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Short fieldwork report

Human remains from Bargat El-Shab, Egypt, 2018

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Nabta Playa, located in Upper Egypt's Western Saharan desert, has played a central role in the research of hunter-gatherers and early pastoralists inhabiting the Saharan desert and Nile Valley during the Late Pleistocene and Early Holocene. There has been extensive archaeological evidence discovered in the Playa, despite the harsh environment that lacks vegetation and is unforgiving to any form of habitation (Wendorf & Schild 2001). Nabta Playa is a paleolake that is centrally placed within the hyper-arid core of the Saharan Desert, which is surrounded by several known prehistoric sites (Nicoll 2004). The dunes and washes as well as the *wadi* movement illustrate the fluctuating weather conditions and changes to the climate that permitted human activity in the area in the past (Schild & Wendorf 2001). Initial excavations of the Nabta Playa region began in 1973 and was conducted by the Combined Prehistoric Expedition (CPA). Extensive ceramic analyses, botanical, geological, and zooarchaeological studies have been carried out since the beginning of research in 1973 (see Wendorf & Schild 2001). While pottery and lithic objects have been discovered throughout the region, human skeletal remains are limited (Irish 2001). As a result, there are few osteological analyses of human remains from the Late Pleistocene and Early Holocene in the region (Irish 2001; Kobusiewicz et al. 2004; Irish 2010; Czekaj-Zastawny et al. 2018), which are afflicted by significant taphonomic damage due to the arid and harsh environment.

New research projects were initiated in the early 2000s in the Nabta Playa region surrounding other playas in Gebel Ramlah and Bargat El-Shab. However, it was not until excavations at Gebel Ramlah, located 30km northwest of Nabta Playa, where over 200 skeletons were uncovered and that human osteological analysis could take place. This collection represents the largest Egyptian Neolithic sample known to-date (Kobusiewicz et al. 2004; Irish 2010). This report will present three additional human skeletons which were recovered from the recent excavations at Bargat El-Shab.

The Bargat El-Shab Playa Basin is situated in the southern part of the Egyptian Western Desert. This small playa is located around 150km west of the Nile Valley (in

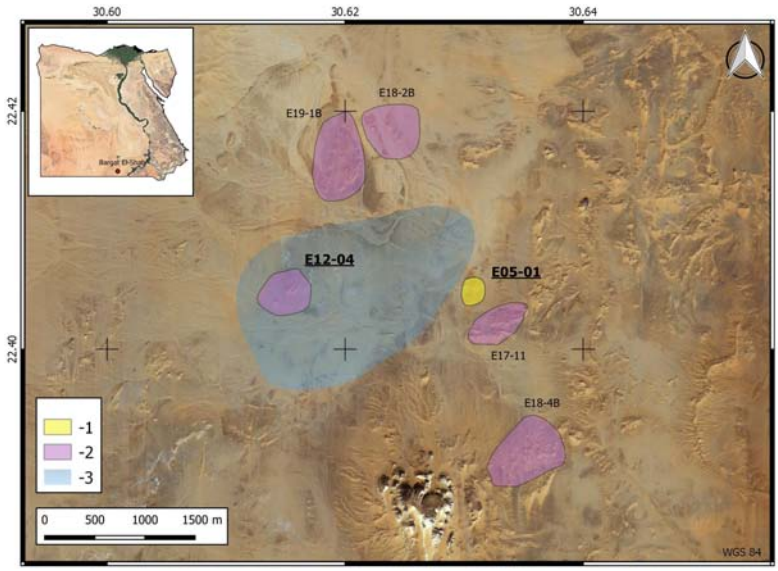

Figure 1. General map of Bargat El-Shab Playa and location of the site on the map of Egypt. Early and Middle Holocene settlement (1) and Late and Final Neolithic (Ru'at El Baqar and Bunat el Asnam) sites (2). Reach of the basin of palaeolake (playa) marked with the colour blue (3). Drawn by P. Wiktorowicz.

the area of Abu Simbel), around 20km south of Gebel Nabta and 20km south-west of Nabta Playa (**Figure 1**) (Bobrowski et al. 2010, 2020).

The excavations at Bargat El-Sheb were conducted intermittently in the 2005–2006 and 2011–2012 seasons, led by Przemysław Bobrowski within the scope of Combined Prehistory Expedition (see Bobrowski et al. 2010, 2020). The excavations from 2017 to 2019 were conducted by the Polish Academy of Sciences (Poznań Branch) as a part of a project sponsored by the Polish National Science Centre (grant NCN No. 2015/17/B/HS3/01315). Research to date at Bargat El-Shab has uncovered, above all, excessive remains of Early Holocene settlement on the eastern shore of the paleolake (playa). Thousands of stone artefacts (tools made from a variety of raw materials, including querns or pestles), animal bones, ostrich egg shells, vessel ceramics, as well as various stone structures (**Figure 2A**) were registered on the sandy surface of an erosional monadnock, which is made of Nubian sandstone and tertiary limestone covered with a layer of Pleistocene sands and winnowed Holocene aeolian sediments (Bobrowski et al. 2020). Fragments of a settlement with numerous utility pits featuring a characteristic bell-shaped cross-section, hearths, small pot holes, wells and human burials were recorded in the investigated trenches located at the site.

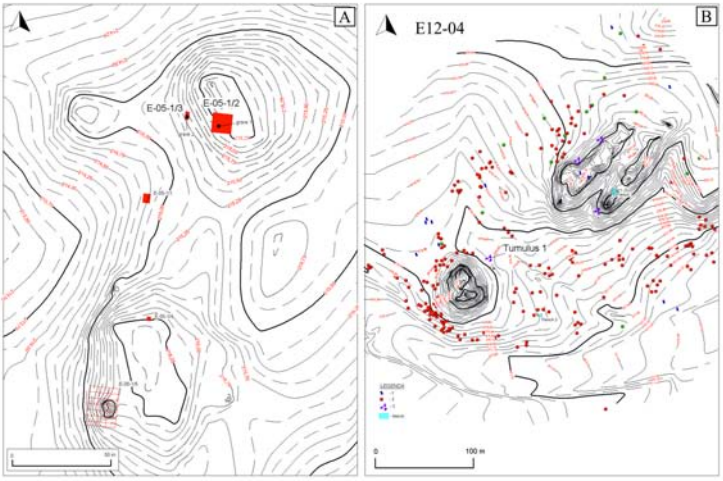

Figure 2. Map of the archaeological site E-05-1 (A) and E-12-04 (B) excavated in the Bargat El-Shab area. Drawn by P. Wiktorowicz.

The situation is much different on the opposite (western) part of the paleolake basin, where an unusual concentration of megalithic features located on a small elevated monadnock was found at site E-12-04 (**Figure 2B**). Due to the alluvial sediments surrounding it, this location was given the working title of the "Island". It is a small terrain form with a surface of around 4.5ha and an irregular two-segment shape extending along the northeast-southwest axis; the relative height varies from 1 to 2.5m above the level of the playa. Within the site, we registered a few tumuli, stone chests and smaller stone structures, as well as the remains of numerous hearths. Similar concentrations with numerous megalithic features, stone structures, hearth complexes or collections of stone steles with anthropomorphic shapes were also noted at several other sites located to the north and south-east of the lake basin (**Figure 1**; sites E-18-02B, E-19-01B, E-17-10, E-17-11, E-18-04B).

During the most recent three-year excavation season, focus was placed on the excavation of the settlement area as well as the tumuli and surrounding stone structures. Two human skeletons were found in the settlement area E-05-1[1] and one human

[1]Both burials were discovered in the course of earlier studies, but were not explored at that time due to the lack of an anthropologist at the site. An on-site anthropologist, who was not subsequently involved with the project, briefly examined the cranium from E-05-1/2 Grave 1 during the 2008 season, and unfortunately, the cranium cannot be currently located. The mandible was examined in 2018 and is included in this paper.

skeleton was discovered in tumulus 1 at site E-12-04 approximately 2km west of the settlement. While the human skeletal sample from Bargat El-Shab is small, the osteological assessment is important due to the limited number for skeletons excavated in this area and provides some insight regarding these individuals.

Figure 3. Bargat El-Shab, site E-05-1/2. Grave 1 in the course of the excavation of the settlement (A). The sub-adult individual from the Grave 1 context (B).

All three skeletons were recovered from different contexts and were discovered *in situ* or partially *in situ*. Radiocarbon dates taken from samples of human bone and charcoal from the settlement and from the tumulus suggest a multiperiod site spanning three millennia (8050–5500 bp). Two of the skeletons excavated from the settlement context (E-05-1/2 Grave 1 and 2) were radiocarbon dated to the Early Neolithic El-Jerar Phase (8050–7300 bp). The third skeleton (E-12-04 Tumulus 1) was discovered in a tumulus structure and was radiocarbon dated to the Late Neolithic Bunat El-Asnam Phase (5300–5500 bp) (after Schild & Wendorf 2013:128, Figure 3). Due to the differences in the chronological dates, it is not possible to make conclusions, however, the child discovered in the tumulus shows some consistency in burial practices that are also observed at Gebel Ramlah.

During the 2018 season, three human skeletons were excavated and underwent systematic osteological analysis at base camp at an on-site laboratory, located approximate 25km away from the site, using protocols based on recommendations by Buikstra and Ubelaker (1994) and Mitchell and Brickley (2017). Additional methods for age-at-death estimation of sub-adults were also used (Smith 1991; Schaefer et al. 2009; AlQahtani et al. 2010). Pathological changes and stress indicators were

Table 1. Summary of the human skeletons analyzed during the 2018 season.

Individual	Age-at-death	Sex	Comments
E-05-1/2 Grave 1	6–8 years	–	Healed transverse rib fracture; new bone formation observed near the proximal ends of the shafts of the right fibula and tibia. *Cribra orbitalia*
E-05-1/3 Grave 1	35–50 years	M	Some porosity and osteophyte formation on the superior and inferior facets of the thoracic vertebrae; some bone elements fossilized
E-12-04 Tumulus 1	4–6 years	–	Right sternal end of clavicle healed transverse fracture; purple/red staining around cervical vertebrae, right scapula and ribs from two large red beads found *in situ*

recorded and scored according to Ortner (2003), Steckel et al. (2006), and Lewis (2017). Results of the analysis are summarized in **Table 1**. All remains are poorly preserved, with friable and weathered bone surfaces, as well as partially fossilized bone elements in one case. After analysis, the human skeletons were reburied in the same location they were excavated as requested by the Egyptian Antiquities Authority.

Two graves, one sub-adult and one adult, were discovered in the settlement context (site E-05-1) within two trenches: trench 2 (E-05-1/2) and trench 3 (E-05-1/3). The child from (E-05-1/2 Grave 1) was located within the western part of the excavated trench. The inhumation was in an oval-shaped pit with dimensions of 0.7×0.4m and the longer axis oriented in the SW-NE direction, around 0.4m below the current surface of the site (**Figure 3**). The burial pit intersected utility pit 4 on one side, while on the other it was damaged by the trench of utility pit 5 (see Bobrowski et al. 2020:198, 202, Figure 6). The skeleton was articulated with the skull oriented towards the north-eastern end of the grave and facing north-west. The sub-adult from Grave 1 was found in a semi-flexed position, lying on the right side. Based on the dental development, the age-at-death of the individual was estimated at 6-8 years. Sex estimation is not possible in such young individuals due to the lack of sexual dimorphism in undeveloped bone. Bone surface preservation and heavy fragmentation limited palaeopathological[1] analyses, as the bone surface was eroded and flaking off in portions, likely due to the aridity of the environment. However, non-specific new bone formation was observed on the right lateral tibia and right medial fibula shafts due to inflammation of the periosteum; along with a healed transverse fracture on one preserved right rib shaft fragment. The deciduous molars show developed attrition indicating high chewing stress.

The second grave (E-05-1/3 Grave 1) was discovered approximately 12m west of trench 2. The skeleton was discovered directly beneath the surface, under a thin layer of cover sand. A small test trench was created around it (trench 3 with dimensions of

[1]Photographic records of the analyzed skeletons were unfortunately damaged and unrecoverable during data transfer. Should further work take place, these elements will be re-photographed as part of the site archive.

Figure 4. Bargat El-Shab, site E-05-1/3. The adult from context of grave 1. Photo by P. Bobrowski.

2×3m) (**Figure 4**). No traces of a burial pit or any other features were observed during exploration, which is the result of the very severe deflation of the site at this location (see Bobrowski et al. 2020:196). Only the middle section of the axial skeleton was articulated. The upper and lower extremities were partially articulated or disarticulated. The sex of this individual was determined to be male based on the robusticity of the bones and preserved skull morphology, and age-at-death was estimated to be 35-50 years based on dental wear and suture closure. Preservation of the bone surface was poor, like in Grave 1, which made identification of pathological changes challenging. The vertebrae had osteophyte formation commonly associated with osteoarthritis as well as heavy attrition on the dentition. In addition, an apical abscess was observed on the mandible with root absorption on the lower left premolars.

Figure 5. Bargat El-Shab, site E-12-04. The partially excavated Tumulus 1. Photo by M. Jórdeczka.

Figure 6. Bargat El-Shab, site E-12-04. The sub-adult individual from the Tumulus 1 context. Photo by M. Jórdeczka.

Tumulus 1 is located approximately 2km west of the settlement E-05-1. The tumulus is an oval structure with a diameter of about 4.5 meters and a height of roughly

Figure 7. Bargat El-Shab, site E-12-04. Possible fracture from on right clavicle. Photo by M. Jórdeczka.

Figure 8. Bargat El-Shab. Interproximal wear visible on the right upper deciduous first molar from E-05-1/2 grave 1 (A), attrition observed on right lower deciduous first molar from E-12-04 Tumulus 1 (B). Photo by M. Jórdeczka.

100cm, although its original height could have been considerably larger (**Figure 5**). It had a stone enclave consisting of several dozen large quartzite sandstone slabs. Their oblique, inwardly oriented arrangement suggests that the embankment (which had suffered much deflation) was pounded first in order to cover it with stone. In the central part of the tumulus there is a burial pit which is oval in shape, with a diameter of about 0.7-1.0m and a depth of about 0.40-0.50m. A sub-adult individual was

discovered centrally approximately 30cm from the top of the burial pit. The skull orientation was towards the west end of the grave, while the face was pointing south-west and lying in semi-flexed position on the right side (**Figure 6**). This inhumation was the only burial uncovered with grave goods at Bargat El-Shab; these consisted of two large beads from red stone (possibly carnelian) located near the cervical vertebrae and resulted in a reddish staining of the cervical 1-3 vertebrae and parts of the right proximal humerus. Dental development indicates that the age-at-death was between 4-6 years for this individual. Similar to the two skeletons from the settlement context, the bone surface of the cranial and post-cranial skeleton is poorly preserved. Nevertheless, some pathologies were observed such as beginning stages of *cribra orbitalia* and porosity around the left zygomatic. In addition, a possible healed transverse fracture was observed on the right clavicle (**Figure** 7), however, identifying fractures in undeveloped bone like in children is difficult due to their plasticity; radiographing the bone would aid in the diagnosis. Dentition was in a fair state of preservation, and the level of severity of attrition was not high.

The three human skeletons discovered at Bargat El-Shab provide a small glimpse into the lifeways of the individuals that were present at Nabta Playa during the Early Neolithic El-Jerar Phase (8050-7300 bp) and Late Neolithic Bunat El-Ansam Phase (5300-5500 bp). It is important to note that any paleodemographic conclusions are not possible with such a small sample size; however, even with the poor preservation of the skeletons, they provide a story of the individuals and may relate to the larger collection from Gebel Ramlah.

While the human remains from the settlement context are dated approximately two thousand years earlier than the tumulus context, all individuals follow a similar burial pattern, with a semi-flexed position on the right side. Only the direction of the skull varies in the case of the sub-adults. It is important to emphasize that it is impossible to apply this interpretation to the entire population based on such a small sample. Nevertheless, it is interesting to note that the burial patterns at Bargat El-Shab observed in Tumulus 1 are similar in nature to the inhumations at Gebel Ramlah, which is dated to the same Late Neolithic Bunat El-Asnam Phase as individual E-12-04 from Tumulus 1 (Kobusiewicz et al. 2004). Tumuli with stone covers and human burials are known for example from Nabta Playa (eg. Final Neolithic tumulus of Little Lord of Nabta Playa – Schild & Wendorf 2013:129), or Shaab Negema, located further north (associated with the early phase of Group A – Gatto 2007:232). This could hint towards a continuity of burial practices in the Nabta Playa region; however, further excavations at Bargat El-Shab would be needed to confirm this.

Pathological changes were limited to a few cases such as the healed traumas on both sub-adult individuals. One of the most common bones that are fractured in human populations is the clavicle, and in sub-adults fractured clavicles are often as-

sociated with accidental trauma especially in childhood (Redfern 2016; Lewis 2017). However, as mentioned above, the diagnosis of healed trauma is particularly challenging in children due to their developing bone and a radiograph would confirm the diagnosis. *Cribra orbitalia* are identified as porosity in the orbital roofs and are commonly associated with anemia or other nutritional or metabolic diseases but can also result from malaria or something more innocuous such as chronic eye infections, which are common in sandy arid environments (Ortner 2003; Stuart-Macadam 1991). *Cribra orbitalia* were observed on the left orbital roof of the child from Tumulus 1, and porosity was documented as well around the left zygomatic, but no other stress indicators that result from nutritional defects such as enamel hypoplasia were recorded. This could suggest a more localized reaction of the assault such as an eye infection. Other stress indicators that result from nutritional defects were not recorded in any of the individuals.

Changes in climate most likely contributed to changes in subsistence methods and the availability of plants and animals that affected the type of diet that groups consumed. Patterns of attrition are connected with age and are also good indicators for the type of diet that individuals consumed (Larsen 2015). Within the Nabta Playa region, extensive studies have been conducted by Irish and colleagues (2001, 2002, 2006, 2008, 2010; Czekaj-Zastawny et al. 2018) on the skeletal collection from Gebel Ramlah (Kobusiewicz et al. 2004; Irish 2010). Irish noted that the overall attrition level at the cemetery is moderate with the presence of interproximal and oblique wear patterns (2010). Oblique or angled occlusal attrition may suggest highly processed food that could be the result of the incorporation of particles from pottery or grinding stones into the food during food preparation (Smith 1984; Irish 2010). This wear pattern could also be indicative of an agriculturalist society; however, evidence of agriculture in this region still needs to be confirmed and most likely the inhabiting groups had a subsistence method that was based on intensive collecting (Irish 2010; Larsen 2006; Wasylikowa et al. 1997). At Bargat El-Shab, the dentition from the two settlement individuals (E-05-1/2 Grave 1 and E-05-1/3 Grave 1) (**Figure 8**), showed a similar pattern of oblique attrition patterns like at Gebel Ramlah. The grinding stones discovered at the settlement and the wear patterns present in E-05-1/2 Grave 1 and E-05-1/3 Grave 1 may suggest grain processing using grinding stones, which in turn resulted in particles in food that had a detrimental impact on the teeth and resulted in angled wear. Interestingly, the child from Tumulus 1, dated almost two thousand years later to the same period as the remains from Gebel Ramlah, did not show angled wear patterns. This could be due to the child being slightly younger, or it could suggest that it had consumed a different diet.

Statistical studies on the Gebel Ramlah collection have compared dental morphology of African samples suggesting that there may have been North and sub-Saharan

African gene flow or admixture within the Nabta Playa region (Irish 2001, 2006, 2008). Many questions still remain unanswered regarding the origins and peopling of the Bargat El-Shab settlement, including the following: how long was the area inhabited, and was it a continuous group? What relationship did they have to the community at Gebel Ramlah? An obvious limitation is the low number of skeletons recovered from excavations in this region, which do not permit extensive discussion about the lifeways of the Neolithic communities, nor allow palaeodemographic analyses. Only 12 tumuli have been discovered thus far along the western shore of the Nabta Playa paleolake with animal offerings (Bobrowski et al. 2014), and only the E-12-04 Tumulus 1 at Bargat El-Shab and tumulus of Little Lord of Nabta Playa (Schild & Wendorf 2013:129) contains a human burial. There are some similarities with the burial positions observed at Gebel Ramlah, however, the individual from Tumulus 1 remains a singular find whose significance will only be understood with further studies of the region. Overall, preservation and taphonomy contribute to the limited skeletal material available for analysis. Without further excavations at Bargat El-Shab that would reveal more skeletal material to provide a larger sample, we can only speculate. In addition, the spread-out timeline of all three inhumations further creates an obstacle to draw substantial conclusions and instead, it is only possible to note that there are some similarities to the larger collection from Gebel Ramlah, and to tell the individual's story. Future biomolecular studies such as stable isotopes could potentially shed light on the type of diet consumed during the different phases of settlement. Genetic studies could also provide insight into the relationship that the individuals had with each other as well as with other groups inhabiting the region and new developing methods are able to detect genetic material in poorly preserved samples. Radiographic imaging would also confirm the traumas recorded on the individuals. Furthermore, additional human remains from similar phases would make it possible to interpret the changes in climate and their effect on human settlement. While the three human skeletons provide a tantalizing preliminary result, further conclusions and analyses will require a larger sample size, which can only be obtained through future excavation at Bargat El-Shab and a more nuanced understanding of the archaeology at this site.

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