

Neolithic Settlement Patterns and Cultural Sequence of Nubia (Northern Sudan)

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Riassunto

In questo articolo si esaminano i cambiamenti nei modelli di insediamento caratteristici delle società neolitiche in Nubia dal VI al tardo IV millennio a.C. Le informazioni disponibili sulla distribuzione dei siti neolitici vengono utilizzate per presentare la struttura degli insediamenti. Si discute anche in breve della cronologia e degli aspetti sociali del Neolitico nella regione. Si conclude che il VI millennio è stato testimone di grandi cambiamenti. All'inizio del VI millennio in tutto il territorio della Nubia meridionale la dimensione variava da ca. 20 a 4.200 mq, e molti di questi piccoli siti erano scomparsi nel 3000 a.C. Il secondo cambiamento nei modelli di insediamento ebbe luogo alla fine del VI millennio. Con il 5000 a.C., il numero di siti nella regione di Dongola in Alta Nubia rifletteva un'occupazione intensiva in tutta l'area.

Summary

This paper investigates the changes in settlement patterns characteristic of Neolithic societies in Nubia from the 6th to the late 4th millennium BC. The available information on the distribution of the Neolithic sites from this region is used to present the structure of settlement. The paper also discusses in brief the chronology and the social aspects of the Neolithic in the region. The paper concludes that the 6th millennium witnessed major changes in settlement patterns. Early 6th millennium sites throughout Lower Nubia ranged from ca. 20 to 4,200 sq. m in size, and many of these small sites ended by 3000 B.C. The second change in settlement patterns happened at the end of the 6th millennium. By 5000 B.C., the number of sites in Dongola region in Upper Nubia reflects a quite intensive occupation throughout the area.

Résumé

L'auteur examine les changements des modèles du peuplement caractéristiques des sociétés néolithiques dans la Nubie, du VI^e millénaire jusqu'à la fin du IV^e millénaire av. J.-C. La structure du peuplement est présentée à partir de l'information disponible sur la distribution des sites néolithiques dans la région. On discute aussi brièvement de la chronologie et des aspects sociaux du Néolithique dans la région. Pour conclure, on observe que le VI^e millénaire a été témoin d'importants changements des modèles du peuplement. Au début du VI^e millénaire, dans la Basse Nubie les sites avaient des dimensions de ca. 20 à 4200 m², et beaucoup de ces petits sites n'existaient plus à l'an 3000 av. J.-C. Le deuxième changement des modèles du peuplement eut lieu à la fin du VI^e millénaire. Avant 5000 av. J.-C., le nombre des sites dans toute la région de Dongola reflète une occupation humaine intensive.

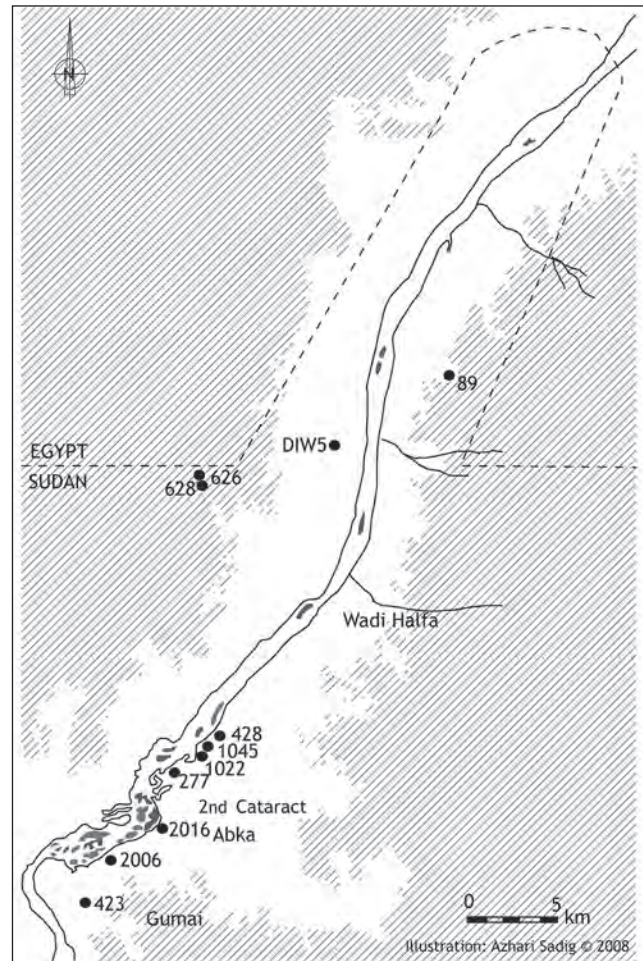
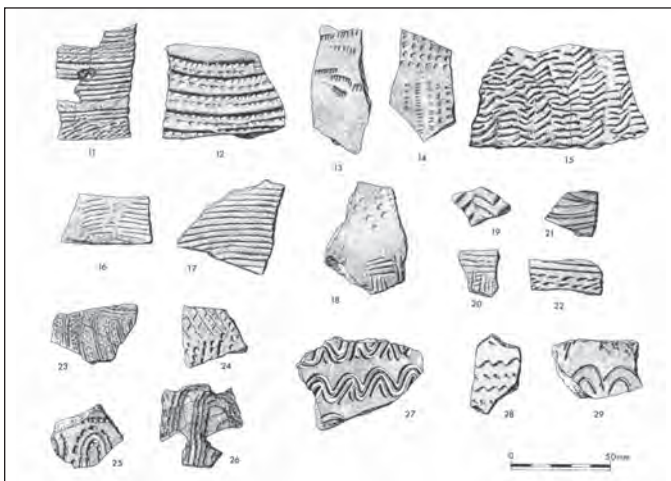
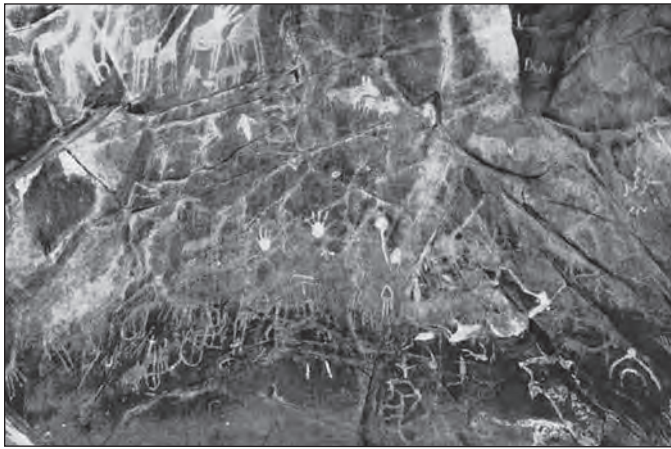
Introduction

The Neolithic period started in Nubia at a time when the climate, in what now is the Sahara, was still warm and humid, although it was becoming more and more arid. The Scandinavian Joint Expedition published two volumes containing rock drawings in Nubia (Säve-Söderbergh, 1970). The rock drawings from many periods present the depiction of a wide range of wild and domestic animals (Fig. 1), including cattle, goats, dogs, elephants, hippopotami, warthog, rhinoceros, asses, giraffe, antelope, feline, hyenas and others. For example, the giraffe is known for its woodland savanna habitat and lives in areas which receive minimum annual rainfall of 300 mm (Tigani el-Mahi, 1982). Comparing them with the animals identified from Central Sudan we may infer that wetter conditions prevailed there during the prehistoric times of Nubia. However, we cannot relate these rock drawings to any known period. Unfortunately, there is no scientific method by which such art form can be dated. It should also be considered that some figures depicted on the rocks were imaginary and had no relation with the environment.

Characteristics of Neolithic occupations

a. Khartoum Variant. The Khartoum Variant industry is primarily represented by eight sites investigated by the Combined Prehistoric Expedition (sites DIW5, 626, 628, 1045, 2006, 2016, 1022, 277), five of

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which are located in Abka, one on the west bank, north of Argin, and two in the desert about 1 km north-west of Wadi Halfa (Shiner, 1968b) (site 1045 is indicated by Nordström as site 428). Four more sites (428, 423, 18A, 89) were recorded by Nordström (1972) (Fig. 2). Later research has extended the known distribution area for Khartoum Variant from its original core around the Second Cataract north into Egypt, west into the Sahara, and upstream, as far south as el-Barga (Honegger, 2004; Usai, 2004, 2005; Riemer & Jesse, 2006).

For the Khartoum Variant, with the exception of Shiner's sites 626 and 628, Nile pebbles (chert and agate) were the source of the great majority of the finished artifacts. Quartz accounts for the majority of the debitage only in desert sites. The Khartoum Variant is also basically a microlithic industry. Its microlithic index ranges between 52% and 92%, with most of the assemblages having an index over 70%. The diagnostic tools are the concave and "exotic" scrapers. Other artifacts include denticulates, lunates, borers, groovers, and micropoinçons. Fragments of grinding artifacts are present on almost all sites. Nordström (1972) placed the fabrics of this group into two groups: IA and IB. The IA is characterized by abundant grains of crushed quartz and feldspar, while the fabric IB is mainly micaceous. The colour is generally light brown or pale red. The wares are characterized by 5-10 mm thick walls; but the textures are generally grainy or gritty, and occasionally coarse. Impressed dotted lines, dotted straight lines, zigzag lines, or a combination of these characterizes the decoration (Fig. 3). The technique employed for making the designs was probably rocker stamp and cord impressions (Shiner, 1968b).

The Khartoum Variant sites are not confined to the region of the Second Cataract, but have a wider distribution in Nubia (as far as Sai). The sites DIW5, 626, 628 lie north and northwest of the Second Cataract. No Khartoum Variant site was found in Batn el-Hagar. Five of the 12 sites are located outside the region of the Second Cataract, in a zone of Nubian sandstone and alluvial plains, and seven are among Precambrian, where there is no actual flood plain.

Fig. 1. Rock drawings from the Abkan Site (IX) (source: Myers, 1958).

Fig. 2. Distribution of Khartoum Variant sites in Lower Nubia (adopted from Shiner, 1968a, 1968b; Nordström, 1972).

Fig. 3. Khartoum Variant decorated sherds (source: Nordström, 1972).

Site	Horizontal extension	Topographical location	Distance from the Nile	Depth of the occupation
1045	c. 150 sq. m	On gentle slope towards the Nile	125 m, and 100 m south of the mouth of Khor Musa	Unspecified
2006	c. 25 m in diameter	On flat top of Precambrian hill	100 m	Surface
277	c. 20 m in diameter	On a sandy slope	50 m	Surface
2016	Small site	On a slope	Unspecified	Unspecified
1022	Small area of occupation	Unspecified	500 m west of Khor Musa	Unspecified
626	.25 m in diameter	On small alluvial fan at southern edge of large jebel	1800 m	Unspecified
DIW5	c. 400 sq. m	On flat hilltop	1200 m	Unspecified
18A	c. 15/5 sq. m	On gentle eroded slope	180 m	0.2 m
89	c. 1000 sq. m	On sandy ridge between two branches of Wadi Ashkeit	4000 m	0.5 m
428	c. 900 sq. m	On northern side of small valley	300 m	0.2 m
423	c. 2500 sq. m	On south eastern slope rocky hill	320 m	Unspecified

Table 1. Aspects of Settlement Patterns among the Khartoum Variant Sites. (Adopted from Shiner, 1968a, 1968b; Nordström, 1972)

All of the known Khartoum Variant sites are small impermanent camps. The most southern Khartoum Variant site was discovered in Sai Island. Khartoum Variant pottery sherds and lithics were identified among small depressions, in an area which was then rightly interpreted as a former river channel bank (Geus, 2000:126). A fragment of plastered mud floor was found at one place (CPE 2016) (Shiner, 1968b: 777), and rude hearth at another (Shiner, 1968b: 789), but there is nothing to suggest that permanent structures had been built. Although the sizes of these sites are relatively small (some of them are described as “small sites” [Shiner, 1968b: 777]), this floor, the deep deposit on site CPE 2016, and high surface artifact densities at all of the Khartoum Variant sites, even those located 15 km from the Nile, suggest fairly stable, long-term occupations by a relatively sedentary population.

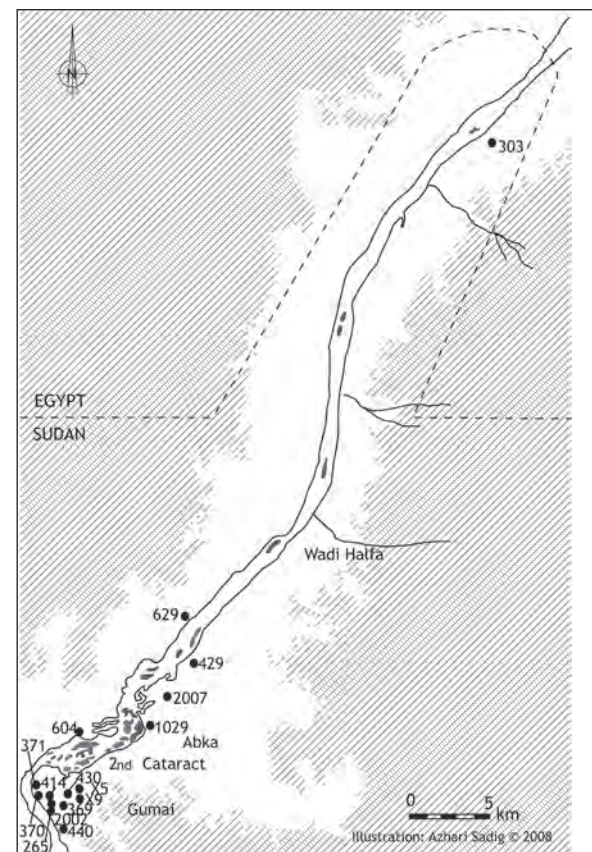
b. Abka. Myers found both Mesolithic and Neolithic occupation south and southwest of Abka. The sites were associated with former side-channels of the Nile that are dry today due to the lowering of the Nile level. The Mesolithic people, with radiocarbon dates at about 7350 and 6300 BC, subsisted mainly by fishing and gathering shellfish. Another radiocarbon date, about 4000 BC, is associated with a much lower Nile; but the same culture survives, now in a Neolithic stage (Myers, 1958). In his missions, Myers excavated 12 sites. Three of them, particularly representative of the prehistory of the area, seem to have been of special interest to him. In his system of reference, they bear the numbers V, IX and XXXII.

Site (V) and site (IX) were the only to have ceramics. Site (ix), more than the others, was excavated in both campaigns. The excavation was done in six successive layers, up to eight layers according to Nordström (1972: 12). Layers “4”, “5” and “6” and apparently layer “7”, correspond to the Neolithic occupation. Layer “4” was ¹⁴C dated 4500±350 and 4470±300 BP, layer “5” 5960±400 BP and layer “6” 8260±400 BP (Myers, 1960).

The ceramic materials include three distinct types, two of which belong to the prehistoric period. The first was called “Khartoum A” (wavy line), a reference to Arkell’s excavations. The second, found in layers “4” and “5”, was simply described as sandy Nile-mud ware, with the surface very crudely combed or perhaps wiped “with grass” (Myers, 1960: 167-177). The lithic materials were described as consisting of high proportions of denticulates, lightly retouched scrapers, groovers, few lunates, backed flakes and backed blades (Palma di Cesnola, 1960).

So far, only Abkan Neolithic sites from the Second Cataract area and the Batn el Hajar are unknown (Fig. 4) (Palma di Cesnola, 1960: 612). Wendorf believed that the Abkan culture blends in perfectly with local traditions, and should not be compared with any cultural remains outside Lower Nubia except, perhaps, near el-Debba in the Dongola Reach (Wendorf, 1968b: 1053). Shiner (1968a: 626) argued that, if the lithic industry has made the Abkan the apparent successor to the Final Qadan, certain ceramic characteristics would make it the precursor of the A-Group. Wendorf (1968b: 1051, 1053) is more reserved about the first argument (i.e., Abkan the apparent successor to the Final Qadan) but agreed with the second (i.e., Abkan the precursor of the A Group). In

Fig. 4. Distribution of Abkan sites in Lower Nubia (adopted from Shiner, 1968a; Nordström, 1972)



Site	Horizontal extension	Topographical location	Distance from the Nile	Depth of the occupation
2002	c. 20 m in diameter	On the slope towards Abka	1200 m	0.04
1029	c. 15 m in diameter	?	?	Surface
604	c. 25x400 m	?	?	0.5 m
629	?	At the mouth of a wadi	?	Surface
2007	c. 20 m in diameter	On a terrace remnant	?	Surface
94	?	On northern site of Wadi Kargas	200 m	Surface
1001	?	On eastern edge of old Nile channel	1600 m	Surface
303	c. 50x70 m	?	400 m	0.15 m
385	c. 40x50 m	On a hillock	800 m	0.3 m
369	c. 60x30 m	On the slope of a hill	900 m	0.7 m
370	c. 60x70 m	On sandy slope	500 m	0.1 m
371	c. 50x50 m	Tops and slopes of a ridge of basement rock	320 m	0.3 m
414	c. 40x60 m	On broad and shallow depression of prominent hill	1300 m	0.2 m
429	c. 15x30 m	On slope of the southern side of small valley	350 m	0.2 m
440	c. 40x40 m	On slope of small hillock	?	?

Table 2. Aspects of Settlement Patterns among the Abkan Sites (Adopted from Shiner, 1968a, 1968b; Nordström, 1972).

general, all the sites are located within a reasonable distance from the present Nile banks, varying between 320-1300 m. The extent of the sites, measured by the surface distribution of the material, gives an average of 2000 m², although some sites do not exceed 300 m². Further sites were discovered some distance from Abka. At Gezira Dabarosa, the University of Colorado discovered some sites that belonged to the Abkan.

Some of the Abkan sites, such as Myers's (1960) Abka IX, have *in situ* deposits, while another, site 6-G-25, contained numerous fragments of burnt, well oxidized clay which may originally have been parts of huts or ovens (Table 2) (Nordström, 1972).

Nordström (1972: 13) reports that the Colorado University expedition excavated the site 6-G.25, a ceramic site discovered by the Sudan Antiquities Service and which Nordström attributes to Abkan. Another site, 11-I-16 at Murshid, dated to 4935±BP, was named Wadi Kargan, after a name given by the expedition to a former Nile channel, and the cultural phase represented was labeled Kargan phase, compared with the Combined Prehistoric Expedition (CPE) Abkan and "judged to be immediately pre-A-Group in time... although it could be contemporaneous with the A-Group of regions further north" (Carlson, 1966: 61).

The reports did not mention the fauna, except in connection with the rock drawings and the remains of Nile mollusks and ostrich eggshells, but apparently a diet based on fishing and gathering of mollusks was indicated. Myers's findings at Abka were in complete agreement with those of the Combined Prehistoric Expedition.

With reference to Myers, the Neolithic industry of layer "4" and "5" of his site IX was named "Abkan" by this expedition (Nordström, 1972: 12).

The CPE examined seven Neolithic sites around the village of Abka (604, 94, 629, 1029, 1001, 2002, and 2007) (Shiner, 1968a: 611-629). In contrast to the Khartoum Neolithic remains, all known sites of the Abkan culture are located close to the present Nile, and they show evidence of a heavy dependence on fishing.

According to Shiner Abkan economy "would have been heavily based on fishing. Some hunting and gathering must have played a part, although direct evidence is scanty. Grinding stones occur, though they are not numerous" (Shiner, 1968a: 626-627).

Sites south of Third Cataract Region

First: Dongola Reach

Around Kerma and Dongola, several sites dating from the Neolithic period were discovered (Fig. 5). The University of Geneva excavated one of the most well preserved Neolithic habitation sites in this area. It occupied the same location as the eastern cemetery of the Kerma civilization. It was buried under several dozen centimetres of Nile silt, and was uncovered in an area revealed by wind erosion. This site is part

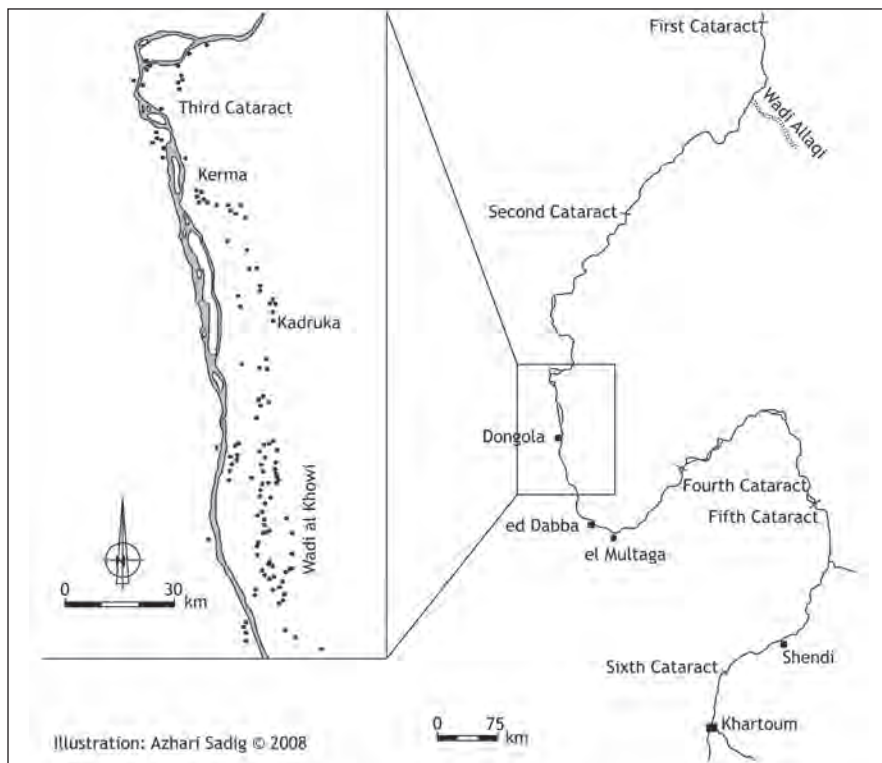


Fig. 5. Distribution of Neolithic sites in Dongola Reach.

of a group of several stratified Neolithic settlements. They had all been subject to erosion by the Nile before being covered by flood silt, showing that this location was reoccupied on several occasions, and that it was not protected from Nile floods (Honegger, 1997: 116).

These sites may have been seasonal, and have been linked to populations practicing animal husbandry, who occupied the alluvial plain during the dry season while seeking pastureland. The sites yielded hearths and postholes, as well as pottery, stone objects (flints, grinders and grindstones) and faunal remains. The species represented consisted mainly of cattle and domestic caprines. An isolated human bone was also found, indicating that graves were dug nearby.

The settlement structures can be reconstructed from the posthole alignments. They consisted of oval huts, rectangular buildings, wind-breaks located to the north of the hearths, and a series of palisades, some of which seem to have formed enclosures (Honegger, 1997: 116).

Many other Neolithic sites were discovered south of Kerma and along paleo-channels of the Nile. Jacques Reinold, working immediately to the south in the area around Kadruka from 1986, suggested that the settlement sites lay along the bank of a branch of the Nile running in the bed of the Wadi el-Khowi, which lies close to the plateau (Reinold, 2000). Derek Welsby, who worked in the area between those sites investigated by Reinold and by the Royal Ontario Museum, defined the Neolithic sites as *“appearing to be much more dispersed and extremely large. They are difficult to define archaeologically as the vast spreads of occupation material gradually fade away in some areas, but in many others their edges are masked by the extensive dune fields”* (Welsby, 2000: 131).

It seems that, in spite of the many sites discovered, it is too early to suggest the functions of these occupations, although they appear to occur over much of the survey area and cover a much greater percentage of the concession area than the sites of the other periods (Welsby, 2001: 569).

Elsewhere, Welsby defined these sites as *“occupation scatters”* rather than as settlements, due to the absence of occupation mounds. He added that *“this may be result of post-Neolithic erosion and one should bear in mind that the occupation scatters of today may have been permanent settlements in the Neolithic period”* (Welsby, 2001: 569). Very occasionally hearth-like features were noted, which may have been associated with the Neolithic occupation and these, along with pits, are one of the most prevalent features of the recently discovered Neolithic settlement under the eastern cemetery at Kerma (Honegger, 1997: 116).

The University of California Dongola Reach expedition reported some Neolithic occupation in the area between Hannek and al-Khandag on the west bank of the Nile (Smith, 2003: 164-165). Smith suggested that the presence of large sherds and bone eroding out alluvial deposits, along with possible pitting, indicate that most of these sites were cemeteries, although no graves were found (2003: 164).

More recent researches recorded small surface Neolithic sites displaying mainly lithics and ceramics. These sites were located within the new area of al-Multaga near Genetti “a resettlement area related to the construction of the Merowe Dam” (Peressinotto *et al.*, 2003). The small size of the settlements, the lack of grave concentrations and the scarcity of grave goods contrast with what is known from other sites of the same horizon excavated in Central Sudan and Nubia (Peressinotto *et al.*, 2003: 35-39).

Debba-Korti area. Former archaeological and associated geomorphologic research was limited to survey and excavations carried out after the end of the Nubian Campaign, from November 1966 to January 1967, between Debba and Korti by former members of the CPE (Combined Prehistoric Expedition) under the leadership of Shiner (Shiner *et al.*, 1971) (Fig. 6). They defined four ceramic-bearing groups of assemblages as the Karmakol (first labeled Early Khartoum Related), Karat Industry, Tergis Industry and El Melik Group. The Karmakol and the Karat Industries showed important affinities, mostly through their ceramic assemblages (Fig. 7), with the Khartoum Mesolithic and Khartoum Neolithic, while the Tergis Industry was considered as specific of the area and the Melik Group as rather poor and possibly representing “more than one cultural entity”. In the Goshabi area they identified 32 localities, belonging mostly to the Karmakol and Karat Industries.

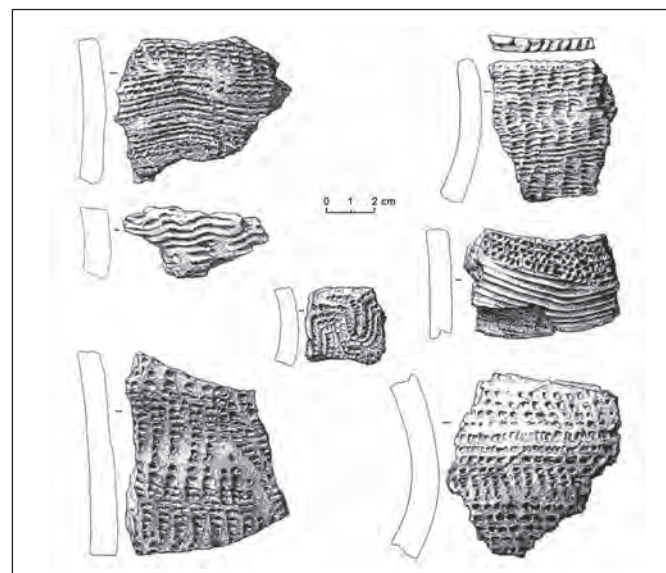
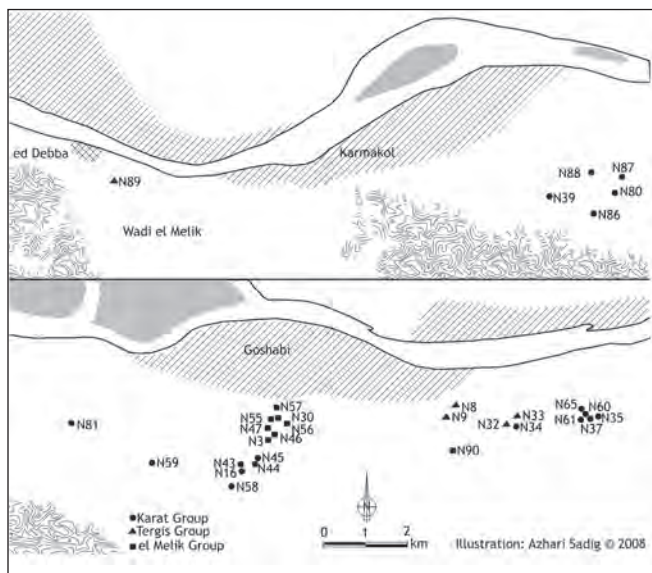
1. **Early Khartoum (Karmakol) Group.** The Early Khartoum-related group owes its name primarily to Early Khartoum-like pottery which occurs in primary association with a previously unknown lithic industry (Hays, 1971a).

2. **Tergis Group.** The eight sites of this group tend to be quite large in area, with dense concentrations of chipped and ground stone. A single tool type cannot even generally characterize this group, as it is rich and varied. The common raw materials at Tergis sites are Nile pebbles of chert and agate. Among the artifacts, lunates, triangles and trapezes are common, but never exceed 12% of any assemblage. Backed flakes and microblades are also present in significant numbers. Microburins are present, but in small numbers. Scrapers occur in varied amounts, from 8-21% of the assemblages. Other tools include notches, denticulates and scaled flakes. The ground tools include grinding stone and stone rings.

No pottery was found on the surface, but two sites (N3 and N55) contained some material, *in situ*, including a few potsherds (Hays, 1971b). Relatively few sherds were recovered. The ones that were

Fig. 6. Distribution of Neolithic sites near Debba and Wadi el-Melik.

Fig. 7. Pottery of Karmakol Industry (source: Hays, 1971a).



found, however, showed a number of characteristics. All sherds were of moderate thickness and tempered with fine quartz sand. Most sherds had reddish outside slip and either no slip or a buff slip on the inner surface. Those with a red slip were normally lightly burnished on the outer surface, but never on the inner surface. Decorative motifs were restricted to the upper portion of the vessel bodies and include a two-line band of simple punctuates or a thick cord impressed band, close to but not reaching the rim.

3. Karat Group. All the sites of this group were located between the villages of Girra and Ganetti. Nineteen sites were located (N16, N34, N37, N39, N43, N44, N45, N48, N58, N59, N60, N61, N65, N66, N80, N81, N86, N87, N88). These sites were easily recognizable by the presence of dense concentrations of burned Nile pebbles, associated with sherds, chipped stones, and small numbers of ground stone artifacts (Marks & Ferring, 1971). Thermally fractured pebbles characterize this group, a technique previously unknown from the Nile Valley (Marks & Ferring, 1971). The technology is characterized by the high index of scrapers, denticulates, notches and lunates. Other tools include notched flakes, backed microblades, scaled flakes and burins. A very few fragments of ground tools were found.

The sparse pottery of this group is of a thin, brownish ware, with a soft sand tempered paste. Two kinds of decoration of the outer surface were typical; a simple 'wolf tooth' pattern in a single band around the upper portion of the body, and a complex design made by small, irregular punctuates, which apparently covered the whole body of the pot. Large numbers of body sherds were undecorated (Fig. 8).

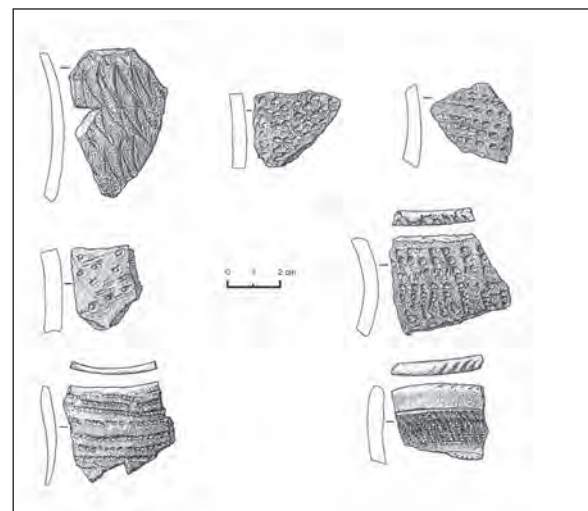
4. El Melik Group. A total of 13 sites were located: (N8, N9, N32, N33, N89) near the Nile and (N50, N51, N24A, N24B, N25, N27, N28, N29) on the gravel hills on the western edge of Wadi El Melik, up to 9 km from the Nile. All sites consist of surface concentration of chipped stone, a very few pieces of ground stone and variable amounts of pottery (Shiner, 1971). Only two sites contained much pottery, N33 and N89. At both sites it was homogeneous, consisting of a rather thin, hard, quartz sand tempered pottery. Most sherds had a red slip on both the outer and inner surfaces. Very few sherds show any decoration, but when present, it tends to be in the form of simple incised lines. This group is characterized by a high percentage of indifferently made and denticulated and notched tools. Combined, they account for between 40-60% of all tools. Logically, blades are rare and odd flakes were often used in tool manufacture. Usually, only about half of all tools were microlithic and lunates and geometric forms were not numerous. Other tools include groovers, scrapers, backed microblades and others. Ground stone tools are rare at the sites along the Nile and often absent at those sites on the western edge of Wadi El Melik.

Second: El Multaga Area

More recent researches recorded small surface Neolithic sites displaying mainly lithics and ceramics. These sites were located within the new area of El Multaga, near Genetti, "a resettlement area related to the construction of the Merowe Dam" (Geus & Yves, 2003) (see Fig. 6). Most recorded settlements are small surface sites displaying mainly lithics and ceramics and documenting limited occupations. 65 sites were classified as Neolithic (Geus & Yves, 2003: 35-39) (Fig. 9).

Old Dongola. The Polish expedition headed by Jakobielski and Krzyzaniak conducted an archaeological survey and excavation in the area of Old Dongola, starting mid 1964. In the third season, 11 December 1966 to 15 February 1967, many prehistoric sites were discovered. The sites were divided into two different groups according to the description of the stone implements and the general geological situation; one, the sites situated on the hills of solid sandstone, and two, the sites situated on the gravel hills (Jakobielski & Krzyzaniak, 1968: 149). Stone implements of the sites situated on the hills of sandstone (Old Dongola Sites 1-5) are composed of large, crudely finished tools, cores, flakes, blades, and a relatively large number of broken lumps or nodules of raw chert. The most imposing tool of this group is the axe with transversal and ground edge, from Old Dongola site 1. Jakobielski and Krzyzaniak mentioned that this axe is similar to another found in Kharga Oasis. On

Fig. 8. Vessel sherds from Karat Group sites (source: Marks & Ferring, 1971).



the other hand, on the explored sites they found no evidence of typical Neolithic attributes as the polished stone and pottery. Moreover, they called these sites “the Proto-Neolithic sites”, and place them in the fourth and fifth millennium BC (Jakobielski & Krzyżaniak, 1968: 150).

Letti Basin. In this area, archaeological survey and excavation were carried out by the Royal Ontario Museum. The terraces extending along the eastern edge of Khor Letti had been known for some time to have Stone Age deposits (Grzymski, 1987). The preliminary reconnaissance, which was carried out in the early 1980s, revealed the presence of some Neolithic sites (Grzymski, 1987). In the 1993 field season, scatters of Neolithic pottery, possibly from a settlement, were also noticed in the area (Grzymski, 1997: 237). Moreover, numerous Neolithic sherds and stone tools were found, suggesting the presence of a Late Neolithic settlement and cemetery there (Grzymski, 1997: 239).

The Fourth Cataract. Little is known about the Neolithic settlement patterns in this area. Garcea mentioned a late Neolithic site near El Kurru but it possesses no Neolithic settlement patterns characteristic of this area (Garcea, 2000: 137-147). The site is identified by a large quantity of lithics scattered over an area of 50 m². Generally it has more similarities to sites in the area of Debba-Korti than the sites in Central Sudan.

The SARS group identified only one Neolithic site in Kirbekan-Amri area during the 1999 survey season. It is located on a flat area among rocky outcrops, and has an appreciable amount of pottery of Mesolithic and early Neolithic date as well as lithic materials (Fuller, 2004) (Fig. 10).

Of the total number of 711 sites recorded in the area between Ka-reima and Abu Hamed (Paner, 2003: 15-20), over 240 yielded ceramic, stone and flint artifacts dating from Neolithic period. Some Neolithic settlements tended to be located on higher terrain, within natural hollows. Oval and circular stone structures up to 1.5 m in diameter probably represent hearths. Larger concentrations of stones (also circular in plan but with larger diameters) may possibly mark the remains of dwellings which were constructed from organic materials. Querns and grinders were also found at these sites. Agate was among the raw materials used for making tools, with white quartz increasingly used on late-Neolithic sites. The pottery of this period is hard, richly decorated and well-fired, with large pieces of mica easily visible to the naked eye. This indicates that the raw materials used for making this pottery originate from the Precambrian basement complex, which was never covered by Nile alluvium in the Fourth Cataract Region.

The “SARS Anglo-German Expedition to the Fourth Nile Cataract” recorded a number of Neolithic occupation sites and workplaces located on the seasonal islands of Umm Mereigit, Umm Balla and Midaimir, as well as on the adjacent left bank near the Fourth Cataract (Wolf & Nowotnick, 2005: 23-31). These sites are strategically well-placed on higher outcrop plateaus, on gravel terraces overlooking the Nile valley or in smaller *wadis*. Materials associated with Neolithic pottery were also recorded near ed-Doma. One site in particular included a vast number of lithics over a large area on the bank of the Wadi Fursib paleochannel.

Case Study: The Third Cataract Region

This section provides preliminary results of the study of Neolithic sites identified during the field seasons of survey in 1990, 1991, 1999, 2001 and 2002. Of the 47 sites discovered during these seasons, 13 sites were revisited during the season of 2002. Moreover, the last survey revealed another 10 sites (Sadig, 2004, 2005) (Fig. 11).

Although there has been considerable archaeological investigation of Nubia since the 1900s, no systematic work has been done in the Third Cataract Region, which is often assumed to have been dominated by archaeological sites.

The results of the first season’s survey of the Mahas project already suggest that the area was extensively settled in prehistory. A high proportion of the occupation sites identified from material scatters spread behind the foot of the hills, outcrops, terraces, and along the *wadis*.

The Neolithic evidence in this area range from a spot find of a single artifact to a big settlement covered with archaeological material



Fig. 9. Neolithic pottery vessels from el- Multaga, Southern Dongola Reach, Upper Nubia.

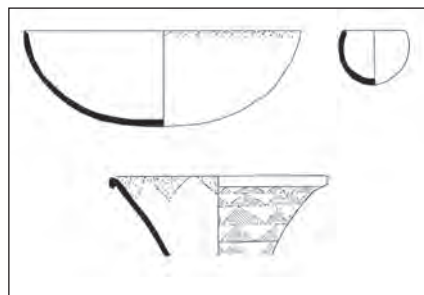


Fig. 10. Examples of Late Neolithic ceramics from Umm Melyekta. Fourth Cataract, Upper Nubia (reproduced from Fuller, 2004).

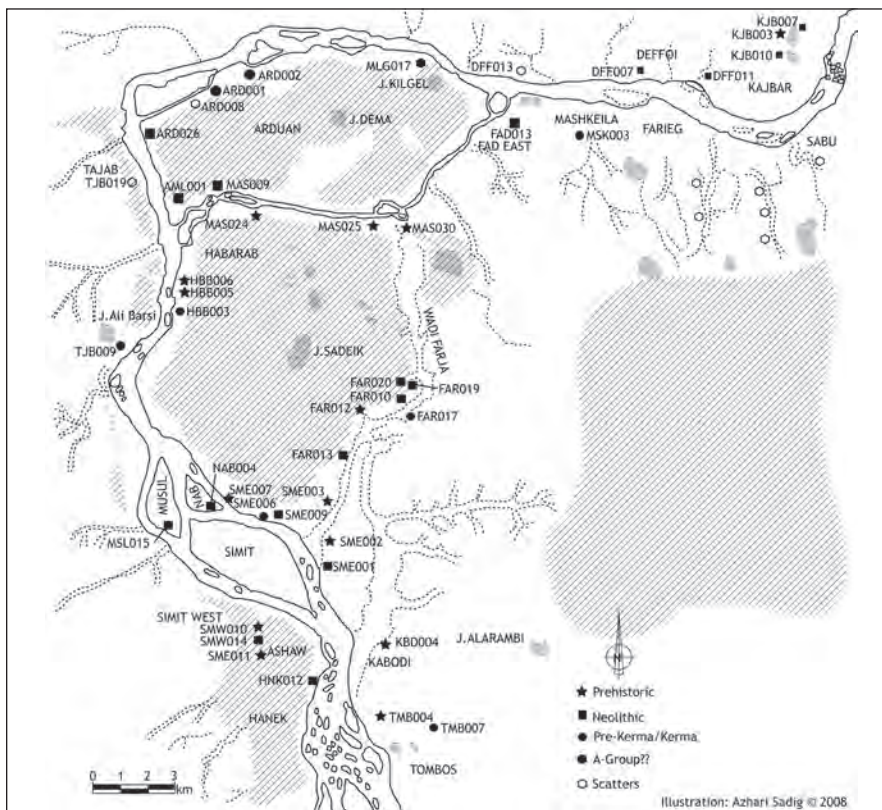


Fig. 11. Prehistoric sites in the Third Cataract Region.

and the remains of the activities of the prehistoric peoples. The area covering Wadi Farja, for example, shows considerable evidence of human settlement close to the *wadis*. The high grounds dominating in the regions are mainly open common lands, settled in the past and serving as a source of raw materials. On either side of this high ground are fertile valleys, where some sites were also noted. Other sites were found close to the Nile or on the open land surrounding the hills and dry *khors*.

Archaeological sites

Satai: TJB019 (90/29): *ca.* 19°54.25/30°18

This site is located at the southeast end of Jebel Satai. It consists of a small group of rock drawings which are mainly of cattle. Some potsherd scatters were also noted in the area; the sherds included incised Neolithic material.

Baree: DFF007 (99/32): 19°56.958/30°28.884

A small site consisting of scatters of Kerma potsherds and some lithics, close to road just west of Baree. A little to the north, lithics and probable Neolithic pottery was recovered in test pitting and surface collections during 1999. Most of the finds were heavily abraded and rolled and probably represent redeposited material.

Haleeba: DFF011 (99/19d): 19°56.57/30°30.44

Thin scatters of Neolithic pottery and lithics were noted in this area, including a fragment of a polished stone axe.

Shofein DFF013 (99/23b): 19°56.7/30°26.37

A small site at the foot of Jebel Shofein that consists of scattered lithics and few eroded Neolithic potsherds. Groups of rock drawings on top of the jebel, mainly animal figures, were also noted.

Siti Nafisa: KJB007 (99/16): 19°57.64/30°32.45

This site is located on the north side of Jebel Siti Nafisa, just north of Kajbar village. Scatters of lithics and small quantities of potsherds, probably Neolithic, were noted. One area is relatively rich in surface concentrations of artifacts.

Kajbar W: KJB010 (99/28b): 19°56.85/30°31.04

This site is located on a plateau west of Kajbar village and southwest of Jebel Noh. Extensive scatters of early Neolithic artifacts were noted here. No ground stone artifacts were found, but “Neolithic” stone lithics were common.

Kajbar: KJB003 (99/14a): 19°57.84/30°32.55

Small lithic scatter at foot of west side of Jebel Noh were recorded. No sherds were found.

Ashaw: SMW014: 19°44.849/30°20.815

This site is situated about 3 km from the Nile to the east of an area surrounded by low gravel mounds. It is located on a gravel ridge of a *khor* running from southwest to northeast. The area of occupation covers about 18x13 m, on an east-west line. Decorated and undecorated potsherds, lithics, grinding stones and animal bones were noted.

Hannek: HNK012: 19°43.784/30°21.912

This site is situated about 500 m from the western bank of the Nile close to a rocky area, some 1 km north of Hannek. Scatters of potsherds and lithics were noted in area about 15x10 m.

Simit West: SMW010: 19°45.09/30°20.631

This site is situated on the eastern bank of Gam Uffa *wadi* which runs from south to north. An extensive spread of Neolithic, Kerma and more recent potsherds were recorded on raised ground.

Simit West: SMW011: 19°44.61/30°20.875

The site is situated on the eastern bank of Gam Uffa site. An extensive spread of Neolithic, Kerma and more recent potsherds were recorded. This area is characterized by many koms which dated back to the Neolithic and Kerma periods besides more recent sites.

Tajab: TJB002 (90/12): 19°49.2/30°18.5

An extensive site running along the south bank of the *khor* Taha'nirki, west of the 'lower' lorry track. Surface material comprises scatters of lithics concentrated around two rock outcrops at its east end. No pottery recorded.

Simit East: SME 001 (91/35): 19°45.867/ 30°22.235

Immediately east of the road, on open ground below a low terrace, are extensive spreads of lithics and Neolithic potsherds, extending over a distance of some 150 m north-south and about 30 m west-east. Within this area a single low stone marks a grave of unknown date. A random test pit on this site during the 2002 season revealed few artifacts at a depth of only 5 cm. The material from all depths is identical and seems to belong to a single cultural period. It comprises more than four areas relatively rich in surface concentrations of artifacts. The site is also covered with quantity of potsherds exhibiting different types of decorations. A number of stone tools and stone grinders of different sizes were also found, in addition to river shells, and fossilised animal and fish bones. This site lies very close to the road and is clearly very vulnerable to increasing traffic.

Simit East: SME002 (91/37): 19°46.739, 30°22.066

This site lies on the southeast side of the wide *khor* mouth, which drains from the northeast. Extensive spreads of lithics, abraded sherds and bone fragments suggest a disturbed cemetery site. Much of the area shows signs of water erosion and considerable recent human disturbance.

Simit East: SME007 (91/31): *ca.* 19°47.5/30°20.4

This site is situated southwest of a prominent conical hill, close to the road along the west side of minor rock outcrops. A number of small gravel patches and clusters of stone are associated with thin lithic scatters and abraded, probably Neolithic, potsherds.

Simit East: SME009: 19°47.779/30°21.048

The site is situated near Simit Island ferry station. Surface material comprises lithics and very few eroded sherds.

Sadiék: SDK003 (91/24): 19°49.494/30°19.877

Situated on the north and south sides of the desert track into Sadeik from the east, *ca.* 3 km east of the village. Three low circular stone structures *ca.* 3 m in diameter, probably grave superstructures, were recorded. No surface finds were recovered and dating remains uncertain.

Habarab SE: HBB 005 (91/45): *ca.* 19°52.25/30°19

This site appeared as a surface scatter of lithic artifacts and probably "Neolithic" potsherds in a disturbed area used for gravel extraction 250 m southeast of the village.

Habarab E: HBB 006 (91/46): *ca.* 19°52.35/30°19.1

In rock outcrops east of the southern end of the village a small sub-circular stone structure is associated with a thin scatter of lithics and potsherds, probably Neolithic. In the 2002 season the author failed to find other material either inside the structure or around it. Moreover, the "Neolithic" sherds were very few and it is difficult at this stage of the investigation to relate them to the structure.

Mesada: MAS 009: 19°54.078/30°19.961

This site is a distinctive flat-topped mound near mouth of prominent *khor*,

ca. 7-10 m diameter. Occasional undiagnostic wheel-made potsherds and stone slabs around the mound were found. Just below the mound worked quartz and Neolithic potsherds were found. A heavily burnt silty layer just below the surface also contains some Neolithic artifacts.

Mesada W: MAS 025 (91/75): *ca.* 19°53.4/30°22.8

This site lies opposite the westerly end of Mesada Island. A number of low stone walls were noted running over the rocky hills. A number of crude stone structures built amongst the large boulders were also noted. Dating of the remains is uncertain although small numbers of possibly Neolithic potsherds were found among the rocks.

Mesada: MAS 030 (91/53): *ca.* 19°53.1/30°23.7

The site is situated at the eastern end of the valley between the ridges running west from J. Farja, northeast of the church (MAS021). A thin scatter of Neolithic potsherds was noted and a small sub-circular stone structure, partially covered by blown sand.

Mesada: MAS 024 (91/54): *ca.* 19°53.7/30°20.9

The site is situated at the southeast of the school at the edge of the village. A thin scatter of lithics and early pottery was noted in a heavily eroded area among small boulder outcrops between the road and the river.

Tombos: TMB004 (91/8): *ca.* 19°42.8/30°23.5

The site is situated within a group of rocks immediately above Pharaonic inscriptions/graffiti close to the river. Thin scatters of sherds and some lithic material, of uncertain date, were recorded, probably representing small camp site(s).

Kabodi: KBD004 (91/40): 19°44.31/30°23.08

The site is situated at the southeast of the hamlet, on gravel spreads east of the road. Extensive scatters of lithic material and sherds were recorded. Closer to the houses around large boulders are further spreads of medieval sherds.

Fad east: FAD 013: 19°55.444/30°25.466

This site is situated just east of Fad east and not far from the famous Nawri jebels. Clusters of stones surround the site on the northern edge of rocky area. Lithic scatters and occasional abraded Neolithic potsherds could be seen amongst possibly disturbed grave superstructures.

Wadi Farja and hinterland: The Wadi Farja (Farja in the Mahas Survey archives) includes the main *wadi* and other channels to the east and west. Its northern end lies by the Meseda church, and sites to the north of this spot are included within Meseda (MAS).

Wadi Farja: FAR 010: 19°49.676/30°23.608

This site lies on a prominent silt bank on the west side of a small *wadi* running from east to west. It has more than one area of concentrations of unburnished, simply decorated potsherds as well as stone implements, the majority of which are grinding stones, extensive spreads of lithics, fragments of green blue 'amazonite'-type stone and bone fragments covering an area of about 180x50 m. Also noticeable was the presence of shells, sometimes clearly concentrated in one place although the site is far from the Nile. No human skeletons or indications of burials were noticed. Several burnt areas with eroded 'hearths' *ca.* 1 m in diameter raised *ca.* 10-15 cm above surrounding ground surface were also seen.

To the west of the site is another site containing the same types of artifacts. The surface around the two sites is covered with undiagnostic potsherds, well-fired bricks and recent potsherds.

The work in this small section of Wadi Farja showed that the *wadi* is likely to be of considerable archeological interest. Sites were found on the prominent silt banks of the *wadi*, or associated with rocky outcrops.

Wadi Farja: FAR 012: 19°49.143/30°22.806

Surface scatters of sand-tempered Neolithic pottery, occasional grindstone fragments and lithics were noted in this area.

Wadi Farja: FAR 013: 19°48.402/30°22.493

Stone structures on raised silt bank include one large sub-circular structure *ca.* 3.6 m in diameter. Some classic Kerma and later potsherds are scattered in the area. The Neolithic material is very scarce and eroded and it is not clear as to whether it is related to the structure.

Wadi Farja: FAR 018 (91/10) *ca.* 19.47.40/30.24

Lying close to the west side of the track running south from the Wadi Farja in a largely featureless plain. The site is marked by a linear scatter of cobbles and small stone blocks covering an area of over 1 ha. Surface finds were limited to a thin scatter of sherds and lithics.

Wadi Farja: FAR019: 19°49.894/30°23.728

This site is situated about 2 km north of FAR10 just west of the road. It is

surrounded by an area characterized by a low plain and rocky outcrops. A small amount of potsherds and a large amount of lithics and grinding implements cover this small site (only 40x20 m from south to north). This site has been affected by the road and by erosion.

Wadi Farja: FAR 020: 19°49.904/30°23.691

The site is situated in rocky outcrops just east of the FAR019. It is a small site covered by a small amount of lithics and potsherds, mostly black fabric. Few Neolithic potsherds were also noted.

Arduan Island: Amla: AML 001: 19°54.035/30°18.45

The site is situated at the southwestern edge of Arduan Island, just northeast of Amla village. This site contains Neolithic pottery scattered on eroded silt banks near mouth of *khor* to the east of the road-line. These potsherds are similar to others noted by the researcher in Farja, although the present site is not as big as the site at Farja.

Arduan Island: ARD 001: 19°56.135/30°19.903

This site is situated about 2 km south of Arduan village, close to the rocky area that dominates the middle part of Arduan Island. An extensive surface spread of abundant pottery and occasional lithics has been discovered on these stony lower terraces. Test excavation conducted in the 2000 season revealed several storage pits and postholes from a settlement site of late Neolithic/early Kerma type (Edwards & Osman, 2000).

Arduan Island: ARD 008: 19°56.081/30°19.409

Some lithic scatters and occasional Neolithic potsherds were discovered in an open area on the southern side of a rock outcrop west of Arduan village deeply cut by two gullies. A medieval sub-circular rough stone structure *ca.* 4 m in diameter and occasional medieval potsherds were discovered nearby.

Arduan Island: ARD 026: *ca.* 19°55.6/30°18

Three Neolithic polished stone axes were reported in rocky outcrops southeast of Konj hamlet.

Nab Island: NAB004: 19°47.706/30°19.485

Scatters of lithics and eroded potsherds were noted on a sandy area just south of Konj hamlet. This material is scattered over a large area and is affected by agricultural activities.

Musul Island: MSL 015: 19°47.379/30°18.400

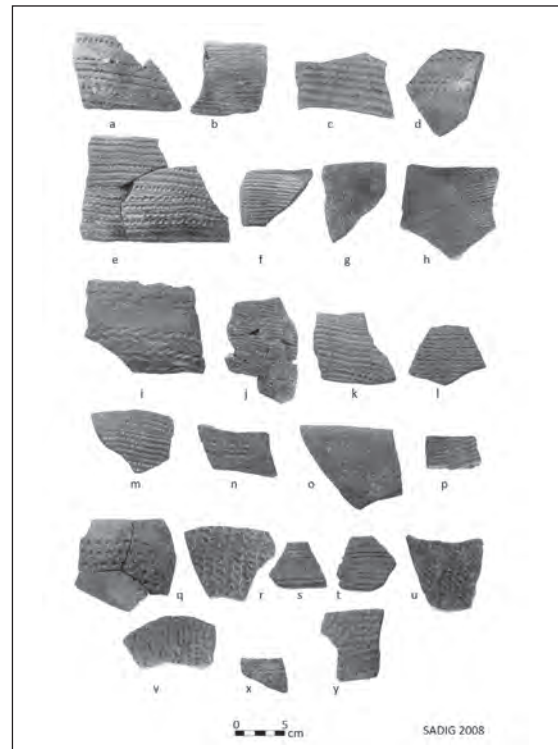
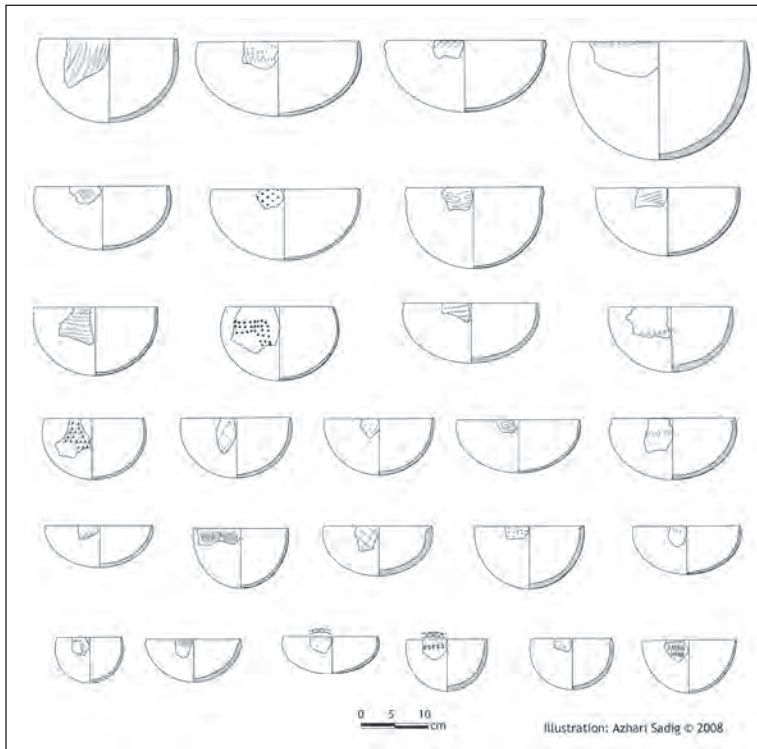
Some lithic scatters and occasional Neolithic potsherds were discovered at the north side of rock outcrops south of Gaame hamlet and southeast of the island. No other features were noted. Extensive scatters of lithics and potsherds at foot of a rocky area were also noted northwest of this site (19°47.282/30° 18.562).

Archaeological materials

The archaeological material from Neolithic sites in the Third Cataract Region within the Mahas Survey project is considered here, and observations presented below are based on the personal examination of artifact samples from each of these sites.

The archaeological material collected from the Third Cataract sites consists largely of potsherds. No complete vessels were found, but some rim sherds discovered permit a thorough study of the materials, texture and decoration of the pottery, and provide a fair idea of the shape of the vessels. All the potsherds from the sites are hand-made, and generally unpolished. Apparently local clay was used. There are minor variations in the soil of the Third Cataract from place to place, but the geology of the region is so uniform that choice and selection were limited. Variations in the final result depend on the thickness and shape chosen for the vessel, the tempering material selected, the amount of effort devoted to smoothing, wiping or scraping and the type of decoration used. The colour runs from black, through dark brown, light brown to gray. In many specimens the colour is uneven, with black and brownish areas. Most of the variations in colour appear to be due to variations in the type of soil or firing. The cross-sections of the potsherds are found to be of uniform texture, but they usually show two colours: a black colour, and a lighter colour beside it. The division between them is uneven; this shows that the change is due to the effects of firing, and not to the presence of two different materials. Decoration is confined to impressions and incised lines. There is no painting or pictorial art.

Vessel shapes at the sites include a variety of open-mouth vessels (Fig. 12). The favorite vessel forms seem to be a medium-sized open bowl and hemispherical vessels. Many decorative patterns were used (Fig.



13). Many decorative patterns were used. The most common pattern is impressed dotted decoration. All the other decorative techniques, i.e. incision, simple impression, rocker stamps, simple Vees are less common. The favourite decorative technique at the Third Cataract Neolithic sites is the impression in all its varieties, accounting for more than 52.5% of the total. The rocker technique accounts for more than 19.3% of the total. The incised lines account for 16% while the rippled and combed decorative patterns account for 15.6%. The Neolithic sites of Shaheinab, Nofalab and Geili offer a different panorama, where the rocker stamping constitutes a higher percentage; 45% at Geili, 58-72% at Nofalab, and 50% at Shaheinab. A comparable occurrence of decorative patterns and/or techniques is shown at the other Neolithic sites in the Central Sudan, especially at Zakiab and Um Direiwa. A slightly similar situation, however, seems to characterize Kadero I, where the rocker stamping motifs account for 36% of the total, while incised motifs account for more than 18% (against 16% at the Neolithic sites of the area studied). From the above descriptive analysis, it is clear that Third Cataract sites ceramic assemblages are similar to those of other Neolithic sites. The differences of some sites deserve additional investigation and may be useful in developing a temporal sequence, through a detailed study, for Third Cataract pottery. Changes in the frequency of decoration may be due to the total number of the collection. The data suggest that additional temporal indicators could be the frequency of coarse or plain potsherds, and the frequency of unsmoothed surface treatment.

The identification of material used for lithic artifacts is always difficult, and it seems especially difficult for items found in this area. The main problem is trying to differentiate between different types of quartz, cherts and jasper found along the *wadis* and gravel pits in the area. This needs more detailed study of the soil features of the region and different materials used on lithic tools. Of the 520 tools collected from Third Cataract (including grinders), 2.9% were made of quartz, 0.6% of granite, 0.8% of rhyolite, 4.6% of sandstone, 0.2% of unknown material and 90.9 % of Nile pebbles. One artifact made of diorite, discovered north of the survey area is not listed in the table. Only five types of raw material were utilized for the manufacture of stone implements. All these raw materials are common locally. They consist of quartz, Nile pebbles, granite, rhyolite and sandstone. The materials utilized for the ground stone tools were sandstone and granite. Both occur in the area in large quantities. Among the raw material, only sandstone and

Fig. 12. Third Cataract Region: Major forms of decorated pottery.

Fig. 13. Decorated vessel sherds from Third Cataract Region sites.

Nile pebbles occur in sufficient quantity to make any statements about their distributions. As is so often the case, both materials are common throughout the areas, and their distribution tends to represent the overall lithic frequency in each site. Very fine-grained gray to dull-red Nile pebbles are found locally in large scatters on terraces and eroded areas along the river and seasonal islands.

A large number of artifacts was made of moderate to coarse-grained, light to dark brown pebbles which were probably collected from the above mentioned sources. Furthermore, some artifacts were made of a white to light-brown quartz, found in cataracts and banks of small seasonal islands. All other types are also available locally on the gravel banks.

Approximately 51.4% of the surface collected lithic samples consist of cores, flakes and retouched flakes. The second most frequent category of lithic artifacts is finished scrapers, which represent about 15.4% of the lithic samples. Backed tools, crescents, borers, groovers, points, axes, and grinders make up the bulk of the remainder (Fig. 14). The flakes and notched flakes vary from place to place and are no sure guide to the age determination of surface collections from different locations. Together, they represent the greatest number of lithic materials (about 49.3%). All examples of notched flakes usually shared in having a notch or notches on one side of a flake. The flakes themselves vary considerably in size and shape, from small flakes to irregular large flakes. Although only a small sample of chipped stone artifacts has been examined, it is possible to describe the sites industry as a flake based industry, with some larger and well-made Nile pebble tools being produced on small blades. This is supported by the frequency of finished flaked tools in the sites.

Another unusual aspect of the lithic assemblage at the sites is the appearance of a rather large proportion of scrapers. These tools comprise around 15.4% of flaked lithic artifacts. This apparent anomaly could, of course, have an analytical rather than a functional explanation. Therefore, our understanding of its occurrence in these sites is not complete, and the proportion of them in this collection may be a result of sampling. This is a possibility that cannot be confirmed or refuted here; it must await further detailed research on the distribution and use of various lithic material types in Third Cataract. Even if we assume that this is an unusually high proportion, closer examination of the distribution of these tools within the sites suggests an explanation for its presence. Of the total number of scrapers recovered from the sites, 25 were found in SME001 and another 20 came from Gam Uffa site (SMW014). Alternatively, either number could be explained as reflecting the favoring of these tools.

Other noteworthy aspects of the lithic materials at Third Cataract sites include the low frequency of groovers and the complete absence of lunates and burins. In contrast, these tools are common in Abkan sites in Lower Nubia (groovers being *“the hallmark of the (Abkan) industry... which together with the borers make up a high percentage of all tools”*) (Shiner, 1968a: 626). It is also interesting to note that almost all of the groovers were collected from one site (SMW014) but they represent only 1.8% of the tools. Here again, the percentage suggests isolated incidents during which SMW014 tools were sharpened or reworked in some manner, rather than initial manufacture of a finished tool from a core or flake (two of the tools are reworked from big scrapers). Again, it is not possible to establish a probable “average” frequency of occurrence for these tools in archaeological sites before a detailed and specific study of all sites. Haaland mentions that engraving tools are the most frequently employed tools at Kadero I and II, Zakiab and Um Direiwa I (Haaland, 1987: t. 9, p. 102).

Relatively many backed tools and crescents were found in the sites. They represent 13.4 and 5% of tools respectively. Blades are by far the most frequent category of worked lithic artifact after scrapers. A large number of backed tools was found in SME001 (28 tools), followed by FAD013 (14 tools). In both sites they were more abundant than any other finished tools. This was not the case on Neolithic sites near Khartoum. Haaland observes that the backed tools and lunates are few in numbers on the Neolithic sites at this area (Haaland, 1987: 75). These tools are used for many purposes, i.e. as weapons, to tip arrowheads (Wendorf, 1968a: 989-992), and to some extent as sickles (Wendorf, 1968a: 943).



Fig. 14. Lithic artifacts from Third Cataract Region (1, 24, 28 Points, 2, 3, 7, 10-23, 25-26 Various blade tools, 4, 9, 27 Borers, 5-6 Scrapers, 8, 29-32 Crescents).

The last function is more speculative and no real data could support this assumption (Haaland, 1987: 75). More than 2,294 complete crescents were obtained from Shaheinab site, about 60% of which were of quartz, about 30% of fossil wood and about 10% of rhyolite (Arkell, 1949: 26).

Borers also are represented in the collection, although to a lesser extent than blades. Some pieces made on large flakes were used as borers. Steep retouching on the dorsal surface along both edges is seen in most cases and most distal and proximal ends are snapped off or broken. They represent about 4.9% of the collection but with a clear absence in HNK012 and FAR019 sites. They represent about 20% of tools in FAR010 site, 2.9% in SME001, 0.6% in SMW014, 2.7% in FAD013 and 14.3% in FAR020.

The points collected from the sites are roughly made tools. They were frequent in FAD013 (13.5%) and SME001 (5%) and they represent about 3.1% of the whole collection. These types were not common in the Khartoum Neolithic sites (Haaland, 1987), but some examples were mentioned in Khartoum Variant sites as a distinct departure from the Final Stone Age (Wendorf, 1968a: 772). The points were formed by a series of obverse, rather steep edge-retouching along both margins of the proximal part. One point, found in SME001 site, is characterized by rather steep edges and sharp tip. Another distinctive type was found in FAR019 site. It is a narrow point showing edge retouch, more near the base and tip, and some along the sides (Fig. 15). Other types were made on flakes and display a poor method of manufacture.

Most of the three types of grinders collected from SME001, SMW014, HNK012, and FAR010 sites are fairly small. No similar tools were found in FAD013, FAR019 and FAR020 sites. This may be due to the poor condition of the sites and the interest of local people in such tools (the phenomenon is observed in some Mesolithic and Neolithic sites in the Khartoum area [see Arkell, 1949 and Haaland, 1987]).

Three types of raw material were observed in the manufacture of axes:

1. Polished granite axes, with a cutting edge and polishing visible on the whole surface. Five examples were mentioned; three of them were from unknown sources.
2. Nile pebbles axe, made on quartz and retouched in one side.
3. Quartz axes, trimmed on the whole surface.

Three Neolithic polished stone axes found in rocky outcrops south-east of Konj hamlet at Arduan are different from any other type (Fig. 16). They were finely polished all over the surface and there is careful retouch on part of the butt end (their lengths are from 160 to 90 mm and the cutting edges are from 70 to 50 mm). A similar type is found in late Neolithic sites at Kadruka, el Kadada and Kadero I. They are commonly connected with cemeteries and rarely found within the settlement. Another Neolithic grave-related tool was found near Aggetteri (AGT001), north of the Third Cataract, a fragment of a diorite mace-head usually found amongst grave goods. Another two polished axes made of green chert were collected by the author near Handdika during the students' field season of the Department of Archaeology in summer 2009 (Fig. 17). This may suggest a Neolithic cemetery site in these two areas or nearby, although there is no clear evidence about the source of these tools.

Some similar examples of what are classified as "varia" in our collection were found in Khartoum Variant sites and described by Wendorf as "proto-gouge" (1968b). Only two examples of this tool were found, and there is no information as to what purpose these tools were used for.

Discussion

In fact, it is unlikely that all of the Third Cataract, for example, can be completely surveyed in just five seasons, given both limited time and resources. During the survey seasons of the Mahas survey and during the work of the present author, a number of observations were made:

1. The sites that were found during these surveys can be divided into the following categories:

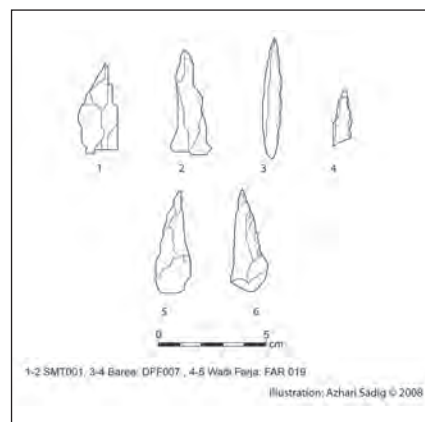


Fig. 15. Lithic points from Third Cataract region.



Fig. 16. Neolithic polished stone axes from Arduan. Third Cataract region (Photo David Edwards).

Fig. 17. Neolithic polished stone axes from Handikka. Third Cataract region (Photo Azhari Sadig).

Type of the site	No.
Occupation	30
Occupation and graves	2
Occupation and rock drawings	2
Habitation	3
Settlement	1
Structure	1
Graves	4
Probable grave-structures	1
Lithic scatters	1
Burning, sherds	1
Find-spot	1

2. Neolithic period site locations and occupation possibilities were extremely variable in the region, depending on the basic geomorphological features: Nile alluvium, gravel terraces, hills and rocky areas, desert and *wadis*.
3. The largest site recorded is not more than 150 m². The density of cultural material within each site would be useful for estimating this, but this information was not consistently recorded during the surveys. Large sites are usually found adjacent to permanent water sources or lithic resources, while small sites are more variable in location, occurring near permanent, ephemeral or relic water sources. However the distribution of sites in relation to components of the environment is difficult to assess in this stage of research. The biased nature of our sample also prevented us from drawing any conclusions about site distribution in this regard.
4. Some materials from SME001 were comparable to material recovered during excavations of a settlement area at al-Barga (Honegger, 2003: fig.6), material associated with a “Mesolithic” occupation dated to as early as *ca.* 7300 BC (2005: 243), while the rest is later taking us into the “Early Neolithic” of this region, for which we currently have dates in the first half of the sixth millennium BC. A number of further Neolithic sites were also identified on the basis of chronologically distinctive pottery, most of which seems likely to date to the fifth millennium BC. A further small number of sites were located which may be dated to the “Late Neolithic” of this region, commonly identified as the “pre-Kerma”, currently dated to the later part of the fourth millennium BC and continuing through the first half of the third millennium BC. Some of these were located along the old terraces of Wadi Farja. Potsherd scatters documented among these belong mostly to the Neolithic period rather than to the “Pre-Kerma” period.
5. There is little evidence in the survey reports of the Neolithic sites in Third Cataract in the open areas east and west of the Nile and along the Nile south of Simit, north of Jebel Ali Barsi and along the eastern bank from Fad till Sabu. Several interesting features along the Farja terraces and along the small *khors* of the west-

ern bank were documented. These features could be associated with the occupation of the region in the Neolithic periods. These finds are not discussed here, as more than a surface collection is required. A series of low-lying linear mounds extending along the terraces of these *khors* may provide good evidence about the nature of the environment during the prehistoric period.

6. Further evaluation of the survey data is required before any additional comments can be offered. However, it must be stressed that the task of reconstructing the cultural landscape associated with the Neolithic period (actually, for any archaeological period) is difficult, given the degree to which the landscape has been modified since then. It is estimated that nearly a hundred of the archaeological sites along the Nile has been either destroyed or badly damaged by agricultural activity or flood. This obviously prevents a thorough understanding of the Third Cataract land, as there is no way to fully evaluate or gauge the nature or percentage of ancient sites destroyed.
7. It is obvious that some of the sites mentioned above may have had more than one function. Some 47 later prehistoric sites (about 16 of them are Neolithic) have been registered (Edwards & Osman 2000; Osman & Edwards 2002); nearly 30 of them are occupation sites.
8. In most cases the settlements have been completely disturbed due to deflation, but careful study of the undisturbed sites has led to important revelations. The distribution of these sites seems to be in close connection, although most of the areas in between witnessed great and active building activities of recent date.

Periodisation of the Neolithic cultures of Nubia

1. Lower Nubia

The internal relative chronology of the Neolithic in Lower Nubia (Abka and Khartoum Variant) is largely derived from technological and typological comparisons of pottery and lithic artifacts from assemblages in the Second Cataract area, where most of the relevant sites lack clear stratigraphic data (Shiner, 1968a: 611ff). For example, the analysis of a few potsherds of a type normally associated with Abkan industry in the CPE Khartoum Variant site (2016) led Shiner (Shiner, 1968a: 629; 1968b: 778) to suggest that the two industries were contemporary and “*in, at least, occasional contact*”. On the other hand, Nordström (1972: 17) suggests that the Abkan industry received its ceramic traits from the latter phase of Khartoum Variant. The main site in the Abka area (No IX) comprised several occupation levels, with Khartoum Variant material at the bottom of the stratigraphic sequence; the various strata overlying the Khartoum Variant made up the Abkan sequence.

Originally thought to span 5500-4500 BC (6500-5500 BP) (Nordström, 1972), Khartoum Variant is now known to cover the period from 7000 to 5000 BC (8000-6000 BP) (Gatto, 2006a). Its temporal overlap with assemblages of Early Khartoum impressed pottery such as that of Aneibis, dated from about 8200 BP (Haaland & Magid, 1995), could imply independent developments in the two areas.

The evidence mentioned above do not necessarily indicate that the two industries were contemporaneous. There is still no direct evidence about the chronological relationship between the Abkan and Khartoum Variant, or between either and the other Neolithic sites in Central Sudan. Shiner (1968a) suggested the Abkan was contemporary with the Khartoum Variant, whereas Nordström (1972) more reasonably suggested a later age: 5000-4000 BC (6000-5000 BP). Nordström (1972) emphasized the technological affinities of Abkan’s burnished and black topped wares with Shaheinab pottery produced by early pastoralists farther south, rather than with the Khartoum Variant ceramics produced by foragers. There are, however, some fairly strong indirect evidence (supported to some extent by ¹⁴C dates) that the Abkan occurs after the Khartoum Variant. If we suppose that the Abkan predates the Khartoum Variant, we might end with “*certain traits common to both industries and with the*

Industry	Site	Radiocarbon age BP	Calibrated age BC	Reference	OxCal Calibration 95.4%
Khartoum Variant	D/W 5	5540±110	5410±140	Hays, 1984	5686-5306
Khartoum Variant	AS 16-V-19	3685±90	2185±90	Olsson, 1972	2400-1778
Khartoum Variant	Soleb, 12	6195±70	5070±115	Stuckmarrh and Ralph, 1965	5315-4964
Khartoum Variant	Soleb, 13	6125±70	5005±90	Stuckmarrh and Ralph, 1965	5287-4848
Abkan	IX, L4	4500±350	3230±360	Crane and Griffith, 1960	4041-2234
Abkan	IX, L4	4470±300	3190±320	Stuckmarrh and Ralph, 1965	3946-2351
Abkan	IX, L5	5960±400	4630±400	Stuckmarrh and Ralph, 1965	5666-3995
Abkan	IX, L5	5860±400	4014±400	Myers, 1960	5666-3995
Abkan	AS-16-S-10	5730±160	3760±160	Myers, 1960; 250	4991-4263
Abkan	AS-16-S-10		3640±115	Myers, 1960; 250	
Abkan	AS-16-S-10	5330±80	3380±80	Myers, 1960; 250	
Abkan	AS-16-S-10		3310±80	Myers, 1960; 250	
Abkan	11-1-16	4935±130	3940-3630	Carlson, 1966	4033-3377

Table 3. Available Radiocarbon Dates from Lower Nubia.

presence of a few sherds associated with the Abkan in Khartoum Variant sites” (Mohammed-Ali, 1982: 143). Nordström’s assumption suggests that there are ceramic affinities which link the Khartoum Variant with Arkell’s Khartoum Mesolithic, although the characteristic features of Khartoum ceramics, wavy line and dotted line, have no representation at the Khartoum Variant sites.

We have only few ¹⁴C determinations from Abakan and Khartoum Variant sites (Table 3). These could be summarized as follows:

1. Excluding the dates from site AS 16-V-19, the Khartoum Variant industry belongs to the 6th millennium BC, or survives into it.
2. The Abkan industry belongs to a part of the 5th millennium BC and survived during the 4th millennium BC.
3. The earliest date of Khartoum Variant sites, *ca.* 5400, is earlier than any other date from the Neolithic sites in Central Sudan.
4. The oldest dates of Abka site, excluding the one from site 11-1-16, correspond with the oldest dates from Kadruka 13 and 21, and R12 cemeteries (see below).
5. The chronology of Abkan and Khartoum Variant covers the entire 5th millennium BC. Unfortunately, no cemetery has been excavated, and the few and poorly published investigated settlements (Myers, 1958, 1960; Shiner, 1968b; Carlson, 1966; Nordström, 1972) can provide only a pale image of these cultures.
6. One of the main problems in Lower Nubian sequence is the labeling of certain sites with different terminologies. This is the case with the two sites (DW4 and DW5) attributed to the so-called “Post-Shamarkian”. The two sites each consist of large concentrations, measuring some 250x50 metres in area but very shallow in depth, made up mainly of chert and quartz debitage but also including an element of Egyptian flint. The sites have yielded two radiocarbon dates: 5600±120BP (4475±270BC) and 5220±50BP (Hassan, 1986; Nordström, 1972: 8). According to Nordström (1972: 96), the Post-Shamarkian “should be regarded as a local counterpart to the Khartoum Variant and the Abkan, which both display a much wider geographical distribution”.

The Abkan Neolithic is followed by the so-called A-Group culture that according to ¹⁴C determination can be dated to mid 4th and mid 3rd millennium BC (Table 4). Evidence related to the so-called “A-Group” culture is located along the Nile river between Kubbaniya, north of Aswan, and Melik en-Nassir, south of the Second Cataract (Nordström, 1972).

Site	Radiocarbon age BP	Calibrated age BC	OxCal Calibration 95.4%
Afiyeh 1	4660±100	3550-3340	3645-3101
Afiyeh 7, 158	4290±120	3100-2670	3336-2579
Afiyeh 7,157	4380±115	3120-2880	3483-2695
Classic A-Group	4655±80	3530-3350	3639-3112
Terminal A-Group	4555±75	3370-3100	3518-3023
Terminal A-Group	4440±90	3330-2920	3356-2909
Terminal A-Group	4160±55	2880-2660	2888-2581

Table 4. Available Radiocarbon Dates from A-Group.

Among the main areas, substantial differences in the archaeological remains were noticed. The differences can be summarized as follows: typology of the shafts of tombs; pottery; evidence associated with the burials; and other materials included in the grave goods.

2. Upper Nubia

The excavations of the Neolithic cemeteries at Kadruka, R12, and El Multaga added valuable information to the typology of the early and late Neolithic remains, their absolute chronology and burial customs. The known dates and their calibrations are presented in Table 5.

Some pottery sherds from the oldest graves at the R12 cemetery in the Northern Dongola Reach (Salvatori & Usai, 2008: 33-38), are typically the same as some sherds mentioned in Nordström's description of Abka pottery. This cemetery also produced few but very characteristic cortex scrapers, typical of the Abkan lithic complex (Salvatori & Usai, 2007: 325). Pottery similar to that found in the older graves at this cemetery is recorded in Letti basin (Usai, 2004: 419). The presence of similar cultural traits all along this part of the Middle Nile valley is clear when the pottery found in the Multaga graves, in the Southern Dongola Reach, in the most recent graves at R12 and in the graves of Kadruka 1 cemetery in the Kerma Basin is considered. Although there are now numerous age determinations on the Neolithic sites of this part of the Middle Nile region, their number is still hardly enough to develop a detailed, firm chronological framework. However, the dates from Multaga, R12 and Kadruka 1 are sufficient to present a general chronological framework of the Neolithic period in this part of the Middle Nile region (Table 6).

Site	Radiocarbon age BP	Calibrated age BC	OxCal Calibration 95.4%
Kadruka 13	5810±60	4720-4580	4798-4505
Kadruka 13	5990±60	4950-4780	5021-4726
Kadruka 21	5910±60	4850-4710	4945-4617
Kadruka 21	5850±70	4800-4610	4897-4540
Kadruka 1/131	5360±70	4330-4040	4341-4003
Kadruka 1	5290±80	4170-3990	4326-3968
R12 Gr. 18	5910±50	4810-4710	4933-4688
R12 Gr. 33	5860±80	4810-4600	4935-4536
R12 Gr. 111	5620±80	4540-4350	4681-4334
R12 Gr. 107	5570±60	4460-4350	4532-4331
Multaga 18/1/1	5640±40	4530-4390	4546-4365
Multaga 13/10	5480±35	4355-4255	4444-4257

Table 5. Available radiocarbon dates from Neolithic sites in Dongola Reach.

Site	Radiocarbon date BP	Calibrated age BC	OxCal Calibration 95.4%
Kerma Site 1	4400±55	3100-2910	2888-2581
Kerma Site 1	4345±55	3030-2900	3322-2887
Kerma Site 27	4345±65	3030-2880	3327-2875
Kerma Site 21	4085±50	2700-2560	2869-2488

Table 6. Available radiocarbon dates from Pre-Kerma sites.

Chronology	Lower Nubia	Upper Nubia	Central Sudan
8000 BC 6000 BC	Qadan ?	Mesolithic (El Barga)	Mesolithic (Khartoum Hospital, Sagga, etc.)
6000 BC 5500 BC	Khartoum Variant (DWS, Saleb, 12, 13,)	Early Neolithic (El Barga)	Late Mesolithic (Kabbashi, etc.)
5500 BC 5000 BC	Abba	?	
5000 BC 4500 BC	AS-16-5-10, 1-1-16)	Middle Neolithic A (Kadruka 13-21, R12) El-Barga Settlement	Early Neolithic (Shaheinab, El Ghaba, Kadero, etc.)
4500 BC 4000 BC	?	Middle Neolithic B (Kadruka 1, R12, Multaga)	
4000 BC 3500 BC	?	?	Late Neolithic (El Kadada, es-Sour)
3500 BC 2600 BC	A-Group (Ariyeh 1 Ariyeh 7, 158, Classic, Terminal)	Pre-Kerma	
2600 BC 1500 BC	?	Kerma	Jebel Tomat, Jebel Makkbour, Umm Singid
1500 BC 1000 BC	?	?	?
	Kush	Kush	Kush

Fig. 18. Neolithic graves at El Multaga (source: Peressinotto *et al.*, 2003).

The ¹⁴C dates from Multaga, R12 and Kadruka 1 contribute to establish a Neolithic phase to the second half of the 5th millennium BC. According to Salvatori (2008: 143) it is possible to recognize the following Neolithic sequence in Upper Nubia (Fig. 18):

1. An early Neolithic phase in the cultural sequence of Upper Nubia around 6000 cal. BC. Unfortunately, the el-Barga Early Neolithic actually covers only the first half of the 6th millennium BC and a gap of almost 500 years separates it from the Middle Neolithic A at Kadruka cemetery and el-Barga settlement.
2. The 5th millennium BC is well represented by some of the graves at Kadruka and El Multaga.

Almost nothing is actually known about Upper Nubian cultures during most of the 4th millennium BC. The 4th millennium BC refers to the beginning of the so-called Pre-Kerma period discovered in Kerma region. Chronologically, the Pre-Kerma period lies between the end of the 4th and the beginning of the 3rd millennium. The Pre-Kerma period is ¹⁴C dated between the end of the 4th millennium and the beginning of the 3rd millennium BC.

Conclusions and general remarks

It now appears that the 6th millennium witnessed major changes in settlement patterns. Early 6th millennium sites throughout Lower Nubia ranged from *ca.* 20 to 4200 sq. m in size, and many of these small sites ended by 3000 B.C. It is difficult to reconstruct the economic aspects of the Khartoum Variant groups, given the rarity of faunal remains. No animal domestication is evidenced, and the remains are primarily of fish and fresh-water mollusks, particularly *Aetheria elliptica*, indicating that these people were still very much directly dependent on riverine resources. The frequent occurrence of grinding stones and ostrich eggs at these sites serves to indicate both the exploitation of local wild plants and the hunting of the ostrich. Evidence of hunting is very clear in the material of Abkan sites in Lower Nubia. Although the economic subsistence is not represented in the archaeological remains of Abkan sites, one of the largest and best known finds of Nubian Prehistoric art was at Abka, closely associated with occupation remains at the Qadan and Abkan industries of the Final Stone Age and the Neolithic. Curiously, in view of the presumed subsistence activity of the people who lived at Abka, there are no representations of fish, although one semi-abstract design might be a fish trap (Myers, 1958: Pl. xxxiv). Although Perkins (1965) considers that the fauna from the Abkan site ASG-G-25 at Wadi Halfa to be wild, his 'large bovids' may very well also have been domestic cattle (Grigson, 1991: 133). The collection from this site contains catfish, Nile perch, ostrich eggshell, Egyptian goose (*Alopothen aegyptiacus*), hare, gazelle, large bovid and wild ass. Domestic goat (*Capra hircus*) seems to be represented by a single distal epiphysis found in the upper layer of the site and may be Terminal Abkan or intrusive (Grigson, 1991: 222). Another Abkan faunal assemblage was described briefly by Carlson (1966: 53-62)

and includes fish, hare, gazelle and remains of a large bovid which could have been domestic cattle at least for part of it (see Fig. 1). The scanty knowledge does not permit an unquestionable affirmation that the Abkans already were practicing animal husbandry, though it seems that they may have combined gathering and hunting with pastoral activities.

Although no direct evidence of food production has been found from the two cultures, the dominance of small sites in Khartoum Variant, both along the river and far at least 20 km west of the Nile, has been interpreted as evidence of a pastoral economy. Evidence of hunting is very clear in the material of Abkan and Khartoum Variant sites. Although economic subsistence is not represented in the archaeological remains of Abkan sites, it seems that the Abkan people were essentially exploiting the river valley, judging from the remains of mollusks and fish (*Lates niloticus*, *Clarias*). Land-based creatures, such as the gazelle, the ostrich and the goose (*Alopochen aegyptiacus*), are also represented among the faunal remains. Finally, the metatarsal bones of domestic goat may possibly be linked with the Abkan stratum at site AS-6-G-25, excavated by the Scandinavian Joint Expedition (Nordström, 1972).

The second change in settlement patterns happened at the end of the 6th millennium. By 5000 B.C., the number of sites in Dongola region reflects a quite intensive occupation throughout the area (Welsby, 2000: 135). These sites may have been seasonal and have been linked to populations practicing animal husbandry, who occupied the alluvial plain during the dry season while seeking pastureland. The settlement structures consisted of oval huts, rectangular buildings, wind-breaks located to the north of the hearths, and a series of palisades. The faunal remains recovered from the graves at site R12 near Kerma indicate that domestic livestock was very important, but collecting and hunting were not minor activities, as shown by the large amount of hippopotamus teeth, gazelle bones and bivalves (Pöllath, 2008: 77). The graves contained a wide variety of faunal remains including different animal products, eggshell, mollusk shells, bones and teeth, worked into ornaments and other tools. Cattle were certainly most important, as is demonstrated by the large amount of tools made from cattle bones and by the burcania that were a sign of wealth, power and influence. Lambs buried with the deceased indicate that sheep also played a vital role in burial customs.

The Neolithic people of Upper Nubia had a mixed subsistence economy, including animal husbandry, hunting and gathering. Major faunal resources for subsistence were probably available within the region. As discussed before, the R12 faunal assemblage reveals an increase in exploitation of domestic animals, especially cattle. The faunal profiles seem to suggest that hunting wild animals, including some very large game, such as elephants, appears to have been a significant activity in the community, though it is difficult to say whether elephants were present in the vicinity of E12 during the Neolithic. The finds from this cemetery are exclusively ivory objects, which are not helpful in answering this question. The evidence of wild animals shows that the Nile Valley inhabitants exploited the aquatic resources and went on hunting trips, exploiting the River Nile itself as well as the riparian forest zone and the adjacent semi-desert (Pöllath, 2008: 73).

Systematic survey and excavations along Kerma basin and Wadi el-Khowi, in the Northern Dongola reach, provide us with detailed information about Neolithic society. The number of sites in this region suggests a quite intensive occupation throughout the area (Welsby, 2000: 135). Cemeteries currently appear as isolated mounds, in a landscape which is today flat. Seventeen cemeteries have been located; of these only five were tested, three were excavated entirely and three are in the process of excavation. Since they cover the 6th to the 4th millennium in date, they inform us about the evolution of the funeral customs and the modifications of the social relations in these first communities practicing agriculture and cattle breeding.

One of the most important cemeteries in the area was discovered at Kadruka (Fig. 19), in the Kerma Basin. This consists of medium-sized Neolithic cemeteries, including wealthy graves that have been tentatively interpreted as those of local chieftains (O'Connor, 1993: 13).

The most impressive example comes from cemetery KDK 1 where, according to its discoverer, grave 131, located at the top of the burial

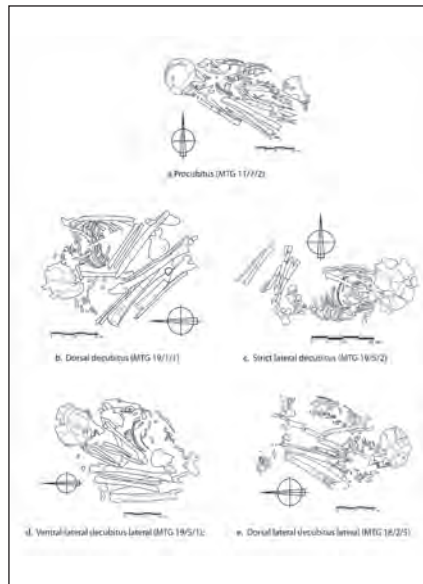


Fig. 19. Cemetery KDK21 at Kadruka: Graves 240-41. The main burial is a female with a sacrificed male placed in the same grave to the north (source: Wildung, ed., 1997).

Fig. 20. Cultural chronology for Nubia and Central Sudan (modified from Salvatori & Usai, 2008).

mound, displays the wealthiest grave furniture ever found in Nubia and Central Sudan in a Neolithic context. The other pits have been arranged around it, expanding out to form concentric circles using the first burial as a focus. Reinold did not use this discovery to infer a related territory that would have been controlled by the owner of the grave, but he concluded that such a finding implied expanding societies, in other words, societies with growing territories, that are a prelude to the emergence of kingdoms (Reinold, 1991: 28). The majority of pits are located on the high part of the kom, between contour lines 230.70 m and 231.10 m. The remainder, nearly a quarter of the total, is situated on the lower part around 230.20 m. Initial observation indicates distribution ordered by gender. The higher are generally male burials, while the lower are female (Reinold, 2000).

Another cemetery, R12, may give a reasonable picture of a Neolithic Nubian society and may contribute to unraveling problems about the cultural and chronological sequence of the Neolithic in Nubia (Salvatori & Usai, 2008). This cemetery, according to ¹⁴C determinations, was used for about 600 years, with the excavation revealing different grave layers, in spite of strong erosion which especially affected the northern and southern periphery in particular. This long use was responsible for graves frequently cutting into each other and for other disturbances. Apart from the risk of mixing of material, careful stratigraphic control often confirmed a chronological order among the different inhumations.

This also means that, unfortunately, many skeletons were found incomplete. Erosion caused extensive damage to both the skeletal and archaeological material. As wind/water cleared part of the original soil of the mound, some of the graves appeared on the surface with bones in a very fragile state and the pottery abraded to such a point that the original surface treatment was sometimes hardly recognizable. Much can be learnt about crafts, ideology and society, from these 170 graves.

Investigations in the el-Multaga area, located near Korti and ed-Daba, brought to light Neolithic burials differing from other known local and contemporary burial sites (Fig. 20). The skeletons lay under mounds in contracted positions inside pits just large enough to contain them. Grave goods were not regular and rather poor. The excavators are of the opinion that such practices probably relate to local nomadic groups (Peressinotto *et al.*, 2003: 54). They also argue that the lack of grave concentrations and the scarcity of grave goods, which are among the most striking differences from other cemeteries, seem to indicate an adaptation based on nomadism, which is probably connected with the exploitation of the great *wadis* that join the Nile in that area. On the other hand, burials of adults and children, whatever their age at death, do not display any significant difference. The diversity of their orientations and positions fits in with what is known from the other sites of the same cultural horizon, but the contracted position of the lower limbs, which involves the use of straps,

is greater here than anywhere else. The writer did not mention if this is greater in number of occurrences, or in the extent of the contraction.

The cemeteries at Kadruka, Kerma and el-Multaga provide us with a remarkable record, displaying many similarities with the sites of Central Sudan and testifying to a common link between the cultures. There are, however, variations that may be interpreted as different modes of evolution or different regional adaptations. These cemeteries display many points in common, especially in material culture. The similarities and differences seem to translate to homogenous populations and indicate a rapid evolution of the social order of the human groups.

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