Umm Marrahi: An Early Holocene Ceramic Site, North of Khartoum, Sudan

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Introduction:

Jebel Umm Marrahi lies on the west bank of the river Nile some 38km. north of Khartoum. It is a small flat topped sandstone hill facing the river just north of Sheikh El-Tayib village and south of Shaheinab (Fig. 1). The low hill, like others along the river bank rises abruptly from the surrounding clay plains and stands at about 410 meter above sea level. The archaeological site, mainly on the summit of the hill, was first discovered by O. G. S Crawford in 1951 when he undertook a survey to record ancient monuments along the Nile in northern Sudan. In his publication of the survey, Crawford mentioned Umm Marrahi only briefly as essentially a Meroitic settlement indicated by remains of stone huts foundations, graves and a fortress. He also referred to the presence of a large stone enclosure which he identified as of Neolithic age. He described the hill; "at all periods it must have been a place of resort, and there are reasons for attributing the walled enclosure to the Neolithic period; Neolithic man certainly occupied the hill" (Crawford 1961: 39). There is no mention, however, of Neolithic material apart from the stone enclosure.

In 1977 Dr. A. Abu el-Gassim El-Hassan, then an M. A student at the Department of Archaeology, University of Khartoum carried out thorough survey and test excavations of the late Meroitic structures and burial mounds at Jebel Umm Marrahi. In his description of the site he refers to the conspicuous presence of 'Neolithic' artifacts covering a large area inside the stone walled enclosure. While testing a late Meroitic hut he came a cross a grave dug directly on an earlier 'Neolithic' deposit. He found that many of the graves were dug on the site area, therefore causing immense disturbance at some sections of it. The main Neolithic occupation, however, covers most of the enclosure area (C. 150 x 100 m.) and 'Neolithic' artifacts are also found extending beyond the southern wall of the enclosure. Indeed 'Neolithic' materials can still be seen scattered at the southern foot of the hill. His study has also demonstrated

that the enclosure itself belongs to late Meroitic settlement (El-Hassan 1979: 67-73, 112). Although what he called 'Neolithic' material was outside the scope of his study nevertheless El-Hassan included a short appendix describing Khartoum Mesolithic wavy and dotted wavy line pottery together with stone artifacts such as cresents, blades and borers. Animal and fish bones and shells were also reported. His excavations has shown a one meter deposit containing solely 'Neolithic' materials (ibid: 190-191).

Due to this information and to personal observations we collected while conducting a survey for the Archaeology department of the University of Khartoum at that time, we became interested in this site. We anticipated that the prehistoric occupation could be a key site in addressing issues of the Mesolithic/Neolithic culture tradition in central Sudan.

In December 1980 (20th to 31st) we excavated a 2x2 m. trench to test the site in what we believed to be undisturbed part of it. The archaeological material was immediately analyzed and two early C14 dates were eventually obtained. In the meantime the faunal remains were remitted to Dr. Gautier at laboratory of Paleontology, Ghent. Our initial plan was to undertake a more extensive and systematic survey and excavations in the area of Umm Marrahi. Unfortunately, due to various commitments and unavoidable circumstances that plan did not materialize. The publication of the material had to wait for all these years. Recently we began planning to organize a project to fulfill our earlier aims and therefore, it became necessary to publish what we already have. To do this we asked Dr. Gautier to provide us with his report on the fauna to include in one joint paper. Eventually, he sent to us a list of the identified species and their counts without commenting on them (Table 1). At a later date Dr. Gautier published independently the information he has on the fauna from Umm Marrahi (Gautier et.al. 2002).

In the present paper we shall describe the archaeological material including lithics, ceramics and data relevant to the subsistence economy of prehistoric occupants of the site. New C14 dates will be published here for the first time to be followed by a discussion of their significance in placing the site in the Central Sudanese Mesolithic/Neolithic cultural sequence.

The site of Umm Marahi as will be seen from the following discussion is one of the early Holocene sites, otherwise known as Khartoum Mesolithic. The location of such a site, however, emphasized

the presence of Khartoum Mesolithic type of sites on the west bank of the river and it is hoped that systematic surveys would reveal more sites to add to the limited number so far known (Fig. 1).

Test Excavation:

In testing the site we chose to start by a 2x2 m trench adjacent to the earlier trench excavated by Dr. El-Hassan[1]. The last is located at the northeastern part of the stone enclosure. He found that this portion of the site was disturbed by the Meroitic settlement. Our excavation of this small area was carried out in a 10 cm. arbitrary levels. The cultural deposit contains large amount of faunal remains, pottery and lithics from the surface down to 115 cm. The distribution, density of artifacts are however variable throughout the deposit. The different types of material were kept separately and then studied level by level. After initial sorting it became clear that the levels don't exhibit discrete cultural layers. The surface of the whole site area is littered with mixed material of both late Meroitic and Mesolithic age. This admixture of artifacts could be observed from surface down to c. 15 cm. Below this, the deposit is intact and the cultural material of Mesolithic affiliation abound. As indicated earlier, the density of artifacts become low at some points though the main categories are always present. The material increases in density from c. 50 cm downwards until it reaches maximum richness between 60 and 80 cm. below surface. In one corner of the square the excavation revealed at c 80 cm below surface, a burial of highly fragmented skeleton of a child laid in a shallow bit about 10 cm. deep. Bone fragments were lined with some cobbles probably to protect the once contracted burial. The cultural material at this level is similar to what has been found in the upper levels suggesting that this burial was contemporary with the Mesolithic occupation. The same material continued down the deposit and at 90 cm. another isolated skull of an adult was encountered, and while the skeleton could not be found there were isolated scattered bone fragments. The area where these bone fragments lie is littered with faunal remains, ceramics and lithics. The same artifacts continued down to the bedrock at about 115 cm. below surface. Despite the occurrence of the

[1] Dr. Gautier et.al. refer to our excavation area as sizeable of several square meters. Apparently they were misled by seeing an unauthorized slide of our dig provided to them by one of our former students. The picture, in fact, shows both areas excavated by Dr. El-Hassan and us (Gautier et.al. 2002: 338).

human burial the cultural material seem to be generally in *situ* and future excavation might well reveal more better stratified deposits.

Palaeoenvironment and Subsistence Economy:

The prehistoric inhabitants of Umm Marrahi occupied the strategic flat top of the hill commanding both the nearby Nilotic environment with its abundant resources[2] and the open Savannah land immediately to the west of the site area.

The interpretation of the faunal assemblage indicates that the inhabitants have more or less exploited all species available though there is evidence for favouring some of them (Gautier et.al. 2002, Elmahi pers. Comm.). To assess the economic basis of Umm Marrahi prehistoric settlement would certainly require consideration of the prevailing environmental conditions during the time span of the occupation. This of course is enhanced by the interpretation of the excavated archaeological data. The adjacent Savannah grassland and the Nilotic habitats have of course undergone major changes at different stages of the terminal Pleistocene and Early Holocene periods. A considerable amount of archaeological and geomorphological research, however, has been conducted in northern Sudan and the region of Khartoum extending south to the northern section of the Gezira plain. The Mesolithic and Neolithic sites excavated in recent years provide us with valuable information on the Palaeoenvironment and prehistoric economies to which the data we obtained from Umm Marrahi can be compared. The cultural materials and C14 dates which will be discussed later suggest that our site was part of the early Holocene human settlement along the Central Nile in Khartoum area.

The fauna from Umm Marrahi represent a considerable range of species which is dominated by fish to be followed by mammals. It is reported, however, that the unidentifiable vertebrate fragments amount to 60% of all the specimens. A reasonable amount of freshwater and land mollusks is also present in the assemblage. The immediate impression this faunal assemblage gives is its consistency with others found at the contemporary sites in the region extending from at least Atbara/ Nile junction in the north to the Gezira plain south of Khartoum. These sites were all early Holocene settlements where people have exploited both the diverse riverine and open Savannah resources (Gautier et.al. 2002: 340-

[2] In August 2002 while visiting the site the Nile water was inundating the narrow flood plain and was only c 50 metres away from the southern foot of the hill.

342, Elmahi 1988, Haaland and Abdul Magid 1995: 9-18; Gautier 1983: 54-55; Peters 1991: 197-236). The number of fish bones at Umm Marrahi represent 94% of the fauna apparently more exploited than at any of the Mesolithic sites in the east bank of the river where the ratio of fish ranges between 50 and 80% (Gautier et.al. 2002: 341 and table 1). It has been shown that at least one quarter of the fish remains is derived from fish caught in the Nile itself (i.e. *Lates niloticus*) while the rest belongs to species that survive in the shallow water of side channels and swamps (i.e. *Hererotis niloticus* and *Clarias sp.*) in the flood plain (ibid: 342).

Table 1: Animal remains from the Khartoum Mesolithic site at Jebel Umm Marrahi(*)

Animal group		Number(a)
Marine molluscs	Cowrey/ Cypaea sp.	1
Freshwater molluscs	Bellamya unicolor	1
	Cleopatra bulimoides	R
	Pila wernei	F
	Lanistes carinatus	RR
	Corbicula consobrina	1
	Caelatura aegyptraca	RR
	Spathopsis sp.	R
	Etheria elliptica	R
Land molluscs	Limicolaria cailliaudi	RR
	Zootecus insularis	F
Freshwater fish (b)		1754
Reptiles	Softshelled turtle (Trionyx triunguis)	2
	Kinixys sp.	1
	Pelusios adansonii	2
	Not identified turtles	2
	Monitor lizard (Varanus niloticus)	17
	Python (Python sebae)	9
	Nile crocodyle (Crocodylus niloticus)	5
	Not identified	1
Birds	Ostrich (Struthio camelus) (c)	29

	Not identified	1
Mammals	Baboon (Papio cynocephalus)	1
	Ground squirrel (Euxerus erythropus)	3
	Small rodents. Not identified	10
	Jackal (Canis aureus)	2
	Wild cat (felis silvestris libyca)	2
	Rihinoceros (Diceros bicornis, Ceratotherium simum)	1
	Warthog (Phacochoerus aethiopicus)	1
	Hippopotamus (Hippopotamus amfibius)	14
	Buffalo (Syncerus caffer)	8
	Roan antilope (Hippotragus equines)	2
	Topi or hartebeest (Damaliscus lunatus. Alcelaphus buselaphus)	4
	Medium sized antilope, mainly kob (kobus kob)	39
	Bohor reedbuck (Redunca redunca)	3
	Small antilope, mainly oribi (Qurebia oribi)	31
Total identified Vertebrates		1944
Total not-identified vertebrates(d)		3000
Total vertebrates (d)		4944

(a) fragment counts: (b) see table 2: (c) only eggshell fragments: (d) estimates: R (R): rare (or very rare), F: frequent.
(*) This table was remitted to us by Prof. A. Gautier.

The early Holocene flood plain of Umm Marrahi was more broader than it is today as indicated by the shifting Nile channel from east to west starting by middle Holocene times. This feature has been demonstrated by the geomorphological observations made during the study of the vicinity of Saggai Mesolithic site (Marcolongo 1983: 39) on the east bank opposite Umm Marrahi (Fig. 1). The high percentage of fish, no doubt, shows the abundance of this food resource and probably indicates the successful catching methods employed by the hunters. Gautier et.al. (2002: 342) suggest that fish in the flood plain marshes might have been available for most of the year and therefore encouraging human settlement in a semi permanent manner.

The study of the mammalian fauna shows that the inhabitants of Umm Marrahi did not domesticate animals and instead they hunted a wide range of wild animals. Lack of domestic animals agrees well with the archaeological evidence and C14 dates which would place Umm Marrahi well in the Khartoum Mesolithic culture tradition. It has been noted that *Kob* and *Oribi* are the most frequently hunted bovid species, with the first more dominant in the lower levels while the second dominated the upper levels. Gautier et.al. interpret this shift as reflecting a decrease in the numbers of *Kob* near Umm Marrahi caused by overhunting (ibid: 343). It is, perhaps, premature to reach such conclusions especially if one remembers the limited excavation area and the sorting of materials which took place in part of it. Short term climatic oscillations and opportunistic hunting practices might have resulted in the quantitative differences in the observed animal percentage. These hunted animals, are rhinoceros, warthog, buffalo, roan antelope. The overall picture of the exploited fauna is that of side-water ecology and open savannah. Freshwater molluscs are numerous with *Pila wernei* as the most frequent. Land molluscs are mostly represented by *Zootecus insularis* (table 1). These molluscs suggest swampy and reasonably wet conditions. An annual rain of about 400 mm is generally required for *Limicolaria cailliaudi*. A considerable number of Ostrich shells were also found suggesting that Ostrich eggs were collected to augment the hunters diet. Edible plants and seeds must have been an important component of the occupants subsistence economy though this assumption is based mostly on indirect evidence. Few seeds of the African hackberry (*Celtis integritolia*) were recovered in the excavated debris. Stone grinders and pounders were also part of the hunters stone equipments used for processing plants. The riverine environment and the savannah

steppe apparently offered them a variety of food resources that could be exploited at different times of the year. Such opportunities, however, depend mainly on the annual Nile regime and the overall prevailing climatic conditions.

Geomorphological and geological research undertaken by a number of scholars along the White and Blue Niles suggest that the period from early to middle Holocene witnessed high floods which were also anticipated for the main Nile stretch in Khartoum region (Adamson 1982: 229). Wickens argued that the cool and dry climate of the terminal Pleistocene in central Sudan was replaced during the early Holocene by wet and warm climatic conditions. Quoting warren's divisions of rainfall zones in Sudan he referred to what is called period II dated to about 12000 – 7000 B.P when the estimated rainfall at Khartoum is over 400 mm. According to this scheme, Khartoum has witnessed its maximum rainfall (c. 490-560 mm.) around 8000 B. P. The associated fauna of the early Holocene wet climate included swamp and Savannah species of which mongoose, waterbuck, buffalo, elephant, reed rat, Nile Lechwe, hippopotamus, and rhinoceros were reported (Wickens 1982: 24 – 30). A progressive shift of the rainfall, vegetation and faunal zones started by Middle Holocene when climate gets drier marking what is called period III. This dry phase was followed by another wet phase coeval with high Nile flood c. 5000 B. P.

The overall evidence, however, suggests that Umm Marrahi was occupied at least during the early Holocene wet phase described as period II above. The occupation of the hill summit by the hunters seems to have been the right choice as it offers a substitute to the inhabitable flood plain and a good command of the Savannah plain at the same time.

Archaeology:

A- Stone Artifacts:

The lithic artifacts from the excavation area are numerous and constitute the most conspicuous cultural element. Lithic inventory includes debitage, cores, retouched tool, grinders and hammerstones. The finished tools are quite few but are fresh and well made. They exhibit somewhat limited technological and typological variability. The presence of very small chips throughout the cultural deposit and the even distribution of tool types indicate that only minor disturbance might have taken place. The occurrence and density of artifacts in the arbitrary level are variable but continuous from sub-surface down to the bedrock. High

density of artifacts occur in the top levels down to c. 50 cm after which they fall in number, between 50 – 70 cm, to rise again where their density reaches its maximum at c. 85 cm. below surface. The collection was initially sorted out according to arbitrary levels but when artifacts homogeneity is confirmed they were treated as one assemblage.

Table 2 shows the distribution of gross artifact types as percentages. It can be seen that the assemblage is dominated by debitage (90%) composed of shattered fragments, broken flakes, small chips and chunks. Retouched tools are just over 3% of the assemblage.

Table 2: Gross artifact types as percentages

Type	No.	%
Debitage	8094	89.3
Cores	641	7.1
Tools	324	3.6
Total	9059	100.0

The clear preference of using small size quartz nodules for manufacturing tools may explain the high percentage of debitage and the microlithic nature of most of the retouched tools. Other rock types utilized in tool making but in small numbers are rhyolite, sandstone and fossil wood (table 3).

Table 3: Raw material utilization as percentages

Rae material	No.	%
Quartz	8047	88.8
Rhyolite	488	5.4
Sandstone	338	3.7
Fossil wood	196	2.2
Total	9059	100.0

The majority of retouched tools are lunates, borers, backed pieces and they are the best made in the collection. Lunates are characterized by their small size and variety of forms. They fall into sub-types depending on size, type of retouch and other morphological features (Fig. 2, a, b, c, Fig. 3 d, h). Scrapers are also an important element in the tool kit and the most common are side, end and semi-circler scrapers (Fig. 3, a. b, c, e). There are also some denticulates, notches and irregular retouched flakes (Fig. 3 f, g). Cores are generally of simple forms used primarily for the

production of flakes. There is no evidence for blade technology and the few blades in the assemblage were likely to have been fortituously produced. The most common cores are those with single or double platforms to be followed by discoided and wedge types. Cores with irregular form are also common.

The assemblage also contain few grinders, hammerstones and fragments of stone rings (Fig. 2 g, h, f). With the exception of lunates and scrapers there seems to be no major difference in the occurrence of tool types and if the cultural deposit has any temporal dimension this is not reflected in the manufacturing techniques of the finished tools. On the whole the assemblage composition is generally comparable to those found at Khartoum Mesolithic sites in the region. The absence of polished tools and gouges known in Shaheinab Neolithic Sites is yet another indication for the Mesolithic affiliation of Umm Marrahi.

B- Ceramics:

The ceramic collection recovered from the excavated cultural deposit at Umm Marrahi is about 1800 sherds. the excavated trench turned out to be the deepest early ceramic bearing deposits second to Shaqqadud in the Central Sudan and in the whole of the Nile valley. Before the ceramic collection was subjected to classification, the sherds from the surface and the uppermost 10 cm. have been excluded, as it was noticed that weathering, deflation and disturbance might have distorted the actual stratification of the upper level of the site. Besides, some intrusive sherds of a later date were found mixed with the Mesolithic components. Moreover, all the sherds whose maximum length does not exceed 2 cm, whether plain or decorated, have also been excluded, as their attributes cannot be identified for certain. This process has resulted in a population of 1511 sherds subjected to classification.

The methodology of classification applied here is the same as that used for the sherds from Shaqadud midden (Mohammed-Ali 1991a: 65-66). This was done for the purpose of consistency and standardization to allow for comparison.

The sherds from each 10 cm arbitrary level were classified separately. Due to the absence of complete pots, semi complete pots or even large sherds with rims and/or bases, it was not possible to comment on profiles shapes or forms of the vessels. Accordingly these variables were excluded. It was also noticed that vessels texture was modified by

smoothing on both surfaces, and neither were they burnished or slipped. The ware (paste and firing) is hard and predominantly well fired.

Some variation were observed in the paste (clay and temper) and decoration. Fortunately these variables are the most emphasized in the classificatory systems in the Mesolithic/Neolithic ceramics of the Central Nile.

Breakage of pots is usually determined by the nature of raw material, the method of building, firing, kind and amount of inclusions, or a combination of all or some of them. In our collection the main cause of breakage was apparently the method of building, as the sherds were predominantly broken in horizontal lines, an indication that they were built by coiling.

Sherds range in thickness between 8 to 5 mm, and they vary in colour, on both surfaces, from gray to dark gray to brown. In cross-section the core colours grade from brown to black.

Classification:

The clays utilized were naturally present at the river bank few meters from the site, deposited annually by the river floods which transported them from eroded deposits in the Ethiopian highlands. While the clays are fairly homogeneous ranging from fine to coarse grained, the inclusions incorporated into them are fairly diverse. But none is foreign to the area. Among these, sand, grit and quartz are naturally occurring in the sandstone formation which characterizes the topography of the western bank of the Nile in Central Sudan (Fig 1). Shell and grog were also available. Mica was occasionally noticed in the clays with a neglegable quantity and was randomly distributed. As it occurs naturally in clays and sands it was not seen as a constituent intentionally added to the clays.

A small ceramic sample was examined under magnification for identifying the paste; and the following types were recognized:

1. fine grained clay particles, moderately to heavily included with very fine to slightly coarse pieces of round quartz or sand. The larger inclusions tend to extrude through the surface of the sherd.
2. Fine grained clay particles, lightly to heavily included with small grit. The inclusions are readily visible on the surface of some sherds and appear to be a factor of the amount of erosion some sherds have been subjected to.

3. fine grained clay, moderately to heavily included with what appears to be ground up fired clays (grog) whose particles are brownish-gray in colour and very small in size.
4. fine grained clay, lightly to moderately included with fine sand, and lightly with small grit or small pebbles. Occasionally the grit extrudes through to the surface of the sherds.
5. fine grained clay, heavily included with fine sand and small angular pieces of crushed quartz and shell whose relative amounts vary in relation to each other, but together they make up a good proportion of the total amount of inclusions.
6. fine to very fine grained clay, lightly to heavily included with small angular pieces of crushed quartz.
7. fine to very fine grained clay, moderately to heavily included with small to large grit already visible on the surface of the sherds.
8. very fine grained clay with no inclusions found even under magnification.
9. fairly coarse grained clay, moderately to heavily included with fine sand and grog.
10. coarse grained clay, heavily included with slightly coarse sand and shell. Inclusions are visible on the surface of the sherd.
11. coarse grained clay, moderately to heavily included with coarse sand and large angular pieces of crushed quartz. Inclusions extrude through the surface of the sherd.

The ceramic collection from Umm Marrahi revealed all the technique and motif types favored in the Khartoum Mesolithic of the Central Nile (tables 4,5). A variety of techniques were employed. These include impressing, pivoting, rocker stamping and combing resulting in a number of motifs among which were the fossil types; the wavy line and the dotted wavy line. While it is sometimes possible to recognize the techniques utilized to produce a certain motif (Caneva 1983c: 167-183), certain technique can produce more than one motif, and vice versa. Moreover, decorative techniques have a very wide range of utilization and in such a case, using them as diagnostic features or as classificatory device is rather inappropriate. Therefore, no emphasis was laid here to classify the ceramics by their decorative techniques. Rather, we emphasized the motif as an attribute easily and consistently identifiable, beside allowing for easy comparisons with other Central Nilotic assemblages. The motifs recognized are:

1. Wavy Line: This is the most striking motif in the early ceramic assemblages of the Central Nile (Arkell 1949, Mohammed-Ali 1982, Caneva 1983c). Despite its variability it was taken as one diagnostic feature for the Khartoum Mesolithic (Mohammed-Ali and Khabir 2003). The decorative motif can be produced by dragging a catfish spine or a comb horizontally in a wavy manner on the surface of the pot to form wavy lines. The spacing between the lines, their number and angularity vary from one sherd to another and sometimes on the same sherd (Fig. 4, a-d).
2. Dotted Wavy Line: Dotted wavy line was considered next to wavy line as a diagnostic ceramic motif for the so called 'Nilo-Saharan Neolithic' (Camps 1974). It was produced either by a cord wrapped stick rolled on the surface or by the rocker technique. The motif is known to be confined to the upper portion of the vessel and is usually found in conjunction with another motif on the same pot (Mohammed-Ali 1991a: 69; Fig. 4, c, f). No other motif was found in association with another.
3. Dotted Zigzag: This is the motif elsewhere referred to as 'Wolftooth' or 'Sawtooth' (Hays 1974: 30). It is produced through rocker stamping by using straight or curved toothed comb. The spacing between the dots and the length of the lines depend on the implement used (Fig. 5, a, b).
4. Dotted Straight Line: This motif is made of parallel lines of dots likely produced by impressing a decorative tool into the surface of the pot. The spaces between the lines can be regular as well as random depending on the shape of the comb and the number of its teeth (Fig. 5, c).
5. Mat Impressions: This motif exhibits shallow identations on the surface of the pot with no clear orientation. Though it looks like mat impressions it can be produced by a cord wrapped paddle or even rocker stamping (Fig. 5, d).
6. Banded: The banded motif consists of a widely spaced parallel horizental lines of dots. It can be mixed with dotted straight lines but here are wider spaces between each group of clustering lines (Fig. 5, e). This may not be identifiable in small sherds.
7. Plain: Plain sherds come from undecorated vessels or from portions close to the base of decorated vessels (Fig. 5, f) especially when they are thicker or showing signs of being parts of cooking pots. From elsewhere it was noticed that the lower

portions of vessels were left undecorated (Mohammed-Ali 1991a: 83-84).

8. Varia: This is a 'group' in the sense that it is a combination of 'categories' in which the decoration is either unclear or does not fall into any of the known types.

Table 4: Distribution of Ceramic motifs through the levels of Umm Marrahi Excavation Trench

Depth in Cm.	W.L.	D.W.L	D.Z	D.S.L.	M.I.	Ban	P.	V.	Total	Density per sq/m.
0-10	-	-	-	-	-	-	-	-	-	-
10-20	27	13	16	19	33	3	56	4	171	43
20-30	24	15	29	16	36	2	38	4	164	41
30-40	24	12	26	17	26	4	48	6	163	44
40-50	33	15	19	12	34	2	28	8	151	38
50-60	12	5	11	7	9	2	24	3	73	18
60-70	54	9	33	20	28	3	54	6	207	52
70-80	66	5	33	35	23	2	73	8	245	61
80-90	38	8	31	12	31	1	54	7	182	46
90-100	19	4	21	12	14	2	26	5	103	26
100-110	18	2	5	3	9	1	12	2	52	13
Total	315	88	224	153	233	22	413	53	1511	-

W.L. Wavy Line
D.Z. Dotted Zigzag
M.I. Mat Impressions
P. Plain
D.W.C. Dotted Wavy Line
D.S.C. Dotted Straight Line
Ban. Banded
V. Varia

Ceramic motifs of Umm Marrahi fit very well within the Khartoum Mesolithic types. The diversity of inclusions remains to be investigated. A large ceramic sample representing each motif type from each level ought to be examined before a firm conclusion can be reached. As yet no clear association is apparent between any particular paste and any specific motif, while paste types and decorative motifs seem to overlap (table 6).

Table 5: Percentages of Ceramic motifs through the levels of Umm Marrahi Excavation Trench

Depth in Cm.	W.L.	D.W.L	D.Z	D.S.L.	M.I.	Ban	P.	V.	Total
0-10	-	-	-	-	-	-	-	-	-
10-20	15.8	7.6	9.4	11.1	19.3	1.8	32.7	2.3	100.0
20-30	14.6	9.1	17.7	9.8	21.9	1.2	23.2	2.4	99.9
30-40	14.7	7.4	16.0	10.4	16.0	2.4	29.4	3.7	100.0
40-50	21.8	9.9	12.9	7.9	22.5	1.3	18.5	5.3	100.1
50-60	16.4	6.8	15.1	9.6	12.3	2.7	32.9	4.1	99.9
60-70	26.1	4.3	15.9	9.7	13.5	1.4	26.1	2.9	99.9
70-80	26.9	2.0	13.5	14.2	9.4	0.8	29.8	3.3	99.9
80-90	20.9	4.4	17.0	6.6	17.0	0.5	29.7	3.8	99.9
90-100	18.4	3.9	20.4	11.7	13.6	1.9	25.2	4.8	99.9
100-110	34.6	3.8	9.6	5.8	17.3	1.9	23.1	3.8	99.9
Average	20.8	5.8	14.8	10.1	16.1	1.5	27.3	3.5	9.99

Table 6: Paste types per decorative motifs at Umm Marrahi

Decorative motif	Paste types
Wavy line	1.2.11
Dotted wavy line	1.10
Dotted zigzag	1.6.7.9
Dotted straight line	1.3.4.6.7
Mat impressions	1.4.5.6
Banded	1.2.6
Plain	1.2.6.8

Dating and Chronology:

The ceramic stratigraphy at Umm Marrahi does not show any marked difference in sherds size or type throughout the cultural deposit. No decorative motif was shown to have developed from, or replaced by another (table 4). Yet halfway up the profile (level 50-60 cm.) it was noticed that the density of sherds deceased to about one third compared to the levels below and to about half compared to the levels above (table 4). This could be due to a number of factors. Accordingly the levels below and above this portion were compared for each decorative motif (table 7).

Table 7: Mean frequency of decorative motifs at lower and upper levels at Umm Marrahi

Decorative motif	Lower levels: 60-110 cm	Upper levels: 10-50 cm
W. L.	25.4	16.7
D.W.L.	3.7	8.5
D.Z.	15.3	14.0
D.S.L.	9.6	9.8
M.I.	14.2	19.9
Ban.	1.3	1.7
P.	26.8	26.0

The comparison shows a minor decrease of c. 9% in the popularity of wavy line partly alternating with an increase of c. 5% in dotted wavy line. No other clear shift was noticed in the frequency of any of the other motifs. However this does not seem to question the integrity of the stratigraphy or mark a significant shift in the occupation.

As stated above this assemblage fits quite well within the Khartoum Mesolithic represented in the Central Sudan by its type-site at Khartoum Hospital (Arkell 1949), and other related sites at al-Qoz (Arkell 1953), Sorourab-1 (Mohammed-Ali 1982; Khabir 1987), Saggai (Caneva 1983a), Lower Shaqadud midden (Mohammed-Ali 1991a); and S-21 (Mohammed-Ali 1991b). Few other sites north and south of Khartoum with consistent assemblages were excavated but not fully published (Clark 1973; Haaland 1987; Caneva 1986).

These assemblages are closely linked and represent among other artifacts, well made and well fired hard ware unburnished and unslipped ceramics. They have smooth surfaces decorated in a variety of motifs amongst which wavy line and dotted wavy line are the most popular. Popularity of each motif differs in degree, but never in kind, from one assemblage to another. This is not unexpected in an industry long-lived for over 2000 years from c. 9000 – c. 6000 B.P.

Within the broad sense of the Khartoum Mesolithic assemblage characteristics the Umm Marrahi ceramics are homogeneous in terms of paste types, surface treatment, decoration, firing, etc. though not all these

assemblages were studied according to standardized classificatory criteria, Umm Marrahi shows closer affinities with some of them.

Table 8: Percentages of certain ceramic motifs at Khartoum Mesolithic sites

Decorative motif	UM	S21	Shaq.L.	Sag.L	Shaq.M.	Sag.U.	SRB-1
W.L.	20.8	22.8	14.8	39.5	0.8	21.3	5.0
D.W.L.	5.8	7.4	0.0	0.3	0.0	1.0	8.0
D.Z.	14.8	37.1	51.1	37.3	7.4	55.7	17.6
D.S.L.	10.1	7.4	1.8	-	2.4	-	17.6
M.I.	16.1	24.7	10.5	-	3.4	-	6.6
Ban.	1.5	7.4	1.5	3.9	70.2	4.7	6.4
P.	27.3	25.3	32.6	14.9	15.6	16.4	13.6

UM = Umm Marrahi, S21 = site S21, Shaq.L = Shaqadud lower levels 66-60.
Sag.L.= Saggai lower levels, Shaq.M. = Shaqadud middle levels 50-45.
Sag.U = Saggai upper levels, SRB-1 = Sorourab-1.

All the decorative motifs of Umm Marrahi were present at the type-site of Khartoum Hospital but the typology at the latter suffers major inconsistencies due to the unidentified criteria used in the initial study (Arkell 1949, Plate 64-71). When Umm Marrahi ceramic frequencies are compared with the middle levels at Shaqadud (Shaq.M.) or the upper levels of Saggai (Sag.U.) or Sorourab-1 (SRB1) some differences in the proportions of motif types can clearly be seen (table 5).

Umm Marrahi ceramic frequencies are most comparable to those from S21 and the contemporary unites of Shaqadud (Shaq. L.) and Saggai (Sag.L.). Comparison with S21 shows that the diagnostic motifs (W.L. and D.W.L.) are not only present but are very close in their frequencies. The same is true for other types (P. and D.S.L.). When Umm Marrahi is compared with the lower levels of Shaqadud and Saggai, once more the basic motifs are present, most of which are closely comparable in frequencies (table 8). The assemblages from these sites share traits

believed by some to mark the early stages of Khartoum Mesolithic (Mohammed-Ali 1991b: 275). These traits are:

1. fairly high percentage of undecorated sherds.
2. reasonable proportional presence of wavy line (over 20%).
3. the presence of only hard coarse ware.
4. absence or low frequency of banded only/or dotted wavy line.

Were Umm Marrahi to be better tied in the temporal record of the long sequence of the Khartoum Mesolithic culture, the available C14 dates should be considered. As most of the Khartoum Mesolithic radiocarbon determinations are beyond the range of tree-ring calibration (Hassan 1986: 88) which may hinder correlation in most cases, the dates quoted here are all uncalibrated.

Four relevant C14 dates are considered controversial. One date of 8370 ± 350 B.P. (I- 1485) was obtained on shell associated with an isolated bone harpoon, said to be of 'Khartoum Mesolithic type' recovered at Tagra on the White Nile south of Khartoum (Adamson et.al. 1974: 120-123). Two shell samples from beneath the occupational levels at SRB-1 yielded dates of 9370±110 B.P. (HAR-3475) and 9330±110 B.P. (HAR- 3476) (Khabir 1987: 377-380). A fourth date of 10060±150 B.P. Saggai is also believed to be unreliable (Caneva 1983b: 149).

The lower levels at Shaqadud provided three relevant dates: 7785±445 B.P. (SMU- 1736), 7056±321 B.P. (SMU 1290) and 6892±131 B.P. (SMU- 1186) (Marks 1991: 61). The nearby site of S21 yielded a date of 7417±67 B.P. (SMU- 1310) (ibid: 61). Further north along the Nile in the Atbara reach Khartoum Mesolithic sites provided a number of dates ranging between 8640±120 B.P. (T- 8624) and 7260±110 B.P. (T- 8631) (Haaland and Abdul Majid 1992: 32).

On the east bank of the river almost opposite Umm Marrahi the site of Saggai provided four dates. They are: 7410±100 B.P. (T-5025), 7320±110 B. P. (T- 5027), 7250±110 B.P. (T- 5026) and 7230±100 B.P. (T- 5024) (Caneva 1983b). The nearby site of Kabbashi which is not fully published yielded a date of 7470±90 B. P. (T- 6654; Caneva et.al. 1993: 226-8). Another C14 date from SRB-1 was 6407±80 B.P. (Q-1536) (Mohammed-Ali 1982: 173, Fig. 1). On the White Nile, Shabona the most southerly Khartoum Mesolithic site provided a date of 7470±204 B.P. (SUA- 2140) and 7050±120 B.P. (SUA- 298) (Clark 1989: 389).

At Umm Marrahi we collected two shell samples from the test excavation trench for dating. One sample from 40 cm below surface gave

a date of 8920±180 B.P. (T- 5300) and the other from 65 cm below surface with a date of 8240±120 B.P. (T- 5301). We consider these two dates to be reliable and compatible with the archaeological, geomorphological and faunal evidence. They suggest a rather early age for Umm Marrahi *(i.e. beginning of the 9th. Millennium B. P)* and therefore call for a reconsideration of the chronology of the known Mesolithic ceramic sites in the region. Should the four older C 14 dates mentioned above remain as controversial as they are, unsupported by additional evidence, then Umm Marrahi would be the earliest place of pottery production in the Nile Valley so far known.

Acknowledgments:

The authors would like to thank the Leaky Foundation, California for financial support. Prof A. Gautier has kindly agreed to study the fauna and we appreciate his co-operation in providing us with the list of species he identified. We are grateful to Prof. A. T. El-Mahi for his valuable comments on the fauna. Dr. A. El-Hassan has offered us first-hand information on the site and made quite useful suggestions. We thank our colleagues in NCAM, Khartoum for their kind help. Thanks are also due to Azhari M. Saddig and Hamza Numeri for illustrating the artifacts.

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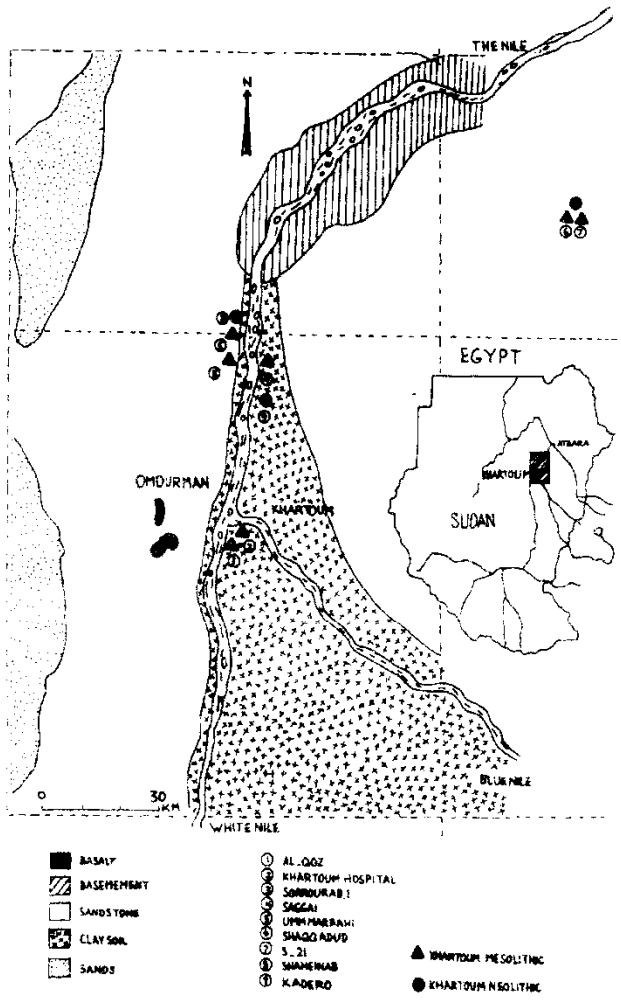

Figure: 1 Map of the area showing natural features and locations of Mesolithic and Neolithic Sites.

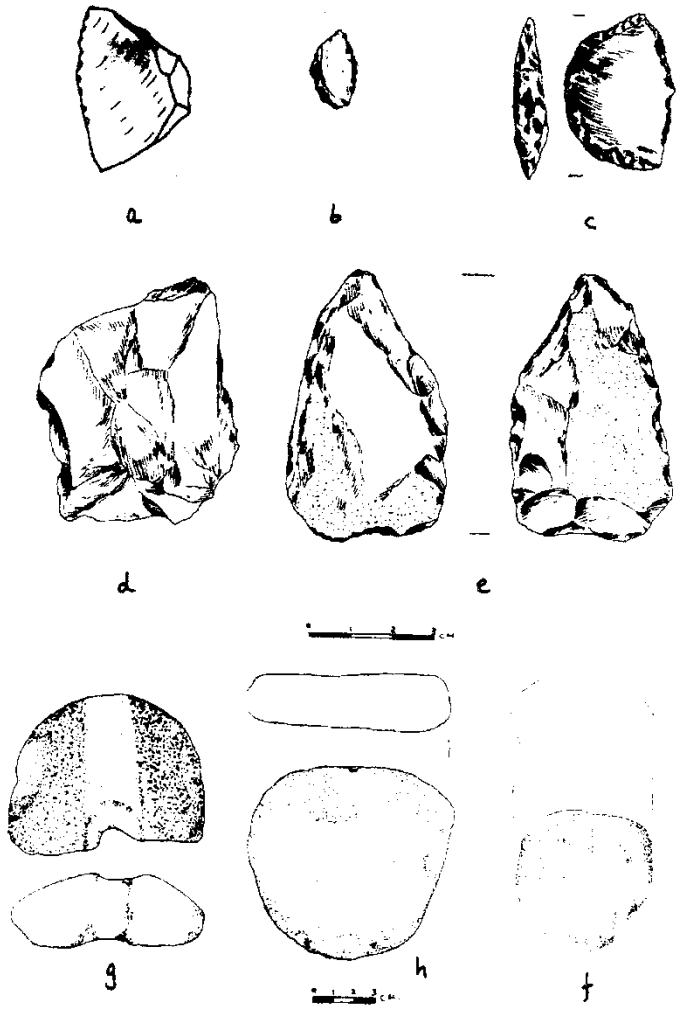

Figure: 2 Stone artifacts; a, b, c lunates, d. core. g, h, f, ground Stones.

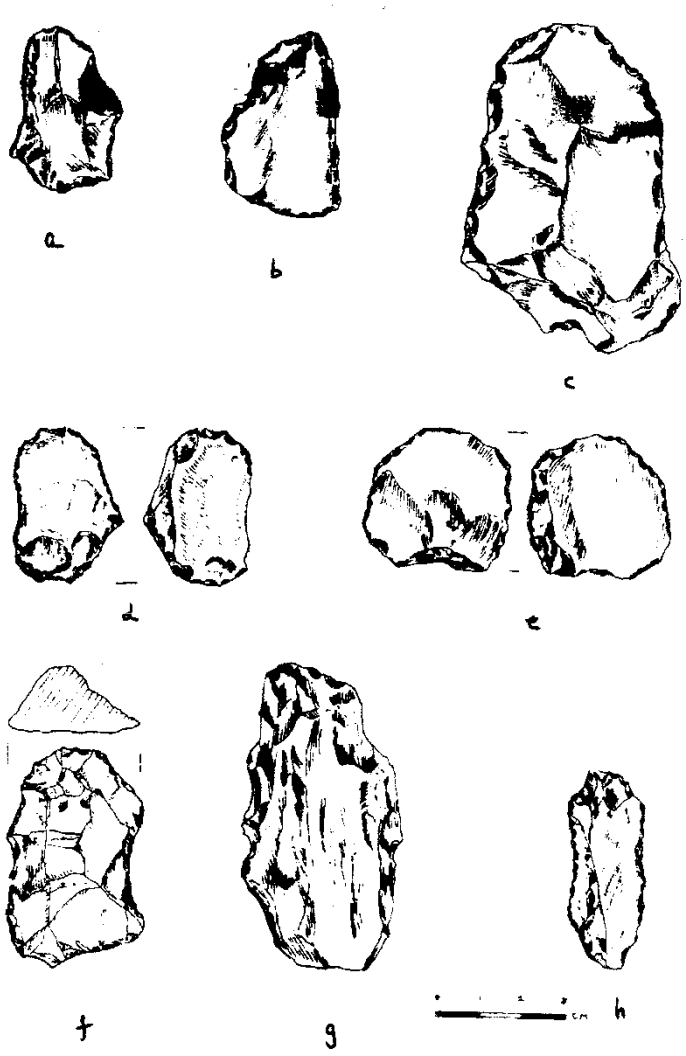

Figure: 3 Stone artifacts; a, b, c, d Scrapers; f, notch/ retouched piece; g, Denticulate; h, borer.

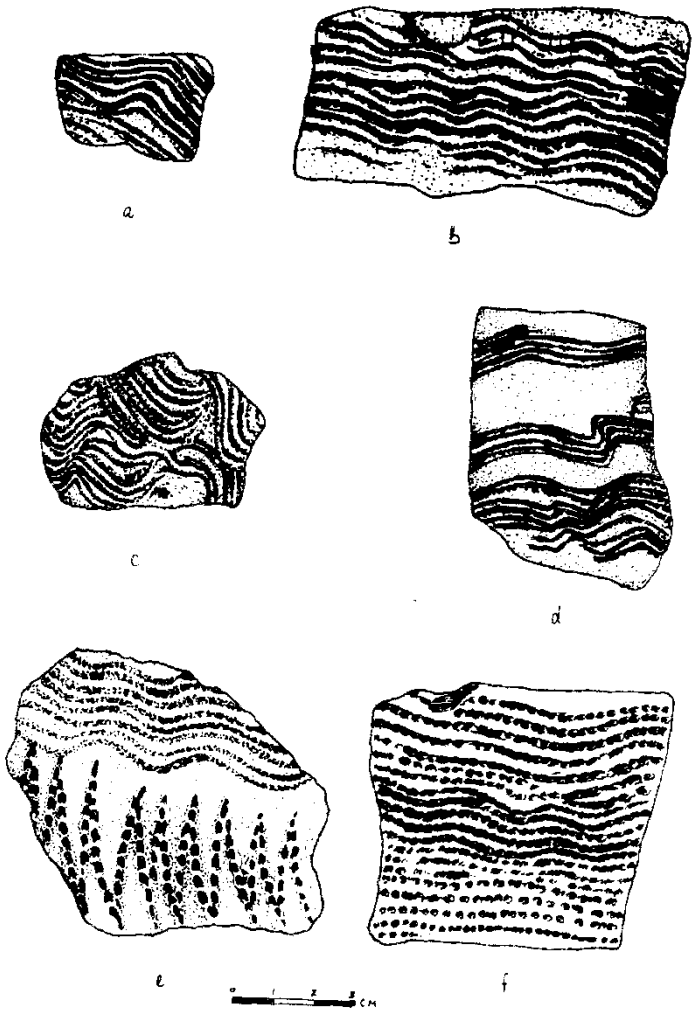

Figure: 4 Ceramics motifs at Umm Marrahi a-d, wavy line, e-f, dotted wavy line.

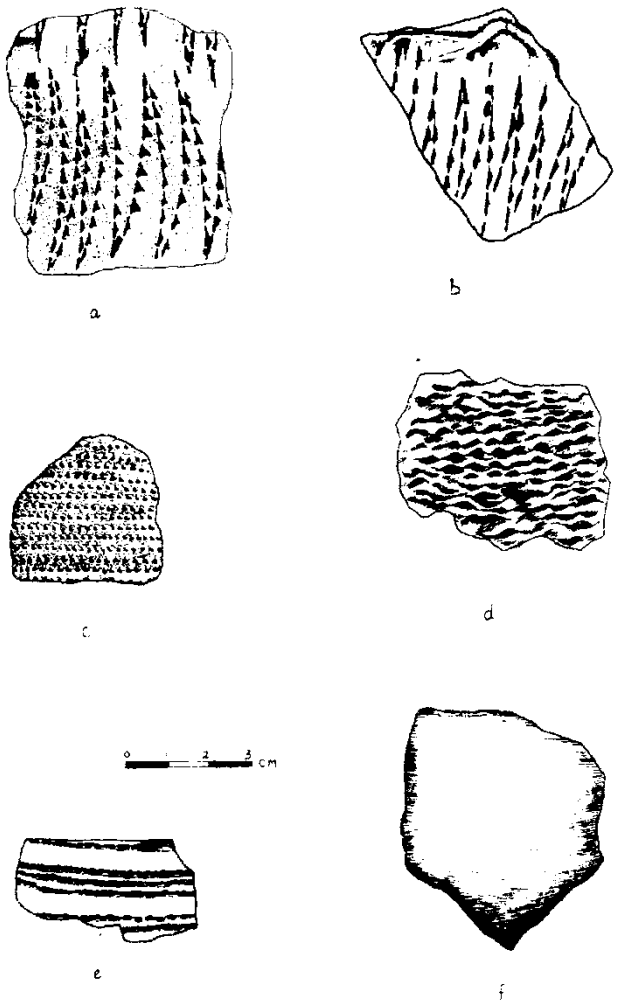

Figure: 5 Ceramics motifs at Umm Marrahi a, b dotted zigzag: e dotted straight line; d, mat impressions; e, banded; f, plain.