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KERMA

SOUDAN

1982-1983 - 1983-1984



Archaeological excavations at Kerma (Sudan)

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Preliminary report for the seasons 1982-1983 and 1983-1984

The last two seasons of excavations by the Mission of the University of Geneva to the Sudan were once again spent on the site of Kerma (Northern Province)¹. The study programme was carried out in good conditions, though the preliminary results indicate that there are many problems still to be solved. The Antiquities Service of the Sudan, directed by Mr. Nigm Ed Din Mohamed Sherif, and in his absence by Mr. Akasha Mohamed Ali, provided us with all the support necessary, and in 1983 this collaboration permitted the undertaking of restoration and protection work. Under the direction of Mr. Fritz Hinkel, of the Institute of Ancient History of the Academy of Sciences of the German Democratic Republic, a team of specialized workers from the Antiquities Service closed the stairway which gives access to the upper terrace of the western Deffufa. The barbed wire fences that surround the archaeological areas have also been reinforced and will by degrees be completed.

The financing of our research was made possible by aid from the Swiss National Fund for Scientific Research and from the Museum of Art and History of Geneva. Private subventions have added to these contributions, especially that of Mr. Harry Blackmer, who has once again shown his interest in our enterprise. The Excavations Committee, representing the University of Geneva, has met several times, and its members have expressed their accord with the objectives chosen for this site². Several Swiss diplomats as well as scholars specialized in the study of the cultures of the Nile Valley have visited us in Kerma. We thank His Excellency the Swiss Ambassador Jean Cuendet for honouring us by officially drawing attention to the interest of our archaeological studies. We may mention likewise the friendly visits of Mr. Jean Leclant, Professor at the Collège de France, who regularly devotes an important section to our site in the review *Orientalia*.

Our research is above all concerned with the vestiges of the civilisation of Kerma, the most important effort being devoted to the ancient city where, for almost a thousand years (about 2300-1500 BC), religious, civil and military constructions followed one another. The rapid extension of the agricultural zone and the destruction of part of the remaining cemetery has encouraged us to work also in this sector. As we emphasized in our previous reports,

the size of this immense cemetery forbids a complete excavation, but our exploration of small areas has already produced significant results. A second rescue intervention has been started in a locality in the modern town, where mud-brick walls had been identified. The owner, Sayed Ali Bakhit, having proposed building a house on the plot, it was decided to clear the remains in order to judge their importance. The Napatan building thus discovered is of great interest, and it will be conserved for inclusion in the future arrangement of the site. Mr. Salah Eddin Mohamed Ahmed, inspector of the Antiquities Service of the Sudan, has taken a very active part in this project, by collaborating as administrator and as archaeologist. We wish to thank him here for his remarkable work.

The excavations took place from December 4th, 1982, to January 26th, 1983, and from December 4th, 1983, to January 24th, 1984. The two rai from Tabo, Gad Abdallah and Saleh Melieh, directed a team of 40 to 50 workmen. It is not easy to conduct three excavations at the same time on such a large site, but in doing so the competence and experience of the collaborators of the Mission was of great help. Ms. B. Privati continued her study of the archaeological material, while also participating in the work in the cemetery. Mr. T. Kohler supervised the excavation of two new quarters of the city, drawing the structures preserved at a scale of 1:20. Mr. Salah Eddin Mohamed Ahmed was occupied with the surveying of the Napatan building and its annexes. Mr. L. Chaix and Mr. C. Simon have been engaged for several years in a thorough study of the skeletal material from both the city and the cemeteries of Kerma. The results obtained provide an indispensable contribution to the understanding of the ancient populations. Mr. J.-B. Sevette and Mr. S. Pulga, helped by Mr. T. Kohler, assured a complete photographic documentation. The administration was placed under the responsibility of Ms. A. Gruaz and Mr. S. Pulga.

The city

After a preliminary study of the religious centre of the ancient city, we have returned to an examination of habitation areas using the method of extensive surface clearance. The diversity of the results thus obtained makes the understanding of the development of the urban centre

difficult; nevertheless, certain phases can already be distinguished.

It appears that it was around and on the site of the western Deffufa that the nucleus of the primitive city was established. The orientations of the constructions seem to converge towards a central point, which cannot be explored, and it is probable that this first settlement occupied a more or less circular surface, probably surrounded by a wall or a palisade. The first dwellings were very simple, made of earth or wood, and usually consisted of a single room of small dimensions (3 m × 2.5 m or 4 m × 3 m). Numerous circular granaries, sunk into the substrata or built above ground within enclosures, witness to the foresight of the inhabitants who wished to have sufficient reserves of food.

This agglomeration is not without a certain resemblance to the representations of towns with circular enclosure walls, which are seen on predynastic palettes. No indications, however, allow us to date the remains to such an early period. As for the fortifications which are so characteristic of the Egyptian documentation, they are for the moment indicated only by postholes or collapsed earthen walls; these remains are not sufficiently significant to justify comparison.

This small primitive city must have been often rebuilt. Stratigraphic sections show that the postholes of the wooden buildings traverse several destruction levels including burnt strata and layers of mud-brick.

At the end of Ancient Kerma and at the beginning of Middle Kerma, the layout of the town seems to have become more regular. Large buildings, identified under and in front of the western annexes of the Deffufa, belong to this period. They are arranged according to an orthogonal plan that extends towards the west for at least 100 metres. Even though erosion has, in places, almost completely destroyed the foundations, the orientation as well as the plan of the buildings places them in relation to the recently excavated houses of the western quarter. Near the Deffufa, the buildings are elongated and very narrow. They probably belonged to the administrative or religious centre of the city. The presence of the bronze worker's kiln, installed in this area somewhat later, seems to indicate that it was also possible that artisanal activities developed in this sector. To the west, on the contrary, the organisation of the different groups of constructions convinces us that they were dwellings, with their typical courtyards used for small livestock and their granaries. The houses, rectangular in form, are generally composed of two long rooms. Narrow streets or larger thoroughfares define a relatively loosely spaced distribution of occupied parcels in which the urban layout can be perceived only indirectly. It may be noted that most present-day villages develop in the same way.

A further stage in the evolution of the city, which very probably also belongs to the Middle Kerma period, shows the presence of an overall plan. It concerns the south-western and north-eastern quarters, which seem to

have been altered and enlarged after the abandonment of certain sections of the ramparts. The houses generally formed of two contiguous rooms, succeed each other on a south-west/north-east axis. This axis indicates a new phase of urbanization within a zone previously occupied by a defensive system and by pottery workshops. The houses of this period had relatively large rooms, the walls of which were almost always reinforced by pilasters. Such buttresses exist also for earlier periods, but their use was not as systematic. The courtyards of these houses are sometimes enclosed by sinusoidal walls which, in contrast to those of the open town at Mirgissa, may be very irregular.

The last stages of construction, to the south-west of the city, reveal a more elaborate architecture. The building of very spacious houses (28, 29, 30), placed within a vast quadrilateral, proves the prosperity of the inhabitants. *House 21*, displaying a very special plan, likewise shows this evolution. Its foundations, almost one metre thick, may indicate that this dwelling was built on a terrace, or that it possessed a second storey, with access from a central staircase. The traces of a row of 5 wooden supports in the principal room weaken, however, this last hypothesis for the whole building. On the south side, the courtyard is divided into two parts, of which one was reserved for a large circular silo, 3.30 m in diameter. Along the road beyond this courtyard, there are two other buildings. One (*house 22*) is formed of two contiguous rooms, whereas the second (*house 23*) comprises only one room.

These last three houses could have belonged to the same family, since the courtyards seem to be joined by a passage that passes around *house 22*. The archaeological material recovered at these levels belongs to Classic Kerma and to the beginning of the 18th Dynasty. Thus, on the floor of *house 21* were preserved several intact ceramic bowls, whose buff-coloured paste and red slip are characteristic of this period. A small Nubian head, modeled in clay, is reminiscent of certain Egyptian statuettes of the beginning of the New Kingdom.

It was also during Classic Kerma that the walls surrounding the courtyards of houses were rounded out into long segments of circles on the street side. Two structures of this type have been uncovered this year. They are composed of a double row of baked bricks, strengthened by small supporting walls and by compartmented structures. These walls, which protected the houses from erosion, perhaps served also to separate this sector from that of the huts, situated lower down, on the axial road.

This way of enclosing the courtyards with rounded walls is attested particularly at Tell el-Dab'a at the end of the Middle Kingdom³. At that site also, large circular silos are present near the houses. At Kerma, the rounded walls developed primarily during the Second Intermediate Period, when they appear to replace the right-angled enclosures of the preceding phases of construction.

The excavated area is very modest in comparison with the extent of the city as a whole. The layout of the successive enclosure walls has been only partially ascertained. A segment of the north-south defense ditch was uncovered in 1983 at the southern extremity of the sectors studied. This town limit, which seems to have been considerably modified during Classic Kerma, still remains difficult to reconcile with the fortifications already brought to light to the south of the Deffufa.

The pottery kilns

The remains of several pottery workshops have been discovered within the city during the last seasons. It seems unlikely that these installations were situated in the middle of an inhabited area, because of the risk of fire. Thus, one can suppose that, originally, these workshops were arranged in or along the fortifications, at some distance from the houses. By their size, as well as by their general structure, these kilns are comparable to those of Buhen, identified by the excavators as bronze-worker's kilns. It is also worth noting that the latter were also situated on the terraces of an enclosure wall of the Old Kingdom ⁴. At Kerma, the presence of numerous wasters near the kilns leaves no doubt as to their use. Moreover, no metallic residue or crucible fragments have been found. It should also be recalled that the bronze kiln excavated two years ago on our site displayed a particularly sophisticated technology ⁵.

The pottery workshops are distinguished by piles of hardened ashes of a whitish colour. The ashes are sometimes retained by small walls of slightly reddened mud-bricks or, in certain cases, in oval enclosures about 1 m long. On the surface, the ashes retain the imprints of circular vessels that had been imbedded in the heap, perhaps while it was still hot.

The three kilns studied have an identical internal structure. An elongated stoking chamber permitted the feeding of the fireplace with fuel. There is no heating chamber, only a short descending shaft, without fixed orientation, that leads to the hearth. The walls are constructed of large bricks (0.34 × 0.20 m), that are not very thick (0.11 m). The firing-chamber is circular or slightly oval, and sunk 0.60 to 0.80 m into the ground. Projecting bricks support the sole of hardened mud and bricks (0.28 × 0.14 × 0.08 m). The latter are not contiguous – leaving enough space for the numerous hot air ducts (14 on the periphery of the sole and at least 10 in the centre). The whole construction is bound together by a large quantity of mud which has vitrified under the effect of the heat.

The western Deffufa

Each year, the analysis of the Deffufa continues. The architectural evolution of this monument is complex and many elements are still missing for an interpretation of the different parts of the building. A rectangular cavity, seen in elevation on the western facade of the structure,

had not been cleared during the excavations carried out by G.-A. Reisner ⁶, thus giving us the opportunity of studying a deposit of ancient debris. After removal of the first layers, a masonry shaft appeared. The limited dimensions of this sort of hiding-place (1.92-1.95 × 1.30 m) did not prevent the builder from constructing a facing of small flagstones of ferruginous sandstone, with perfectly aligned edges. This fine stone masonry bound with clay was not, however, visible, since originally it was covered by a surface coating. The hiding-place, like the chambers of the north-western and south-western angles of the Deffufa, belong to a phase of construction anterior to that of the monument as we now see it. The ancient shaft was thus preserved when the building was heightened. Access to it was from the top of the Deffufa, and the arrangement seems comparable with that of shafts Z 3 and Z 4 of G.-A. Reisner ⁷, situated in the eastern part of the Deffufa, which was a very late addition.

The archaeological material provides no information about the use of this shaft. One could suppose, by comparison with Z 3 and Z 4, that it was employed as a storeroom. As in the rest of the building, traces of fire are to be seen in the filling, in the form of charred palm tree trunks or of partly burnt bricks. Classic Kerma sherds, animal bones, more than a hundred rounded mud cylinders, bits of sheets of mica and two fragments of faience vessels were also found. At the bottom of the shaft, the remains of a large wall show that this installation was not designed for drawing water. The wall belongs to the buildings which surrounded the primitive Deffufa. Probably, it belongs to the same group as the remains of foundations brought to light underneath the annexe at the south-western angle of the Deffufa.

The position of this storeroom provided an opportunity for conducting soundings in the interior of the monument, in order to complete the plan of the primitive building, of which only the northern apse has so far been recognised. The help of Mr. Fritz Hinkel proved to be indispensable for this undertaking. After the installation of wooden shorings, a passage was dug horizontally for a distance of 4 metres. Our advance was then blocked by a vertical wall, made of thin bricks, similar to those of the solid apse of the original building. Situated at 8.60 m from the outer face on the western side of the Deffufa, this primitive wall is distinguished by the presence of a course of baked bricks. Contrary to Reisner's opinion, this material was in use at a period considerably anterior to the end of the Kerma civilisation.

Continued research will be necessary in order to define more completely the internal organisation of the primitive apsed edifice. Comparison with the chapels built in the necropolis will no doubt help in our interpretations.

The eastern necropolis

In the eastern necropolis, the excavations are being carried out in localised areas. Six to eight tombs are

studied in each area. The results obtained in the course of the last two seasons are exceptional in several respects, and our research will be continued in this zone.

Using as a basis the chronology proposed by B. Gratien⁸, we had attempted a preliminary classification of the excavated areas according to the type of tomb and the kind of material found, and admitting an *a priori* hypothesis that presumes the existence of a north-south linear topo-chronology. For this reason, we had begun our investigations in the north, in order to discover the features characteristic of the evolution of the necropolis by stages. However, the pattern of development of the cemetery has proved to be exceedingly complex. Consequently, we are abandoning for the moment the terms Ancient Kerma, Middle Kerma and Classic Kerma in reference to the eastern cemetery, to avoid possible confusion with the classifications of B. Gratien. The new numbering corresponds to the different sectors excavated which, for the moment, are classified according to a widely defined relative chronology, which can be narrowed down during the course of the dig. The prefix CE (eastern cemetery), preceding the numbers of the sectors, therefore replaces 'KA', 'KM' or 'KC'.

The leather coverings frequently preserved in the graves provide excellent material for ¹⁴C analysis; a sample has therefore been taken from each series of tombs. The results will serve to complement the archaeological observations and at the same time will enable us to recommence our investigations if certain dates seem to be aberrant.

Beginning at the time of phases CE 7 and CE 8, a change linked with an important social evolution is found in funerary practices. The population of Kerma seems to have developed a more marked hierarchical system. It is at this time that superstructures of large dimensions first appear. Certain tombs attain 8 to 10 m in diameter, and one imagines that their construction must have required a considerable labour force. The relatively rich furnishings, as well as the size of the tombs, show that these were destined for persons of high rank with considerable means. This evolution is also visible in the pottery, which was produced in series. Dozens of bowls, of identical shape and decoration, have been discovered turned upside down on the ground, to the east of the large superstructures, around which are grouped smaller tombs.

It was probably during this period that the primitive urban centre of Kerma took on the proportions of a city. The material found in the quarters near the western Deffufa is associated with this stage in the development of the cemetery.

We can add to these observations concerning the sectors recently studied that the funerary customs become more elaborate. Leather coverings appear almost systematically over and underneath the skeletons. The placing of animals in the tombs becomes common. Vessels were also placed inside the tombs, near the body, although the tradition of sharing a meal with the deceased around the tomb continued. The number of bucraniums placed to

the south of the tombs increased, but their preparation remained identical with that observed for anterior phases of Ancient Kerma⁹. It is only in sector CE 10 that this was to be modified.

Our analysis has been much facilitated by the appearance of D. Dunham's work, devoted to the eastern cemetery at Kerma¹⁰. The greater part of this publication concerns the zone situated between CE 5 - 6 and CE 7 - 8 excavated by G.-A. Reisner between 1915 and 1916. The 197 tombs excavated provide a very characteristic image of the 'Nubian cemetery' near our CE 7.

The series of 4 tombs of CE 7 has also permitted a better understanding of some of the findings made by G.-A. Reisner. The superstructure of the *large tumulus* (t 76) was studied in detail. On its eastern side, we found 18 bowls placed upside down on the ground. Traces of liquid were still visible under the vessels, as well as fragments of suspension cords made of palm leaves. The funerary ceremonies during which these bowls were turned upside down took place around the circular pit, 8 to 8.5 m in diameter. Subsequently, the superstructure of the tomb was raised on the edges of the pit and, in places, on top of the pottery. A mass of wet mud facilitated the placing of black stones (basalt and ferruginous sandstone) in regular circles around it; to consolidate and decorate the structure, numerous small white pebbles (quartz) were added to the stone circle marking the tomb. In the centre of the tumulus, the filling of earth and sand was also covered with a large quantity of white pebbles. For lack of time, and in view of the disturbed condition of the earth filling, excavation of the pit was not undertaken.

Three subsidiary tombs near the large tumulus were studied. In *tomb 77*, severely pillaged, the principal personage lay on a bed, in a bent position on the right side, the head oriented towards the east. The man, aged between 40 and 50 years, wore ivory bracelets and earrings of bone. His leather clothes were decorated with beads. Beside him was a bronze mirror, placed in a leather sac, a bowl and an ostrich-feather fan. On the south side, a second body, that of a woman aged between 20 and 30 years, lay extended alongside the bed of the principal person. This position suggests that the woman, perhaps one of the wives or slaves of the master, had been sacrificed; a custom which became very frequent in later periods of the Kerma civilisation. Five sheep were also sacrificed during the funerary ceremonies; they were tied up in leather bags. In *tomb 79*, the individual, a man of more than 30 years of age, wore a bone ring on his left hand. A bronze mirror with a wooden handle, wrapped up in a fabric, lay near a long ivory or bone spatula.

The 60 metres more or less which separate sector CE 7 from CE 8 do not perhaps represent a sufficient distance to indicate that a long period had elapsed between these two series of burials. *Tomb 81* had been disturbed at the head end; nevertheless, the body of the person, less than one year old, had remained untouched underneath a leather covering. The offerings, as well, were still in

their original position. The loincloth of the child, tinted red, was decorated with four lozenge-shaped leather patches, on which were sewn blue and white beads. An identical decoration can be seen on the loincloths of Nubian soldiers, wooden models of which were placed in the tomb of Mesekhthi at Assiout, in Middle Egypt¹¹. An ivory and bone hafted bronze dagger, slipped into its leather holder, rested on the hip of the infant. In front of the chest was a necklace of faience beads and a fan of ostrich feathers. To the north of the tomb, six ceramic vessels had contained offerings; they had perhaps been used by the infant before its death, since three of them are very small. On one of these bowls, which has a spout, there are two incised crocodiles.

On the west side lay two lambs sacrificed during the funerary ceremonies. Their collars, made of finely braided leather thongs, and the cords that were used to tether them were still preserved. The head of one of the lambs was covered by a sort of bonnet, surmounted by a disk of feathers whose base fitted the shape of the skull between the two horns perfectly. The head-dress was held in place by thongs. A perforated leather band, tinted red and passing through the pierced horns, held in place two precious bead pendants. On these was outlined a series of white and black triangles on a blue background. We note also that the coat of the animal was marked with several patches of red ochre.

This discovery is reminiscent of the rock engravings of North Africa and of the Nile Valley. The jugular pendants, as well as the frontal disk¹², so often debated¹³, closely resemble the objects which adorn the lamb of tomb 81. In at least three of the tombs studied by G.-A. Reisner, there were sheep with feather attributes on their heads¹⁴. Finally, we may note another instance in tomb 92 of sector CE 10. In this example, we were able to ascertain that the *calami* of the feathers were pierced with a small hole, through which to pass a string in order to maintain them firmly in place. This system does not seem to have been used for the fans, whose *calami* were simply held in hardened clay or wax.

It is still premature to draw conclusions from this surprising find. Although the god Amon in his criocephalic form became, during the New Kingdom, one of the major divinities of Egypt and the Sudan, it appears that even before this period, the ram was an object of worship in Nubia¹⁵. The very beautiful quartz head found at Kerma by G.-A. Reisner¹⁶, the human figurine with a sheep's head from Askut¹⁷, as well as the terracotta statuette of a sheep from Aniba adorned with a spherical attribute¹⁸, are examples tending to demonstrate the importance of this animal in different Nubian cultures. We should keep in mind that in Middle Kerma as well as in Classic Kerma, it was customary to add joints of mutton to the other food offerings placed on the northern side of the tomb pit. It is therefore probable that the deposits of whole sheep in sacks on the opposite side of the pit had a particular religious significance.

Sector CE 9 was placed 60 m to the south of G.-A. Reisner's excavations and of sectors CE 7 and 8. In this zone as well, the cemetery is marked by scatterings of black and white stones left strewn about by pillagers. A few complete circles indicate the remaining untouched tombs.

Two archer's tombs have been found (*t 89-91*). In each tomb, the bow cord was passed through the left hand of the deceased, whilst the weapon lay in front of him. In one case, the right hand of the archer held the middle of the bow, as if he had been placed in a position of defense. The two men (one more than 40 years old, and the other only 25) wore sandals and a well preserved leather loincloth, of a type attested in Egyptian iconography. The loincloth, which seems to have been pleated, was worn fairly on the thighs. It was held by a sort of belt, of a darker colour, knotted on the abdomen. One of the two archers was surrounded by two goats, two sheep, a dog, a large bowl and a jar; the floor of the tomb was thus completely occupied. Profound changes are apparent in the decoration and forms of the pottery, but it was not possible to find analogies between this material and Middle Kerma pottery as defined by B. Gratien.

Sector CE 10 is situated almost 100 metres to the south of CE 9, not far from a large tumulus. Only three tombs were excavated. The pottery, although very fragmentary, shows a clear evolution towards the types of Middle Kerma. New carinated forms make their appearance, as well as an incised decoration of triangles under the lip of a bowl.

One tomb (*t 94*), unfortunately severely plundered, differs from the others. It was covered by a low tumulus, that had not been reinforced by a circle of white or black stones. These were simply piled up on top of the circular pit, which was 1.5 m deep. Thieves had dug three vertical holes on the east side in order to reach the offerings and adornments of the deceased. These holes, about 1 m apart, were joined at the bottom of the pit by horizontal passages that passed alongside the body of the deceased. A tree had grown above the tomb and its roots had invaded the holes, causing them as well as the top of the tumulus little by little to fall in. A deposit, originally placed at the surface of the superstructure, was thus preserved. It consists of an offering table, and of a jar with its truncated conical stand.

The pottery offering table is in the form of a boat. The interior is divided by two low partitions, each surmounted by a stylized animal (rams?). In each of the compartments there is another small animal (sheep?). A runnel was provided at one of the extremities, and a hole pierced near one of the partitions could also have served for emptying liquids. The offering table was very badly fired, and it will be difficult to conserve it.

Underneath the debris of the original filling, the remains of a rectangular wooden coffin appeared in the hardened mud. A thin layer of yellow paint was still visible on the walls of the coffin both inside and outside,

whereas the lid and the base were enveloped in solid mud, in which traces of yellow paint were visible. The coffin measured about 1.90 m long and 0.50 m wide, with a height of at least 0.50 m¹⁹. The bones, strewn loose in the tomb with the exception of the feet and the lower parts of the legs, permit us to estimate the age of this rather robust man at about 40 years. Moreover, the position of the bones lead us to the conclusion that the man's head was oriented to the east, and that he lay on his right side, in a half-bent position. In one of the thief's holes, a mace-head of gabbro had been abandoned; this is the only object found that probably came from inside the coffin. To the north of the tomb, a bowl decorated with triangles and a few sherds of a jar represent the remains of offerings. No animal bones or traces of leather coverings were found in this tomb.

Meticulous cleaning of the sides of the coffin revealed what seems to have been a decorated surface. Since the wood of the coffin had been entirely destroyed by termites, this cleaning proved to be particularly difficult, and, unfortunately, the results remained very incomplete. Nevertheless, it is certain that the coffin was decorated with a band of hieroglyphs along its two exterior sides, underneath the lid. A column of inscription 0.80 m high was painted on the end panel at the south-west corner. Another column seems to have existed near the north-west angle. The separating lines as well as the hieroglyphs were painted in blue, with a thin black outline. In one place only, a red mark is perhaps a remnant of the preparatory drawing by the painter. The few signs which could be identified were too badly preserved to permit a reading.

This discovery is obviously very important. Stylistically, the coffin is close to those exhumed in the Egyptian necropoli of the end of the First Intermediate Period and of the Middle Kingdom. Taken together with the offering table, also of a type attested from the end of the First Intermediate Period, it poses the problem of the influences to which the population of Kerma was subjected²⁰. Even if the coffin was produced by an Egyptian craftsman, or by a Nubian well acquainted with Egyptian techniques, the position of the deceased shows that he followed, at least in part, the traditional funerary practices of Kerma. The absence of sheep in the circular pit is very striking. Could this indicate that the body was that of an Egyptian? But it is well known how reluctant these people were to be buried abroad.

The northern Meroitic cemetery

Since the area to the north-west of the site of the ancient town has been brought under cultivation, the shafts and burial vaults of several Meroitic tombs have been uncovered by a tractor. The cemetery excavated by G.-A. Reisner near the modern town²¹ is thus very

extensive, since we have recognised tombs of the same period to the south and the west of the western Deffufa.

The Napatan Building

Along the road leading to Kerma En Nuzl, within the modern urban centre, a building project about to be put into operation incited us to organise rescue excavations. The area, surrounded by houses, has remained an open space for centuries. Donkeys, and more recently cars, were stationed in the shade of a tree. This archaeological site, near some Christian tombs, is on a slight rise, and covered with a scattering of sherds of all periods. Ancient walls are visible at the surface, not only on the site of the future house but also on the neighbouring mounds that have already been built upon. The initial results of this research, conducted in collaboration with Salah Eddin Mohamed Ahmed of the Antiquities Service of the Sudan, are presented in an appendix. The wealth of material discovered opens up a new chapter in the history of the city of Kerma.

Conclusion

The study of the different cultures of Kerma is confronted by a major difficulty, that of distinguishing the Egyptian contributions from those of the Nilotic cultures further south. The funerary practices and civil architecture, as well as the handicrafts, are specifically Nubian. There is nothing in common between the large circular tombs with stone *tumuli* of Ancient Kerma and the quadrangular burial vaults or the mastabas of the Old Kingdom. On the other hand, it is true that in the case of civil architecture, comparative study remains limited, since examples from Egypt for that period are few. As for the regional influences, they are more difficult to determine. Imported pottery is rare, and research in the neighbouring deserts to the east and to the south is only just beginning.

It is clear that the civilisation of Kerma developed in an independent manner, and that its originality cannot be denied. The Egyptians no doubt conquered a part of the territory of Kush well before the 18th Dynasty. However, the proximity of the Egyptian armies did not change the evolution and the customs of the region. Although rare objects, such as the bronze mirrors, for example, or certain jars or vases, came from Egypt, it is in contrast more difficult to make a decision in the case of the coffin and the offering table of tomb 94. Should these be attributed to a Nubian mercenary returned from Egypt or, on the other hand, to an Egyptian who had partially adopted Nubian traditions?

Up to the present, the Nubian cultures have above all been regarded from the viewpoint of Egyptian history. In the case of Kerma, this approach was even more

marked because the work of G.-A. Reisner was above all concerned with remains contemporary with the Second Intermediate Period, an époque during which the kings of Kush occupied part of the Egyptian territory. The numerous objects exhumed in the tombs were probably

brought, perhaps as booty, from the forts of Batn el Hagar. We must therefore today reconsider the study of the Kerma cultures taking into greater consideration the regional archaeological findings, and using the Egyptian 'model' with greater discretion.

¹ See for the work in progress:

C. BONNET, *Fouilles archéologiques de Kerma (Soudan), Rapport préliminaire de la campagne 1977-1978; 1978-1979 et 1979-1980; 1980-1981 et 1981-1982*, in *Genava*, n.s., t. XXVI, 1978, pp. 107-127; t. XXVIII, 1980, pp. 31-62; t. XXX, 1982, pp. 29-53; *Une ville antique du Soudan: Kerma, in La ville dans le Proche-Orient Ancien, Actes du Colloque de Cartigny 1979, Les cahiers du Centre d'Etudes du Proche-Orient Ancien*, Université de Genève, I, Louvain, 1983, pp. 125-132; *Kerma: An African Kingdom of the 2nd and 3rd Millennia B.C.*, in *Archaeology*, Vol 36, No. 6, nov-déc. 1983, pp. 38-45; *Excavations by Archaeological Mission of the University of Geneva to the Sudan: 1981-1982 Season; 1982-1983 Season*, in *Nyame Akuma*, a Newsletter of African Archaeology, No. 20, June 1982, pp. 54-56; No. 22, June 1983, pp. 23-24.

J. LECLANT, *Fouilles et travaux en Egypte et au Soudan, 1978-1980; 1980-1981*, in *Orientalia*, vol. 51, fasc. I, 1982, pp. 105-106; vol. 51, fasc. 4, 1982, pp. 473-474.

² For the last few years, the president of the Commission for Excavations in the Sudan was Professor M.-R. Sauter. While this report was in preparation, we unhappily learnt of the death of Professor Sauter, who had provided an essential support to our project, and who had often guided us in our work. Professors J. Dörig, A. Giovannini and O. Reverdin also participated in meetings of the Commission.

³ M. BIETAK, *Avaris and Piramesse: Archaeological Exploration in the Eastern Nile Delta*, in *Proceedings of the British Academy*, London, vol. LXV (1979), Oxford University Press, 1981, pp. 238-239.

⁴ W. EMERY, *Report on the Excavations at Buben*, in *Kush*, 11, 1963, pp. 116-120; W.-Y. ADAMS, *Nubia, Corridor in Africa*, London, 1977, pp. 170, 174, note 20.

⁵ C. BONNET, *Rapport préliminaire . . .*, 1982, pp. 6-11.

⁶ G.-A. REISNER, *Excavations at Kerma*, part I, Harvard African Studies, vol. V, Cambridge (Mass.), 1923, pp. 21-40.

⁷ G.-A. REISNER, *op. cit.*, pp. 25-29.

⁸ B. GRATIEN, *Les cultures Kerma, Essai de classification*, Lille, 1978.

⁹ L. CHAIX, *Seconde note sur la faune de Kerma (Soudan), Campagne 1981 et 1982*, in *Genava*, n.s., t. XXX, 1982, pp. 67-70.

¹⁰ D. DUNHAM, *Excavations at Kerma*, part VI, Museum of Fine Arts, Boston, 1982. We would like to emphasise the collaboration that has been begun with the Department of Egyptian and Near-Eastern Art of

Boston, under its Director Professor W. K. Simpson. Members of our Mission have been able to study the material conserved at the Museum of Fine Arts thanks to the help of Mr. T. Kendall and Mr. P. Lacovara.

¹¹ The tombs dates from the end of the First Intermediate Period (about 2100 BC). These objects have been presented to the Museum of Cairo (CG 257).

¹² J. LECLANT, *Une province nouvelle de l'art sabarien: Les gravures rupestres de Nubie*, in *Maghreb et Sahara, Etudes géographiques offertes à Jean Despois*, Société de Géographie, Paris, 1973, pp. 239-246.

¹³ G. CAMPS, *Le bélier à sphéroïde des gravures rupestres de l'Afrique du Nord*, in *Encyclopédie berbère*, cahier N° 26 (édition provisoire); *La préhistoire, à la recherche du paradis perdu*, Coll. Histoire et décadence, Paris, 1982, pp. 415-417.

See for recent findings at the site of Boualem-El Ouidiane: F. SOLEILHAVOUP, *Une approche géomorphologique de l'art rupestre en Algérie; problèmes de méthode pour l'étude des sites de plein air*, in *Archéologie africaine (cultures néolithiques) et sciences de la nature appliquées à l'archéologie (GMPCA) - 1^{er} Symposium international - Bordeaux - 25-30 septembre 1983*, Fig. 23-26.

¹⁴ D. DUNHAM, *Excavations at Kerma . . .*, tomb B 80, pp. 4-5; tomb. N 180, pp. 151-152; G.-A. REISNER, *Excavations at Kerma*, part III, K 1085, p. 363.

¹⁵ D. WILDUNG, *Der widergestaltige Amun - Ikonographie einer Gotterbildes*, text presented at the Congrès International des Orientalistes, Paris, 1973; St. WENIG, *Africa in Antiquity, The Arts of Ancient Nubia and the Sudan, II, The Catalogue*. The Brooklyn Museum New York, 1978, pp. 135-146, n° 44; *Amun*, in *Lexicon der Ägyptologie*, Bd I, Wiesbaden 1975, col. 237-247.

¹⁶ St. WENIG, *Africa in Antiquity . . .*, p. 145, n° 44.

¹⁷ St. WENIG, *Africa in Antiquity . . .*, pp. 122-123, n° 12.

¹⁸ St. WENIG, *Africa in Antiquity . . .*, p. 129, n° 20.

¹⁹ A sarcophagus of the same dimensions but of a much later date was found by G.-A. Reisner. G.-A. REISNER, *op. cit.*, part III, p. 346, K 1058; see also: part IV, pp. 207-208.

²⁰ R. MOND et O. MYERS, *Cemeteries of Armant I*, London, 1937, pp. 59-60, pl. XXII, 5 et 6; W. M. FL. PETRIE, *Denderah*, London, 1900, p. 26, pl. XIX. *Gizeh and Rifeh*, Londres, 1907, p. 14-20, pl. XIV.

²¹ G.-A. REISNER, *op. cit.*, part II, pp. 41-57.

Figurines and clay models brought to light in the city of Kerma

By Nora FERRERO

Since 1976 each season of excavation has produced its share of objects of fired clay: anthropomorphic and zoomorphic figurines, miniature ceramics, models of boats and of tools. Similar objects were already noted by G.-A. Reisner during his excavations of 1913/1916¹. On the whole, the figurines and models are of mediocre workmanship and small size, the majority measuring between 2 and 6 cm high. The firing is not always homogeneous. Certain pieces are well fired, others only superficially, and a few examples were simply sun-dried. The colours vary from beige-orange to black. Sometimes, there are traces of a coat of red ochre. This archaeological material can be divided into four principal categories: zoomorphic figurines, anthropomorphic figurines, miniature vessels, and small cones.

Together with the models of pottery vessels, the *zoomorphic figurines* (Pl. I/12-21) make up the category that is quantitatively the most frequent on the site. The greater part represent cattle or caprines, the most common domestic species of livestock at Kerma. It is not always possible to make a precise zoological determination, because of the schematisation of the forms and the rarity of anatomical details. Two iconographical types can be distinguished:

- The animal is standing (Pl. I/12-15). Its legs are short and conical, and are fashioned in a rudimentary manner. The genitals appear only on rare examples. A dewlap is sometimes present.

- The animal is without legs (Pl. I/16-17). This absence perhaps represents an animal lying down, or it could equally derive from a desire for simplification or from a wish to limit the risks of breakage. It is principally the cattle that are modelled in this way.

On certain cattle, one remarks a more or less well-developed cervico-thoracic hump (Pl. I/13, 16). This exists as well on the statuettes described by G.-A. Reisner. But, since no zebu have been recognised on the site up to the present², the hump is perhaps only an exaggeration of the protrusion on the back of the animal; it could, for example, have served to distinguish the bulls from the cows.

There are few representations of non-domestic species. In contrast to stock rearing, hunting played only a minor role in the life at Kerma³. Other than two tiny crocodiles—a motif occasionally incised on the walls of certain containers—a few statuettes can be identified as hippopotami, animals figuring among the beasts painted on the walls

of the funerary chapels of the eastern cemetery (Pl. I/19-20)⁴.

The *anthropomorphic figurines* (Pl. I/1-11) remain rare. With the exception of three examples, where the head is rendered in spherical form (Pl. I/9-11), they have all been found headless. Certain of them display a cavity in place of a neck, which probably allowed attachment of a separately modelled head, as is suggested by the discovery of a head provided with such a cavity at its base (Pl. I/1, 2, 4, 6). Several small 'eggs' of fired clay provided with such a hole for attachment have been found; they could also be heads (Pl. I/5). Manufacture in two pieces is well established for figures modelled in the round exhumed in the C-Group necropolis of Lower Nubia, which belong to the same cultural horizon as Kerma⁵.

The body is cylindrical, with either a slightly flaring or a pointed base. The separation of the legs is not indicated. The arms are greatly foreshortened or marked only by rounded protrusions. Although the breasts and the navel are sometimes noted, the genitals are never present. In certain cases, the shortness of the body gives the figurines the appearance of simple torsos.

Two examples, of more careful manufacture, diverge from this schema (Pl. I/7-8). The body is marked by a constricted waist, a strong lumbar curvature and by the presence of a decoration consisting, in one case, of a group of perforations on the thorax and, in the other, of horizontal incisions on the abdomen. These motifs probably indicate a body decoration, tattooing or scarification⁶. These decorative motifs form a link between our figurines and the clay statuettes of the C-Group, which are, however, generally of a larger size.

A third object deserves to be described here in more detail, because it appears to belong to a type of figurine different from those presented above. It consists of a small human head, preserved down to the lower extremity of the neck (Fig. 1). Reconstituted, the figurine would have been approximately the size of the oarsmen in the faience model of a boat brought to light by G.-A. Reisner in the eastern cemetery⁷.

The face is very elongated and framed by a hair-do which completely covers the ears. The forehead is receding, the superciliary arches prominent, the nose narrow and the lips everted. The physiognomy represented is that of a Nubian⁸, for whom parallels may be found in certain Egyptian bas-reliefs of the 18th Dynasty. The lengthen-

ing of the face and the line, almost vertical, that unites the extremity of the nose to the projection of the chin are, moreover, evocative of the Amarna style. It can be remarked that this head was discovered in the destruction levels of a house (M21) where ceramics dating to the end of Classic Kerma and to the 18th Dynasty were found⁹.

There are no specific attributes that permit identification of the figurines, either anthropomorphic or zoomorphic, with divinities.

It is rare that *miniature ceramics* (Pl. II/1-13) reflect the variety and quality of contemporary ceramic production¹⁰. In this, the models from Kerma, of very small size, constitute no exception. The forms are generally simple: bowls, cups, or jars with spherical or oval bodies which, in the latter case, are not hollow. Decoration is infrequent and composed of isolated figurative elements (flowers, animals) or geometrical patterns (triangles, chevrons). The fabric is usually coarse. A fragment of a tiny black-topped, red polished beaker represents one of the rare miniature vessels reproducing a fine ware original (Pl. II/8). It is perhaps well to include in this category the *truncated conical objects* with more or less flared bases, partially hollowed out at the top (jar-silos, pot stands ?) (Pl. II/14-17). Several of these were, in any case, found associated with the miniature ceramics.

The *small cones* (Pl. II/18-19) constitute the last category of our material. These could be games pieces, tokens, or possibly models of bread¹¹.

A few isolated objects can be added to these main categories, such as grindstones, small potter's rollers, loom-weights, models of boats (Pl. II/20-22).

The distribution of this material is restricted to the ancient city. Differing from other Nubian cultures, the populations of Kerma do not seem to have had the custom of placing figurines in tombs; the objects collected by G.-A. Reisner in the eastern cemetery came almost exclusively from the debris accumulated around a funerary chapel¹². Work in progress in the necropolis will probably lead to a more definite statement on this point.

Whereas the zoomorphic figurines and the models of pottery are uniformly distributed throughout the whole city (religious quarters, residential quarters, fortifications), the anthropomorphic figurines appear to be associated particularly with the houses¹³, while the cones and the models of boats are found mainly in the Deffufa and the cult areas dependent on it. It is difficult to decide whether this distribution reflects a reality, or whether it is due to the hazards of discovery; the sample available not being as yet sufficiently representative. Figurines and model vessels have been found in levels belonging to both Middle Kerma and Classic Kerma. The analysis of the objects belonging to each of these periods has not indicated the existence of a particular relationship either to a morphological type or to a special technology. For Ancient Kerma, the question remains open, since the documentation for the primitive settlement is too fragmentary.

Concerning the manufacture of the material, the variety of techniques and of morphology suggests domestic manufacture rather than a specialised production for sale, as suggested by G.-A. Reisner. Although, in many cases, the modelling of the objects appears to imply the work of an adult, the possibility that children participated in their production cannot be excluded.

It is difficult to decide what were the functions of these objects. Only a small percentage have been discovered in contexts significant in this respect. This is partly to be attributed to the exigences of excavation, which involved clearance of large areas to uncover the layout of the city. In 1913-16, several hundred fragments, essentially cones and zoomorphic figurines, were recovered from two storerooms situated inside the eastern part of the Deffufa, considered at the time as an administrative and commercial centre. The fragments were associated with a large number of seal impressions and small lumps of mud. The homogeneity of the deposit, with an identical clay used for the three types of objects, showed that the grouping was not fortuitous. Thus, G.-A. Reisner was inclined to consider the figurines and models as votive offerings¹⁴. This interpretation now seems all the more justified, since reconsideration of the Deffufa has led to an understanding of the religious character of the edifice. Such an interpretation would, also, account for the schematic nature of the material: since these objects were above all functional, their quality was relatively unimportant.

Certain recent findings also point in the direction of a religious interpretation. We note especially the presence of a number of model vessels in a foundation deposit of a western annexe of the Deffufa¹⁵. Six animal figurines (hippotami, crocodiles, cattle), about twenty cones, a fragment of a beaker, bone pins, a small bronze globe and a gold bead were part of the contents of this partially plundered pit. Miniature pottery, accompanied by small models of offerings and tools are, moreover, well established as components of foundation deposits¹⁶.

It is probable, however, that these objects were invested with many other meanings in the eyes of their users. The manufacture of miniatures is a practice very widely distributed both in time and in space, and its motivations were as much religious as secular¹⁷. P. J. Ucko has emphasised the extreme diversity in the usage of anthropomorphic figurines, and his discussion would seem to apply to the whole of our material¹⁸. These could very well have been votive offerings – indications, perhaps, of domestic worship – but, considered in an urban context, the objects could be toys, or objects associated with initiation rites, or vehicles of sympathetic magic. It is interesting to remember, in this connection, that more than three hundred clay objects and figurines were found together with the execration texts discovered near the fortress of Mirgissa, in Lower Nubia¹⁹. Certain of our figurines, moreover, appear to have been intentionally pierced.

In concluding this presentation, the preliminary nature of which should be emphasized, two statements must be

made. Firstly, that classification of this archaeological material is difficult, given its characteristics and its often mediocre state of preservation; and, secondly, that our over-all view is still very superficial. Work in progress in the city and the eastern cemetery, especially in the funerary chapels, could, by increasing the amount of the material, indicate a wider variety than is apparent at present. For example, concerning figures modelled in the

round, as properly defined, their existence is proved at present by only a single fragment, a little more than 7 cm long, and belonging to the hind leg of a zoomorphic statuette, probably bovine (Pl. I/12). Finally, more detailed excavation of certain houses, together with study of the dissemination of the objects and associated material, should help in the interpretation of these figurines and models.

¹ G.-A. REISNER, *Excavations at Kerma*, Harvard African Studies, vol. V-VI, Cambridge, Mass., 1923, part III, pl. 26.2; part IV, p. 46-48. We thank Mr. P. Lacorava, of the Museum of Fine Arts of Boston, who provided photographs and drawings of these objects.

² L. CHAIX, *Note préliminaire sur la faune de Kerma (Soudan)*, in *Genava*, n.s., t. XXVIII, 1980, p. 63.

³ L. CHAIX, *Les troupeaux et les morts à Kerma (Soudan), 3000 à 1500 av. J.-C.*, Colloque international CNRS, Méthodes d'étude des sépultures, Toulouse, 1982 (to appear).

⁴ G.-A. REISNER, *op. cit.*, part III, K II, p. 132, pl. 4.2; K XI, pp. 263-264, pl. 19.1-2-3-4.

⁵ G. STEINDORFF, *Aniba*, Service des Antiquités, Mission archéologique de Nubie 1929-1934, Glückstadt et Hambourg, 1935, vol. I, pp. 120-121, taf. 72. See also: St. WENIG, *Africa in Antiquity*, The Brooklyn Museum, 1978, vol. II, Nos. 14 et 15, p. 125; n° 17, p. 128.

⁶ For examples of tattooing for sculptures in the round of the C-Group, see: I. HOFMANN, *Die Kulturen des Niltals von Aswan bis Sennar vom Mesolithikum bis zum Ende der christlichen Epoche*, Hambourg, 1967, pp. 233, 272. St. WENIG, *op. cit.*, n°s 13, 15, 18, pp. 124-125, 128.

⁷ G.-A. REISNER, *op. cit.*, part IV, pp. 170-172, pl. 48.

⁸ The long face, the narrow nose, as well as the prognathism are morphological traits that are characteristic of one of the two human types found on the site. See: Ch. SIMON, *Etude anthropologique préliminaire sur le matériel du Kerma Ancien (Kerma, Soudan)*, in *Genava*, n.s., t. XXX, pp. 65-66.

⁹ Ch. BONNET, *Rapport préliminaire sur les campagnes de 1982-1983 et 1983-1984*, in *Genava*, n.s., t. XXXII, pp. 5-8.

¹⁰ J. BOURRIAU, *Pottery from the Nile Valley before the Arab Conquest*, Catalogue of an exhibition, Cambridge, 1981, pp. 112-113.

¹¹ See, for example, J. VERCOUTTER, *Nouvelles fouilles de Saï*, in *Bulletin de la Société française d'égyptologie*, n° 58, juin 1970, p. 28.

¹² G.-A. REISNER, *op. cit.*, part IV, p. 46.

¹³ This limited area of distribution probably explains the small number of anthropomorphic figurines brought to light by G.-A. Reisner.

¹⁴ G.-A. REISNER, *op. cit.*, part IV, p. 46.

¹⁵ C. BONNET, *Rapport préliminaire des campagnes de 1980-1981 et de 1981-1982*, in *Genava*, n.s., t. XXX, p. 34.

¹⁶ *Lexikon der Ägyptologie*, Wiesbaden, 1977, bd 11, col. 906-912 (Grundungsbeigabe).

¹⁷ See, for example, D. DUNHAM, *The second Cataract Forts*, vol. 2, *Uronarti, Shafalk, Mirgissa*, Boston, 1967, pl. XXXVIII, XXXIX, LXIV, XCI; W. B. EMERY, H. S. SMITH, A. MILLARD, *The fortress of Bubem, the archaeological report*, London, 1979, part III, *The finds*, pp. 145-149, pl. 51-54; E.-E. EVANS-PRITCHARD, *Les Nuer, description des modes de vie et des institutions politiques d'un peuple nilote*, Paris, éd. franç. 1968, pp. 57-58; L.L. GIDDY, D.G. JEFFREYS, *Fouilles à Ayn Asil (1979-1980)*, in *Bulletin de l'Institut français d'archéologie orientale (BIFAO)*, t. 80, p. 264, pl. LVIII; L.L. GIDDY, *Balat: Rapport préliminaire des fouilles à Ain Aseel, 1978-79*, dans *BIFAO*, t. 79, p. 37, pl. XVIII. It is interesting to note that on the neighbouring site of Tabo, a large number of animal figurines were brought to light during the excavations of 1967-75.

¹⁸ P.-J. UCKO, *Anthropomorphic figurines of predynastic Egypt and neolithic Crete with comparative material from the prehistoric Near East and mainland Greece*. Royal Anthropological Institute occasional paper n° 24, London 1968.

¹⁹ A. VILA, *Un dépôt de textes d'envoitement au Moyen Empire*, in *Journal des Savants*, janvier-mars 1963, pp. 135-160.

Preliminary anthropological study of the material from Ancient Kerma (Kerma, Sudan)

By Christian SIMON

During the last two seasons (1982-84) several sectors of the necropolis of Kerma have been excavated. We have been able to determine the sex of 80% of the total of 25 subjects.

	Sector	Male	Female	Undetermined adult and non-adult
Excavations 1982-1983	CE 3	2	1	—
	CE 7	2	2	—
	CE 8	2	1	1
Excavations 1983-84	CE 1	1	1	—
	CE 8	—	2	—
	CE 9	2	2	2
	CE 10	2	—	2

Distribution of sex by sector

Because of the small size of each excavated zone, the distribution of sex by sector does not provide any interesting information. However, taken as a whole, the number of individuals of each sex is proportionally very similar, with a slight advantage for the males. The number of non-adults is lower than that found during the seasons of excavation of 1981-82 (Simon, 1982). They form, however, 28% of the population.

Sector	Age Classes				Adults
	1-4	5-9	10-14	15-19	
CE 3	—	—	—	—	3
CE 7	—	—	—	—	4
CE 8	1	—	—	2	1
CE 1	—	—	—	1	1
CE 8	—	—	—	—	2
CE 9	1	1	—	—	4
CE 10	—	1	—	—	3

Distribution by age of the non-adults

The age of death of the adults is spread over various age classes. 57 individuals belonging probably to Ancient Kerma have been exhumed during the excavation seasons from 1978 to 1984. The relative abundance of the material has prompted us to make several more general observations concerning this population, which is still little understood at the anthropological level.

Demography

Sex determination disclosed a slightly larger number of males than females (males, N = 22, 38.6%; females, N = 18, 31.6%), with a masculine to feminine ratio $\left(\frac{N_{\sigma}}{N_{\phi}} \cdot 100\right)$ of 122.

Infant and adolescent mortality accounts for a rather large percentage (36.8%) of deaths in relation to the total age group count, even though certain age classes are not or are only slightly represented.

Age classes					Total
1-4	5-9	10-14	15-19	Adults	
8	3	4	6	36	57

Distribution by age classes (excavations 1978-84)

There are no babies aged less than 1 year, and only a small number of infants between 1 and 5 years. Nevertheless, thanks to the number of infants between 5 and 10 years, the life expectancy at birth (e_0) has been estimated at about 25 years. This age corresponds to that for the Bronze Age in Europe and the Balkan peninsula, and therefore seems plausible, even though it should be remembered that it is only a first estimate, and may need to be revised after future discoveries.

The age at death of the adults was determined by observing the order of synostosis of the cranial sutures, a method employing probability vectors (Masset, 1982). The structures at death of the two sexes are both relatively similar.

Figure 1 shows, however, a slightly higher masculine mortality rate, a phenomenon which is present in historical demography. It should be noted that, on the contrary, a higher feminine mortality rate appears in numerous palaeodemographic studies. This higher rate has previously been interpreted by anthropologists as being the consequence of a large feminine mortality at the time of or after child-birth. One cannot repeat too often that this conclusion is based principally on a methodological error concerning the occurrence of cranial synostosis which is slower in the female than in the male. The method used in this study avoided this error, and consequently shows a feminine mortality rate that is considerably more correct.

All age classes are thus represented in our population, with a high mortality, however, amongst the young. This is not simply an exact reflection of reality; it results from a phenomenon of secular drift in the occurrence of synostosis of the cranial sutures (Masset, 1982; Simon, 1982). The obliteration of the sutures appears earlier nowadays than previously, and the estimation of the age at death of ancient populations is thus proportionally underestimated.

Morphology

Certain morphological characteristics were already observed in 1982. They are confirmed by the new anthropological material found these seasons. We note a great

heterogeneity in the population with, however, predominance of two human types: individuals with rather long skulls and faces, and a somewhat narrow nose; and others with shorter skulls, average faces and large noses.

By means of a preliminary statistical analysis, we have attempted to understand the variability of our population. Using multivariate analysis of principal components¹, with thirty cranial and post-cranial variables, we have calculated the morphological distances between individuals. The initial results of this analysis are presented in the form of a dendrogram (Fig. 2), which shows clearly the heterogeneity observed visually, and which shows also the presence of groups with relatively similar morphology. Three groups appear. That of the lower part of the dendrogram is composed of individuals with skulls of small size and average elongation (dolicho- or mesocranial), and with average size faces and large noses. Robust individuals with elongated skulls of large size (dolichocranial), and narrow faces and noses comprise the central group of the graph, whereas the group of individuals of the upper part is formed of subjects with intermediate cranial dimensions, a skull with average elongation, average or long faces and large noses. This preliminary study confirms our intuitive observations, but with even more diffuse groupings. It is very possible that the heterogeneity of the population is due in part to the composition of the sample, which includes specimens from different chronological periods. However, even within a limited chronological level, there is a large morphological diversity. It is highly probable that this population is composed of individuals coming from diverse geographical locations, even though it is difficult for the moment to say more, given the small sample size, spread over a long chronological period.

We have attempted another study, comparing the qualitative variants of the skulls, so as to place our population in relationship with others of the Nile Valley and Africa.

Our study was conducted in the same way as that of Berry and Berry (1967), attempting to use the same descriptive criteria as these authors, and retaining 28 of the 30 variants that they described.

For this study we have a sample of 34 subjects, combining the two sexes, given the small differences between them. The populations for comparison came from the several series studied by Berry and Berry (1967, 1972), as well as by Berry and Ucko (1967).

9 groups were used, namely:

- 5 Egyptian populations; Badari and Nagada (pre-dynastic), Old Kingdom (first dynasties), Middle Kingdom, Gizeh (late dynastic)

¹ We thank Mr. Roland Menk of the Department of Anthropology for his help in the statistical treatment of the data.

- 2 Sudanese groups; Classic Kerma and Jebel Moya
- 2 groups not from the Nile Valley; Ashanti (Negro- from the Gold Coast) and Lachish (Palestinian from the Iron Age).

The frequency of the presence or absence of the variants was compared. For the 28 frequencies of the 10 populations, we have calculated a mean measure of divergence. This measure was calculated for each pair of populations. The whole set of values was again represented in the form of a dendrogram, assimilating these measures to the distances between populations.

Study of the dendrogram (Fig. 3) shows some interesting elements. We see the Egyptian populations grouped at the top of the graph, and Ancient Kerma in the centre, not very far from the Egyptians. Further away, we find Classic Kerma associated with the Negro Ashanti. Jebel Moya and Lachish appear very different from the other populations.

We note two important features: firstly, the affinity between Ancient Kerma and the Egyptian populations; secondly, the distance separating the two Kerma groups, one being closer to the Egyptians, the other approaching the Negro populations.

Unfortunately, we do not know the composition of the sample of Berry for Classic Kerma. We know that during this period numerous burials involved sacrifices. Perhaps this sample includes a certain number, whose ethnic composition could include a more marked Negro component. This is only a supposition on our part, but the populations of Kerma seem clearly to have an intermediate position between the Egyptians and the Negroes, whilst being relatively closer to the former than to the latter.

This study is only a first approach, and we are actually preparing a biometric study of these same populations. The future results will perhaps shed some new light on the problem.

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Third note on the fauna of Kerma (Sudan)¹

Seasons 1983 and 1984

By Louis CHAIX *

During the last two seasons of excavations, the study of the fauna from Kerma has produced several findings of the greatest interest. The preliminary results of specialized studies (Ryder, to appear; Desse and Chaix, to appear) allow not only a refinement of our knowledge, but also a placing of this research within a larger ecological context. We especially emphasise here several new discoveries, made either in the eastern necropolis, in the city or, finally, during the excavation of the building of the Napatan period.

1. The city

The study of a large number of elements of bones from the ancient city confirms our previous observations (Chaix, 1980; 1982). Thus, there is a very large proportion of domestic animals, principally cattle and caprovines. A few rare remains of dogs and of small equids have also been brought to light.

Finally, a horn core belonging to a gazelle, *Gazella* sp. should also be noted. The general morphology of this object is reminiscent of *G. rufifrons* (Gray), but its dimensions are larger than those of Upper Palaeolithic examples from the south of Egypt (Gautier, 1976). It may be *Gazella dama* (Pall.), whose ancient distribution was more widespread than nowadays (Uerpmann, personal communication).

Among the manufactured objects, we have discovered numerous awls, fabricated from the metapodials of caprovines. They indicate the importance of leather work at Kerma, an importance confirmed by the finding of a large amount of leather clothing and hides in the tombs of the eastern cemetery. We can also note the handle of a mirror made of elephant ivory.

2. The eastern cemetery

Several tombs have been excavated with the aim of understanding possible changes in typology, or in the funerary practices (BONNET, 1984). Two of these are exceptionally interesting. Tomb 81 was that of an infant of 1 to 2 years, richly decorated. At its feet there were two

lambs tied together with a long leather braided head-stall. One of them carried between its horns a disk of ostrich feathers framed by two pendants of stitched beads (cf. BONNET, 1984, pp. 14-17). The disk was held in place on the intercornual area by means of two leather straps attached to the base of the disk and crossing the extremities of the horn-sheaths (Fig. 1). This operation can quite easily be carried out on a living animal if the perforation is only through the horny sheath, and does not touch the papillary layer.

The lamb wearing the disk is a young male of about 3 months. The other animal does not have any particular attributes. It is also a male, aged 2 1/2 months.

No trace of slaughtering could be observed on these animals.

Another tomb (No. 92), very much plundered, also concealed a skeleton – that of a sheep, situated on the west of the pit.

On the rear of the skull of this animal, probably a female and aged between 8 and 9 months, we found the remains of a very degraded disk of feathers. The feathers were separated, and we were able to observe that their rachis² had been pierced, so that they could be assembled using a thread (Fig. 2). The remains of a red leather strap indicates the same method of attachment as that of tomb 81.

It is still too early to interpret such findings. One cannot, however, be prevented from thinking of the rock-drawings of the Sahara, representing sheep with 'spheroids', often carrying lateral pendants (CAMPS, 1980; HUARD, LECLANT and ALLARD, 1980), and also of the god Amon-Rê personified during the New Kingdom by the ram with a disk. We wish simply to point out here that this is the first time that such attributes, which have so often been represented figuratively, have been found attached to the mummy of a real sheep, in a funerary context. To go further in interpretation would be to go beyond the objective domain of archaeozoology.

Other tombs showed particularities that are worth noting: thus, in tomb 85, three sheep were placed at the foot of the deceased. On the animal situated furthest to the north, a young ram of 2 1/2 to 3 years, had been

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scattered grains of polystic barley (*Hordeum vulgare* L.)³. These grains were not carbonised. This observation resembles that made at Sai, where a Kerma tomb also showed a scatter of burnt barleycorns on the sheep (ERROUX, 1980). In the same tomb 85, the southernmost lamb, a male of about 11 months, had black fur, though a blob of frontal white fur between its horns indicates the existence at the time of piebald breeds.

Finally, tomb 89, despite its small size, produced 5 animals: one dog, two goats and two sheep.

The dog, situated to the east of the pit, lay in a position of natural sleep. It was an animal of male sex, aged more than 10 years. Its teeth displayed an advanced state of abrasion. Its withers height, reconstituted following Koudelka (1885) was 52.2 cm. It is thus an animal of average to less-than-average height, whose slender skeleton shows the characteristics of the type 'pariah' (EPSTEIN, 1971; CHAIX and OLIVE, to appear). As mentioned above, two goats were also discovered in this tomb. One of these, probably a female, was aged more than 5 years. It has very slender horn cores and a homonymous torsion characteristic of a long domestication. What is striking is its small stature. This, using the method of Schramm (1967) is 61.6 cm. It is not a case of a dwarf form in the meaning of Epstein (1971, p. 211) or of Bate (1953), but of a stature very inferior to that of the goats actually present in Sudanese Nubia. The analysis of the stomach contents of this animal revealed the presence of a bezoar.

Other studies are possible in the eastern cemetery which will help to complete our knowledge. As already mentioned several times (CHAIX, 1980; 1982), the exceptional state of preservation of the animals brought to light in the necropolis has allowed observations that can rarely be made under other climatic or pedological conditions. Thus, the study of the hair and of the skins promises to provide information of primary importance (RYDER, to appear). We wish to describe here the principal results already obtained.

The samples of leather show that several of them were tanned using a vegetable product (oil). The others could have been treated with alum. The vegetable fibres, frequently found associated with the skins of caprovines, seem always to come from flax (*Linum* sp.). The sheep are of the hair-type group, fleeced-sheep appearing later in Egypt, during the New Kingdom.

Morphometric study of the hair shows that the animals were slaughtered at the end of the summer. This observation raises several problems concerning the interpretation of the burials.

Finally, the colours of the coats indicate essentially black or white individuals.

Several stomach contents of sheep or goats have produced a large number of seeds belonging to trees of the genus *Cassia* (Caesalpinaceae) or *Albizia* (Mimosaceae). The present-day caprovines of the region continue to consume the grains of these trees (taleh) (Fig. 3).

3. The Napatan building

The excavation of this residential building, which appears to have been occupied between 700 and 500 BC (BONNET and Salah Mohamed AHMED, 1984, pp. 35-42) has furnished a certain number of animal remains that are here presented briefly.

The excavation of the different rooms has produced bones essentially attributable to domestic cattle (*Bos taurus* L.) and caprovines (*Capra/Ovis*).

The majority of the cattle bones are those of very young calves. However, the presence of one fragment of the frontal bone of an adult animal should be noted. This shows distinct transversal marks at the level of the spina frontalis of the bone of the same name. It is very probable that these comprise the typical marks of the preparation of a bucranium, the importance of which we have already seen in the civilisation of Kerma (CHAIX, 1982, and to appear).

Most of the bones show classical butchering marks. A caprovine tibia shows several marks notched circularly on the shaft at different levels. Similar scorings have also been observed on the median part of the shaft of a left femur of a he-goat coming from the west quarter of the ancient city of Kerma. We have as yet no definite idea as to the function of these marks.

In several rooms, belonging to different stages of the building (BONNET and Salah Mohamed AHMED, 1984), jars have been brought to light. Sieving of the contents of these containers has produced both numerous carbonised cereal grains of polystic barley (*Hordeum vulgare*) and pips of water melon (*Citrullus* cf. *lanatus*) (determined by W. Schoch). This species has also been found in the foundation deposits of the temple of Semna (1500-1480 BC), at the second cataract (van Zeist, 1983) (Fig. 4).

Besides these vegetable remains, a large number of fish vertebrae have been discovered. A preliminary study of these has been carried out by Dr. J. Desse⁴. We give here his principal observations: 'The bone remains of fish collected from the jars of the Napatan building comprise dissociated elements all belonging to small individuals (fish with a weight always less than one pound). The majority come from skeletons of Cyprinidae, probably of the genus *Barbus* (barbel), as also shown by radiography of the post-thoracic vertebrae and the elements of pharyngeal bones (DESSE G. and J. DESSE, 1983). Amongst the other genera present, which cannot yet be determined precisely, appear fish of the genus *Hydrocyon* and probably small specimens of the genus *Lates* (Nile perch). Characteristic elements of the cranial vaults of Siluridae, elements of great robustness, do not appear in these remains. The other fish are represented as much by elements of the skull as by fragments of the postcephalic skeleton. Therefore, preparation was not of the type 'garum', but probably a real conservation (pickling brine?) of whole small fish'. (DESSE, *in litteris*). In this context, it is interesting to note that the present-day inhabitants of

the region of Kerma still salt and conserve in ceramic jars small fish of the genus *Hydrocyon*; this preparation ('fasikh') allowing a simple storage and easy transport of aliments rich in proteins.

We hope better to demonstrate the role of fish in the alimentation of the ancient population of this region, by

systematic sampling and sieving, completed by modern methods of study of such remains (Desse, 1980).

The results of the palynological analysis actually in progress will allow, we hope, an enlargement of the field of our investigations, and study of the relationship between the livestock and the vegetable environment.

¹ This study was made possible by financial aid from the Swiss National Fund for Scientific Research (Grant No. 1580-0.82), which we gratefully acknowledge here.

² This term indicates the basal part of the axis of the feathers.

³ The intact vegetable remains were determined by Dr W. Schoch of The Federal Institute for Forestry Research at Birmensdorf (ZH). We especially take this opportunity to thank him.

⁴ Dr J. Desse is director of the Laboratory of Osteology of the Centre for Archaeological Research of the CNRS at Valbonne (France). He has kindly studied the fish remains that we have sent to him, and is collaborating as paleoichthyologist in the work of our mission.

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A residential building of the Napatan period

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The plot of land on which we are excavating is situated 680 m to the west of the western Deffufa, and is today more than 1 km from the banks of the Nile. The modern city here spreads out on both sides of the main road leading to Kerma En Nuzl. A sand dune has here been formed extending for some distance along the bank of the river. This was already mentioned by G.-A. Reisner in the first part of his publication concerning Kerma¹. Contrary to K.-R. Lepsius², however, he considered that this mound - then free of any construction - did not conceal any archaeological remains. At that time, the town of Kerma was much less important than now. In the meantime, a group of houses has been built all around the site of our excavations.

Mud-brick structures, among them several foundations of unusual thickness (0.50 to 1 m), are at present visible on the surface within the whole area. Napatan and Christian sherds are found scattered over the ground at places where the surface layers are particularly eroded. Archaeological remains are present over a distance of about 2 km. To the north, G.-A. Reisner had excavated part of a Meroitic cemetery of the 2nd to 4th centuries³. We have been able to ascertain, during this season, that the funerary remains associated with this horizon are ten times greater than was supposed by the American archaeologist. In the last few years, three other rescue interventions have, moreover, provided information about the New Kingdom and Napatan cemeteries as well⁴. Even though it is no longer necessary to demonstrate that occupation continued after the decline of the Kerma civilisation, it still remains unclear how the regions to the south of the 3rd cataract were organised, and what was the role of the town that is being studied. These considerations seemed to us sufficiently cogent to warrant our beginning work on this new site, even at the risk of dispersing our efforts.

The ancient remains within this small area surrounded by houses have been badly damaged by the trampling of domestic animals, and by natural erosion. However, surface clearance immediately revealed broad foundations of mud-brick. We very quickly realised that a quadrangular building had existed at this spot. It is interesting to note that the positions of the modern houses still follow the general layout of the ancient buildings. After first having envisaged the presence of a church, and then of a temple, it finally became clear that the structure was a residential building.

At least three buildings succeeded each other on this site, varying little in plan. By contrast, the entrances and annexes surrounding the principal edifice seem to have been frequently remodelled. The excavation is not yet finished, and the secondary installations - whose walls extend into neighbouring plots - remain to be studied. More ancient levels, identified in the stratigraphy, will be analysed during subsequent phases of research, as well as certain structures of the first stage of the building. The mud-bricks are not all equally well preserved, and excavations in depth have proved difficult. Meticulous clearance has, nevertheless, revealed the exact outlines of the walls. A single deep sounding was made, to the north of the building.

The proprietor of the parcel, Sayed Ali Bakhit, has obtained an equivalent parcel of land elsewhere, thus giving us the possibility of working here as long as necessary. Field work was begun in December, 1982, and has continued for two periods of two months. Urban archaeology, in the Sudan as in other countries, presents certain organisational problems, but the active interest of the population remains as an encouragement for the researcher.

To facilitate our description, a different numbering has been used for each of the three stages of the building. It should be noted that the first stage presented in this report does not correspond to the earliest occupation. The domestic ovens (F) have been classed in the order of their excavation.

The first stage of the building

The principal building has an almost square outline (12.50 m by 13.90 m on the inside). It is probable that it comprised two floors, with perhaps an upper terrace. The north-south orientation was probably linked with the prevailing winds, and with the general direction of the roads bordering the Nile. At the present stage of research, we are unable to localise with any certainty the entrance to the building. By comparison with later buildings, access was probably on the south side of the square. The layout is regular; two walls divide the available space into 3 equal parts (4.25 m by 4.30 m on the inside). Other partitions separated a group of chambers of the same size (I/2, 3, 4, 5), whereas, in the south east corner, the probable presence of a stairway modified the arrangement.

The partitions of the different rooms have not yet all been identified. It is evident, for example, that the room I/1 did not have the dimensions shown on the drawing. The foundations found in the middle could indicate that a staircase was built against the northern exterior wall. As for the jars discovered near one of the extremities of the room, they were, probably, originally placed in the middle of a much smaller chamber, comparable with room II/4.

Several vessels still *in situ* indicate the floor level of the lower rooms of the building. This level has been reached in only a few places, and it is possible that additional vessels remain to be discovered. Sifting of their contents revealed numerous barleycorns, fish-bones, and a few animal bones (caprine), sometimes carbonised.

To the north of room I/7, large ceramic fragments were found. One of these, a stand (?) in the form of a truncated pyramid, topped by a spherical object, is adorned with a painted geometrical pattern and an inscription. Among the many beads and amulets found on the floor and in the destruction layers of this building, we may mention an inscribed amulet, as well as a limestone seal found in room I/5.

The kitchens were installed in a room (I/3) at the south-west angle of the building. Three domestic ovens, of small size, were uncovered (F4, 5, 10). Several pottery vessels were still *in situ*, sunk into the floor. Numerous fragments of bread moulds were found in this area. They are round and have a flat bottom and a prominent rim. We also note the presence of several conical moulds, such as are often found in the bakeries of Napatan or Meroitic temples¹.

Installations brought to light to the west of the building probably represent more important kitchens. Several low walls, and a storage jar, are not sufficient evidence on which to base a precise identification. On the other hand, the series of ovens installed at a higher level indicate a long occupation, and allow us to follow the development of the western kitchens during the first and, especially, the second stages of the building.

A circular oven (F9) appears to be older than the others. Its irregular walls were built of brick only. It is possible that a vault partially covered the heating chamber.

Two ¹⁴C samples have provided dates for these two series of ovens. The kitchens of chamber I/3 antedate the western installations by almost a century. Oven 4 is dated between 830 and 400 BC, whilst oven 9 is dated between 755 and 275 BC⁶.

Other annexes were built to the south as well as to the west of the building. They have not yet been excavated.

On the north side stands a more or less circular structure (mean diameter 4.5 m) with very thick brick walls. It seems to have been altered several times. In the centre, the outline of a small round pit was still visible in the hardened mud. Several mud-bricks linked this hole with the wall of the structure. The very fragmentary jars discovered in the interior probably belong to a later

deposit, as does also the small lean-to shelter on the eastern side, in which two ceramic vessels were found.

It is not easy to define the functions of this circular structure. The pottery belongs most probably to an installation designed for the storage of food. The thickness of the walls could perhaps indicate that it was a silo. On other sites, similar structures were used to protect the access to wells. The examples closest to our discovery were found at Kawa, near the 'buildings belonging to the Temple of Taharka' (sites II and III)⁷. On site II, notably, the round structures were aligned along an enclosure wall; the presence of trunks and roots shows that they were originally designed to protect trees. Such structures still exist today, but they are generally smaller. At Kawa, the 'enclosures' were also re-utilised, since Meroitic jars were found sunk into their floors.

These findings provide elements of information for reconstructing the dwelling place of a person occupying a relatively high position. Although we do not yet know the extent of this group of constructions, we know that the principal building was surrounded by a certain number of annexes, indispensable for the carrying out of daily activities. The 'western palace' of Faras⁸ shows an architectural layout rather similar to that at Kerma. Certainly, at Faras, the construction is of a much later date, and its layout better organised. The central building was reserved above all for the official duties of the owner, whereas the annexed buildings were used by the family and servants. Similarly, at Tabo, a large courtyard was bordered, on two sides at least, by elongated chambers. The eroded condition of the site has prevented identification of the plan of the main building. In spite of this, it would seem that there existed on this neighbouring site and almost at the same period a similar style of residential building, a style that probably descended from a New Kingdom model⁹.

The second stage of the building

This new stage of construction was begun on the razed walls of the preceding building, of which only the eastern and western foundations were partially retained. The new building was displaced almost 4 m towards the north. Despite this almost total reconstruction, the general dimensions hardly changed. The creation, on the western side, of an access ramp only very slightly diminished the utilisable surface. The outline remained quadrangular, with sides measuring 13.20 m and 13.55 m on the inside. On the other hand, the internal arrangement was modified by a different orientation of the partition walls. Whereas the preceding building was slightly trapezoidal, the new walls were built at right angles. The link with the walls preserved from the first stage is particularly noticeable at the north-east corner.

The internal organisation of the second building is straightforward, with a separation into 6 rooms. Circu-

lation in and around the building can be deduced from the disposition of the ramp leading up to the principal entrance, the two staircases, and at least six passages at the lower level. The living quarters and reception rooms were on the first floor, while the ground floor was occupied by storerooms and service quarters. The arrangement of the rooms on the first floor is inferred from walls which are preserved only as high as floor level. Thus, rooms II/3-6 served as vestibules, providing access both to the principal rooms and to the staircase II/9 leading to the storerooms. The second staircase (II/2-1), of which two steps still remain in the corner of room II/1, must have been used as a secondary passage for leaving the building by the small door on the north.

Staircase II/9 was modified during the transformation of the building. It is delineated by solid foundations which could indicate that a flight of steps connected the first floor to a higher level, probably a terrace. The reinforcement of the walls of the building during its successive reconstructions supports this idea.

Numerous ceramic vessels were abandoned in the lower rooms. The jars were often placed in the broken base of older vessels, which allowed them to be removed more easily. Some of them had been turned upside down, probably to avoid a rapid degeneration of the food. Sifting of the contents has revealed a large amount of barley-corn, fish-bones, as well as a few remains attributed to birds (Gallinaceae?). Jars with handles, goblets and jugs lay overturned on the floor, or had been placed in small cavities. Amulets, beads, three spear heads of bronze and iron, and several grindstones complete the list of finds.

The kitchens, situated to the west of the building, were installed within a light construction, with narrow walls. Seven ovens, of different sizes and shapes, were still preserved along the length of the residential building. It is very difficult to connect them precisely with one or other of the two stages. Oven 9, however, appears older, and we think, for the moment, that the other ovens (F 1, 2, 3, 6, 7, 8) are contemporary with the second construction. These six bread ovens are of a well-known type. They are formed of a vertical cylinder of pottery. A hole pierced at the bottom of the walls provided a draught when, as a first step, the oven was heated. An external wall of mud-bricks helped to retain the heat¹⁰. The bread moulds were placed directly on the embers. Only fragments of flat, circular moulds, with rims, have been found.

The presence of a much used road has prevented study of the extension of these kitchens to the west; but it is likely that a larger surface was required for preparing food for a large number of people. Finally, we have been able to note that the bread ovens were also used for the cooking of other foods. In their filling were found bones of young calves, goats and fish, indicating a varied alimentation.

A new circular structure on the north side can perhaps be associated with the second stage of construction, since a low wall linked it to the north-east angle of the building.

A circular arrangement of mud-bricks was preserved inside. This is a secondary, later, installation.

The third stage of the building

The work associated with the third stage of construction was carried out principally around the building which, therefore, could have remained in use. The access ramp was displaced towards the south. A new exterior wall was added on three sides of the preceding edifice. Subsequently, the old eastern wall was demolished. The masonry of the interior partitions is almost completely preserved. All the foundations were strengthened with mud-brick or stone. These became so thick that we are forced to envisage a new heightening of the building. The transformation of staircase III/9 is also significant. A stairwell was constructed which allowed access to the upper floor as well as descent to room III/8, in which were found a large number of jars. The stairwell is reminiscent of better preserved examples, notably those of the 'castle' of Karanog¹¹, and those of Meroe¹².

The staircase linking the first floor to room III/1 was retained, as well as the north door leading to the exterior. The layout of the rooms in the centre of the building was hardly changed. At the level of the living quarters, rooms III/3-6 retained their function as vestibules. A large room (III/10) was added on the western side, in direct communication with the ramp of the main entrance. It is likely that this vast room was designed for the reception of visitors.

Jars were still present in the storerooms of the ground floor. As in the previous periods, they contained fish, probably salted and dried, and barley, as well as kitchen waste (sherds, ashes, charcoal and a few bones).

Against the eastern facade, a few remains of foundations indicate secondary rearrangements. These perhaps included a second entry leading to the upper floors, or represented a restoration of the base of the wall. In either case, the remains are insufficient to be interpreted with certainty.

Conclusions

The illustrations of objects presented in this report provide an initial image of the material found in the residential building. The faience amulets, the beads, the spearheads, as well as the pottery, belong to the Napatan period. The architectural development indicates, on the one hand, that the building was in use for a long period and, on the other, that the functions of its owners did not change. It is likely that the earliest building excavated was built at the time of the 25th Dynasty. The four ¹⁴C analyses carried out on the samples taken from ovens 4 and 9 and from rooms II/1-3, after calibration, indicate occupation of the site between 800 and 300 BC. These are extreme maximum and minimum dates, making allowances for the imprecision of ¹⁴C analysis. We can thus

consider a period of occupation between about 600 and 500 BC for the end of the first building and for the second building¹³.

It is therefore established that the city of Kerma remained prosperous after the Egyptian colonisation of the New Kingdom. The size of this economic and religious centre is shown by the temples erected 1 km to the north of the Deffufa, by the vast necropoli, and by the city that we are beginning to understand after excavation of

a part of its residential quarter. Together with Meroe, Napata, Kawa and Tabo, the urban centre of Kerma can thus be considered as one of the large cities to the south of the 3rd Cataract, during the period when the 'Ethiopian' Pharaohs took power in Egypt. The city retained its importance later on, and up to the end of the Meroitic period, since several large pyramids of notables were still to be built in front of the Deffufa that had by then been abandoned for almost two millenia.

¹ G.-A. REISNER, *Excavations at Kerma*, Harvard African Studies, Vol. V, Cambridge (Mass.), Part. 1, p. 21.

² K.-R. LEPSIUS, *Denkmäler aus Aegypten und Aethiopien*, Ergänzungsband V, bearbeitet von Walter Wreszinski, Leipzig, 1913, p. 245.

³ G.-A. REISNER, *op. cit.*, pp. 41-57.

⁴ C. BONNET, *Fouilles archéologiques de Kerma (Soudan), Rapport préliminaire de la campagne 1977-1978; 1978-1979 et 1979-1980*, in *Genava*, n.s., t. XXVI, 1978, pp. 116-126; t. XXVIII, 1980, pp. 58-60.

⁵ H. JACQUET-GORDON, *A Tentative Typology of Egyptian Bread Moulds*, in: *Studien zur altägyptische Keramik*, D.A.I., Mayence, 1981, pp. 11-24.

⁶ Analysis by the Centre de recherches géodynamiques, Thonon-les-Bains (France). Oven 4, analysis n° 500; Oven 9, analysis n° 499.

⁷ M.-F. L. MACADAM, *The temples of Kawa, II*, London, 1955; L.-P. KIRWAN, *Account of the Excavations*, 1935-6, pp. 216-237, Pl. 19-20.

⁸ F. L. GRIFFITH, *Meroitic Antiquities at Faras and other sites*, in

Annals of Archaeology and Anthropology, Liverpool, 1926, vol. XIII, pp. 21-24, pl. XIII-XXI.

⁹ B. G. TRIGGER, B. J. KEMP, D. O'CONNOR and A. B. LLOYD, *Ancient Egypt, A Social History*, Cambridge University Press, 1983, p. 193, Fig. 3.1.

¹⁰ B. BRUYERE, *Rapport sur les fouilles de Deir el Medineh (1934-1935)*, III^e partie: *Le village, les décharges publiques, la station de repos du col de la vallée des rois*, Cairo, 1939, pp. 72-73.

¹¹ C.-L. WOOLLEY, *Karanog, the town*, University Museum, Philadelphia, 1911, Vol. V, Pl. 21-23.

¹² J. GARSTANG, *Fifth Interim Report on the excavations at Meroe in Ethiopia*, in *Annals of Archaeology and Anthropology*, Liverpool, 1914-1916, vol. VII, pp. 1-8.

¹³ Analysis by the Centre de recherches géodynamiques, Thonon-les-Bains (France), Analyses n°s 497, 498, 499, 500.