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Front cover. Cattle and two goats\gazelle from Site GRD-14 in the Wadi Gorgod (photo Hamad Mohamed Hamdeen).

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Archaeological report on the excavation of a post-Meroitic necropolis at el-Madanab (Shahid Rescue Archaeological Project)

Fakhri Hassan Abdallah, Romain David and Iwona Kozieradzka-Ogunmakin



Figure 1. Map showing the al-Madanab area, south of Shendi (Google Earth 2018).

Introduction

The site of el-Madanab is located 20km south of the city of Shendi, c. 3km from the right bank of the Nile River and c.1km from the railway line (Figure 1). This area is located within the Al-Shahid Agricultural Project sector and the subordinate agricultural axis, Zadna International Company - Zadna for Irrigation and Excavations. The site was uncovered following a report from a member of the Tourism and National Heritage Insurance Police, who noticed that crushed pottery and remnants of human bones were appearing on the surface, resulting from the agricultural machinery that Zadna Company used to dig and prepare the land for its agricultural operations.

In 2009, a team from the National Corporation for Antiquities and Museums of Sudan (NCAM) conducted an archaeological survey in south Shendi, which revealed 21 archaeological sites dating to various historical periods. Among them were sites located within the area of the Shahid Agricultural Project, south of Shendi.¹ In 2018, a more in-depth archaeological survey was conducted and led to a preliminary monitoring of the discovered tombs, and to an assessment of the extent of damage and destruction to the archaeological site as a result of the initial agricultural operations.² Circular mounds with a surface

¹ The preliminary results of these test excavations were published in Mohammed Faroug *et al.* 2009.

² The operation was conducted by Mahmoud Suleiman Bashir, Director of the Regional Antiquities Office - River Nile State, and Emad Taj Al-Sir, an archaeology graduate and collaborator at the Regional Archaeology Office, Shendi Office. This work was reported in Mahmoud Suleiman Bashir 2018.



Figure 2. Distribution of post-Meroitic graves excavated at al-Madanab (after Google Earth).

of black stones and pebbles, ranging in diameter between 9-16m, were identified. The ceramic material and the presence of red bricks extracted by earlier agricultural activity pointed to a Meroitic and post-Meroitic necropolis. Other potsherds decorated with corrugated lines scattered on the surface suggested Late prehistoric activity (c. 7000 BC). In 2018 NCAM sent a team of archaeologists³ to conduct rescue excavations for the archaeological sites that fell within the scope of the agricultural project of the Zadna International Company. These excavations were carried out with financial support from the Zadna International Company - Zadna for irrigation and excavations.

General description of the post-Meroitic necropolis

The necropolis covers an area of c.1km north-south and c. 800m east-west. The site includes approximately 37 circular and oval tumuli distributed across the site, ranging in diameter between 8-17m (Figure 2). The tombs were distinguished by the presence of two types of mounds: Type 1 has an upper structure of 300-600mm in height made of black volcanic stone mixed with small quantities of gravel and fine sand, ranging in diameter from 3-16m (Figure 3). Type 2 consists of smaller mounds of 50-200mm height and ranging in diameter from 7 to 12m, made of calcareous soil and gravel, which forms a more cohesive layer than the first type (Figure 4).

The excavation strategy was to focus on the mounds located in the middle of the site due to the density of tombs, which are distinguished by their upper construction with gravel (concrete) and limestone and were in a good state of preservation. Since these were salvage excavations, and due to the short period of time, the strategy was to remove the central part of the mound, which leads directly to the substructure and then the burial chamber. Some burials had already been destroyed by agricultural machinery, but they could be distinguished by the presence of black stones.

The soil at the site consists of three layers, through which the burial was dug. These consisted of a soft sandy limestone layer on the surface, which is not cohesive. The second layer was formed of gravel mixed with a little fine sand. Immediately beneath this, the burial chamber was dug into a homogenous calcareous solid layer (Figure 5). Fifteen graves were excavated. In this paper, we will present some of

³ The team from NCAM included: Fakhri Hassan Abdallah (Field Director), Al-Samani Ezeldein Abdel-Rahman, Majdi Muhammad Ahmed, Huzaifa Abdel-Majid Abdel-Bagi, Luaiy Shams Al-Ola Ibrahim, and Emad Taj Al-Sir and about 12 daily local workers.

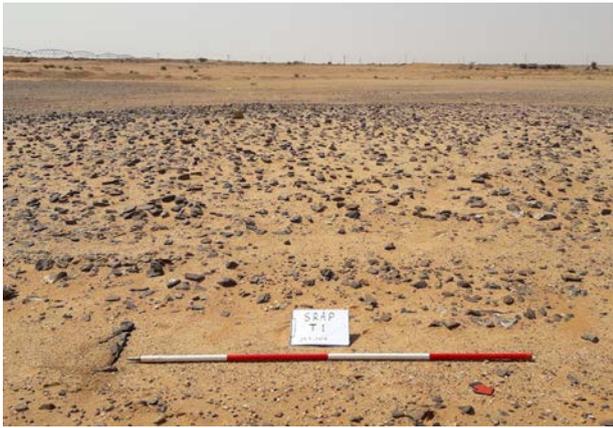


Figure 3. Mound type 1 made of black (volcanic) stone mixed with small quantities of gravel and fine sand (© Fakhri Hassan Abdallah, NCAM).

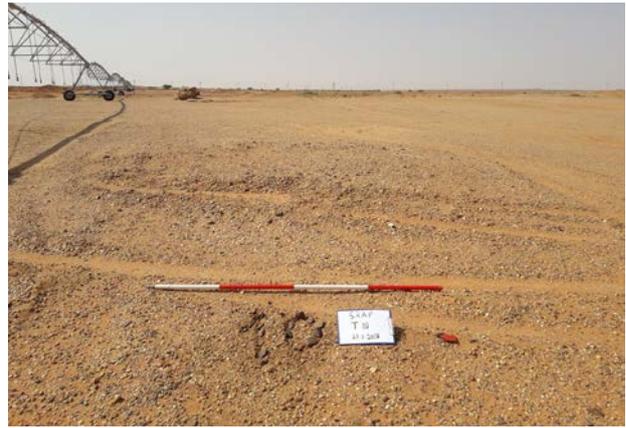


Figure 4. Mound type 2 made of calcareous soil and gravel (© Fakhri Hassan Abdallah, NCAM).



Figure 5. Trench showing the various geological layers: 1) fine sandy limestone – surface layer; 2) gravel layer (concrete) mixed with a little fine sand; 3) hard calcareous layer (© Fakhri Hassan Abdallah, NCAM).



Figure 6. The semi-oval shaped stone building at the base of the mound T2 (© Fakhri Hassan Abdallah, NCAM).

the most important ones as highlighted by the richness of their funerary deposits, which provides important evidence to integrate this necropolis within the frame of the post-Meroitic sites located in the Shendi Reach.⁴

Description of the graves (Figure 40)

Tomb 2: This tomb was marked by a circular mound, c. 11m in diameter and c. 0.6m high, filled with black volcanic stones, gravel and fine sand and surrounded by irregular stone blocks (Type 1) (Figure 6). We plotted the centre of the

superstructure, over an area of 3x4m, and excavated to a depth of 0.4m. The original cut of the entrance of the tomb formed an east-west oval. At a depth of 0.75m, we removed stones from the blocking system, and an oval burial chamber in a north-south direction was uncovered, cut into solid calcareous soil, having a slope from east-west, with a length of 1.7m and a width of 1m. Due to looting, the skeleton was in a poor state of preservation, with the head to the south, facing east. A large, hand-made pottery jar was found in

⁴ For a general assessment see Lenoble 2008; El-Tayeb and Czyżewska-Zalewska 2021, 12, table 2.1.



Figure 7. Burial chamber of T2 (© Fakhri Hassan Abdallah, NCAM).



Figure 8. Goat or sheep sacrificed on the surface of T5 (© Fakhri Hassan Abdallah, NCAM).



Figure 9. Blocking system made of red bricks in T5 (© Fakhri Hassan Abdallah, NCAM).



Figure 10. Burial chamber of T5 (© Fakhri Hassan Abdallah, NCAM).



Figure 11. Various faience, ostrich eggshell, quartzite and carnelian beads from T5 (© Fakhri Hassan Abdallah, NCAM).



Figure 12. Iron chain from T5 (© Fakhri Hassan Abdallah, NCAM).

the northern part of the burial chamber with a hole in its base (Figure 7).

Tomb 5: The mound had a diameter of c. 10m with an estimated height of c. 0.6m (Type 2). We planned a 2x9m excavation to reach the burial entrance easily. Excavations began from east to west until they reached a depth of 0.4m, when stones were found surrounding the entrance to the tomb to the south and west. Then, we expanded 0.6m to the north to clear the complete shape of the tomb. In the northwest corner, the skeleton of a sacrificed goat or sheep was discovered (Figure 8). Excavations continued until the discovery of the blocking system composed of stones of varying sizes only preserved in the northern corner of the entrance (Figure 9). The burial chamber was quite narrow, extending north-south, and was partially disturbed. The skeleton was in very poor condition and scattered around the grave, which makes its original position difficult to determine (Figure 10). Hand-made jars were found at each extremity of the burial chamber, as well as large quantities of beads made of quartzite, ostrich eggshell and carnelian. In addition, an iron chain, damaged by rust, and a piece of cloth, perhaps cotton, were also recovered. The cloth was in a very poor state of preservation and dissolved to a powder upon contact (Figures 11 and 12).

Tomb 10: The circular mound had a diameter of c. 10m filled with gravel and sandy soil (Type 2). The northwest half of the superstructure was removed to a depth of c. 400mm, until the descandary appeared. At this level, complete pottery vessels and remains of human bones probably from the burial itself indicated the plundering of the grave. The descandary was cut into the fixed concrete layer in an oval shape, sloping from east to west towards the burial chamber. At a depth of 1.2m, the burial chamber took an oval shape in a north-south orientation (Figure 13). Inside, an incomplete skeleton lying in a contracted position, head to the south and facing east, was found with the hands extended in front of the face. An archer's loose on one of the fingers of the left hand and a spear deposited close to the hand (Figures 14 and 15) suggest this is an archer's burial. Ostrich eggshell and faience beads (Figure 16) and a partly broken wheel-made jar were also found.

Tomb 11: In the eastern part of the necropolis, this grave was marked by a circular mound c. 11m in diameter (Type 2). Crushed pottery and human bones in the upper part of the filling indicate this was plundered. The grave consisted of a descandary leading to an elliptical burial chamber oriented north-south. The looting affected the original position of the deceased, who was probably lying in a contracted position, head to the south, facing east (Figure 17). In addition to faience, ostrich eggshell and carnelian beads found in large quantities at the neck, pelvis and knees, four vessels were also deposited in the burial chamber.

Tomb 14: A circular mound, with a diameter of c. 9m, filled with sandy clay and white limestone soil, marked the grave (Type 2). The descandary measured c. 2.9m long and c. 0.6m wide at the front, expanding to c. 0.7m at the middle and c. 1.43m at the back. The burial chamber was oval, c. 1.4m long and 0.80m wide. At a depth of 0.6m, the entrance to the tomb was found located in the east-west direction, measuring c. 2.9m. The remains of human bones and crushed decorated and plain pottery were found in the rubble layer. The tomb began with a narrow entrance with a width of c. 0.5m and gradually expanded, taking a sloping shape cut in the solid calcareous soil layer. The grave was emptied, and the skeleton was badly preserved, the head and the upper pelvis being located on the south side (Figure 18).

Tomb 17: The mound consisted of gravel, sand and white lime (Type 2), and was more solid compared to other burials, with a diameter of c. 12m. The descandary was rectangular in an east-west direction with a length of c. 2.4m and a width c. 0.50x1.6m leading to a burial chamber at a depth of 0.2m. The burial was partially disturbed but the original position of the deceased, in a contracted position, head to the south, facing west could be identified (Figure 19). A hand-made jar was deposited at the feet and a cup was found broken in two pieces in the filling of the descandary and inside the burial chamber. Personal ornaments such as beads of various types (ostrich eggshell, stone and qashani), a bracelet in copper alloy (Figure 20)



Figure 13. View of the grave T10 (© Fakhri Hassan Abdallah, NCAM).



Figure 14. Upper part of the deceased in T10 with archer's loose *in-situ* (© Fakhri Hassan Abdallah, NCAM).



Figure 17. View of the burial chamber of T11 (© Fakhri Hassan Abdallah, NCAM).



Figure 15. Spear deposited close to the hand of the deceased in T10 (© Fakhri Hassan Abdallah, NCAM).



Figure 18. View of the burial chamber of T14 (© Fakhri Hassan Abdallah, NCAM).



Figure 16. Various faience, ostrich eggshell and stone beads from T10 (© Fakhri Hassan Abdallah, NCAM).

and various metallic rings were also discovered.

Tomb 18: The c. 13m diameter mound (Type 1) covered an east-west descandary, which sloped for c. 2.5m, starting with a width of 0.7m and ended in a burial chamber with a width of 1.5m. The burial chamber was cut into a solid calcareous layer and had an oval shape of 1.90m north-south and 1.1m east-west (Figure 21). Only partial remains of the skeleton were found, scattered with most in the rubble layer. Eight ceramics were deposited on the northern side (Figure 22), and personal ornaments were found at the bottom of the head and feet, including ostrich eggshell and coloured beads made of stone and ceramic, as well as wood remains. The burial chamber was particularly wide and deep in comparison to the other graves in the cemetery.

Tomb 19: This tomb was marked by a circular mound with a diameter of c. 12m and a height of c. 0.3m, filled with gravel and sand (Type 2). The filling of the descandary contained a few stones and small quantities of crushed pottery. The blocking system made of stones was partially removed (Figure 23). In the looted burial chamber, a skeleton was found almost completely disturbed with a hand-made jar at the feet (Figure 24).

Tomb 21: This tomb was located c. 6m north of the square excavated by the company's machinery. Immediately under the mound (Type 1), the descandary appeared, cut into a solid limestone layer in an east-west direction, with parts of the original blocking system made of bricks in its filling (Figure 25). At a depth of 0.5m, the skeleton of a child covered with red bricks (Figure 26) was found in the south-western corner of the tomb lying in a contracted position, head to the south and facing east. This burial type is related to later inhumations that reuse the soft soil of the descandary, as has been already noticed in other sites in Nubia (Francigny 2016, 150-151). The partially preserved blocking system led to the burial chamber in which a completely disturbed skeleton was found (Figures 27 and 28). An archer's loose, four iron arrowheads and a hand-made jar were still present despite heavy looting (Figure 29).

Tomb 22: Located c. 5m east of tomb T.21, and c. 7m north of the axis excavated by the Zadna Company, the mound had a diameter of c. 12m, consisting of black volcanic stones, gravel, sand and calcareous soil (Type 1). While crushed pottery and the remains of human bones were found in the rubble layer of the descandary, the blocking system made of red bricks appeared to be intact at a depth of 1.8m (Figure 30). Inside the burial chamber, the skeleton was in a contracted north-south position, head to the south, facing west (Figure 31). The skeleton was covered in a shroud of palm leaves and textiles (Figure 32). A bronze bracelet on the left arm and two rings were found near the head as well as a necklace composed of quartzite drop beads, faience tubular beads, carnelian globular beads and small ostrich eggshell cylindrical beads (Figures 33, 34 and 35). On the eastern side of the burial chamber, four ceramics were deposited alongside the body; one of these was covered with a palm frond-like stopper.

Assessment of the skeletal assemblage from el-Madanab

Human remains recovered from excavated graves at Madanab were transferred to the National Corporation for Antiquities in Khartoum and subsequently examined by Dr Iwona Kozieradzka-Ogunmakin. Skeletal remains of a total of 12 individuals recovered from 11 burial contexts (T.21 contained the remains of two individuals) were subjected to macroscopic examination to determine their demographic attributes (biological sex and age-at-death) and physical health.

The examination and recording of the skeletal remains was conducted using the standard protocols presented by Buikstra and Ubelaker (1994). Sub-adult dental age estimation was based on AlQahtani and colleagues (2010). All skeletons were affected by taphonomic processes with varying degrees of post-mortem fragmentation. Two skeletons were nearly complete (T.17 and T.22) whereas three inhumations (T.12, T.18, T.21A) showed less than 25% of skeletal completeness. All but one of the inhumations ($n=11$,



Figure 19. View of the burial chamber of T17 (© Fakhri Hassan Abdallah, NCAM).



Figure 20. Copper alloy bracelet from T17 (© Fakhri Hassan Abdallah, NCAM).



Figure 21. View of the grave T18 (© Fakhri Hassan Abdallah, NCAM).



Figure 22. View of the burial chamber of T18 (© Fakhri Hassan Abdallah, NCAM).



Figure 23. Partially removed blocking system made of stone in T19 (© Fakhri Hassan Abdallah, NCAM).



Figure 24. View of the burial chamber of T19 (© Fakhri Hassan Abdallah, NCAM).



Figure 25. Surface of the descendency of T21 (© Fakhri Hassan Abdallah, NCAM).



Figure 26. Infant burial in the descendency of T21 (© Fakhri Hassan Abdallah, NCAM).



Figure 27. Partially removed blocking system made of red bricks in T21 (© Fakhri Hassan Abdallah, NCAM).



Figure 28. View of the burial chamber of T21 (© Fakhri Hassan Abdallah, NCAM).



Figure 29. Arrowheads found in the burial chamber of T21 (© Fakhri Hassan Abdallah, NCAM).



Figure 30. The intact blocking system made of red bricks in T22 (© Fakhri Hassan Abdallah, NCAM).

92%) belonged to adult individuals (≥ 18 years); an inhumation of a young child (4–5 years of age at the time of death; T.21A) was also included in the assemblage. Males and females represented equally 33.3% ($n=4$ of 12) of the individuals, whereas the sex of the remaining 33.3% ($n=4$ of 12) of the individuals in the assemblage remained undetermined due to their poor skeletal preservation and/or young age (e.g. T.21A). The results of the macroscopic examination of the assemblage are presented in Figure 40.

Skeletal assessment of health in the majority of the individuals was hindered by the incompleteness and poor preservation of the remains. The most common findings included degenerative changes in the spine (T.2; T.5; T.14; T.17; T.19; T.22) and major joints, e.g. the knee (T.14; T.19). A possible case of cancer (X-Ray examination is required to verify diagnosis) was identified in a young adult individual from T.11 (unsexed due to skeletal incompleteness). Skeletal anomalies included a case of an additional sacral element in a female from T.17 and unilateral incomplete fusion of the left lunate and triquetral (carpal coalition) in a female from T.5. The latter is the most common carpal coalition – abnormal fusion of two or more carpal bones due to failed segmentation during intrauterine development – that affects 1% of the modern population globally (Chew *et al.* 2012). To date, several cases of carpal coalition have been reported in ancient Sudanese skeletal assemblages (Judd 2012; Kozieradzka-Ogunmakin *in press*).

With regards to dentition, multiple ante-mortem tooth loss (AMTL) was recorded in a total of three individuals (T.10; T.14; T.17) with a single case of periapical granuloma in a male from T.14. Evidence of non-alimentary dental wear associated with the use of teeth as a tool, such as notches, enamel polishing, and lingual surface attrition of the maxillary anterior teeth (LSAMAT) and enamel chipping, was recorded in a total of four individuals (T.5; T.10; T.11; T.17).

Ceramic report

The study, conducted by Romain David (SFDAS) assisted by Wafa Sharif Dawod Hussein (el-Neelain University), Fakhri Hassan Abdallah and Al-Samani Ezadeen Kara (NCAM), focused on 24 complete bowls and jars from 9 graves. Each complete pot was labelled according to the grave number and the number of object found within the grave. Some potsherds unearthed during fieldwork were also studied to describe the fabric of some of the broad categories distinguished among the material. Each category encompasses ceramics sharing the same manufacturing technics and surface finish. As most of the pots were complete, it was impossible to ascribe them to a more precise fabric group. Categories can be defined as follows:

Group 1 corresponds to hand-made black burnished open shapes made by coiling, fired in a reducing atmosphere (Figure 36). Some decoration made by incision, impression or the application of lump of clay has been observed. The hemispherical bowls, with the preferential applied decoration on the lip, follow Meroitic practices that continued in the post-Meroitic period.⁵ Convex bowls, on the other hand, are a fashion that is certainly related to a development of ceramic production in the 4th-5th centuries AD.⁶ The applied decoration of the T11-18 bowl thus finds a convincing parallel at Meroe.⁷

Group 2 is a counterpart of group 1 encompassing hand-made black jars, made by coiling and fired in a reducing atmosphere, whose surface can be either smoothed or burnished (Figure 37). Decoration is generally incised but impressions are also attested. The typology is varied with some types quite close to Meroitic production examples (T2-12; T5-42; T18-32) that are part of the transitional phase⁸ and others (T11-19; T18-33) whose form and decoration fully anchor them in the post-Meroitic period.⁹

Group 3 distinguishes the hand-made mat impressed ceramics (Figure 38). Much has already been

⁵ e.g. Malykh 2017, 138-139, fig. 1; Mahmoud Suleiman Bashir 2007, pl. 2; Lenoble 2018, fig. 5; Smith 1998, 178, fig. 6.27; no. 6801.

⁶ Geus and Lenoble 1985, 80, fig. 10.

⁷ Garstang 1911, 40, pl. XLII, no. 5.

⁸ e.g. El-Tayeb 1999, fig. 3b; Garstang 1911, pl. XLII, no. 4 left.

⁹ Smith 1998, fig. 6.29; David *et al.* 2020, 211, fig 17.



Figure 31. View of the burial chamber of T22 (© Fakhri Hassan Abdallah, NCAM).



Figure 32. Tied textile found in the burial chamber of T22 (© Fakhri Hassan Abdallah, NCAM).



Figure 33. Deceased in T22 with bracelet and necklace *in situ* (© Fakhri Hassan Abdallah, NCAM).



Figure 34. Copper alloy and iron (?) jewellery from T22 (© Fakhri Hassan Abdallah, NCAM).



Figure 35. Various faience, ostrich eggshell and stone beads from T22 (© Fakhri Hassan Abdallah, NCAM).

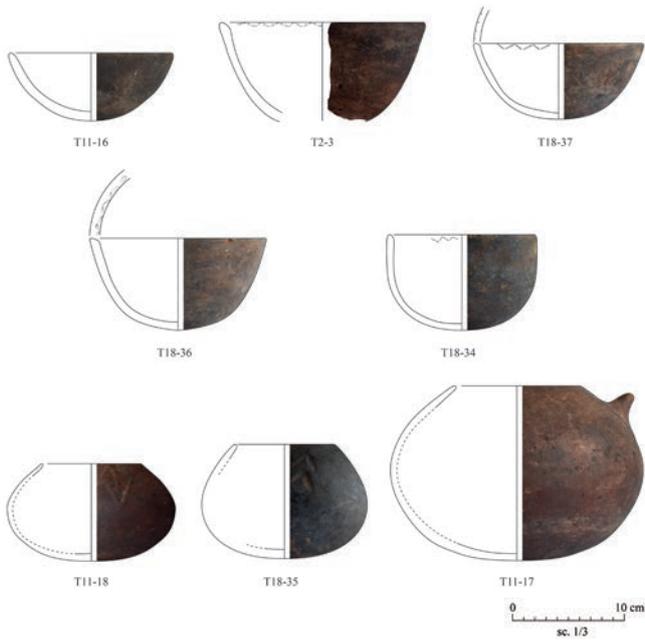


Figure 36. Hand-made black burnished ceramics from Group 1 (© R. David, SFDAS).



Figure 37. Hand-made black burnished ceramics from Group 2 (© R. David, SFDAS).



Figure 38. Hand-made mat-impressed ceramics from Group 3 (© R. David, SFDAS).

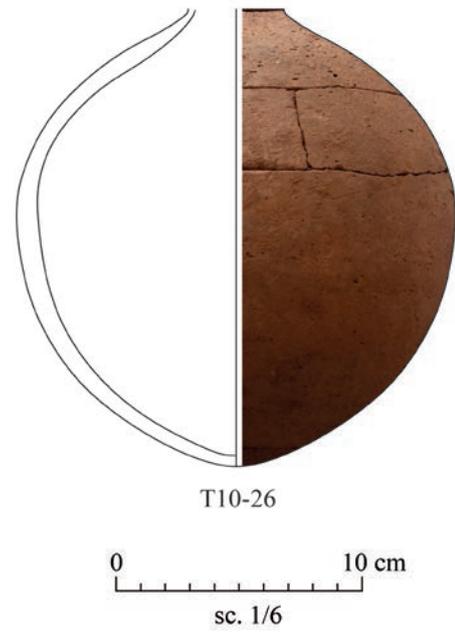


Figure 39. Wheel-made jar from Group 4 (© R. David, SFDAS).

written about these and their mode of manufacturing by the paddle-and-anvil method, the fact that they are present in the majority of post-Meroitic tombs and are thus considered a chronological marker of the transitional phase.¹⁰ The necropolis at el-Madanab shows a developed typology with hemispherical bowls whose rather thick red slip partially covers the mat impressions and spouted bowls well recorded in these contexts.¹¹

Group 4 is only illustrated by the broken inferior part of a wheel-made jar (Figure 39). It attests, like many others before it, to the permanence of wheel-made ceramic production in central Sudan, probably until the end of the 4th century AD.¹²

It is difficult to replicate the phasing identified at el-Zuma from this material alone. The material from el-Madanab rather corresponds to the earlier post-Meroitic phase between the 4th and the 5th centuries AD according to the analogies it shows with the necropolises of Meroe, el-Hobagi, Berber and Sennar.¹³

Discussion

Two recent publications report on the progress made in recent decades in understanding the post-Meroitic period. The long-awaited publications of el-Hobagi and el-Zuma seem to close the debate on the end of Meroe by illustrating the continuity of Meroitic practices after the royal necropolis of Meroe was abandoned. These publications finally open the perspective of studying the '*Méroïtique postpyramidale*' (Lenoble 2018, 255) or 'Terminal Meroitic' (El-Tayeb and Czyżewska-Zalewska 2021, 5) as the last phase of the Kush kingdoms before the inception of the Christian kingdoms, and of placing the discoveries of this period in a new conceptual framework rooted in the Meroitic and only distinguished by a reorientation of production and an adaptation of the funerary superstructure in the royal and elite sphere. What we can observe from the excavation on el-Madanab supports such a view.

The mounds at el-Madanab are not different from those observed in the Central Sudan, which attests to the continuity of this burial practice from late prehistory.¹⁴ The two types distinguished (Figure 41) do not seem to be related to the internal geography of the site, as they are scattered among the necropolis, or even to a specific chronological trend. As observed elsewhere, the filling of the tumulus is likely opportunistic and depends on the local geology.¹⁵ The variation of height according to the filling would be also related to the sand erosion that is not restricted in case of sandy filling while stones better preserved the integrity of the mound.

The tombs follow the same pattern among the graves excavated: a descendary oriented east-west, sloped towards a perpendicular burial chamber of an oval shape cut either into a limestone or a sand gravel layer. The burial chamber was closed with red bricks (T21, T22) or stones (T2, T5, T19). Inside, the deceased, when its original position could be clearly identified, was always lying in a contracted position, head to the south following a 'southern' tradition as evidenced in many occasions in Central Sudan in the Meroitic and post-Meroitic periods.¹⁶

The sacrifice of a goat or a sheep as seen in T5 follows a widespread custom in the Nile valley, which is better evidenced during the Kerma period but is not without parallels from the Meroitic and post-Meroitic periods.¹⁷

The funerary deposit consisted mainly of personal ornaments, pottery and, in some cases, an archery

¹⁰ For a synthesis Lenoble 2018, 268-275; El-Tayeb and Czyżewska-Zalewska 2021, 140-144.

¹¹ Lenoble 1992, pl. III; El-Tayeb and Czyżewska-Zalewska 2021, 51.

¹² E.g. Lenoble 2018, 34-39, fig. 12.

¹³ See Garstang 1911; Lenoble 2018; Lenoble 1991 and Edwards 1991.

¹⁴ For a recent update see Francigny 2021, 593-594.

¹⁵ See for instance Lenoble 1987, 207; Caneva 1994, 84; Edwards 1998, 204.

¹⁶ Francigny 2016, 148; Edwards 2019, 949.

¹⁷ For further references see: Bonnet *et al.* 1989, 28-30; Francigny 2016, 110-111; El-Tayeb 2012, 82-83.

kit. The typology of the beads represented at el-Madanab corresponds to what is expected in such a region during the post-Meroitic period (Then-Obłuska 2014). The tubular faience and ostrich eggshell beads represent the majority of the finds with the rest being white quartzite tear-drop shaped and various coloured stone and glass beads. Other jewellery in bronze or copper alloy such as bracelets and rings were more rare or looted but they were in each case associated with a female burial (T5, T17, T22). The pottery remained partially untouched, so offers a good overview of the repertoire in use. The typology fits with transitional and early post-Meroitic productions of the region that would correspond to the Early Makuria phase 1 identified further North (El-Tayeb and Czyżewska-Zalewska 2021). One would expect a more comprehensive study to match Nubian assemblages in Central Sudan. Finally, the increased archery material seen elsewhere (Lenoble 2006) is also seen at el-Madanab, as two male individuals (T10, T21) were buried with an archer's loose and a spear in one case, or arrowheads in the other case.

There are still burials that need rescue excavations in this cemetery. We will carry out the second rescue excavations in April 2022, according to the planned schedule.

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Tomb No.	Sex	Age-at-death (Years)	Overall Completeness (%)	Observations
T. 2	M	>45	50–75	Incomplete skeleton; extensive post-mortem bone fragmentation; degenerative changes (porosity and marginal osteophytes) observed in the cervical (C3-C4) and lower lumbar vertebrae; squatting facets on the dorsal aspects of the first metatarsals; dentition poorly preserved and incomplete; severe occlusal wear in the mandibular molars.
T.5	?F	25–35	50–75	Incomplete skeleton; extensive post-mortem bone fragmentation; evidence of porotic hyperostosis on the ectocranial surface of the parietal bones; porosity on the superior body of C4; unilateral incomplete fusion of the left lunate and triquetral (carpal coalition); squatting facets on the dorsal aspects of the first metatarsals; slight occlusal wear consistent with a young adult; non-alimentary tooth wear (notches on the distal aspects of the right mandibular lateral incisor and canine (the left counterpart lost post-mortem) and lingual surface attrition of the maxillary anterior teeth (LSAMAT) with exposed dentine and extensive enamel chipping on the right central incisor (the left counterpart and lateral incisors lost post-mortem); green stain on interproximal phalanx (united) most likely due to contact with a copper object; ovicaprid bones (sub-adult) found mixed with the human bones.
T.10	M	30–40	>75	Nearly complete skeleton; extensive post-mortem bone fragmentation; Schmorl's node on the superior body of L4; healed trauma to the 5th proximal foot phalanges; single AMTL (right upper lateral incisor); non-alimentary tooth wear (notch on the mesial aspect of the left maxillary canine) and extensive enamel chipping on the left maxillary central incisor; animal bone mixed with the human remains.
T.11	?	20–25	50–75	Incomplete skeleton; extensive post-mortem bone fragmentation; thickened diploë and deep vascular grooves on the endocranium with small (2mm–3mm) smooth-walled lesions, similar lesions also present in the vertebrae (possible cancer); osteochondritis dissecans on the right distal ulna; squatting facets on the dorsal aspects of the first metatarsals; enamel polishing on the interproximal aspects of the right maxillary molars (M1 and M2) and enamel chipping.

Figure 40. Demographic and physical health data of the skeletal assemblage from el-Madanab.

Tomb No.	Sex	Age-at-death (Years)	Overall Completeness (%)	Observations
T.12	?	20+	<25	Largely incomplete skeleton of an adult individual; extensive post-mortem bone fragmentation; <5 cranial fragments, long bones fragments, patellae, and left metatarsals present; squatting facet on the dorsal aspect of the left first metatarsal.
T.14	M	30–40	25–50	Incomplete skeleton; post-mortem bone fragmentation; bones very brittle; pronounced musculo-skeletal markers (exostoses) on the long bones of the upper and lower extremities; periosteal new bone plaque (evidence of healed periostitis) on the medial aspect of the right distal femur; osteoarthritic changes in the knee joints (marginal lipping on the distal femora; surface pitting and eburnation on the patellar surface of the lateral condyle of the right femur; extensive ossification of the ligament attachment and surface pitting on the left patella); marginal osteophytes on two fragmentarily-preserved lumbar vertebrae; multiple AMTL; a smooth horizontal groove present at CEJ across the intermediate surface (possible use of a dental implement); the right maxillary central incisor with pulp cavity exposed, complete reduction of the crown, and formation of a periapical granuloma.
T.17	F	35–45	<100	Nearly complete skeleton; marginal osteophytes on the first lumbar vertebra; additional sixth sacral element; marginal lipping on the patellae; squatting facets on the dorsal aspects of the first and second metatarsals (R+L); multiple AMTL affecting the upper molars; non-alimentary tooth wear (LSAMAT on the maxillary left lateral incisor with exposed dentine and extensive enamel chipping (no other upper incisors present)); green stain on the right first proximal phalanx most likely due to contact with a copper object.

Figure 40 (continued). Demographic and physical health data of the skeletal assemblage from el-Madanab.

Tomb No.	Sex	Age-at-death (Years)	Overall Completeness (%)	Observations
T.18	?	20+	<25	Largely incomplete skeleton of an adult individual; extensive post-mortem bone fragmentation; multiple cranial fragments, long bone fragments, patellae, metatarsal and phalanges present; inactive cribrotic lesions in the orbits; squatting facet on the dorsal aspect of the left first metatarsal.
T.19	F	50+	50–75	Incomplete skeleton; post-mortem bone fragmentation; bones very brittle; inactive cranial porosity (porotic hyperostosis); pitting and altered contour of the body margin in the cervical vertebrae (C3–C4); porosity and marginal osteophytes in the lumbar vertebrae; pronounced musculo-skeletal markers (exostoses) on the long bones of the upper and lower extremities; porosity and marginal lipping on the glenoid fossae; porosity on the articular surface of the right patella.
T.21A	?	4–5	<25	Largely incomplete skeleton of a young child; post-mortem bone fragmentation; no pathological changes or abnormalities observed on the skeletal elements present.
T.21B	M	18–20	>75	Nearly complete skeleton; post-mortem bone fragmentation; two small depressions (possible healed depression fractures) on the frontal bone; inactive cribra orbitalia; small depressions (Schmorl's nodes) on the superior bodies of the lumbar vertebrae (L2–L5); osteochondritis dissecans in the right talus (posterior articular facet with the calcaneus); pitting and altered contour of the head of the proximal phalanx of the right third ray.

Figure 40 (continued). Demographic and physical health data of the skeletal assemblage from el-Madanab.

Tomb	Mound type	Blocking system	Orientation of the deceased
Tomb 2	Type 1	Stones	Contracted, Head S., Facing E.
Tomb 5	Type 2	Stones	Disturbed
Tomb 10	Type 2	-	Contracted, Head S., Facing E.
Tomb 11	Type 2	-	Contracted, Head S., Facing E.
Tomb 14	Type 2	-	Head S.
Tomb 17	Type 2	-	Contracted, Head S., Facing W.
Tomb 18	Type 2	-	Disturbed
Tomb 19	Type 2	Stones	Head S.
Tomb 21 A	-	-	Contracted, Head S., Facing E
Tomb 21 B	Type 1	Red bricks	Disturbed
Tomb 22	Type 1	Red bricks	Contracted, Head S., Facing W.

Figure 41. The presented tombs and their main characteristics.