

K E R M A

2012-2013

SOUDAN

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I M P R E S S U M

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Cover figure : Mesolithic pottery sherds from Waydi El-Arab. Photo: Matthieu Honegger

ARCHAEOLOGICAL EXCAVATIONS AT KERMA (SUDAN)
PRELIMINARY REPORT OF THE 2012-2013 SEASON

The investigations of the Swiss Archaeological Mission started on 2 December 2012 and were completed on 1 February 2013. As usual, the mission was organised in two teams.

The team directed by Matthieu Honegger worked in the eastern cemetery at Kerma and at the site of Wadi El-Arab. Additionally, a survey in the area of Wadi Farjar was begun, in anticipation of the possible building of a dam at Kajbar, 30 km north of Kerma. The team was composed of rais Khidir Magbul, who supervised eight local workers for the excavation of graves in the eastern cemetery. Marc Bundi was in charge of management and logistics (supervision of the construction of walls protecting the eastern cemetery, work in the Museum and in the new rest house) and pursued his PhD work. Seven collaborators or students from Neuchâtel participated in fieldwork (Camille Fallet, Bastien Jakob, Léonard Kramer, Ellinor Dünning, Leyla Duvannel and Deborah Locatelli). They were accompanied by two students from the universities of Geneva (Noémie Monbarron) and Basel (Salomé Keller). As is customary, a curator of the Kerma Museum (Shahinda Omer) joined our team. This year, the team benefited from the presence of Dr. Isabelle Crèvecoeur (CNRS, Bordeaux), who worked on the Mesolithic skeletal remains of Wadi El-Arab and El-Barga.

The team led by Charles Bonnet pursued its works at Dukki Gel and conducted restoration projects in the ancient city of Kerma and at Dukki Gel. This second group comprised rais Gad Abdallah, Saleh Melieh, Abdelrazek Omer Nuri and Idriss Osman Idriss, who supervised 60 local workers. Three specialists from Switzerland worked in their respective domains: Philippe Ruffieux (ceramology), Alain and Pauline Peillex (archaeology and drawing) as well as two French specialists, Severine Marchi (archaeology and drawing) and Jean-Michel Yoyotte (photography). Prof. Dominique Valbelle (University of Paris IV, La Sorbonne) worked on the publication of the engraved blocks at Dukki Gel.

The Swiss Mission was 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 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 and Research of the Swiss Confederation, the Foundation Kerma and the University of Neuchâtel (Switzerland). For more information, see www.kerma.ch

This year, the mission was reorganised and, from now on, its two contingents will operate independently. The team directed by Matthieu Honegger will continue its

work in the eastern necropolis as well as at the pre- and protohistoric sites located within the Kerma concession. Regarding the other team, Charles Bonnet will pursue the excavations at Dukki Gel and continue the conservation programme at both this site and the city of Kerma. With this aim in mind, he is associated with NCAM as well as with French colleagues and the French Ministry of Foreign Affairs. Bonnet's activities report will be published in Genava, as was always the case in the past, while our excavation report and the results of our first analyses will continue to be published in the present journal.

The investigations of this campaign focused on the following sites:

Wadi El-Arab, where we expanded the excavation of more recent levels over an area of 160 square metres eastward. The goal was to clear the bottom of more huts in the horizon that has already revealed three (7300-6800 cal BC) and to find sectors where more recent levels (6500-5400 cal BC) are still preserved, in order to understand the transition to a production economy.

- El-Barga, the skeletal remains of which are being studied by Isabelle Crèvecoeur. A new tomb dated to the Mesolithic was discovered on the surface during a site visit and this increased the total number of interred individuals to 45. El-Barga is the one of the largest African necropolis of pre-Neolithic date and, due to the paucity of cemeteries of this period, its study is of utmost interest (Crèvecoeur 2012). For this reason and the fact that the site must surely contain more tombs in the unexcavated sectors, we decided to undertake during the 2013-2014 campaign a new excavation of more than 100 square metres, relatively close to the large concentrations of Mesolithic burials.
- The eastern necropolis, where the clearing of tombs was focused on sector 23, dated to the Kerma ancien II and previously excavated by Charles Bonnet, but where only a sample of tombs was studied. Our goal was to complete the systematic documentation of the burials in order to study the spatial distribution of this entire sector and later compare the data with those of sectors 27-28, the excavation of which is now complete. We also cleared an area west of sector 28 with the hope of reaching the limit of the necropolis. Furthermore, with this sector having revealed Neolithic remains (hearths, postholes), the aim was to understand a section of the settlement from this period (5th millennium BC). We are aware that to date there are no known excavations for this period in either Nubia or Sudan, with the exception of what has been uncovered in sector 12 of the eastern cemetery (Honegger 2001).
- Wadi Farja, which we surveyed over a three day period. This is today a dry valley, located in the bend of the Nile 20 km north of Kerma. This area was the subject of an earlier survey (Osman and Edwards), but the possible construction of a dam downstream at Kajbar led us to respond to NCAM's appeal, looking for

teams to evaluate the threatened sectors and conduct excavations if necessary. The sector selected, Wadi Farja, includes Mesolithic, Neolithic and Kerma settlements and fits well into our research programme. We have checked 18 previously discovered sites and, in certain cases, were able to refine their dating using pottery discovered on the surface. Four new sites were also discovered.

- Dukki Gel, where Charles Bonnet continued his work on temples, sanctuaries and fortifications of Nubian or Egyptian traditions (18th dynasty). He also continued restoration works at the site by reconstructing in mud brick the foundations of the main buildings.

We will present here the results of the work conducted at Wadi El-Arab and the Kerma necropolis. Research undertaken at El-Barga and the survey at Wadi Farja will be presented at a later time, when investigations are further advanced. Further studies presented in this report include contributions by Maria Gatto, who a few years ago had undertaken a first analysis of the oldest mesolithic pottery from the Kerma region, and Marc Bundi, who discusses recent results obtained for his PhD research on the perception and the functioning of the two principal archaeological museums in Sudan, those at Khartoum and Kerma.

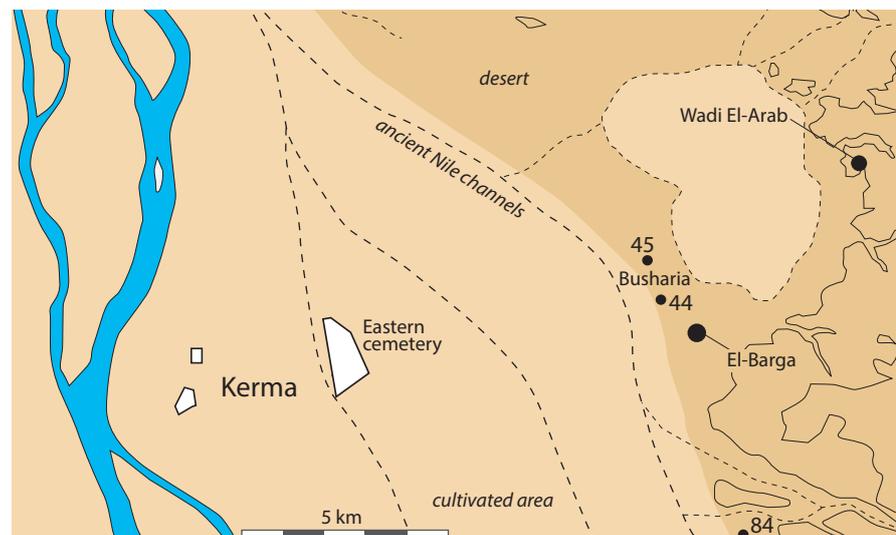
PRELIMINARY REPORT ON THE MOST ANCIENT POTTERY FROM THE KERMA REGION

In the frame of the prehistoric research programme carried out by the Swiss Archaeological Mission at Kerma (Sudan), many prehistoric sites were identified in areas located east of the alluvial plain. During the 2004-05 field season a small group of potsherds, from surface or trial excavations on selected sites, has been collected (figure 1). Diagnostic fragments, such as bases, rims or decorated walls, were preferred.

The study of the collected sherds, in combination with the radiometric dates available for every site, had the aim to precise the cultural affinities and to check the chronological coherence of this most ancient pottery of the area. The oldest dates obtained on different sites at Kerma are comprised between 8300 and 7700 BC (all the dates mentioned in the text are calibrated). They came from four sites (figure 2):

1. Site 45 in the area of Busharia. Material was collected at the surface and from a small excavation (2 x 2 m). The four C14 dates are between 8300 and 7800 BC. It is the most ancient documented occupation of the area.
2. Site 84, with a date of 8200-7700 B. The pottery sherds were collected at the surface.
3. Site 44 in the area of Busharia, with three dates between 8200 and 7400 BC. The material was collected at the surface.
4. Site 41 which is Wadi El-Arab (see Honegger, this volume), a site still under excavation, where the most ancient layers were identified in stratigraphy at about 80 cm under the surface. Fives dates are comprised between 8300 and 7800 BC, but the occupation layer contained only few eroded sherds. This sample was too small to be studied.

Figure 1 / Location of sites in the Kerma region having revealed the oldest human occupations of the Holocene period.



Finally, for this first study only the pottery coming from sites 45, 84 and 44 has been chosen. From a ceramological viewpoint, this is the first study undertaken on the oldest productions from the Kerma region. It has to be pointed out that the finding in this area of pottery with such an old date was unexpected but most welcome to fill the gap in the local sequence and to confirm information coming from near and far areas - particularly Nabta Playa, the second cataract region, Khartoum region and Central Sahara (Gatto 2002, 2006, Caneva 1987, 1988, Caneva and Marks 1990, Salvatori 2012). Previous studies on prehistoric pottery from the Kerma Basin, all made by Honegger (2004a), mainly regarded the Pre-Kerma ceramics, dated to the first half of the third millennium BC, with the exception of some fifth millennium BC Neolithic pottery from a settlement found in the area of Kerma Eastern Cemetery. There is no doubt that, as far as the Kerma region is concerned, we are still at the beginning in the reconstruction of the whole prehistoric pottery sequence, with many missing information that needs to be added, especially from the future study of the sites of El-Barga and Wadi El-Arab, with their detailed archaeological sequence (Honegger 2012, fig. 3).

In describing the fragments all the attributes were taken into consideration: fabric, surface treatment, decoration, shape, size, vessel parts, function and find context. However, it must be said that in many cases the potsherds were too small and poorly preserved to make possible the report of all the aforementioned attributes. Moreover, their number was definitely too small for a precise account. As a result, decorations and fabrics, always recordable, were observed more carefully.

For the fabric the type of inclusions, the porosity and the structure of the paste, and the colour of the fracture were observed, making reference to the Vienna System (Nordström and Bourriau 1993) and to Nordström's classification (Nordström 1972) of Egyptian and Nubian fabrics, respectively.

Figure 2 / Table indicating the dates of the oldest Holocene occupations in the Kerma region. Calibration from Reimer et al. 2013.

reference	date BP	BC cal (2 σ)	site	context	material
ETH 30345	8465 +/- 70	7600-7360	44	earth surface	charcoal
ETH 31783	8560 +/- 65	7730-7510	44	surface	freshwater shell
ETH 30044	8815 +/- 70	8220-7680	44	surface	freshwater shell
ETH 40941	8820 +/- 40	8200-7750	41	Sc 165/G8/10	ostrich eggshell
ETH 40950	8820 +/- 40	8200-7750	41	Sc 165/H2/6	ostrich eggshell
ETH 40939	8835 +/- 40	8210-7760	41	Sc 165/G7/8	ostrich eggshell
ETH 30048	8840 +/- 70	8230-7730	84	surface	freshwater shell
ETH 40528	8845 +/- 45	8210-7790	45	A2/4	ostrich eggshell
ETH 31782	8860 +/- 65	8230-7760	45	B2/4	ostrich eggshell
ETH 31789	8870 +/- 70	8240-7760	41	Sc 165/H8/10-11	ostrich eggshell
ETH 35679	8880 +/- 55	8240-7820	45	A2/déc.2	ostrich eggshell
ETH 31788	8990 +/- 65	8300-7960	41	Sc 165/H8/7	ostrich eggshell
ETH 30046	9040 +/- 70	8320-8020	45	surface	ostrich eggshell

Nordström's classification of Nubian pottery (1972) was used as reference for description of shape and vessel parts. As far as the decoration is concerned, the terminology in use follows that proposed for the Early and Middle Holocene fabrics from the Second Cataract (Khartoum Variant) and the Nabta-Kiseiba region (Early and Middle Neolithic) (Gatto 2002, 2006 a), based on the Caneva's system (1987, 1988; Caneva and Marks 1990).

Classification

Fabrics

- KIa very coarse sand tempered
- KIb coarse sand tempered
- KII medium sand tempered
- KIII fine sand tempered
- KIV mica and fine sand tempered

Decorations

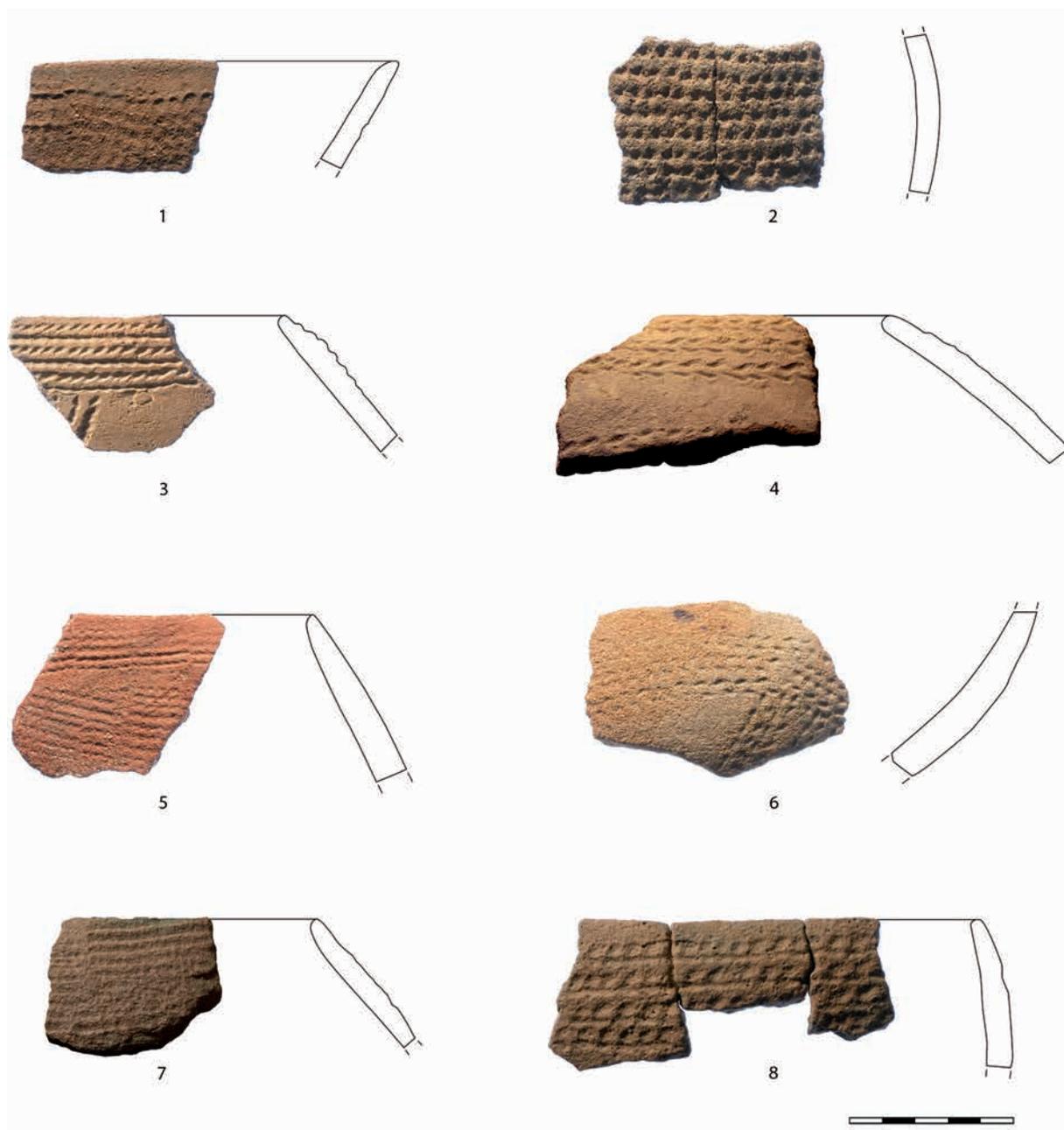
Rocker Stamp Technique

- R1 Rocker, Continuous Packed Dotted Zigzag, Various Patterns
- R3 Rocker, Continuous Spaced Dotted Zigzag
- R4 Rocker, Continuous Packed Dashed Zigzag
- R7 Rocker, Continuous Spaced Dashed Zigzag

Alternately Pivoting Stamp Technique

- A1 Alternating Pivoting Stamp, Herring-bone Pattern
- A2 Alternating Pivoting Stamp, Double Grain-shaped Dotted Line
- A7a Alternating Pivoting Stamp, Double Grain-shaped Dotted Line, Zoned-Banded
- A7b Alternating Pivoting Stamp, Double Grain-shaped Dotted Line, Zoned Geometric Pattern
- A9 Alternating Pivoting Stamp, Return Technique, Atypical Pattern
- A10 Alternating Pivoting Stamp, Return Technique, Triangle-shaped Pattern
- A11 Alternating Pivoting Stamp, Return Technique, Packed Horizontal Dotted Lines
- A12 Alternating Pivoting Stamp, Return Technique, Double Rounded Dots, Horizontal Lines
- A13 Alternating Pivoting Stamp, Return Technique, Double Dragged Grains, Zoned-Banded
- A14 Alternating Pivoting Stamp, Return Technique, Double Dragged Lines, Zoned-Banded
- A15 Alternating Pivoting Stamp, Return Technique, Double Packed Grains, Evenly Serrated
- A16 Alternating Pivoting Stamp, Return Technique, Double Grains, Packed Festoon-like Patterns

Figure 3 / Pottery from sites
45 (1-2), 84 (3-6) and 44
(7-8). Scale: 1/2.



Site 45

Following radiometric dates of 8300-7800 BC, obtained from ostrich egg-shell fragments, the small group of potsherds collected from the surface of this site are within the oldest known in the whole Africa. According to Honegger the site does not show any further occupation, thus the potsherds supposed to belong to one phase.

To support this hypothesis there is a great homogeneity within the fragments. All of them are low fired and technologically made using the coiling and the pinching techniques. Surfaces, unless abraded, are smoothed and impressed. Half of them are decorated using the rocker stamp technique, the other half with the alternating pivoting stamp technique. In spite of the small size of the fragments, the decoration seems to cover the whole exterior surface. The only shape recorded is an unrestricted simple contour bowl with an undecorated rim, pointed to rounded towards the outside (figure 3.1). Wall thickness goes from 5 to 13 mm.

The majority of fabrics are tempered with medium-size sand in a medium to high percentage in the paste (KII); rarely small and few vegetal remains, probably natural inclusions, are noticed. Generally, porosity is medium to open and structure medium strength. However, few examples of a finer sand tempered (KIII) fabric, as well as a quite high number of a very coarse sand tempered fabric (KIa), were noticed. As far as the latter is concerned, it appears to have a too much high percentage of sand inclusions in the paste compared to the amount of clay. Sub-angular and sub-rounded medium to big size grains are present in a very high percentage. The cohesion between the clay and the inclusions is really low. Large voids on surface are left by big grains removed by erosion or during the firing. The porosity is very open and the structure is soft and crumbly. The imbalance detected in the fabric's components clearly shows the early stage in the development of pottery manufacturing in the area.

The fine sand tempered fabric, instead, stands aside from the rest of the collection, though the decorative patterns in association to it perfectly fit with the others. It may bears witness to the presence of a younger, undetectable, phase at the site.

Describing the decorations, the rocker stamp impressions form only two motifs: the packed dotted zigzags (R1) and the spaced dashed zigzags (R7), because of the small size of the fragments, it is difficult to define the decoration' structure. The two types were obtained using different implements, respectively a comb and a possible piece of cord wrapped around a stick (wrapped-stick cord roulette or *peigne fileté*, Soper 1985; Gosselain et al. 1996, for a latest update see Haour et al. 2010), respectively. The alternately pivoting stamp impressions (of type A11) are obtained using a two-pronged tool, in all cases but one (A12) applied by making the tool pivot, for each pair of lines, in the dots of the last line impressed (return technique, figure 3.2), resulting in a regular smocking pattern (Caneva 1987; Caneva and Marks 1990).

The identification of the return technique, common in the Central Sahara during the local Middle Pastoral phase (mainly the 6th millennium BP - Caneva 1987) is a unique feature in a context with such an old date and along the Nile valley. This technique doesn't seem to have been so common in successive periods in the Nubian area, although I could notice some examples of return technique within the Neolithic ceramics from the Dongola Reach (Karat and El Multaga, still unpublished), while others are recorded at Shaqadud (Caneva 1987). Decorations obtained with the same technique, but showing different patterns, were found in the Khartoum Variant ceramic production as well as in the contemporary and culturally associated pottery collection from the Eastern Desert (Gatto 2006 a: types A9 and A10, Caneva et al. unpublished, Lanna and Gatto 2006).

Site 84

Again a small assemblage of potsherds has been collected from the surface of the site, dated to around 8000 BC. Technologically, they are all low fired and made using the coiling and pinching techniques. Judging from the rim fragments and the only base on hand, the common shape is a deep bowl or neckless jar with rounded rim and rounded base. Wall thickness goes from 5 to 10 mm, less than in the previous site. Most of the fabrics are medium sand tempered as described before (KII), some of which in a way similar to Nordström's Abkan fabric IC (Nordström 1972). Few examples still have coarse sand inclusions (KIb), definitely smaller in size and less in percentage than the variant recorded at site 45 (KIa). Here as well, a very small number of potsherds has a finer sand fabric, similar to Nordström's Khartoum Variant fabric IA, corresponding to my fabric I (Nordström 1972; Gatto 2006 a); this pottery may be dated to the second half of the 7th millennium BC (See Honegger 2012, fig. 3 Mesolithic IV).

As for the decorations, this time most of them appear to be only zonally applied on the vessel wall. The rocker stamp impressions, still of types R1 and R4, are now rare. The alternately pivoting stamp impressions, on the other hand, are the most common, although new types are recorded. Double-grained lines, banded and horizontally placed on the surface (A7a) or forming geometric patterns (A7b) are well attested, as well as a variant formed by dragged double grains (A13) or lines (A14) applied in horizontal bands (figure 3.3-6). No return technique has been detected on the site. Because of the presence of zonal patterns also undecorated sherds were found.

In spite of the close radiometric date between sites 45 and 84, the two ceramic assemblages are quite distinctive, the one from site 84 showing a further stage of development that has many more similarities with the successive productions from sites 44 and El-Barga (Honegger 2004b). As far as the interregional relationships is concerned, it must be pointed out the resemblance between some of the fabrics

here recorded and those from the Khartoum Variant, Abka and Nabta assemblages. Also the few rocker stamp decorations are similar to the northern productions and their rareness on the site leaves open any hypothesis. The alternately pivoting stamp patterns, on the other end, are rarely found in the northern contexts (Gatto 2002, 2006).

SITE 44

A small amount of fragments has been recovered also at this site, dated around 7700 BC. The assemblage in this case is definitely more simplified compared with the previous, although technologically they belong to the same tradition. No rocker stamp impressions have been recorded and all the fabrics have medium sand inclusions. The majority of the impressions, all alternately pivoting stamps, are of types A7a and A7b, with double-grained lines banded and zonally applied (figure 3.7-8). Only one has the dragged grains version (A13) and another the return technique smocking pattern (A11). The latter case seems to differ from those recorded at site 45 because of a possible zonal pattern.

The assemblage from this site well fits into the production attested, during the 8th millennium, in the area (see also site 84 and more clearly El-Barga).

Conclusions

As a result of what aforesaid there are two different main phases of pottery productions to be associated to the following chronological sequence:

- 8300-8000 BC: the pottery is decorated with both rocker and alternately pivoting stamp technique the latter with the smocking pattern. Fabrics are in most cases very coarse and the technology is still at an early stage. To be noted is that even if the techniques applied to decorate the vessels are different the patterns obtained are very similar. It may be possible that they had also a functional meaning.
- After 8000 BC: the sites 84 and 44 belong to what we can call the El Barga phase (see Honegger 2012, fig. 3, Mesolithic II) with basically only alternately pivoting stamp impressions, zonally applied. The fabrics are mostly medium sized. Shapes recorded are only deep bowls. The future publication of the Mesolithic hut of El-Barga with its material will provide more complete description of this phase which is well represented in the area of Kerma.

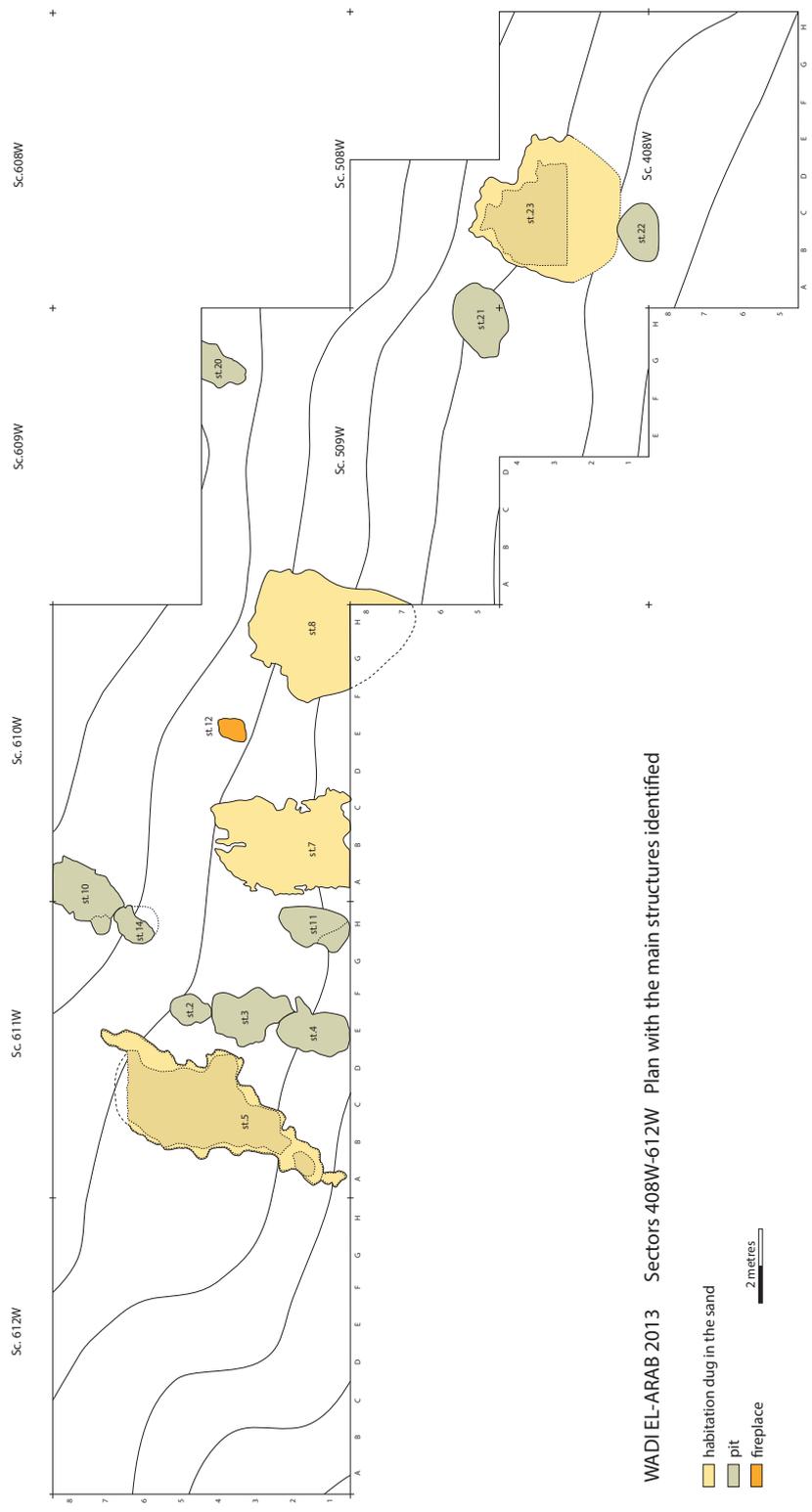
WADI EL-ARAB: SEEKING OUT OCCUPATIONS FROM THE 6TH MILLENNIUM BC

Notwithstanding the considerable extent of the site of Wadi El-Arab (3 to 4 hectares), which covers the entire Sudanese Mesolithic sequence (8300 to 6000 BC, all dates are calibrated) and that of the Sudanese Early Neolithic (6th millennium BC), we anticipate having soon explored the principal aspects of the prehistoric occupation of the site, even if we might always find justifications for continuing the excavation of this major site. We will therefore focus our attention on the publication of the results over the coming years.

As previously noted, we have applied a stratigraphic approach these past years (Honegger 2011a, Williams 2012), that the main occupations of the site have been dated, that some ten sepulchres have been excavated and that within the overlapping of the successive occupations, we have identified two habitation levels with their structures, which have been exposed over a certain surface. One consists of several pit-dwellings, whilst the more recent occupation consists of two huts identified by the stones used to prop up the posts. The abundant finds have been systematically inventoried and described according to the criteria established at inception. Given the wealth of artefacts, this task has not yet been completed, and a selection of objects remains to be drawn before we can consider drafting the report with a view to publication.

The 45 ¹⁴C dates obtained for the site of Wadi-El Arab over a period of some ten years have placed the occupation of the site between 8300 and 5400 BC. The earliest levels yielded sparse material, whilst the more recent ones are generally highly eroded. At the highest point of the site, where an area of 24 square metres was opened between 2005 and 2007 (Honegger and Jacob 2009: 3), it is the habitation levels dated between 8000 and 7200 which are best represented, whilst at the lowest point, where we are currently excavating (figure 4), the principle occupations are dated between 7300 and 6800 BC. After having tried to extend the excavations in a westward direction two years ago in a area unfortunately badly disturbed by erosional channels, we have opened an extensive surface in an eastward direction this year. The excavations have consisted in cleaning a surface of 160 square metres (Sectors 408W to 609 W) so as to facilitate the identification of excavated structures, whether they be pits or pit-dwellings. In this way a sub-circular pit-dwelling already identified as such was further uncovered and another one discovered further to the east (figure 4). Three pits were also excavated and a fairly large volume of material also found. The complex continues to appear to be a village made up of at least one alignment of huts, similar to the layout of the contemporaneous establishment of Nabta Playa E75-6 (Wendorf and Schild 2001) to which we had already compared our results.

The more elongated shape of the huts to the west could be due to the slope, which might have deformed the structures during the course of the millennia. The last hut



WADI EL-ARAB 2013 Sectors 408W-612W Plan with the main structures identified

- habitation dug in the sand
 - pit
 - fireplace
- 2 metres

Figure 4 / Plan of the sectors currently under excavation at Wadi El-Arab. Only the structures associated with the level dated to 7200-6900 BC are presented here. They include an alignment of four bottoms of huts dug in the ground, pits and a hearth. Equidistance between the level curves: 10 cm.

brought to light (structure 23) has to date only been excavated over half its surface (figure 5). The infill is darker and more powdery than the surrounding terrain. It also contains larger sherds, with a lower level of fragmentation existing in the depression. This structure did not contain pottery with a decorative style usually found in habitation levels dating between 7300 and 6800 BC, which is to say a repertoire dominated by impressions made with a comb, with notably the presence of types A1, A2, A7, R1 and R4 (cf. Gatto, this volume: 6).

As indicated by the two dates obtained from the fill at the top of this structure (figure 6, sector 508W), this last contained more recent remains, no doubt trapped in the depression, and which date from approximately 6000 BC. It is in fact not the first time that more recent horizons have been found, since later material had been found on the surface whilst prospecting the site, as well as in other sectors of the excavations. The radiocarbon dates obtained from these recent levels are bracketed between 6500 and 5400 BC. Yet we know from the Neolithic cemetery of El-Barga (6000-5500 BC) that this period witnessed important changes in the funerary rites and the material culture (Honegger 2004b). It also corresponds to the introduction of the first Neolithic elements to the region, notably that of bovinds.

At Wadi El-Arab, the upper levels, which might have furnished more data regarding this period of transformation, do not contain many faunal remains, since aeolian erosion has eliminated most of these. We will therefore learn little from this site regarding the introduction of the first domesticated animals in Nubia. In certain places however, pottery or lithic elements were still preserved, which effectively indicate the appearance of certain innovations.

The pottery is clearly dominated by the decorations made using pivoting combs

Figure 5 / Northern half currently under excavation of the bottom of a hut discovered during the last campaign in the new sectors opened to the east.



Figure 6 / Table indicating the dates from the latest occupations found at the surface of Wadi El-Arab. All the radiocarbon analysis were made on ostrich eggshells fragments. Calibration from Reimer et al. 2013..

reference	date BP	BC cal (2 σ)	context
ETH-47148	6526 +/- 33	5560-5380	Sc 612W/CF7-8/déc. 1
ETH-51609	7006 +/- 36	5990-5800	Sc 508W/AD-1-8/déc. 1
ETH-51610	7365 +/- 35	6360-6100	Sc 508W/AD-1-8/déc. 2
ETH 40526	7400 +/- 40	6390-6120	Sc 610W/AB-7-8/déc. 1
ETH 40524	7590 +/- 40	6500-6290	Sc 610W/AB-1-2/déc. 1

Figure 7 / Table showing certain characteristics of the pottery of the latest occupations at Wadi El-Arab (6500-5400 BC) in the sectors 508 to 612. Rocker stamp is the most frequent decoration (R1, R3) but the proportion of burnished pottery with few decorations is growing. For the significance of the type of decoration A (alternative pivoting stamp) and R (rocker stamp), see Gatto, this volume: 6..

level	A7a	A2	A1	R1	R3	burnished	varia	total (nb of sherds)
1	6.0	2.3	9.8	53.4	3.8	18.8	6.0	100% (138)
2	3.7	1.2	15.7	43.8	6.2	20.1	9.3	100% (326)
3	4.9	4.9	23.2	48.8	2.4	9.8	6.1	100% (168)
4	17.3	1.9	34.6	25.0	1.9	13.5	5.8	100% (53)

(rocker stamp, R1, R2), which is fairly characteristic of the levels dating from the 7th millennium BC. Furthermore, in addition to the decorations already identified of long date, there appear, in ever increasing quantities, the first undecorated potteries whose surface is more or less carefully burnished (figure 7). New incised decorations also make a discreet appearance (figure 8). In short, these characteristics announce the Nubian Neolithic pottery styles, which develop during the 5th millennium BC, and which are known from numerous cemeteries, amongst which those at Kadruka, close to Kerma. As far as the lithic industry is concerned, we had in previous years collected two fragments of polished metamorphic rock, the first of which belonged to a polished axe and the other possibly to a chisel. These two tools, which are characteristic of the Neolithic, add weight to the idea that levels representing the beginnings of this period are to be found at Wadi El-Arab. To these can be added a series of flint or agate tools also found in the same top levels, which have the particularity of being bifacially shaped using a flat retouch (figure 9). The lithic industries of Sudan do not normally contain bifacially retouched tools. The dominant flint tool-type remains the segment, in most instances obtained by abrupt retouch on a flake. The rest of the industry is made up of perforators, drills, scrapers, as well as a few truncations and tools with abrupt retouch. Bifacially retouched tools are however unknown from this repertoire, being tools commonly found to the north. This technique, long practiced in the Near-East and from where it probably originates, is particularly well represented in the northern half of Egypt and close to the valley, becoming rarer towards the south-east (Gehlen et al 2002, Riemer 2007). It is mentioned in contexts dating from 6500 BC and extends progressively towards the south where it is occasionally mentioned in Lower Nubia. At Wadi El-Arab, the tools found all have simple elongated shapes. There are no

Figure 8 / Pottery discovered on the surface, dated to the end of the 7th and the beginning of the 6th millennia BC. Scale: 1/2.

arrow-heads with peduncles as is the case in Northern Egypt. Their presence in the Kerma Basin, even if in small numbers, attests therefore to new stimuli which all seem to emanate from the north, and which, over the space of a millennium, appear to have had an important impact on society. These stimuli do not appear to be limited to certain elements of the material culture, but also concern the funerary rites and most likely also the population, as we have discovered at El-Barga. In fact, the notable differences which have been highlighted between the Mesolithic and Neolithic populations inhumed at El-Barga (Crèvecoeur 2012) have been confirmed by other means.

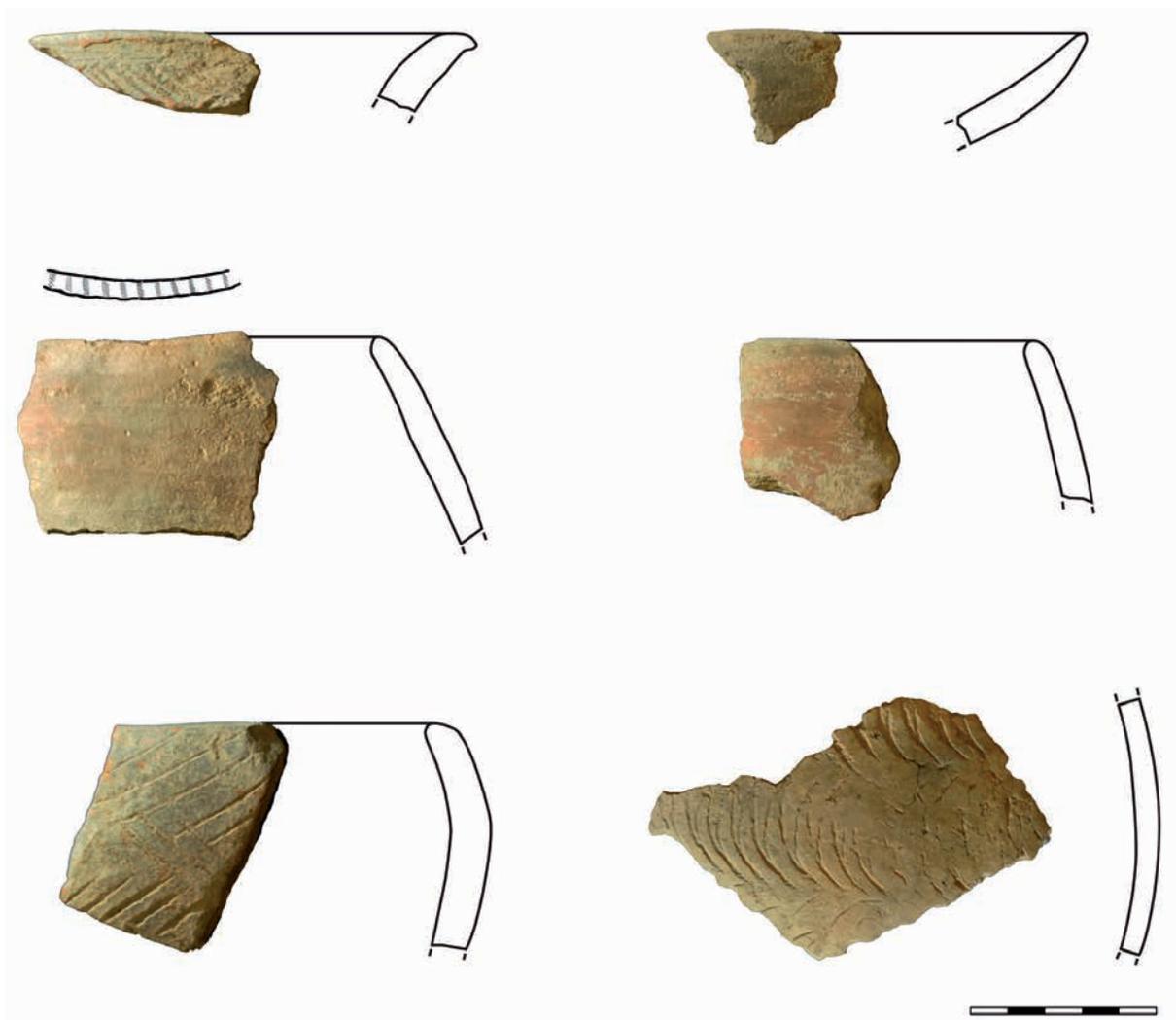
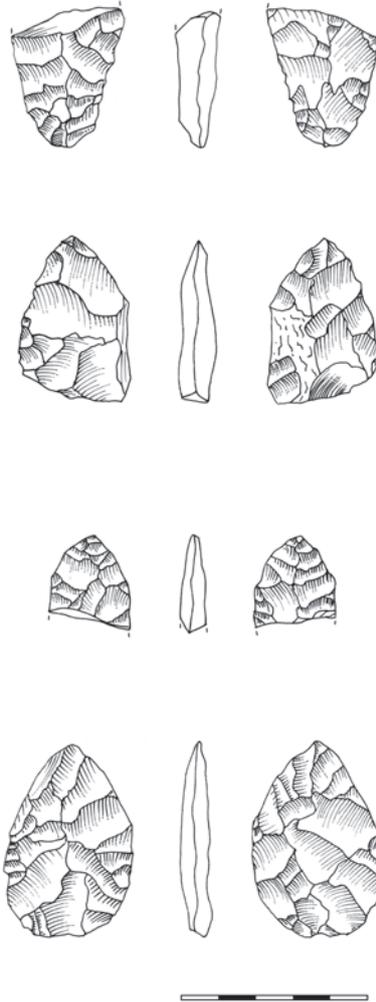


Figure 9 / Bifacial pieces
discovered on the site
surface. Scale: 2/3.



THE OLDEST SECTORS OF THE EASTERN CEMETERY: NEOLITHIC OCCUPATIONS AND THE EARLY STAGES OF THE KERMA CIVILISATION

The eastern necropolis is today one of the few areas of the Kerma alluvial plain that has not been cultivated over the millennia. The sheer number of graves, particularly their stone and earth tumuli, has contributed to the preservation of the area. From their number we can gain an understanding of the settlement's intensity during Prehistory, before the site was used as a cemetery between 2500 and 1500 BC.

Neolithic occupation

The discovery in 1986 of the Pre-Kerma agglomeration in the middle of the cemetery in sector 12 had already revealed an established presence dated to approximately 3000 BC (Bonnet 1988, Honegger 1995). During the excavation of this agglomeration, which was completed a few years ago, we became aware that the area also showed traces of Neolithic occupation levels. Stratigraphic observations had also revealed that these were numerous and discreet, having systematically been washed away by the Nile floods as though unprotected from them. This led us to consider the settlements as the successive encampments of a pastoral population, occupying the site only during the dry season when the herds were seeking the last pastures and watering holes. Several C14 dates obtained on charcoal from hearths identified either on the surface or in a stratigraphic context gave a chronological range between 4700 and 4300 BC (Honegger 2004a).

Today we believe that the eastern necropolis at Kerma must have been used during all periods in a quasi continuous manner, from the moment when the increasing aridity led populations to occupy the alluvial plain, at the end of the 6th millennium BC (figure 10). Admittedly, not all periods are well represented and, often, the occupations identified are extremely discreet, composed of a few pottery sherds and eroded remains located between graves of the Kerma period. However, evidence dating from the 5th, 4th and early 3rd millennia is increasing, particularly in the form of isolated sherds that correspond to neither the Neolithic nor the Kerma periods (figure 11).

These last few years, during the excavation of sectors 27 and 28 located north of the necropolis, we have identified postholes, hearths and sherds belonging to a Neolithic occupation. As the evidence increased and several hearths had also been identified within the stratigraphy (figure 12), we decided to clear a surface west of sector 28 so as better to understand the organisation of this occupation. At the same time we wished to determine the limits of the Kerma necropolis, suggested by fewer and further distanced burials. The surface covers approximately 200 square metres and, Clearing the area, we did in fact observe a diminution in the number of burials, suggesting we were reaching one of the limits of this funerary space.

Figure 10 / Distribution of occupations in the eastern necropolis dated to the Neolithic or the Pre-Kerma period.



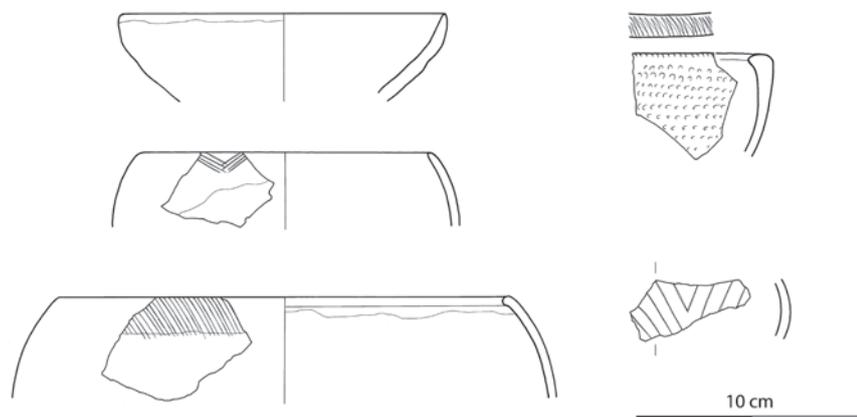


Figure 11 / Pottery sherds discovered on the surface of the eastern necropolis, belonging to neither the Neolithic period nor the Kerma culture.

Moreover, two hearths dating to the Neolithic were cleared on the surface. One of which was radiocarbon-dated to circa 4300 BC. Few objects were discovered, mostly small-sized sherds, but postholes of approximately 10 cm were identified (figure 13). They draw a few alignments, but mostly two circular huts of 3.4 and 3.8 m in diameter. As far as the construction units are concerned, we are dealing with a relatively repetitive pattern: the huts are of the same dimensions as those discovered in sector CE 12 a few years ago. The hearths are also located outside the habitations, as was the case in the previous excavated encampment, and palisades are outlined (figure 14). Should the excavation continue, livestock pens and windscreens would probably be revealed.

Sector 23 and the Kerma ancien II burials

Most of the work undertaken during the 2012-2013 campaign concentrated on the excavation of Kerma burials. Although five graves were excavated in the south of sector 27 in order to refine our chronology, our efforts were directed towards the excavation of 33 burials in sector 23, dated to a slightly more recent period (Kerma ancien II, according to Privati 1999).

We sought to date as precisely as possible the early development stages of the eastern necropolis at Kerma by obtaining C14 dates on approximately 20 samples. We selected the most reliable material we could associate with these burials. It appears that ostrich eggshell beads gave reliable results as opposed to human or animal bones and teeth or to bovine and goat skins discovered in the graves. Dried grasses generally placed under cowhides covering the floor of graves also gave excellent results, as did the quills of ostrich feathers that occasionally accompany the deceased. The distribution of these dates slightly modifies the earlier attempt that was based on only four results (Honegger 2011b: 12). The increase in the number of dates obtained should not lead to overanalysis, particularly since the mid-3rd millennium is not the best for the calibration of C14 dates - an essential procedure if we want to express dates in years before our era. Finally, it is possible to distinguish two evolutionary periods for the beginning of the necropolis (figure 15). The first takes place 2550 and 2300 BC and includes sectors 27 and 28. Based on the evolution of pottery and the shapes of the graves, sector 28 is older and must represent the initial core of the necropolis, established ca. 2550 BC. Sector 27 corresponds to the Kerma ancien I development that continues until 2300 BC. Lastly and based on four C14 dates, sector 23 was in use between 2300 and 2100 BC.

The pace of the excavations has been slower than in previous years due to the fact that burial pits of sector 23 are generally much bigger than in older sectors. Indeed, it is from the Kerma ancien II that greater distinction can be seen in the burials of a certain size, while others remain smaller. The tumuli become larger, grave deposits are more numerous, and bucrania fronting the tombs of certain individuals make their appearance (as opposed to the earlier goat horns occasionally deposited within the burial pit). It is also during this period that double burials increase, indicating the development of subsidiary burial rituals, which will increase significantly in the succeeding periods. While the oldest sector (sector 28) did not reveal any double burials, four were brought to light amongst the 143 graves excavated in sector 27 and 5 were identified amongst the 63 burials exposed in sector 23. To the latter, we must add two burials each containing four individuals. It must also be noted that the deposit of entire animals - most often a sheep, occasionally a dog - is an emerging practice during this period.

The Kerma ancien II period thus marks an important change from the earlier period. The practice of relatively small burials, reminiscent of those from the Neolithic, the A-Group and the Pre-Kerma, is replaced by a system in which distinctions between graves are more pronounced. This suggests the emergence of social stratification, which will increase over time and culminate with the royal tumuli of the Kerma classique excavated 100 years ago by George Reisner. We should also note that stelaes, present in the older sectors (27 and 28) have not been found in the Kerma ancien II sector.

Figure 13 / View of a section of the Neolithic occupation, with postholes outlining the structures of the huts.



Figure 12 / Cross-section of a hearth in a tomb from sector 28, located below the cleared surface.



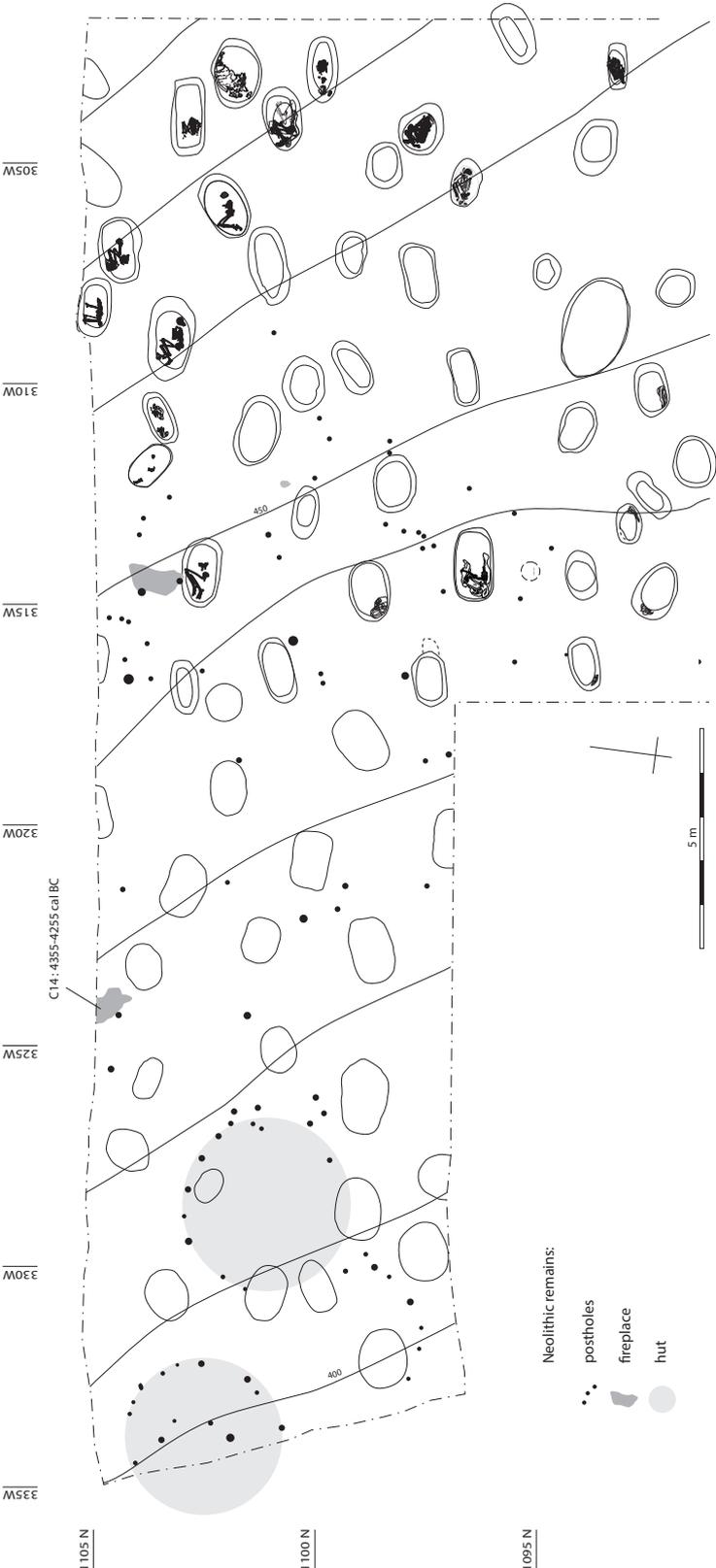
Graves in sector 23, which were more richly furnished, were looted in ancient times in a more systematic manner than in earlier phases of the necropolis. Tomb plundering is not limited to the area surrounding the head, but often extends to the upper half of the body, if not the entire grave. While the skeletons were generally discovered rearranged by the filling of the grave, they remain in good condition and did not impede the anthropological study (Fallet, this volume). Archaeological observations, however, were complicated by this situation. Intact burials in this period are thus rare, which reinforces the exceptional character of tomb 57 - the "tomb of the archer" - mummified and only partially looted. It was discovered by Charles Bonnet in sector 4 and also dated to the Kerma ancien II (Bonnet 1982: 15-19).

Within the burials, the bodies were in the same flexed position resting on the right side, head toward the east. They are systematically placed on a carefully cut piece of bovine skin and then covered by a second skin (figure 16). Their clothing comprised a loincloth made of leather strips sewn together lengthwise that was tied at the hips by a twisted and knotted leather strap. Most individuals wore leather sandals, but we have not been able to identify linen shawls worn around the shoulders, generally noted in later burials. Apart from the presence of a few pottery found on the bottom of the grave, other objects include finery worn by the deceased, notably sea-shell earrings characteristic of this period (figure 17) as well as strings of beads, bracelets or rings. Ostrich feather fans, rare in the past, were regularly placed beside the deceased. Numerous tombs also contained fragments of goat-skin bags and the burial of a 2 to 3 year old child revealed an astonishing object comprised of three leather balls linked together by straps (figure 18). It resembles South American bolas, used as throwing weapons to capture animals (notably cattle) by entangling their legs. Another innovative characteristic of Kerma ancien II burials is the fairly regular presence of a wooden staff, or more rarely a bow, held in one of the deceased's hands. The wooden staffs are approximately 1.2 metres in length and evoke the shepherd's staff found in pastoral societies. As for bows, only one burial contained string fragments and the end of a bow (figure 16). Observations made regarding "the archer's tomb" indicate that we are dealing with a simple straight bow of 1.20 metres in length, which corresponds to the length estimated from bow fragments found last winter. While "the tomb of the archer" contained the body of a young man, the one found in sector 23 belonged to a man more than 30 years old.

Evolution of the pottery

The pottery associated with the burials were either placed upside down next to the tumulus or deposited in the burial pit beside the deceased. Pots discovered on the surface are fragmentary and often scattered by looting. However, in zones spared from these disturbances, we have brought to light instances of 6 or 7 vessels placed around a grave. The rest of the vessels were found at the bottom of the pit, generally less disturbed. We should note that pottery deposits inside the grave are exceptions

Figure 14 / Plan of Neolithic remains in sector 28 with the distribution of tombs of the Kerma cemetery.



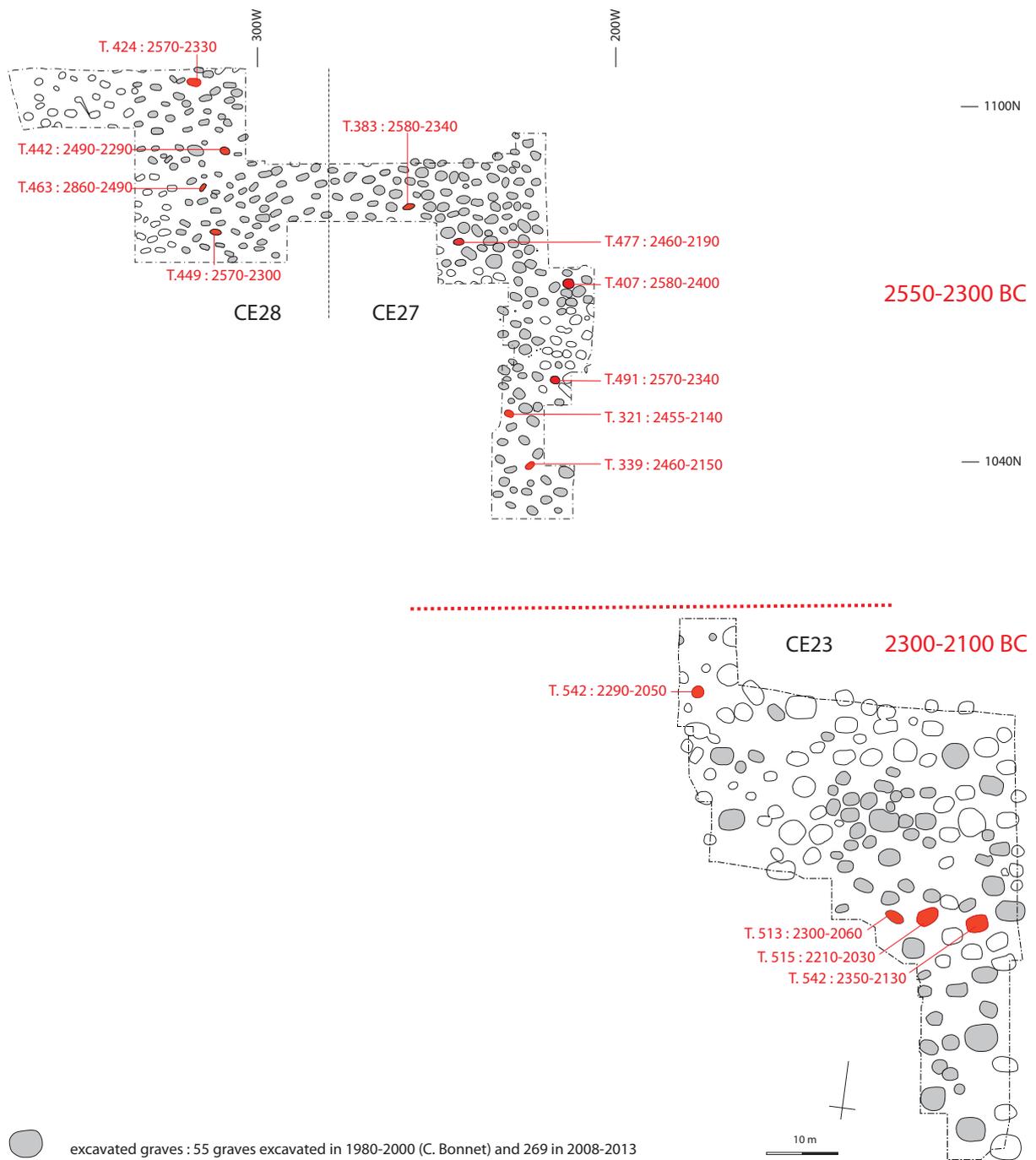


Figure 15 / Plan of sectors 23, 27 and 28 of the eastern necropolis at Kerma showing the location of the graves, excavated or not, and the results of C14 dates.

Figure 16 / Tomb 516, partly looted and containing the body of a young man (?) resting on a cowhide. He holds an ostrich feather fan in his left hand, while a second fan is located to the right of his feet. Two nested vessels were deposited near his legs. Left of these pots, we can discern the impression of a bow and its string, whose careful examination allowed the 'reconstruction' of its dimension-approximately 1.20 metres in length. Finally, below the feet, a mass of decomposed organic material of a roughly rectangular shape.



Figure 18 / Three leather balls linked by straps found in tomb 503 (sector 23). The resemblance to South American bolas is striking and this object undoubtedly served similar function, that of a throwing weapon to entangle the legs of cattle.



Figure 17 / Mother-of-pearl earrings found in tomb 516 (sector 23).



during earlier periods (sectors 27 and 28), but are a common practice starting in the Kerma ancien II. The vessel types found there were much fewer in number (when they are present, we count a maximum of two examples). In spite of the fragmentation of the pottery found at the surface, we made calculations to determine the number of vessels rather than count sherds. We have, for the 248 burials excavated between 2004 and 2013, systematically inventoried and associated each vessel with its tomb. The 910 pots counted in sectors 23, 27 and 28 originate from 210 burials, giving an average of more than four vessels per grave.

Amongst the 27 vessel types defined for these three sectors, we first concentrated on thin-walled pottery featuring a treatment and a meticulous finish (generally, an even polish). We are dealing with undecorated black-topped vessels, the only type present in all ancient sectors of the necropolis. They comprise 20% of the assemblage and are generally placed upside down next to the tumulus, with the exception of smaller examples more often deposited inside the tombs. The evolution of this type's profile was described earlier, based on material from the eastern necropolis excavated by Charles Bonnet (Privati 1999) or from Sai Island (Gratien 1986). During the Kerma ancien I the forms were rather tall and straight; while during the Kerma ancien II, they become squat and spherical. In terms of decoration, the second type is more interesting. It is represented by black-topped vessels whose decoration - a single band below the lip - is printed with varied and fine geometric motifs. This type is characteristic of the Kerma ancien period and the variations in the decoration evolve rapidly. It represents 35% of the 910 vessels inventoried. According to our observations, this type is exclusively placed upside down next to the tumuli. Its distribution is interesting, showing that the type does not appear when the necropolis was first established (sector 28), but shortly, in sector 27, stylistically attributed to the Kerma ancien I (figure 19). Admittedly, there are exceptions in sector 28 where three tombs were furnished with this type of pottery, but these are later burials dug in this ancient sector. From this distribution, we can say that sector 28 cannot be attributed to the Kerma ancien, as currently defined. This earlier phase is, of course, in keeping with the rest of the necropolis, but from a stylistic standpoint we are dealing with different cultural features.

Another interesting type of the Kerma ancien is represented by completely black bowls with incised geometric patterns covering the whole body. On some of the better preserved examples, a white residue incrusting in the incisions was identified (Privati 1986). This type of pottery is characteristic of the Lower Nubian C-Group, located between the First and Second Cataracts (Bietak 1968). The association of this pottery with the Kerma ancien period has already been highlighted and, at the site of Kerma, its association with tumuli featuring stelae around their perimeter has also been suggested. Apart from highlighting characteristics specific to another culture, the difficulty in establishing cultural or chronological features typical of the Kerma ancien I was stressed (Privati 1986). In concordance with these first observations, we have observed during the last few years that the graves that

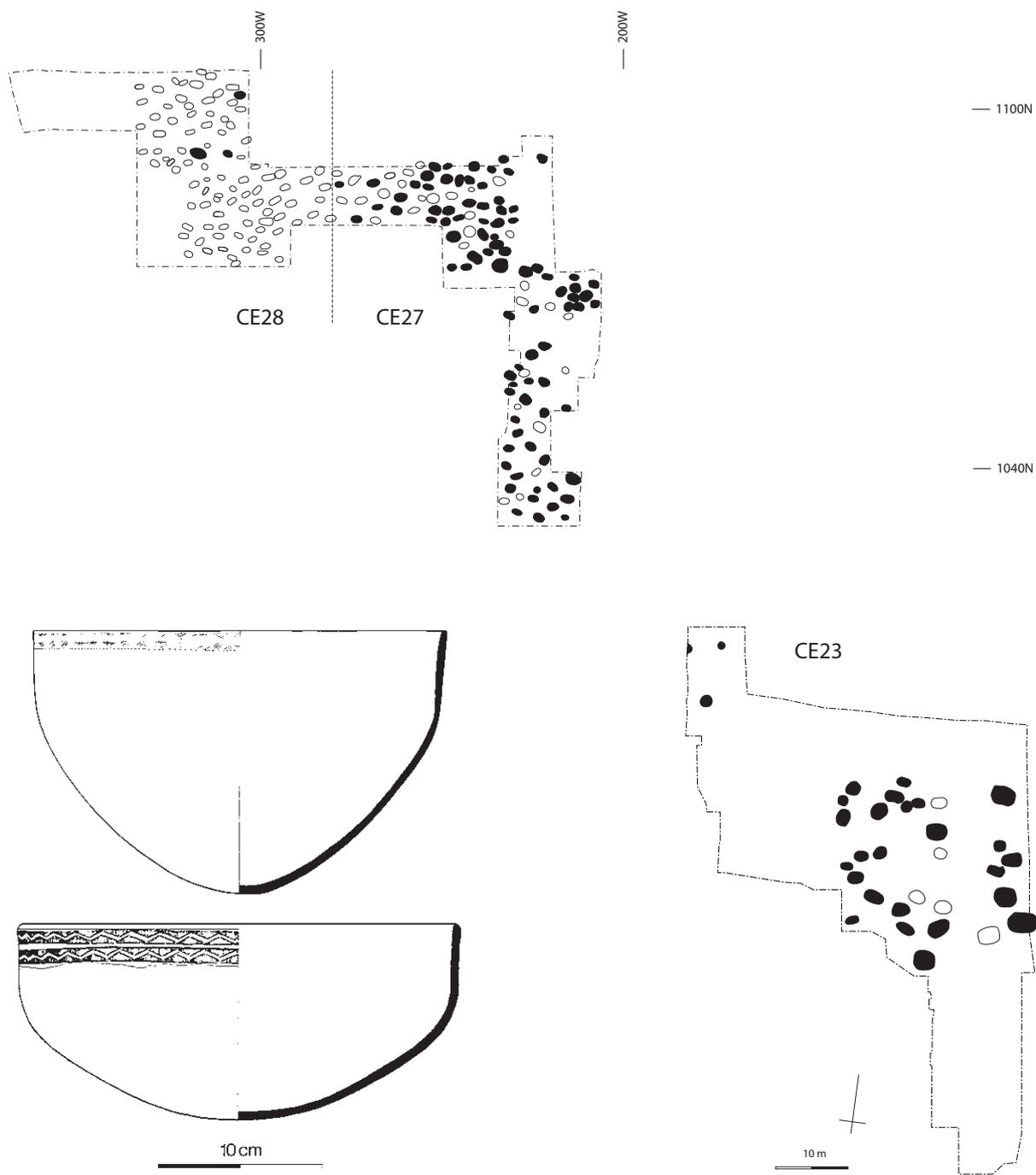


Figure 19 / Distribution of black-topped ware with a fine impressed decoration below the rim among the 210 studied graves. These vessels are characteristic of the Kerma ancien, notably the first two phases when they are particularly fine.

included stelae were not concentrated in a single area, but were dispersed over a wide area (figure 20), together with the tumuli of Kerma tradition (Honegger 2010). Originally, we thought that sector 28, the oldest sector, contained only ancient C-group material (phase Ia, according to Bietak 1968) and, by this fact, was brought in opposition with the Kerma ancien I sector (Honegger 2011b). However, our systematic approach carried out on the entire pottery assemblage did not bear this out. Indeed, it happens that tumuli comprising stelae produced typical Kerma ancien I pottery without necessarily including decorated, completely-black vessels. The distribution of the typical C-group vessels shows a rather clear picture, since they are distributed in sectors 23 and 27, whilst they are rare in sector 28. Their distribution thus matches perfectly that of the decorated black-topped ware, typical of the Kerma culture (figure 20). We must admit that the coexistence of these two sets of characteristics, which are not clearly defined, are essentially based on whatever significance we attribute to the two cultural groups established by George Reisner. We could be dealing with closely related populations and the C-Group intrusions in the eastern necropolis might indicate associations between the two groups (marriage?). Clarifications on these connections between the C-Group and Kerma will be possible by conducting a more pointed study of the pottery and the rest of the grave goods, reconsidering the question for each tomb.

In this preliminary presentation, in which we have only retained a selection of a few types, the pottery style characteristic of the earliest utilisation of the necropolis will be presented. The pottery is invariably red outside and black inside, carefully polished, with the red tending nonetheless a little towards brown and the pottery surface entirely covered in carefully executed regular horizontal combed impressed decorations. This type had already been described by Brigitte Gratien at Saï (Gratien 1986: 410, type AIX), but it was associated in this study to the Early Kerma I. It is different from the pots decorated with spaced vertical lines obtained with a thin comb (Gratien 1986: 409, type AVIII), which is present in small proportions in Early Kerma I (cf. Privati 1999) and in the Early Group C Ia (Bietak 1968). At Kerma, the distribution of the first type with horizontal comb decoration, is almost exclusively concentrated within sector 28 and it is striking to note that its distribution is in opposition with those of the two types mentioned earlier (figure 21). This amounts to saying that, at its origins, we have at the Kerma necropolis a cultural group that is neither Kerma ancien nor C-Group. Indeed, the most characteristic vessels of these two cultures are nearly absent. The most characteristic type of vessel is that with horizontal comb decorations, of which the closest comparisons can be found in the Pre-Kerma. Our first typological study of Pre-Kerma pottery had highlighted the importance of this type of decoration (type 7) in what we have called recent Pre-Kerma, dated between 2800 and 2500 BC (Honegger 2004).

In cultural terms, the eastern necropolis at Kerma - probably the principal centre of this civilisation - begins with a first set of burials to be dated to the end of the Pre-Kerma, ca. 2550 BC. It is only later, around 2450 BC, that we notice tombs of the

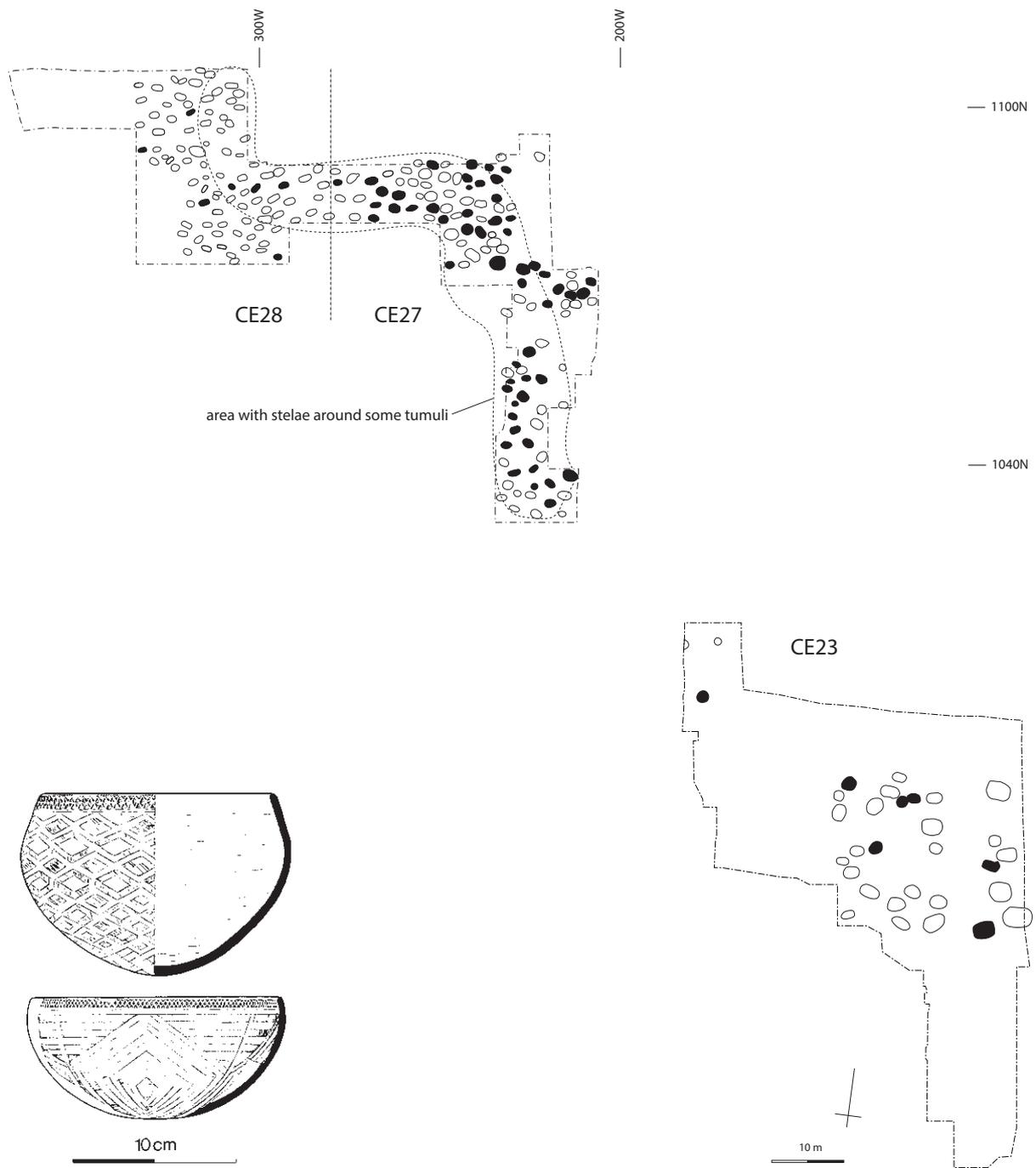


Figure 20 / Distribution of completely-black vessels decorated with geometric motifs made by incision among the 210 studied graves. These vessels are characteristic of the C-Group.

Kerma ancien I and of the ancient C-Group I, which appeared closely connected, or at least overlap from a spatial and temporal perspective. This first Kerma phase ends around 2300 BC and is followed by Kerma ancien II.

The unexpected results on the origins of the necropolis clearly demonstrate our ignorance regarding the centuries that preceded the first kingdom of Nubia. Except for a few sites and the intensive research conducted in the Kerma region, we still know very little of what transpired there between 3000 and 2500 BC. We cannot over-emphasize the urgent need to fill the gaps in our knowledge of Upper Nubia at a time when road constructions, the expansion of cultivated lands and the current gold rush are destroying the last unexplored territories, where discreet vestiges of these occupations are still in place.



Figure 21 / Distribution of black-topped ware decorated with parallel lines made by horizontal impression of a comb among the 210 studied graves.

Since 2008 an extensive research programme is conducted in the ancient sectors of the royal necropolis of Kerma. These excavations and the ensuing studies shed new light on the origins of the Kerma civilisation. The anthropological study is currently in progress and includes the individuals discovered during the excavations of the Swiss archaeological mission at Kerma. The bioarchaeological analyses focus on the funerary practices and the biological affinities of the ancient population of Sudanese Nubia between 2500 and 1500 B.C. (Fallet 2011).

This article presents the latest results related to the organisation of the more ancient sectors (composition of the buried population, burial selection, spatiality, multiple burials, etc.). The analysis focuses on three distinct chronocultural groups identified in the more ancient sectors: Pre-Kerma (ca. 2550 B.C.), Kerma ancient I (2500-2300 B.C.) and Kerma ancient II (2300-2100 B.C.). These three groups correspond to sectors CE28, CE27 and CE23 respectively (cf. Honegger, this volume).

The anthropological study conducted between 2008 and 2010 focused on sectors CE27 and CE28. It had shown the following trends: an over-representation of male burials in the sector 27 (Kerma ancient I) and less so for the sector 28 (Pre-Kerma); an under-representation of different classes of immature individuals in the two sectors, more obvious in the Kerma ancient I; and a total absence of newborns [0-1] in the two sectors (Fallet 2010).

We examine funerary practices linked to the physical characteristics of the individuals in the three groups defined above by integrating the data collected during the last three excavation campaigns. The goal is to compare these three distinct chronocultural groups by focusing on the biology of the interred populations.

Material and Methods

The corpus comprises 284 individuals distributed over the three sectors: 88 belonging to Pre-Kerma, 128 to the Kerma ancient I and 68 to the Kerma ancient II. All individuals were examined by the author, including those from older excavations (1995-1996) stored in the anthropology department at the University of Geneva.

A data-collection sheet is filled out for each individual. The following criteria are systematically recorded: pathology, trauma, taphonomical deformation, etc. Classical measurements are made on both cranial and post-cranial skeleton. The sexual diagnosis is based on the coxal bone according to the methods defined by Bruzek (1991; 2002) and Murail et al. (2005). We used the dental and bone maturation to assess the age of immature individuals and the determination for the adults is based on the observation of the sacropelvic surface (Schmitt 2001).

Figure 22 / Distribution of adult and immature individuals.

	adults			immature	undetermined	total
	men	women	sex undeter.			
Pre-Kerma (CE28)	26	22	18	21	1	88
Kerma ancien I (CE27)	53	37	9	28	1	128
Kerma ancien II (CE23)	10	22	11	24	1	68
total	89	81	38	73	3	284

Results

For the present study, 284 individuals have been selected in relation to their preservation state, only three were omitted because of either poor representation, or their state of preservation.

Sector CE28 (Pre-Kerma) contains 88 individual burials, which include 66 adults, 21 immatures and 1 undetermined individual. The Kerma ancien I area (sector CE27) preserves 122 burials. They contained 128 individuals: 99 adults, 28 immatures and 1 undetermined. As for the 61 burials excavated in the Kerma ancient II area (sector CE23), they represent 68 individuals, i.e. 43 adults, 24 immatures and 1 undetermined. Figure 22 sums up the data as well as the results of the sex determination of the adults, with a sex ratio varying from 1.18 (Pre-Kerma) and 1.43 (Kerma ancient I) to 0.45 (Kerma ancient II)¹.

The individuals are sorted into age groups to examine the representation based on the age at death. These groups are quinquennial for immature individuals. Adults are sorted in two groups, young adults [20-29] and adults older than 30 years old. Figure 23 illustrates the repartition by age group for each sector.

Discussion

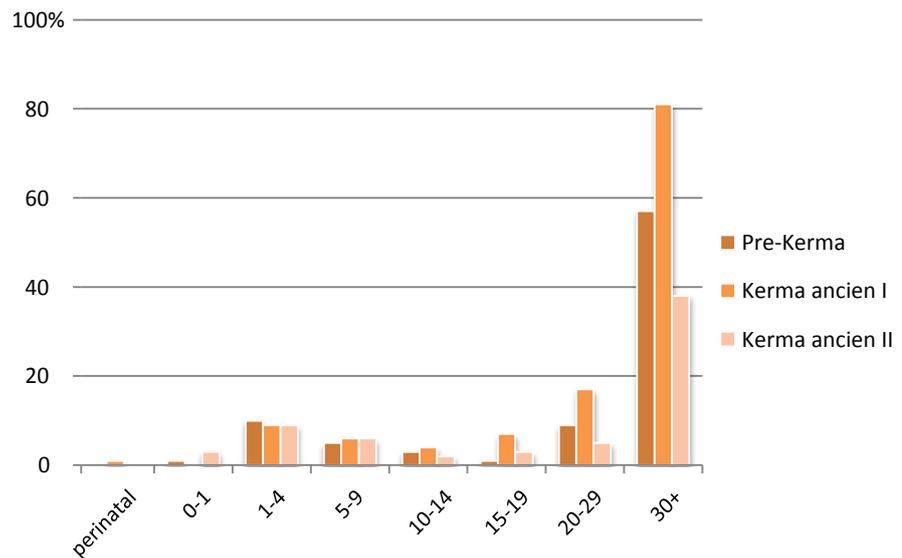
To assess the potential presence, or absence, of a selection in the individuals buried in the necropolis, we refer on the data related to sexual diagnosis and the age at death.

The over-representation of male burials observed in the early trends for CE27 and CE28 seems to be confirmed by the sex ratio, while the representation of female burials is high amongst the tombs of the Kerma ancien II (figure 24). However, regarding to the theoretical values, a chi-squared test (for $p=0.05$) shows that the differences are not significant, even if the values for the Kerma ancient II are close to the threshold one². The sex ratio differences between the Kerma ancient I and II were not identified at first during the excavation campaign from 1995-1996. Even if the sector CE23 is still under excavation, these preliminary trends are supported by the exhaustive study of the burial compared to the preliminary observation made in the 90s.

1. The sex ratio defines the sexual composition of the population by the ratio between the number of men and the number of women. The sex ratio at birth is approximately 1.05. It varies over time based on the mortality of the two groups (Susanne et Polet 2005: 356).

2. $X^2(1, N=32)=3.09, p=0.05$ / X^2 theoretical = 3.841

Figure 23 / Repartition of individuals by age groups and by sectors.



The distribution of the individuals within the different age groups is compared to the theoretical mortality quotients for populations with a life expectancy at birth between 25 and 35 years (Ledermann 1969; figure 25). The results show an identical general trend for all three sectors: very young children of less than one year of age are rarely represented. A single individual has been determined to be less than one year old. We are dealing with a foetus of approximately 7 months, buried with a feminine individual. The four children between 0 and 1 year old fall within the upper limit of this age group. As for children over 1 year old, the curves follow the anticipated global trend: high mortality of the 1-4 year old group, then a progressive decrease until 10-14 years, followed by a slight increase between 15-19 years old. However, a more detailed comparison of the three groups shows a few dissimilarities in the curve pattern. In the Kerma ancien I, the burials of young children between the ages of 1 and 4 are under-represented compared to the theoretical values, as well as compared to Pre-Kerma and Kerma ancien II. From ages 5 to 14, the three curves follow the same trend—a decrease in the number of buried individuals. The number of 15-19 year old individuals in C-Group 1a does not follow the same tendency as the others sectors, with an under-representation of the deceased from this age class.

Based on these preliminary results, some distinctions appear between the three areas under analysis. Considering that the sample size is acceptable, we can emphasize some pattern of variation between the three periods.

We won't discuss much the question of a selection based on sexual criteria, but if it

Figure 24 / Histogram of the sex ratio for sectors CE28; CE27 and CE23.

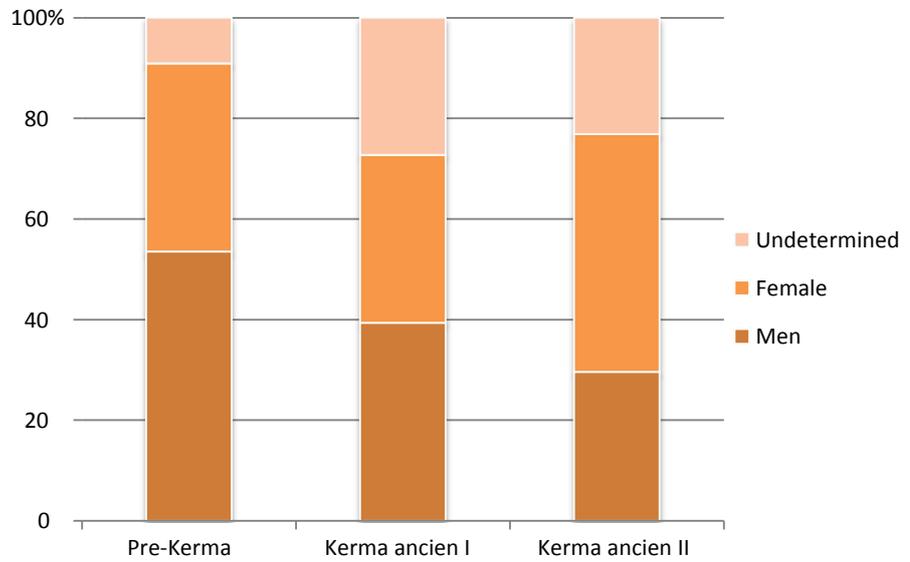
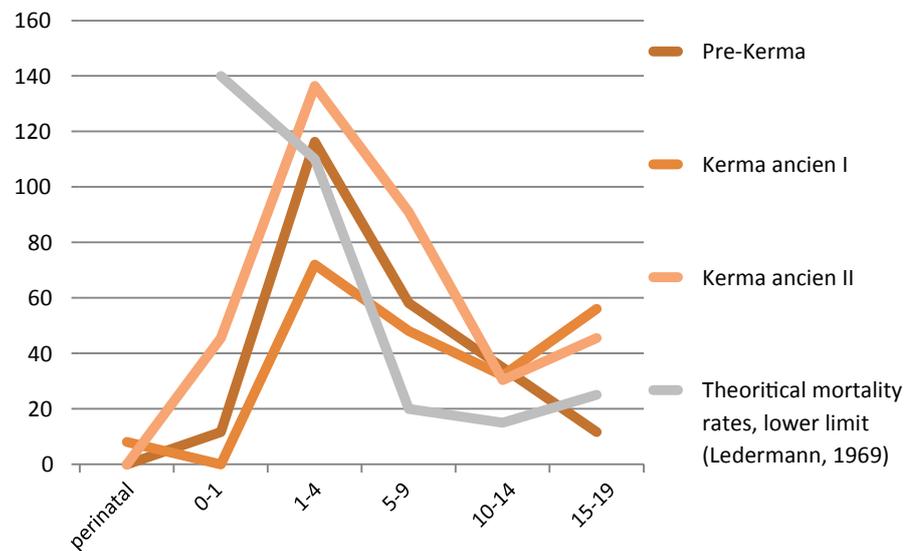


Figure 25 / Distribution of the different age groups expressed in proportion of the total population per sector.



is confirmed with a broader sample, it will need to be addressed in terms of a possible selection. The same hypotheses can be proposed for the immature individuals that are under-represented in the samples: namely, the children deceased before the first year for the three sectors, and the children from the [1-4] age class for the Kerma ancien I. These preliminary results emphasize some distinctions between the three sectors and question the reasons of this under-representation. If we can preclude the impact of taphonomic processes (the preservation of the remains are exceptional), we may suggest a difference in treatment of the young deceased. Since the spatial organisation of burials don't support a specific organisation of the individuals based on age and/or sexual criteria, it is legitimate to propose that young individuals might have been treated differently.

The next issue will be to cross the observations provided by the anthropological study with the archaeological data.

Conclusion and perspectives

These various observations suggest that biological criteria, or others criteria linked to the biological aspects, could have played a role in the access to the burial ground and that these varied through time. Indeed, in many respects, and even if some homogeneity of the practices is noticeable, the groups identified on chronological basis are also distinguished in their funerary practices. The biological criteria leading to the access to the necropolis may differ in relation to the periods of use. And they are not the only elements that vary: in addition to ceramic deposits (cf. Honegger, this volume), the type of superstructure, the size and shape of the graves change as well. In this respect, the phenomenon of multiple burials is as follows: absent in Pre-Kerma, there are few during the Kerma ancien I and affect only double tombs, uniting two adults (male-male or male-female). This phenomenon increases during the Kerma ancien II: multiple burials are more numerous and the number of interred individuals also increases (two and four). Such a grave can also contained men, women and children.

The potential of this exceptional funerary assemblage has been long known and the global evolution of funerary practices is already known. The extensive research dedicated to the ancient sectors enhances both the knowledge of funerary practices and the interred population. The challenge is now to correlate biological and archaeological data in order to delve deeper into the customs of its populations.

THE HISTORY OF MUSEUMS IN THE SUDAN: THE CASE OF THE KERMA MUSEUM

The corpus of data on the history of museums of archaeology and ethnography in the Sudan is very limited. It mainly consists of the annual reports on the antiquities service and museums and of occasional inspection reports. Among the first scholarly attempts to trace aspects of the history of archaeology and museums in the Sudan is Frank Addison's and John W. Crowfoot's "Early Days 1903-31". Further approaches to the subject appear in the context of the first major international exhibitions on the Ancient Sudan in the 1980s. Exemplary is Hakem's "A History of Archaeological Research in Nubia and the Sudan" (1978)³. Prominent practitioners in the field of the historiography of archaeology and museums in the Sudan are El Tahir El Nour Ogeil and Ayman al-Tayib; both staff members of the "National Corporation of Antiquities and Museums" (NCAM). While El Tahir El Nour Ogeil's study of 2002 emphasis is on the reconstruction of the history of the Sudan Antiquities Service, Ayman al-Tayib (2010) surveys the history of the national and regional museums in the country. Another important contribution to the history of archaeology and the genesis of museums in the Sudan is to be found in Ida Dyrkorn Heierland's unpublished master thesis *Artifacts, Interests, and Agencies: The Politics of Sudan Archaeology* (2008). Furthermore, the development of museums and heritage in the Sudan has become a recent research focus of a team under the direction of Dr. Ahmed Hussein Abd El-Rahman Adam of the Department of Archaeology at the University of Khartoum.

However, the available literature on the history of these museums is very basic and often even lacks the most elementary key data (like the year of foundation or closure of the museums). At times this may lead to a biased account of events in the past. A telling example is the persistence of the urban legend portraying the late Friedrich Hinkel as the driving force and architect of the Sudan National Museum. As a matter of fact, Hinkel, was indeed responsible for the design of the museum's garden and for the on site erection of the relocated monuments from the 'Nubian Campaign'⁴. But the construction of the National Museum was initiated by the Sudanese authorities long before and was planned by the Austrian architect Aleco O. Petermüller and the Lebanese engineer Robert M. Ayoub, while the works were executed by Greek and Sudanese contractors. An inspection of the archives of the NCAM (formerly Sudan Antiquities Service) in February and May 2012 has yielded a vast corpus of insightful sources relating to the genesis of the Sudan National Museum, including those restoring the authorship of the Sudan National Museum to Petermüller and Ayoub.

3. Subsequent accounts in the context of international exhibitions are to be found in: Salah Eldin Mohammed Ahmed 1997 and 2013; and Siddiq Mohamed Gasm Elseed 2004.

4 "International Campaign to Save the Monuments of Nubia"; 1959 -1980.

As to the regional museums, the situation is rather different. Here, the quantity of written sources is fairly small and at times biased by the perspective of the narrator. Useful information on the Kerma Museum is provided on the website of the 'Mission

archéologique suisse au Soudan' (www.kerma.ch). Cécile Widmer's unpublished master thesis *Regard anthropologique sur un nouveau musée d'archéologie en Afrique: l'exemple de Kerma au Soudan* (2011) further provides interesting insights in the functioning of the Kerma Museum from an anthropological perspective.

The history of the origins of the Kerma Museum – a central research topic of the author's ongoing PhD project (cf. Bundi 2011) – can briefly be outlined by the keywords genesis, context, organisation and museography.

Genesis

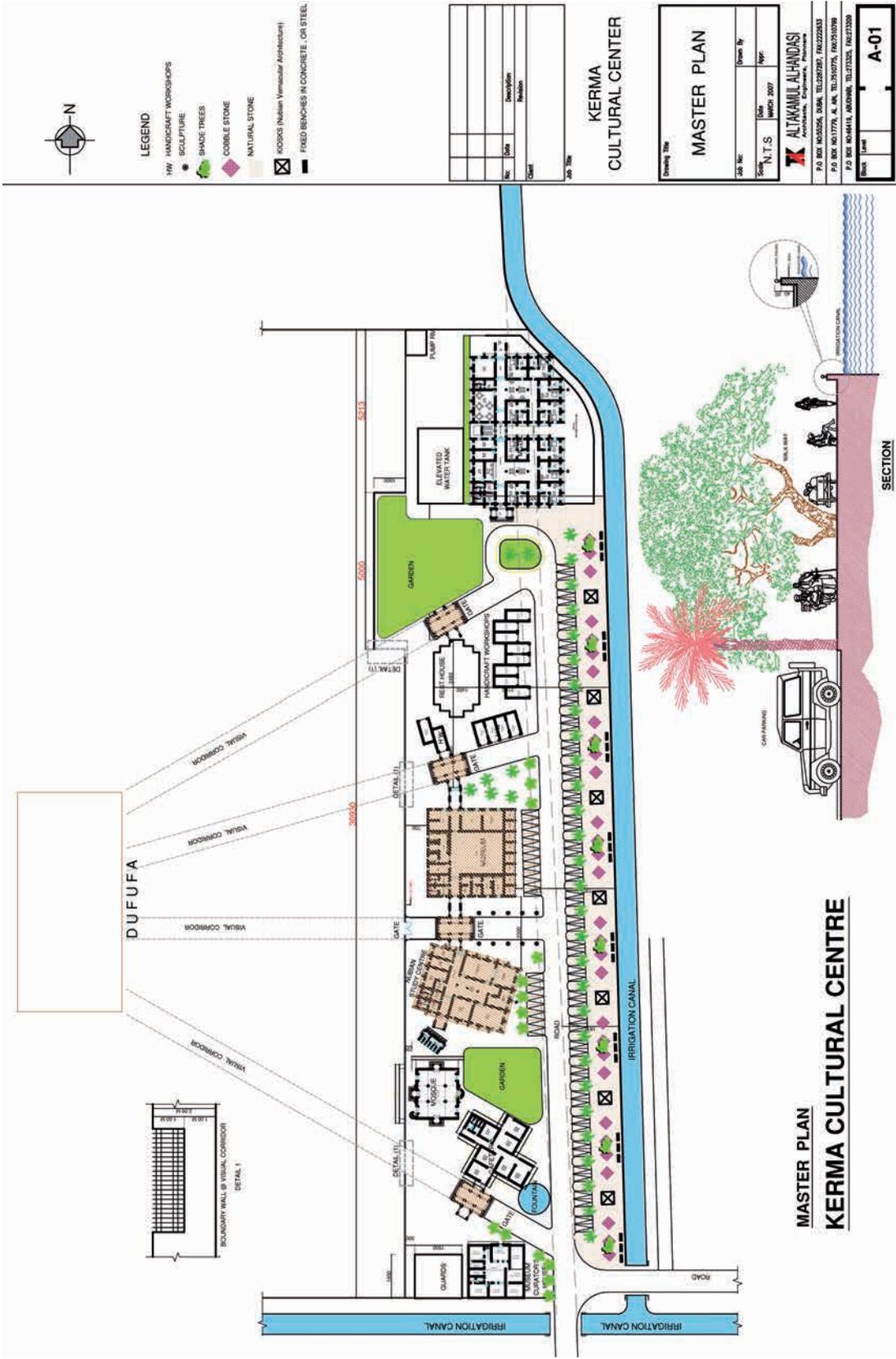
While the establishment of an archaeological museum in the capital was vindicated as early as 1904 and promoted from the very beginning by the elite of the colonial administration, the establishment of the Kerma Museum at the turn of the 21st century might be considered as the result of a joint effort by government bodies and representatives from the civil society. The idea for a museum and associated facilities emanated as a local initiative from the 'High Committee for the Kerma Civilization Complex', which aims at the protection and the promotion of the region's past. The leading figure in the 'High Committee' is Sirr al-Khatim Fadul, a former general of the Sudanese army originating from Kerma. In his then position as Undersecretary at the Ministry of Tourism, Antiquities and Wildlife, Sirr al-Khatim managed to convince his superiors and the public of the validity of his vision and to raise funds both from governmental sources and from the Nubian community for the construction of the museum building. Additionally, the Swiss government had contributed substantially to the funding and upkeep of the Kerma Museum.

In 1998, the consultancy firm Al Takamul al-Handis led by Architect Abdalla Sabbar presented (and donated) the Master Plan and the detailed design of the 'Kerma Cultural Complex' (figure 26) which was supposed to include at its completion the museum building, a public toilet block, a resthouse, a handicraft village, a mosque, the curator's house and a centre for Nubian studies ('Nubian Studies Centre'). In the same year, the foundation stone for the construction of the museum building was laid and the Dongola based contractor Abu Gerga & Co. started the construction work on site. The inauguration of the Kerma Museum by the President of the Republic on January 19, 2008 was paralleled by start of construction of the adjacent 'Nubian Studies Centre'. For the time being, the finishing of the building is suspended due to funding problems.

Context

The Kerma Museum was from the very beginning conceived as site museum. It's location next to the nearby site of the ancient capital of Kerma and it's architectonic orientation towards the western 'Deffufa' (the central monumental building in the ancient town of Kerma) symbolizes this commitment. The museum is the central component of the 'Kerma Civilization Complex', which aims at representing the

Figure 26 / Master Plan of the 'Kerma Civilization Complex'. Al Takamul al-Handis / Abdalla Sabbar. Khartoum / Dubai, March 2007.



material remains of Nubian culture and at promoting the Nubian cultural heritage. The museum has become a major cultural venue for the inhabitants of Kerma, who value the enhancement of Nubian history and the role that the museum plays in the development of the region. The promoters of the ‘Kerma Civilization Complex’ believe that their enterprise has triggered a wave of cultural awakening among the Nubians, since the centre has become a focus point for a wide range of social and cultural activities such as dance, music, poetry, wedding ceremonies and leisure activities⁵.

The ‘High Committee’ and the directorship of the Kerma Museum are maintaining close ties and productive collaborations with the Swiss Archaeological Mission (‘Mission archéologique suisse au Soudan’), active since 1977 in Kerma. The Swiss Mission was for instances responsible for the initial conceptualization of the permanent exhibition and is since advising the museum in terms of heritage management and museography.

Organisation

The ‘High Committee for the Kerma Civilization Complex’ – the umbrella organization of the Kerma Museum – was founded on the 16.7.1997 by Sirr al-Khatim Fadul. It is under the patronage of Abdel Rahim Mohamad Hussein, Federal Minister of Defence; likewise a native of Kerma. Further members of the ‘High Committee’ are representatives of NCAM, representatives of the municipal administration of Kerma, representatives of the federal state at Dongola, the architect of the museum as well as notables from the Kerma region. The Kerma Museum is depending from two administrative units: the Ministry of Culture, Information and Tourism at Dongola (founded in 2010) and the NCAM at Khartoum. The financial administration of the Museum and of the surrounding archaeological sites is hold at Dongola, while the ‘political’ administration is located in Khartoum. Five staff members of the museum are on the payroll of the NCAM and seven on the payroll of the Ministry of Culture, Information and Tourism at Dongola. The current director of the museum, Abdel Maged Mahmoud Abdelrahman, succeeded the founding director, Abdelhai Abdel Sawi, in 2010.

Museography

The Kerma Museum is at present the second museum in Sudan by size and number of visitors. Covering an area of 500 m², it is organized in a chronological order from the early Palaeolithic to the Christian and Islamic periods and includes a small folklore section.

The objects displayed in the exhibition include finds from the different archaeological sites of the Kerma region. Sixteen information panels in English and Arabic guide the visitors through the exhibition and supply essential information on the different cultures and civilizations that have flourished in the region. The museum also

5. Sirr al-Khatim Fadul.
Personal communication.
Khartoum, September 11, 2013.

features three reconstructed graves with the aim to retrace the evolution and the complexity of funerary rituals. Additionally, three scale models of the Mesolithic hut of el-Barga (7500 B.C.), the proto-urban agglomeration of the Pre-Kerma (3000 B.C.) and the ancient city of Kerma (2500-1500 B.C.) provide a glimpse of the world of the living. The main attraction of the museum consist of seven monumental granite statues of the five Nubian Pharaohs Taharqa, Tanutamun, Senkamanisken, Anlamani and Aspelta, discovered on January 11, 2003 by the Swiss Mission and arranged for exhibition by the late scenographer Pierre-Alain Bertola and by the graphic designer Laurent Bonnet.

The Kerma Museum is visited on average by 15'000 Sudanese and 500 foreign visitors per year (peak: 22'261 Sudanese and 574 foreigners in 2012). However, the official figures are significantly underestimated, since museum visits by school classes are not precisely recorded. Foreign visitors are mostly attending the museum on an individual base. On weekends and holydays, the museum's garden is a gathering place for families as well as a meeting place for the local youth.

The future challenges and prospects for the Kerma Museum are depending on the capacity of the involved actors to deal with the structural complexity of shared administration between Dongola, Kerma and Khartoum. Actually, the unclear allocation of competences and responsibilities among the involved parties is hindering the accomplishment and the development of the 'Kerma Civilization Complex'. However, the planned establishment of the 'Nubian Studies Centre' – a research centre dedicated to the study and research of the archaeology, history and culture of Nubia is an essential element to accomplishing the Kerma Museum's research mission.

BIBLIOGRAPHIE

Al-Tayib, A. 2010. *Madkhal ila al-matahif al-Sudan* [Introduction to the Museums in the Sudan]. Khartoum: Khartoum University Press.

Addison, F. 1953. "Early Days 1903 -31 (II)", *KUSH* Vol. I: 56-59.

Bietak, M. 1968. *Studien zur Chronologie der nubischen C-Gruppe: ein Beitrag zur Frühgeschichte Unternubiens zwischen 2200 und 1550 vor Chr.* Wien: H. Böhlau.

Bonnet, C. 1982. "Les fouilles archéologiques de Kerma (Soudan): rapport préliminaire sur les campagnes de 1980-81 et 1981-82", in: Bonnet, C. & collab. *Les fouilles archéologiques de Kerma (Soudan)*, *Genava, n.s.*, 30: 1-25.

Bonnet, C. 1988. "Les fouilles archéologiques de Kerma (Soudan): rapport préliminaire sur les campagnes de 1986-87 et 1987-88", in: Bonnet, C. & collab. *Les fouilles archéologiques de Kerma (Soudan)*, *Genava, n.s.* 36, 5-20.

Bruzek, J. 1991. *Fiabilité des procédés de détermination du sexe à partir de l'os coxal: implication à l'étude du dimorphisme sexuel de l'homme fossile.* Paris, unpublished thesis.

Bruzek, J. 2002. "A method for visual determination of sex , using the human hip bone", *American Journal of Physical Anthropology*, 117: 157-168.

Bundi, M. 2011. "Museums, Memory and Meaning. Politics of Identity and Representation in the Context of Sudanese Archaeological Museums", *Kerma, Documents de la mission archéologique Suisse au Soudan*, 3: 41-44.

Caneva, I. 1987. "Pottery decoration in prehistoric Sahara and Upper Nile: a new perspective", in: Barich, B. E. ed. *Archaeology and environment in the Libyan desert.* Oxford: BAR 368: 231-254.

Caneva, I. 1988. *El Geili. The history of a Middle Nile environment, 7000 BC – AD 1500.* Oxford: BAR 424.

Caneva, I., Marks, A. E. 1990 "More on Shakadud pottery: evidence for Saharo-Nilotic connections during the 6th-4th millenium BC", *Archéologie du Nil Moyen*, 4: 11-36.

Caneva I., Gatto M.C., Giuliani S. and Lanna S. unpublished. *Ce.R.D.O. Survey 2004: Eastern Desert, Sudan. Preliminary report of the pottery collection. 2005.*

Crèvecoeur, I. 2012. "First anthropological insights on the early Holocene assemblages from El-Barga", *Kerma, Documents de la mission archéologique Suisse au Soudan*, 4: 19-28.

- Crowfoot, J. W. 1953. "Early Days 1903 -31 (I)", *KUSH* Vol. I: 54-56.
- El Nour Ogeil, T. 2002. History of the Sudan Antiquities Service. Unpublished Master's Thesis. Department of Prehistory. Faculty of History. Adam Mickiewicz University, Poznań.
- Fallet, C. 2010. "Paleoanthropological study of the oldest sectors of the eastern cemetery", *Kerma, Documents de la mission archéologique Suisse au Soudan*, 2: 12-17.
- Fallet, C. 2011. "Population and funerary traditions in eastern cemetery of Kerma and in Nubia (2500-1500 BC)", *Kerma, Documents de la mission archéologique Suisse au Soudan*, 3: 15-17.
- Gasm Elseed, S. M. 2004. "Sudan National Museum, Past and Present", in: Welsby, D., Anderson, J. R. eds. *Sudan Ancient Treasures: an exhibition of recent discoveries from the Sudan National Museum*. London: The British University Press, 10-11.
- Gatto M.C. 2002. "Early Neolithic Pottery of the Nabta-Kiseiba Area: Stylistic Attributes and Regional Relationships", in: Nelson, K. & associates eds. *Holocene Settlements of the Egyptian Sahara, Vol. II, The pottery of Nabta Playa*, Dallas: Southern Methodist University: 65-78.
- Gatto M.C. 2006a. "The Khartoum Variant Pottery in context: Rethinking the Early and Middle Holocene Nubian Sequence", *Archéologie du Nil Moyen*, 10: 57-70.
- Gehlen, B., Kindermann, K., Linstädter, J.- Riemer, H. 2002. "The Holocene occupation of the Eastern Sahara: regional chronologies and supra-regional developments in four areas of the absolute desert", in: Jenesstrasse. *Tides of the desert – Gezeiten der Wüste*. Köln: Heinrich Barth Institut (Africa Praehistorica; 14): 85-116.
- Gosselain O.P., Langlois O., Livingstone-Smith A., MacDonald K.C. and Mayor A. 1996. *Preliminary classification of African Rouletting Tools*. Documents of the Ceramics & Society Project N. 5: Tervuren.
- Gratien, B. 1986. *La nécropole Kerma (Sai ; I)*. Paris: Ed. du CNRS.
- Hakem, A. M. A. 1978. "A History of Archaeological Research in Nubia and the Sudan", in: Sylvia Hochfield, S., Riefstahl, E. eds. *Africa in Antiquity. The Arts of Ancient Nubia and the Sudan. Vol. 1 (The Essays)*. New York: The Brooklyn Museum: 37-45.
- Heierland, I. D. 2008. *Artifacts, Interests, and Agencies: The Politics of Sudan Archaeology*. Unpublished Master's Thesis. Department of Archaeology, History, Cultural- and Religious studies (AHCR) / Faculty of Arts. University of Bergen.
- Honegger, M. 1995. "Kerma: note sur la reprise des fouilles de l'agglomération Pré-

- Kerma”, in: Bonnet, C. & collab. Les fouilles archéologiques de Kerma (Soudan), *Genava, n.s.*, 43: 31-64.
- Haour, A., Manning, K., Arazi, N., Gosselain, O., Gueye, S., Keita, D., Livingstone-Smith, A., MacDonald, K., Mayor, A. K., McIntosh, S.K., & Vernet, R. eds. 2010. *African Impressed Pottery: Roulette Decoration Past and Present*. Oxbow: Oxford.
- Honegger, M. 2001. “Fouilles préhistoriques et prospection dans la région de Kerma”, in: Bonnet, C. & collab. Les fouilles archéologiques de Kerma (Soudan), *Genava, n.s.*, 49: 221-228.
- Honegger, M. 2004a. “The Pre-Kerma; a cultural group from Upper Nubia prior to the Kerma civilisation”, *Sudan & Nubia*, 8: 38-46.
- Honegger, M. 2004b. “Settlement and cemeteries of the Mesolithic and Early Neolithic at El-Barga (Kerma region)”, *Sudan & Nubia*, 8: 27-32.
- Honegger, M. 2010. “The ancient Kerma area of the eastern cemetery”, *Kerma, Documents de la mission archéologique Suisse au Soudan*, 2: 6-11.
- Honegger, M. 2011a. “Excavation at Wadi El-Arab”, *Kerma, Documents de la mission archéologique Suisse au Soudan*, 3: 3-8.
- Honegger, M. 2011b. “The beginning of the Kerma civilisation in the eastern cemetery”, *Kerma, Documents de la mission archéologique Suisse au Soudan*, 3: 6-11.
- Honegger, M. 2012. “Excavations at Wadi El-Arab and in the eastern cemetery of Kerma”, *Kerma, Documents de la mission archéologique Suisse au Soudan*, 4: 3-9.
- Honegger, M. Jakob, B. 2009. “The early Holocene sequence of Wadi El-Arab”, *Kerma, Documents de la mission archéologique Suisse au Soudan*, 1: 3-6.
- Lanna S. and Gatto M.C. 2006. “Prehistoric Human Occupation in the Nubian Eastern Desert: an overview”, in: Godlewski, W. ed. *Between the Cataracts, Proceedings of the XIth International Conference of the Society for Nubian Studies*, (PAM Supplement Series Vol. 2.2), Warsaw: 319–328.
- Lederman, S. 1969. *Nouvelles tables-type de mortalité*. Paris: INED-Presses universitaires de France.
- Murail, P., Bruzek, J., Houët, F., Cunha, E. 2005. “DSP: A tool for probabilistic sex diagnosis using worldwide variability in hip-bone measurements”, *Bulletin et mémoires de la Société d’Anthropologie de Paris*, 17 (3-4): 167-176.
- Mohammed Ahmed, S. E. 1997. “More Than a Century of Archaeological Research in the Sudan”, in: Wildung, D. ed. *Ancient Kingdoms of the Nile*. Paris and New York: Flammarion: 1-5.

- Mohammed Ahmed, S. E. 2013. "Archäologie im Sudan - Einst und Jetzt", in: Wenig, S., Zibelius-Chen, K. eds. *Die Kulturen Nubiens – ein afrikanisches Vermächtnis*. Dettelbach: Verlag J.H. Röhl: 13-30.
- Nordström, H. 1972. *Neolithic and A-Group sites*. Stockholm: Scandinavian Joint Expedition to Sudanese Nubia, 3.
- Nordström H.A., Bourriau J. D. 1993. "Ceramic Technology: Clays and Fabrics. Fascicle 2", in: Arnold, D., Bourriau, J. D. eds. *An Introduction to Ancient Egyptian Pottery*. Mainz: 142-190
- Privati B. 1986. "Remarques sur les ateliers de potiers de Kerma et sur la céramique du Groupe C", in: Bonnet, C. et collab. *Les fouilles archéologiques de Kerma (Soudan)*. *Genava, n.s.*, 34: 23-28.
- Privati B. 1999. "La céramique de la nécropole orientale de Kerma (Soudan): essai de classification", *CRIPPEL*, 20: 41-69.
- Riemer, H. 2007. "Mapping the movement of pastro-foragers: the spread of Desert Glass and other objects in the eastern Sahara during the Holocene humid phase", in: Bubenzer, O., Bolten, A., Darius, F. eds. *Atlas of cultural and environmental change in arid Africa*. Köln: Heinrich Barth Institute (Africa Praehistorica; 21): 30-33.
- Salvatori, S. 2012. "Disclosing archaeological complexity of the Khartoum Mesolithic: new data at the site and regional level", *African Archaeological Review*, 29: 399-472.
- Schmitt, A., 2001. *Variabilité de la sénescence du squelette humain. Réflexions sur les indicateurs de l'âge au décès: à la recherche d'un outil performant*. Thesis presented to Bordeaux I University (unpublished).
- Soper R. 1985. "Roulette decoration on African pottery: technical considerations, dating and distributions", *The African Archaeological Review* 3: 29-51.
- Susanne, Ch., Polet, C. dir. 2005. *Dictionnaire d'anthropobiologie*. Bruxelles: Ed. De Boeck Université.
- Wendorf, F., Schild, R. 2001. *Holocene Settlement of the Egyptian Sahara, volume I, The Archaeology of Nabta Playa*. New York: Kluwer Academic
- Widmer, C. 2011. *Regard anthropologique sur un nouveau musée d'archéologie en Afrique: l'exemple de Kerma au Soudan*. Unpublished Master's Thesis. Institut of archaeology, Faculty of science. University of Neuchâtel.
- Williams, M. 2012. "Geomorphology and Quaternary geology of the region between Wadi El-Arab and Kerma", *Kerma, Documents de la mission archéologique Suisse au Soudan*, 4: 10-15.

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- Matthieu Honegger The oldest sectors of the eastern cemetery:
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- Camille Fallet Bioanthropological study of the ancient sectors of the
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- Marc Bundi The history of the museums in the Sudan:
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