The Stone Age Archaeology of the Sudan

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Abstract:

This article provides a general reading of the Stone Age archaeology of the Sudan, focusing on presenting the general features of the three Stone Age periods: the Paleolithic age, the Mesolithic age, and the Neolithic Age. The Stone Age period in Sudan was distinguished by a unique diversity of archaeological sites and material remains. Despite the limited information relating to the Paleolithic period, there is increasing evidence from later periods on the forms of social and economic organization. During the Mesolithic and Neolithic ages, ways of living developed and the exploitation of environmental areas by diverse human groups organized as close as possible to family groups (or bands), which paved the way for the emergence of villages and chiefdoms and then the state during the following Bronze Age period.

Keywords: Sudan, Paleolithic, Mesolithic, Neolithic, Nubia, the Nile, Early Khartoum, Red Sea, Shaheinab

آثار العصر الحجري في السودان

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ملخص:

يقدم هذا المقال قراءة عامة لآثار العصر الحجري في السودان، مع التركيز على تقديم السمات العامة لفترات العصر الحجري الثلاثة: العصر الحجري القديم، والعصر الحجري الوسيط، والعصر الحجري الحديث. تميزت فترة العصر الحجري في السودان بتنوع فريد من نوعه في المواقع الأثرية والبقايا المادية. على الرغم من المعلومات المحدودة المتعلقة بالعصر الحجري القديم، هناك أدلة متزايدة من فترات لاحقة على أشكال التنظيم الاجتماعي والاقتصادي. خلال العصر الحجري الوسيط والعصر الحجري الحديث، تطورت طرق المعيشة واستغلال المناطق البيئية من قبل مجموعات بشرية متنوعة منظمة أقرب ما يمكن من المجموعات العائلية (أو الجماعات) ، مما مهد الطريق لظهور القرى والمشيخات ثم الدولة خلال فترة العصر البرونزي التالية.

الكلمات الدالة:السودان، العصر الحجري القديم، العصر الحجري الوسيط، العصر الحجري الحديث، النوبة، النيل، الخرطوم المبكرة، البحر الأحمر، الشهيناب

Introduction:

This article deals briefly with the cultural developments that Sudan witnessed during the Stone Age period, through archaeological discoveries, especially those that took place during the twentieth century. Despite the archaeological surveys and excavations that took place in many regions of Sudan, there are still many outstanding issues, especially with the focus of archaeological research on the riverine regions. This article is based on many specialized research and studies that cannot be fully reviewed in this article (as an example of these studies: Arkell, 1949, 1953, Mohammed-Ali. 1982, Sadig. 1999. 2010, 2017, 2020, Garcea 2020). These studies contributed to giving a general perception of the archaeology of the Stone Age in Sudan, and we present a general summary of it in this article.

1. Stone Age of Sudan: Paleoenvironmental Conditions:

The cultural and chronological stages of the Stone Ages used by archaeologists are directly influenced by the chronology of paleoclimatic development, and to some extent by the geological chronology. The Stone Age begins 3.3 million years ago, during what is called the "Paleolithic Age", and it is divided into several stages.

During the Stone Age, Sudan witnessed many fluctuations in the climate, and they occur within a general framework of successive wet and dry cycles that have been traced during the past 300,000 years. The Pleistocene corresponds to many changes in rivers in Sudan, especially the White Nile. It was more like a lake than a slow-flowing river as it is today (Williams 2019) and was called the White Nile Paleolake, which reached its maximum during the last glacial period about 110,000 years ago.

Evidence also pointed to numerous floods of the Blue and White Niles and major river formations from the Pleistocene period in Atbara River, dated to about 126000 and 92000 years ago. Later, during the last maximum ice age 23,000-19000 years ago, the flow of the Nile decreased, Lakes Victoria and Albert in East Africa no longer flowed into the White Nile, and the Nile's main flow stopped throughout the year. About 18,000 years ago, most parts of sub-Saharan Africa and parts of North Africa were uninhabitable due to severe aridity. A brief phase of relatively high flow occurred in the White Nile at about 20,000 years ago in a period that saw the emergence of many sand dunes (Williams 2019 in Garcea 2020).

The most important periods of climate change occurred with the beginning of the Holocene era (about 10.000), which was characterized by humid climates and heavy rains in those areas and thus contributed to the develop-

ment of human settlements along Sudan. Shortly after about 12,500 years ago, rainfall increased in the tropics resulting in the flooding of Lake Victoria and Lake Albert resulting in "dramatic and enduring changes in the lower White Nile valley" (Williams et al. 2000, 310). Although there was a short dry period about 9000 years ago, this aridity did not last long, and the humid climates returned to the desert before 8000 years ago.

During these Holocene wet periods (between 10,000 and 5500 BC), intensive hunting and gathering cultures known as the Mesolithic (or later Epipaleolithic) cultures prevailed in most parts of Sudan, and then the beginning of the transition to the period of food production known as the Neolithic period, which was characterized by important economic changes (especially the animal husbandry such as cattle, sheep and goats) and technical changes (the development of pottery and stone industries), as well as various cultural and social transformations that will be discussed later.

The western tributaries of the Nile (Wadi Hawar and Wadi al-Malik) had become important waterways by 7300 BC that connected western Sudan with the Nile Valley (Pachur and Kröpelin 1987). The flow of water in Wadi Hawar continued even after 4000 BC, when the surrounding areas became desert, and the population was concentrated in the valley's path.

Over the past five thousand years or so, the climate in much of the Nile Basin has become increasingly dry with the development of conditions comparable to the present. Recent work in Dongola, northern Sudan, has revealed dramatic changes in the geomorphology of the valley floor and human use of the river environment during the Neolithic, Kerma civilization (about 2500 to 1500 years BC) and later periods (Woodward et al. 2001).

2. Fossils Record:

Although surrounded by countries where the fossil witnesses of the earliest times of mankind are concentrated, Ethiopia, Kenya and Chad, Sudan is relatively poor in the very ancient traces of human existence. For example, the human skull found at Singa on the Blue Nile, which dates to about 151.000-131.000 years ago (McDermott et al. 1996), belongs to an ancient form of Homo sapiens. The skull was found with some fossilized animals and tools, including some from a nearby site in the Abu Hoggar region. Singa's skull has been somewhat neglected in studies of human evolution in recent times. This is partly due to doubts about its proposed geological age, and because its morphological composition is unusual in its measurements with other globally known samples. A few stone tools allegedly associated with this discovery have been collected from different areas of Singa itself and from

another nearby site in the Abu Hugar region located about 15 km south of Singa (Arkell et al. 1951). Animal remains associated with the early Upper Pleistocene period have also been described.

Recently, several attempts have been made to date Singa skull using evidence of associated animal species and associated calcareous materials, indicating it return to a period known as the isotope stage 5-6 (Grün and Stringer 1991), and a history of more than 133,000 years for Homo sapiens (McDermott et al. 1996). The most recent evidence indicates that Singa skull represents (a mixture) of ancient and modern biological traits of Homo sapiens, making it a direct precursor to the emergence of Homo sapiens in Africa and the Middle East.

Later evidence that could date back 800,000 years, represents roughly stone pebbles with no traces of fossils, were found in Sai Island in northern Sudan.

Recent discoveries have confirmed the finding of many Acheulean sites in the Wadi Atbara extends for a period of 800,000 to 200,000 years, which reinforces the importance of the Atbara River as a pathway for human migration towards Sudan and beyond (Masojc et al. 2019).

3. Stone Age of Sudan

The archaeological research of the Stone Age period in Sudan is linked to the pioneering works of the English archaeologist Anthony John Arkell (1898 - 1980). His work as the first director of the Antiquities Service in 1939 enabled him to travel to many parts of Sudan. Among the most important sites discovered by Arkell are the site of Khor Abu Anga in Omdurman, which dates to the Lower Paleolithic period, the site of Khartoum Hospital, which dates back to the Mesolithic period and the site of the Shaheinab, which dates back to the Neolithic period (Arkell 1949a; 1949b; 1953, See full summary of Stone Age in Sudan in Garcea, and Arabic summaries in Sadig. 1999. 2010, 2017, 2020).

During the Nubia Salvage Project (1959-1966) Stone Age studies were included for the first time in the field work program (Wendorf 1968a; 1968b).

After these two phases, a new phase of research began in the seventies and the following years, but it was often focused on the periods of the Mesolithic and Neolithic periods. However, research has proven the existence of a distinct Paleolithic age in several areas, especially the area of South Dongola, the Fourth Cataract, Khashm al-Qirba and Omdurman (Figure 1).

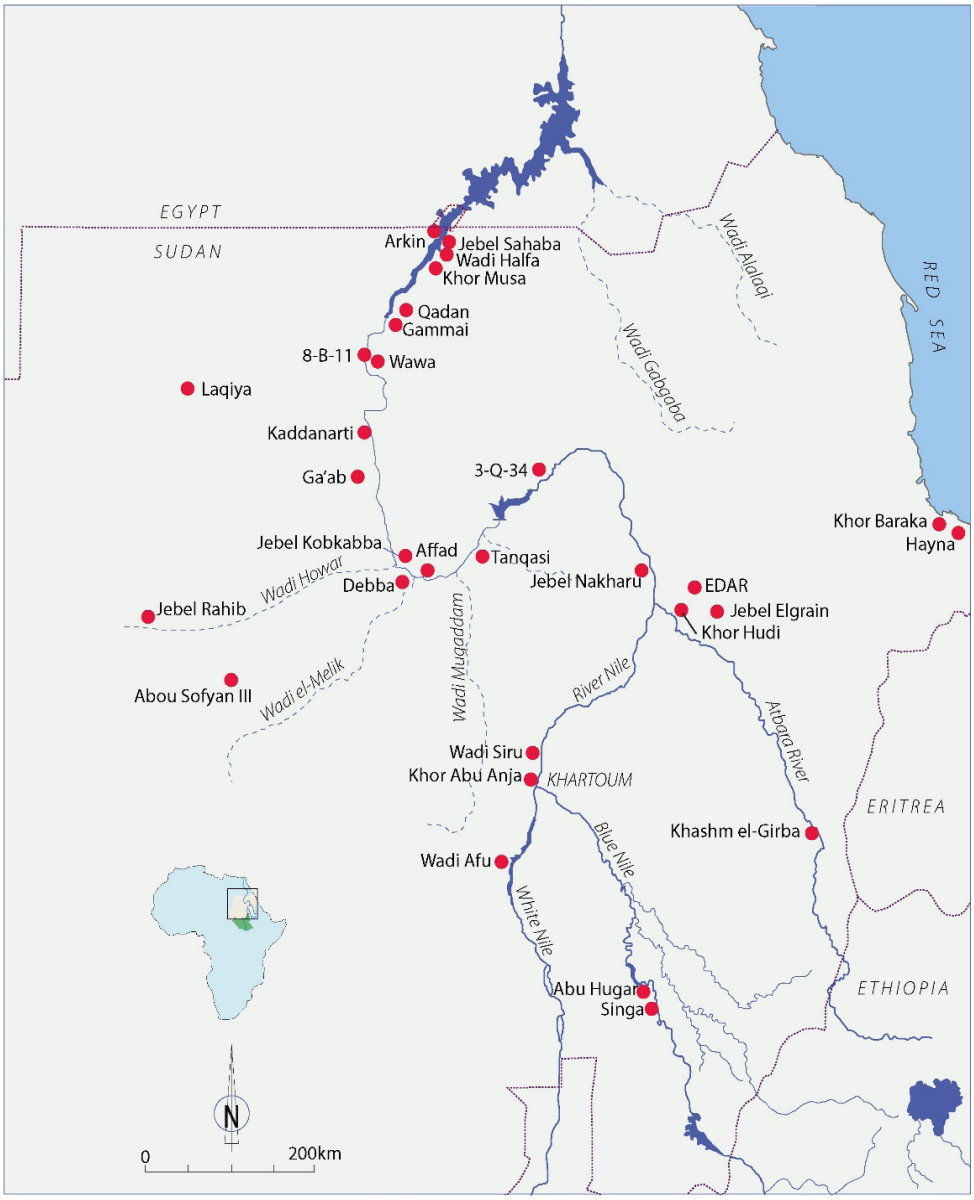

Figure 1. Location map of Paleolithic sites (Illustrated by Sadig 2021)

4. Paleolithic Age:

4.1. Lower Paleolithic:

Most of our early knowledge of Lower Paleolithic comes from Arkell's study of the Khor Abu Anja site in Khartoum region and the research in Lower Nubia. The Lower Paleolithic in Lower Nubia has been divided into three secondary phases: Early Acheulean, Middle Acheulean, and Late Acheulean (Wendorf 1968a) (See full summary of Lower Paleolithic in Sudan in Garcea 2020, and Sadig. 2017).

During the Lower Acheulean period, Levallois tools were not found, and the tools were made of sandstone. During the middle and upper Acheulean periods, the quantity of Levallois tools and many flaked tools increased, as well as large quantities of handaxes. Acheulian sites were not recorded in western Sudan except in the Wadi Hawar region at the Jebel Rahib site (site 80/88), and in the Laqiya region (site 82/40) (Idris 1994). Sudan also yielded one of the rare African sites with evidence for an Early Paleolithic/Middle Paleolithic transition or rather overlap. The site of Sai 8-B-11 in northern Sudan contains a succession of occupation levels comprised within a sedimentological sequence that spans the end of the Middle and the early Upper Pleistocene (Van Peer et al. 2003). Site 8-B-11 indicates that the Early Palaeolithic and early Middle Paleolithic technical complexes were partially contemporaneous with the Late Acheulean and early Middle Paleolithic (Sangoan), which may reflect a plausible chronological overlap of biologically different human groups (heidelbergensis and early H. sapiens).

In addition, the most recent discoveries in the Atbara River confirmed the great importance of this early period, especially with the great spread of sites in those areas, and suggested links with Acheulean and Sangoan industries in addition to East African connections. (Nassr 2014; Masojc et al. 2019). OSL dating has given ages of Acheulean complexes from pre-231,000 BP to 181,000 BP. EDAR 6, is one of the largest Acheulean sites in Northeast Africa, with an area exceeding 40 hectares (Figure 2).

Figure 2. Typical Acheulean handaxes from lower Atbara River, Site EDAR6 (Nassr 2014) Copyright (C) Nassr.

To the east, on the Red Sea, Acheulean sites have also been found on the Red Sea Hills at Gebel Karaiweb (Kobusiewicz et al. 2018), and in Hayna (Beyin et al. 2017; 2019). Perhaps these sites represent further evidence of human migration via a route other than the Nile River.

One of the most important sites dating back to the Lower Paleolithic is the site of Khor Abu Anga, which is located on a small ancient tributary of the Nile located directly north of the confluence of the Blue and White Niles (Arkell 1949a; Guichard and Guichard 1965; Carlson 2015). Arkell did not undertake any organized excavation but collected more than 2,000 tools from the surface of the site, very few of which were found in situ (Arkell 1949a). Arkell divided the tools according to African similarities of East Africa to describe the tools of the Khor Abu Anga site. In subsequent studies conducted by Carlson (2015), the stratigraphy of Trenches 5 and 11 show a series of Late Acheulean and Middle Paleolithic artifacts. An entire Lupemban sequences were also found at distinct levels in separate trenches (Trenches 4, 7 and 9).

4.2. Middle Paleolithic

The Middle Paleolithic period was divided into a number of stone industries that spread in particular on the banks of the Nile, waterways and mountains, especially in northern Sudan. The oldest of these industries was known as the "Mousterian" industry, in reference to the stone tool that characterized the Middle Paleolithic period in other parts of the world (Wendorf 1968a). A number of sites dating back to this period were studied in the Wadi Halfa region, which were characterized by a large amount of completed stone tools, and large workshop sites. Next comes the "Denticulate Mousterian" industry, which was known from only two sites near Wadi Halfa and is contemporary with the first industry. Most of the tools in this industry are made of sandstone and there are few Levallois tools with a large number of denticulate tools. At the end of this period, another industry known as the "Middle Paleolithic" industry prevailed and extended from the second cataract to the north of Abu Simbel, and most of its sites were workshops and quarries, in which a large number of Levallois tools were noted (Wendorf 1968a, See full summary of Middle Paleolithic in Sudan in Garcea 2020, and Sadig. 2017).

In addition, the literature on the Middle Paleolithic period contains many definitions of technical complexes that include many terms that have been used in other regions of Africa such as Sangoan and Lupemban (Van Peer 2016), and Aterian (Scerri 2013).

During the ongoing excavations in northern Sudan, the Affad 23 site which dated to a c. 16.000 years (15.90±1.75 kya) (Osypinski et al. 2016), yielded evidence of dwellings or shelters, well-defined activity zones including meat-processing areas, and a faunal assemblage confirming a specialized hunter-gatherer economy. The occupants of Affad 23 were not using conventional Epipalaeolithic stone tool technologies (e.g., microliths), but continued to exploit Levallois-like tools. This late use of Middle Paleolithic technology, along with a highly organized camp configuration, points to an unusual adaptive strategy.

More recently, various Middle Paleolithic stone assemblages have also been found further south in the Bayouda Desert (Masojć 2010), and eastern Sudan (Nassr 2014) (Figure 3).

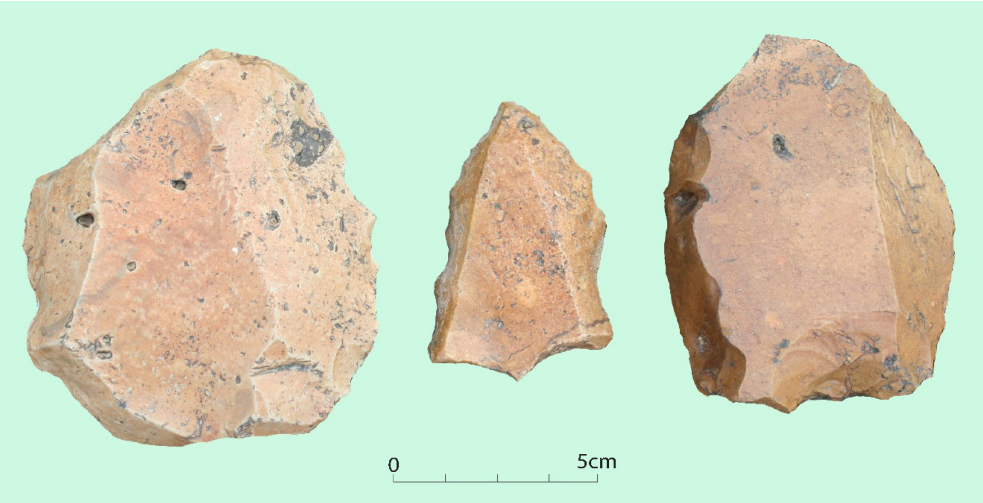

Figure 3. Middle Paleolithic stone artefacts, Levallois technology from lower Atbara River, site EDAR143 Copyright (C) Nassr.

4.3. Upper Paleolithic:

In the late Paleolithic period (about 18,000 years ago), arid climatic conditions prevailed in much of North Africa and many of its regions became uninhabitable. These conditions also affected large parts of Sudan (See full summary of Upper Paleolithic in Sudan in Garcea 2020, and Sadig. 2017).

Until now, relatively little is known about the Upper Paleolithic period especially in the central region of Sudan. In the far north of Sudan, a series of stone industries have been identified in the Upper Paleolithic, but their importance to the areas to the south has not been accurately determined because there are not enough sites for comparison.

During the dry period between 25000-16000 BC, the industry known as the "Khormusan" industry prevailed. This industry is characterized by large sites and some small camps, in which Levallois tools and several types of raw materials such as sandstone, volcanic stones and Nile gravel are spread. The dominant economy during this period was fishing and hunting wild animals.

The Khormusan industry was followed by the "Gemaian" industry (15500-13000 BC), which was characterized by the presence of many scrapers and denticulated tools. It relied on the economy of fishing and hunting animals.

The Gemaian industry was followed by the "Sebilian" industry (13,000-9000 BC), which extends from the second cataract in the south to Edfu, north of Kom Ombo in Egypt. Its stone technology is distinguished by large sandstone flakes, as well as some Levallois tools. Evidence indicates that the inhabitants of this industry were hunting small wild animals.

Other industries from the same period were placed within what was known as the "final Nubian Stone Age", to distinguish them from contemporary or later industries with the emergence of new stone techniques, especially the microlithic tools technology.

One of the oldest of these industries is the "Halfan" industry (18000-15000 BC), which stretches along the Nile from Kom Ombo in Egypt to Khor Musa in Lower Nubia. It is distinguished by a number of camps along the Nile and inhabited for a long period of time. The inhabitants practiced fishing, with great emphasis on hunting large savannah animals. The stone tools that distinguish them are the small blades that are made of Nile pebbles.

In this period, the industry of Ballana (Ballanan) (14000-12000 BC) was also known along the Nile near the Ballana area and some few sites on the western bank of the Nile near the Second Cataract and Kom Ombo in Egypt. It was distinguished by the economy of hunting large savannah animals and fishing.

One of the most important Upper Paleolithic industries is the industry of Abd al-Qadir (Qadan) (13,000 to 9,000 years ago), which is characterized by microlithic stone techniques and residential camps near the river. Sites were small at first and then became larger in size. Archaeological remains also indicate a greater focus on large animals and fishing. For the first time, grinding tools are found as an indication of the importance of grinding wild grains. A number of tombs were also found, consisting of deep oval pits that were sometimes covered with slabs of stone, the most famous of which were those found near Jebel Sahaba, 3 km from Wadi Halfa, known as site 117, and in the Toshka area.

The Jebel Sahaba cemetery contains 58 skeletons representing both sexes. Evidence indicates that at least 6 of those buried in that cemetery died as a result of some violence, as 116 stone tools were found near 24 skeletons, including 6 inside the bones of those skeletons, which may indicate the outbreak of conflicts and regional conflicts between groups in that period (Close and Wendorf 1990: 53). No settlement was found connected to this cemetery (Figure 4).

Figure 4. Archival photograph illustrating the double grave of individuals JS 20 and JS 21 with pencils indicating the position of associated lithic artefacts. © Wendorf Archive, British Museum.

One of the relatively late industries, which dates back to this period, is the "Arkinian" industry (dated to about 7440±180 years ago), which is known in one place on the west bank of the Nile north of Wadi Halfa and is characterized by microlithic technology and an increase in the number of blades. The economy was based on hunting large animals. Another industry, the "Shamarkian" (5750-3270 BC), is known in a small area near the western bank of the Nile north of Wadi Halfa, in small camps that increased in size over time, and there is no clear evidence of the economy as no animal bones or plant remains were found at any of the industry sites.

There are a few other sites that are attributed to the Upper Paleolithic period in the areas of Batn Al-Hajar the Dal region and Al Ga'ab in northern Sudan (Tahir and Nassr 2015) (Figure 5). There are also other sites that were discovered in the Khashm El-Girba area in eastern Sudan characterized by distinctive blades (Marks and Fattovitch 1989).

Figure 5. Upper Paleolithic artefacts from El-Gaab depression northern Sudan (Tahir and Nassr 2015) Copyright © Tahir and Nassr.

5. Mesolithic Period:

The Holocene, especially in the early period (about 8500 to 7000 BC) witnessed humid climatic conditions in most parts of the Sudan and Egypt (Haynes 2001). Climate change is closely related to the spread of settlements during the Mesolithic and Neolithic periods, which were clearly concentrated on the two banks of the Sudanese Nile and indicate that the climatic conditions were optimal for these settlements. The same situation was observed in northern Sudan and near the oasis of Sliema, and along Wadi Howar and the valleys east of the Kerma and Dongola basins (see, for example: Kuper 1989; Welsby. 2001) (See full summary of Mesolithic in Sudan in Garcea 2020, and Sadig. 2022).

The Mesolithic cultures in Africa spread widely and reflected a different adaptation from Europe. Between the rainforests and the desert there is a series of ecological belts, ranging from the savannah in the south to the desert with thistles in the north, while eastern and southern Africa is characterized by vegetated plains and forests. In addition to multiple rivers and lakes. With this environmental diversity, the effects of the Mesolithic were diverse as well. Several elements emerged as key features of this period. These features can be summarized as follows:

1. Hunting and plant gathering has developed and the collection of marine, river and wild oysters, fishing, gazelle, and riverine environment animals has spread.
2. The development of Microlithic technology, which appeared in large parts of North Africa and along the Nile River, the Horn of Africa and Kenya, which indicates strong cultural relations during that period.
3. The spread of plant food was evident with grinding tools.
4. An important tradition that spread in parts of East Africa, the Congo and Sudan was the spread of fishing using bone spears (harpoons).
5. Pottery appeared in large parts of the Nile, the Sahara, eastern and western Africa. The Early Khartoum culture is one of the oldest cultures that used pottery (Arkell 1949b).

5.1. Chronology:

In 1944, Arkell discovered one of the oldest sites containing pottery in the central Nile Valley region, which was called "Early Khartoum", or "Khartoum Mesolithic" as well as "Wavy Line Culture" (Arkell 1949b). It was considered at that time an unprecedented discovery of the use of pottery by hunters and gatherers in a site that was inhabited for a period extending from 2000 to 3000 years, especially since pottery was not known during the Mesolithic in other regions of the world and was considered a major distinctive for later Neolithic cultures.

According to many c14 dates and other pottery elements, the Mesolithic was divided into two main periods, an early and a late, dated 8600-6500 cal BC and 6500-5500 cal BC respectively. Some studies have developed this sequence to include terms such as Pre-Mesolithic, Middle Mesolithic A, B and C for a chronological sequence of the Mesolithic extending from the ninth millennium BC to the sixth millennium AD, with archaeological sites concentrated during the second half of the seventh millennium BC. AD (summarized in Salvatori and Usai 2019, table 1, 181):

1. 9th millennium BC: Sorourab 2, Sphinx, Umm Marrahi
2. 8th millennium BC: Abu Darbein, El Damer
3. 7th millennium BC: Aneibis, al-Khiday 1, al-Khiday 3
4. Second half 7th millennium BC: Saggai, al-Khiday 2, al-Khiday 2B, Awlad el Imam, Umm Singid, El Mahalab, Sheikh Mustafa, Shabona
5. Late 7th /6th millennium. BC: Shaqadud, Rahib 80/73, Rahib 80/87, Kabbashi Haitah, 10-W-4

The earliest sites are located at Abu Darbein, el-Damer, Saggai and Sarurab. El-Qoz, Kabbashi and Shaqadud yielded stratigraphic sequences with late Mesolithic materials following those of the early Mesolithic. Late

Mesolithic pottery is characterized by impressed dotted wavy lines, which replaced incised wavy lines.

5.2. Archaeological Sites:

Traces of the Mesolithic population have been found in most parts of Sudan, with a particular focus on settlement in areas with permanent water sources. These include the riverine areas along the two Niles as well as around other major waterways and lakes to the west and east (Figure 6).

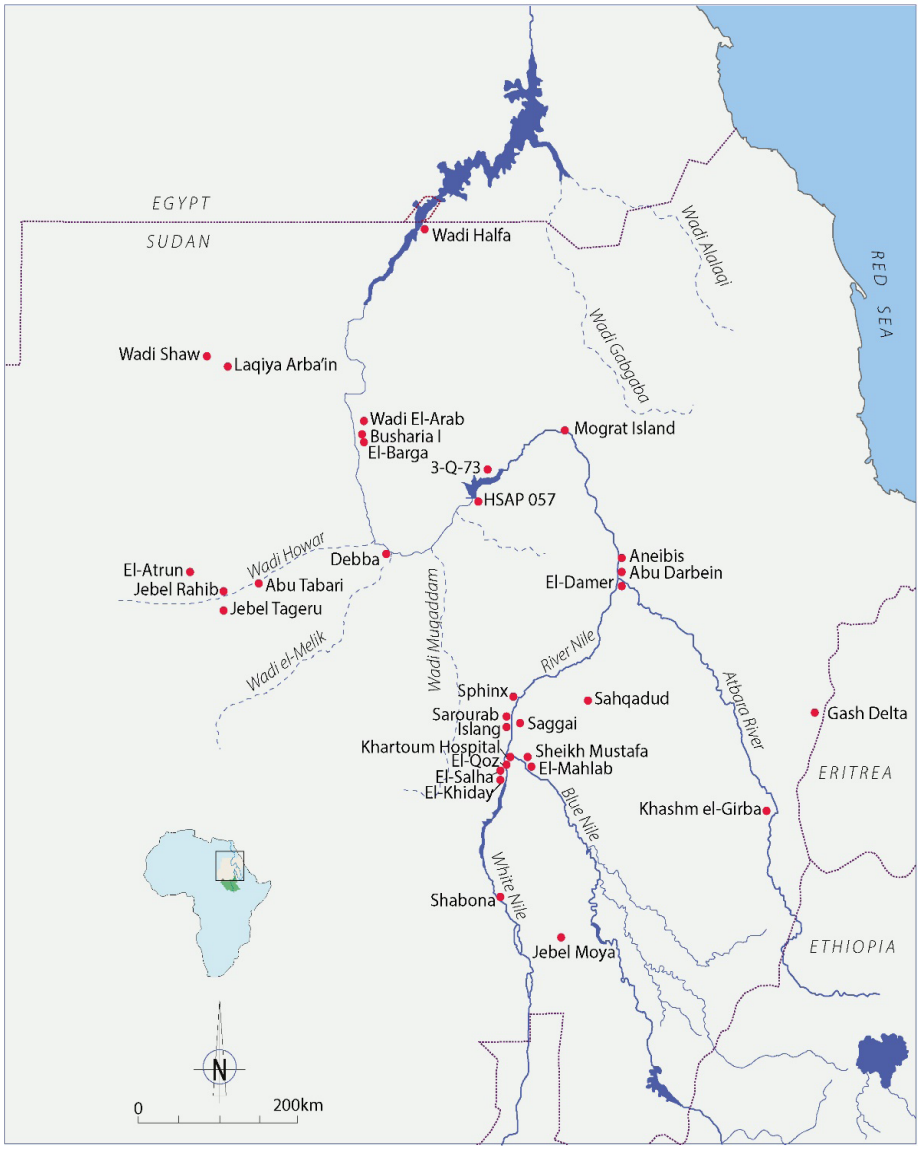

Figure 6. Location map of Mesolithic sites (Illustrated by Sadig 2021)

Evidence indicates semi-permanent settlements in these sites, which was confirmed earlier in the excavations of Khartoum Hospital. Evidence indicates a distinctive spread of pottery decorated with wavy lines, as well as bone harpoons and spears, in many areas covered by the archaeological survey during the twentieth century in the areas of the White Nile (Adamson et al. 1974; Clark 1989, Haaland 1984), Wadi Hawar (Kuper 1995), Gezira (Clark 1973) and others.

In the north, several archaeological sites dating back to the Holocene period were recorded in the north of Upper Nubia and the island of Sai, especially those known as (Khartoum Variant), and one of them contains important evidence of a complex pattern of hut building dating back to the late sixth / early fifth millennium BC and the eighth millennium BC, and pottery from the Khartoum Variant period (Garcea 2016).

In the Kerma region, north of Dongola, several early Holocene sites have been recorded, the oldest of which is Busharia I, which contains hearths and pottery dating from the second half of the ninth millennium BC (8400-7400 BC) (Honegger and Williams 2015). Studies in el-Barga and Wadi al-Arab east of Kerma have greatly contributed to the understanding of regional sequences outside central Sudan, generally consistent with other regional sequences in Lower Nubia that are classified as Neolithic and known as the Khartoum Variant. The latter, now classified into a broader cultural framework extending from the ninth millennium to the middle and beginning of the seventh millennium (Honegger 2014).

In general, archaeological surveys around the Dongola region, the third and fourth cataracts, Lower Nubia and southern Dongola revealed some important evidence of human presence during the Mesolithic period.

Some sites were recorded further south in the Fourth Cataract during archaeological surveys in the Meroe Dam area, where some sites provided important evidence of cultural influences and economic adaptations (e.g., site: Q-73-3 (Dittrich et al. 2007) site HSAP 057 (Kiraly 2012). The studies extended southward on the island of Mograt (Dittrich 2018), as well as in several desert valleys such as Wadi Al-Alaqi, Wadi Al-Muqaddam, and the Bayouda desert (Fuller 1998; Mallinson 1998).

As for the areas that witnessed extensive research, such as the Khartoum area, as well as in Butana around the Shaqadud area, and on both banks of the White Nile between Khartoum and Jebel Awliya, north and south of Gezira, east in Kassala and Khashm al-Girba, and to the north around Atbara and Damer (see summary in Sadig 1999, 2010). To the south, in Jebel Moya,

pottery from the Mesolithic dating to the end of the sixth millennium BC has been excavated, which is somewhat similar to some of the pottery decorations at other Mesolithic sites (Brass et al. 2020).

In western Sudan, numerous studies around Wadi Howar and Laqiya have confirmed the existence of permanent or semi- permanent settlements and an economic system based on hunting and gathering, with a heavy spread of dotted wavy line pottery and Laqiya pottery (Jesse 2006).

In the lower Howar valley, hunting and gathering economy was widespread during the 6th-5th millennium BC (Jesse 2003), while the middle Howar valley was too swampy for long-term settlements during the early Holocene and the sites were few and superficial (Keding 2000).

On the other hand, the archaeological evidence indicated a clear development of housing construction techniques, although this has not been thoroughly studied in later archaeological research except in rare cases (see: Honegger 1999). Arkell had found traces in Khartoum Hospital site of rope prints on blocks of mud wall fragments that were built with timber and covered with mud (wattle and daub). This indicates that the inhabitants were skilled in braiding the fibers and turning them into ropes so that they could be used to tie home timber or make nets or arches and hooks. The house on the site consists of a group of reeds or tree branches tied together with ropes and covered with mud. This type of "barns" was present in Sudan and is still manufactured by some Nile tribes today. Arkell had found several tombs under or near these dwellings (Arkell 1949b).

At the Wadi El-Arab site in the Kerma region, semi-subterranean huts with hearths and pits (Jakob and Honegger 2017) were excavated. A habitation structure was also found in el-Barga, with evidence of an oval pit containing pottery, a grinding tool, stone tools, and animal remains, among others (c. 7500-7200 BC) (Honegger 2014).

Moreover, the site of the Sphinx, on the western side of Jebel Sabaloka in central Sudan, featured semi-circular arrangements of granite cobbles, oval sunken features, and structures built against the boulders delimiting the site. The wood may have been used for windbreaks or other structures (Varadzin et al. 2017). Research at the El-Khiday site also revealed several pits with multiple uses (Zerboni 2011).

At the Jebel Moya site, a dry mud wall was found in the Late Mesolithic layer at this site. According to Brass et al. (2020) the data is needed to flesh out the nature and timing of the first in-situ Mesolithic remains and artifacts from the southern Gezira.

The remains of wattle and daub at other sites such as Aneibis and El-Damer, in the Atbara area (Haaland 1987) indicate an architectural style similar to the Khartoum hospital site.

5.3. Archaeological Artifacts and Objects:

The most important technical features of the Mesolithic sites are decorated pottery (with wavy lines and dotted wavy lines), bone spears and harpoons, microlithic tools, and grinding objects (Figure 7). The early appearance of pottery is a unique feature, but it is not a single phenomenon, but rather spread over a very wide area of sub-Saharan Africa. At first, Arkell saw that there are two types of decoration separated by about a thousand years (Arkell 1949b). The oldest is the decoration of wavy lines, which dates back, according to the most recent discoveries, to about 7000 BC, and then the decoration of dotted wavy lines dating back to about 6000 BC. In Arkell's opinion, it is not necessary that the pottery of the Khartoum Hospital site was the real beginning of the pottery industry in Sudan (Arkell 1949b).

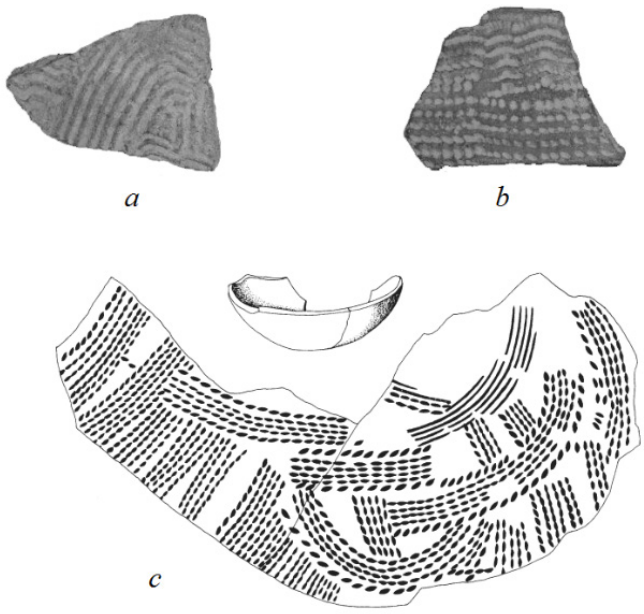

Figure. 7: Mesolithic pottery. a and b: from Khartoum (from Arkell 1949, uc13968, uc13976 Copyright (C) The Petrie Museum, UCL "Digital

Egypt for Universities website and Petrie Museum online database"). c: a small pot from Aneibis (from Haaland 2007, Copyright (C) Haaland).

In addition, the Mesolithic sites were distinguished by many other technical features, including barbed bone harpoons, which were found on two types, one of which is a large bone blade equipped with side thorns and has a base with grooves so that it can be tied to a long fishing rod. The second type consists of small blades with multiple thorns. Arkell believes that the latter type may have been used with the bow, although there is no direct evidence for it (Arkell 1949b). This opinion was proven by large quantities of crescent-like tools made of quartz stone, which are believed to have been used as arrowheads.

Other bone tools include awls, polishers, and engraved points, hairpins (Fernandez et al. 2003), bracelets and other ivory ornaments (Usai and Salvaotri 2019) and many beads, especially those made of ostrich eggshell and bone (e.g., Caneva 1983)

Other tools that indicate a great interest in fishing are stone sinkers. The sinkers are a stone block whose central sides are carved so that they can be used as weights for the net or for the hook. However, Arkell did not find any hooks, despite other evidence of fishing.

Ground stone tools include querns, stone rings, and grooved stones that may have been used for a variety of purposes, including grinding wild seeds, but also dry meat or fish, crushing nuts, crushing coloring materials, and grinding clay for pottery making.

Lithic tools were numerous and varied, with multiple edged and concave scrapers, as well as perforators, notched and denticulated flakes, truncations, burins, crescents, and different types of lunates.

5.4. The Economic Activity

Fishing was not the only economic activity during the Mesolithic period. Arkell (1949b) and other researchers (e.g., Haaland 1987) found many evidences that indicate a clear development in the processing and grinding of wild grains using grinding tools, despite the incorrect early assumptions of Arkell, who believed that such tools were used to grind ocher (ferric oxide" Ochre), which is used to color pottery and others (Arkell 1949b). Later, in his 1975 book "The Prehistory of the Nile Valley", Arkell concluded that the early inhabitants of Khartoum also used these tools to grind wild grain (Arkell 1975).

In general, the economy of most of the people of Sudan during the Mesolithic depended mainly on water resources, especially in central Sudan,

where detailed studies in many sites provided important results about the strategies of the economy at that time. On the other hand, the economy in the northern sites may have also depended on water resources, although animal remains from many Mesolithic sites in Lower Nubia have not yet been published.

One of the sites that provides important indications of exploitation of animals is the site of Wadi Al-Arab, east of Kerma. Today the site is in a desert mountainous area, but it was the site of a camp made up of huts, the most important of which were cemented by a deep foundation dug into the rock, indicating the presence of the first step towards sedentism. Here, too, the deceased was placed in pits under or near buildings. The dating of this site ranges from 8000 to 6000 BC. However, the most important discoveries in this site are the presence of skulls of cattle that appear to have been domesticated. At a nearby site, in the el-Barga site, near Kerma, similar remains have been dated to 6800 BC. These are the first records of animal domestication in Sudan and perhaps Africa as a whole, and only a few rare sites such as Acacus in Libya or Napata Playa and Bir Kasseiba in the Western Desert in southern Egypt show such ancient remains of domesticated cattle (Honegger 2004).

5.5. Burial Customs:

In his excavations at the Khartoum hospital site, Arkell found several tombs under or near the dwellings. The tomb is a simple pit in which the dead is placed in a contracted position, with no strong evidence of any sacrifices or grave goods. Arkell has noticed that the upper incisors have been removed from most of the skulls, which are similar to some of the southern Nile tribes who remove the lower incisors.

South on the White Nile, two tombs dated to the same period as the Khartoum Hospital site were excavated at Shabona (Clark 1989).

More than 100 burials have been recorded at El-Khiday 2 (16-D-4) dating back to the Pre-Mesolithic period (<9500->7000 cal BC). Most of them are simple graves containing elongated structures without any grave goods except for a single ivory bracelet (Salvatori et al. 2011). In northern Sudan a cemetery dating from 7800–7000 cal BC was found containing fifty burials at el-Barga (Honegger 2006).

In general, there is little funerary goods in most of these excavated

tombs. Often there is a suspicion that it is intrusive to the tombs. Grave goods mostly contain Mollusc shells, Nile oysters, bone tools, grindstones, and ostrich eggshell beads. Haaland (1993) pointed out the presence of a gazelle skull near the Damer site tomb on the Atbara River, and Arkell (1949b) found a piece of pottery under one of the skulls.

6. Neolithic Period

Neolithic studies, since the seventies of the twentieth century, have tended to find new theoretical models and ideas related to cultural developments, especially regarding food production, burial customs, and social development, and were no longer confined to the study of pottery, stone tools, etc. This is clear in the archaeological research carried out by the Department of Archeology at the University of Khartoum in the mid-seventies between Wadi Sayedna and Sarurab (Khabir 1981), and the rescue excavations carried out by the French Archaeological Unit and Sudan Antiquities Service (SFDAS) near Shendi in Kadada, El-Ghaba, and others (Geus 1984). They greatly contributed to expanding the time frame put forward by Arkell in the forties of the twentieth century and adding new information related to the late Neolithic periods (See Summary of the Neolithic in Sadig 2010).

During the eighties of the twentieth century and subsequent decades, the archaeological work extended to includes the remote areas of the Nile (Marks and Mohammed -Ali 1991). In the same period, archaeological studies began south of Khartoum in the area of Rabak (Haaland 1987), as well as in the area south of the Third Cataract, especially in Kadruka (Reinold 2006) and North Dongola, in addition to large-scale works in Wadi Howar (Kuper 1989). Some regions have also witnessed extensive surveys, especially in the Mahas region of the third cataract (Edwards and Sadig 2011), the fourth cataract, southern Khartoum, Middle Nile River regions, eastern Sudan, and others (e.g., Sadig 1999; Welsby 2003; Fuller 2004) (Figure 8 and Figure 9).

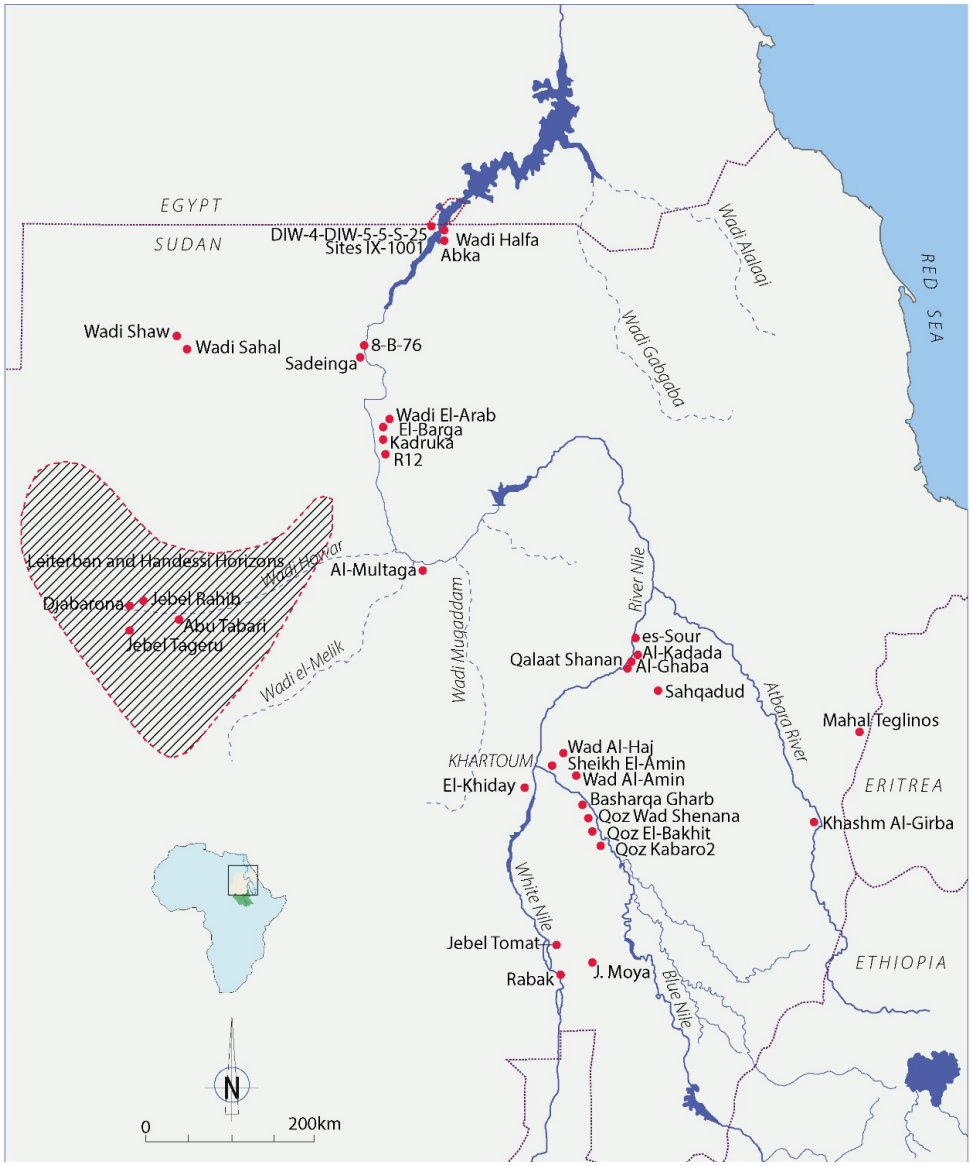

Figure 8. Location map of Neolithic sites (Illustrated by Sadig 2021

Figure 9. Location map of Neolithic sites in Khartoum region (Illustrated by Sadig 2021)

These works have contributed greatly to solving many issues related to the Neolithic period, especially the issues of domestic animals and food production in general, social development, in addition to issues of environmental change and intercultural relations and others. Other issues were also discussed, such as the chronological gap between the end of the Neolithic period and the beginning of historical periods especially in central Sudan (Sadig 1999).

6.1. Chronology:

Radiocarbon dates obtained from the Neolithic sites in Central Sudan cover a period of at least 3000 years. Most of the sites flourished during the 5th millennium BC, whereas others continued till the 4th and 3rd millennia BC. The sites of Shaqadud, Islang 2, and Jebel Tomat continued till the first decades of the 3rd millennium BC and the end of the 2nd millennium BC, Jebel Moya continued to be occupied until the end of the 1st millennium BC.

In northern Sudan, the Neolithic chronology is laid out in detail in phases extending from the Early Neolithic (6th millennium cal. BC) and the Middle Neolithic (A and B) known in the R12 cemetery and Kadruka cemeteries (Welsby 2001; Salvatori and Usai 2008; Reinold 2006) and extending from the 5th millennium BC (A) and the middle of the 5th millennium BC (B) (Salvatori and Usai 2019. 184).

6.2. Archaeological Sites:

6.2.1. Lower Nubia:

As a result of the numerous excavations carried out during the last Nubian Salvage campaign, more was known about the Neolithic period in Lower Nubia, although it still received little attention compared to central Sudan. This may be due to the speed with which the excavations were carried out or the lack of specific features that can be relied upon to define the Neolithic age, as pottery remained the main indicator for determining this period there (Shiner 1968). Accordingly, the large number of sites were divided into groups according to the distinctive patterns of pottery, or into industries within a number of periods that characterized the Stone Age period in Lower Nubia. The Nubian Ceramic Age was divided into two industries or cultures: Abka and Khartoum Variant (Shiner 1968, 789).

As a result of the absence of many of the characteristics of Central Sudan sites in the Khartoum Variant culture, Nordström (1972) suggested that the Khartoum Variant culture should not be compared with the Neolithic period in Khartoum, but with the pottery decorated with dotted wavy lines represented by Al-Qoz site in Khartoum, a site dated to the period between Mesolithic and Neolithic periods.

The Abka was divided culture into two periods, Early Abkan and Developed Abkan, after the study of pottery and the characteristics of stone tools and others (Wendorf 1968b, 1051). As a result of the discovery of remnants closely related to this culture in other areas in Lower Nubia in the region of Abka, another name for the Abka culture appeared, which is Terminal Abkan, after the study of pottery showed the presence of northern influences in specific types of it dating back to a late period of this culture (Nordström 1972, 17). As general, the current chronology of Abka (5500–3700 cal BC) correspond the other dates of Neolithic sites in Central Sudan.

Outside of Lower Nubia, few sites of the Abka culture have been found specially in Sai Island (Site 8-B-76) (Garcea et al. 2016), and in the Western Desert at Nabta-Kiseiba and the Laqiya region, and as far south as Dongola (Lange and Nordström 2006). Most of these sites are simple settlement sites and do not generally contain deep layers or tombs. Reports of surveys south of Batn el-Hagar and in Kerma (R12) indicated the presence of some archaeological remains that can be compared to Abka (Salvatori and Usai 2008).

Another culture identified in Lower Nubia was called "post- Shamarkian" (Wendorf 1968b). This culture bears features of pottery technique identical to what the CPE called the "Khartoum Variant".

6.2.2. Upper Nubia:

Neolithic sites are known in many areas in upper Nubia, especially in the Third Cataract region between Tombos and Delgo (Edwards and Sadig 2011). Despite the small number of Neolithic sites that have been discovered, surveys and some short-term excavations have proven the existence of settlement extending from the sixth millennium BC until the end of the fourth millennium BC (Sadig 2004).

Since 1986, many Neolithic have been discovered south of the Third Cataract, in the Kadruka and Wadi el-Khowi region (Reinold 1987). It includes a great number of funerary sites and settlements. The excavations were concentrated on a land along Wadi el-Khowi (the Kadruka area), where it was possible to identify all the components of the Neolithic culture, such as animal domestication, pottery production and the technique of polished stone tools since the second half of the fifth millennium BC (Reinold 1987, 44). In addition, there are more than thirty cemeteries in the Kadruka area, through which the development of burial customs can be traced from the sixth to the fourth millennium BC, and the number of tombs in these cemeteries exceeds a thousand (Reinold 1987, 50-51). These sites have proven the existence of a social system at that early time, as it is believed that there were chiefs at the

head of clans or tribes in that region since the fifth millennium BC (Reinold 1987, 51), which is a matter of importance for that early period. This burial evidence was corroborated by other excavations near Kerma in a cemetery named R12, which was completely excavated and published in a comprehensive volume (Salvatori and Usai 2008).

To the south of Dongola, a number of sites that contain pottery, were classified into four groups: the Early Khartoum group, the Karat group, the Tarqis group, and the Malik group (Marks 1968). The Early Khartoum and Karat groups are of particular importance in understanding the nature of the spread of pottery along the Nile. Both groups contain pottery that can be compared with the pottery found in central Sudan and north of the second cataract (Khartoum Variant and Abka).

Later work near Qanati and El-Multaga revealed some settlement sites and cemeteries different from what is known in central and northern Sudan (Peressinotto et al. 2004). 65 Neolithic tombs have been discovered in this area that may be related to the Karat Group, and to Kadruka in the north. These tombs have been interpreted as a cemetery for nomads (Geus and Lecointe 2003).

To the south, in the Fourth Cataract region, there are many prehistoric sites uncovered during Meroe Dam salvage campaigns. Many of the research results are still being published. Most of the sites are small settlements and few cemeteries. Other sites were also discovered in three resettlement areas in the vicinity of the Fourth Cataract, in the El-Multaqa, New Amri and Wadi Al-Makabrab. Sporadic sites were also recorded in El-Kurru (Garcea 2000, 137-147) and the Karbakan-Amri region (Welsby 2003, 28; Fuller 2004) and other areas.

6.2.3. Western Regions:

In the western part of Sudan, the study of the Stone Age began relatively late. However, thanks to the archaeological work carried out by Mohammad-Ali in the upper Wadi Howar basin at the beginning of the eighties (Mohammed-Ali 1981), a new stage in the history of archaeological work began in the remote areas of the Sudan. Mohammad-Ali has pointed out that archeology in Sudan until that moment was a study of the archaeology of the Nile, with great emphasis on historical periods (Mohammed-Ali 1981, 176). Mohammad-Ali paved the way for others to show the importance of revealing the problems that confront researchers in prehistoric studies in the Nile River by pointing out that the way to understand these problems comes from looking and researching the effects of the neighboring areas of the Nile Valley (Mohammed-Ali 1981, 176).

The archaeological work has continued since 1995 under the so-called (Arid Climate Adaptation and Cultural Innovation in Africa-ACACIA) project. Surveys and excavations have been carried out in and adjacent to Wadi Howar (Jessi 2008).

In the Holocene, Wadi Howar formed a natural corridor during the appropriate climatic stages, linking the eastern Chad Mountain ranges with the plateaus and plains adjacent to the Nile in the east.

However, no evidence of human settlement was found before about 6000 BC in the western parts of the basin, when groups of hunter-gatherers settled using pottery, exploiting permanent water resources during the dry season and seasonal pastures during the wet months (Lange 2005, 15). A later stage in Wadi Howar is characterized by a culture closer to what was found in many parts of the Nile during the period extending from the beginning of the sixth millennium BC. It was characterized by pottery similar to what was found at the Neolithic site of Shaheinab. After the beginning of the fourth millennium BC, a great change occurred in Wadi Howar, with the emergence of a different culture called (Leiterband Horizon). The term was used to describe a decorative pattern in the form of grooves in the pottery vessels. The Leiterband extended chronologically for a period between c. 4000-2000 BC. The earliest stages of this culture were very similar to the Neolithic cultures of Central Sudan, while later stages show greater affinity with areas to the west of Wadi Howar, such as Enndi, or even sites in Mali (Jessi 2008, 68). Cattle were important in the economy of this period. Later in the third millennium BC, Wadi Howar witnessed increasing aridity, however, a new development occurred, its features appear in the so-called Handessi horizon (geometric horizon) (2200-1100 BC) in the middle Wadi Howar. During this period, the lower Wadi Howar region was no longer suitable for permanent settlement due to increasing aridity, although the entire region was still served as an important desert passage.

6.2.4. Eastern Regions:

Archaeological studies in eastern Sudan and the Atbara and Butana Rivers (Marks and Fattovich 1989) have recorded many Neolithic sites, especially in the area between Atbara and Al-Gash. The oldest of these cultures was dated to the fifth millennium BC and was known as the Saroba Phase (Mohammed-Ali 1981; Fattovich et al. 1984). In the late stages of the cultural development in eastern Sudan, it seems that the economic and social developments have gone hand in hand with increasing evidence, especially from the site of Mahal Taglinos, on the first administrative system linked to society in this region of Sudan.

6.2.5. Central Sudan:

Since Arkell's excavations at the Neolithic site of Shaheinab, completed by the end of the 1940s (Arkell. 1953), interest in the Neolithic culture-history of the central Sudan has increased significantly, especially during the last fifty years.

Large-scale excavations have been carried out in this area at sites such as Geili, Kadero I, Islang, Nofalab, Umm Marrhi, Rabak, Um Direiwa, el Kadada, el Ghaba, Shaqadud, Al-Saliha, Es-Sour and Haj Yousif (See Summary in Sadig 2010).

6.3. Archaeological Artifacts and Objects:

One of the most important Neolithic artifacts is the stone tool called the Gouge, which is a tool similar to an ax or chisel. Arkell considered it the distinguishing mark of the Neolithic sites in the Khartoum region. Rather, the Shaheinab site and its remains were called the Gouge Culture (Arkell 1953). Arkell believes that this tool was used mainly in the boat making by digging tree trunks. In a recent study, Kapustka et al. (2019) present a comprehensive technical analysis of these tools in the Jebel Sabaloka region and other sites.

The bifacial celt was also popular, and it represents a new technology of stone cutting tools. A similar tool is made of bone (Bone Celt). Arkell believes that this tool was used to cut meat from large animals.

Other indirect evidence of food production is the use of lithic tools associated with plant activities. These comprise luntaes, sickle-blades, grinders, rubbers, and sandstone rubbers.

Grinding tools and axes were more common in cemeteries and settlement sites in central Sudan. Moreover, the numerous grinders found in Neolithic sites indicate the increased importance of vegetal foods such as sorghum and perhaps the beginning of their cultivation (Haaland 1987, 215).

Among the important inventions in the Neolithic period that did not appear at the Shaheinab site are the polished stone palettes that were used in grinding colors, and some evidence was found for them in the sites of El-Kadada and Kadero (see Krzyżaniak 1992). Pottery figurines and personal ornaments using ostrich eggshell, quartzite, and carnelian have also spread to other sites.

The most common non-lithic artifacts at Shaheinab are bone harpoons. Bone celts were also found at Shaheinab; these are wholly polished. A few bone awls or borers and fishhooks made of Aspatharia shell were found (Arkell 1953, 56-60). The hooks made of shells appeared for the first time during the Neolithic period, and they indicate the continuation of fishing. Other bone artifacts include bone and eggshell beads, lip and nose-plugs, and ivory rings (Geus 1984)

Pottery continued to become a clear technical feature in the Neolithic period, but it differs from the Early Khartoum pottery in that it is always polished and contains many decorations.

Shells and Amazonite stone were used in personal adornment and the man-

ufacture of beads. The Amazonite is a type of stone Arkell believed to have been brought from the Tibesti region. There is a pin-like ornament made of zolite that Arkell believes were used as lip-plugs (Figure 10 and Figure 11 and Figure 12).

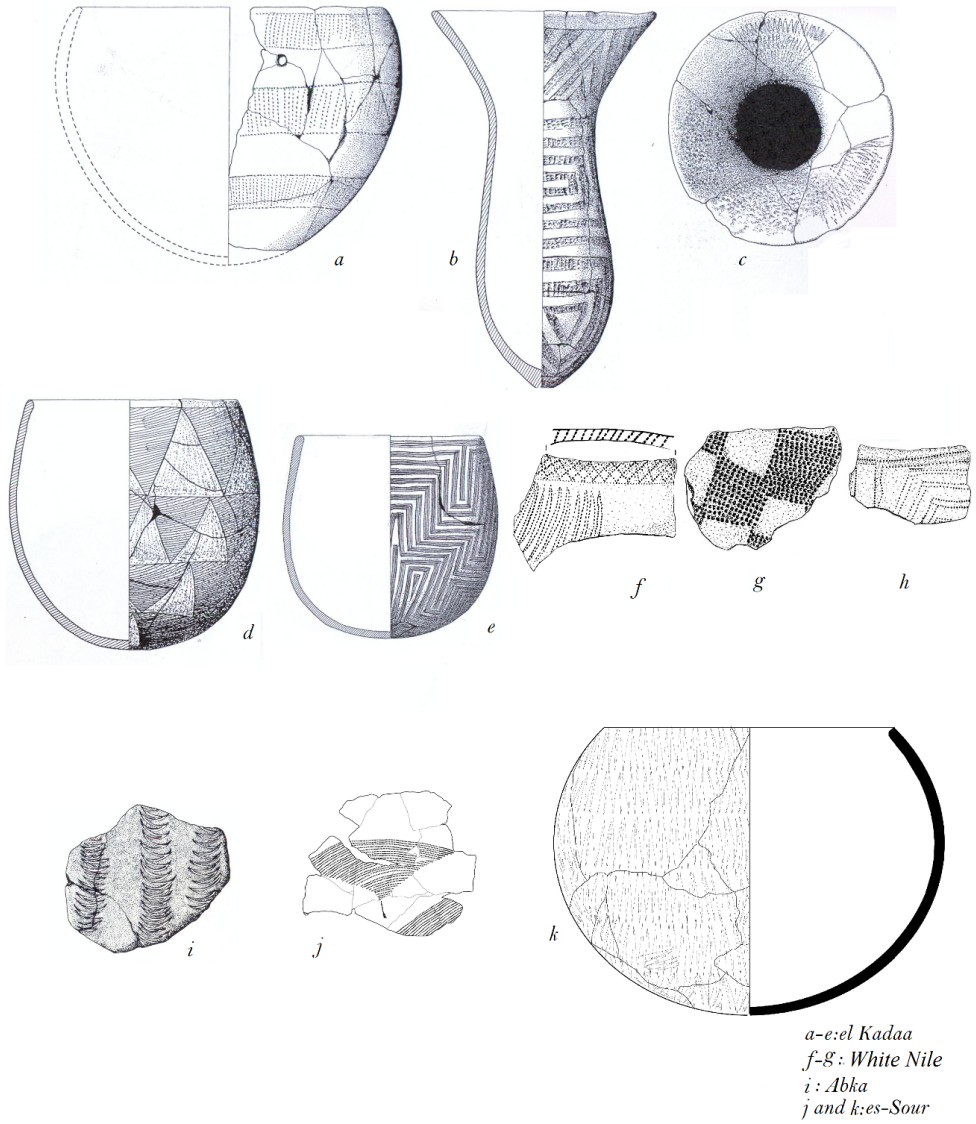

Figure. 10: Neolithic pottery. a-e from el Kadada. f-h from White Nile. i from Abka. j and k from es-Sour (a, b, c, d, and e: from Reinold 2008 copyright (C) Reinold/SFDAS. f, g and h: from Sadig. 2010. i: from Nordström 1972 copyright (C) Nordström. J and k: from Sadig 2010).

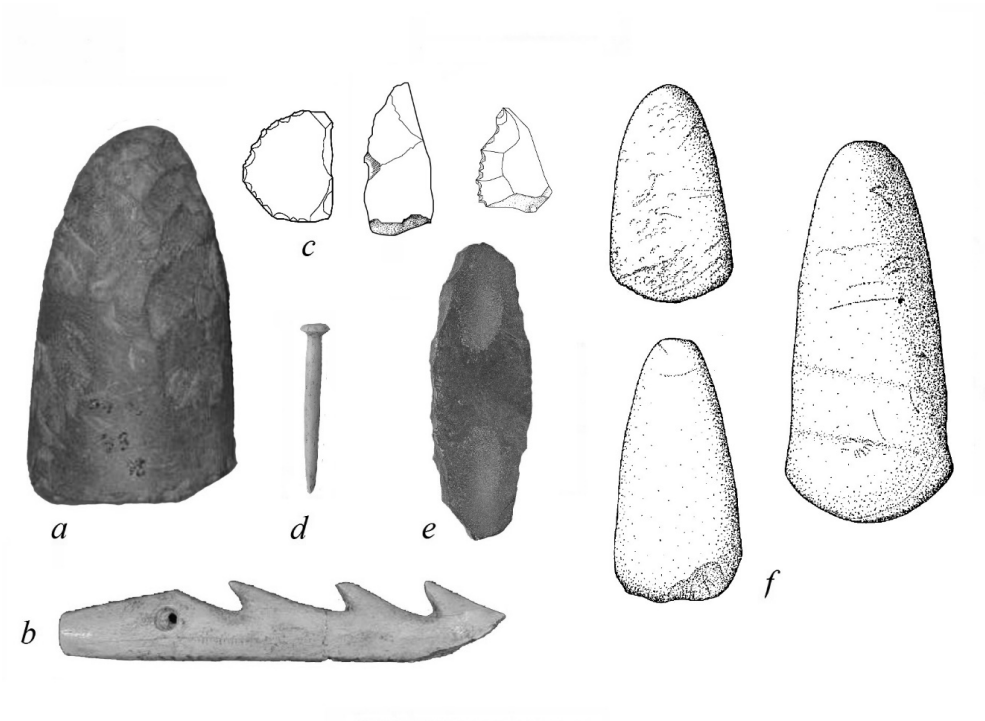

Figure. 11: Neolithic artifacts. a: stone gouge. b: bone harpoon. c: microlithic tools. d: lip-plug. e: Small stone grinder/polisher. f. Polished stone axes. (a and b: from Arkell 1953, uc14029, uc14058, Copyright (C) The Petrie Museum, UCL "Digital Egypt for Universities website and Petrie Museum online database". c-e: from Sadig 2010. f: from Edwards and Sadig 2011 copyright (C) Sadig)

Figure. 12: Neolithic human figurines from es-Sour (copyright (C) Sadig)

Further north, the Abkan Industry sites show more use of quartz in manufacturing lithic tools. Other types of raw materials, such as quartzite, petrified wood, etc. were utilized sparingly. Among the Abkan assemblages, the microlithic index is high. The most characteristic tools of the industry are groovers and borers. Other tools include denticulates, points, lunates, micropoincons, notched flakes, burins, truncated and retouched flakes and blades, but they vary greatly in relative abundance from one assemblage to other. Ground stone artifacts include axes, proto-gouges and grinding implements (Nordström, 1972). Nordström (1972, 49) defined the fabric of Abkan pottery as having “a relatively dense and homogenous groundmass containing a high proportion of silt”. The fabric is fired to colours ranging from dark gray to grayish brown, or in few instances black.

For the Khartoum Variant, apart from 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. The diagnostic tools are the concave and "exotic" scrapers. Other artifacts include denticulates, lunates, borers, groovers, and micropoincons. Fragments of grinding artifacts are present on almost all sites. Pottery is characterized by abundant grains of crushed quartz and feldspar, as well as micaceous fabric.

6.4. The Economic Activity

There are two opinions about the origin of domesticated animals, which were a mainstay of the economy during the Neolithic period in Sudan: the first believes that these animals have reached the middle Nile River from the north, that is, from Egypt, and the second opinion focuses on the existence of ancient contacts that precede the Neolithic period between The Nile and the Sahara regions, which resulted in the spread of pastoralism to the Middle Nile River (Mohammed-Ali, 1984).

On the other hand, most of the plant remains from the Neolithic period in the Sudan are derived from imprint that are found in pottery, especially of millet (Pennisetum Vidacum) (Haaland 1987, 181; Stemler 1990, 87-98).

6.5. Burial Customs:

On the evidence of the first excavations at Shaheinab, Arkell suggested that Early Neolithic people were not burying their dead. Only since the late 1970s have significant numbers of burials been excavated in the Khartoum region, in the Shendi region, and at Kadruka, el-Barga, R12 and Al Multaga in Dongola region.

Other Neolithic cemeteries together with occupation scatters have been located along the Nile west bank north of Dongola by S.T. Smith (2003, 165). Further south, east of the Fourth Cataract, a total of 282 Neolithic sites, including graves, have been located on the Nile right bank between Karima and Khor el-Dagwali (Paner and Borcowski 2005, 91), but there has been no systematic excavation, or any detailed publication of the materials collected during the survey operations. Other Neolithic graves are documented in the Umm Melyekta Island. A total of 19 Neolithic graves have been excavated, but data from only one has been published (Fuller 2004).

The Neolithic cemeteries provide us with a remarkable record displaying many similarities and testifying to a common link between the cultures along the Nile. There are, however, variations that may be interpreted as different modes of evolution or different regional adaptations. These cemeteries dis-

play many points in common, especially in material culture. The similarities and differences seem to translate to homogenous populations and indicate a fast evolution of the social order of the human groups.

Infant pot burials beneath the floors of domestic houses or within the cemeteries are also found in sites dated to the Late Neolithic, especially at el-Kadada and es-Sour (Sadig 2005).

7. Concluding Remarks

Despite the increasing interest in Stone Age studies in Sudan since the first discoveries in the early twentieth century, there are many issues that are still under investigation (See the full list of topics and new trends of Sudan prehistory in Garcia. 2020) . The most important of these issues relate to the origins of the Paleolithic period and the spread of early humans in the Nile River, in addition to local developments in remote areas of Sudan, especially in the west of the country. The issue of the subsequent developments of the Upper Paleolithic period remains one of the issues that are still controversial among researchers, especially since in some areas, such as Khartoum, for example, only very few evidences attributed to this period have been found. Despite the limited information about the Upper Paleolithic in Sudan, its occurrence in this northern region of Sudan during the arid climatic periods may contribute a lot to our understanding of the origins of the inhabitants of later cultures during the Mesolithic, who quickly spread in large areas across the Middle and Upper Nile regions and many areas of Central and West Africa and adjacent areas.

On the other hand, continuous archaeological research has enabled researchers to learn more about the Holocene cultures in Sudan and to realize the cultural disparity between and within the regions in which archaeological sites and material culture remnants were spread, as well as how they changed and developed over time. It seems that, in spite of many excavated Neolithic sites, evidence for the social organization of the people of the Neolithic in Sudan will be limited to that derived from burial information. Although the hypothetical social classes reflected in the graves were not observed in the settlements, currently available evidence seems to indicate that the Neolithic burial grounds illustrate well the process of the increasing concentration of goods and power by a social “elite”- toward the end of the Neolithic.

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