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Cover Photo: Elevated view of the entrance of the
Temple of Mut (B 300) at Jebel Barkal, March 2002.

The Prehistory of the Bayuda: New Evidence from the Wadi Muqaddam

D. Q. Fuller and L. Smith

Introduction

The early Holocene of the Northern Sudan was a period when a number of long-lasting cultural traditions began, such as those relating to ceramics and subsistence practices. This period has also been implicated in the beginnings of sub-Saharan food-production, especially relating to the domestication of savannah millets and the spread of pastoralism. It is still unclear if the mid-Holocene dry phase, between the "Mesolithic Wet Phase" and the subsequent "Neolithic Wet Phase" drove people to an increased reliance on grain foods (see, e.g., Clark 1984). More primary evidence is needed to resolve such issues. While data are available from the Shendi reach of the Nile valley, from part of the Atbara valley, and the Wadi Howar, it is still needed from a wider range of geographical areas. In this paper we present some preliminary data from this period deriving from surface survey carried out along the planned line of the 'Shariyat Shemal,' the road through the Bayuda Desert along the Wadi Muqaddam (Fig. 1) (See Mallinson, this volume, and Mallinson, Smith, and Fuller 1998). The available evidence raises interesting questions about the past environment of the wadi, including whether it may have been a river course at that time, and highlights the need for more archaeological work in areas like the Wadi Muqaddam which further broaden our perspective away from the core areas of archaeo-

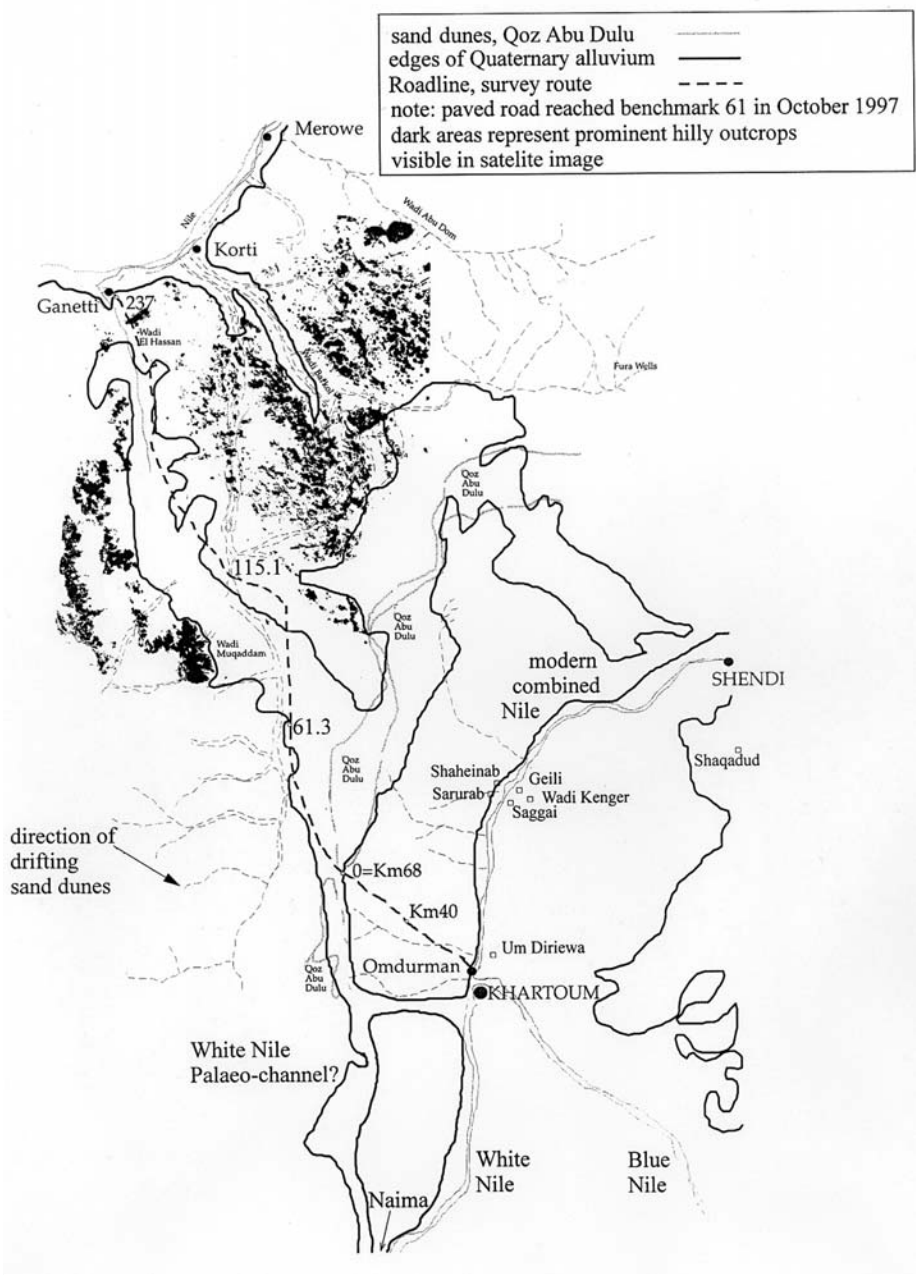


Fig. 1.

logical exploration along the modern Nile valley.

Two Mesolithic sites, 115.1 and site 61.3, produced the most spectacular range of surface material recovered during the season. Site 115.1, a low tell, had unfortunately been largely destroyed before the Survey began. Although a level roadbed had been made through the site, the exposed material included large quantities of pottery, lithics, grindstones, mammal bones and mollusc shell; numerous samples of these different classes of evidence were collected. Site 61.3, at the end of the Tarmac as it stood in October 1997, holds more promise for future work as it appears to be a low, largely intact, tell on a rocky ridge immediately west of the main wadi bed. Sampling was possible here because much later (perhaps Meroitic) tumuli were dug into parts of it. The surfaces of these tumuli and those around them were littered with material brought up by the excavators of the later graves. Here too was found a range of mammal and mollusc remains in addition to artefacts.

Ceramic evidence and Chronology

The largest samples of ceramics from the Survey considered to date to the Mesolithic came from these two sites, 115.1 and 61.3. From the available sample it does not appear that Site 115.1 is a purely Mesolithic assemblage. There is, for example, one decorative motif (Fig. 2a) on certain sherds in the vegetable-tempered fabric which is similar to some varieties of rockerstamp with evenly spaced dots from Geili, dated to the later Neolithic period (Caneva 1988, Fig. 7, no. 5). There are a few examples that may be assigned a generally 'Medieval' date, having a rim cross-section thickened on the interior, with a slightly convex top. These sherds have a series of flattened 'X'-shaped incised motifs on the top of the rim (Fig. 2j). Such a rim form and decoration are known from Medieval period ceramics further north (I. Welsby Sjöström, pers. comm. 1998). However, the sherds providing the clearest evidence of the forms and decorations could be related to the 'Khartoum Mesolithic' and form the majority of ceramics from 115.1.

The Wavy Line and Dotted Wavy Line styles are present at 115.1, although these motifs only occur in relatively small numbers of sherds (Fig. 2b-e). Such a decoration type is similar to that of the Early Khartoum Mesolithic as seen at the Khartoum site itself (Arkell 1949, Pl. 60, 61, 72) and at Shaqadud (Caneva and Marks 1990, Pl. IV, 1, 3, 5). Further characteristic decorative motifs, as exemplified from Site 115.1, are dotted undulating lines composed of closely-spaced comb impressions (Fig. 2f) and several varieties of rockerstamp decoration. A common type of the latter comprises closely-packed zigzags, composed of square or rectangular impressions, forming a reticulated pattern over the vessel surface (Fig. 2g-h). Other decoration types include packed zigzags forming lines meeting at an oblique angle, which is similar to D92 in the classification of ceramics from the Begrawiya-Atbara survey (Smith 1996, 182, Pl. 15, 2).

Several rim sherds were recovered, which could mainly be assigned to various forms of moderately or strongly inturned bowl or jar. Most rim cross-sections are conical and approximately symmetrical on the interior and exterior. In some cases the rims are flattened on the interior, forming a facet at a more, or less, oblique angle to the horizontal (Fig. 2k-n).

The dating of the main portion of the material from 115.1 to the Khartoum Mesolithic (equivalent to the Early-Middle Neolithic in the Eastern Sahara) is based mainly on the presence of the Wavy Line and Dotted Wavy Line motifs and the lack, in the sample taken, of decoration types characteristic of the 'Khartoum'-type Neolithic, such as the 'fish-scale' pattern of Arkell (1953, 73, Pl. 32, 7) in plain-edged rockerstamp, decoration with elements comprising triangles, dots and 'vees' (Arkell 1953, 71-72, Pl. 30, 1, 2, Pl. 32, 1), and overlapping panels composed of semi-circular incised or dotted lines as at El Gharba

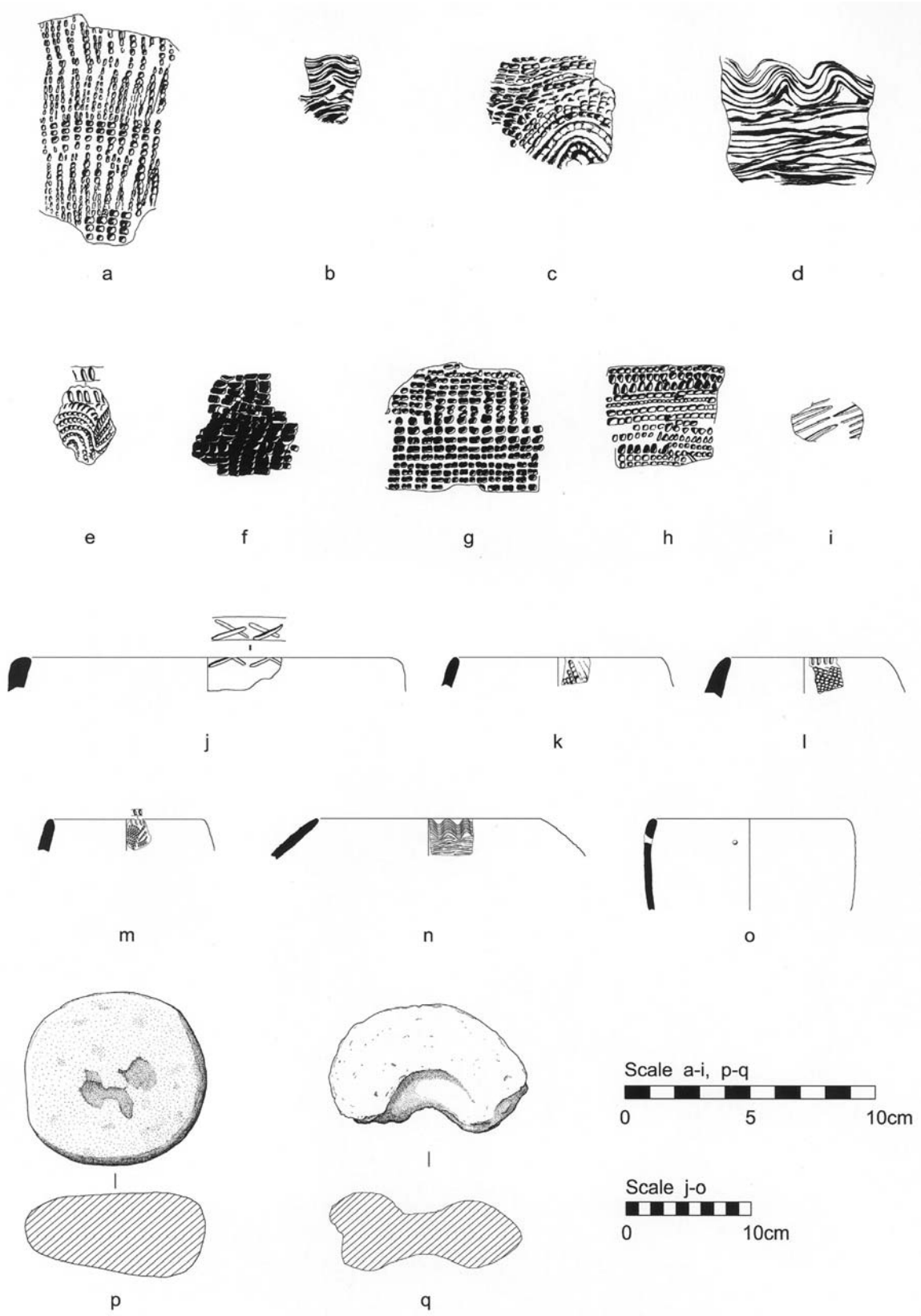


Fig. 2.

(Lecointe 1987, Fig. 6a,b).

This dating seems to be supported by the sequence at Shaqadud, to take for comparison another site outside the main Nile Valley. Here, it can be seen that certain decorations considered characteristic of the Mesolithic do continue into the levels classed as Neolithic, particularly motifs including Dotted Wavy Line, Dotted Zigzags, together with Banded and Mat decoration. The latter two types as defined at Shaqadud (Mohammed-Ali 1991, 69-74) correspond quite well with two of the decoration types composed of closely packed zigzags seen at 115.1 site. However, despite the continuation of these motifs, it can also be seen at Shaqadud that they occur with decorations including 'triangles' and 'vees' and the 'fish-net' (i.e. Arkell's 'fish-scale') motif in those levels considered to be fully Neolithic, whilst these latter types are essentially absent from the completely Mesolithic levels. Although it is clear that there is, at Shaqadud, a gradual transition in terms of decorative types from the Mesolithic to the Neolithic, the sequence at this site indicates that a sample of ceramics lacking these decorations characteristic of the Neolithic is most likely to be Mesolithic, or only very early in the transition towards the Neolithic (cf. Mohammed-Ali 1991, 88-93).

The pottery assigned to the Mesolithic occurs most commonly in three fabric types. Two are similar to those also encountered on the Begrawiya-Atbara Survey, characterised by a dense texture and a very low occurrence of vegetable temper: those designated Fabrics 2.16 and 2.17. The former is further characterised by abundant opaque white inclusions, most likely to be either calcitic or to comprise feldspars. The third fabric type has a much more porous texture, and contains abundant, often very coarse, vegetable temper (Fabric 1.11). In some cases, impressions of the plant fragments are well preserved.

Pottery in a similar fabric to Fabric 1.11 has been recovered from two areas of the southern Dongola Reach. The first is the stretch between Debba and Korti, including the locality of Ganetti, where the '*Shariyat Shemal*' returns to the Nile. The material from this area, exhibiting Wavy Line and dotted Wavy Line motifs together with several varieties of rockerstamp decoration, was designated the 'Early Khartoum Related Group' and dated to the 4th Millennium BC (Marks, Shiner and Hays 1968, 321, 323, Figs. 1 and 5). The second area is that of the Letti Basin, where sites have yielded sherds in a vegetal tempered fabric exhibiting Wavy Line and varieties of closely-spaced and packed zigzag decoration similar to types from 115.1. This material has also been assigned to the Early Khartoum Related Group (Usai 2001).

A link to regions further to the west of the Nile Valley may be indicated by further findings of dotted Wavy Line ceramics in a highly vegetable-tempered fabric during a recent season in the Ennedi Erg, to the north-west of the Wadi Howar (B. Keding, pers. comm. 1998). It is evident that the route of the Wadi Howar could provide a link between these two areas, at least in terms of the distribution of the decorative motifs, although it may not link with the more central Saharan region (cf. Jesse, this volume).

There are discrepancies in the absolute dating of wavy-line/dotted wavy line pottery in the Central Sudan and Eastern Sahara. The occurrence in the Khartoum area has sometimes been dated to the 6th and the first half of the 5th Millennium BC (Caneva 1988, Fig. 4; Marks and Mohammed-Ali 1991, 239). However, radiocarbon dates from sites in the region of the Nile-Atbara junction, including Abu Darbein and Aneibis, calibrate to ages from ca. 7500 BC to 6500 BC (Haaland 1987; 1995; Khabir 1987; Hassan 1988; Close 1995, calibrated using Stuvier and Reimer 1993). Dates from Sarurab and one early date from Saggai are a millennium earlier and are in general agreement with a large number of dates from other Saharan sites with ceramics of this general style (Close 1995). Unfortunately, the large number of dates on bone and shell has introduced problematic data. At present it appears that ceramics may have appeared in the Central Sudan as early as the ninth millennium BC and certainly by the end of the eighth. The Khartoum Mesolithic tradition may have represented a particularly long-lived tradition that persisted until

the 5th Millennium BC when the transition to Neolithic, connected with the adoption of pastoralism, occurred (Haaland 1987; El Mahi 1988; Marks and Mohammed-Ali 1991).

In the Survey area, there appears to be relatively little evidence for the Neolithic of 'Khartoum'-type. A small number of eroded sherds appear to have the remains of rockerstamp decoration (Fig. 2i) similar to some decoration types (decorations D43, D43.1 and D43.2) characteristic of Group 7a in the Begrawiya-Atbara classification, assigned to the Neolithic (Smith 1996 190-191, Pl. 13, 2) but the design on the Bayuda specimens is not clear enough to be certain of this. Only one site, 74.2, had evidence in the form of quite large rim sherds (Fig. 2o), which are from moderately inturned bowls or jars, having a somewhat 'club-shaped' cross-section. These are comparable in cross-section to Type D from Shaheinab (Arkell 1953, Pl. 36) and to the cross-sections of examples of bowls from the Neolithic of Geili (Caneva 1988, Fig. 4, 9).

Other Artefacts

Regarding other artefact types, the sites 115.1 and 61.3 yielded two of the main collections of grinding stones. The raw material of which these are made has been provisionally identified as grey sandstone. The most common forms include moderate-sized rubbers oval in plan and both rounded and flat in cross-section, together with smaller approximately disk-shaped types (see Figs. 2p, 3). Whilst grinding stones are likely to have retained similar forms over long periods of time, the dating of these sites is supported, to some extent, by the presence of similar forms of grinding stone at the Khartoum Hospital site. Disk grinders on sandstone of similar, approximately circular, shape in plan with an irregular oval shape in cross-section and of similar size to examples from 115.1 have been illustrated by Arkell (1949, Pl. 32, 1 and 4). One of the larger grinding stone types at 115.1 (Fig. 3, left) is generally similar to examples of roughly oval grinders with a nearly rectangular cross-section from Khartoum. The second example from 115.1 (Fig. 3, right), having a smooth rather convex face, is similar to types with strongly convex faces, although several of those illustrated appear to be more noticeably 'keeled' than the Survey specimen (Arkell 1949, Pl. 32, 7; Pl. 29, 4; Pl. 31, 1, 4, 5, 7, 8).

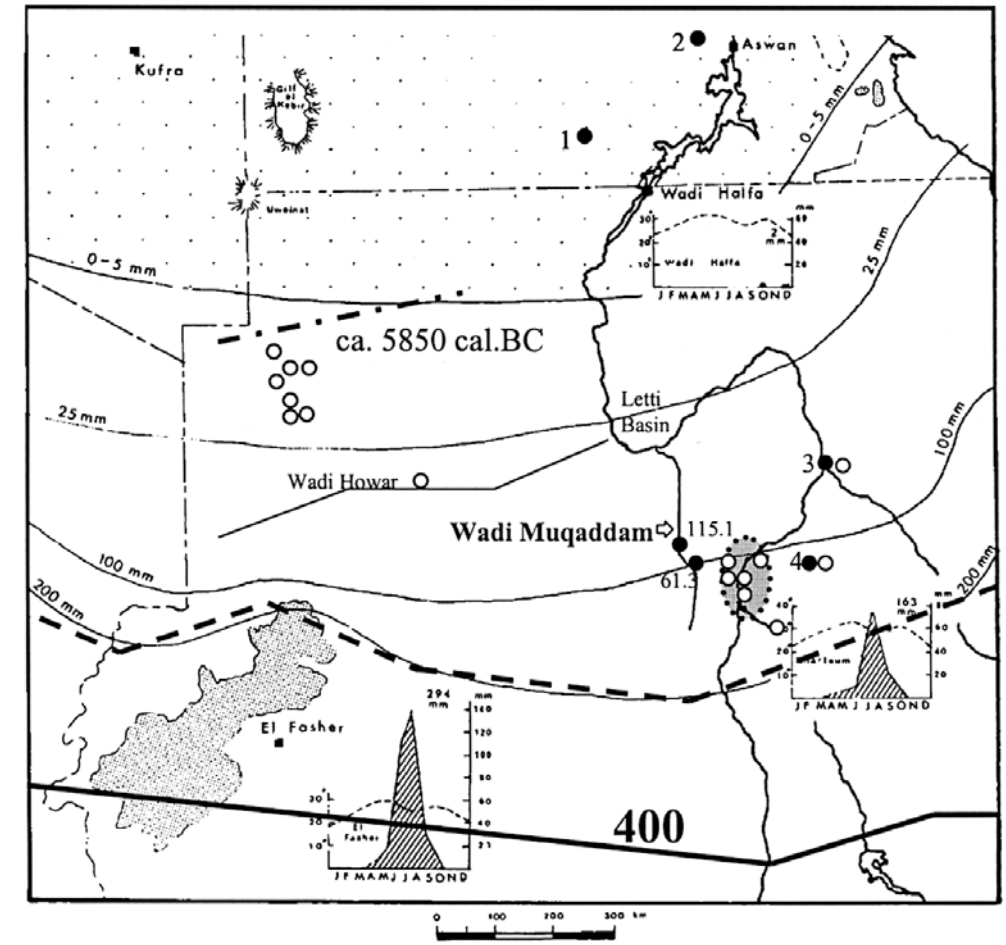
Fig. 3.

Site 61.3 also yielded some examples of stone disks with roughly hemispherical impressions in the centre of each face (Fig. 2q). These are similar to artefacts from the site in the Wadi Kenger, studied by Caneva, who identified them as unfinished stone rings. These provide additional confirmatory evidence for a Mesolithic date since the stone rings are one of the artefacts considered to occur usually in a Mesolithic context (Caneva and Gautier 1994, 76, Fig. 9). Rings at a similar stage of manufacture, with the holes partly bored from each face, were found at the Khartoum Hospital site (Arkell 1949, Pl. 34, 1 and 2, right).

Both sites also yielded collections of chert lithics. These are still under study, but may in general be compared to types found on other Early Khartoum-related sites. Forms include bladelets (trapeze), lunates and various flakes.

Paleoecology and Paleoeconomy

The period of the Khartoum Mesolithic (Eastern Saharan early-middle Neolithic) corresponds with an epoch of higher rainfall throughout the Saharan region. In general, this Early Holocene Wet Phase set in during the second half of the ninth millennium BC (after 9500 bp) with peaks in rainfall at ca. 7000 BC



○ Early Holocene *Limicolaria* snails (requires ca. 400mm rain). Sources: El Mahi 1988; Caneva 1988; Haynes and Mead 1987; Pachur and Kropelin 1987; Lario et al 1997
Approximate modern day northern limit indicated by solid line labeled 400.

— — — Approximate present day northern limit of thorn savannah zone in which wild *Sorghum* and *Pennisetum* occur.

— · — · same limit reconstructed from charcoal (Neumann 1993)

● Archaeological sites mentioned in text. Numbered sites: 1. Nabta Playa. 2. Wadi Kubbaniya. 3. Abu Darbein. 4. Shaqadud

Core concentration of Early Khartoum sites, including Geili, Wadi Kenger, Sarurab, Saggai, Shaheinab, and Um Diriewa.

Fig. 4.

and 6000 BC (Wickens 1982; Hassan 1988; Haynes et al 1989; Muzzolini 1993; Grove 1993). Neuman's (1989, 1993) charcoal studies agree in indicating a northward shift in vegetation belts during the early Holocene and mid-Holocene wet phases requiring an increase of 150 to 200 mm in rainfall. Within this larger wet phase, a couple of relatively short periods of intense aridity have been reconstructed, corresponding to periods of abandonment of sites in more marginal regions such as the Western Desert of Egypt (Hassan 1988; Wendorf and Schild 1994). These shorter dry spells are not yet evident in the Sudan and may not have been so severe in these southern areas.

During wetter periods, flora and fauna shifted northwards (Fig. 4) indicated, for example, by the land snail species *Limicolaria cailliaudi* (syn. *L. flammata*) (Williams et al 1982; Haynes and Mead 1987; Pachur and Kropelin 1987; Peters 1991; Lario et al 1997). These snails were recovered at two localities in the Wadi Muqaddam. Although neither was found with clear cultural associations, this species indicates higher rainfall at sometime in the past. During drier periods sand dunes formed and moved across the landscape (Warren 1970). It is during such a dry period that the sand dunes known as Qoz Abu Dulu, just east of the source of the Wadi Muqaddam, must have formed. The dating of this particular set of dunes is of the utmost importance for understanding the prehistory of the Wadi Muqaddam and its possible connections with the White Nile.

Bone and shell fragments were widespread on sites 115.1 and 61.3. Larger bone pieces recovered are highly fragmentary and specific identification has not been possible. Further specialist study should allow identification of some fragments. At present, it can be claimed that large and medium-sized mammals contributed to the diet, in addition to smaller food items.

Small bones are inevitably missed in surface hand collections, but two 0.5 litre soil samples from the site 115.1 at points where there were concentrations of fragmented shells were wet sieved through 1 mm mesh and revealed numerous small bone fragments. These include a number of fish bones (Fig. 5). *Tilapia* sp. is represented in our collection by a fragment of a dorsal fin bone (Fig. 6). While these fish lack the auxiliary breathing organs of some floodplain fish, the haemoglobin in their blood has an enhanced affinity for oxygen, allowing for survival in shallow pools (Van Neer 1989; Gautier and Van Neer 1989). Another important fish remain is a fragmentary pectoral spine such as that found in catfish, families Clariadae and Siluridae. Unfortunately no skull fragments which are useful for distinguishing these species were recovered. Distinguishing the family and genus of catfish is important for environmental reconstruction since each has very different requirements and tolerances: *Synodontis* sp. live almost exclusively in the open waters of the

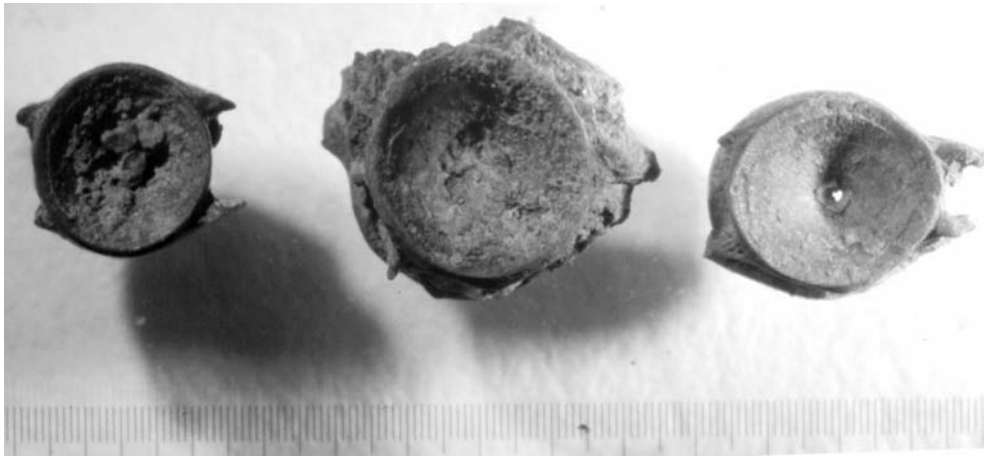


Fig. 5.

Fig. 6.

Nile's main channel while *Clarias* sp. frequents floodplains and has auxiliary breathing organs that allow it to aestivate (hibernate through the dry season) in wet burrows (Van Neer 1989; Gautier and Van Neer 1989). More complete material, collected through excavation, is desirable.

The vast majority of the mollusc remains came from a single species of semi-aquatic snail, *Pila wernei* (Fig. 7). This snail requires at least semi-permanent water; today it is found in lakes, such as Lake Chad, and rivers, especially the White Nile (Gardner 1932; Van Damme 1984; Pachur and Kropelin 1987; Peters 1991; Brown 1994). However, it is also capable of aestivating thanks in part to its thick, cornaceous operculum (Arkell 1945; Peters 1991; Brown 1994). It is likely to have been used as food, a practice for which there is ample ethnographic evidence from the Sudan (Gautier 1986; Peters 1991; Gautier and Van Neer 1997). This interpretation is supported in the case of the Wadi Muqaddam sites by the fact that these snails were not found with other species with which they would be associated in natural communities and thus must have been concentrated through human action. This species was a significant food item for many communities, as indicated by

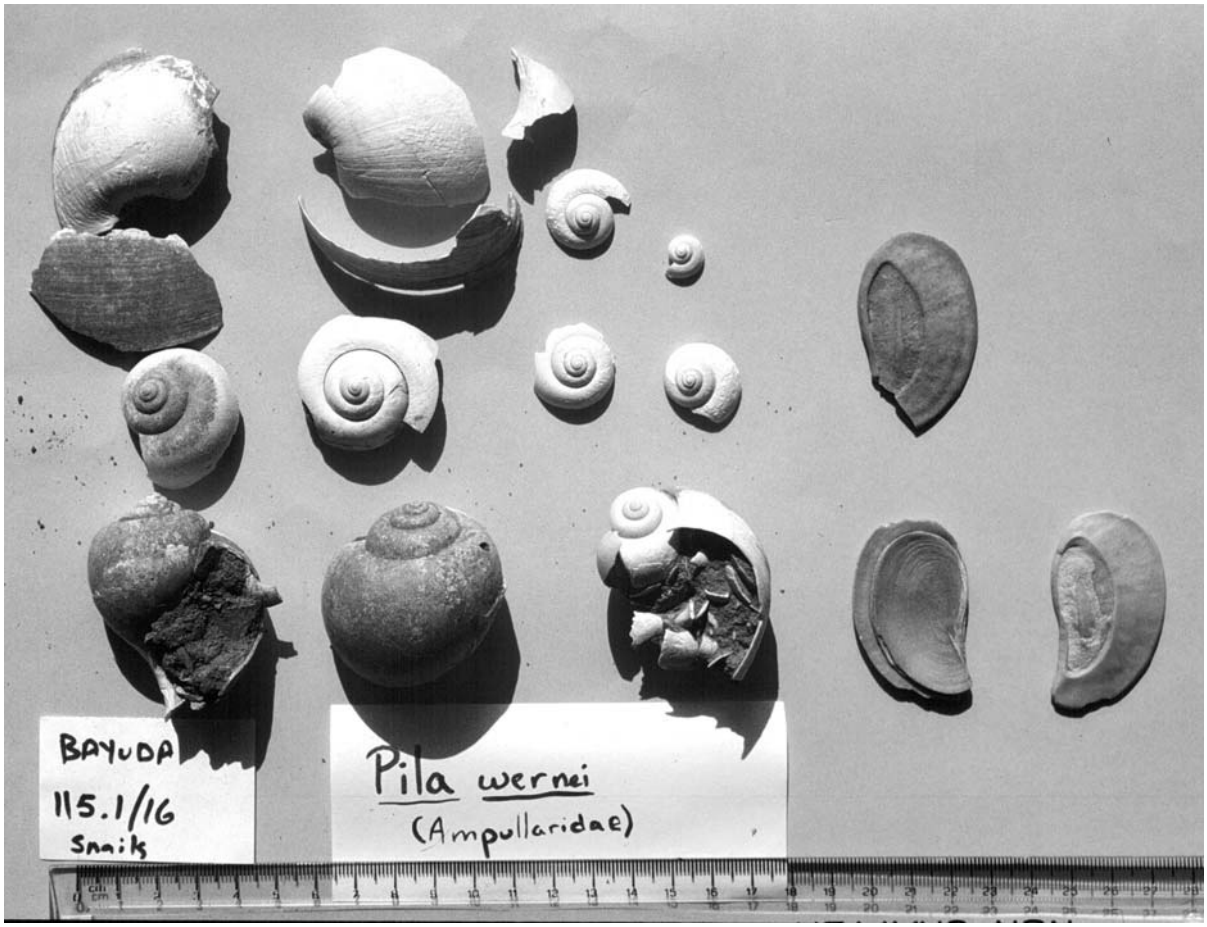


Fig. 7.

its ubiquity on archaeological sites of the Mesolithic and Neolithic Sudan (Clark 1984; Gautier 1986; Peters 1991; 1993; El Mahi 1988; Haaland 1995) and later periods further south (Gautier and Van Neer 1997). In addition, at both Wadi Muqaddam sites a few fragments of large bivalves (probably river mussels, family Unionidae) were found.

The Khartoum Mesolithic may represent a period of subsistence intensification directed at smaller food resources such as fish and molluscs (Haaland 1992: 48). However, as noted by Close (1995) the intensive use of aquatic resources was nothing new, since evidence from Wadi Kubbaniya in Egypt, 16,000 BP, indicates a heavy reliance on fish from the flood-pains of rivers and which often can survive seasonally in shallow or even negligible water bodies (Gautier and Van Neer 1989). These fish could have been captured by harpooning or clubbing, especially when restricted to dry season pools. Similar species are recovered from early Holocene (Khartoum Mesolithic) sites in the central Sudan (Gautier 1986; El Mahi 1988; Van Neer 1989; Haaland 1992; 1995). During this later period there is evidence for the use of nets from grooved stones interpreted as net weights (Arkell 1949), as well as perforated ceramic and stone disks that might also be net sinkers (although other interpretations are possible). In addition barbed bone points for harpoons are prominent in this phase. These data suggest fishing in shallow to medium waters, perhaps from rafts (cf. Haaland 1992; 1995; Close 1995: 30), but deeper water fishing is probably a subsequent development, as fishhooks are present only in the Shaheinab Neolithic (Arkell 1953). Specimens of probable unfinished stone rings (Fig. 2q) may indicate the use of nets in the Wadi Muqaddam, while no bone points were found. Fish, however, were not universally utilized by the early Khartoum peoples, as they are absent from Shaqadud, a site that occurs away from the river valley, but where *Pila* snails were still consumed (Peters 1991). The presence of fish at the Wadi Muqaddam sites therefore seems to indicate a wetter, perhaps river-like environment.

Another small and intensively exploited food resource appears to have been wild grass seeds. Fabric 1.11 which was abundant on both Mesolithic sites contained a high proportion of vegetable temper. A preliminary investigation of plant impressions was undertaken on a sample of 30 sherds from site 115.1 which initial examination suggested had fairly well-preserved surface impressions. The vast majority of the impressions are of grass blades and culms, which cannot be identified more specifically. However, a few examples of spikelets or parts thereof are also preserved. Although the available reference material was inadequate for specific identification, some taxa, notably those related to major domesticated crops, can be ruled out. All examples fit well within the Paniceae and Eragrostidae grass tribes, but several of the major genera that one might expect to have been utilized, including *Setaria, Panicum, Sorghum* and *Pennisetum*, are absent. Instead, preserved impressions show a greater similarity to *Digitaria, Brachiaria, Urochloa* and perhaps *Echinochloa* and *Paspalum*. This evidence suggests the harvesting and consumption of a range of wild grains, as has been suggested for the Khartoum Mesolithic in the past (e.g. Clark 1984). The importance of wild grass harvests in the prehistoric Sahara and sub-Saharan savannahs has been discussed on the basis of historical and ethnographic evidence for the continuing use and sustainability of wild grain resources (Harlan 1989; 1995; Borlaug et al 1996).

Although much attention has been focused in the past on the potential role of these cultures in the utilization of *Sorghum* which lead to its domestication (e.g. Magid 1989; Haaland 1992; 1995; 1999), there is actually relatively little evidence for such a specialization during this period. Those assemblages which have been studied from Khartoum Mesolithic and indeed the later Neolithic sites (with the presence of domestic animals as well as developments in ceramics) show a diverse range of grass species exploited, including *Setaria* spp. and other Paniceae grasses including possible wild *Pennisetum* (Magid 1989: 147; Stemler 1990; Haaland 1995). Only at the site of Um Diriewa, a Khartoum Neolithic site, have a few wild and possibly domesticated *Sorghum* been identified in the central Sudan (Stemler 1990). Further west at

early Southwest Libyan sites of Tardart Acacus, a similar range of wild grass grains were utilized but without evidence for *Sorghum* or *Pennisetum* (Wasylikowa 1993; Castelletti et al. 1998).

Similarly, at the East Saharan Neolithic sites of Nabta Playa a range of grass taxa were recovered, including *Echinochloa, Digitaria, Urochloa/Brachiaria, Panicum, Setaria* and *Sorghum* (Wasylikowa 1997; Wasylikowa et al. 2001). Although *Sorghum* was the most ubiquitous, the evidence clearly suggests the gathering of a broad spectrum of wild grains, within which a growing emphasis on *Sorghum* may have developed. Whether this emphasis at Nabta Playa led to actual domestication is unclear as early evidence for domesticated *Sorghum* is still lacking in the Middle Nile region or the central Sudan (Rowley-Conwy et al 1997). The earliest finds of domesticated *Sorghum* remain those from India where it was apparently introduced by ca. 2000 BC, as evidenced by a number of clear identifications from secure contexts (Fuller 2001). While the eastern Sudanic savannah/Sahel region may be the appropriate place to seek *Sorghum* domestication (Harlan 1995), the necessary evidence is still lacking. *Pennisetum*, on the other hand, is now thought to have originated in the far west of Africa (Mauritania), on the basis of genetic studies of the crop and its wild relatives (Tostain 1994; 1998). Thus the Early Khartoum Related cultures can no longer be seen as early sorghum cultivators on the basis of present evidence. The available material, including that recovered from the surface of Wadi Muqaddam, underscores the likelihood of a widespread and long-lasting tradition of utilizing a range of edible wild grains.

On the basis of the current evidence we can begin to reconstruct aspects of the environment and raise questions for future research. The grasses present, although not specifically identified, suggest semi-arid savannah grasslands, sustained by higher rainfall levels. The snails, river mussels and fish indicate water, at least for much of the year. If fish species other than the resilient *Tilapia spp, Clarias* spp. and *Protopterus* are identified, then substantial year round water bodies would be indicated. But the question remains as to whether the Wadi was permanently flowing as a river or whether it was perhaps seasonal, drying back to a series of pools during the dry season. In the latter case the Wadi would be expected to have had an environment similar to that reconstructed for the Wadi Howar for the early Holocene (cf. Pachur and Kropelin 1987). One difficulty with this comparison, however, is that the Wadi Muqaddam does not have its source in a large upland area, as the Wadi Howar does in the Jebel Marra massif; the Wadi Muqaddam represented a rather smaller watershed. An alternative hypothesis is to envisage a more significant difference in the past: the Wadi Muqaddam as a former course of the White Nile.

Hypothesis of a Muqaddam-Nile Reach

Since geomorphological work has not been carried out in the Wadi Muqaddam, the hypothesis that the Wadi may have once been the actual channel of the White Nile deserves to be developed as a focus for future research. As the most recent geological map of the Central Sudan indicates, the Wadi follows a strip of alluvial sediment which cuts through the Nubian sandstone formation, connecting the alluvial valley of the White Nile south of Khartoum and the main Nile near modern Ganetti/Gabolab (indicated in Fig. 1). This raises the strong possibility that sometime in the past water flowed through this passage, but no secure dating is available as to when, whether during the earlier Holocene or the much earlier Pleistocene.

Today the Wadi's southern stretch is separated from the While Nile by the Qoz Abu Dulu sand dunes. Most of the road under construction follows this alluvial deposit because it provides a ready source of gravels, which can be used as road metal. These gravels, themselves alluvially transported, indicate much higher energy flow regimes, perhaps of a river, sometime in the past. The alluvial clays of the White Nile Valley thought to be of Holocene age extend west from the valley in the area of modern Naima, south of Khartoum (cf. Williams et al 1982: 124, Fig. 7.7). While there are alluvial deposits in the hollows between dunes of

the Qoz Abu Dulu sands, indicating high flood levels after the dunes were in place (Adamson et al 1982) it is plausible that these are from the Neolithic Wet Phase with Early Holocene (Mesolithic) alluvium beneath these dunes.

The higher water levels of the Blue Nile at this time in the past are accompanied by evidence that the current White Nile must have cut through old bank terraces of the Blue Nile in order to join it at Khartoum. This implies that these rivers did not merge near modern Khartoum and indeed it has frequently been hypothesized that the White Nile formed a lake at this time (Whiteman 1971: 112 ff.; Wickens 1982; Adamson et al 1982; Williams et al 1982). Is it possible that this lake gave rise to a more northerly river reach through what is today Wadi Muqaddam? Two observations may argue against this hypothesis. First, we observed green silts below the modern surface in some of the road diggings which might indicate pooling or stagnation water in some parts of the wadi; the dating of these is, however, completely uncertain but their nearness to the surface above the gravels suggests that they are relatively recent. The single find site of Lower Paleolithic implements was associated with the gravels, although given that it was a surface collection it is unclear whether the gravels actually date to the Middle Pleistocene. The hypothesis of a White Nile-Muqaddam reach is plausible, although whether Pleistocene or Holocene is unclear, and clearly indicates the need for geomorphological studies in the Wadi.

Conclusion

The Wadi Muqaddam includes evidence from Early Holocene, ceramic-producing cultures and promises to provide new evidence for understanding these pre-agricultural societies. These cultures are of particular interest as they constitute the cultural traditions from which sedentary and agricultural societies developed in northern Africa, including ceramic production, fishing and grass harvesting. Artefactual evidence from sites 115.1 and 61.3 assessed to date, comprising ceramics and ground stone implements, provides a general dating for the associated paleoenvironmental evidence within the period of the 'Khartoum Mesolithic', perhaps to be dated to the ninth/eighth millennium BC. Apparent stylistic similarities, most striking in the ceramics, further indicate links between the region of these sites in or near the Wadi Muqaddam and areas to the north and south within the Nile Valley itself and, potentially, much further west into Saharan regions like the Wadi Howar.

The material presented in this paper provides a basis for future work. First, absolute dating of materials from the sites is crucial. The material culture and environmental evidence need to be related chronologically to the other occurrences of Early Khartoum/Early Khartoum Related Group sites, in order to assess the synchronicity or diachronicity of these cultural phenomena. Secondly, more detailed comparisons need to be made between the Wadi Muqaddam material and that from the other areas, including an assessment of the similarities and differences between the other Nile Valley material and that from the eastern Sahara. Additional, dated, evidence will enable the testing of the hypothesis that the Wadi could have formed a 'Muqaddam-Nile Reach' and so could have provided a link between the region around Khartoum and the Dongola Reach (cf. Usai, this volume).

The Wadi Muqaddam provides an additional set of evidence that indicates that ceramics in the Saharan region developed outside a context of agriculture, sometime early in the Holocene. This raises fascinating issues relating the causes and consequences of the production of early ceramics. As discussed by Close (1995), the earliest use of the ceramics in the eastern Sahara may not have been strictly functional, in an adaptive sense. Instead, the highly decorated wavy-line and rockerstamp-decorated wares may have developed for reasons of social display, perhaps in the context of giving gifts of food or drink associated with historical feasting in many parts of Africa. Indeed, Hayden (1990; 1995) has suggested that it was such social events

and competition for status that lead the development of ceramics in many parts of the world as well as agriculture. The role of foodstuffs, beer, and decorated ceramics in forging social relationships and maintaining hierarchy has been discussed in the context of later eras of Middle Nile archaeology by Edwards (1996). Haaland (1995), on the other hand, has proposed that ceramics were developed within a female sphere of labour in which they played an important role in allowing new food preparation methods, especially of fish and later grain, and that this facilitated the earlier weaning of infants. Whatever the case may have been, it is clear that more archaeological and paleoecological evidence is needed, especially from dated, excavated contexts, in order to understand the social, technological and ecological factors that contributed to the development of ceramics, grain use, and subsequent sedentism and cultivation in the northern savannah and Middle Nile region.

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The Significance of the Palm Leaf in Meroitic Religious Scenes

Ali Ahmed Gasmelseed

Since the time of predynastic Egypt evidence has revealed that the palm leaf was connected with funerary customs. It was put inside the grave in order to secure for the deceased a permanent youthful life.[1] This custom was not confined to ancient Egypt. This practice found its way to neighbouring Nubia,[2] which was always influenced by what was going on in the north as well as being itself another homeland for the palm tree. We do not know exactly when this tradition started to appear in Nubian tombs, but in Egypt there is evidence that it existed from predynastic times to the dynastic age. Two limestone door lintels dating to the Middle Kingdom were found reused in a foundation of a late temple. Both of them bear representations of a king celebrating the *heb-sed* and receiving the palm leaf from two deities (Egyptian Museum No. 956496). These two blocks must have come originally from a temple. It is very rare to notice the presence of the palm leaf in Egyptian funerary scenes.

Deities attending the dead king are usually shown holding the *wꜣs* sign in one hand and the *ꜥnḫ* sign in the other.

When the Napatan kings conquered Egypt in the 8th century BC and began to adopt Egyptian burial customs, the scenes on the walls of their burial chambers at El Kurru,[3] and the chapels and walls of the burial chambers of Nuri did not include any representation of the palm leaf - at least as far as we can know from the surviving remains. At El Kurru the tomb chambers of King Tanwetamani (Ku. 16) and his mother Queen Qalhata (Ku. 5) bear the best preserved funerary scenes of all the Napatan-Meroitic tombs.[4] In the burial chamber of Ku. 16 the group of deities depicted on the south and north walls are almost a copy of those painted on the walls of the tombs of Psousennes, Sheshonq III and Mutirdis.[5] In all these scenes none of the deities was shown holding a palm leaf.

The earliest Meroitic scene to show the palm leaf as an element in its decoration dates only from the time of King Arnekhamani (322 - 315 B. C.). In his Lion Temple at Musawwarat es-Sufra, the exterior South wall of which bears the best preserved Meroitic religious scene, King Arnekhamani is shown standing facing many gods. Behind him stands Isis holding a palm leaf in her left hand. One side of the palm leaf is completely plucked away. The leaflets of the other side are partially cut off. From the top of it hangs the *ꜥnḫ*-sign. The exterior north wall also shows King Arnekhamani facing a group of gods amongst whom the god Satis stands holding a palm leaf.[6]

At Begrawiyeh, tomb Beg. N. 8, attributed to an unknown king (ca. 203 - 186 BC),[7] is perhaps the earliest Meroitic tomb to show a clear representation of the palm leaf. In its chapel the south wall bears a scene showing a group of people (more than eleven). Each of them holds in their left hand a palm leaf, the leaflets of which are entirely plucked away with the exception of the two uppermost. The same people raise their right hands in adoration of the seated king.

Immediately succeeding this king was Queen Shanakdakhete (ca. 186 - 177 BC). The chapel of her

[1] I. Wallent, *Die Palmen im Alten Ägypten*, p. 101.

[2] Herbert Tomandl, *Anthropos* 81, p. 289.

[3] All the funerary chapels at El Kurru had been entirely removed together with the stones of the pyramids by the local inhabitants.

[4] D. Dunham, *RCK* l, pls. XX, X.; cf. A.A. Gasm el-Seed, "La Tombe de Tanoutamon à El Kurru, (Ku. 16)," *Revue d'Egyptologie* 36 (1985), pp 67-72.

[5] P. Montet, *Les constructions et le tombeau de Psousennès à Tanis*, pl. XC 11; idem., *Les consructions èt le tombeau de Chèchanq 111 a Tanis*, pl. XXX; J. Assmann, *Das Grab der Mutirdis*, p. 91.

[6] Fr. Hintze, *Die Inschriften des Lowentempels*, pl. 11.

[7] D. Dunham, *RCK* IV, p 6; S. E. Chapman; *RCK* III, pl. 5 D.