

K E R M A

2019-2020 and 2022-2023

SOUDAN

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Cover figure :View of a building inside the Classic Kerma fortified site excavated in
2020 and 2023. Photo: Matthieu Honegger

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SOUDAN

Sous la direction de Matthieu Honegger

ARCHAEOLOGICAL EXCAVATIONS AT KERMA (SUDAN)
PRELIMINARY REPORT OF THE 2019-2020 AND 2022-2023 SEASONS

We present in this report the activities of the Swiss Archaeological Mission to Kerma for the last two seasons when we were able to go to Sudan. The democratic revolution that began in 2018, followed by the COVID-19 crisis and finally the putsch in 2021, have led to instability, a weakening of the administrative apparatus and an impoverishment of the population. As a result, we were only able to travel to Sudan for two excavation seasons, arriving in Khartoum at the end of December and working at Kerma through the months of January 2020 and 2023. Since then, war broke out in Sudan in April 2023, leading to a dramatic humanitarian situation. It is not yet known when it will be possible to return to Kerma. First of all, we must hope for a rapid end to hostilities and the reconstruction of a country that has been suffering for years. Our thoughts are also with our Sudanese collaborators and our colleagues at the National Corporation for Antiquities and Museums (NCAM) who have had to move to northern Sudan or Egypt. It is from Cairo that they are courageously trying to deal with the situation and gather information on archaeological sites with a view to preventing the endangering of Sudan's archaeological heritage.

In 2019-2020, our fieldwork started on January 2 and ended on January 25, 2020. The Swiss team was limited to 4 people (Matthieu Honegger, Jérôme Dubosson, Daniele Conforti and Théophile Burnat) and our NCAM inspector was Shahinda Omer. For work in the Eastern Cemetery, 16 local workers were supervised by the rais and gaffir Khidir Magboul. In the Museum of Kerma, three local workers were employed to build a podium for a small-scale model.

Our several objectives for this campaign were:

- Jérôme Dubosson's priority was to work on the final installations to be made in the Kerma museum with funds from the Qatar-Sudan archaeological project (QSAP). He installed a small-scale model of the temple of Taharqa of Tabo. He also changed the image on two panels of the museum and reinforced the seven panels installed previous year in the museum and the pavilion located close to the Eastern Cemetery, since their system of fixation was not adapted to the high summertime temperature in the region.
- Théophile Burnat came to study the 212 leather sandals from the tombs we had excavated in the Eastern Cemetery. This work enabled him to obtain his master's degree in archaeology, and since then he has begun a doctoral thesis on all the leather and textile material from the Eastern Cemetery, including the clothing of the deceased and some of their personal objects.
- Also in the Eastern Cemetery, we wanted to excavate a last royal tomb located to the south, in a sector dating from the end of the Middle Kerma period, in order to verify whether, like the earlier tombs, it contained internal wooden architecture.

- On the desert side, the aim was to verify the Middle Stone Age sites identified the previous year and search for more recent sites. This work enabled us to discover twelve new Middle Stone Age sites, a number of engravings and a series of undated stone cairns, which appear to be markers for tracks or observation points.
- Finally, we wanted to make test excavations in the Classic Kerma fortified site close to the site of Wadi El-Arab in order to obtain an idea regarding the state of preservation of the foundations and the archaeological levels. Furthermore, the fact that the site of Wadi El-Arab had been regularly damaged over the years by gold miners, suggested that the fortified site might also have been the target of their search. These initial tests made it possible to clear some of the walls of the enclosure, check that they were in good state of preservation in some place, reaching about 1.5 metres of height. A first cleaning of a building proved that several artefactual remains were still in place. All the excavations we undertook were carefully covered with sand before we left and were not visible on the surface.

After a two-year of absence, we returned to Sudan in December 2022. Our fieldwork began on January 1 and ended on January 30, 2023. The Swiss team was made up of only of three members (Matthieu Honegger, Jérôme Dubosson and Théophile Burnat). As usual, our NCAM inspector was Shahinda Omer. The reis Khidir Magboul supervised the team who reconstructed some protection walls of the Eastern Cemetery. Three other local workers helped us excavate sections of the Kerma fortified site. A second team under Prof. Nuno Bicho of the University of Algarve (Portugal) was invited by the Swiss team to work on MSA sites. The team was made up of prof. Nuno Bicho (Pleistocene archaeologist), prof. Jonathan Haws (Pleistocene archaeologist), Dr. Alvise Barbieri (geoarchaeologist) and Dr. Milena Carvalho (zooarchaeologist). They were accompanied by a Sudanese archaeologist, Osman Khaleel, who is employed by the University of Algarve as a PhD Student. The choice of this student was made under the recommendation of Dr. Salah Mohammed Ed-Din.

Our work focused on:

- The rehabilitation of our rest house, located north of the Eastern Cemetery and the reconstruction of a part of the protection walls in earth located of the east side. They were eroded by the wind and partially destroyed by the local farmers who seek to cross the cemetery with donkeys or motor vehicles. For this reason, we are now building walls with mud bricks, which takes longer, is more expensive, but stronger.
- The study on leather artefacts, textiles and basketry from the Eastern Cemetery by Théophile Burnat as part of his work on his doctoral thesis.
- The excavation on the Kerma fortified site. During the past two years, a lorry with a mechanical excavator came on the site as well as that of Wadi El-Arab and destroyed certain areas with pits dug several metres deep in the sandstone. They destroyed part of a stone building in the fortress. For this reason, we maximised the observations on this site, considering it to be in danger.

- The project DIASPORA – Early human Migrations and the Nile Valley: the Kerma region during the MSA is dedicated to the Pleistocene human occupation of the Kerma region. The basis for this project was established in January 2019, when it involved a short one-week visit to Kerma, following an invitation by Matthieu Honegger. That visit resulted in the discovery of a series of Middle Stone Age sites, in addition to the ca. 20 Pleistocene sites that Honegger had previously identified. Based on the results, Nuno Bicho, professor at the University of Algarve, obtained some funds to conduct a 3 years project. The fieldwork itself was conducted in the area of Jebel El- Azrak, with a survey and four test excavations on sites SK7 (rockshelter), SK11 (at the top of Jebel El-Azrak), SK87 (a quartzite quarry location mid-slope in Jebel El-Azrak) and SK95 (site on the alluvial plain). At these sites, samples were collected for dating and Pleistocene environmental research in the region was conducted. Moreover, a geophysical program based on GeoRadar under Alvise Barbieri was developed, in collaboration with the company Geo-Earth Integrated Solution, with the participation of Drs Mohamed Wahab and Dr Zuhir Mergani.

- Finally, the new project led by Marc Bundi on the conservation and valorisation of the recent heritage of the Argo Island began in December 2022, under the supervision of Matthieu Honegger. This project was submitted to the Kerma Foundation in 2019, with additions made in 2020 following a preparatory field campaign. This project also benefits from the support of the association PIN (Projects in Nubia), based in Zurich.

We warmly thank the director of the National Corporation of Antiquities and Museums of Sudan (NCAM), Dr. Ibrahim Moussa, and the director of archaeological fieldwork, Dr. Abdelhay Abdelsawi, for their support and for the possibility to continue our work, which began in 1994. The Swiss Mission is supported by the University of Neuchâtel, the State Secretariat for Education, Research and Education of the Swiss Confederation and the Kerma Foundation.



Figure 1 / Aerial view of the Eastern Cemetery in May 2023 obtained by Google earth. The intensification of cultivation stimulated by the new irrigation canals is exerting continual pressure on the preserved areas of the Eastern Cemetery, which represent a surface area of around 70 hectares.

After the excavation of one of the first royal tombs in the Eastern Cemetery in 2018, in a sector from the beginning of Middle Kerma (sector 31, tomb 691), we excavated another large tomb nearby in January 2019, which had already been previously studied by George A. Reisner's assistant in the Northern Cemetery (KN, tomb 170) (Honegger 2018a, 2019). In both cases, the presence of wooden architecture inside the grave was well attested, showing that a semi-circular shelter had been built, probably to expose the deceased for a time for a last homage, before closing the tomb and covering it with a tumulus. This is the first instance of a body lying on a bed, the footprints of which were found on the floor. The bed itself was surrounded by a wooden palisade, which was covered by the semi-circular structure, both open to the west. Searching through old documentation, we found the report of a similar example in a tomb excavated by Charles Bonnet in sector 25, dating from *Kerma moyen I or II*, situated further south than the two referred-to above.

Based on these observations, we wanted to confirm that the presence of wooden architecture in the largest tombs continued until the end of Middle Kerma. For the Classic Kerma period, almost all the large tombs were excavated by Reisner more than 100 years ago. As they contained mud-brick structures inside the tombs, we believe that this signifies the end of the use of a wooden architecture. This is how we came to excavate a last tomb in this Eastern Cemetery, in a location close to sectors 15 and 16, excavated 35 years ago by Bonnet and dated to the end of Middle Kerma (figure 2, grave 702). It is located at 30 metres north of the area excavated by Reisner. As is the case for the majority of Middle Kerma royal graves, the tomb was completely plundered. Nothing remained in place at the bottom of the grave and the material found originates from the filling of the grave. It is composed of numerous sherds of jars and fine vases of Kerma and Egyptian manufacture, as well as sheep and human bones – these last from at least two individuals. A large piece of hematite for the manufacture of red pigment was also found. The stones belonging to the tumuli described a circle of 15 metres in diameter, but plundering and erosion have resulted in an extension of the circle. At inception, the tumulus was probably smaller and more adapted to the seven metres diameter of the grave (figure 3). The filling of the tumulus itself contained earth, sherds and several mudbricks, suggesting that the workers who built it took earth from the surrounding area, which contained sherds originating from the plundering of other graves and mud bricks from the plundering of chapels.

The grave was two metres deep. At the bottom, postholes were present which described approximately the same kind of architecture we identified during the two previous seasons, namely a semi-circular hut open to the west with some imprints corresponding to the bed of the deceased (figure 4). However, the bottom of the grave was difficult to clean due to its irregular surface and because it was partially composed of sand. For this reason, it was not possible to identify all the postholes,

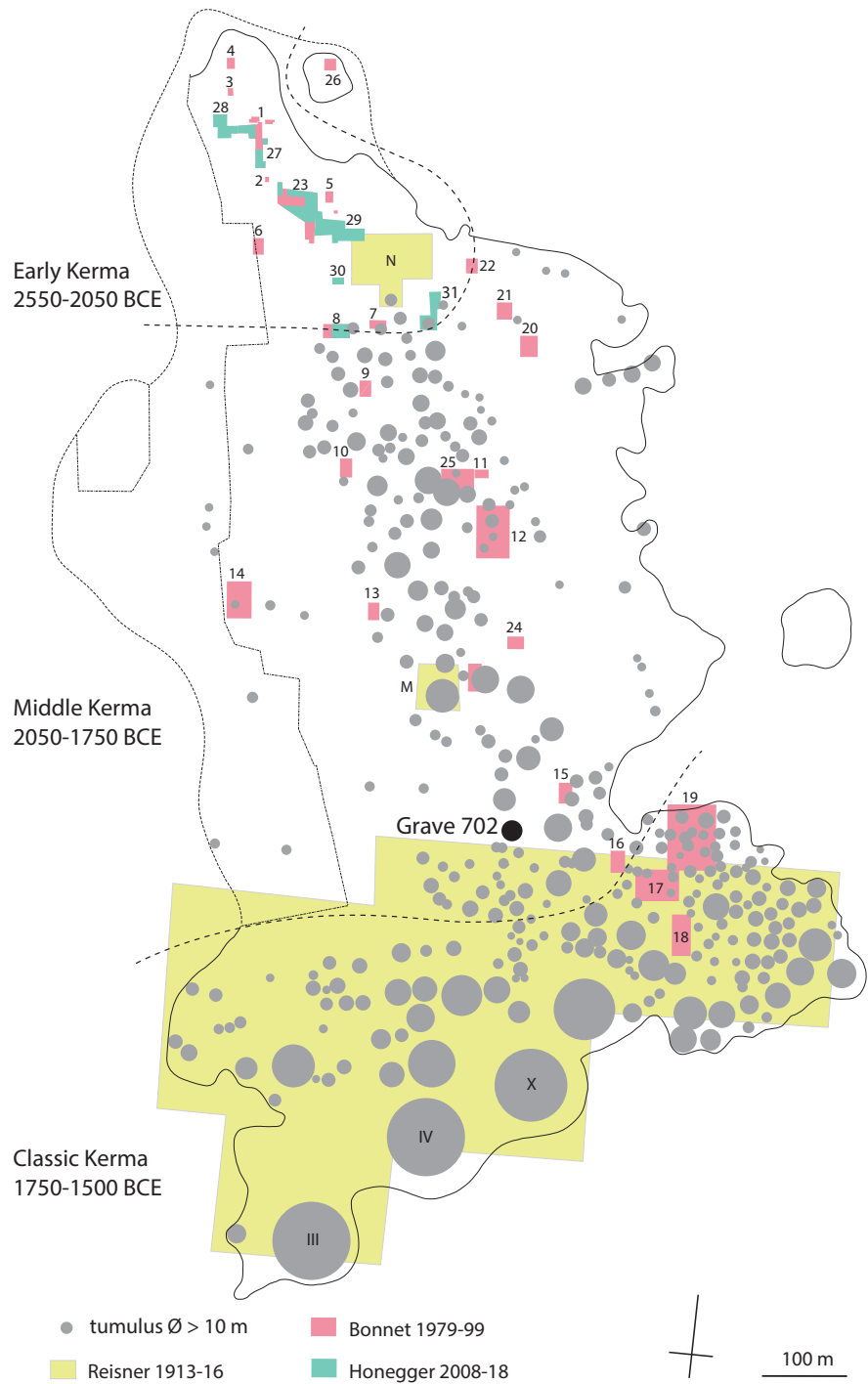


Figure 2 / Location of tomb 702, to the north of the section excavated by Reisner and close to sectors 15 and 16 excavated by Bonnet. This elite tomb, possibly a royal tomb, dates from the end of Middle Kerma.

as was the case during the two previous seasons when we excavated the first royal tombs of the Middle Kerma period. Consequently, the location of the deceased's bed is hypothetical and the arc of the circle described by the posts inside the tomb is incomplete (figure 5). South of the grave, bucrania were present as it is the case for the large graves in the cemetery. We cleaned them over a small surface area to gain

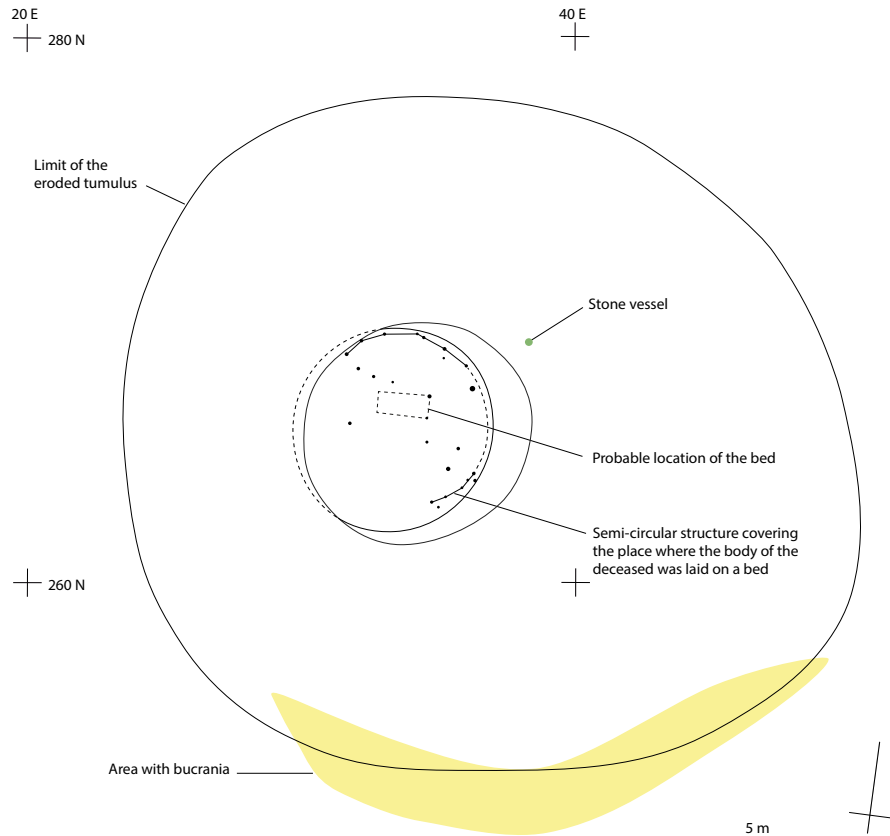


Figure 3 / View of tomb 702 during excavation.

Figure 4 / View of the grave-pit after it had been emptied. Following the looting, nothing was left in place and the remains were collected in the pit-fill. After cleaning, the bottom of the pit shows post holes forming part of a wooden structure similar to those found in the first royal tombs of the early Middle Kerma period.

an idea of their number, but it was not possible to make a precise estimate because they were in a poor state of conservation, but they probably numbered over 200. After cleaning them, they were again covered with sand to protect them.

The sherds collected in the filling of the grave correspond to 68 different vessels (figure 6). A detailed comparison with the published studies of Reisner and Béatrice Privati (Reisner 1923, Privati 1999) will be necessary to precise the pottery typology for this period of transition between Middle Kerma and Classic Kerma, which is not very well documented. During the excavation, we identified the presence of a carinated red and black top vase similar to some examples found by Reisner in the M Cemetery (Dunham 1982) and the absence of Classic Kerma beakers. Another thin vase has a metal strip under the black rim, as also found in sector 17, dating from the extreme end of Middle Kerma (*Kerma moyen VIII*, according to Privati



1999). Apart from one large wheel-turned jar with an orange paste, much of the pottery collected consists of pots of varying thicknesses, usually with a thickened rim and a body decorated with printed motifs or criss-crossing incised lines. These types appear to be common from the 2nd half of Middle Kerma. Some examples have a neck, one of which is a carefully finished and elaborately decorated vase with a particularly developed neck, which is also a late feature of Middle Kerma. As things stand, it is difficult to be more precise, but overall, it would seem that we are indeed in one of the last phases of Middle Kerma.

A stone vessel, carved out of black stone, was found in the tumulus 50 centimetres east of the grave and ten centimetres below the surface (figure 5). This vessel corresponds to Reisner's type V, described as Kohl-pots (Reisner 1923, 63-65). It has a flat bottom and a disc-lid. It is dark-coloured and could correspond to what Reisner called blue marble. The example found is larger than the pots described by Reisner, with a height of 14 cm and a width of 8,6 cm. The bottom is slightly damaged with a small hole, and a small flake is missing from the exterior of the body. The lid is somewhat fragile and has a small crack, whilst the rim and the opening of the disc-lid are worn. Nothing was found inside except sand but some small red tracks on the rim could correspond to hematite. This object is exceptional in the Eastern Cemetery because its surface is decorated with two monkeys (baboons) and two

Figure 5 / Plan of grave 702 with the location of the postholes inside the pit, the bucrania to the south of the tumulus, and the stone vase.

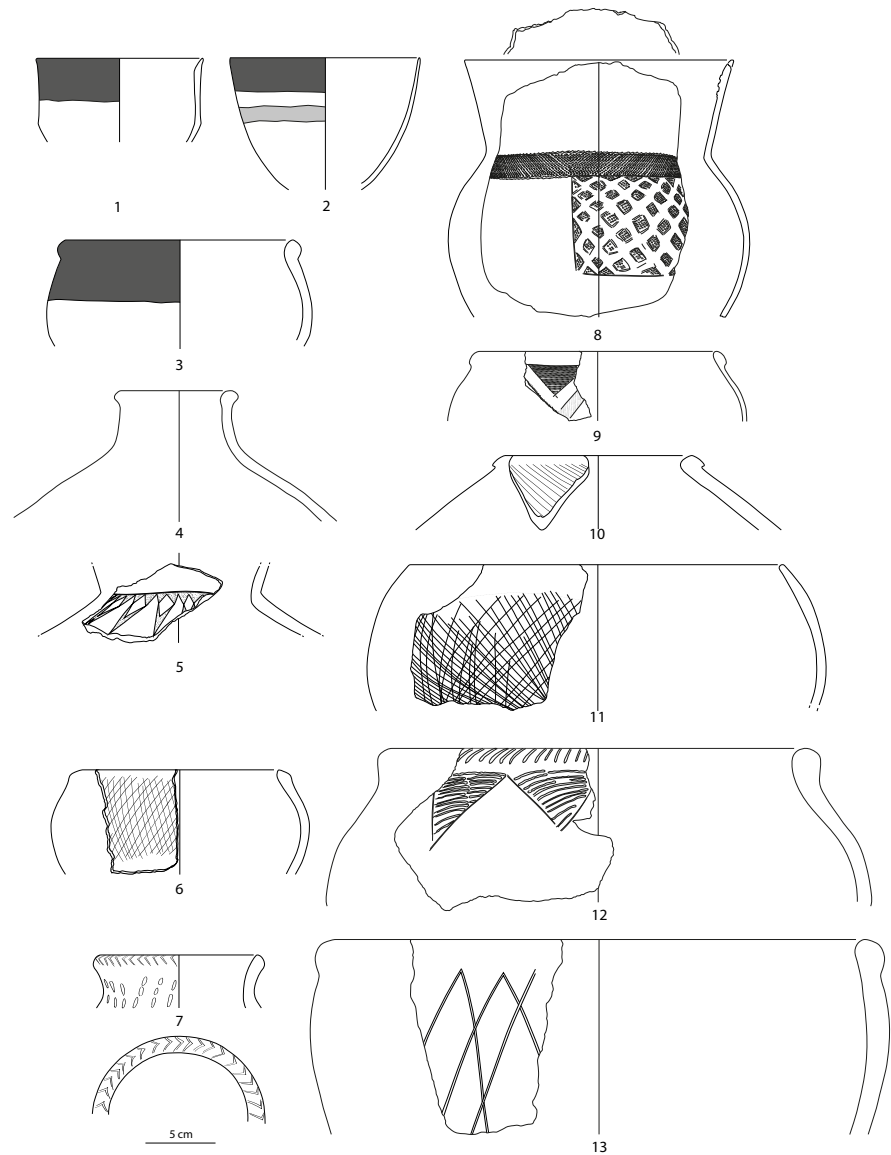


Figure 6 / A selection of pottery found in the pit of tomb 702, dating from the end of the Middle Kerma period.

crocodiles (figure 7). The style of these representations is apparently not Egyptian and is closer to a Nubian style. While the crocodile is a well-represented animal at Kerma, the interpretation of which was presented when the wall paintings at the KXI temple were analysed (Bonnet 2000), representations of baboons are rare. The only surviving examples are locally produced earthenware amulets, many of which have been found in the area of Classic Kerma excavated by Reisner (D'Itria 2021). Although such amulets were also produced in Egypt, those from Kerma are attributed to local production. The two baboons depicted on the Kohl-pot have their arms outstretched towards the sky. It is debatable whether this is a reference to the sun, even if it is not the usual posture of the adoring baboon. We know that the cult of the sun played an important role at Kerma (Bonnet 2000). Reisner highlighted the large number of Kohl-pots at Kerma and suggested that they might have been

produced locally. We do not have the evidence to prove this, and we first have to identify the stone used and its origin. Regarding these crocodile and baboon decorations, a whole series of marks can be seen around the figures, suggesting that the work was carried out after the vase had been manufactured and polished.



Figure 7 / View of the stone Kohl-pot with engraved baboons and crocodiles found in the tumulus of tomb 702.

FIRST INSIGHTS INTO THE EXCAVATIONS OF A CLASSIC KERMA FORTIFIED SITE IN THE HINTERLAND

A fortified site of the Kerma period was identified three decades ago on the edge of the alluvial plain south of the 3rd cataract, about 15km from the actual course of the Nile (Bonnet and Reinold 1993). It lies on the edge of the Nubian sandstone plateau that borders the alluvial plain and rises a few dozen metres above it (figure 8). The site consists of an enclosed area, oval in shape, 134 m long by 84 m wide. We have been monitoring it regularly since 2005, when we began excavating the Mesolithic site of Wadi El-Arab, a few hundred metres to the north. Wind erosion is gradually damaging the site, especially its surrounding wall. Vehicle traffic, which has become much more frequent in the desert since the 2010s and the gold rush, is also tending to damage the site. In addition, the Wadi El-Arab site had already been destroyed on several occasions in the form of pits of varying depths, probably in search of treasure or gold. For all these reasons, we had been keen for some time to carry out a series of test pits in order to assess the state of the remains and gather a minimum amount of documentation on the site. As a result, we were able to carry out two short surveys and excavations, the results of which will shortly be published in the journal *Sudan & Nubia*.

In January 2020, a first plan of the enclosure was drawn up and some areas were opened in order to establish the state of the walls and their dimensions (figure 9).

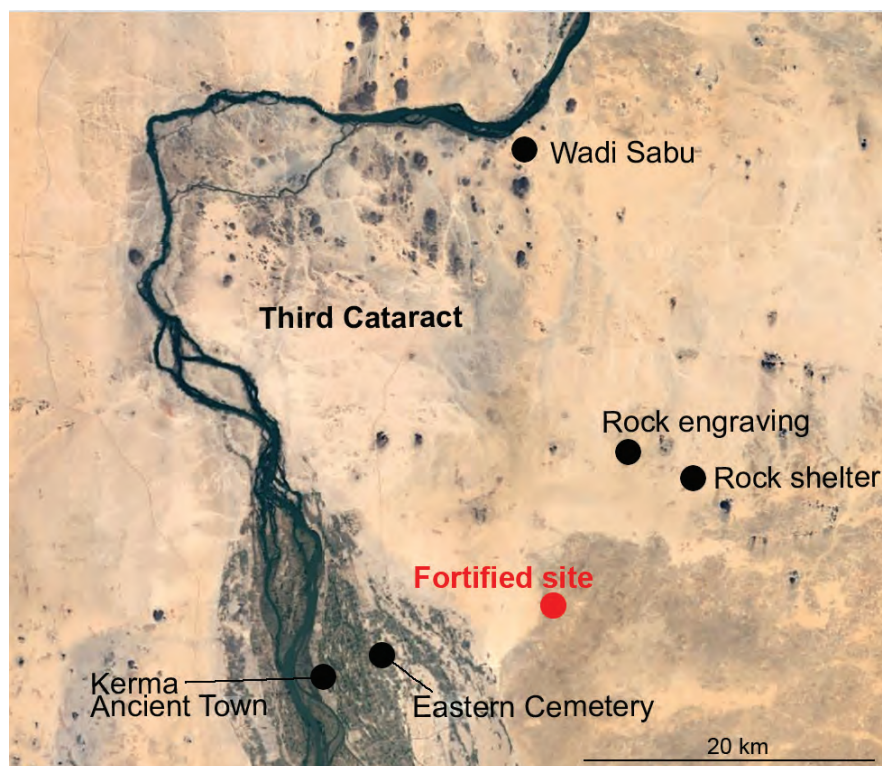
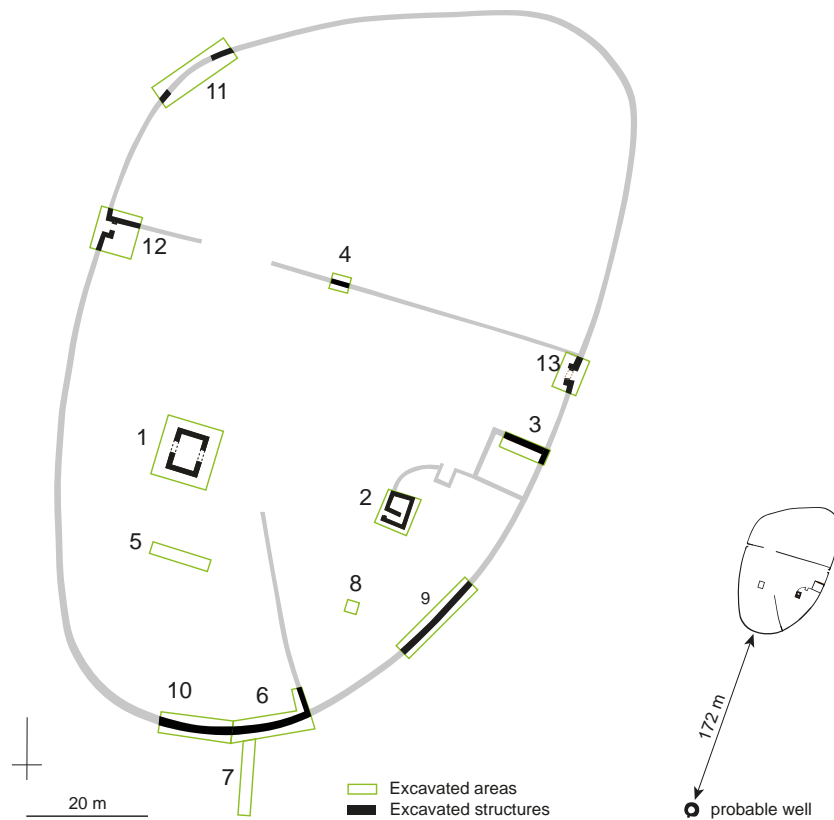


Figure 8 / Location of the fortified site south of the third cataract with the two main Kerma sites (ancient town and Eastern Cemetery) and other sites mentioned in the text.



From its southern edge, 172 m to the south-west, was a circular stone structure 14 m in diameter, which could be a well. We selected eight areas for surface cleanings or test excavations. Areas 1, 2, 3, 4 and 6 provided information on the state of preservation of the stone walls, their dimensions, and the presence of artefacts, while the areas 5, 7 and 8 were partially excavated to identify archaeological layers or destruction levels. After clearing the surface layer of sand and stones, the structure of the walls appeared clearly (figure 10). Made with yellow or black Nubian sandstone blocks quarried in the vicinity, with a mortar composed of silt mixed with small sandstone gravel, they were built very regularly. The width of the enclosure wall is comprised between 1,1 and 1,3 m when its elevation is preserved to a height of 1,5 m in the less eroded areas (figure 11). These walls were built of stone and silty mortar, since we did not observe the presence of any mud or red brick. The other walls identified inside the enclosure are generally built differently, with smaller and less regular sandstone blocks, as is the case with the three rectangular buildings (areas 1, 2, 3). Two walls were erected inside the enclosure; one crossing the site from east to west divided it in two parts. Bonnet suggested that it belonged to the enclosure of an earlier fort, later enlarged by the addition of a semi-circular area to the north (Bonnet and Reinold 1993). Based on our observations made in area 4, we cannot confirm this interpretation since the general oval shape of the enclosure is not in agreement with the idea of a building in two phases. In addition, our cleaning work has shown that the inner wall dividing the site in two was built against, and after, the wall of the enclosure.

Figure 9 / Plan of the Classic Kerma enclosure with the location of excavations areas. The small plan at bottom right shows the location of the supposed well in relation to the site.



Figure 10 / Portion of the wall of the enclosure after surface cleaning (area 6).



Figure 11 / Elevation of the enclosure wall on the right and of an inner structure wall on the left (area 3). The foundations of the enclosure wall appear to be only of 20 centimetres deep.

We opened some trenches or cleared small square surfaces to look for archaeological layers or destruction levels (areas 5, 7, 8) but did not find any remains other than a few pottery sherds. It suggests that a large part of the archaeological deposits is not preserved, other than inside the three square structures or close to some walls, particularly in the southeastern part. Inside the enclosure, there are few buildings and large areas appear to be without any preserved architectural structures. As suggested by Bonnet, the garrisons probably lived in huts made of wood and mud, the remains of which have generally not withstood wind erosion.

After a two-year absence due to the Covid crisis, we undertook a new excavation campaign lasting two weeks in January 2023. During our absence, a lorry with a mechanical excavator came on the site and destroyed some areas with pits reaching deep into the natural sandstone layer (It would seem that they came from the Delgo area where various gold mining companies operate). It is possible to date this destruction to the period between the end of 2020 and the end of 2022 (figure 12). Subsequent to this event, we decided to focus on two of the three quadrangular buildings inside the enclosure and on identifying the fortification gates.

Both excavated buildings are quadrangular and contain all the typical remains of habitation structures: fragments of jars and pots, grinding material, lithic tools, fireplaces and faunal remains. Building 1 is rectangular and its dimensions range from 5,3 m east-west to 6,9 m north-south and its entrance must probably have been on the east or west side, but the trench made by the looters destroyed it (figure 13). The width of its walls is about 0,80 m and they are preserved to a height of more than 0,5 m. The trench made by the plunderers provided the opportunity to clean two stratigraphic profiles to obtain a better understanding of the building techniques as well as the history of the occupations of this building. The same mortar as for the enclosure walls was used between the stones and on the inner surface of the walls,

Figure 12 / Destructions made by looters on the Kerma fortress. The tracks of the lorry are still observable. On the right, the structure 1 with a part of the east-west trench.



Figure 13 /View of building I taken from the south-west. The trench made by the looters cut the building in two parts. A grinding stone still in place is visible in the north-western angle.



Figure 14 / View of building 2 taken from the west. The entrance of structure 2 is located to the west and a wall of separation inside the building defines a kind of antechamber or corridor. In the north-eastern angle is installed a fireplace with a stone structure.



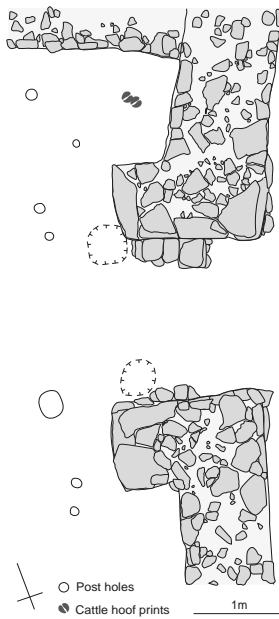


Figure 15 / Plan of the eastern entrance of the enclosure.

which is relatively thick for a plaster, attaining approximately 10 cm in some places. The floor inside the building was also covered by a fine layer of mortar on two separated levels of occupation, which means that the floor was refreshed. In these occupation levels we found Kerma artefacts and faunal remains, accompanied by a fireplace and a grinding stone still in place in the north-west corner of the room, set into the mortar floor. Other remains of hearths were present at the base of the sandy superficial level and probably correspond to recent occasional activities at the site. The remains of a tin plate and very coarse, poorly fired pottery confirm these recent occupations, which probably date back to the last century.

The dimensions of the slightly smaller building 2 range from 4,1 m east-west to 5 m north-south (figure 14); its walls are thinner (0,5 m) and its layout is more complex. The entrance is on the west side and leads through an antechamber to the main room in the northern part of the building. The north-west corner of this room was looted a long time ago, but despite this, a fireplace was preserved, consisting of a combustion area surrounded by two rows of stones used to support the cooking pot.

Finally, we looked for the entrances of the enclosure, which were identified after a series of tests in the extension of the east-west dividing wall (areas 12 and 13). The western entrance is not very well preserved. Many of the stones from the walls had collapsed and it was difficult to determine certain boundaries. It is 1,3 m wide and consists of a re-entrant wall to the south, while to the north it backs onto the east-west dividing wall of the site. The entrance to the east is the best preserved; it is 1,7 m wide and consists of two re-entrant walls (figure 15). Nearby, two very distinct depressions in the floor must be associated with a door system. Otherwise, this eastern section, protected from erosion by the east-west wall, has yielded in situ levels and a relatively well-preserved floor. Postholes and cattle tracks were found. Several fragmented beakers were also found in this sector. These discoveries show that the internal surfaces of the enclosure are preserved in places and that we should be able, particularly in the eastern part, which is the less eroded, to carry out more extensive excavations to detect the architecture built in wood and earth, which cannot be detected on the ground surface as is the case with the stone walls.

Generally speaking, the artefacts and faunal remains were mainly concentrated in the levels of destruction of the two buildings excavated. Among the pottery, there are at least two Egyptian wares, one with an orange paste (type EIII of Gratien 1986, 402), the other with a grey-yellow paste similar to the Qena type (type EI of Gratien 1986, 398-400). The most characteristic elements are the beakers with their metal strips, typical of the Classic Kerma period (figure 16). Our inventory shows that jars, pots and bowls dominate the finds in the enclosure, which is hardly surprising considering that it was a place of habitation. Fine wares are less common here than in funerary contexts, where they are always better represented. The typology of the jars is not well known either. Gratien (1986) points out that jars



Figure 16 / Beakers found close to the eastern entrance.

Figure 17 / Fragments of jars found in building I.

often had fairly large openings with thickened rims printed with a cross-hatched pattern. A few similar examples can be found in the fortified site, while others have a raised rim (figure 17). It is difficult to determine whether the fortified site covers the whole of Classic Kerma period or whether it dates from the beginning or end of it. ¹⁴C analyses on charcoal from the fireplaces found in the buildings should provide sufficiently precise results to clarify this question.

Research into fortresses and enclosures in Nubia has developed considerably in recent years (cf. Jesse 2019; Jesse and Vogel 2013; Zurawski 2019). Apart from the fortresses built by the Egyptians during the Middle Kingdom along the 2nd cataract, most of the finds are more recent than the present site and are generally quadrangular in plan. In our case, it's safer to talk about a fortified site or an enclosure, rather than a fortress. The latter is usually a heavily defended site, whereas our Kerma enclosure

has simple gates, its walls were most probably not topped with a parapet walk and it is located on relatively flat ground without any extra defensive features. However, a number of non-quadrangular enclosures have been documented, showing that this type of layout is not unknown. The fortified village of Wadi es-Sebua, dated to the end of Group C ca. 1800 BC, seems to be slightly older than our Classic Kerma site (Adams 1977, 149). Other oval enclosures relatively similar to the Classic Kerma site have been recorded in different part of Sudan, but few of them are well-documented and are much more recent, when dated (e.g. Gratién 2013, 36-40, pl. 28-29, Kröpelin 2006). Moreover, the differences in their cultural and geographical context make comparisons with the Kerma region difficult. In addition to their defensive role, these sites can fulfil multiple functions, such as posts to protect watering places, trade and traffic routes, places of refuge (Jesse 2019, 1087). In our case however, it must have been built to control the access to the Kerma basin and to protect the region, particularly the kingdom's capital and the entire network it controlled. The presence of stone cairns or shelters built on the heights around the site could correspond to markers visible from afar or to observation posts (figure 18). However, they may have been used at various times and it would be necessary to carry out excavations there to date them precisely.

The fortified site was built during the last period of the Kingdom of Kerma (Classic Kerma, 1750-1500 BC), at a time when the kingdom's power was great, but the Egyptian threat very real, at least from the New Kingdom onwards. Its location seems coherent (figure 8). It is at the end of the road coming from Wadi Sabu, skirting the relief of the 3rd cataract, which is one of the natural routes into the Kerma basin from the north.

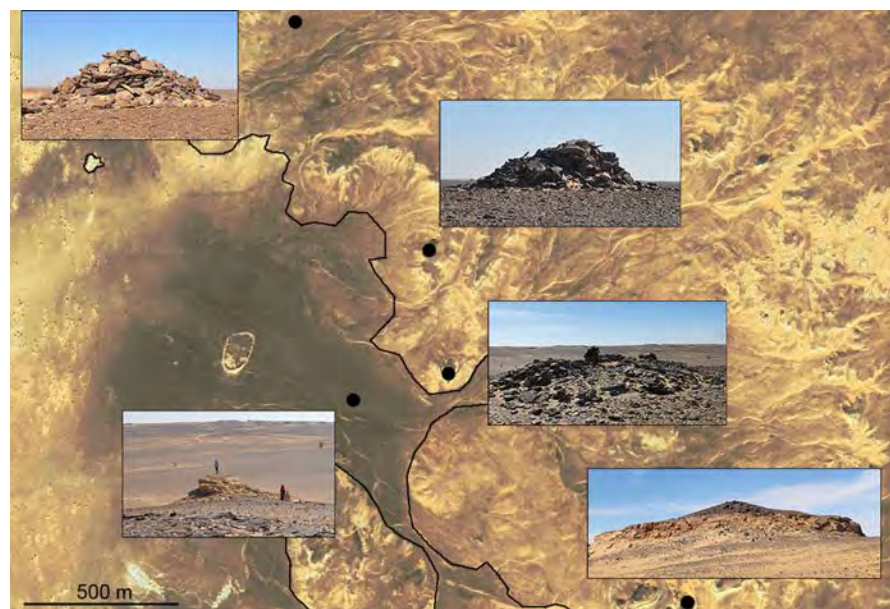


Figure 18 / Location of stone cairns or shelters at the top of the Nubian sandstone plateau in the vicinity of the fortified site. They may have been used as observation points to monitor the surrounding area.

DIASPORA - EARLY HUMAN MIGRATIONS AND THE NILE VALLEY: THE KERMA REGION DURING THE MIDDLE STONE AGE

The project DIASPORA – Early human Migrations and the Nile Valley: the Kerma region during the MSA – is an integral part of the concession of Professor Matthieu Honegger and is dedicated to the Pleistocene human occupation of the Kerma region. The basis for the project took form in January 2019, with a short one week visit to Kerma, subsequent to an invitation by Honegger. The visit resulted in the discovery of a series of Middle Stone Age sites, in addition to the *ca.* 20 Pleistocene sites that Honegger had previously discovered. Based on the results, it was decided to submit a 3-year project to the Portuguese National Foundation (Fundação para a Ciência e a Tecnologia), which was successful in obtaining funding in the 2020 FCT call for projects. The project was due to officially start in 2021 but did not get underway until the end of 2022 due to the COVID pandemic.

The fieldwork started on the 4th of January, 2023 and there were 14 days of effective fieldwork. The team was composed by: Nuno Bicho (PI), Matthieu Honegger (Co-PI), Jonathan Haws (University of Louisville, USA), Milena Carvalho (ICArEHB, Universidade do Algarve), Alvise Barbieri (ICArEHB, Universidade do Algarve), and Osman Khaleel (ICArEHB, Universidade do Algarve). The team hired 2 cars from the company Discover Sudan, which were driven by Mr El Amani Hassan and Mr. El Taieb Mohamed.

The main objectives of the 2023 field season were:

1. Survey and establish the location of more Pleistocene sites, particularly those dating from the Middle Stone Age;
2. Collect artifact samples from the sites, to ascertain the technological and typological characteristics of the regional MSA, topic of the doctoral dissertation of Osman Khaleel;
3. Carry out archaeological testing at 2 to 4 sites, including the rockshelter identified in 2019, with the designation SK7;
4. Collect samples from the Pleistocene for dating and environmental research of the region;
5. Develop a geophysical program based on GeoRadar headed by Alvise Barbieri, in collaboration with the company Geo-Earth Integrated Solution, in particular with Dr Mohamed Wahab and Dr Zuhir Mergani.

The survey focused on the northern area around the basalt plug named Jebel El-Azrak (also known as Jabel El-Azraq or El-Azrag) - JEA, within a radius of about 5 km in all directions from JEA (figure 19). The survey took place on foot, starting on natural features, such as basalt outcrops and basalt plugs, including JEA or a plug to the south-east, named Jebel El-Tabak, equally covering the top part of the hills, outcrops and plugs, the immediate low-land vicinity, as well as some of the



Figure 19 / Sites identified during the survey in the Jebel El-Azrak region with the location of the transects covered with GeoRadar (GPR).

alluvial plain between those natural features. For the most part, the on-foot survey was carried out in parallel individual lines, 25 and 50 meters apart.

Eighty-nine sites were identified during the survey, of which one was Holocene, 9 contained both Holocene and Pleistocene materials, and 73 were Pleistocene. There were also 6 sites where the materials did not include any diagnostic stone tools and it was therefore not possible to attribute a general chronology to their assemblages. Five rockshelters sites were identified while the remaining sites were open-air, of which at least 3 were quarry locations. During the survey, most of the artifact collection took place at sites with MSA material. Artifact collection was focused mostly on material that was either diagnostic or could provide particularly important technological information to define and characterize the local and regional MSA. Material was collected from 64 sites for a total of more than 1300 artifacts (figure 20).

Test excavations took place in 4 different locations: at the multicomponent rockshelter site named SK7 (figure 21), found in 2019; one of the artifact concentrations on the top of JEA; a quartzite quarry location mid-slope on JEA (SK87); and an isolated surface concentration of basalt artifacts on the alluvial plain (SK95).

At SK7, two contiguous 1 m² test pits, were opened (figure 22). The excavation revealed a 1,1 m deep sequence, with at least 3 components. The top 30 to 35 cm was marked by the presence of Kerma age materials, followed by a *ca.* 40 cm thick Mesolithic horizon capping a MSA horizon at the base of the sequence (figure 23).



Figure 20 / Artifact collection at the site SK49.

Figure 21 / General view of the rock-shelter SK7.



The whole sequence was very rich in material, with the presence in the Holocene horizons of ceramics, lithics, ostrich egg-shell (OES), aquatic shells and small, very eroded bone fragments. In the Pleistocene horizon there were only lithic artifacts. A set of optic stimulating luminescence (OSL) samples were collected at the bottom of the sequence and ostrich eggshells (OES) will be used to date the Holocene contexts.

The test excavation on the JEA circle artifact concentration was limited to 0,5 m² due to the density of the material finds. The archaeological horizon was 30 cm thick, resting on large basalt blocks, probably part of the local bedrock. The lithic assemblage is typical of the MSA technocomplex.

Figure 22 / View of the testing under the rock-shelter SK7.

SK87 was identified in 2023 and immediately tested. It is a quarry site for white quartzite and, as normal for similar sites, very rich in artifacts. A 1 meter-wide profile was cleaned, and testing took place again in a 0,5 m² excavation. The artifacts were



heavily concentrated in the top 30 to 40 cm, resting on sandstone bedrock. As at the previous location, the material was typical of the MSA.

SK95 is a unique location. It was the only site found on the alluvial plain and was likely exposed very recently, since the material shows very few signs of wind erosion. The more than 300 artifacts, which were 3D mapped on the surface, were concentrated in an area of *ca.* 25 m². Mapping took place of the entire archaeological site and it is expected to provide data for spatial analyses at some future date. The GPR results show that there is an old surface that emerges at various points of the alluvial plain and it is at one of these points that SK95 is located, which explains the site preservation and exposure of the artifact-bearing surface.

OSL samples were collected in sites SK7, JEA and SK95. In addition, there was an artificial trench previous to our work, in the middle of the alluvial plain, where



Figure 23 / East profile of test 2 under the rock-shelter SK7.

Figure 24 / General view of a GPR transept, between Jebel El-Azrak and the site of SK7.

two OSL samples were collected for reconstitution of the landscape during the Pleistocene. In addition, sediment samples were collected for phytoliths and pollen analyses. The GPR program was developed to better understand the evolution of the regional palaeolandscape, with readings around SK7, SK95 and in the alluvial plain between SK7 and JEA (figure 24).

Artifact analyses will be carried out by Osman Khaleel for his doctoral dissertation, while geophysical analyses will be carried out by Alvise Barbieri.



STUDIES ON THE MATERIAL AND EXCAVATIONS OF THE EASTERN CEMETERY

After the excavation of a last royal tomb in January 2019 (Honegger, this volume), we no longer plan to excavate new tombs in the Eastern Cemetery. For the period from the beginning of Early Kerma to the beginning of Middle Kerma, our excavation of 409 tombs enabled us to investigate the sectors that had already been opened up but not studied in their entirety, while opening up two new sectors that provided new information. It has thus been possible to build an absolute chronology covering five phases, from 2550 BC to 1950 BC, which enables us to precisely reconstruct the evolution of funerary rites and how society evolved up to the advent of the Kingdom of Kerma, marked by the appearance of the first royal tombs at the beginning of Middle Kerma I (2050-1950 BC). As regards that part of the cemetery used during Classic Kerma, it was almost entirely excavated by Reisner (figure 2), although Bonnet, in his work aimed at collecting information on all periods, did open-up two sectors that had not yet been exploited (CE18 and CE19). Thus, for Middle Kerma, we believe that the sectors excavated by Bonnet, supplemented by the results obtained by Reisner from Cemetery M, provide sufficient information on the rituals of this period, although it may prove fruitful to return to certain sectors and excavate them systematically, as we did for the first phases of the cemetery. The excavation of Middle Kerma tombs comes up against two difficulties however: firstly, the pits are often large and require a lot of time to empty before any remains can be found, and secondly, looting was much more intense in Middle Kerma than in Early Kerma, resulting in many funerary contexts being completely dismantled. Added to these considerations is the fact that in recent years there has been talk of classifying the main Kerma sites as UNESCO World Heritage sites. As a result, it now seems more important to publish the results of our excavations and concentrate on protecting the Eastern Cemetery, which is under constant pressure from the extension of cultivated land.

In recent years, we have completed an inventory of all the categories of artefacts found in the tombs excavated during our programme, which ran from 2008 to 2018. A number of studies are nearing completion (bioanthropology, ceramics from the Kerma, Group C and Egyptian traditions), while others are in progress. To facilitate the analysis of the distribution of artefacts within the Eastern Cemetery, the plan of the latter was digitalised using GIS, which made it possible to link the topographical data with all the tombs and excavations since Reisner's first excavations (Dubosson and Burnat, this volume).

As regards the inventory of artefacts and ecofacts, these were classified according to the material used, for the sectors from *Kerma ancien 0* to *Kerma moyen I* that we excavated (figure 25). These initial inventories were subsequently taken up again during specialised studies, which invariably resulted in certain reorganisations and groupings. In 2020, the University of Neuchâtel student Théophile Burnat defended

a Masters dissertation on the sandals discovered during our excavations, starting with the basic inventories and then completing and modifying these in the course of an in-depth study (Burnat, this volume). Subsequent to this work, he has begun a doctoral thesis on the leather and textiles objects discovered during our excavations, with particular emphasis on clothing and leather craftsmanship.

For our part, the documentation at our disposal enabled us to carry out research on the archers' tombs and the material discovered relating to archery (Honegger 2023a), as well as on the potters' tombs and the craft of pottery (Honegger 2023b). In addition, during the first half of 2023, we organised a seminar with Master and Bachelor students from the University of Neuchâtel, on adornment from Kerma; by taking into account the material used, it was possible to distinguish six categories of adornment, each dealt with by a group of two students (figure 26). The first task was to check the inventories, to recognise each record as a complete set of ornaments (necklace, bracelet, belt, etc.) and to validate the records and control the quantity of their constituent elements, for the most part beads. It was only by surveying the tombs and locating where the objects of adornment had been discovered, that these records could be validated. To take one example, in the category of blue or black earthenware ornaments, 210 records were identified, although these included 11,956 beads. The students' work consisted in classifying the ornaments and their components according to precise observation and to the work carried out on the Kerma cemetery on the Saï Island, which remains the most comprehensive global study of Kerma ornaments (Gratien 1986). The inventories were also completed in the form of a catalogue. These ornaments were then analysed, taking into account their position in the tombs, as well as their position in the cemetery, the latter being obtained using the GIS carried out on the Eastern Cemetery. This approach

Figure 25 / Inventory of artefacts and ecofacts collected during excavations of the Early Kerma and Early Middle Kerma sectors of the cemetery carried out between 2008 and 2018 (CE 28, 27, 23, 29, 31, 8).

Category of artefacts and ecofacts	Number of records
Pottery (Kerma, C-Group, Egyptian)	2001
Cords, textiles and basketry	218
Leather objects and clothing	403
Ornaments	537
Stone objects (flint or cornelian flakes and tools, hammer, grinding material)	57
Organic elements (coprolites, contents of ceramics, plant and faunal remains)	481
Various objects (bone and ivory industry, wood, metal, incense, figurines, potters' tools)	80

Figure 26 / The six main categories of ornament defined on the basis of the nature of the material used in their manufacture.

Category of ornaments	Number of records
Ostrich feathers (fan, disc, plume)	30
Stone (beads, pendants, necklaces, bracelets, earrings)	67
Shell and coral (beads, pendants, necklaces, bracelets, earrings)	71
Animal bones, ivory and ostrich eggshell (beads, pendants, necklaces, bracelets, earrings, rings)	149
Blue and black faience (beads, pendants, belt, necklaces, bracelets, earrings, rings)	210
Miscellaneous (copper, gold, clay)	10

at cemetery level made it possible to specify the dating of a given ornament, i.e., whether it was specific to a given period or whether it was used throughout the Kerma culture (figure 27). Finally, the types of adornment were systematically compared with the sex and age of the buried individuals who wore them, in order to identify the types of adornment more specific to women, men or immature individuals. The seminar resulted in an overall study of ornament, which will be used to prepare the planned monograph on our excavations in the Eastern Cemetery of Kerma.

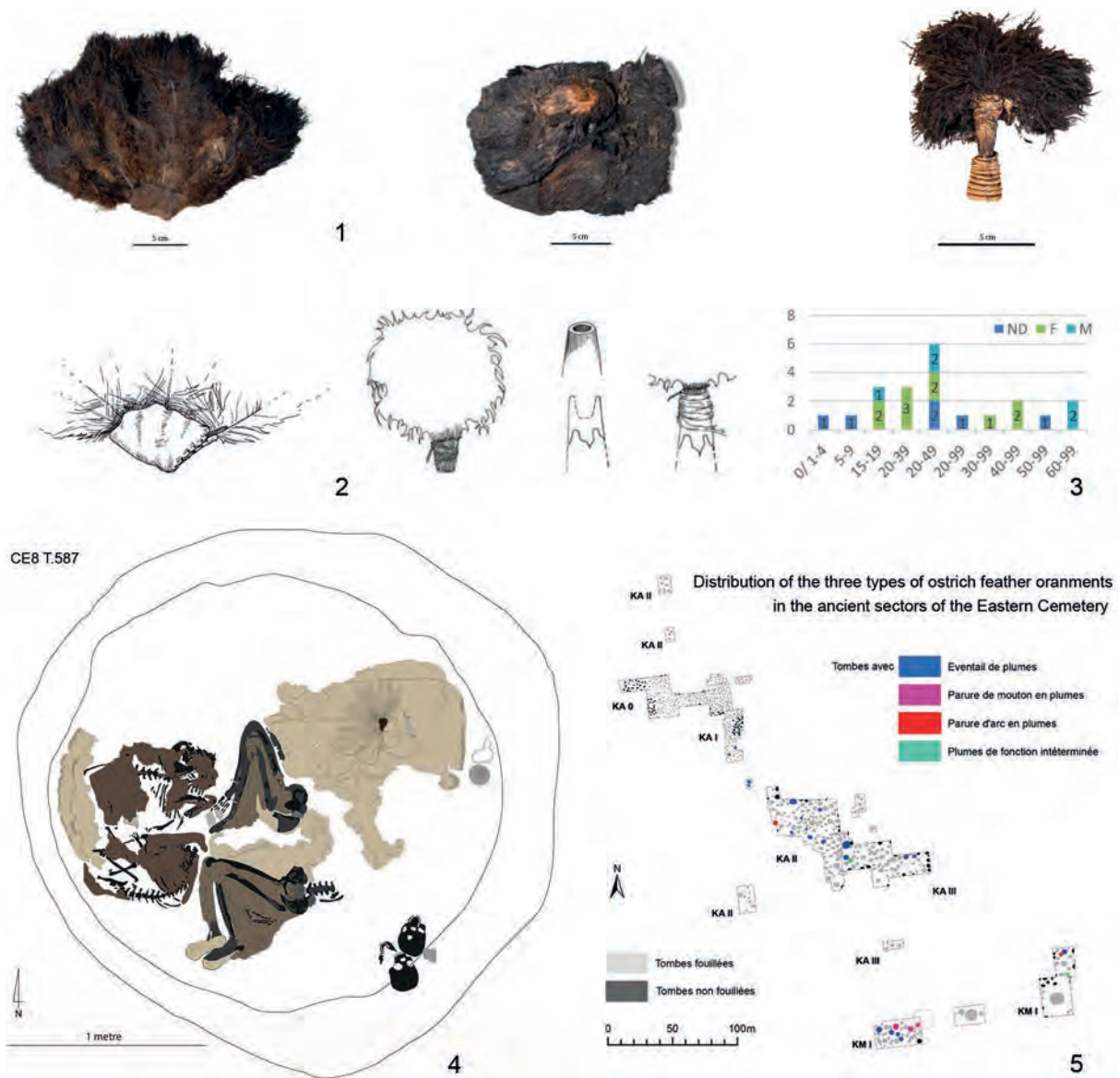


Figure 27 / Ostrich feather ornaments. 1. The three known types from left to right: fan, disc inserted in the skull of sheep, plume adorning the end of a bow. 2. Feather attachment system for a fan and a plume. 3. Distribution of fans according to the sex and age of the deceased. 4. Burial containing two women over 20 years-old with two sheep at their feet and a fan placed to the left of the centre of the burial. 5. Distribution of the three types of ostrich feather ornaments in the ancient sectors of the Eastern Cemetery. It shows that fans were present in *Kerma ancien I*, bow feathers in *Kerma ancien II*, and discs adorning sheep in *Kerma moyen I*.

From the first excavations carried out more than a century ago to those in progress today, the Eastern Cemetery of Kerma has been the subject of several plans, drawings and topographical surveys, some of which can be found in written paper archives (publications, excavation notebooks, binders or portfolios linked to field documentation) or in digital format (computer hard disk, computer server). These cartographic documents are generally limited to a particular sector, with rare overall plans. Most of them have common landmarks, but they also have different grid systems with relative positioning of the finds. Until now, these finds have not been located with the precision that would allow their absolute location in space to be established.

The aim of the project GIS and Digital Mapping of the Eastern Cemetery we are carrying out here is to bring together all the information relating to it in a computerized and long-lasting form, initially cartographic and then archaeological. In order to do this, our project will rely both on the data from the old excavations, which have been the subject of a major compatibility and archival effort initiated by the Swiss Archaeological Mission to Kerma several years ago, and on unpublished data from the recent excavations. From this point of view, the digital mapping represents a compilation of information compiled over an extended period of time, which will make possible to combine on a user-friendly medium the results of decades

CONTENT	DATA	BIBLIOGRAPHY
Early Kerma tombs drawings, direction M. Honegger. Sectors 23, 27, 28, 29, 30.	Illustrator Topography Paper <i>plannings</i> Published plans	Honegger, Bonnet and collab. 2009, 2010 Honegger and collab. 2011, 2013, 2015, 2017, 2019
Middle Kerma tombs drawings, direction M. Honegger. Sectors 8, 12, 31, 32.	Illustrator Topography Paper <i>plannings</i> Published plans	Honegger and collab. 2009, 2013, 2017, 2019
Early Kerma tombs drawings, direction C. Bonnet. Sectors 1, 2, 3, 4, 5, 6, 27.	Published plans MASK archives	Bonnet and collab. 1984, 1988, 1999
Middle Kerma tombs drawings, direction C. Bonnet. Sectors 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 20, 21, 22, 23, 24, 25, 26	Published plans MASK archives	Bonnet and collab. 1984, 1988, 1999
Classic Kerma tombs drawings, direction C. Bonnet. Sectors 18, 19S, 19N.	Published plans MASK archives	Bonnet and collab. 1982, 1986, 1988, 1991, 1999
Early, Middle and Classic Kerma tombs drawings, direction D. Dunham. Sectors N, M, B.	Published plans Satellite imagery	Dunham 1982
Early or Middle Kerma tombs drawings, direction G. Reisner. Sector N.	Published plans Satellite imagery	Dunham 1982
Middle Kerma tombs drawings, direction G. Reisner. Sector M.	Published plans Satellite imagery	Reisner 1923
Classic Kerma tombs drawings, direction G. Reisner. Sector B.	Published plans Satellite imagery	Reisner 1923
Official limits of the Eastern Cemetery	MASK archives	
GPS points.	MASK archives	
ESRI world base map	ArcGis Online	ESRI 2021

Figure 28 / List of the main data sets for the Kerma GIS project.

the complex evolution of the Kerma culture during more than thousand years of activity in the Eastern Cemetery (*ca.* 2550-1500 BC).

The aim of our approach is to reconstitute the complete topography of the site and to precisely locate in space each tomb of the first historically known kingdom in sub-Saharan Africa. GIS and Digital Mapping offer us new modes of representation of the Kerma funerary space. In a second stage, the digital projection of each funerary structure in vector form should allow us to integrate, store, analyze and display all the information needed for a detailed analysis of the site (figure 30). To each tomb, we will thus be able to associate a specific date, a funerary architecture, one or more deceased, their sex, and age, the objects associated with them, as well as the animals that accompanied them in death. This will allow us to highlight the spatial distribution of specific phenomena and the evolution of funerary practices over time. These are only the most obvious of the many issues addressed by field research and the study of the material.



Figure 30 / Layout from digital mapping of the Eastern Cemetery of Kerma (Sudan) based on available excavation data (Reisner, Dunham, Bonnet, Honegger) and satellite imagery (Google Earth).

STUDY OF THE LEATHER SANDALS FROM THE EASTERN CEMETERY OF KERMA

Since 2008, research led by the Swiss Archaeological Mission in Kerma under the direction of Professor Matthieu Honegger is focused on the earliest phases of the Kerma culture in order to understand the emergence of this original kingdom in the middle Nile valley. In particular, the excavations carried out in the northern sectors of the Eastern Cemetery enables new light to be shed on the chronology, material culture and socio-political organization during the second half of third millennium BC. This period corresponds to the oldest evidence known today concerning this Nubian community.

Among the numerous artefacts uncovered in the graves of Early Kerma, objects made from animal skin are of particular importance in view of their absolute number and impressive technical diversity. In fact, it would seem that the arid environment, where the principal necropolis of Kerma was founded, preserved to the present-day, one of the most important and ancient collections known of manufactured objects made from animal hides in the world. This collection contains a large variety of objects testifying to the way of life of this Bronze Age population, such as different types of garments, bags, quivers, shrouds and even archers' wrist guards, as well as composite objects, such as ostrich feathers plumes, where the feathers' beam is maintained in place by a sewn piece of rawhide. One particularly informative category of such objects is the sandals, which were likely present in every tomb of this period before either suffering natural degradation, or being plundered.

During the 2019-2020 season, a specialized study of these particular objects was undertaken as part of my Master studies final dissertation (Burnat 2020). The primary aim of this project was to provide basic description and analysis of the corpus dug up recently in order to feed the growing interest of the scientific community for this category of artefacts (see in particular Veldmeijer 2019). This corpus is made up of some 141 pairs of sandals discovered over these last few years, to which 10 additional pairs were integrated as they were available for study in the *Museum of Kerma*, Sudan, and in the *Musée d'Art et d'Histoire de la ville de Genève* in Switzerland. These supplementary sandals had been found in Kerma cemeteries during earlier excavations led by the Swiss Archaeological Mission managed successively by Charles Maystre and Charles Bonnet during the second half of the twentieth century. Thus, our study was able to analyse a total of 151 pairs of Kerma sandals, belonging exclusively to the "Eared Sandals" type, which is specific to the Nile valley of the pharaonic period (figure 31). This corpus represents by far the most important and ancient collection of such objects ever assembled, and revealed itself to be very rich and powerful material to understand the Kerma culture under very diverse aspects, such as artistic style development, technology, funerary rituals and symbolic representations.

Typo-chronological matters

One of the most important contributions of this study to archaeological issues lies in the typo-chronological definition of these objects, as it benefited from the unequalled morphological diversity of the sandals considered, as well as from the precious absolute dating of their archaeological context provided by the recent studies in Kerma, since every pair of sandals could be associated with the excavation sector in which it had been discovered and systematically ^{14}C dated (Honegger 2018). The 14 types of Nubian “Eared Sandals” identified and their 10 different types of decoration could therefore be precisely correlated with the five earliest phases of the Kerma Culture distinguished in the northern part of the Eastern Cemetery. In so doing, the stylistic evolution of these sandals could be reconstructed for the time lapses comprised between the *Kerma ancien 0* and the *Kerma moyen I*, between 2550 and 1950 BC. These results offer Nubian archaeology a brand-new instrument of chronological attribution, which could be considered complementary to traditional typologies based on pottery or the evolution of funerary structures, allowing sometimes to fine-tune the chronology of individual Nubian tombs excavated in contexts where physical dating techniques were not available. Above all, however, this precise dating of the ancient sandals from Kerma allows us to correct our current understanding of the evolution of footwear in the Nile valley. Contrary to what has been proposed in recent studies, the data we have collected suggests that leather “Eared Sandals” were produced and worn in Nubia long before they had been widely adopted in pharaonic Egypt, where they appear in a somewhat simplified form during the Second Intermediate Period, almost one thousand years later than the oldest specimens we know from Upper Nubia.

Figure 31 / Example of a typical pair of sandals from Early Kerma with a well-preserved decoration. Pair n°87, left and right sandals.



As suggested above, the study of sandals allows us to go beyond typology and chronology, as we seek to understand the general “way of life” of these Bronze Age populations. To this end, it has proved necessary to contextualize insofar as possible the evidence available. In the following sections, the principal topics reviewed in this study are presented alongside the archaeological data that, in addition to sandals themselves, were reviewed to this end.

Technology

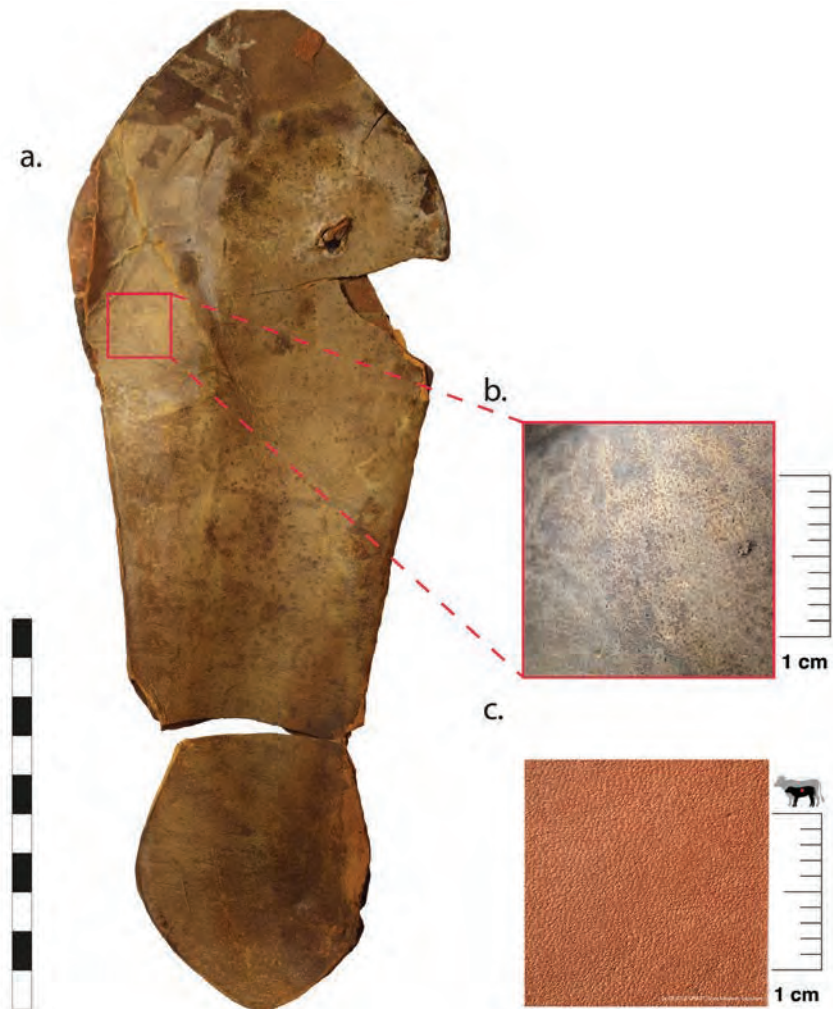
Based on the rich literature dealing with the manufacture of animal hide objects in prehistory, a general *chaîne opératoire* used by Kerma craftsmen to produce sandals could be presented in the form of seven successive stages. In order to enrich this reconstruction based on the observation of the objects, the study of sandals technology has benefited from two major sources of information produced as part of the research taking place in Kerma: on the one hand there are the tools associated with this specific craft, and on the other, the iconographic representations of sandals, both of which were recovered from tombs in the Eastern Cemetery.

As is the general situation in archaeological research on the use of hides and leather, many of the manufacturing steps employed remain unknown, such as the tanning processes to preserve the hide in both prehistoric archaeology in general and in the Nile valley in particular during pharaonic times, which give rise to heated debate. Thanks to the exceptional state of preservation that the sandals from Kerma show, however, two of these production stages which are most of the time impossible to examine could be documented, namely step one (selection of raw material) and step five (cutout), including the reconstitution of cutting patterns.

Concerning the selection of skins, decisive clues are directly provided by the surface of the soles of some of the sandals, on which the grain layer and follicle pattern have been preserved, which is very rare for such old artefacts. Comparing these specific patterns to the skins of modern animals enables us to identify sandals made of bovine (likely cattle) as well as caprine (likely goat) hides. Without surprise, these species are represented in proportions suggesting that the hides of bovines were selected in a privileged way to make sandals at that time, this raw material including pelts of mature as well as juvenile animals (figure 32).

As regards the cutout, the presence of pelt residues on certain specimens represents a discreet but particularly precious clue for the purpose of technical analysis (figure 33). In effect, the direction towards which fur grows on animal hide depends on the species concerned, but it always follows the same pattern on the animals of the same family. Identifying the orientation of hair on the objects made of a determined type of skin thus allows us to determine the original place and orientation of the soles' models on the original skin from which it was extracted (figure 34). Moreover, some sepultures of this period, documented by the Swiss mission,

Figure 32 / Example of a sandal from Early Kerma made of calfskin. a. Pair n° 136, left sole, view from above; b. Detail of the follicle pattern; c. Comparison sample of modern calfskin leather.

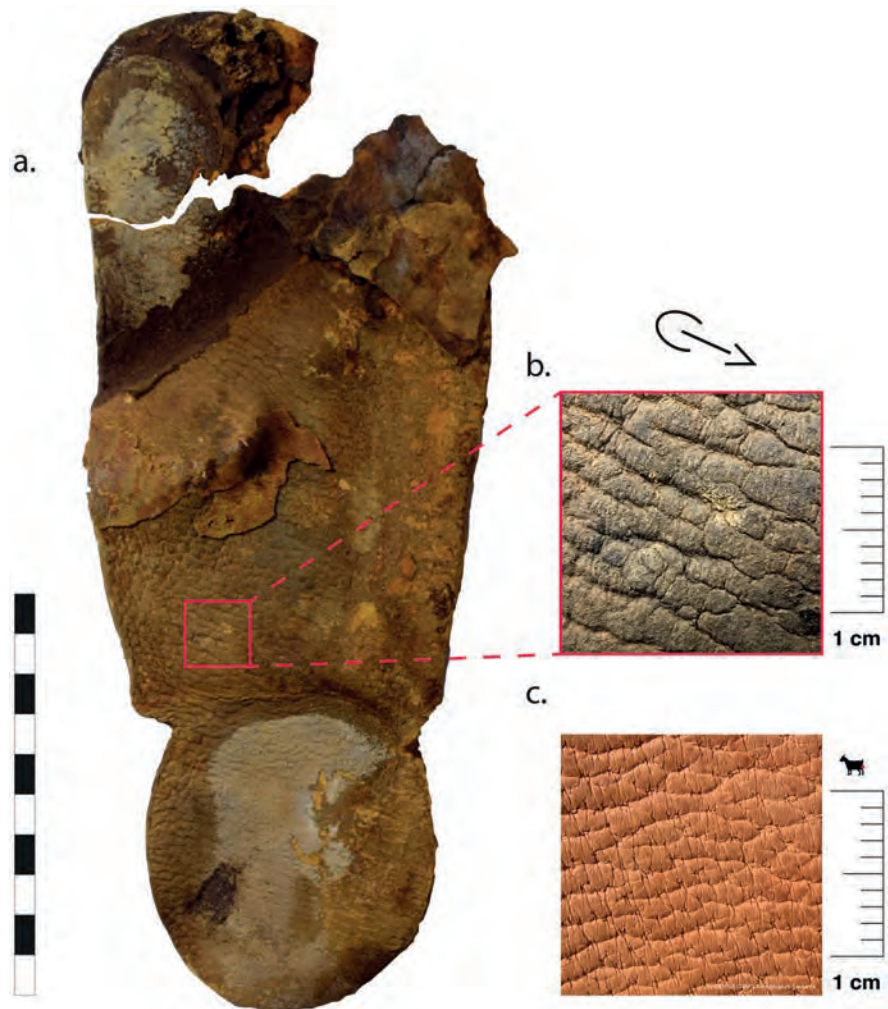


yielded shrouds made of cattle hides, on which sandal soles patterns were painted in red ochre. These figurations are organized in tightened rows corresponding to the cutting pattern identified, based on the observation of sandals. Of course, it is likely that the symbolic significance of such representations goes far beyond artisanal considerations. Nevertheless, it is remarkable that these representations were obviously inspired by the very cutting pattern in use at that time (figure 35).

Funerary practice

Thanks to the analysis of human remains discovered in the graves of Early Kerma phases, it was possible to associate the sandals with their original owner, thus enabling us to study the distribution of different types of sandals within the population buried in the Eastern Cemetery. Furthermore, the analysis as regards the placing of sandals in the funerary structure, available through the documentation associated with the excavations, appeared to have been of primary importance,

Figure 33 / Example of a sandal from Early Kerma made of a mature goatskin. a. Pair n° 12, right sole, view from above; b. Detail of the follicle pattern; c. Comparison sample of modern goatskin leather.



especially in regards to graves where several pairs of sandals were discovered. The majority of sandals were discovered in situ at the feet of the individual buried. In a few graves, however, the deceased possessed more than one pair of sandals in death, in which instances the extra pair or pairs were deposited near his legs (figure 36). This type of displaying illustrates the important role of sandals within the funerary equipment at Kerma, this role appearing to be representative of the central position sandals occupied in the symbolic conceptions of that time in the Nile Valley, especially regarding representations of death.

Symbolic representations

From the Palette of Narmer to the royal throne of Tutankhamun, there are numerous examples of Egyptian art testifying to the great symbolic importance of sandals during the pharaonic period. It would appear that depictions of sandals were assigned different meanings depending on the context and objectives pursued. Data

Figure 34 / Schematic representation of the fur on a goatskin with reconstituted position of a sandal sole.

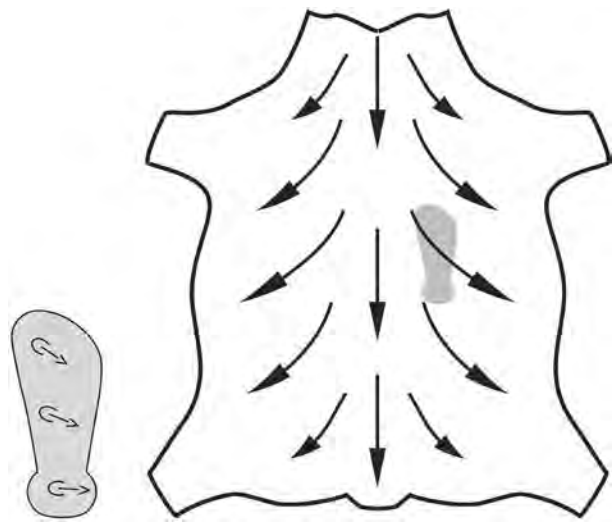


Figure 35 / Three tombs of Early Kerma where patterns of eared sandal soles were painted on the hide shrouds covering the corpses. Eastern Cemetery of Kerma (KAll and III; 2300-2050 BC). The skeletons, incomplete and disturbed by looting, have been reconstituted here in their original position, to clarify the illustration.

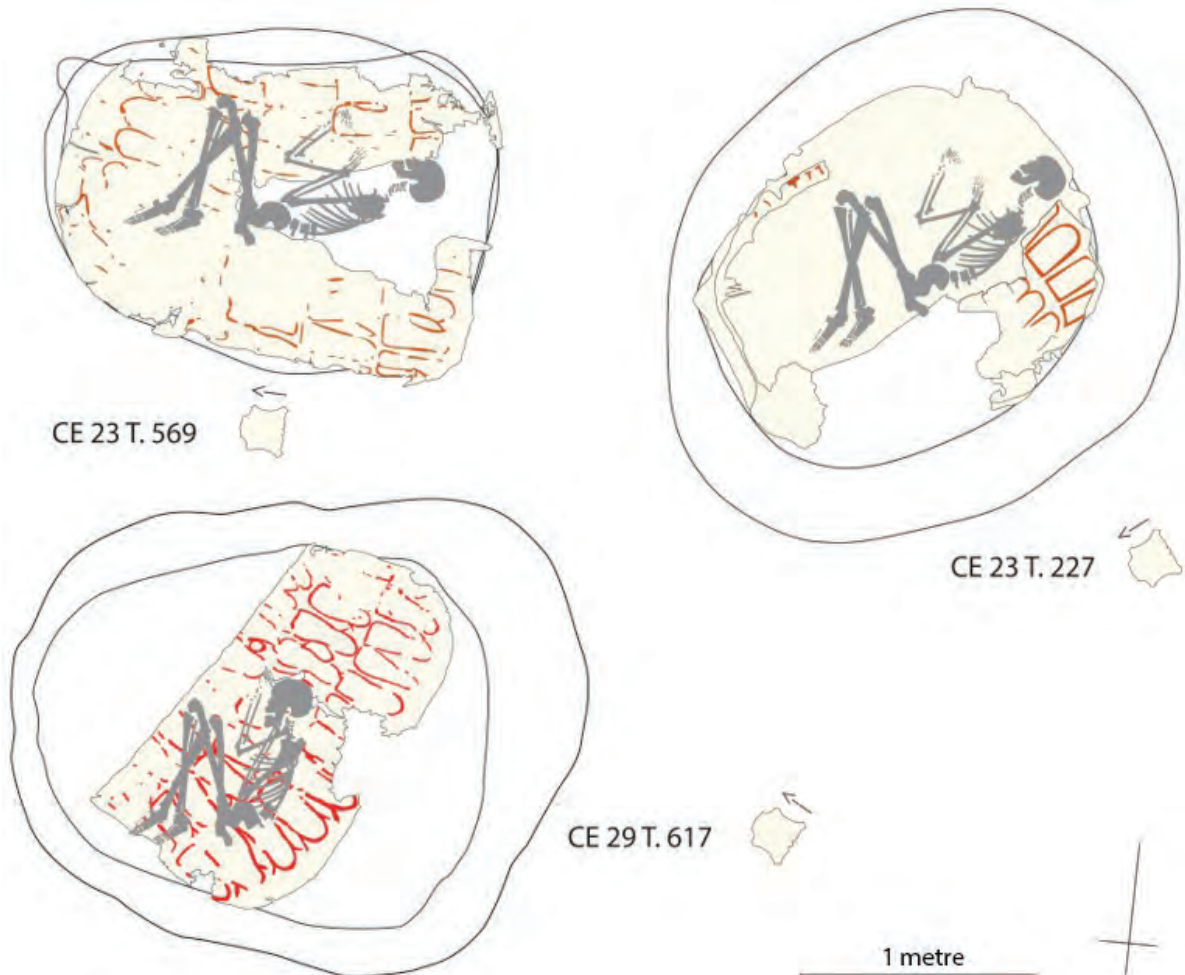
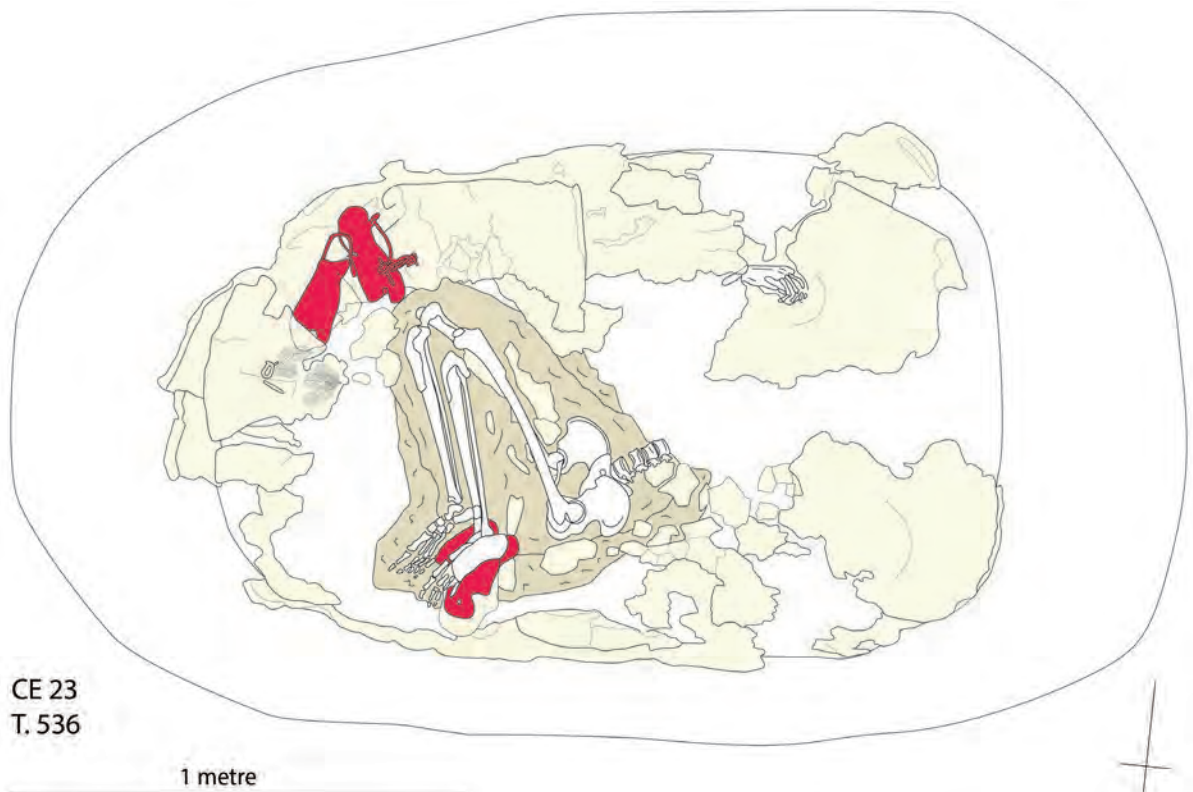


Figure 36 / Example of an Early Kerma grave from the Eastern Cemetery where the deceased woman was equipped with an additional pair of sandals. The two pairs of sandals are highlighted in red.

available in Nubia reflect this diversity, since there are representations of sandals in rock art of Nubian deserts as well as in certain early tombs of the Eastern Cemetery, where patterns of sandals were painted on shrouds covering the corpse (figure 35); this appears to represent a particular role of sandals in the representation of death consistent with Egyptian data, as evidenced by the spectacular collection of sandals discovered in the tomb of Tutankhamun, for example. It would therefore appear that footwear was a central element of the funerary rituals for the Egyptians as well as for the Nubians (Veldmeijer 2011). Even the famous hieroglyph “Ankh”, which refers essentially to the concept of life in Ancient Egypt, originally depicted elements of sandals (Allen 2014, 33). From this point of view, it is not surprising that sandals constitute the oldest painted figuration attested in Nubia. The special importance of sandals in the representations of death appears therefore to be part of a cultural background shared in the whole Nile Valley during the third millennium. The symbolic value of these objects possibly explains their high quality and astonishing diversity of their physical manifestations.



VALORISATION OF RECENT NUBIAN CULTURAL HERITAGE: THE NUBIAN HERITAGE INTERPRETATION POINT ON ARGO ISLAND

In 2019, after defending my doctoral thesis on archaeological museums in Sudan, I wanted to take advantage of my experience acquired over the last several decades in the Kerma region. I therefore decided to engage in another project to safeguard and promote the cultural heritage of Nubia. For several years, I have been employed by Matthieu Honegger as a scientific collaborator. In this function, I assumed responsibility for the protection of the Eastern Cemetery of Kerma which includes construction of roads and a protective wall, as well as for the rehabilitation of the Kerma Museum, a project supported with funds from the Qatar-Sudan Archaeological Project. My new project on Argo Island focuses on the more recent heritage, covering the last two centuries, including the history of the local royal family whose descendants still live on the island. The aim is to create an outdoor exhibition space situated in a landscaped courtyard, which serves to display a unique collection of 16 restored mud granaries used to store food or cereals (Gusaibas). Additionally, a covered section will be used to display other objects relating to the heritage of Argo Island.



Figure 37 / Mud granaries (Gusaibas) in the courtyard of the heirs of Abdelillah Abbas al-Malik (Argo-Tabdimar, January 2020). These are traditional granaries dating from the 17th to the 20th centuries, which will be restored and showcased in an exhibition space accessible to the public.

This project was inspired by my meetings with Abdelillah Abbas el-Melik (1947-2017), a descendant of the kings of Argo, who expressed the wish to protect the legacy of his ancestors and the preservation of the cultural heritage of Argo Island. After his untimely death, his children, Sitana (1982-) and Abbās al-Malik (1984-), took over the project and launched the idea of creating the Nubian Heritage Interpretation Point in a part of their house that would be accessible to the public. With this in mind, we founded the Zurich-based non-profit association, Projects in Nubia (PIN), to raise the necessary funds. At the same time, in 2019, we asked the Kerma Foundation to fund a part of this project. It implies to operate under the umbrella of Matthieu Honegger in collaboration with the association Projects in Nubia. The obtention of a written authorisation from the director of the National Corporation for Antiquities and Museums (NCAM) to build the centre and a cooperation agreement with the Kerma Museum were prerequisites for receiving the subsidy of the Foundation. The cooperation agreement was obtained in June 2020, but complications caused by the COVID-19 pandemic and by the political situation in Sudan meant that the project could not start as planned. Finally, initial funding from the Kerma Foundation was received before the end of 2022, thus allowing us to initiate the first phase of the project.

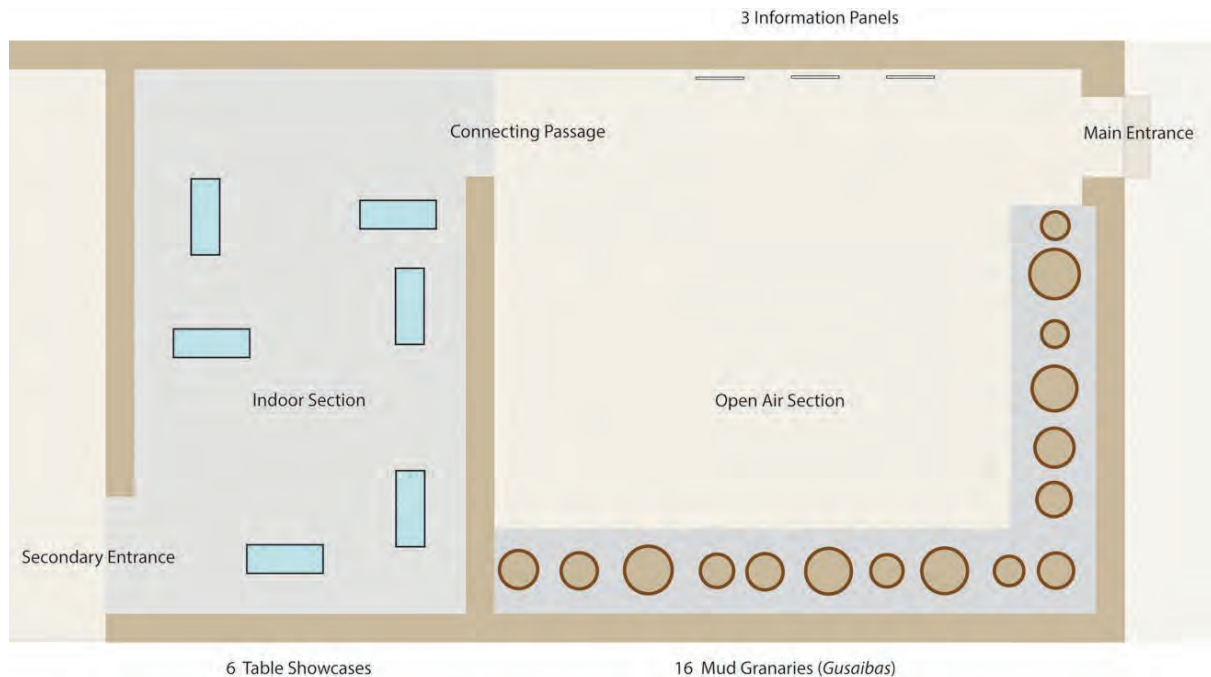


Figure 38 / Layout of the Nubian Heritage Interpretation Point on Argo Island, with the indoor and outdoor sections.

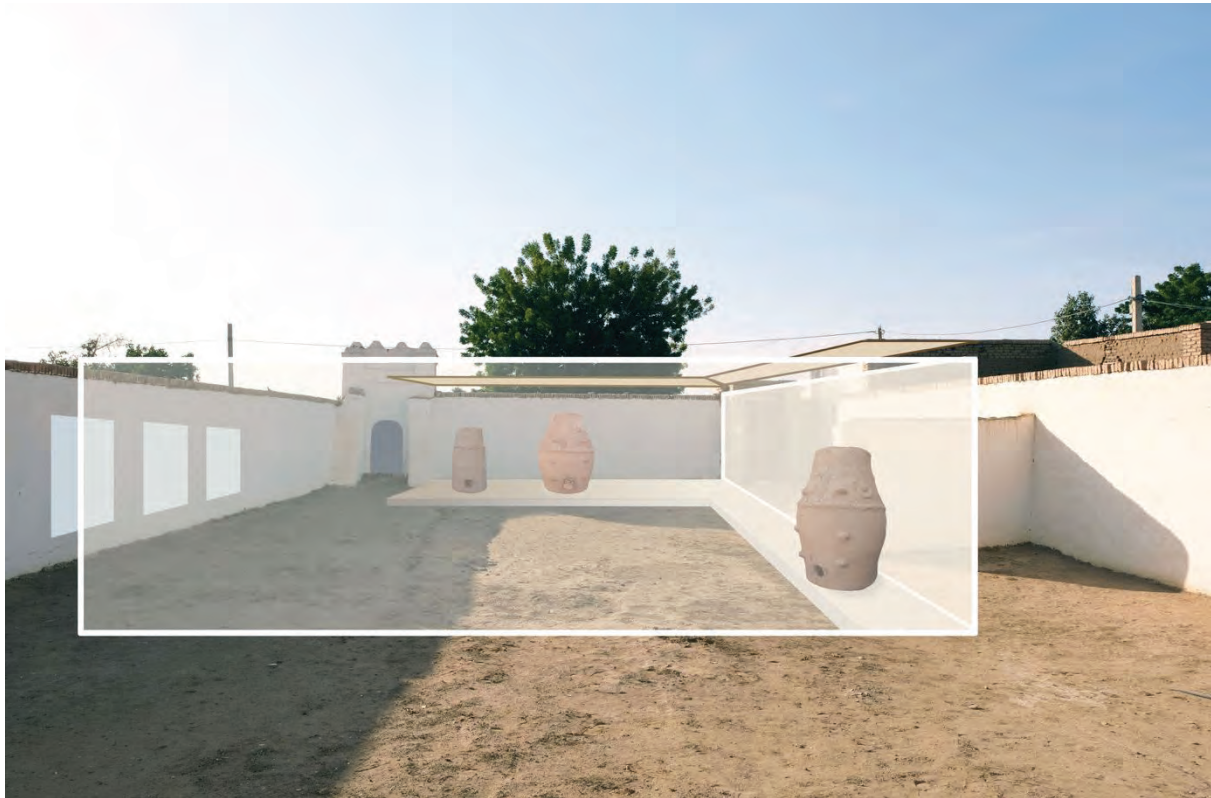


Figure 39 / Simulation of the open-air section with mud granaries and information panels on the eastern enclosing wall.

The project was scheduled to three years (2022-2024), but the difficulties in Sudan did not allow us to meet this timetable. Before we went on site last winter, two years of preparatory work enabled us to carry out historical research, to draw up an inventory of the objects to be exhibited and to carry out an initial cleaning of the granaries. These objects, which are part of Nubia's recent heritage (17th to 20th centuries), are unique in terms of the quality of their conservation and their anthropomorphic nature (figure 37). Similar but much simpler and undecorated granaries still exist in some parts of the Nile Valley, but most have disappeared over the last 30 years as a result of the modernisation of society and the effects of globalisation. The Gusaibas also echo one of the rooms in the Kerma Museum - the most popular with the local population - devoted to local objects and the farming culture, dating back more than 50 years.

The Nubian Heritage Interpretation Point will comprise an open-air area with a surface area of 120 m² and a covered area with a surface area of 80 m² (figure 38). In the open space, the 16 mud granaries (Gusaibas) will be presented after restoration (figure 39). The Gusaibas - which feature anthropomorphic decorations - are symbols of fertility and abundance, and bear witness to an agrarian surplus economy whose origins go back in time. Explanatory panels on the inside of the



Figure 40 / Tests on building materials and wall-building techniques. Ramming of earth layers after repositioning of the formwork at a higher level.

enclosure wall will inform visitors about the economic and social history of Argo Island, as well as the aesthetic, functional and symbolic aspects of the Gusaibas. The open space will also be used for social and cultural events. The covered area will house a small permanent exhibition devoted to the history of the kings of Argo, as well as ethnography and the history of the region. The Nubian Heritage Interpretation Point will be privately managed, but of public interest.

The building project was designed by Boltshauser Architects; it is simple and ambitious at the same time. The building features earth walls and columns supporting a sheet steel roof most probably covered with solar panels. It includes a windcatcher for passive cooling and natural ventilation. A survey of available construction materials revealed that the materials needed cannot easily be found locally. Since we aim at using local materials, Boltshauser Architects are refining and simplifying the project. Wood for the formwork is locally available, although the quality of the wooden planks varies from year to year. In rural northern Sudan, prefabricated scaffoldings is not widely used. Scaffolding is made from a few wooden planks and two oil drums. For security reasons, we are developing a system which allows us to clamp a working platform directly onto the masonry. Building materials, such as sand, gravel, earth, crushed brick, and crushed stones etc., are available locally.

During the winter of 2022-2023, our work focused on:

- Evaluating the feasibility of the architectural project proposed by Boltshauser Architects. Our stay at Argo showed that the project needed to be adapted to the local conditions. For instance, the efficiency of a windcatcher for passive cooling and natural ventilation has been demonstrated by simulations, but its development on site still requires choices to be made regarding the best solutions to adopt;
- Evaluating the proposed construction materials and building techniques. Construction tests were carried out in the courtyard (figures 40-41) and a survey of available construction materials revealed that the materials needed for construction could not easily be found locally. Since our objective is to use local materials, Boltshauser Architects are refining and simplifying the project;
- Evaluating the measures for the conservation and restoration of the Gusseibas. Andri Bundi, who originally assessed and documented their condition in 2020, has re-assessed the condition of the silos. In 2020, termites nesting in the Gusseibas were observed. Since, termite infestation has grown and surface degradation caused by termites and erosion due to rainfall has considerably increased. Nevertheless, the core substance of the Gusseibas can still be described as stable;
- The production of visual and written content for a project website. A project website will contain detailed information on the objectives, work processes and the current state of the project. But the website is also an important fundraising tool through our association. During our stay in Argo, Patrica Jegher gathered visual and written content to use on the website.

Figure 41 / The builders of the first rammed earth wall in Argo: Mahjoub Abdu, Abdu Osman Nakal, Samuel Gibrain, Micha Abdu, Mohammed Gellal, Felix Hilgert [and Marc Bundi].



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FIGURES

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Jérôme Dubosson	Figures 5, 6, 9, 15, 25-27
Nuno Bicho	Figures 19-24
Théophile Burnat	Figures 31-36
Marc Bundi	Figures 37-41
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- Matthieu Honegger and Jérôme Dubosson First insights into the excavations of a Classic Kerma
fortified site in the hinterland
- Nuno Bicho DIASPORA - Early human migrations and the Nile Valley
The Kerma region during the Middle Stone Age
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