

Azhari Mustafa Sadig

The Late Neolithic: Regional Diversity and Cultural Unity in Central Sudan

Introduction

The so-called Late Neolithic term is applied to some sites that share similar material culture, graves, and subsistence economy. Some sites like Shaqadud Cave are related to this period although they exhibit exclusively a local material culture and mode of life. Other sites like es-Sour (Sadig 2005) have dates belonging to the Late Neolithic although they remained and continued without any changes throughout their time span. There is, however, sufficient evidence to show continuity in these sites and to suggest that they represent a continuous cultural tradition. An unknown sequence of occupation can be traced through the 4th millennium BC. This means that any attempt to divide the Neolithic period of Central Sudan must include specific studies of the material culture and modes of life. Any division must not be restricted to chronology; it must also be applicable to the whole cultural elements of every site.

The Late Neolithic development of the Central Sudan represents a wide distribution of the post-Khartoum Neolithic “cultures/horizons” (c.4000 BC) which spread from the Shendi Reach south of the Atbara River down into the Gezira Plain between the White and Blue Niles (Fig. 1, 2). These “cultures/horizons” can be grouped into three distinct regional manifestations:

1. The first of which existed in the Shendi Reach area and is associated with the sites of el Kadada (Geus 1984a) and es-Sour (Sadig 2010).

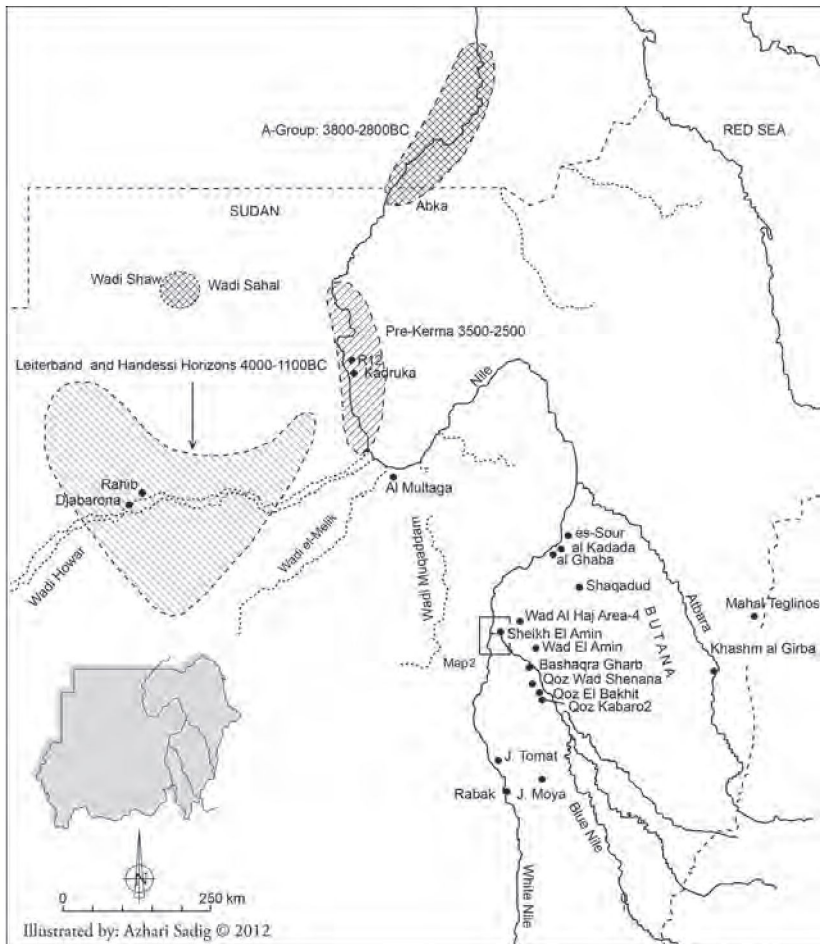


Fig. 1. Location of Neolithic Sites 1

2. The second existed in the Khartoum region and is primarily associated with Late Neolithic burials at Esh Shaheinab, Omdurman Bridge, and el Geili (Arkell 1949; 1953; Caneva 1988).
3. The third regional manifestation of the Late Neolithic existed in the Butana and is associated with the site of Shaqadud (Marks and Mohammed-Ali 1991) and maybe the Blue and White Niles (Haaland 1987; Fernandez *et al.* 2003).

The first two Late Neolithic developments in Shendi and the Khartoum region appear to be very closely related to one another and probably represent a single facies which contained two or more “culture/horizon” groups (Caneva 1988: 163-187). The third development, associated with the middle to southern Gezira

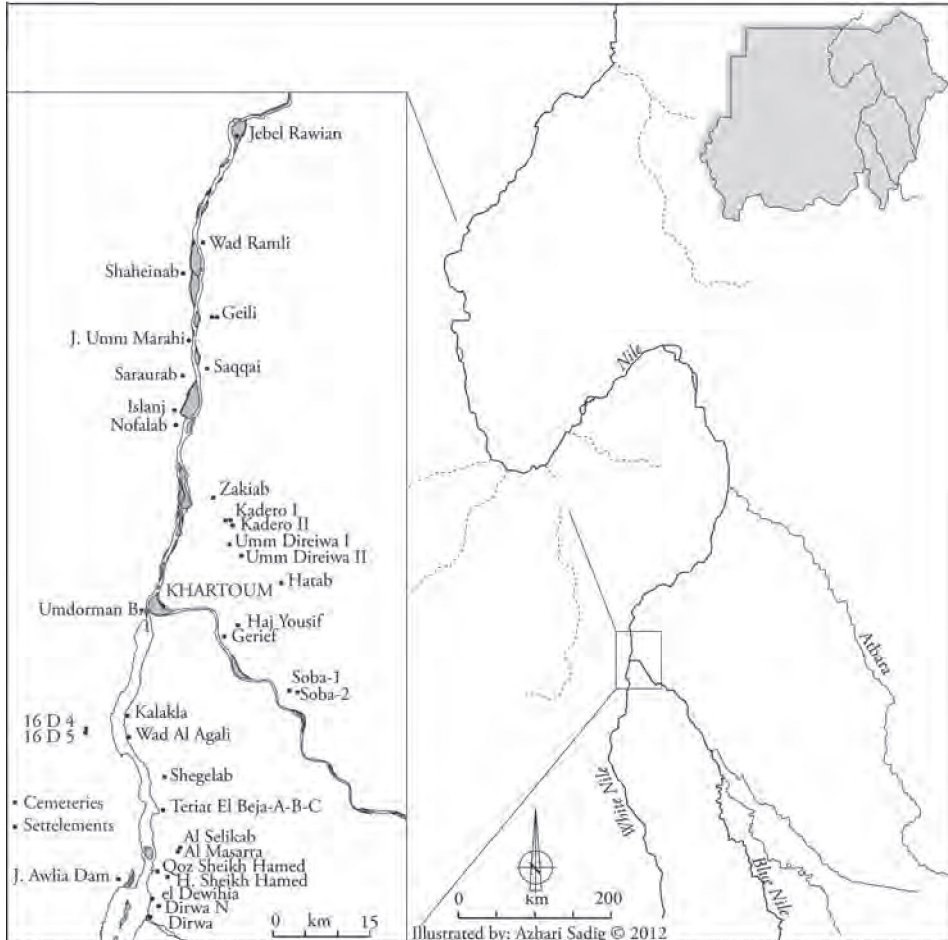


Fig. 2. Location of Neolithic Sites 2

Plain, appears to represent another facies which does not share as many common elements as the first two do. It is very likely that this particular facies is later in time than the other developments in the Shendi Reach area and the Khartoum region. The common denominator among these Late Neolithic developments within the Central Sudan is that they were indigenous to the region and probably evolved out of an earlier Khartoum Neolithic base (Geus 1984a; Haaland 1987; Caneva 1988).

Late Neolithic Subsistence Economy

The archaeological evidence of Neolithic subsistence shows that the people practiced subsistence using multiple resources during late Neolithic. There is evi-

dence for food production based on animal husbandry since 6000 BP. It seems that all the riverine setting of the Central Sudan during the Vith and Vth millennium BC, was occupied by populations following basically similar mixed economy strategies, which consisted of the following (based on Krzyżaniak 1984: 314):

1. Riverbank Adaptation: subsistence based on fishing, collecting and hunting, supplemented by small-scale animal husbandry (possibly only of the ovicaprids).
2. Valley Plain Adaptation: subsistence based on large-scale animal husbandry (mainly cattle) of a pastoral character combined with the intensive collecting (perhaps already with elements of specialization) of seeds of wild tropical cereals, other grasses, tree fruits, mollusks, and some hunting. The remains from the Neolithic sites in Central Sudan represent a sedentary or semi-sedentary mixed economy population, which in some cases included cultivation of domesticated plants, and herding of domesticated animals. Haaland has argued that the processes of cultivation started at an early date and constituted the selection pressures which finally led to the evolution of domesticated sorghum (Haaland 1987).
3. Wadi Adaptation: subsistence based probably on pastoralism, hunting and collecting. This adaptation can be observed at the sites of Shaqadud (50 km from the river Nile bank), Sheikh el Amin (18 km), Wad el Amin (25 km), Bir el Lahamda (40 km), and at Wadi Rabob (58 km).

All of the three systems were found in one or more late Neolithic sites. According to Haaland (1978) that some "inland" sites might have been occupied as herding camps during the rainy season. The recognition of "base camps," as opposed to other site types, rested not only on the large size of such sites as Kadero but also on the presence of large numbers of grinding stones (Haaland 1979). In addition, Haaland went on to postulate that large numbers of grinding stones implied cereal cultivation, in spite of the fact that the earliest evidence for domestic cereal (sorghum) in the central Nile Valley was from the site of Jebel et Tomat, dated to A.D. 245 ± 60 (UCLA 1874) (Clark and Stemler 1975), though Fuller and Hildebrand (in press) suggested that the domesticate sorghum (*Sorghum bicolor*) was present in Nubia and Libya by 0 BC.

Clark (1973: 59) stated that "...the prehistoric populations of Jebel Tomat were cultivating sorghum, owned stock, were hunters, fowlers and also fished". No evidence was found of permanent dwelling structures and this "suggests the use of light, easily transportable shelters of mats or grass". At the time the settlement was occupied, the Jebel would have been almost an island at flood time (July to

December) and it may be suggested that Jebel et Tomat was a wet season (flood time) settlement of a population that “spent the other part of the year living on the Nile itself and practicing a regular system of transhumance between the Nile and the jebel, in a similar manner to the traditional pattern of the pastoral population in the region today practicing dry cultivation of sorghum during the rains which now fall in July and August. The whole region of the Gezira Plain south of Jebel Aulia is today cultivating only Sorghum and Pennisetum but the earliest evidence of them is too recent to be of use. Other late evidence comes from Abu Geili, north east of Khartoum, where a Meroitic engraving of King Sherkarer (c.12-17 A.D.) shows what appears to be a field of Sorghum (Shinnie 1967: 51).

According to Marks *et al.* (1985: 261) the Shaqadud people “...had adapted primarily to grasslands and were not merely Nilotic folk exploiting the savanna after the summer rains as had been postulated. Furthermore, “...there is relatively little evidence for riverine exploitation, in spite of the presence of both the Atbara and Gash rivers in the core area”. The authors speculate that Shaqadud is probably one of many yet undiscovered sites that show this grassland adaptation, and that it was likely part of a larger tradition that spread eastward from the Butana steppe all the way to the Ethiopian border. However, based on the work in Eastern Sudan (Fattovich *et al.* 1984) it is no longer realistic to view sites such as Shaqadud as merely “...eastern outliers of a Nilotic adapted culture (Marks 1991: 31) or as places to which Nile herders moved their livestock after the rainy season. We are now faced with the larger problem of explaining why large stratified sites exist in the Butana and the Atbai and how they relate to contemporary occupations in the Nile Valley.

Present state of knowledge about the Late Neolithic in Central Sudan

Four “Cultures/Horizons” can be recognized in the Neolithic context of Central Sudan (Sadig. 2012, 2013):

1. Classic Early Neolithic Horizon: sites contain the typical Esh Shaheinab material culture, especially gouges (Geili, Nofalab and Kadero I).
2. Terminal Early Neolithic Horizon: sites share some traits with Esh Shaheinab but lack gouges (Rabak, Jebel Tomat, and Nofalab2).
3. Late Neolithic Horizon Type A: sites like el Kadada are partly contemporary with the late period of other two assemblages listed above but reflect more sophisticated material culture than them (Es-Sour). Some similar materials have also come from a small cemetery at Geili, partly overlying the Early Neolithic settlement (Caneva 1988).

4. Late Neolithic Horizon Type B: this horizon contains different sites with archaeological materials that differ partially from riverine sites (Shaqadud (A), formerly Jebel Moya (Phase II)¹ and Jebel Tomat).

The first and second horizons cover the 'Early Neolithic' of the Central Sudan, broadly spans the 5th millennium BC, while the third and the fourth horizons related to the 'Late Neolithic', runs through the 4th into the early 3rd millennium BC. The late Neolithic clearly continues much later in some parts of the Central Sudan, even if we still know relatively little about the later prehistory of many regions.

Late Neolithic Horizon Type A

1. Shendi Area:

Excavation at el Kadada showed the presence of Neolithic remains consisting primarily of burials in the form of either child pot burials or normal adult inhumations in grave pits. No remains of habitations were found, although finds were collected from what is likely a settlement area (Geus 1984a). The combined remains show an intriguing combination of features from the Khartoum Neolithic, the A-Group, and the C-Group complexes. Two radiocarbon dates obtained from shell samples (4630±80 B.P. and 4830±50 B.P.), indicate a definite contemporaneity with the A-Group to the north. The similarities with the Esh Shaheinab Neolithic are not numerous, but at the same time, they cannot be ignored. These include "...serrated Nile bivalves...amazonite beads, lip-plugs, barbed bone harpoons, [and] shell fish hooks (Geus 1984b: 369). Important differences between el Kadada and Esh Shaheinab occur in the pottery decorations and in the complete absence of the gouge at el Kadada.

Similarities with the A-Group are far more numerous and include some distinctive decorated bowls very similar to examples found in the A-Group "Royal cemetery" at Qustul (Geus 1984a: Plate 12; Williams 1986: Fig. 34), frequent occurrence of circular or sub-circular grave shafts, super imposed burials, and a large quantity of grave goods inside the shafts. Undecorated sherds, related mainly to quite coarse, black-topped red wares, were found in the Neolithic site of Es-Sour, 15 km north of el Kadada (Sadig 2005; 2008a; 2008b). Such black-topped red wares have been found at Esh Shaheinab (Arkell 1953: 75) and Geili (Caneva 1988: 110). They are also reported to have been quite common at Kadero, el Kadada and among the pottery assemblage of the A-Group of Lower Nubia (Nordström 1972: 88-89) and are consistent with the relatively late 14C dates obtained for the site at

¹ See the contribution by M. Brass in this volume for the new chronology, based upon a re-examination of the pottery and OSL dates on the pottery

Es-Sour (Wk23036: 5296±48 BP [cal. BC:4140±80], Wk23037: 5330±54 BP [cal. BC:4160±80], Wk23038: 5180±48 BP [cal. BC: 4000±40]) (Sadig 2008a). These dates slightly earlier than the oldest dates from el Kadada (GIF-5770: 5170±110 BP (Geus 1981) [cal. BC: 3990±160]).

Typical C-Group characteristics evident in the el Kadada material culture are the abundance of black incised pottery, sometimes with white filling, as well as the presence of the circular grave shafts that are special of the early C-Group. It may well be wondered how the site of el Kadada was assessed given these cross-cultural characteristics. Geus (1984b: 368) proposes that the culture be viewed as "...a late and brilliant development of the Central Sudanese Neolithic, presenting a number of affinities with the A-Group and C-Group of Lower Nubia", but he also cautions against adopting Arkell's terminology too literally for this site (Geus 1984a)

One of the most important observations at el Kadada cemetery concerns the superimposed inhumations of two and three individuals. A comparative analysis of these burials seems to indicate the presence of human sacrifice in those tombs containing three bodies. If confirmed, as Geus said, "this would be the first occurrence of a custom destined to become widespread in later times, particularly in Kerma" (1984a: 58). Geus argued that the presence of human sacrifices, the increasing complexity of the graves and their grouping in clusters are all factors that point to "a non-egalitarian society in which the elements of social differentiation were beginning to exist" (1984a: 58).

2. Khartoum Area:

Along the riverine Central Sudan, some evidence may indicate that some populations continued to live in the region. The recent finds of tumuli at Umm Singid (Wadi Kanjer, Khartoum North), dated to 3220 BP [cal. BC: 1506] (Caneva 2002), and with some cross-hatched pottery similar to that of the Nubian Pan-Grave culture in Northern Sudan and the Mokram group in Eastern Sudan, ancestors of the present-day Beja Cushitic-speakers (Sadr 1990), appears to be a further support for the existence of some population in the Khartoum region during the middle of the second millennium BC. There is also late materials from Khartoum Hospital (Arkell 1949) and Saggai (Caneva 1983), which has been almost completely ignored in research so far. Arkell (1949: 49) noted that some of later sherds found in this site might belong to a ware also found at Jebel Moya and "not earlier than the Napatan Age". Arkell also noted some sherds dated to what he termed as "protodynastic date" (1949: 95). Sherds from two or three fine red ware bowls were attributed to "Pan-grave ware"....."seems to be that they come from a Pan-grave"

burial” (Arkell 1949: 95). In Saggai, Caneva (1983: 28) reported late Neolithic graves that are differ totally in shape as well as their depth from late Neolithic graves in the region. These data, along with those from Khartoum hospital site need more detailed analysis in terms of cultural identity.

There are no sites in the Khartoum area, except Nofalab2, that yielded a C14 date after ca. 3000 BC. According to Khabir (*per. comm.* 2011), the dates from Nofalab2 (4230±220 BP [cal. BC: 2860±320], 4130±220 BP [cal. BC: 2690±270]) were found in full association with pottery and lithic finds that are akin to Esh Shaheinab and other related sites (equivalent to what he has termed “a late Khartoum Neolithic Horizon”). The absence of gouges – typical of early and classic Neolithic criteria - coupled with the steady increase of more refined pottery in this occupational level mixed with ashes seems to reinforce this suggestion (Khabir 2006). With these dates, it seems that Esh Shaheinab phase lasted far longer than originally thought.

Late Neolithic Horizon Type B

1. Southern Central Sudan:

Three sites in the Gezira Plain south of Jebel Aulia- Jebel Moya (Addison 1949), Jebel Tomat (Clark 1973), and Rabak (Haaland 1987) - have given dates between 2600-2000 BC. The late Neolithic component associated with these sites has been termed the Jebel Moya tradition or complex (Clark 1973: 60; 1984: 122-124; Haaland 1987: 220). The ceramics of “Jebel Moya Complex” combined shapes and motifs resembling those of C-Group, Kerma and Butana Group ware (Gerharz 1994: 334). Both Clark and Haaland believe that the Butana Group might be a part of the Jebel Moya Complex (Clark 1984; Haaland 1987), though the Butana comparison has subsequently been disputed by Winchell (2013). Furthermore, Brass (2013), has since shown that there are no sherds with anything beyond a superficial resemblance to pottery from the Kerma, C-Group or Butana groups and has proposed a different chronology for the site.

The site of Jebel Tomat is situated about 40 km due west of Jebel Moya on the east side of the White Nile. Jebel Tomat consists of an extensive village occupation with graves, which probably began sometime during the late Neolithic and lasted well into Meroitic times (Clark 1973; 1984). The bulk of the occupation at Jebel Tomat consists of a midden deposit approximately 120 cm in depth. One radiocarbon date recovered at 80 cm below the surface placed the early occupation of the site at about 2600 BC (Clark 1973: 57).

The site of Rabak (also referred to as Kosti) is situated on the east side of the White Nile (ca. 3 km from the river’s edge) about 20 km upriver from Jebel Tomat

and about 40 km to the east of Jebel Moya (Haaland 1987: 35, 45). Of the three sites, Rabak has the clearest evidence of a late Neolithic occupation in this part of the central Nile Valley. This site is about 16,000 m² in size and has about 60 to 80 cm of midden deposits (Haaland 1987: 45-46). In the lower levels of the deposit is a Khartoum Neolithic occupation, while the upper levels contain a Late Neolithic occupation. The Khartoum Neolithic occupation dates roughly between 6000 and 5800 BP, while the Late Neolithic occupation dates to about 4500 BP (Haaland 1987: 61). Given that there is an approximate gap of 1500 years between the latest Khartoum Neolithic occupation and the Late Neolithic occupation, it is possible that there was a settlement hiatus between the Khartoum Neolithic and Late Neolithic at this site (Haaland 1987: 46). However, Haaland argues that the ceramics at Rabak represent a continuous sequence between the Khartoum Neolithic and the late Neolithic components there (Haaland 1987: 362). The lithics are also very reminiscent of the earlier Khartoum Neolithic material (however, no gouges are at Rabak) farther north (Haaland 1987: 35, 46).

The ceramics of the late Neolithic occupation at Rabak consist of mostly simple contour vessels with either smoothed or wiped exteriors (burnishing is less common) with impressed decorations (dots, and simple dentations) many of which have been restricted to the rim portion of the vessel (Haaland 1989: 362-364). The chipped stone artifacts from Rabak were manufactured from flakes (mostly of quartz) consisting mostly of retouched flakes followed by convex and concave scrapers (Haaland 1989: 361-362). Some of the larger chipped stone artifacts (mostly convex scrapers) were made from rhyolite (which was a preferred raw material used in the Khartoum Neolithic in the Khartoum province) imported from the 6th Cataract some 300 km north of Rabak (Haaland 1989: 362).

As mentioned earlier, the sites of Jebel Tomat and Rabak also have ceramic assemblages associated with the Jebel Moya complex. Of these two sites, only the ceramics from Rabak have been published in any detail (Haaland 1987, 1989). As it has been previously pointed out, Rabak (which is only 40 km to the west of Jebel Moya) consists of a multi-component occupation and contains both Khartoum Neolithic and Late Neolithic ceramics, of which the later are believed to be affiliated with the Jebel Moya complex (Haaland 1987: 46-47; 1989: 363-365). It was also felt that the ceramics at Rabak show a development from the Khartoum Neolithic to the Late Neolithic.

Some of the Rabak sherds associated with Haaland's Jebel Moya complex are also found in the Khartoum Neolithic levels. according to Brass (2013), The Jebel Moya-like sherds are found in Layer 2, the second youngest lay-

er. Also, Jebel Moya OSL dates (Brass 2013), cast serious doubt on the Layer 2 date from Rabak or at least on the stratigraphic association of those Jebel Moya-like sherds with Layer 2. So a huge question mark over associating the sherds with the Khartoum Neolithic. As mentioned above, Haaland believes that the Jebel Moya complex (at least at Rabak) may have developed out of the local Khartoum Neolithic (Haaland 1989: 364). This is based on the fact that there is an overall gradual trend of the appearance and disappearance of varying ceramic types between the Khartoum Neolithic and late Neolithic levels at Rabak. Indeed, Haaland believed that level 2 at Rabak represented a transition between the Khartoum Neolithic and the late Neolithic. At the site of Jebel Tomat, there is an increase in the frequency of thin burnished sherds through time, as well as an increase of large pots (assumed to be smoothed) with “thick rolled” (exterior thickened) rims (Clark 1973: 58). However, it is important to note that there are no burnished sherds at Rabak.

Based on the sites of Jebel Moya and Rabak, no Kerma or Napatan artefacts have been uncovered at Jebel Moya (Brass 2013). Among the impressed decorated ceramics, dentated (evenly serrated edge) rocker stamped and double pronged decorations (alternate pivoting stamping) were common (for Assemblage 1 and for aspects of Assemblage 3, but not for Assemblage 2 (Brass 2013). As mentioned above, this later decoration is also commonplace in the late Neolithic ceramics of the central Nile valley farther to the north (Geus 1984a; Caneva 1988: 112, 179).

As part of an ongoing programme of research, Brass re-examined the extant archival excavation records held at the Duckworth Laboratory for the first time since Addison. These records were combined with the laboratory’s osteological database to construct a new, updated and expanded Register of Graves for Jebel Moya (Brass 2013). Three assemblages have been determined from the remaining Jebel Moya pottery assemblage at the British Museum, totaling 486 (mostly) rim sherds. None of the assemblages were directly associated with “late Neolithic” as mentioned in earlier publications (Clark 1973, 1984; Haaland 1987). Although there are Jebel Moya-like sherds at both sites, it’s the very unclear dating from each site (shell from Rabak and one Neolithic from Tomat). In short, the chronology of the early occupation of both sites needs revision.

Similar material from Rabak has been discovered near Kawa (40km north of Rabak), and at Soba (30 km south of Khartoum). Surface collection from the White Nile (Dwahiya site near Jebel Awlia), Central and west Gezira (Qoz sites) seem likely to relate to a ‘late’ phase of a Neolithic occupation and this is confirmed at the sites of Kabarao and Qoz Bakheit.

The site of Shaqadud in the western Butana presents a different panorama. Identification of Shaqadud as a Neolithic site is far from the truth; Shaqadud is a complex site, which includes several sub-sites and several occupation phases, including a distinctly “Post-Neolithic” one (Shaqadud Cave). The occupation at the site continues through to ca. 2000BC. Pottery from the site also bears comparison with northern traditions of the third millennium BC, with black and red burnished wares and heavily incised decoration. The Atabai plains east of the Nile in Eastern Sudan increasingly appear as culturally distinct from the riverine areas by the fifth millennium (Mohammed-Ali 1985: 26). Neolithic sites have been located in this area, contemporary with the last half of what has been designated the Kas-sala phase; there occurred a group of over fifty sites termed “Jebel Mokram”. This phase has been generally dated to around 2nd millennium B.C. and is characterized by seasonal occupations of nomadic groups who moved into the Butana and the Atbai (Mohammed-Ali 1985; Fattovich *et al.* 1984: 182).

2. North and East of Central Sudan:

In Lower Nubia, the Abkan “Early” Neolithic is followed by the so-called A-Group culture that has been radiocarbon dated from the mid-4th to the mid-3rd millennium BC. Evidence related to the A-Group culture is located along the Nile between Kubnaniya, north of Aswan in Egypt, and Melik en Nassir, south of the Second Cataract (Nordström 1972). Other evidence was located far west near La-qiya and Wadi Shaw (Lange 2006). Among the main areas, substantial differences in the archaeological remains, such as the typology of the shafts of tombs, pottery, the evidence associated with the burials and other materials included in the grave goods, were noticed.

According to Salvatori (2008: 143), it is possible to recognize the following Neolithic sequence in Upper Nubia:

1. An early Neolithic phase in the cultural sequence of Upper Nubia starting 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 five hundred 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 Kadruka and el-Multaga materials.

Almost nothing is actually known about Upper Nubian cultures during most of the 4th millennium BC. The last date refers to the beginning of the so-called Pre-Kerma period discovered in the Kerma region. The Pre-Kerma period is ra-

diocarbon dated between the end of the 4th millennium and the beginning of the 3rd millennium BC (Honegger 1997).

A small number of sites were located in the Third Cataract region 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 (Edwards and Sadig 2011). Again, identification of sites has depended on the presence of some very distinctive styles of pottery decoration, showing many correspondences with the long-known A-Group of Lower Nubia (Edwards 2004: 66-8), currently best known from the Kerma area (Honegger 2004a; 2004b). In this respect it must be noted that a number of sites where thin scatters of lithics and undecorated sherds were encountered may well be of broadly 'late Neolithic' date; it seems likely that on occasions such material is not always easily distinguishable from similar material dating to the Kerma period.

Some chance finds of polished stone tools, while lacking context, must also be considered as perhaps falling into this period. These include finds of polished stone axes from the Arduan area and a mace-head found beneath Jebel Agetteri. It may also be noted here that two further axes were found by Azhari Sadig on the hill-slopes west of Handikke in 2008. This recent find would seem to be an interesting example of a deliberate caching, or some other form of (ritual?) deposition, of a kind not previously encountered in the Middle Nile.

The region of Wadi Howar and the adjacent areas provide evidence for human occupation between the 6th and 2nd millennia BC. The first traces of human occupation are represented by pottery decorated with dotted wavy line and Laqiya-type patterns, which date to the 6th and 5th millennia BC. Humans practised fishing, hunting and gathering. During the 4th millennium BC, a new mode of subsistence appeared: intensive cattle herding. Leiterband and Halbmondleiterband patterns are typical for the decoration of pottery in this period (Jesse 2008). In Lower Wadi Howar, incised herringbone patterns appeared. With the onset of the Handessi Horizon at around 2200 BC, which is characterized by geometric patterns, a further change in the way of subsistence occurred. In response to increasing aridity, small livestock like sheep and goats were added to the herds. The varying intensity of human activities in different areas of the Wadi Howar region can clearly be attributed to environmental changes. At the beginning of Holocene occupation, all sectors but Middle Wadi Howar which was too wet and marshy were intensively used. With the Leiterband Horizon, the focus of occupation shifted to Middle Wadi Howar. During the Handessi Horizon, the Ennedi Erg

region and Lower Wadi Howar were no longer suited for permanent habitation due to increasing aridity. Lower Wadi Howar was, however, still used as an important thoroughfare. Site distributions show a growing concentration along Middle Wadi Howar after the 3rd millennium BC, thereby reflecting the climatic change with increasing aridity spreading from north to south.

In the further east, surveys beyond the River Atbara have identified many sites on the steppes between the Atbara and the Gash, known as the 'Saroba Phase', for which dates in the 5th millennium BC have been suggested (Fattovich *et al.* 1984). Parts of this area seem likely to have still been swampy, at least on a seasonal basis. The local populations seem to have remained essentially hunter-gatherers, with evidence for the hunting of mainly smaller mammals like small bovids, warthog, and monitor lizards as well as the collection of Pila shells. The eastern region increasingly appeared as culturally distinct from the riverine areas by the 5th millennium BC. Domestic livestock seems to have reached the region fairly later than areas further west, probably in the late 4th millennium BC, and is associated with the 'Butana Group', sites lying along the Atbara and the palaeochannels of the Gash which at that time flowed west to join the Atbara. During this period, the channel of the Gash seems to have progressively moved eastward, reaching its present course in perhaps the 2nd millennium BC. Hunting and the exploitation of aquatic resources were still important among those who may have been relatively sedentary. The pastoral element seems to have become more prominent during the 3rd and early 2nd millennia BC, identified as the 'Gash Group', occupying and exploiting the Gash Delta, with settlements of varied size scattered across the alluvial plain (Edwards 2004: 64). Some have deep *in situ* deposits suggesting that they were stable, long-occupied settlements, while others were quite ephemeral.

Late Neolithic as seen from the recent excavation at es-Sour

The site of el-Sour (16°57'045" N / 33°43'133" E) is located about 35 km north of Shendi, 1.5 km from the right bank of the Nile and west of the Khartoum-Atbara railway (Fig. 1; 3). It was discovered during a field-training season of the Department of Archaeology, University of Khartoum, in February-March 2004. It occupies an area of approximately 176 x 90 m (64 x 90 m for the main kom) and while generally flat, it features two low mounds in its eastern part. The nearby village extends over much of the western part, while the central part of the site has been much disturbed by tracks running across it. Currently, three C14 dates are available² (see above).

² A freshwater mollusk (Nile oyster) shells from levels between 20 and 50cm in squares C6, B13 and F7. Performed at the Radiocarbon Dating Laboratory of University of Waikato, New Zealand,

These dates place the site in the middle Neolithic of central Sudan (labeled in this paper as Late Neolithic Horizon Type A) and perhaps slightly earlier than the oldest dates from el Kadada (GIF-5770: 5170±110 BP) [cal. BC: 3990±160] (Geus 1981).

Following the discovery of the site, surface collections and test excavations were carried out in five seasons (2005-2009). The finds from es-Sour seemed to be scattered over the site with no definite arrangement, except for the greater concentration at depth.

The lithic inventory includes flakes, cores, a few retouched tools, crescents, burins, borers, and grinders. The finished tools are few and poorly made. They exhibit a somewhat limited technological and typological variability. The occurrence and density of artifacts was variable but continuous, from the surface down, although the largest group was concentrated in the top 50 cm of deposits. No polished stone tools and gouges of the type found at El Shaheinab were found, except for two small fragments of granite palettes found on the surface. It is odd, however, that our sample contains only one identifiable, broken polished axe. However, one interesting find was small rhyolite artifacts of characteristic shape and two small hollows on both faces. Their function remains uncertain, although the shape suggests that they may have been used as a fine polishing / grinding tool or palette. The example from es-Sour is very similar to specimens found at el Kadada (Geus 1984a: 69, Fig. 5). Parallels are also known from Eastern Butana and a site near Kassala.

The preliminary analysis of the material revealed a minimum range of rocks used as raw materials (include quartz, sandstone, rhyolite, quartzite, granite, fossil wood, and Hudi chert). Giving the available raw materials used by the inhabitants of es-Sour, it is obvious that their selection was very limited. With exception of granite and rhyolite, the sources of the other rocks could be easily found in large amounts in close locations of es-Sour. Granite and rhyolite were the object of some regular exchange networks along the Nile exploiting the sources of these rocks, for example, at the Sixth Cataract.

The main characteristics of the potsherds are their hard texture, good firing and polished surfaces (Fig. 4). A coloured polished slip was evident in some examples. The decoration generally covers most of the surface, extending to near, or to the rim itself. The predominant surface colour of the sherds is grey through dark grey, to brown and black. Most of the variations in colour appear to be the result of the firing process. The rims are simple in shape with vessels at the site including a range of mainly openmouthed forms. The prevalent vessel forms seem to be medium-size open bowls and hemispherical vessels. Undecorated sherds are often characterized by a scraped or wiped surface, with good burnishing on some examples.



Fig. 3. Es-Sour site: General View and hinterland



Fig. 4. Potsherd from Es-Sour

The ceramic collection from El-Sour included all the techniques and motif types favored in the Khartoum Neolithic of the Central Nile Valley. A variety of techniques was employed, including impressing, incision, rocker stamping and combing, giving in effect a number of ornamental motifs. Rocker stamping was the preferred technique accounting for more than 60% of the total. The impression technique stood for more than 19.5%, incised lines 8.4% and the rest 12.1%. Other Neolithic sites in the area offer a similar picture with rocker stamping predominating: 45% at Geili, 58-72% at Nofalab, and 50% at El Shaheinab. Similar decorative patterns and/or techniques are found at other Neolithic sites in the Central Sudan, especially at Zakiab and Um Direiwa. At Kadero, however, rocker stamping accounts for 36% of the total, while incised motifs account for more than 18% (against 8.4% at El-Sour). Rippled pottery is less abundant than at el Kadada. The undecorated sherds are often characterised by a scraped, or wiped surface, although they are often burnished. They relate mainly to quite coarse, black-topped red wares. Such black-topped red wares have been found at Esh Shaheinab (Arkell 1953: 75) and Geili (Caneva 1988, 110). They are also reported to have been quite common at Kadero (Krzyżaniak 1984), el Kadada and among the pottery assemblage of the A-Group of Lower Nubia (Nordström 1972: 88-89) and are consistent with the relatively late date suggested for the site at es-Sour. The ceramic collection from es-Sour included all the techniques and motif types favoured in the Khartoum Neolithic of the Central Nile Valley. A variety of techniques were employed. These include impressing, incising, rocker stamping and combing, resulting in a number of motifs.

The character of the pottery assemblage from es-Sour needs to be further explored, not least because so much of our published comparative data relates to assemblages derived from cemeteries (*e.g.* el Kadada or el Ghaba), which cannot be seen as 'typical' and may differ significantly from those from settlement sites. The relative abundance of pottery and good preservation of much of it, provides an excellent opportunity to increase our understanding of the range of Neolithic pottery in use on settlements sites during this period.

Other finds of potential importance were many fragments of human figurines (Fig. 5). Some of them represent human heads, with no prominent features, very similar to examples found at el Kadada (Geus 1984a: 22). The hair of one figurine is decorated with rippled decoration. The others are incomplete human figurines, each one comprising the torso of a female body. Unfortunately, the upper and lower parts of the figurines were lost. The purpose of these pottery figurines remains unclear, although it is often assumed that they have a religious significance.



Fig. 5. Human Figurines from Es-Sour

Other artifacts were rare at el-Sour. Very few beads made of egg-shell, carnelian beads, lip-plugs, a single shell object used as a comb for decorating pottery and one ivory artifact were recorded. The ivory tool could have been used as an awl/perforator, but it could have been equally well a personal adornment. Other typical Neolithic bone artifacts, such as harpoons and gouges, were not found. Bone tools are absent from most other Neolithic sites in Central Sudan, although recent finds in more arid areas further north have suggested that this may be due to poorer preservation.

Faunal remains consisted of bones of wild and domesticated animals including domesticated cattle, giraffe, buffalo as well as numerous remains of shells. This identification was carried out by Prof. Achilles Gautier who based his identifications on photographs of the remains.

Late Neolithic Pot-Burials

At present the earliest evidence of pot-burial in the Middle Nile Region goes back to the Late Neolithic. At el Kadada, extensive remains revealed the first example of pot-burial, shows a particular ritual for the burial of children, all deceased, before the age of six years (Reinold 2000: 72-73). The superposition of plan in curves of levels with the plan of the burial distribution permits the identification of two cemeteries occupying the slopes of the terrace. These

two cemeteries contain only adult's burials. They are situated on the hillside in border of the terrace. The top of this terrace is flattened and defines a space of about 900 m² which was devoted for settlement. On this occupation site, seventeen vase burials were found sparsely distributed around the main mound of the site, essentially bordering the inhabited area. Their distribution is very sparse and cannot be attributed to a cemetery, the conclusion is reached that these children were buried inside or on the border of the houses. The burials did not appear to conform to a particular spatial organization, as some were isolated, while others occurred adjacent to another, and others were cut into slightly earlier pot burials.

Few other objects are found in these graves and are not representative compared with those from adult burials. The pottery vessels appear to have been previously used and are sometimes broken (urns sometimes have a pierced base). The objects were deposited on or underneath the bodies or were placed against the walls of the vessels. They included mollusc shells, beads, items of amazonite, agate, carnelian, and quartz, elephant ivory bracelets, pottery, and fragmentary and complete palettes.

I think Reinold's most significant contribution in his study was to determine the ages of the infants interred in pots. Reinold writes: "Malgré la très mauvaise conservation de ces squelettes, il est possible de déterminer que ce mode d'inhumation s'applique pour les nouveau-nés et les enfants jusque vers l'âge de cinq ou six ans ... Le statut d'inhumation en plein terre (i.e., the adult burials) à el Kadada, intervenant pour les sujets d'âge supérieur à six ans, correspond probablement à une étape dans la vie de l'adolescent (initiation...). (Reinold 1985: 281).³ The latter idea is, I think, a fascinating one, and although not developed further by the author, could supply a logical reason for the infant vase burial in both es-Sour (see below) and el Kadada contexts. I will take the idea one step further to suggest that the enclosure of an infant in the vase could be symbolic of the enclosure of the individual in a womb, suggesting perhaps that the person was still considered in a child-like state or closer to childhood than, as Reinold implies, an individual who had already undergone an initiation procedure towards adolescence or adulthood. Such an ideology would adequately explain why older children and adults were not buried in vases.

³ "Despite the very poor preservation of these skeletons, it is possible to determine that this method of burial applies to children up to the age of five or six years ... The status burial ground in the open (the adult burials) in el Kadada, speaking for subjects aged more than six years, is probably a step in the life of the adolescent (initiation. ...)"

Bacvarov (2008) notes that the majority of pot burials found in south-eastern Europe are believed to have been still births, though some have been found to contain individuals up to six years old. Similarly, in the southern Levant pot burials have been documented with age ranges from fetal to ten years old (Orrelle 2008). However, a Lebanese burial site from the Chalcolithic period (4000-3150 BC) revealed that of 2097 burials, 2059 were pot burials that did not show any age based selection for the use of pot burials since nearly half of those found were adults (Artin 2008). The higher occurrence is likely attributed to the fact that a smaller body is easier to fit into the vessel, indicating that perhaps pot burials hold practical and symbolic meaning.

Orrelle (2008) examined pot burials in the southern Levant with the aid of ethnographic data from modern populations. Pot burials are used by some modern communities in northern Sudan for stillborn births and in Zimbabwe for stillborn and aborted fetuses. In both of these communities Orrelle (2008) makes the observation that pot burials symbolize the womb; however these two cultures view it in a different context. The Sudanese population views the pot as a metaphor for the ideal womb, protective and watertight, which would not have resulted in a stillborn fetus; while in Zimbabwe the pot is not intended to represent idealized protection, but rather a womb that has not yet given birth. The Zimbabweans place the pot burial in a dry riverbed, resulting in the body being washed out of the pot during rain, symbolizing birth (Orrelle 2008).

Although the extensive archaeological research has considerably extended the amount of knowledge on the Neolithic burial rite, only recently other evidences were discovered for this practice. Most new findings come from es-Sour (Fig. 6-7) and Qalat Shanani (Nassr 2012). Although preliminary reports, contains the new information of pot-burials, has been published since 2005 (Sadig 2005; 2008a; 2008b; 2010), the new data were not mentioned by Reinold in his last publication when he stated that “no other site in Central Sudan or Upper and Middle Nubia has provided this type of burial, but this custom is found in Lower Nubia” (Reinold 2008).

A preliminary study of es-Sour material has been undertaken so far, but it is difficult to draw comparisons between this material and the el Kadada pot burials because so few examples are known in the former case and these have not been as well reported as those at el Kadada. One important discovery at the site was evidence of pot-burials. Four pot-burials were discovered at es-Sour. The four pots containing the burials are large and decorated. One of these pot-burials lacked any kind of grave goods.

The offerings associated with three of the burials include:

1. Offerings placed directly into the funerary vase (in one case these included fragments of ostrich eggs, shells and one bead.
2. Offerings placed inside and outside the pot (internal offerings include small grinder, pounder, beads, and shells. External offerings include lower and upper grinding stones found just beside the pot.
3. Offerings placed directly into the funerary vase. These contain two complete bowls and a single shell.

The graves themselves were simply hollowed-out pits near the habitation area. Reinold stated that at el Kadada the vase burials “...ne semblent pas faire l’objet d’un rituel important” (Reinold 1985: 279-289).⁴ I would argue, however, that the discovery of objects inside the vases with the bodies indicates that some sort of funerary ritual was associated with the infant pot burials, whether we think of it as ‘important’ or not.

Later evidences of pot burials are very limited. Comparative material for A-Group infant pot burials is very sparse. Except for the occasional occurrence of an infant pot burial, children were generally given a burial treatment similar to that of adults. Generally older children were buried in pits, albeit in much smaller graves than those used for adults. Children were also buried with male and/or female adults, with no evidence of what the factors were in the choice of this type of burial over the independent child burial. A-Group infant pot burials did occur in direct association with adult burials, such as in Grave 60 at Cemetery 148 near Jebel Um Simbela (Firth 1927: 228). A newly-born infant was placed in a thin red-polished bowl at the feet of the adult in the grave. Both burials appear to have been made simultaneously. Again, unless one advocates sacrificial burial, this type of situation can only indicate a death of the mother during childbirth in which the infant was stillborn.

The inclusion of objects inside A-Group pot-burials has not been noted. If this was not an oversight on the part of excavators, could it indicate that el Kadada and es-Sour perhaps represent a more evolved form of the infant pot burial?

The burial type is known nowhere else in Nubia and the Sudan except at el Kadada and es-Sour, but it is also known in the Naqada II phase in Egypt (Cenival 1973: fig. 39). One infant burial was found inside a vase at el-Amrah (Vandier 1952: 237-238), without grave offerings of any kind. In his “Manuel d’archéologie Égyptienne”, J. Vandier emphasizes that the practice was almost exclusively reserved for children (Vandier 1952: 237-238 and fig. 151). Ikram (2003) also notes

⁴ “does not appear to be an important ritual”.

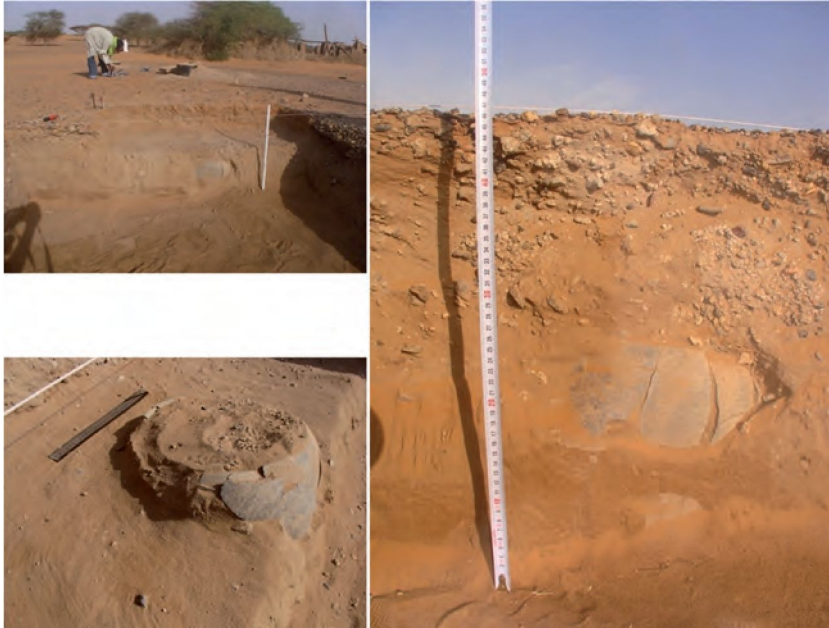


Fig. 6. Pot-Burials from Es-Sour 1



Fig. 7. Pot-Burials from Es-Sour 2

the use of pots and even baskets for burials in predynastic Egypt. The use of pots has been attributed to a desire for cheap ready-made receptacles instead of more elaborate labour intensive coffins.

At Abydos at least one infant in a pot was found interred with grave goods consisting of a wavy-handled pot and two additional vessels (Vandier 1952: 238). Vandier has also noted that in undisturbed graves containing infant pot burials, there was a definite preference for a southward orientation of the vessel opening. This feature has not been noted in the A-Group, es-Sour or el Kadada examples. A few other examples were from Kubanieh (Junker 1920: 39) and other sites excavated during the major surveys of 1907-1911. Between Meris and Markos traces of a camp were discovered belonging to the late phase of the Predynastic Period. One tomb (No. 404, Cemetery 41) consisting of a large pit covered by a large bowl forming a lid. It contained a child's skeleton and two small pots (Reisner 1910: 219). The other example (Firth 1927: pl. 25 e, f) is Tomb 23 in cemetery 110 and dated back to the C-Group or the Kerma period.

As yet no Neolithic adult burials have been found and the area of the site so far investigated would seem to represent a settlement area. As at el Kadada, child burials, which the pot-graves represent most likely, may have been buried within the settlement area, apart from the main cemetery. Further excavations will be required to determine whether any structural features survive on the site, although it is possible that it has been severely deflated. More testing and survey work is also needed to see if there is an associated cemetery in the vicinity. In the absence of radiocarbon dates the exact date of the site remains as yet uncertain, although there are enough similarities with material from sites such as el Kadada to suggest a date in the later Neolithic period (late 5th-4th millennium BC).

The most distinctive features of the El-Sour material suggesting a date in the later Neolithic include the high flake index, pottery decoration styles, special types of lithic artifacts and potburials, along with carnelian beads and human figurines. Gouges, a typical tool at earlier sites such as Esh Shaheinab, are absent. However, the character of the pottery assemblage needs to be further explored, not least because so much of our published comparative data relates to assemblages derived from cemeteries (e.g. el Kadada or el Ghaba) which cannot be seen as 'typical', and may differ significantly from those from settlement sites. Such differences may also explain the absence of items such as polished stone axes, mace-heads and palettes (all likely to be prestige objects) from this settlement site. similar to other Neolithic sites in Central Sudan but the potential differences deserve additional investigation.

The evidences from es-Sour prove that the early pot-burial development in the Middle Nile Region displays two distinct chronological levels:

1. A Late Neolithic core area in el Kadada and es-Sour
2. Later post-Neolithic manifestations scattered in Lower Nubia. The practice is known to have continued into the C-Group, where pot burials were made outside the family tomb, and beyond, Firth suggests that this was merely a matter of convenience. He writes: "Burials of newly born infants appear to have been often made in household bowls, filled with sand, charcoal and earth, and these bowls were then buried just outside the superstructure wall of the family tomb. No doubt it was not thought worthwhile to unseal the doors to the funerary chambers for the sake of an infant." (Firth 1927: 49). Other examples were recorded in the fortress of Askut (c. 1850-1070 BC, New Kingdom/Third Intermediate Period), located a little upstream of the Second Nile Cataract in Sudan (Britton 2009). Seven fetal skeletons (dated c. 1260-770 BC) were examined for their biocultural significance. These individuals, all interred in ceramic pots, were excavated from the pomaerium (the religious/sacred boundary or symbolic wall) of Askut's fortress. The interment style and burial location indicate that these individuals were treated differently in comparison to the children and adults of Askut, who were most likely buried in the cemeteries along the banks of the Nile.

Both the age and location of the pot burials from Askut hold suggestions for social treatment of fetuses. It may have been beneficial to populations in the past to bury fetuses or infants in pots as ceramic vessels were less costly and labour intensive to produce than coffins. This suggests that such skeletons would not receive the same funerary rituals as people who had been more integrated into society, especially when considering implications of cultural views on fetuses - that they were not fully integrated into society or viewed as nonpersons as described by Reinold (2008).

Another example was noted by Francigny (2009) at site 8-B5.A in Sai. He mentioned that it is most likely that at the beginning of the Christian era, the Meroitic grave shafts could be easily recognized, due to their sandy fills. Thus, people from that period would have taken advantage of these spots, which were relatively easy to dig, in order to deposit fetal and stillborn burials (Francigny 2009: 96). The greater part of the burials was made in pottery vessels. Fetal and stillborn babies were placed in amphora or cooking pots.

As noted above there is much evidence for pot-burials outside the Nile valley dating from the late seventh millennium BC in Anatolia to about AD 500 and

later in Albania, Italy and elsewhere. These show much more variability of this funerary practice. Some of pot-burials were located inside the houses, and others were placed within adult cemeteries. It is obvious, on the current evidence, that the sites of es-Sour and el Kadada represent the oldest attestation of pot-burials along the Nile Valley known so far. The es-Sour dates are younger than those of el Kadada, though this does not prove that the origin of this practice is to be sought in the latter site.

General remarks

The Neolithic of the Sudan has been formed through gradual changes among early Holocene hunter-gatherers. Certain elements of Neolithic life like pottery production continued from the preceding local culture. Other aspects such as a pastoral lifeway are thought to be introduced by inter-regional contacts. The people at Esh Shaheinab had domesticated goats and cattle about 6000 years ago but fishing was still important and they had pottery similar to that of their hunter-gatherer predecessors at the site of the Early Khartoum in the same region.

The late Neolithic development of the central Nile Valley represent a wide distribution of post-Khartoum Neolithic cultures (*ca.* 4000 BC) which extended from the Shendi Reach south of the Atbara River down to the southern Gezira Plain between the White and the Blue Nile. These cultures can be grouped into four distinct regional manifestations:

The first of which existed in the Shendi Reach area and is associated with the sites of el Kadada (Geus 1984a; 1984b), and Es-Sour (Sadig 2010). The second existed in the Khartoum province and is primarily associated with Late Neolithic burials at Esh Shaheinab, Omdurman Bridge, and el Geili, (Arkell 1949; 1953; Caneva 1988). The third regional manifestation of the late Neolithic existed in the Butana and is associated with the site of Shaqadud (Marks and Mohammed-Ali 1991) and in the southern Gezira Plain and associated ceramics from Jebel Moya and Jebel Tomat (Clark 1973), the later occupation at Rabak (Haaland 1987) and maybe the Blue Nile (Fernandez *et al.* 2003).

The first two late Neolithic developments in Shendi and the Khartoum province appear to be very closely related to one another and, for all practical purposes, probably represent a single facies which contained two or more culture groups (Caneva 1988: 163-187). The third development, associated with the southern Gezira Plain, appears to represent another facies which does not share as many common elements as do the first two. It is very likely that this particular facies is later in time than the other developments in the Shendi Reach area and the Khar-

toum province. The common denominator among these late Neolithic developments within the central Nile Valley is that they were indigenous to the region and probably evolved out of an earlier Khartoum Neolithic base (Geus 1984a; 1984b; Haaland 1987; Caneva 1988).

The evidences from areas south of Khartoum (University of Khartoum Survey along the White Nile) (Eisa 1999), suggest that there might have been a wide-spread late Neolithic occupation along both Niles (White and Blue Niles (Fernandez *et al.* 2003) and in the hinterlands away from them. Levels at Rabak site are datable to the fourth millennium BC (Haaland 1987: 45). Link with interior of Gezira are indicated by the presence of very similar pottery at Jebel Moya, Jebel Tomat and other sites (Haaland 1984). The Jebel Moya pottery found at Rabak has one associated date in the uppermost layer, early 3rd millennium BC. The occupation at Tomat continued into the 3rd millennium BC (later than any Late Neolithic site in the Khartoum-Shendi region). Shells from the site, found at a depth of 60-80 cm, in a soil pit dug by Williams in December 1971, yielded a date of 4540±200 years BP [cal. BC: 3250±260] (in Clark 1973: 57). This may be an indication that the beginning of the settlement may be as early as 3000 B.C. but the date should be treated with caution until it can be verified.

Potentially, even later material has also been found in a single burial on the edge of Jebel Makbor, ca. 5km away from the river (Lenoble 1987). There, a contracted burial beneath a stone cairn was associated with pottery which has similarities with material of the late third and second millennia BC from Dongola Reach. According to the findings at the 4th Cataract, the finds from Jebel Makbor are apparently of Kerma horizon and influence. This may point out to an emergence of different burial custom in the edge of Butana, dating back to the end of the second millennium BC.

The sites of el Kadada, Jebel Tomat, Shaqadud Cave, and Jebel Moya offer a different panorama, with dates in the 4th and 3rd millennia BC. The current Jebel Moya chronology is early 5th millennium BC, 3000-800 BC, and 800-100 BC (Brass per. comm. 2011). Shaqadud Cave sheds more light on the chronology of Central Sudan since Shaqadud Cave is the only site that survived during the late 2nd millennium BC.

There are also some surface sites discovered along the Begrawiya-Atbara road during a survey which contain some material stylistically similar to the 3rd millennium pottery at Shaqadud (Mallinson 1996). These sites need a detailed study but their existence holds potential for future investigation of the cultural history of Central Sudan.

It must be kept in mind that the Neolithic culture in Sudan is characterized by the slow spread of several cultural traits across different environments in different periods as it seen from northerner and eastern hinterlands. Discussion on the spread of late Neolithic goes beyond these spatial, chronological and cultural limitations. Moreover, in Central Sudan around Khartoum, the development of Neolithic economy and society is generally due to increasing emphases on herding, while in northern and eastern Sudan as well as the western environs much evidence demonstrates the extension of long occupation during the 5th-2nd millennia BC.

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REFERENCES

- ADDISON, F. 1949. *Wellcome Excavations in the Sudan: I, Jebel Moya, 1910-1914*. Oxford. .
- ARKELL, A. J. 1949. *Early Khartoum. An Account of the Excavation of an Early Occupation Site Carried Out by the Sudanese Government Antiquities Service in 1944-5*. London.
- ARKELL, A. J. 1953. *Shaheinab. An Account of the Excavation of a Neolithic Occupation Site Carried Out for the Sudan Antiquities Service in 1949-50*. London.
- ARTIN, G. 2008. "The Jar Burials of the Chalolithic "Necropolis" at Byblos". In: K. Bacvarov (ed.), *Babies Reborn: Infant/Child Burials in Pre-and Protohistory*: 79-85. Oxford.
- BACVAROV, K. 2008. A Long Way to the West: Earliest Jar Burials in Southeast Europe and the Near East. In: K. Bacvarov (ed.), *Babies Reborn: Infant/Child Burials in Pre-and Protohistory*: 61-70. Oxford.
- BRASS, M. 2013. Jebel Moya (Sudan): New dates from an agro-pastoral cemetery on the southern Meroitic frontier. *Azania*. In print.
- BRITTON, L. R. 2009. *A biocultural Analysis of Nubian Fetal Pot Burials from Askut, Sudan*. MA manuscript. Orlando. Department of Anthropology in the College of Sciences at the University of Central Florida.
- CENIVAL, J. L. DE. 1973. *L'Égypte avant les Pyramides, 4e millénaire*. Paris.
- CANEVA, I. (ed.). 1983. *Pottery Using Gatherers and Hunters at Saggai (Sudan): Preconditions for Food Production*. Origini XII. Rome.

- CANEVA, I. (ed.). 1988. *El-Geili. The History of a Middle Nile Environment 7000 B.C.– A.D. 1500*. BAR International Series 424. Cambridge Monographs in African Archaeology 29. Oxford.
- CANEVA, I. 2002. Second Millennium B.C. Pastoral Cultures in the Nile Valley: The Ghosts of the Khartoum Province?. In: Jennerstrasse 8 (ed.), *Tides of the Desert. Contributions to the Archaeology and Environmental History of Africa in Honour of Rudolph Kuper* (= Africa Praehistorica 14): 231-238. Köln.
- CLARK, J. D. 1973. Recent Archaeological and Geomorphological Field Studies in the Sudan: Some Preliminary Results. *Nyame Akuma* 3: 56-64.
- CLARK, J. D. 1984. Prehistoric Cultural Continuity and Economic Change in the Central Sudan in the Early Holocene. In: J. D. Clark and S.A. Brandt (eds.) *From Hunters to Farmers. The Causes and Consequences of Food Production in Africa*: 113-126. Berkeley.
- CLARK, J. D and A. STEMLER. 1975. Early Domesticated Sorghum from Central Sudan. *Nature* 254: 588-591.
- EDWARDS, D. N. 2004. *The Nubian Past. An Archaeology of Sudan*. London.
- EDWARDS, D. N. and A. M. SADIG. 2011. The Later Prehistoric Archaeology. In: Ali Osman and D. N. Edwards (eds.) *The Archaeology of a Nubian Frontier. Survey on the Nile Third Cataract, Sudan*: 37-58. England.
- EISA, K. A. 1999. The White Nile Archaeological Survey Project. In: D. A. Welsby (ed.) *Recent Research in Kushite History and Archaeology. Proceedings of the 8th International Conference for Meroitic Studies* (= British Museum Occasional Paper 131): 267-268. London.
- FATTOVICH, R., MARKS, A. E. and A. MOHAMMED-ALI. 1984. The Archaeology of the Eastern Sahel: Preliminary Results. *The African Archaeological Review* 2: 173-188.
- FERNÁNDEZ, V. M., JIMENO, A. and M. MENÉNDEZ. 2003. Archaeological excavations in prehistoric sites of the Blue Nile area, Central Sudan. *Complutum* 14: 273-344.
- FIRTH, C. M. 1927. *The Archaeological Survey of Nubia. Report for 1909-1911*. Le Caire.
- FRANCIGNY, V. 2009. The Meroitic Necropolises of Sai Island: First Season at the Meroitic Cemetery 8-B-5.A?. *Sudan and Nubia* 13: 92-96.
- FULLER, D. and E. HILDEBRAND, E. In press. Domesticating plants in Africa. In: P. Mitchell and P. Lane (eds.) *Oxford Handbook of African Archaeology*.
- GERHARZ, R. 1994. *Jebel Moya* (= Meroitica 14). Berlin.

- GEUS, F. 1981. Franco-Sudanese Excavations in the Shendi Area (1980). *Nyame Akuma* 18: 37-42.
- GEUS, F. 1984a. *Rescuing Sudan's Ancient Cultures. A Cooperation between France and the Sudan in the Field of Archaeology*. Khartoum.
- GEUS, F. 1984b. Excavations at el Kadada and the Neolithic of the Central Sudan. In: L. Krzyżaniak and M. Kobusiewicz (eds.), *Origin and Early Development of Food-Producing Cultures in North-Eastern Africa* (= *Studies in African Archaeology* 1): 361-372. Poznań.
- HAALAND, R. 1978. The Seasonal Interconnection between Zakiab and Kadero: Two Neolithic Sites in the Central Sudan. *Nyame Akuma* 13: 31-35.
- HAALAND, R. 1979. Report on the 1979 Season in the Sudan. *Nyame Akuma* 14: 62.
- HAALAND, R. 1984. Continuity and Discontinuity. How to Account for a Two Thousand Years Gap in the Cultural History of the Khartoum Nile Environment. *Norwegian Archaeological Review* 17: 39-51.
- HAALAND, R. 1987. *Socio-economic Differentiation in the Neolithic Sudan*. BAR International Series 350. Cambridge Monographs in African Archaeology 20. Oxford.
- HONEGGER, M. 1997. *Kerma: l'agglomération Pré-Kerma*: 113-118. Genava 45.
- HONEGGER, M. 2004a. The Pre-Kerma Settlement: New Elements Throw Light on the Rise of the First Nubian Kingdom. In: T. Kendall (ed.), *Nubian Studies 1998. Proceedings of the Ninth Conference of the International Society of Nubian Studies. August 21-26, 1998. Boston, Massachusetts*: 83-94. Boston.
- HONEGGER, M. 2004b. Settlement and Cemeteries of the Mesolithic and Early Neolithic at el Barga (Kerma Region)? *Sudan and Nubia* 8: 27-32.
- IKRAM, S. 2003. *Death and Burial in Ancient Egypt*. London. Longman.
- JESSE, F. 2008. Time of Experimentation? The 4th and 3rd millennia BC in Lower Wadi Howar, Northwestern Sudan. In: *Between the Cataracts. Proceedings of the 11th Conference for Nubian Studies. Warsaw University, 27 August – 2 September 2006. Part One. Main Papers, PAM Supplement Series Vol. 2.1*: 49-74. Warsaw.
- JUNKER, H. 1920. *Bericht Über die der Akademie der in wien auf den Friedhofen von El- Kubanieh-Nord, Winter 1910-1911*. Wien.
- KHABIR, A. M. 2006. Radiocarbon Dates of Islang 2 and Nofalab 2. Neolithic Sites in Khartoum Province, Sudan. *Aus der Archäologie* 17: 117-120.
- KRZYŻANIAK, L. 1984. The Neolithic Habitation at Kadero (Central Sudan). In: L. Krzyżaniak and M. Kobusiewicz (eds.), *Origin and Early Development*

- of Food-Producing Cultures in North-Eastern Africa* (= Studies in African Archaeology 1): 309-315. Poznań.
- LANGE, M. 2006. *Wadi Shaw – Wadi Sahal: Studien zur holozänen Besiedlung der Laqiya-Region (Nordsudan)* (= Africa Praehistorica 19). Cologne.
- LENOBLE, P. 1987. Quatre tumulus sur mille du Djebel Makbor A.M.S. NE-36-0/3-X-1. *Archéologie du Nil Moyen* 2: 207-247.
- MALLINSON, M. D. S. 1996. *Road Archaeology in the Middle Nile*. Vol. 1. London.
- MARKS, A. E. 1984. Butana Archaeological Project: 1983/84. *Nyame Akuma* 24/25: 32-33.
- MARKS, A. E. 1991. Relationship between the Central Nile Valley and the Eastern Sudan in Later Prehistory. In: W. V. Davies (ed.), *Egypt and Africa, Nubia from Prehistory to Islam*: 30-39. London.
- MARKS, A. E and A. MOHAMMED-ALI. 1991. *The Mesolithic and Neolithic of Shaqadud*. Sudan. Dallas.
- MARKS, A. E., MOHAMMED-ALI, A., J. and R. ROBERTSON. 1985. The Prehistory of the Central Nile Valley as Seen from Its Eastern Hinterlands: Excavations at Shaqadud, Sudan. *Journal of Field Archaeology* 12 (3): 261-278.
- MOHAMMED-ALI, A. S. 1985. The Later Prehistory of Eastern Sudan. In: M. El Bedawi and D. Sconyers (eds.), *Sudan Studies Association. Selected Conference Papers 1982-1984, Washington/D.C.*: 21-31.
- NASSR, A. H. 2012. Qalaat Shanan: a Large Neolithic Site in Shendi Town. *Sudan and Nubia*. Bulletin No. 16: 8-12.
- NORDSTRÖM, H. A. (ed.). 1972. *Neolithic and A-Group Sites. The Scandinavian Joint Expedition to Sudanese Nubia*. Vol. 3.1. Uppsala.
- ORRELLE, E. 2008. Infant Jar Burials-A Ritual Associated with Early Agriculture?. In: K. Bacvarov (ed.), *Babies Reborn: Infant/Child Burials in Pre-and Protohistory*: 71-78. Oxford.
- REINOLD, J. 1985. La nécropole néolithique d'el-Kadada au Soudan Central: les inhumation d'enfants en vases. In: F. Geus and F. Thill (eds.), *Mélanges Offerts à Jean Vercoutter*: 279-289. Paris.
- REINOLD, J. 2000. *Archéologie au Soudan-Les Civilisations de Nubie*. Paris.
- REINOLD, J. 2008. *La nécropole néolithique d'el-Kadada au Soudan central - Les cimetières A et B (NE-36-O/3-V-2 et NE-36-O/3-V-3) du kôm principal*. Paris.
- REISNER, G. A. 1910. *The Archaeological Survey of Nubia. Report for 1907-1908*. vol. I. Archaeological Report. Cairo.
- SADIG, A. M. 2004. *The Neolithic of Nubia and Central Sudan. An Intra-Regional Approach*. PhD manuscript. Khartoum. University of Khartoum.

- SADIG, A. M. 2005. Es-Sour: a Late Neolithic site near Meroe. *Sudan and Nubia* 9: 40-46.
- SADIG, A. M. 2008a. Es-Sour: a Neolithic site near Meroe, Sudan. Antiquity Project Gallery, <http://www.antiquity.ac.uk/ProjGall/sadig/index.html>, *Antiquity* 82/316.
- SADIG, A. M. 2008b. Pottery from the Neolithic Site of es-Sour. *Sudan and Nubia* 12: 13-16.
- SADIG, A. M. 2010. *The Neolithic of the Middle Nile Region. An Archaeology of Central Sudan and Nubia*. Nile Basin Research Programme Publications. University of Bergen. Norway.
- SADIG, A. M. 2012. Chronology and Cultural Development of the Sudanese Neolithic. *Beiträge zur Sudanforschung* 11: 137-184.
- SADIG, A. M. 2013. Reconsidering the 'Mesolithic' and 'Neolithic' in Sudan. In: N. Shirai (ed.) *Neolithisation of Northeastern Africa. Studies in Early Eastern Production, Subsistence and Environment* 16: 5-22. Berlin.
- SADR, K. 1990. Les Medjaou dans le sud de l'Atbai. *Archéologie du Nil Moyen* 4: 63-86.
- SALVATORI, S. 2008. Relative and Absolute Chronology of R12 Cemetery. In: S. Salvatori and D. Usai (eds.) *A Neolithic Cemetery in the Northern Dongola Reach. Excavations at Site R12* (= Sudan Archaeological Research Society Publication Number 16): 139-146. Oxford.
- SHINNIE, P. L. 1967. *Meroe: A civilization of the Sudan*. London.
- VANDIER, J. 1952. *Manuel d'archéologie Égyptienne, t. 1, Les époques de formation*. Vol. 1. La Préhistoire. Paris.
- WILLIAMS, B. B. 1986. *The A-Group Royal Cemetery at Qustul: Cemetery L*. The University of Chicago Oriental Institute Nubian Expedition Vol. III. Chicago.
- WINCHELL, F. 2013. *The Butana Group ceramics and their place in the Neolithic and Post- Neolithic of Northeast Africa* (= British Archaeological Reports, Cambridge Monographs in African Archaeology 83). Oxford.