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Short fieldwork report

Human remains from Saqqara West, Egypt, 2023–2025

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The Saqqara necropolis, located some 30km south-west of Cairo, Egypt, on the desert plateau adjacent to the modern village of Saqqara, is the largest in the north-south running chain of cemeteries, collectively known as the Memphite necropolis (**Figure 1**). Saqqara West (29.871352°N, 31.214597°E), the area immediately west of the funerary complex of Pharaoh Netjerykhet (Djoser, c. 2649–2611 BCE) with the Step Pyramid as its focal monument, has been excavated by the Polish-Egyptian archaeological team since 1987. The necropolis is characterised by two temporally distant phases of funerary activities with distinctive burial practices and assemblages reflective of each individual's social standing. The so-called Lower Necropolis, dated to the late 5th and 6th Dynasties through to the early First Intermediate Period (c. 2498–2055 BCE), was a designated burial place for the social élite and administrative officials of the Old Kingdom capital city of Memphis (Kuraszkiewicz 2013; Myśliwiec et al. 2004, 2010). They were buried in the so-called mastaba tombs that comprised the superstructure with a funerary chapel and the underground rock-hewn burial chamber accessible through a vertical shaft. The body was wrapped in linen and placed in a wooden or reed coffin (**Figure 2**), with some individuals placed in stone-made sarcophagi. In contrast, the later Upper Necropolis of the Graeco-Roman Period (332 BCE – 394 CE) comprised simple and predominantly uncoffined inhumations in shallow grave pits made in the top colluvial and sand deposits that accumulated over the limestone bedrock (Radomska et al. 2008; **Figure 3**).

To date, a total of 768 human inhumations have been excavated, with approximately 75% of the assemblage represented by the later period burials. Due to the hot and dry climatic and environmental conditions of the region, coupled with elaborate funerary traditions, the overall preservation and condition of the human remains at Saqqara West was exceptional (**Figures 2** and **3**), bar the individuals treated with molten resin as part of the mummification process. The latter practice, recorded in some of the later period inhumations, significantly affected both the preservation and condition of the skeletal remains (**Figure 4**). However, the majority of the inhumations at Saqqara West showed no evidence of such treatment and were found largely or

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completely skeletonised (Kaczmarek 2008; Kaczmarek & Kozieradzka-Ogunmakin 2013). The latter cases also demonstrated exceptional skeletal completeness, even those disturbed during episodes of ancient looting that primarily targeted the wealthier and richly equipped tombs of the Lower Necropolis. The combination of exceptional preservation and completeness of the skeletal remains at Saqqara West has been instrumental not only in establishing a demographic profile of the cemetery population, but also in recording a variety of skeletal changes (normal variations, abnormal, pathological, or due to trauma) and differential diagnosis to identify specific conditions and diseases. Of particular significance are the oldest-to-date cases of multiple epiphyseal dysplasia (Kozieradzka-Ogunmakin 2011) and metastatic can-

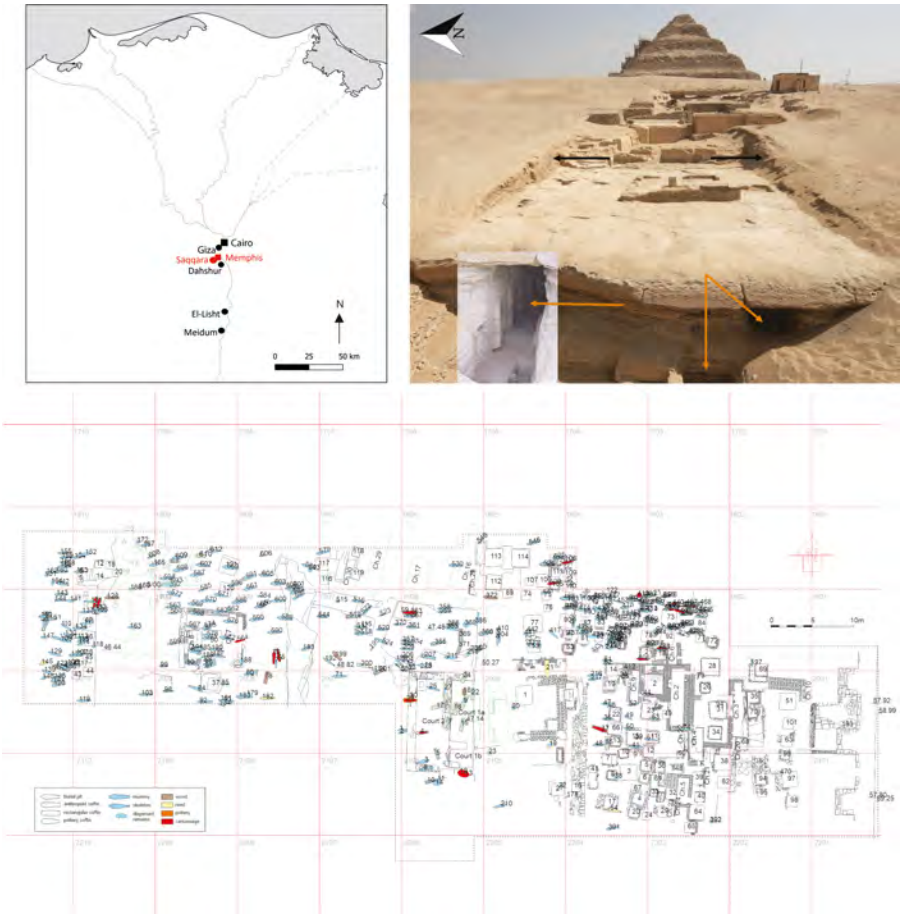

Figure 1. Location of the Saqqara West necropolis and site stratigraphy; Lower Necropolis with subterranean rock-hewn structures (yellow arrows) and Upper Necropolis with inhumations in the overlying colluvial deposits (black arrows). Drawing by I. Kozieradzka-Ogunmakin. Saqqara West necropolis plan by K.O. Kuraszkiewicz.

cer (Kozieradzka-Ogunmakin 2015) diagnosed in archaeological human remains; the affected individuals were buried in the Lower Necropolis.

The field seasons in 2023 and 2025 focused on completing the study of the remaining 66 individuals excavated from burial contexts between 2018 and 2025. Overall, the assemblages from both the Lower and Upper Necropoleis show a sig-

Figure 2. Example of excellent preservation and completeness of skeletal remains in a reed coffin; Burial 555 (male; 18–20 years); Lower Necropolis. Photograph by W. Wojciechowski.

Figure 3. Skeletonised inhumations with only traces of linen wrappings present; Burials 717 (female; 50+ years) and 718 (male; 20–35 years); Upper Necropolis. Photograph by J. Dąbrowski.

nificant under-representation of sub-adults (<20 years); this demographic group was particularly under-represented in the Lower Necropolis assemblage. As the skeletal remains of sub-adults and adult individuals preserved equally well at Saqqara West, the likely disproportion in the demographic representation between the age groups could be due to burial practices (particularly for infants and small children), the choice of the

Figure 4. Poor skeletal preservation and condition due to use of molten resin during mummification; Burial 710 (male; 35–50 years); Upper Necropolis. Photograph by I. Kozieradzka-Ogunmakin.

Figure 5. Multiple horizontal hypoplastic lines in enamel (LEH) affecting multiple mandibular teeth; Burial 735 (female; 20–35 years); Upper Necropolis. Photograph by M. Osiadacz.

excavation area within the cemetery, post-mortem animal and human disturbance, inexperience of some of the excavators, or excavation practices.

Taking into account their generally good (50%–75%) to excellent (75%–100%) preservation and completeness, the skeletal remains from the Saqqara West necropolis provide a valuable record of health experiences among the local population during the two distinctive time periods. The most commonly observed, particularly among the sub-adults, is the evidence of physiological stress during life sustained prior to maturity, including dental enamel hypoplasia (**Figure 5**), *cribra orbitalia* (**Figure 6**), and porotic hyperostosis (Kuraszkiewicz et al. 2020). The impact of early childhood stress on child development and growth has been investigated on a sample of 38 sub-adults ($\leq$12 years), and the findings are currently being prepared for publication (Kozieradzka-Ogunmakin et al., in preparation). Among adults ($\geq$20 years), the most common findings include cases of dental disease (caries, ante-mortem tooth loss, periodontal disease; **Figure 7a**) and degenerative changes of the spine and major non-spinal joints. Less frequently observed are developmental or congenital anomalies or defects (e.g., *spina bifida occulta*, transitional vertebrae; **Figure 8**), trauma (including stress fractures), and evidence of non-specific infection.

The skeletal assemblage of 240 individuals retained and stored on site at Saqqara West was reassessed for the presence or absence of cranial and dental non-metric traits, according to well-established guidelines (Buikstra & Ubelaker 1994; Scott & Irish

Figure 6. *Cribra orbitalia*; Burial 642 (infant); Upper Necropolis. Photograph by M. Osiadacz.

2017). Cranial and dental morphology can inform about the development, health and affinity of individuals and populations; thus, the collected dataset can be applied in a host of studies with the aim to understand the life experiences of the people buried in Saqqara West. Due to skeletal preservation and age of the individuals, the cranial (n=168) and dental (n=181) datasets differed; while the crania and mandibles in general showed excellent preservation, dental attrition among adults ranged from

Figure 7. A case of (a) dental disease and (b) severe attrition; Burial 722 (male; 35–50 years); Upper Necropolis. Photograph by M. Osiadacz.

moderate to extreme (**Figure 7b**), in some cases further compounded by the evident use of teeth as a tool. While the teeth of sub-adults do not bear this degenerative impact, the excellent condition of the maxillae and mandibles meant the permanent

Figure 8. A case of *spina bifida occulta* (S3–5) and lumbosacral transitional vertebra (LSTV, type IIIb according to Castellri's classification); Burial 718 (male; 20–35 years); Upper Necropolis. Photograph by M. Osiadacz.

Figure 9. Multiple ossicles in lambdoid sutures; Burial 714 (female; 50+ years); Upper Necropolis. Photograph by M. Osiadacz.

dentition was often still within their crypts, not available for recording. Additionally, the youngest individuals cannot be fully recorded for cranial non-metric traits due to incomplete ontogeny.

Preliminary results suggest ossicles, additional bones forming in cranial suture lines, are prevalent in the Saqqara West sample, particularly along the lambdoid sutures (**Figure 9**). From dental traits, particularly notable was the absence of one or more third molars. Other common traits were incisor shovelling, *tuberculum dentale* and Carabelli cusps (**Figure 10**), while traits such as enamel pearls, supernumerary teeth and palatine tori were noted only in a few cases. Further analysis of the data will be conducted using multivariate statistics.

The use of the Lower and Upper Necropoleis at Saqqara West spanned times of major socio-political and climatic changes that shaped the ancient Egyptian population (Thompson 1988; Malek 2000; Seidlmayer 2000; Stanley et al. 2003; Welc & Marks 2014; Manning et al. 2017). Owing to the excellent preservation and completeness of the skeletal remains, these two temporally distant assemblages offer an op-

Figure 10. Shovelling visible in upper incisors and right canine, with *tuberculum dentale* partially obscuring the formation of the marginal ridges. Right central incisor exhibits a slight formation of labial mesial marginal ridge but no corresponding distal ridge; Burial 743 (male?; 20–35 years); Upper Necropolis. Photograph by I. Kozieradzka-Ogunmakin.

portunity to investigate the impact of the climatic and environmental changes on the ancient Memphite population through the analysis of temporal variation in skeletal indicators of morbidity, seasonal mortality (Upper Necropolis), as well as biodistance analysis to investigate mobility and population relatedness. Datasets collected on the Saqqara West skeletal assemblage will be further analysed to address these research questions.

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