K E R M A

2013-2014 and 2014-2015

SOUDAN

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Université de Neuchâtel
Documents de la mission archéologique suisse au Soudan
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Cover figure : The "grave of the archer" found in the cemetery of Kerma by Charles Bonnet in 1982 and reconstructed for the exhibition "Aux origines des pharaons noirs, 10'000 ans d'archéologie en Nubie" held at the Laténium Museum (2014-2015).
Photo: Laténium, Marc Julliard

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Matthieu Honegger

ARCHAEOLOGICAL EXCAVATIONS AT KERMA (SUDAN) PRELIMINARY REPORT OF THE 2013-2014 AND 2014-2015 SEASONS

We present in this report the activities of the Swiss Archaeological Mission to Kerma of not one, but two winter seasons. As described below, the organization of an exhibition at the Laténium Museum and the International Conference for Nubian Studies both held in Neuchatel have taken up much of our time and energy. As a result our field activities were somewhat modified. While the 2013-2014 season consisted of excavations involving specialists and students, as it has been the case for several years, the 2014-2015 season was restricted in its scope. This time no excavations were conducted, but a small team focused on the inventory and study of the abundant archaeological remains gathered over the last few years as well as on the protection of the Kerma necropolis.

In 2013-2014, the investigations of the Swiss Archaeological Mission started on 11 December 2013 and were completed on 27 January 2014. The first part of the season was conducted by Marc Bundi (11 to 31 December). He worked with a Swiss specialist, Bastien Jakob, and a Sudanese team of 7 to 13 workers under the supervision of gaffir Khidir Magboul. They cleaned ancient sectors of the El-Barga cemetery and opened three new sectors corresponding to a surface area of 116 square meters. In the eastern cemetery of Kerma, they emptied grave pits in sector 23 where we began work during the preceding season. This sector was opened by Charles Bonnet 15 years ago; however, he had studied only a few graves in this area. The aim of this campaign was to finish the excavation of the sector. The director of the Kerma Museum, Abdelmagid Mahmud, was the inspector during this first part of the season, which consisted of preparatory work in advance of the upcoming excavations by the entire Swiss team as well as the study of the remains. From 1st January 2014 onwards, Matthieu Honegger took charge of the team and excavations were started in the eastern cemetery and at El-Barga. They were joined by six Swiss students (Léana Catalfamo, Camille Fallet, Charlotte Hunkeler, Déborah Locatelli, David Chavez, François Ghiringhelli) and two specialists (Léonard Kramer, Daniel Conforti). At the beginning of January, Dr. Marc-Antoine Kaeser, Laténium Museum Director, came for a one-week visit on site along with filmmaker Stéphane Goël, who took photographs for the upcoming exhibition organised by the Laténium Museum in Neuchâtel. Finally, a French specialist from the CNRS, Isabelle Crèvecoeur, stayed in Kerma for about three weeks (6-29 January) to study the collection of Mesolithic skeletal remains of Wadi El-Arab and to participate in the excavation of the new graves discovered at El-Barga. In addition to this, we continued the survey in the area of Wadi Farjar, in anticipation of the possible building of a dam at Kajbar, 30 km north of Kerma. During this second part of the season, the mission's inspector was Shahinda Omer, but Abdelmagid Mahmud continued to support us.

In 2014-2015, the investigations of the Swiss Archaeological Mission started on 18 December 2014 and were completed on 2 February 2015. Marc Bundi, who directed this mission, started the season by himself. Other than general logistics and management, his work focused on the protection of the Kerma necropolis, notably the construction of a new road that would prevent vehicles from crossing the site and destroying the archaeological remains on the surface. He also oversaw the construction of the earthen wall that will enclose the entire cemetery—an area covering 70 hectares—thereby stopping the expansion of agricultural fields and vehicular traffic. The director of the Kerma Museum, Abdelmagid Mahmud, served as antiquities inspector. Three specialists from Switzerland arrived in early January to study the archaeological material discovered within the last few years. Bastien Jakob, whose doctoral dissertation will focus on the lithic industry, studied the thousands of flint flakes, tools and nuclei from Wadi El-Arab. Léonard Kramer drew up a detailed inventory of the entire corpus of material from the 320 Kerma ancien burials excavated between 2008 and 2013. Finally, Clément Vorlet worked on the description of the ceramics from the site of Wadi El-Arab as well as the sherds discovered during surveys at Wadi Farjar. A selection of the most interesting objects were drawn and photographed.

The Swiss Mission is supported by Dr. Abdelrahman Ali, director of the National Corporation of Antiquities and Museums of Sudan (NCAM) and his collaborator, Mr. El-Hassan Ahmed Mohamed. Abdelmagid Mahmud, director of the Kerma Museum and inspector of the Swiss team, followed our fieldwork. The project is supported by the Swiss National Fund (SNF 100012-137784/1), the State Secretariat for Education, Research and Education of the Swiss Confederation, the Foundation Kerma and the University of Neuchâtel (Switzerland). In 2014, we obtained the support of the Qatar Sudan Archaeological Project for the next four years.

The investigations focused on the following sites:

- El-Barga: after the discovery of a Mesolithic grave during the 2013-2014 season, we conducted new surface cleanings in December 2014 in order to estimate the full extension of the Mesolithic and Neolithic cemeteries. These are of great importance in the understanding of the transition between Mesolithic and Neolithic in Africa. We found six new graves, three dating to the Mesolithic and three others from the Neolithic. The excavation was conducted by Isabelle Crèvecoeur, who is in charge of the bio-anthropological study of the human skeletons found in this cemetery. The Mesolithic remains were in good condition (figure 1) but the Neolithic ones, found close to the surface, were badly preserved. We estimate today that the site is larger than previously thought (Crèvecoeur 2012, Honegger 2007) and that it may still contain about 10 to 30 graves. The preserved sections of the cemetery are located in the north of the site, under a thick layer of sand and gravel, as well as in the south of the site, in a sandy area. The cleaning will be considerable in order to continue excavations at the site and

we thus decided to publish what was excavated these last ten years before even considering starting a new project. The site is outside the alluvial plain, in an area without any habitation. Until now, it has not been particularly exposed to human destruction and we have not notice any degradation since 2008.

The three Mesolithic graves (graves 142, 143, 145) contained adults without any funerary material, which is common for this period. However, the vertebras of individual 142, most probably a female, were perforated by three arrows heads (lithic segments). The three Neolithic graves contained remains of children with adornments (graves 144, 146, 147). A badly preserved ivory bracelet, two amazonite beads and one carnelian bead were found in the first grave. In the second burial, three bone pendants were located near the neck and, in the third grave, 9 ostrich eggshell beads were discovered at the base of the cranium, the rest of the skeleton being completely eroded.

- The Kerma cemetery: during the season 2013-2014 we finished the excavation of sector 23 by studying 51 graves, many deeply plundered. This sector of the Early Kerma II period (2300-2100 BC) is contemporaneous of the Egyptian Sixth Dynasty. It is precisely at this period that we notice in the Kerma civilisation the beginning of social stratification with the appearance of richer and larger graves, the multiplication of funerary offerings, the frequency of sacrificed individuals and the intensification of plundering (Honegger 2013b). Many of the graves were completely empty, but the careful study of their contents gave important information, in particular on the pottery around the tumuli and in the graves. This season's exceptional find was the discovery of twenty-seven graves belonging to Nubian archers, which were in general the richest tombs of this sector. When it was possible to observe the shape of the bows, we noticed simple curved ones; however, in five graves, we found recurved bows like those seen in certain Egyptian representations of Nubian archers. Some of these archers were accompanied by a dog, occasionally with a leash preserved.

- Wadi Farjar: we continued in January 2014 the survey in Wadi Farjar, where we started to work during the season 2013-2014. The area is located about 20 km north of Kerma. Twenty-eight sites discovered by Ali Osman and David N. Edwards years ago were checked (Osman and Edwards 2011). Nineteen new sites were located. Sherds were collected in order to date more precisely these sites. Some of them seem to be of great interest, dating to the 6th millennium BC and the Pre-Kerma period. We hope to conduct trial excavations there in one or two years.

Figure 1 / Mesolithic grave of an adult female excavated in El-Barga.

Matthieu Honegger
Bastien Jakob
Léonard Kramer

SURVEY IN WADI FARJAR

Wadi Farjar is located in the Third Cataract region, on the right bank of the Nile and along an ancient wadi that must have been a branch of the river, flowing further to the east (figure 2). This wadi extends from the bank of the Nile at Simit in the south to the small town of Miseeda in the north, rejoining one of the branches of the river after its characteristic bend westward. Its general axis is north-south and the distance it travels from one branch of the Nile to the other is approximately 13 km. This arid zone comprises several granite outcrops and few alluvial deposits. The rugged terrain, the distance from the Nile and silt accumulation present little interest to human occupations. Other than tracks that cross it, the site is not endangered from human activities, notably the expansion of cultivated areas. The survey project was initiated in 2012 following an appeal from the National Corporation for Antiquities and Museums (NCAM). In the event of the construction of a dam at Kajbar, north of Wadi Farjar, several archaeological sites in the Third Cataract region would be threatened. For this reason, survey areas were defined by NCAM and assigned to international teams having an interest in survey work in this region and even in studying the most interesting sites. Today, it appears that this dam is not a priority amongst the numerous hydroelectric projects along the Nile contemplated by the government.

The region was the subject of surveys during the 1990s as part of the "Mahas Survey Project," a collaboration between David N. Edwards, Ali Osman and the University of Khartoum (Osman and Edwards 2011). At that time, 51 archaeological sites were identified. As was noted by the researchers, the wadi must have been active during most of the Holocene, as attested by the presence of oyster shells in the alluvial deposits (Etheria elliptica) found near site FAR39 and radiocarbon dated to the 7th millennium BC. According to the typological dating of the sites discovered during these early surveys, the majority fall between the Mesolithic and Kerma periods. Few sites more recent were discovered, although stone walls were noted but could not be precisely dated. At first analysis, Wadi Farjar appears to be a Nile palaeochannel active as early as the Mesolithic (9th or 8th millennium BC), drying up by the end of the Kerma period, during the 2nd millennium BC. We know that the climate was more humid during the first half of the Holocene, notably during the African Humid Period (circa 10,000-3,000 BC, DeMenocal et al. 2000, Manning and Timpson 2014, Otto-Bliesner et al. 2014). The moving north of monsoon rains and the high Nile levels can easily explain how a Nile palaeochannel could have been active at Wadi Farjar and how it dried up progressively during the 2nd millennium, eventually prohibiting permanent settlements in the vicinity. We know of similar scenarios further south in the Kerma Basin (Honegger 2007) and the Northern Dongola Reach (cf. Macklin et al. 2013).

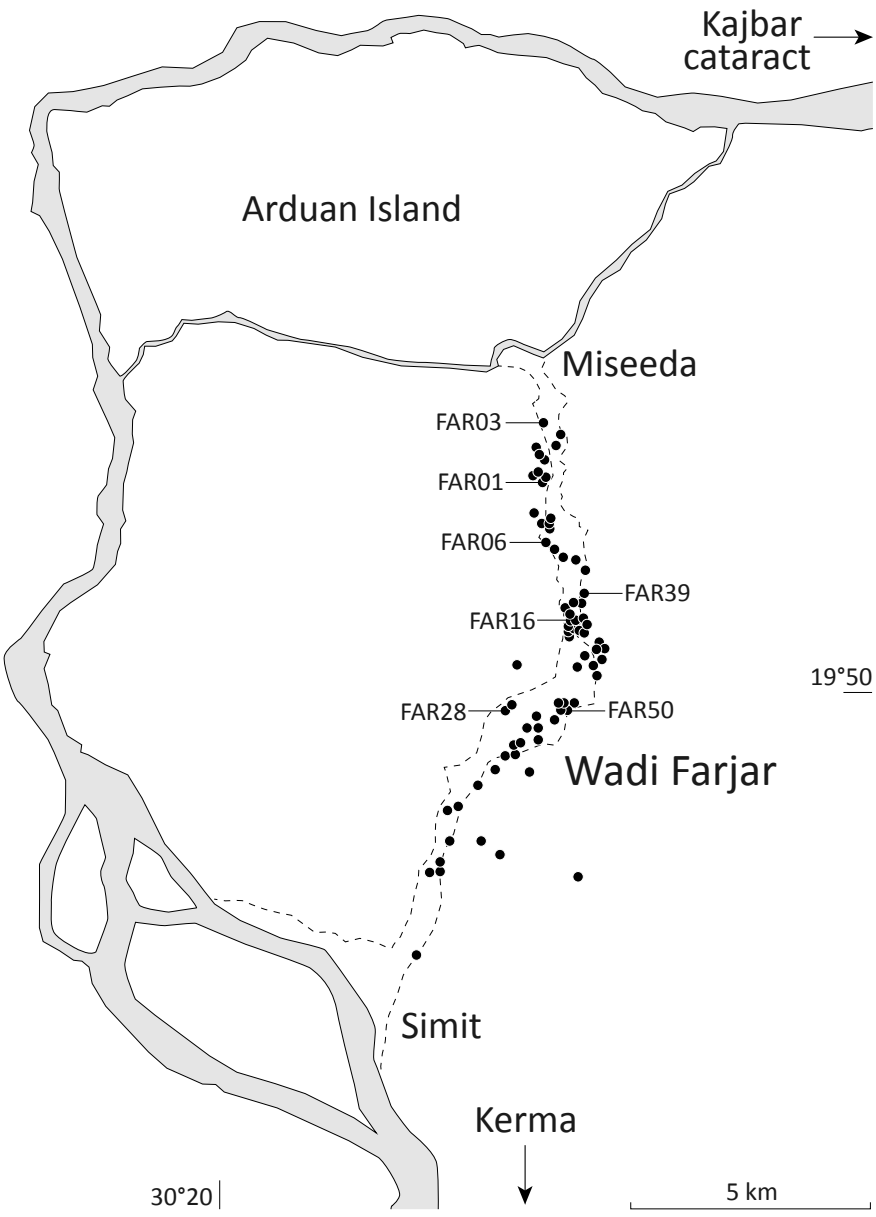


Figure 2 / Map of the area of Wadi Farjar in the third cataract, with the location of the sites identified during the survey. The number of the sites mentioned in the text is indicated.

Surveys conducted during the 2012-2013 and 2013-2014 seasons consisted of returning to the sites identified by Osman and Edwards in order to date them more precisely and to obtain a better idea of their archaeological potential. Additionally, we tried to contribute to earlier knowledge by identifying possible new sites. Forty-six of the 51 sites discovered by our predecessors were identified. Surface finds were collected and the sites benefitted from further examination. Generally, when these sites reveal the presence of structures on the surface (tumuli, stone circles, hearths, etc.), they almost systematically show traces of recent excavations or surface cleaning. This was notably the case for sites FAR01, 03 and 16, where stone

Figure 3 / Wadi Farjar, site FAR01 discovered by Osman and Edwards. A deep trench was recently dug in the stone structure, probably a tumulus. Some Kerma sherds were found around it.

Figure 4 / Wadi Farjar, site FAR16 discovered by Osman and Edwards. This stone structure probably dated of Kerma period is crossed by a recent trench.

structures were deeply dug into the emptying out of a well or deep trenches dug in the middle of tumuli, to reach in all likelihood the funerary chamber (figures 3 and 4). The dramatic development of gold mining in Sudan over the last few years has resulted in increased traffic in desert zones and a heightened interest in the possible riches yielded by archaeological sites. We have experienced this phenomenon during the excavations at the Mesolithic site of Wadi El-Arab, where illegal excavations – often very deep holes dug into the previously studied areas – were conducted numerous times during our absence (Honegger 2012). Our ongoing excavation in this desert zone undoubtedly triggered the interest of gold diggers, especially since

Figure 5 / Wadi Farjar, site FAR06 discovered by Osman and Edwards. Many of these stone walls have been identified in the area.

sediments were systematically sifted and this may have been interpreted as searching for gold. However, the fantasy of unearthing a priceless archaeological find may also have caught the attention of treasure hunters. Our observations at Wadi Farjar appear to corroborate this change in attitude and every isolated archaeological site is now put in serious jeopardy. The fact that this region has long been identified as possibly containing ancient gold deposits is certainly known to gold diggers, who take the opportunity to search the surrounding archaeological sites.

The archaeological remains of Wadi Farjar can be grouped into two categories. In the first group, the sites feature stone structures easily identifiable on the surface, whether we are dealing with low stone walls (figure 5), tumuli, stone circles or rock carvings. The second category comprises more discrete and generally eroded sites with materials such as ceramics, lithics and, more rarely, faunal remains. Few structures are present, if only eroded hearths forming small mounds, caused by the hardening of silt by fire (figure 6). We conducted surface cleaning at prehistoric sites that revealed ceramics that were not too fragmented. At the moment, no archaeological stratum has been found in situ. In general, erosion is substantial and the sites with visible stone structures are actually those most likely to contain preserved vestiges below the surface – whether they be wells, burials or other structures with foundations dug into the soil. These sites do not appear to predate the Kerma period.

In addition to the 51 sites reported by Osman and Edwards, 24 new ones were discovered. Generally prehistoric sites (Mesolithic, Neolithic or Pre-Kerma), these contain rather discrete vestiges. Out of these 75 sites, several present multiple occupations, which gives a total of 88 distinct occupations overall. These are essentially dated between the Mesolithic and Kerma periods, with a few rare sites with later occupations. We have proposed an initial dating of these occupations based on the typology used at Kerma for several years (Honegger 2014a). However, due to lack of associated archaeological remains, not all these sites could be dated. This is notably the case of the numerous low walls, which Osman and Edwards often refrained from dating, even if the hypothesis that they could date to the Kerma period is plausible. Rock carvings, some tumuli and sites having suffered major erosion could not be dated either.

Only 53 of the 88 occupations could be dated. Compared with sites discovered in the Kerma region, we notice certain constancies, such as the fairly high frequency of Neolithic deposits assigned to the 5th millennium BC, of which ceramics with burnished surfaces and frequent comb decoration are characteristic (figure 7). In contrast, Wadi Farjar has revealed significantly more Pre-Kerma sites (figure 8) and particularly sites dated to the Kerma period. Having at hand an estimate of the number of sites per period allows us not only to ponder the density of past occupations, but also the representativeness of our finds. From this perspective, the comparison between the situation at Wadi Farjar and in the Kerma region is interesting (figure 9). On one hand, Wadi Farjar is mostly unaffected by recent human activities and should give us a relatively representative image of the past. On the other, the region of Kerma spreads over an immense alluvial plain, highly cultivated. Although a few large and archaeologically rich sites remain, the smaller

Figure 6 / Wadi Farjar, site FAR39 discovered by Osman and Edwards. This site is composed of fireplaces forming small mounds.

Figure 7 / Wadi Farjar, site FAR50. Pottery sherds dating from the 5th millennium BC.

Figure 8 / Wadi Farjar, site FAR28. Pottery sherds dating from Pre-Kerma period (3500-2500 BC).

and more discrete deposits must have disappeared – unless they are located in the desert, along the cultivated plain. At Wadi Farjar, the Mesolithic is less well represented, possibly due to a less rich environment, and the post-Kerma sites are rare because of the aridity. The number of 5th millennium BC sites is proportionally much lower than at Kerma, a contrast reflecting the intensive research in the cemetery at Kerma, which has resulted in a substantial increase in the number of sites. At Wadi Farjar, however, the proportion of these sites is also reduced, due to the fact that Pre-Kerma and Kerma sites are considerably more abundant than in the Kerma area, where they have been largely obliterated by agricultural practices. The picture at Wadi Farjar therefore appears to be more representative of historic reality. As is the case at Kerma, there appears to be few sites dating from the 6th millennium BC and the drop in the number of sites from the 4th millennium BC is equally apparent. It is only at the end of this millennium that the number of sites increases again, to reach a peak during the Kingdom of Kerma.

The estimation of occupation density from these two separate regions confirms some of our previous observations, and in particular the fact that there is a dramatic drop in the number of sites at the end of the Neolithic, in the 4th millennium BC, which could explain why the growth seen in Predynastic Egypt does not have an equivalent in Nubia.

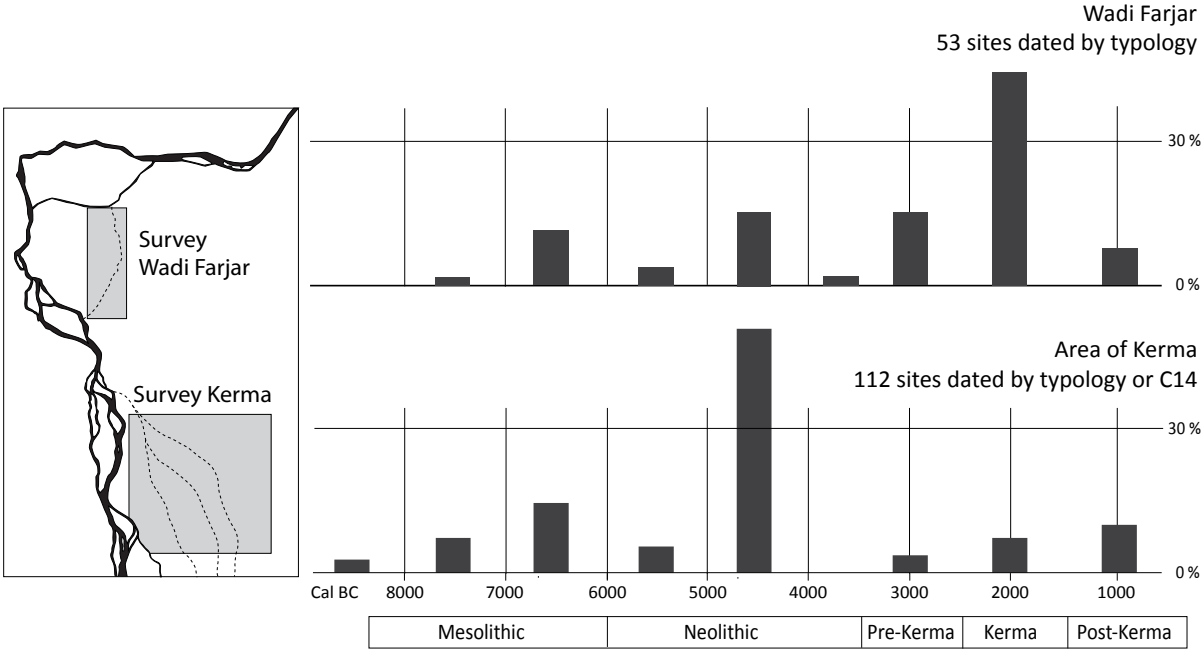


Figure 9 / Comparison of the proportion of Holocene archaeological sites between Wadi Farjar and the Kerma area.

Seven excavation seasons at the site of Wadi El-Arab (2005 to 2013) have brought to light an important stratified occupational sequence stretching from the Mesolithic to the Early Sudanese Neolithic (8300 to 5400 Cal BC). No field excavations took place during the course of this past winter. Time was taken to complete the inventory of the material discovered these past years, and in particular that of the large collection of lithic artefacts made up of 36.000 pieces, including 1983 nuclei and 2850 tools. The study of this reference collection, complemented by the finds from the nearby sites of El-Barga and Boucharia (Honegger 2012), will permit the characterisation of each phase of the regional chronology. This work will form the basis for a synthesis of the Nubian Mesolithic knapped lithic industry, which we anticipate registering as a subject for a doctoral thesis this summer at the University of Neuchâtel.

The excavated surface at the site of Wadi El-Arab covers almost 380 m2, whilst the site extends over three to four hectares. Some 20 structures were discovered, including four semi-subterranean habitations (Honegger 2010, 2013a), comparable to the contemporary structures brought to light at the Egyptian site of Nabta Playa (Wendorf and Schild 2001). The good state of conservation of the stratigraphy, reaching a depth of one metre in certain areas, permitted a stratigraphic approach.

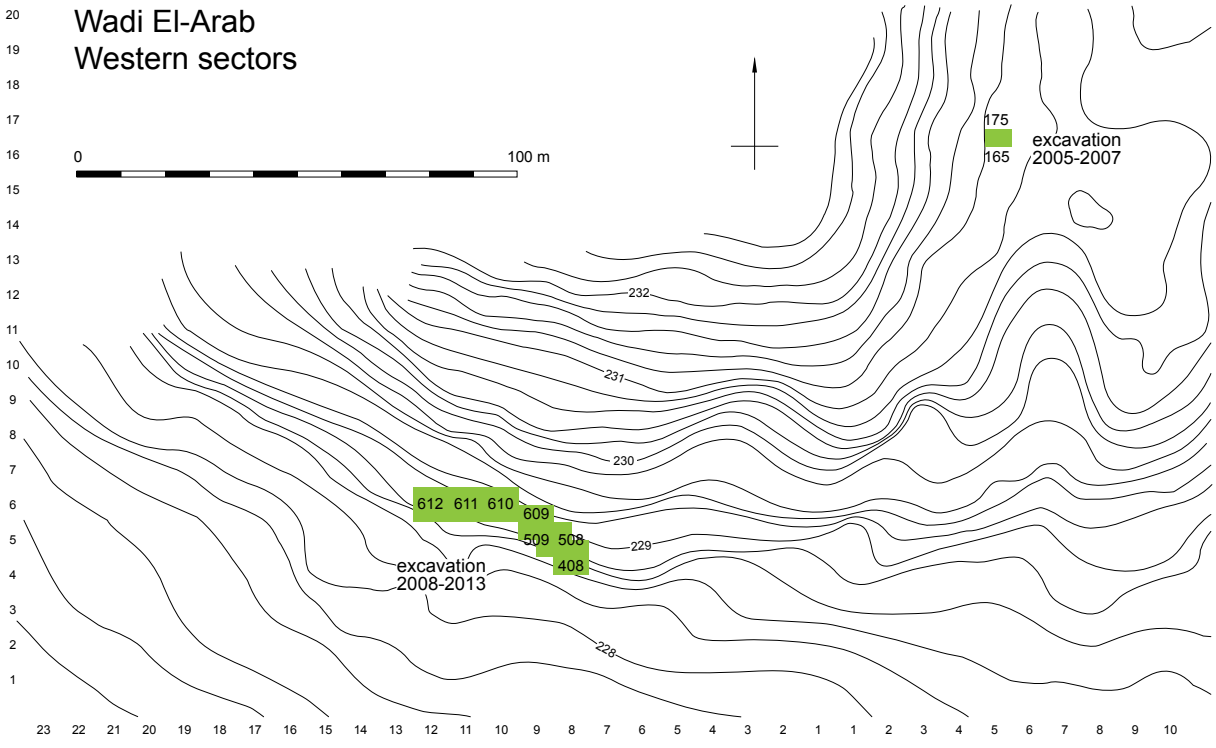


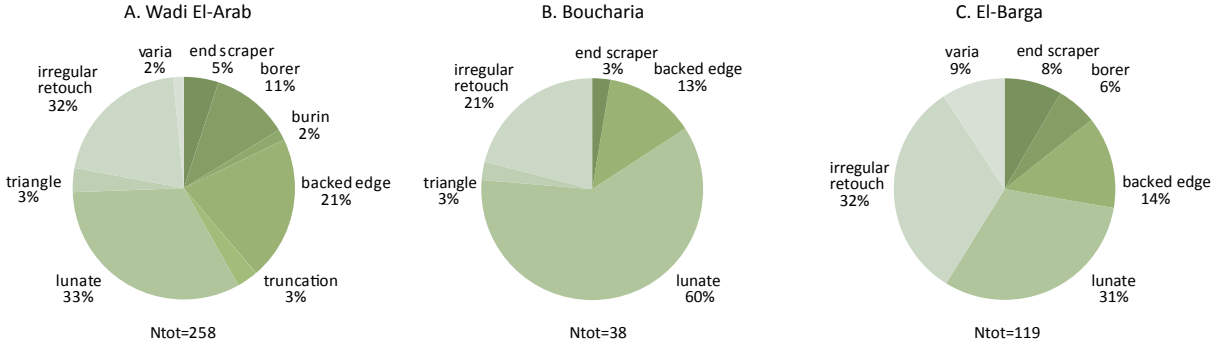
Figure 10 / Location of excavated areas retained for the analysis of the chipped stone artefacts from the site of Wadi El-Arab.

Five occupational levels were brought to light, whose well-dated chronology is spread between 8300 and 5400 cal. BC by 45 radiocarbon dates (Honegger 2013a). In addition to the rich collection of lithics already mentioned, the finds include large quantities of pottery, objects made of hard animal matter (beads, harpoons, etc.), large stone artefacts (axe blades, hammer-stones, sleeping grind-stones and grinders, etc.) and well-preserved terrestrial and aquatic faunal remains.

A first series of lithics was analysed by the author in his Master's dissertation (Jakob 2010). This collection originated from a surface area of 24 m2 (sectors 165-175), excavated between 2005 and 2007, and which essentially characterises the period dated between 7300 and 6500 cal. BC (figure 10). The corpus analysed, comprising 5341 pieces, includes 258 tools (figure 11a) and 203 nuclei. The majority of the tools is made up of small segments (< 30 mm) and backed pieces (figure 12). There is also a large proportion of perforators, as well as notched, denticulated and irregularly retouched pieces. The lithics are for the most part knapped from small chert, agate and quartz pebbles whose provenance is to be found on the alluvial terraces of the Nile. Most of the debitage is flake-based, whilst there is a reasonable proportion of longer pieces which tend towards blades.

This Master's dissertation has helped create an initial analytical framework and set the parameters for the continuation of the inventorying. During the course of this winter, we have completed the inventory of the knapped lithic assemblage found during the 2008 to 2013 excavation seasons (figure 10). The new sectors opened have allowed us to complete the chronological sequence (sectors 408-612). The lowest stratigraphic levels produced material dating from the earliest phase of the Mesolithic of the region (ca. 8300 cal. BC), whilst the topmost levels produced material dating from the Terminal Mesolithic and Initial Neolithic (between 6500 and 5400 cal. BC). More than 31000 pieces have been examined, which means that there is a substantial corpus for each occupational phase. The study of this large corpus is now under way.

Figure 11 / Quantification of the tool-types in the series from: a) Wadi El-Arab (sectors 165-175), b) Boucharia and c) El-Barga.



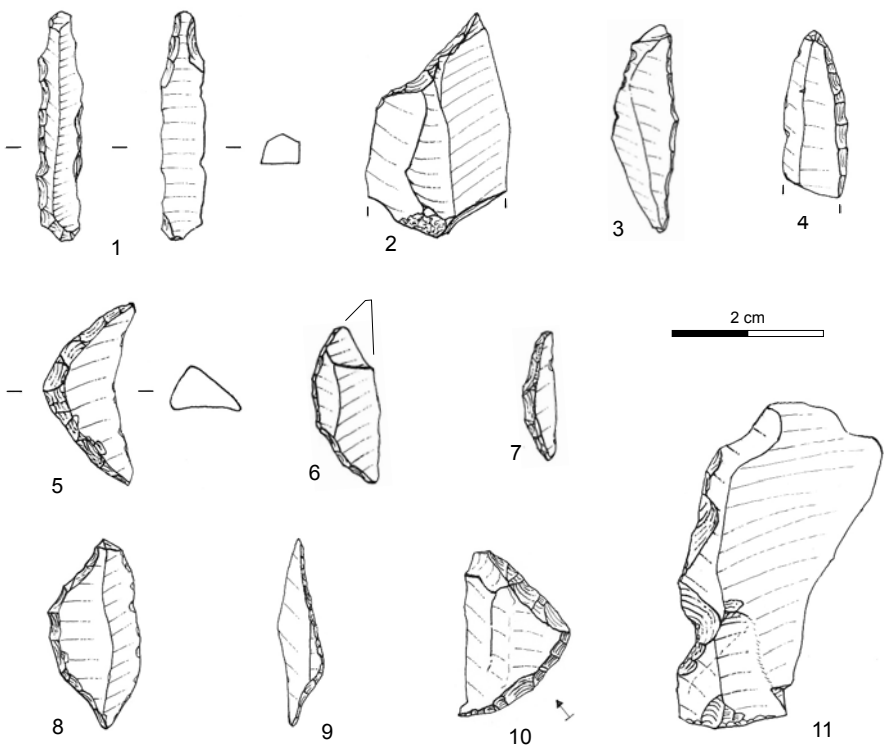


Figure 12 / Selection of tools from the site of Wadi El-Arab (sectors 165-175): perforator (1), truncation (2), backed pieces (3-4), segments (5-8), triangles (9-10) and notched piece (11).

At the regional level, two sites allow us to complete the sequence from Wadi El-Arab. The sites of Boucharia and El-Barga, located only a few kilometres from Wadi El-Arab, have yielded lithic series dating from the initial phases of the Mesolithic, dated between 8300 and 7200 cal. BC. The first site produced a relatively small assemblage, made up of 811 pieces, of which 38 tools and 15 nuclei (figure 11b). A large majority of the tools are segments (almost two thirds) and there are no perforators. The second site produced a larger corpus (Honegger 2008), which includes 119 tools (figure 11c). Here as well, segments are in the majority, but there is a relatively important component of irregularly retouched artefacts (notched and denticulated pieces, etc.). These additional series allow us to constitute a true reference collection for the regions of Kerma and Upper Nubia, which remains chronologically and culturally poorly known (Honegger 2014a).

On the basis of these regional observations, it will be possible to elaborate comparisons with neighbouring regions, especially the two best documented. These concern Lower Nubia on the one hand, based on the results of the High Dam campaign dating from the 1960s (Wendorf 1968) and the research undertaken in the region of Nabta Playa (Wendorf & Schild 2001). On the other hand, Central Nubia has been the subject of numerous Mesolithic and Neolithic research projects between the regions of Khartoum and Atbara (see Caneva et al. 1993, Haaland &

Magid 1995). The Kerma sequence connects these two regions separated by over 800 km and fills the scant knowledge regarding Upper Nubia, which is habitually located between the second and fifth cataracts.

The objective of this study, which will be based on a comparative approach followed by a synthesis, will be to track the evolutionary processes of the knapped lithic industry of Central Sudan as far as Lower Nubia, during the key period between the Epipalaeolithic and the Neolithic. The study, based on typo-technological criteria, will focus on highlighting the possible contacts and exchange networks which could have developed between the populations of these regions over a period of time which witnesses profound changes, particularly as regards the transition from an economy based on predation (hunting, fishing, collecting), to one based on production (stock-breeding, agriculture).

Matthieu Honegger
Camille Fallet

ARCHERS' TOMBS OF KERMA ANCIEN

The winter 2013-2014 excavation season focussed primarily on Sector 23 of the eastern cemetery of Kerma, with the objective of completing its study. This sector had been excavated a first time by Charles Bonnet during the 1996-1997 season, when 30 tombs were investigated (Bonnet 1997). We decided to renew the excavations in this sector at the end of 2012, so as to be able to complete our understanding regarding the origins of the Kingdom of Kerma (Honegger 2012, 2013b). The sector contains a total of 116 tombs, 86 of which have been excavated and inventoried during these past three years (figure 13). It belongs to the second phase of Kerma ancien (Privati 1999) and has been radiocarbon dated to between 2300 and 2100 cal. BC. This ensemble is preceded by the first phase of Kerma ancien (2500-2300 cal. BC), which we had occasion to study during the excavations of Sector 27, as well as by an initial phase going back to the Recent Pre-Kerma (Sector 28), which is dated ca. 2550 cal. BC.

Generally speaking, pillaging within Sector 23 has been intense. With the exception of a female sepulchre found intact with poor grave-goods, all the burials have been substantially disturbed. As is their custom, the pillagers concentrated on the upper part of the cadavers, particularly in the neck-region, looking for body ornaments and metal objects. Whilst in the earliest sectors only the head tended to be displaced, in this case it is the entire upper part of the body down to the pelvis which has been disturbed. In the best of cases, the lower limbs have remained in place, with a few objects besides then, but very often the tomb has been completely emptied, in which

Figure 13 / View of the main part of the Sector 23 at the end of the excavation.

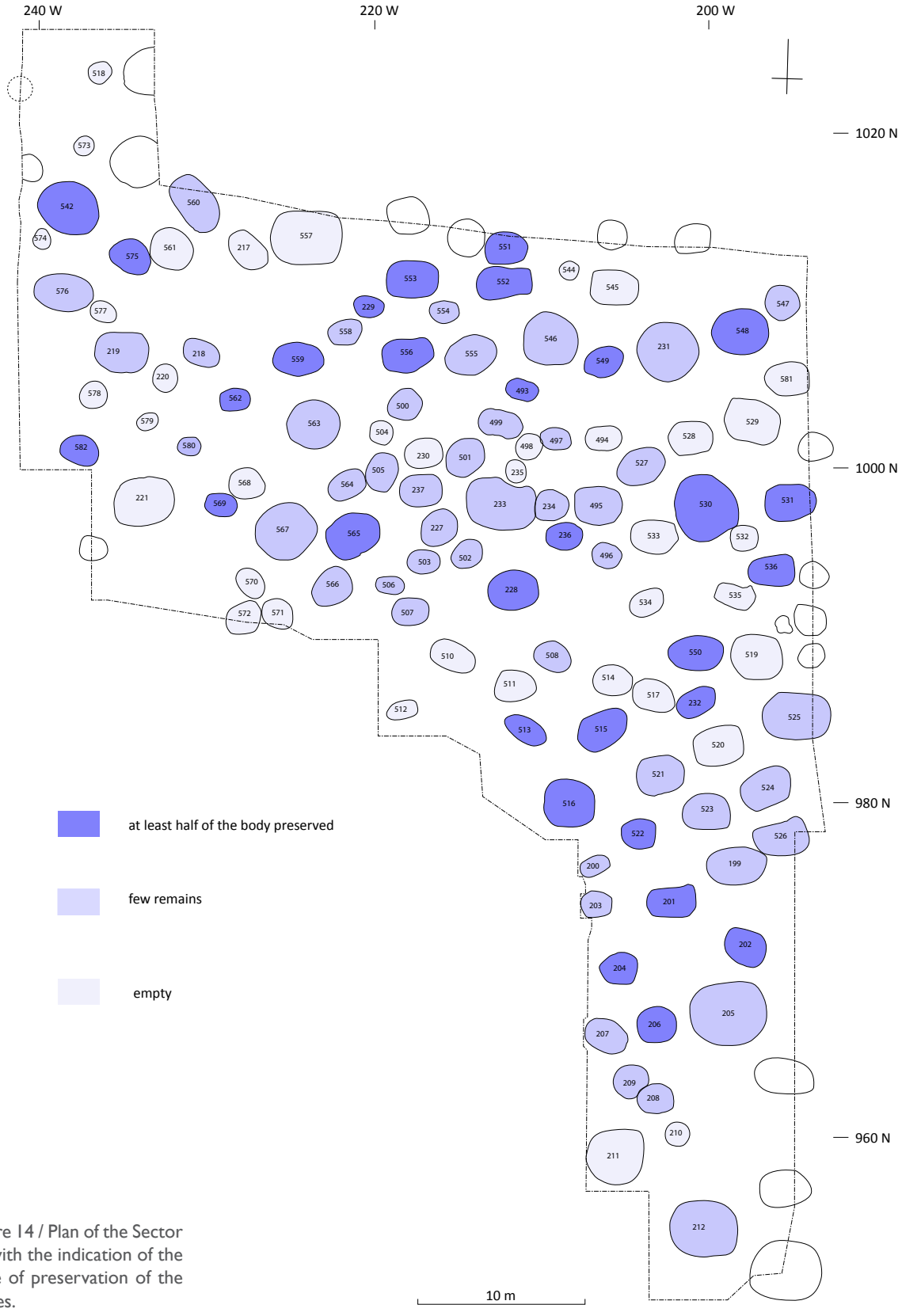


Figure 14 / Plan of the Sector 23 with the indication of the state of preservation of the graves.

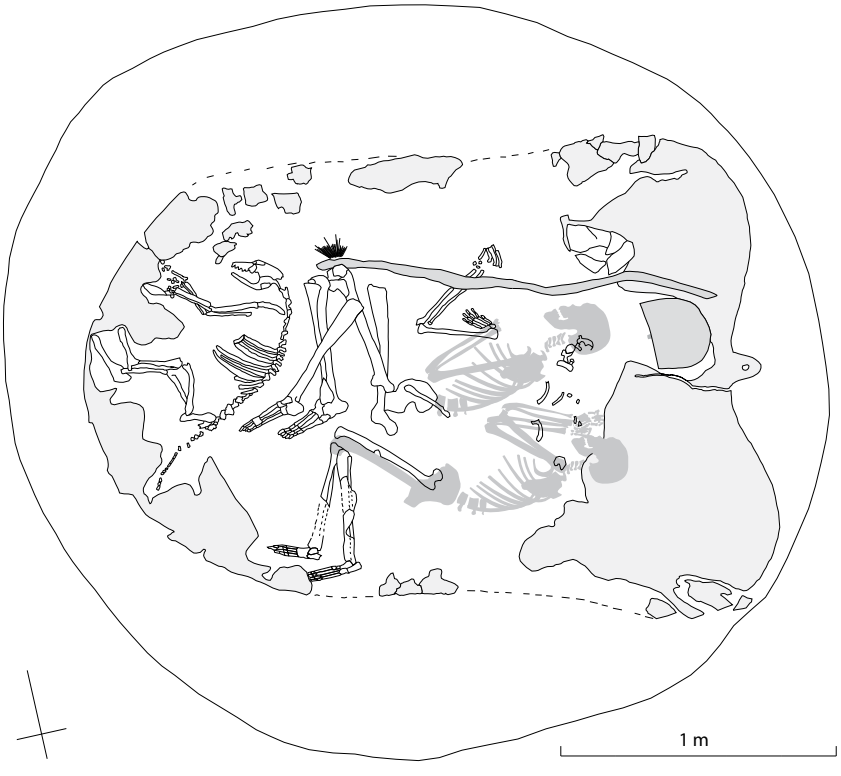


Figure 15 / Grave 530, Kerma ancien II. It was partially plundered and contained two individuals: a joung man in central position and a woman placed by his side. A dog, a bow, an ostrich feathers fan and a bronze mirror accompanied the young man.
At the top: view of the first cleaning with the bodies covered by a bovine skin. At the bottom: drawing of the grave with reconstruction of the upper part of the skeletals.

case the only evidence regarding the contents is the bones and other objects found in the back-fill of the grave-pit. By way of comparison, Sector 27, dating from the Kerma ancien I, yielded 27% of intact tombs, whilst in 34% of the cases it is the skull that has been displaced. Only 15% had been completely emptied. This proves that the first inhumations in the cemetery were less rich in objects of value and therefore less attractive to the pillagers. To the contrary, Sector 23 of Kerma ancien II appears to have been much more interesting as regards the richness of the graves. From the total of 116 tombs excavated, only 1% were still intact, whilst 33% had been completely emptied. The remaining inhumations were found with less than half of the skeleton in place and quite often contained only a few remains in situ. The distribution of tombs within this sector according to their state of conservation allowed us to determine which areas had been partially spared, and leads us to be cautious regarding generalised interpretative approaches from the best preserved graves (figure 14).

Notwithstanding this unfavourable situation, the fact that we meticulously collected the remains in the backfill of the grave-pits allowed us to dispose of reliable information regarding the ceramics and anthropology. Our estimates demonstrate that these remains are representative of the original contents of the tombs. On the other hand, the destructions brought about by the pillaging make it difficult to make any determination regarding the remainder of the grave-goods. By way of example, the presence of a bow or an ostrich feather fan often depends on little: if a small section of a sepulchre has not been damaged, their presence can be attested. By way of contrast, such objects are almost impossible to identify if mixed-in with the back-fill of the pit, which will have accelerated their destruction. For this reason, the tombs that have been completely emptied supply no information regarding funerary rites, other than that regarding the individual and the pots deposited with them or placed on top of the grave.

As we had indicated, Sector 23 and more generally the Kerma ancien II phase shows spectacular changes in the funerary rites, compared to the earlier phases in the cemetery (Honegger 2013b: 20-22). The tombs are generally larger and contain more objects. Animal sacrifices make their appearance (dogs, caprines) as well as bucrania in front of the tumuli. Tombs with multiple burials are also more frequent (figure 15). All these indices point to the emergence of a more marked stratification within society, whilst previously the image was one of relative equality of treatment in the face of death. The most outstanding finds in the sector are tombs containing one or two bows, occasionally a quiver, whilst others contain a stick, which it is tempting to interpret as a shepherd's accessory.

A total of 27 tombs with bow(s) and/or quivers have been identified, whilst 9 others contained a stick. The presence of the bow and its attributes (quiver, arrows) clearly evokes the importance of the bowmen in Nubia, particularly in the Kingdom of Kerma. We know that the Egyptians designated this region as early

Figure 16 / Scene representing archers on a rock engraving at the 3rd cataract (Wadi Es-Sabu, 3rd or 2nd millennium BC, height of archers about 15 cm). One of them wears a loin-cloth and all have a head dress made of an ostrich feather, a typical Nubian adornment frequently used by the Egyptians when representing their southern neighbours.

as the third millennium BC in the hieroglyph *Ta-Seti*, which signifies the land of the bow. The qualities of the Nubian archers were repeatedly stressed by their northern neighbours and they were recruited by them since the Old Kingdom. The archaeological evidence for the presence of Nubian archers is however scarce during the Kerma Period (2500-1500 BC). Their graphic representation is rare, but two of the most important are worth stressing. One, published recently (Honegger 2014b), represents a group of archers engraved on a sandstone rock in the Wadi Es-Sabu, at the third cataract (figure 16). The stick-form representation of their bodies, somewhat similar to the representations known at Kerma (Bonnet 1986: 10), the presence of a loin-cloth and a feather on the head, leads us to date this engraving to the 3rd or 2nd millennium BC. The five bowmen carry single arched bows with arrows in their hands. Some are dressed in loin-cloths and all wear a feather on their heads, which is an attribute also used in Egypt to designate Nubians. The second one is a stele made of fine-grained sandstone, found in the region of the second cataract, and dating from the end of the Kerma period (figure 17). It represents a Nubian king with a double bend bow with a triangular body in the style already alluded-to. He is flanked by royal attributes of Egyptian tradition, which is to say a mace held in his hand and the crown of Upper Egypt on his head. From these illustrations we can already identify two types of bow, one with a simple curvature and the other with a double one. As regards their size, it is not certain that the engravings are realistic

Figure 17 / Sandstone stele showing a Nubian king (Buhen, Kerma classique, ca. 1500 BC, height. 26 cm, Sudan National museum, no 62/8/17). The king holds a double bend bow and arrows.

enough for this information to be pertinent. Nonetheless, their dimensions are small on the engraving from Wadi Es-Sabu and would correspond to bows of 60 to 70 cm in length. On the stele from the 2nd cataract, the bow is substantially larger and could be as long as 140 to 150 cm.

It is quite unusual for archers to be identified in graves. For the Kerma Period, the most important discovery consists of an almost intact tomb of an archer naturally mummified, which Charles Bonnet discovered in the Kerma necropolis more than 30 years ago (Bonnet 1982). Also dating from the Kerma ancien II period, this sepulchre was excavated in Sector 4, 150 m to the north of Sector 23; it contained the body of a young man, only whose head had been displaced by the grave-robbers. He was accompanied by two bows of simple curvature 120 cm long, one of which was decorated with a plume of ostrich feathers (see cover picture of the present review). Arrow shafts were also noted. The tomb was not otherwise particularly richly endowed, if we make abstraction of the possible necklace made of copper or gold beads stolen by the robbers; it contained a stone pendant, another made of mother-of-pearl, a belt made of blue beads at the level of the hips and a red vase with a black rim.

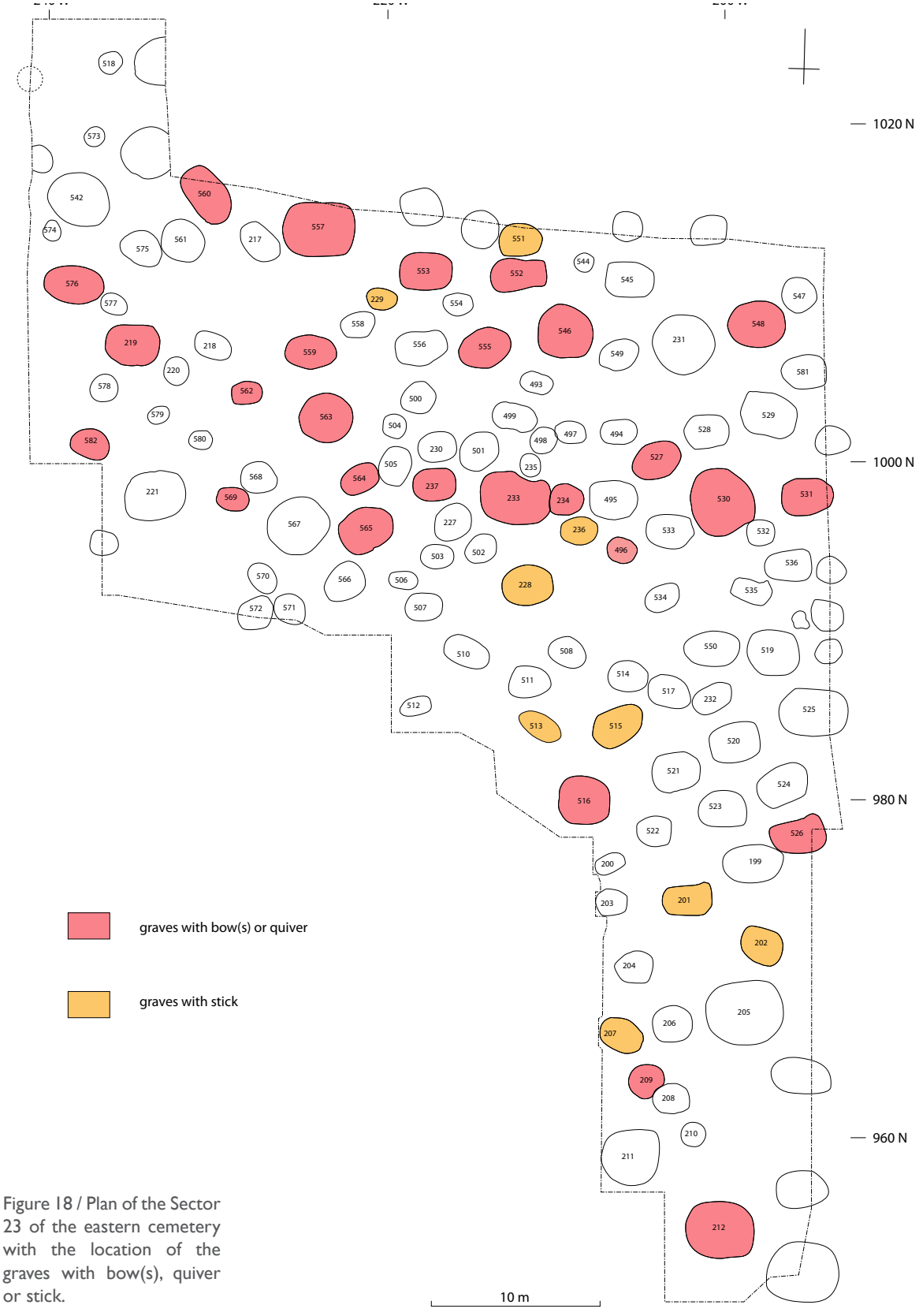


Figure 18 / Plan of the Sector 23 of the eastern cemetery with the location of the graves with bow(s), quiver or stick.

Due to the sparse information available regarding Nubian archers, the 27 tombs which we have studied add new data, notwithstanding the fragmentary nature of the remains uncovered. We will not only examine the characteristics of the bows, arrows and quivers, but also the contents of the tombs, which should permit us to express hypotheses regarding their social status. Their distribution does not indicate any particular tendency, other than their greater concentration in the area where the graves have been the least pillaged (figure 18). The diameter of their pits is often quite large but there are also smaller ones, some of which correspond to child burials. Proportionally, they represent 23% of the graves studied, but considering the destructions caused by the pillaging, their proportion should attain double this level. The presence of archers is thus well marked in this sector from Kerma ancien II. The fact that the famous archer's tomb excavated by Charles Bonnet should date from the same period, leads one to believe that the placing of the bow in a funerary context is a specific attribute of the second phase of Kerma. This practice is attested in other periods, as evidenced by a sepulchre containing a bow which we found dating from Kerma ancien I. In this instance however, it is the only such tomb out of more than 130, thus representing a very small proportion of the total. By the same token, a tomb in Sector 12 in the centre of the necropolis, dating from Middle Kerma, which contained 36 arrowheads, probably belonged to an archer (Honegger 2008). Here again, however, we are dealing with an isolated case. Finally, the rarity of archers' tombs mentioned in the context of other cemeteries excavated in Nubia dating from the Kerma Period, could be due to several reasons, such as the intensity

Figure 19 / Grave 546. Extremity of a bow with its string and a plume of ostrich feathers.

Figure 20 / Grave 569. Plundered grave containing an adult with his leather loincloth and a double bend bow. At the bottom: general view of the grave. At the top: detail of the bow which length is more than 1,5 m.

of the pillaging, the number of tombs excavated systematically and the care taken in the observation of organic materials. We must in fact stress that the bows are generally very poorly preserved, with their wood invariably attacked by termites, and in most instances only the imprint of their decomposition survives. It is the bow-string, manufactured of entwined tendon, which best survives (figure 19). The leather quivers decompose more slowly, whilst as for the arrows, only the imprint of their shaft survives, but the arrowheads made of flint segments have survived.

Out of the 27 tombs, 23 produced the remains of bows, whilst the remaining 4 yielded the remains of quivers. The remains of the bows are often too fragmentary to obtain an accurate idea of their shape and size. In some better preserved instances however, we have been able to identify bows with simple as well as with double curvature, both of which appear to have co-existed (figure 20). It seems to us that not too much should be made of this distinction, as suggested by J.-L. Le Quellec in his analysis of the archers on the rock-art of the Sahara (Le Quellec 2014). The bow with a double curvature does not necessarily imply that it is composite, which is a far more sophisticated manufacturing technique, since it is not attested in Africa at this time. On the other hand, ethnographic material describes simple techniques to

Figure 21 / Grave 542. Plume of ostrich feathers with a string which was rolled up at the extremity of the bow.

obtain a strong incurvation of the extremities of the bow, which consist in bending the wood by means of ligaments and forms (Le Quellec 2014: 62). It is probably the use of similar techniques which explain the well-attested differences in the Nubian bows.

The most common dimension is 120 cm, but two larger bows about 150 cm long have been found. In a child's tomb, a small model, 90 cm long, was discovered. The remains of bow-strings have often been found in situ alongside the bow. In some instances the extent of the bow's curvature leads one to believe that it was strung when placed in the tomb. The bow is always placed to the north of the cadaver, close to the hands. It is occasionally decorated with a plume of ostrich feathers at its extremity (figure 21). As regards the quiver, a well-preserved example manufactured of goat-skin, sewn at the edges, has been saved from the pillagers (figure 22). As with other instances, it contained the remains of arrow shafts with feathers and arrowheads made of small flint segments (figure 23).

As was the rule at that time, the skeletons of the archers were found lying on a complete ox hide and covered in another one of equal proportions. Dressed in a leather loincloth held at the waist by a belt and wearing sandals, they often held a fan made of ostrich feathers in their hand. In two tombs we found a small cup which

Figure 22 / Grave 555. Well-preserved goat-skin quiver found in a grave.
Figure 23 / Grave 560. Content of a quiver with the remains of arrow shafts with feathers.

Figure 24 / Grave 565. Incense burner made with the fragment of the bottom of a vase, with a piece of incense.
Figure 25 / Grave 530. Bronze mirror with its lether bag.

Figure 26 / Grave 530. Necklace with gold beads.

had been burned on the inside. It was the identification of the small piece of incense placed next to one of these that we understood that we were dealing with incense burners (figure 24). We must also mention the presence of bronze mirrors slipped into their leather bag (figure 25). Although these mirrors were almost systematically stolen by the grave-robbers, they were probably quite regularly placed in the tombs. The same goes for the pendants, necklaces and ear-rings made of gold (figure 26). Although these are rare discoveries today, these jewels probably regularly accompanied the deceased, particularly those in the richer tombs, which are of above-average size. At the feet of the deceased has sometimes been found a leather bag, whilst in the larger tombs one or two sacrificed dogs, or else a sheep (figure 27). In three graves we have been able to observe the presence genuine leads. In two instances they were round the necks of dogs and in the third that of a sheep. In the largest tombs, which are quite often identified as those of archers, there is occasionally an accompanying deceased person. This situation has been observed in six tombs, whilst in a seventh, the principal individual was accompanied by three other deceased.

Whilst the function of the bow is evident, that of the stick is a little less so. In the present-day African pastoral societies it is the shepherd's primary attribute, that of the flock or herd owner, or at least its carer. It can also be used in traditional dances,

Figure 27 / Grave 531. Archer (immature) with two dogs at its feet.

in which case it is not necessarily a male attribute. In societies that do not know the plough or the hoe, it can also be used as a digging tool, to till or to uproot. Should the need arise, it can also be used as an armament, or at least as a means of defence. In short, it can serve many purposes, but we will note that the presence of sticks accords well with the pastoral nature of the Kerma society. The tombs of persons with a stick are less numerous than those of archers (figure 28). They had been noted by Charles Bonnet, who had excavated two tombs of women with sticks, one of which was accompanied by a dog on a lead (Bonnet 1982). These tombs were located not far from that of the mummified archer, to the north of the necropolis, and are also dated to Kerma ancien II. In Sector 23, nine graves contained a stick, which represents 8% out of the 116 examined. As with those for the archers, the number is most likely substantially underestimated due to the pillaged state of the graves. Generally speaking, the tombs are smaller than those of the archers. They did however yield comparable grave-goods. The ostrich feather fan is present in several cases, one tomb yielded a bronze mirror and another a contained a dog. The sticks found were entirely destroyed by termites, in the same way as the bows and other wooden objects. They are always straight and are about 100 to 120 cm long and about 4 cm thick.

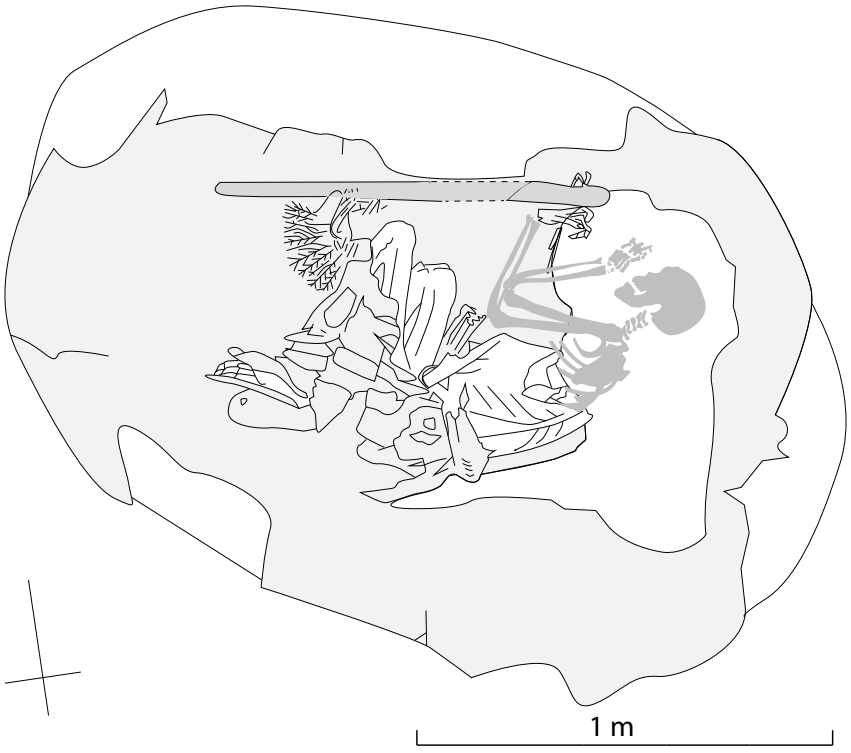


Figure 28 / Grave 202. Woman of 20-29 years old, with a wooden stick and an ostrich feather fan. The upper part of the skeletal, destroyed by the looters, has been reconstructed.

The anthropological study, undertaken by Camille Fallet, furnishes details on the age and sex of the individuals. About the possibility of a selection in the individuals buried in the necropolis, we must first note that Sector 23, taken as a whole, does not differ substantially from Sectors 27 and 28 excavated previously. All three show similar tendencies, which is to say an underrepresentation of immature individuals and a relative balance between the sexes (Fallet 2013). If we focus on the tombs of archers and those with sticks, we notice a marked contrast (figure 29). The tombs of archers are mostly represented by adult males (17 tombs), to which can be added four child burials and two others attributed to women. Notwithstanding the probability of errors flowing from the methodology used in determining the sex of the individuals, the presence of women archers cannot be gainsaid, particularly that of the oldest one, who has well-marked female characteristics, especially in the pelvic area. In the tombs containing sticks, the opposite is true, in that adult females are best represented, with the presence of one male only, and well as that of an immature individual.

This opposition between the two types of tomb is interesting. The graves of archers are clearly primarily the preserve of adult males, whilst those with sticks are for the most part associated with females. It is probable that that we are in the presence of

fundamental values of the society, tied in to those relating to power and prestige. The references to war, the hunt and pastoralism no doubt bore symbolic values. In Pre-Dynastic Egypt, hunting scenes in its iconography usually express the power of the elite (Hendricks 2013). Bows, dogs on leads, control of the natural world and their correlation with military triumphs are part of the recurrent themes which will later be found in Pharaonic Egypt. By analogy, it is possible that the references to the hunt or warfare at Kerma carry the same connotations.

Sector 23 dates from Kerma ancien II. Contemporary with the VIth Egyptian dynasty, it shows the emergence of an elite which expresses itself with richer tombs in which an important number are endowed with bows and to a lesser extent with sticks. In other contemporaneous areas of the necropolis we also find tombs of archers and others with sticks, accompanied by a similar range of grave-goods (fans, mirrors, animal sacrifices, etc.). This leads us to consider the bow and stick to be important attributes in the funerary rituals of a precise period in time. They would have been a constituent part of the visible expression of the power of the elite.

Graves with bow	**Sex**	**Age**
219	male*	15-19
530	male	15-19
552	male	15-19
209	male*	20-29
548	male	20-29
555	male	20-29
582	male	20-29
546	male	20-39
563	male	20-39
516	male	20-49
527	male	20-49
557	male	> 30
565	male	> 40
553	male	> 50
212	male*	adult
233	male*	adult
237	male*	adult
564	female	20-39
559	female	< 60
560	immature	1-4
526	immature	5-9
576	immature	5-9
531	immature	10-14
562	undetermined	20-29
569	undetermined	adult
234	undetermined	no skeletal
496	undetermined	no skeletal
Graves with stick		
201	male	> 60
202	female	20-29
513	female	20-29
551	female	20-29
228	female*	adult
236	female*	adult
207	female	> 60
229	immature	5-9
515	undetermined	adult

Figure 29 / Determination of sex and age of the main individual found in the graves with bow(s), quiver or stick. The majority of the determinations were made by Camille Fallet. The sexual diagnosis is based on coxal bone according to Bruzek (1991; 2002) and Murail et al. (2005). The determination of the ages is based on the methods described by Schmitt (2001). The determinations followed by an asterisk were made by Christian Simon in the 1990. For the determination of the sex, he used in particular the method of Bruzek (1991).

Matthieu Honegger

THE EXHIBITION AT THE LATÉNIUM MUSEUM AND THE 13TH INTERNATIONAL CONFERENCE FOR NUBIAN STUDIES HELD AT THE UNIVERSITY OF NEUCHÂTEL

On the agenda since 2010 and in preparation since 2012, setting up the exhibition «Aux origines des pharaons noirs: 10'000 ans d'archéologie en Nubie» represented the most important operation of the Swiss Archaeological Mission these past few years. Set up in the facilities of the Laténium Museum in Neuchâtel, the exhibition has been a partnership between the museum and the «Kerma Foundation to Promote the Nubian Archaeological Heritage» both in organisational and financial terms. It is in particular thanks to the interest and support of the director of the Laténium, Marc-Antoine Kaiser, that this event was able to take place at this location, which is one of the largest and most recent archaeological museums in Switzerland, having been established in 2001.

The exhibition has occupied two exhibition halls, the one normally used for temporary exhibitions (ca. 320 square metres) and a new one made available by reorganising the hall previously used as an introduction to the museum (over 150 square metres). In this way it has been possible to set up this exhibition of international scope, in a

Figure 30 / View of the exhibition hall devoted to the world of the dead, with a display cabinet containing objects retrieved from graves, and a wall panel of bucrania originally deposited in front of Kerma tombs.

Figure 31 / View of the exhibition hall devoted to the world of the living with the model of the town of Kerma in the foreground and the replicas of the statues of Tanutamon and Taharqa.

space of almost 500 square metres in which almost 300 objects were put on show: 180 of which came from Sudan, 42 from the Geneva Museum of Art and History, 28 from the Geneva Natural History Museum, 23 from the Leipzig Museum, and some twenty objects from the Swiss Archaeological Mission at Kerma (objects currently being studied or restored). In addition to the objects, the exhibition was punctuated by video films produced by Stéphane Goël (director of the film «On the Traces of the Black Pharaohs», a co-production RTS-Arte), which aimed at restoring the objects within the context of the Nubian excavations, and which also presented by means of a wall projection, both the interior and exterior of the Kerma Museum on a scale of 1/1. Two reconstitutions of graves (see picture on the cover of the present review), a display of over 20 bucrania, three models and two replicas of Black Pharos discovered at the site of Dukki Gel completed the exhibition. It is to be noted that the statues were realised three-dimensionally by means of a scan (cf. article by Marc Bundi in this publication).

As the title suggests, the exhibition presents a reconstitution of the principal stages in the evolution of Nubian society over a period of 10.000 years, from the establishment of the first sedentary settlements, via the Kingdom of Kerma, to end with the discovery of the Black Pharos, symbols of the rebirth of Nubian royalty and the point of departure for the creation of the Kerma Museum. In this context,

it follows closely the activities of the Swiss Archaeological Mission at Kerma, not only from the point of view of the results obtained and the activities of the Mission as projected in the video films, but also with our concern these past 10 years to develop a narrative covering a long time-span, which takes in both prehistory and the emergence of the first royal organisations. The exhibition was split into two main sections, the first devoted to the world of the dead and the associated funeral rites (figure 30), the other to the world of the living, with particular emphasis on the evolution of the settlements from the first villages to the emergence to the town of Kerma (figure 31). It ends with the presentation of the Kerma Museum, to highlight the fact that the excavations and research go hand-in-hand with a dialogue with the local population, with a concern to restore a part of their past, which is also materialised by the work undertaken to protect and restore the main excavation sites. This final section was also the occasion to question how the narrative regarding their heritage was received in the rural environment of a developing country, for which reason this section also includes interviews with Sudanese visitors to the museum, in which they express their opinion regarding the site and its importance.

The exhibition ran from September 2, 2014 to May 17, 2015. The inauguration coincided with the start of the International Congress of the Society for Nubian Studies, which brought together almost 500 people, amongst which several personalities from the Swiss political and academic spheres (Secretary of State for Education, Research and Innovation, rector of the University of Neuchâtel, Neuchâtel State Counsellor responsible for culture), Sudanese representatives (Minister for Culture, Director of the Sudan National Museum, University

Figure 32 / In front of the projection showing the museum of Kerma, from left to right, Alain Ribaux (Member of the Council of State Neuchâtel), Mauro Dell'Ambrogio (State Secretary of the Swiss Confederation), Mohamed Abdala El-Had (Minister of the Republic of the Sudan), Matthieu Honegger, Yusuf Fadl Hassan (Honorary Professor of the University of Khartoum), Abdelrahman Ali (Director of the NCAM, Sudan).

professors and researchers) and representatives from Foreign Affairs, including the current and past Swiss ambassadors in Khartoum (figure 32).

The financing of the exhibition was split approximately equally between the Laténium Museum and the Kerma Foundation, this last having been funded in large part by Swiss institutions, and by contributions from Sudan and Qatar.

Building on the synergy with the exhibition, the four-yearly International Congress of the Society for Nubian Studies took place the first week of September at the Humanities Faculty of the University of Neuchâtel. As things stand, this is currently the most important scientific meeting on the subject of Nubia. Its importance was increased by the cancellation of the 2012 Congress of Meroitic Studies, which was due to take place in Egypt, so that Neuchâtel integrated all the participants of Meroitic Studies.

Almost 300 people participated at the Neuchâtel Congress, some 40 of which came from the Sudan and Egypt. More than 20 nationalities were represented, many of whom were noteworthy, including several university professors, as well as museum curators, including those from the Egyptology Departments of the Louvre and the British Museum, the director of the Boston Fine Arts Museum, that from the Georg Steindorf Museum of Leipzig, etc. (figure 33). The number of communications totalled 19 in plenary sessions (mornings), 185 communications in parallel sessions (6 parallel sessions were organised in the afternoons) and 14 posters. Several members of the Swiss Archaeological Mission, including the PhD students, made presentations and chaired a session. Each evening an event completed the programme (inauguration, conference, cocktails). The publication of all the presentation is planned.

The Kerma Foundation participated in this Congress by making personnel available for its organisation (M. Bundi and C. Fallet), by paying for the meals of persons from Sudan and Egypt attending the conference and by participating in the Congress closing event. Other than that, the main part of the budget was covered by funds from the University of Neuchâtel, the Academic Society, the Swiss National Fund for Scientific Research and the registration fees.

Figure 33 / View of the participants to the 13th International Conference for Nubian Studies (University of Neuchâtel).

Marc Bundi

3D SCANNING AND PRINTING – AN ALTERNATIVE APPROACH TO THE DISPLAY OF SENSITIVE AND FRAGILE HERITAGE ASSETS

The seven granite statues depicting the Nubian Kings Taharqa, Tanutamun, Senkamanisken, Anlamani, and Aspelta – discovered by the Swiss Mission on January 11, 2003 in a cachette at Dukki Gel – are the key attraction of the Kerma Museum, inaugurated in 2008. In the context of the preparations of the exhibition «Aux origines des pharaons noirs: 10'000 ans d'archéologie en Nubie» in Neuchâtel, the possibility of exhibiting a selection of statues from the Dukki Gel cachette was thus subject to a comprehensive evaluation. However, in consultation with the commissioner of the exhibition – Prof. Dr. Matthieu Honegger – it was decided to exclude the display of original statues for a number of technical, logistical and ethical reasons.

On a technical level, we first had to consider the fragility of the statuary. Unlike other statues of the 25th Dynasty Rulers discovered in amazingly preserved condition, the ones from the cachette at Dukki Gel are reconstructed from a series of connected fragments (e.g. 12 for Taharqa and 7 as for Tanutamun, cf. Bonnet and Valbelle 2005: 89, 95). This operation – executed by the German restorer Markus Bloedt – continued for two seasons and involved the skilled reassembling of the statues including the insertion of steel rods in order to ensure proper structural integrity. Originally, the surface of the statues in grey and black granite was richly gilded and painted – and traces of both are still visible. The actual texture of the statues is thus very delicate and extremely vulnerable. Secondly, we have to consider the fact that for security reasons, the statues had been firmly anchored in a concrete podium construction within the Kerma Museum. The effort of removing the statues from the podium would entail an incalculable risk and threat to the integrity of the artefacts, which are of inestimable value and which must be considered both as part of the national treasures of the Sudan and the universal heritage of mankind.
On a logistical level, we realised that the relocation of statues was a sensitive and complex issue, as well as a costly and risky enterprise. The handling and transportation of items of cultural heritage requires an appropriate range of knowledge, skills and competences from those involved in the process. The availability of experts with working experience in the Sudan is very limited and the cost of shipping services is thus excessively high. Additionally, the framework of national laws and regulations regarding the (temporary) export of cultural assets is intertwined with international standards such as the «Recommendations concerning the International Exchange of Cultural Property», adopted by the General Conference of UNESCO on its 19th session in 1976:

«Member states should give special attention to the problem of covering the risk to which cultural property is exposed throughout the duration of loans, including the period spent in transport, and should, in particular, study the possibility of

Figure 34 / Scanning of the statues of Taharqa and Tanutamun by TrigonArt. Kerma Museum, January 2014.

introducing government guarantee and compensation systems for the loan of objects of great value, such as those which already exist in certain countries» (Yusuf 2007: 504).

Initially, this recommendation referred to an indemnity guarantee only (van Woudensberg 2012: 24). However, in recent years it has been expanded by a large number of source nations including Sudan with regards to immunity from judicial seizure. Consequently, potential borrowers should not under-estimate the possible impact of administrative and political complexities in the borrowing process.

But above all else, our strongest argument against the removal of the statues from the actual site derives from ethical considerations. The Kerma Museum began as a local initiative from the 'High Committee for the Kerma Cultural Complex', which aims at the protection and the promotion of the region's past. The ultimate aim of the 'High Committee' as defined at its foundation in 1997 is, according to the chairman Sirr al-Khatim Fadul, «to keep the objects and collections to be extracted from the excavation in the area» and «to make these objects accessible for research, public enjoyment and education» (personal communication to the author, Khartoum 2013). Since that date, the seven statues displayed in the main hall of the

Figure 35 / . 3D rendering of the statues of Taharqa (height=257,6 cm) and Tanutamon (height=214,3 cm).

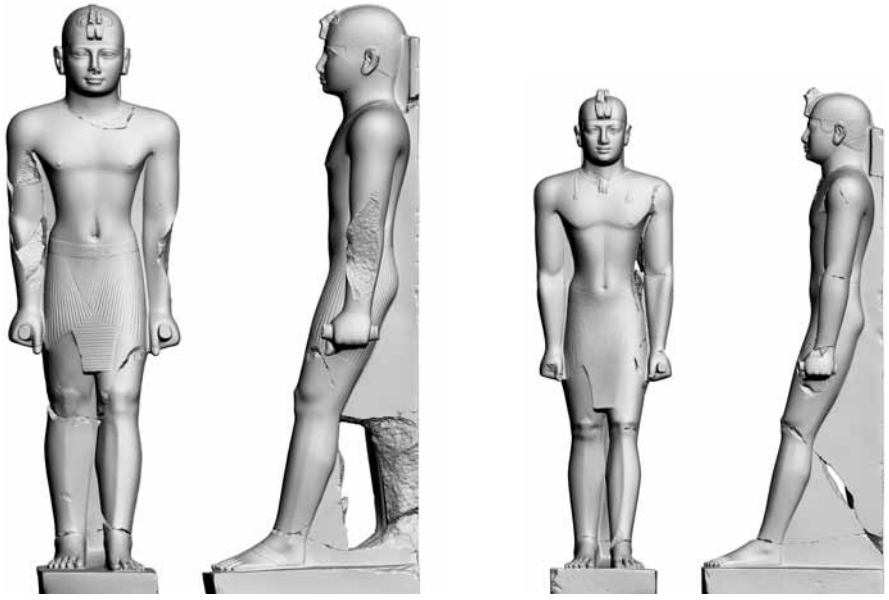


Figure 36 / . 3D printing of Taharqa in silica sand and resin executed by Voxeljet. Friedberg/Augsburg, June 2014.

Kerma Museum have become important emblems of a distinctive 'Nubian identity' and the pride of the nation. Their removal from the Museum – albeit of a temporary nature – would be an immeasurable and irreparable loss. The museum would lose its main attraction and thus also substantial amounts of revenue from entrance fees. But most of all, the people in Nubia would be deprived of a central pillar of their ancestral heritage.

In consideration of these arguments, we decided to pursue an alternative to the display of the original statues and eventually decided on the manufacture of full-sized 3D reproductions in facsimile of the monumental granite statues of Taharqa (Entry No. 35583) and Tanutamun I (Entry No. 35584) from the Kerma Museum. Thanks to a suggestion by Karla Kroeper from the Naga Project, we got in contact with the Berlin based scan specialists TrigonArt – one of the leading engineering and manufacturing companies for 3D printing – who successfully implemented our project, which involved the following steps:

1. After approval of the project by the National Corporation for Antiquities and Museums (NCAM) TrigonArt started the high-definition scanning process of the statues on site in the Kerma Museum in January 2014. The captured 3D data files have the character of a virtual backup copy which allows the meticulous reconstruction of the originals in the event of damage caused by natural forces, the passage of time or human agency (figure 34).

2. The processed and refined data (figure 35) were sent to the Augsburg based 3D printing company Voxeljet where the statues were printed in quartz sand in a total of 5 pieces. Due to weight restrictions in the exhibition space of the Laténium – Neuchâtel's archaeological museum – and in order to save on the costs of materials, the parts were printed hollow (material thickness: up to 45 mm). For structural reasons, it was planned to insert metal bracings and to inject synthetic resins in the hollow cores of the reproduced statues (figure 36).

3. Since the richness of detail in the high-definition scans found its full expression in the printed elements, only minor manual finishing was required. TrigonArt again executed the assembling of the elements and the mounting of the internal bracing.

4. The highly experienced restorers Rütt & Schulz in Berlin executed the application of the colour scheme (figure 37). A series of different layers of thin, glazing colour and wax was applied in an alternating sequence on the reproduced statues in order to match the original colouring and patina.

5. TrigonArt also assumed the construction of customized transport crates, the professional packing, the shipping of the reproduced statues to the exhibition venue at the Laténium and their installation in the exhibition hall.

The inauguration of the exhibition «Aux origines des pharaons noirs» in the Laténium, Archaeology Park and Museum of Neuchâtel, on September 2, 2014, coincided with the 13th International Conference for Nubian Studies, which was attended by a large number of domestic and foreign participants. As we had anticipated, the faithful copies of Taharqa and Tanutamun became a key attraction of the exhibition (figure 38). Although replicas, which according to Walter Benjamin (1968), lack the authentic aura of the original statues, in an age of post-mechanical reproduction, they succeed in conveying a particularly powerful aesthetic experience.

Figure 37 / Application of the color scheme on Tanutamun and Taharqa at Rütt & Schulz. Berlin, August 2014.

At the end of the exhibition, the faithful copy of Taharqa will go to DAL Group Khartoum, a main sponsor of the project, whilst the copy of Tanutamun will be placed at the disposal of the Sudan National Museum in Khartoum where it may serve as an exhibition copy for upcoming presentations, both in the Sudan and abroad.

A central aspect of our project explored the process of cultural transmission – i.e. the reciprocal sharing of cultural information – via the transfer of knowledge and technologies. We hope that our approach sets the example for the future management of fragile heritage assets.

Involved Project Partners
DAL Group, Khartoum. www.dalgroup.com
Qatar Sudan Archaeological Project. www.qsap.org.qa
Rütt & Schulz Restaurierung GbR, Berlin. www.berlin-restaurierung.de
TrigonArt Bauer Praus GbR, Berlin. www.trigonart.com
Voxeljet AG, Friedberg. www.voxeljet.de

Figure 38 / Tanutamun and Taharqa on display in the main exhibition hall of the Laténium. Hauterive-Neuchâtel, September 2014.

Marc Bundi
Matthieu Honegger

REPORT ON ACTIVITIES SPONSORED BY THE QATAR SUDAN ARCHAEOLOGICAL PROJECT (QSAP)

Since 2014, the Swiss Archaeological Mission at Kerma benefits – for a period of four years – from financial assistance granted by the Qatar Sudan Archaeological Project (QSAP). While the excavations and the post-excavation research are funded by other sources, the QSAP activities of the Swiss Archaeological Mission are implemented at the following three levels: protection of archaeological sites, development of visitor facilities and final installations at the Kerma Museum.

Protection of the archaeological sites within the concession area

Kerma is one of the most important archaeological sites of the Nile Valley. Under excavation by Swiss experts for more than forty years, it has revealed exceptional archaeological remains, monumental temples and vast necropolises buried in the ruins of ancient cities. The remains of three consecutive ancient towns (the Pre-Kerma agglomeration; the ancient town of Kerma, capital of the first Kingdom of Kush and the Egyptian town of Pnubs on the site of Dukki Gel), within a perimeter of no more than five miles, document a highly sophisticated civilization and demonstrate the continuous evolution of the first African urban centre over three millennia.

The Swiss Mission has made huge efforts to protect and conserve these archaeological remains, and to date two of the main sites of the area – the site of the ancient capital of Kerma and the site at Dukki Gel – are well protected against the trespass of vehicles as well as against the extension of agricultural lands. However, this is not yet the case for the site of the royal cemetery, which is one of the most important necropolises of the Sudan. It covers 70 hectares and contains an estimated 50’000 graves. In 1945, Anthony J. Arkell – then Commissioner for Archaeology and Anthropology in the Sudan – evaluated the possibility of erecting barbed wire fencing around the site, but due to war-time budget constraints this was never realized.

In 2009, the growth of motorized traffic and the development of irrigation with the consequent agricultural intensification in the area of the royal cemetery, led us to decide on the protection of the cemetery by the erection of earthen barriers and by sections of a low wall in *galous* (rammed earth). While the earthen barriers erected by tractors proved not to be lasting, the rammed-earth walls are simple to construct and very durable; they are at the same time real and symbolic barriers as the means of exercising territorial control over the archaeological areas protected by federal decree. The funding from the QSAP project now permits the acceleration of this enterprise and the completion of the enclosure wall over the next three years. However, it must be stressed that traditional earthen architectural techniques require regular and ongoing maintenance and there lies the challenge for the future.

Figure 39 / Construction of the enclosing wall by Awadalla Khalifa Osman and his team. Kerma, royal cemetery.

The main focus of the 2014–15 campaign was on the construction of new sectors of the enclosure wall at the northern and eastern limits of the royal cemetery (figure 39). This works included the construction of 430m in the north-western sector, 550m in the north-eastern sector and 890m in the south-eastern sector. For this purpose it was necessary to transport large amounts of earth and sand to the site as well as providing the water needed for the construction work. Two separate teams consisting of four members each undertook the construction work. We wish to express our deepest gratitude to them and at the same time pay tribute to their skill and dedication.

It proved necessary to refurbish the roads next to some of the newly built sectors of the enclosure wall in order to grant farmers access to their fields (figure 40). Finally, we also decided to manufacture almost 100 cement posts and place them in order to signal and delimit the protected perimeter of the necropolis, as well as to impede the adjacent landowners from expanding their fields onto the cemetery. Even though we are investing a great amount of time and effort to explain and defend our approach, we are aware of the necessity of further raising the awareness among the local population of the importance of the eastern necropolis as a critical element of Nubian heritage. The NCAM inspector assigned to the Swiss Mission, Abdelmajed Mahmoud, has assisted and supported our operations with great dedication and expertise. We would like to take this opportunity to express our sincere thanks for his continuous support and cooperation.

The upcoming campaigns will ensure the careful continuation of the works on the enclosure wall. Additionally, we plan to restore the foundations of the Pre-Kerma agglomeration (dated to the 3 millennium BC), which is the most ancient fortified settlement of the Nile valley. Here, our focus is on the exemplary reconstruction of selected elements of the defensive system and of the habitat. The architecture follows a Sub-Saharan tradition which includes a series of palisades and buttresses made of posts and lumps of rammed earth, erected either in a circular arc or as parallel rows around the habitation huts, animal pens and storage pits. The main challenge is to give the visitors a vision of the past in strict accordance with the archaeological evidence.

Development of visitor facilities at the archaeological sites

Possessing the first examples of African monumental architecture, the region of Kerma offers a variety of archaeological attractions for visitors to explore. It is therefore a major concern of the Swiss Mission to enhance the visitor experience and to increase the general awareness of the archaeological remains. On the other hand, it is important to take into account the impact of archaeological tourism on the sites and on the natural environment in which they are located.

As in previous years, we have devoted much effort to the upkeep of excavation sites and of the monuments. Apart from the measures referred to above, this included clearing the sites of plant growth and the collection of plastic waste. In collaboration with the NCAM inspector we have installed a number of signposts to demarcate the borders and billboards bearing basic information on the sites. Within the scope of the QSAP project we plan to publish a booklet on the archaeology of the region of Kerma, providing additional background information on the history and setting of the archaeological sites.

Also included in the scope of the QSAP project is the establishment of a visitors information centre at the south-western edge of the royal cemetery. Here, visitors will find detailed information both regarding the history and development of the necropolis, as well as regarding the history of its discovery and subsequent exploration.

Museographic presentation of the archaeological heritage of Kerma

The completion of the museographic project in the Kerma Museum, which was inaugurated in 2008, is another priority within the QSAP activities of the Swiss Mission. Within the scope of the QSAP project, we plan to implement the following activities at the Kerma Museum:

- Repainting of the exterior façade of the Museum;
- Replacement and upgrade of the lighting system;
- Mounting of a protective glass panel over the reconstructed graves;
- Refurbishment of the showcases and preparing new displays of museum objects;
- Creation of two supplementary information panels for the gallery devoted to the Middle Ages;
- Publication of a museum guide in Arabic and English.

In parallel with the works planned for the museum within the region, we have proposed that certain museographic objects regarding the archaeology of Kerma be displayed in the National Museum of Khartoum, which is soon to be renovated. We are convinced that a presentation enriched by discoveries made at Kerma, within the museum in the capital city, will enhance the awareness of the Nubian archaeological heritage, and bring this to the attention of the public. For this reason, funds from the QSAP have been used in 2014 to partially fund the making of two models, one involving the reconstruction of the Mesolithic huts found at Wadi El-Arab, the other a 1/100 scale model of the town of Kerma. This last is a remarkable object both in terms of quality and in terms of importance, since it covers a surface of 24 square metres and represents one of the oldest towns of the continent. A replica of the statue of the black pharaoh Tanutamon has also been realized with the help of QSAP funds, with the same objective as the models. Presenting this replica in Khartoum will compensate for the fact that the seven statues of the black pharaohs discovered in January 2003 at Dukki Gel cannot be moved. Key exhibits at the Kerma Museum, they are at the centre of the exhibition and have been anchored in their concrete podium so as to render then untransportable elsewhere in future. Discovered fragmented, they have been restored in situ using metal pins and glue made of two components, but remain nonetheless fragile. Their transport over long distances would risk the degradation of their state of conservation and not ensure their safe return.

Figure 40 / Construction of the enclosing wall and the bypass road. Kerma, royal cemetery.

The two small scale models and the replica of the statue were first presented to the public during the exhibition on the activities of the Swiss Mission in Kerma («Aux origines des pharaons noirs: 10'000 ans d'archéologie en Nubie»; Neuchâtel/ Switzerland; September 3, 2014 to May 17, 2015) and will in few years become a part of the attractions of the Sudan National Museum.

The presentation of the archaeological heritage to a wider public and the transfer of knowledge to those interested is a core concern of the QSAP project. It represents an opportunity as well as a challenge, which we gladly accept with passion.

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SUMMARY

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