly speaking, the tomb's architectural features have led archaeologists to classify it as Type IIa, a corridor tomb with a funerary complex that was common for officials during the Middle Kingdom (Arnold 1971: 43–46; Soliman 2009: 95–108, 191–192; P. Chudzik, personal communication, 2018). The tomb entrance is located within the remains of an outer courtyard; after an irregular chamber that probably functioned as a funerary chapel, the main tomb corridor was carved into the hillside, with several shafts and an irregularly shaped burial chamber opening off the main tomb axis (Chudzik 2017) [*Fig. 1*]. The four shafts appear to be intrusive, later additions, probably created for one or more of the occasions when the tomb was reused (P. Chudzik, personal communication, 2018). Human remains were recovered both inside the tomb and in the courtyard area outside. An additional rock-cut corridor tomb, 514a, is located on the western side of the main courtyard. It also yielded human remains, which are discussed here. This subsidiary tomb belonged to a lower official associated with the main tomb owner of MMA 514 (P. Chudzik, personal communication, 2020). Chudzik (2016) notes that the fill in front of 514a showed reversed stratigraphy, a strong indicator that the fill was deposited during previous excavation or clearing of the main and accompanying tomb, whether in antiquity or in more recent times. Various fragments of Middle Kingdom and Third Intermediate Period funerary objects were found in the fill, and are described elsewhere (Chudzik 2016; Campbell 2018).

THE HUMAN REMAINS

Careful work by the Asasif Project uncovered numerous fragments of human remains, in various states of preservation. An inventory of the human remains, begun in 2017 when this author joined the project, was completed in 2020. Over the course of these two seasons, the human remains were sorted from the faunal remains, identified when possible, and cataloged. Over 350 entries were recorded, with many entries including multiple elements. Individuals of all ages were recorded, and levels of preservation varied from fragmentary and badly weathered to intact mummified elements that retained soft tissue, and sometimes linen mummy wrappings and resin. Pathological conditions were noted as they were encoun-

tered and photographed. Preliminary findings are presented here, but future work will focus on more in-depth analysis of demographic trends and, when possible, the health profiles apparent in these remains.

METHODS

Given the highly commingled nature of the human remains from MMA 514, an exact count of individuals present is not possible. Instead, the minimum number of individuals (MNI) represented in the assemblage was estimated based on standard osteological methods (Adams and Byrd 2014; Osterholtz, Baustian, and Martin 2014). Though methods vary slightly, the primary task in calculating MNI is to count the occurrences of an identifiable, unique feature on a specific element (e.g., the medial condyle of a right femur). While this prevents an individual from being counted more than once, it also tends to underestimate the actual number of individuals, since it cannot account for paired but unmatched bones (e.g., a left femur and a right femur that are from different individuals) (Adams and Byrd 2008; Osterholtz, Baustian, and Martin 2014).

When possible, age at death and sex were assessed and noted. Broad age estimates were assessed based on standard osteological analysis of epiphyseal closure and dental eruption (Buikstra and Ubelaker 1994). In a few cases, preservation of the auricular surfaces of adult *os coxa* allowed the estimation of more precise age categories, following the criteria set forth by Buckberry and Chamberlain (2002). Nonadult remains were defined as any individuals demonstrating ongoing growth and development, either skeletal (as evidenced by epiphyseal fusion) or dental (Scheuer and Black 2000; 2004; Corron et al. 2018). Nonadult remains were assigned to age categories based on morphological features, using the following categories from Baker and colleagues (Baker, Dupras, and Tocheri 2005): fetus/prenate, perinate (around the time of birth), infant (from birth to one year), child (one year to the onset of puberty, usually around 10 to 12 years of age), and juvenile (puberty to the mid-20s, when the last skeletal element, the clavicle, completes fusion). As morphological characteristics are generally considered more reliable indicators of age than metrics for nonadult remains, metric methods were not used for aging these remains (Baker, Dupras, and Tocheri 2005). While population-specific standards are always preferable, such standards are still being developed for Egyptian remains, and those that do exist tend to be restricted to specific populations and time periods, and thus may not accurately reflect aging rates for populations of different time periods, geographic locations within Egypt, or demographic mixtures.

When possible, sex was assessed based on morphological features of the *ox coxa*, following standard osteological methods (Buikstra and Ubelaker 1994). Before the onset of puberty, assessing the sex of skeletal remains is difficult and often inaccurate, and thus was not attempted for the nonadults in this assemblage (Scheuer and Black 2004; Baker, Dupras, and Tocheri 2005; Corron et al. 2018). While metric methods may be used for adult remains with some degree of accuracy in commingled assemblages (see Marlow 2016; Mar-

low and Kozieradzka-Ogunmakin 2016), assessment of morphological features, whenever possible, is generally agreed to be the most accurate method of sex estimation (Buikstra and Ubelaker 1994).

Pathological conditions were noted and described as they were encountered, and photographed for further analysis.

RESULTS

Preservation of the human remains ranges widely, which is unsurprising given the many occasions the tomb has been reused and excavated over the centuries. Some remains show poor preservation and heavy weathering, while others retain large amounts of soft tissue, and sometimes mummification materials as well. A few elements have been partly or completely burned.

AGE AND SEX DISTRIBUTION

Based on data gathered in 2017 and 2020, the minimum number of individuals (MNI) recovered from the entire MMA 514 complex is 13. This number was calculated by first assessing the number of proximal left ulnae present (n=12). At least one infant is represented by other elements, thus bringing the MNI to 13. This is a very conservative estimate, and it is highly likely that more individuals are present, given the number of fragments that were too small or damaged to be sided and the apparent mismatch of some paired elements.

Of these 13 individuals [*Table 1*], one is an infant, one is a child (between one and 10–12 years of age), one is a juvenile, eight are adults, and two are older adults. The juvenile is certainly on the young end of the range, based on epiphyseal fusion of the proximal ulna. A mandible showing fully erupted first and second molars but no eruption of the third molar may belong to this same juvenile. At least one adult is represented in the accompanying tomb, 514a, by a proximal left ulna. The partial remains of an additional individual, either a child or a young juvenile, were also found in the entrance corridor of 514a, but as no other nonadult remains were definitively identified inside this tomb, it seems likely that the remains of these two individuals were heavily mixed with other remains from the main tomb 514 in the courtyard.

For reasons discussed above, sex estimation was not conducted on the nonadult remains. Fragments of *os coxae* indicate that of the eight adults at least one was male. Biological sex could not be assessed for the remaining adults due to fragmentation, weathering, and the absence of skeletal elements with sexually dimorphic features. None of the remains from 514a yielded information about the sex of the individual(s) buried there.

Table 1. Age and sex distribution of human remains from the MMA 514 complex

Age category	MNI	Sex distribution
Infant (perinatal to 1 year)	1	Undetermined
Child (1 year to ~12 years)	1	Undetermined
Juvenile (~12 to ~25 years)	1	Undetermined
Adult (~25 to ~40 years)	8	1 Male
Older adult (~40 years and up)	2	1 Male 1 possible female
Total	13	2 Males 1 Female(?) 10 Undetermined

One older adult is represented by a fragmented right *ox coxa*; the very narrow sciatic notch suggests this individual was a male, though the iliopubic and ischiopubic rami are absent postmortem. Assessment of the auricular surface of this *os coxa* suggests a mean age at death for this individual of 66 years (Buckberry and Chamberlain 2002). A fragmentary left *ox coxa* could belong to the same individual, however, the wider sciatic notch and slightly lower age-at-death estimate (62 years) for the left *os coxa* could also indicate a different individual who died at a similar age (Buckberry and Chamberlain 2002). Another older adult (median age 66 years), possibly a female, is represented by another *os coxa* fragment, indicating the presence of at least two, and potentially three, older adults.

It should be noted that the use of the ulna to calculate MNI also has some bearing on age estimation; epiphyseal closure of the proximal ulna is highly variable, sometimes reaching completion before the 20s (McKern and Stewart 1957; Scheuer and Black 2004), and in rare cases sometimes persisting unfused into adulthood (O'Donoghue and Sell 1943; Skak 1993; Scheuer and Black 2004). In this study, the proximal ulnae fell into three categories: 1) clearly adult, i.e., completely fused, 2) apparently adult and/or articulated to adult elements, but epiphyseal surfaces were covered by soft tissue, and 3) clearly nonadult, i.e., still in the process of fusing (as in the case of the two ulnae deriving from children). Those which fell into categories 1 and 2 were counted as adults, as all these elements appeared to be of adult size, and many were articulated with adult (i.e., fully fused) elements.

PATHOLOGICAL FINDINGS

The frontal bone of a child shows evidence of pitting characteristic of *cribra orbitalia*, which was healing at the time of the child's death [*Fig. 2*]. The right mandible of an adult shows perimortem loss of the mandibular first and second molars, with complete resorption of the alveoli, and loss of the third molar shortly before death, as indicated by the active resorption of the alveolus. There was no evidence of caries. Osteophyte formation on several adult lumbar vertebrae may be an indicator of advanced age or repetitive heavy lifting, or both.

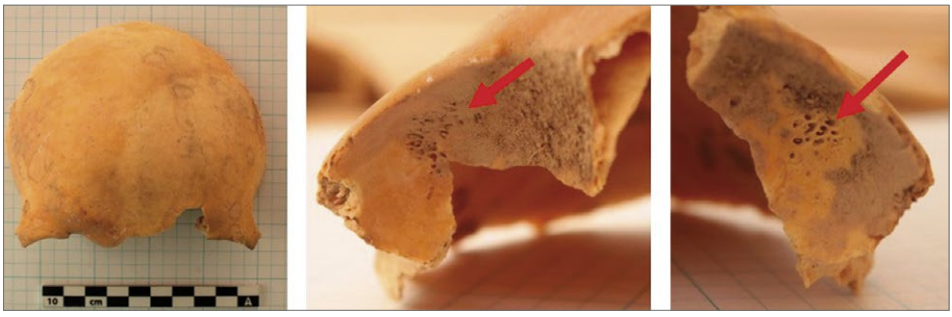

Fig. 2. Unfused frontal bone of a child (left image), with evidence for cribra orbitalia in both the right (center image) and left (right image) orbits (PCMA UW Asasif Project/Photos R.A. Campbell)

SPATIAL DISTRIBUTION OF HUMAN REMAINS

The greatest number of human remains was found in the courtyard area near the entrance to MMA 514a; given Chudzik's (2016) previous suggestion that the material in this area may have been placed here during earlier excavations, this wealth of material is no surprise (see also Campbell 2018).

Regarding the intrusive shafts in the main tomb, the greatest number of remains was recovered from Pit 4, followed by Pits 2 and 3, respectively. No human remains were recorded from Pit 1, nor from the main burial chamber, though many elements were found in the main tomb corridor and courtyard. Using the proximal left ulna as a proxy for distribution of individuals, it is clear that the human remains were distributed throughout the main tomb, most likely during the original use of the tomb, as well as during excavation and looting [see *Table 2* and *Fig. 3*]

The infant remains that were found may hint at the extent to which the human remains were scattered. Infant remains were found in three locations: Pit 4, Pit 2, the east side of the courtyard [see *Fig. 3*]. While it is possible that multiple infants are represented, there are no duplicated elements, and all appear to derive from an infant of approximately

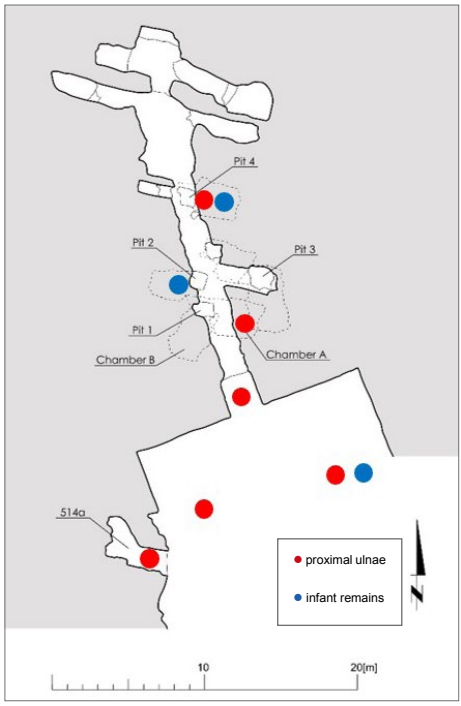

Fig. 3. Distribution of proximal ulnae (red circles) and infant remains (blue circles) inside the MMA 514 complex (general locations, not exact findspots) (PCMA UW Asasif Project/ original drawing K. Andraka)

Table 2. Distribution of proximal left ulnae from the MMA 514 complex, as well as the remains of at least one infant.

General location	Specific location	Minimum Number of Individuals
514	Main tomb, no specific location	2 (adult)
	Pit 4	2 (child)
		2 (adult)
	Pit 2, Pit 4, and Courtyard, east side	1 (infant)
Courtyard	West side (Sector A4)	1 (adult)
	East side	2 (adult)
	In front of 514a	2 (adult)
514a	Entrance corridor	1 (adult)
		Total MNI = 13

the same age (i.e., birth to one year). Likewise, a nonadult femur of a child or young juvenile, found in the entrance corridor to 514a, is the only nonadult element that was found in 514a; all other elements found in this accompanying tomb were either obviously adult, or the age could not be determined due to fragmentation. It is clear then that the distribution of remains presented here represents only a glimpse into the actual complexity of this tomb's history.

DISCUSSION

Due to the complex and layered history of the tomb, the archaeological material has been heavily fragmented and commingled. This makes conclusions about burial practices, and differentiation of separate tomb uses, extremely difficult, beyond the observation that the tomb was indeed used multiple times and during specific time periods, based on funerary material (Chudzik 2016; personal communication, 2018).

As with the nearby and roughly contemporaneous tomb of Khety (MMA 508) (Campbell 2019), MMA 514 yielded human remains ranging in age from infants to older adults. This broad distribution suggests that at least during one of its reuses, MMA 514 was employed for group burial, most likely for family members. Group burial of family members has been suggested for both the Middle Kingdom as well as the Eighteenth Dynasty and the Third Intermediate Period, when MMA 514 was used and reused (Chudzik 2016; personal communication, 2018; Campbell 2018). That the accompanying tomb, 514a, also yielded the remains of one adult and one nonadult presents a tantalizing hint that perhaps this tomb could have also been used for more than one burial, but given the disturbance of 514a and the distribution of material, this is in no way conclusive.

In some cases, multiple types and layers of mummy wrapping have been preserved [*Fig. 4*]. Even when mummification materials are not present, some of the human remains display very good preservation, including extensive soft tissue and even, in one case, locks of medium length hair, still attached to the skin of the scalp. The multiple layers of linen used to wrap these remains, and the fine quality of the outer wrappings, are an indication of this individual's high status.

Two joining fragments of a juvenile mandible, found in Pit 4, show bright green staining on some of the elements, particularly on a mandible fragment [*Fig. 5*]. Green staining in archaeological contexts is often due to the presence of copper artifacts, which corrode and come into contact with bone as the soft tissue decayed over time (Buikstra and Ubelaker 1994; Schultz et al. 2003; Schultz 2012; Dupras and Schultz 2013). A few other elements, including a cervical vertebrae and several cranial fragments, also show small areas of green staining, and may derive from the same juvenile.

Although the etiology is imperfectly understood, *cribra orbitalia* visible in the orbits of a child' frontal bone suggest a systemic stress on the child's system. Though imperfectly understood,

cribra orbitalia manifests as small pits in the superior portion of the orbits, caused by widening of the diploe (Angel 1964; Goodman et al. 2013; Keita and Boyce 2006; Ortner 2003; Waldron 2009). Though the condition is typically attributed to chronic iron deficiency (Sandford, van Gerven, and Meglen 1983; Stuart-Macadam 1985; 1992; Burkhard et al. 2001; Ortner 2003; Waldron 2009; Larsen 2015), some studies suggest it may also be linked to Vitamin C or D deficiencies, or to secondary periostitis (Ortner 2003; Larsen 2015). Regardless of the proximal cause, such lesions do indicate systemic stress of some kind, and typically appear in nonadults, whose systems may be stressed not only due to deficiencies but through the normal processes of maturation. Both

Fig. 4. Fragment of a mummified limb, showing the vertical layers of coarser linen covered by very fine linen wrapped horizontally (PCMA UW Asasif Project/Photo R.A. Campbell)

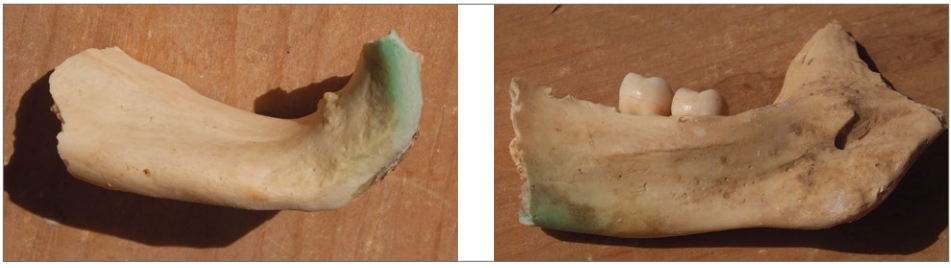

Fig. 5. Bright green staining on the central mandible of a juvenile (lingual aspect shown). (PCMA UW Asasif Project/Photo R.A. Campbell)

cribra orbitalia and its counterpart on the cranial vault, porotic hyperostosis, occur frequently on ancient Egyptian remains, and based on modern comparative studies may be partly caused by persistent blood loss due to parasitic infections, such as hookworm and schistosomiasis (Stephenson and Holland 1987; Chandiwana, Bradley, and Chombo 1989; Tanaka 1989; Brooker, Bethony, and Hotez 2004; Keita and Boyce 2006; Larsen 2015).

CONCLUSIONS AND FUTURE WORK

With the initial inventory and preliminary analysis of the human remains from the MMA 514 complex complete, it is possible to begin to understand the layered history of this tomb. While the remains from both the main and the accompanying tomb have been heavily scattered and commingled, it is possible to identify numerous individuals of various ages within the assemblage. In future seasons, work may include radiographic analysis of the remains, particularly the mummified individuals, as well as a more in-depth analysis of pathological conditions.

Dr. Roselyn A. Campbell
https://orcid.org/0000-0001-8936-369X
Getty Research Institute
roselyncampbell@gmail.com

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