Poznań Archaeological Museum

Recent Research Into the Stone Age of Northeastern Africa



Poznań 2000

Recent Research Into the Stone Age of Northeastern Africa

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Recent Research Into the Stone Age of Northeastern Africa

edited by
Lech Krzyżaniak
Karla Kroeper and
Michał Kobusiewicz

Poznań 2000

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Cover:
Engraving on a vessel from the cemetery of Minshat Abu Omar (Eastern Nile Delta), showing the Horus name of *king Narmer,* the first historic king of a united Egypt (ca. 3200 BC).

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From the Organizers and Editors

These are the Proceedings of our fifth symposium on the Stone Age archaeology of Northeastern Africa. As it was the case with the Proceedings of the previous four symposia, the reader will find in this volume papers not only dealing with the main subject of the meeting but also presenting other themes. This undoubtedly is the result of a lack of regular conferences devoted to other periods of the African past in different parts of that continent. Consequently, we always have a certain number of scholars participating in our symposia who work in areas bordering Northeastern Africa and who study the post-prehistoric developments there.

We are very happy to see a continous stream of scholars from diffferent countries attending our symposia. It is particularly nice to see numerous participants of the the younger generation of archaeologiest from Europe who are increasingly working in Africa. On the other hand it is rather worrying to see a decline in the numbers of North American scholars working in Northeastern Africa. As it was already the case with previous meetings, we are deeply worried by the very small number of African scholars who were able to come to Poznań due to a lack of financial possibilities. We hope that this may somehow be changed in future meetings.

We would like to express our gratitude to all participants of our 1997 symposium and particularly to those who submitted their contributions to this volume. Words of thanks to all of you who again have patiently been waiting for the publication of these Proceedings.

Lech Krzyżaniak Karla Kroeper Michał Kobusiewicz

Poznań, December 2000

Words of Thanks

I first came to Poznan in 1980, to attend the initial conference on the Late Prehistory of Northeast Africa at Dymaczewo. Many things have changed in Poland since 1980, but one thing that has continued without change has been the warmth of the welcome and the efficiency of the conference organization.

It is hard to overestimate the value of these meetings in Poland. Not only do they provide a forum for all concerned with our studies on Northeast African prehistory. The regular meetings enable us to follow research developments, and the finely produced volumes keep the work visible to those who cannot attend the conferences.

We all owe an enormous debt to Lech Krzyzaniak, Michal Kobusiewicz and Karla Kroeper, with all their collegues, and our thanks, in making this symposium possible. We are deeply grateful and note particularly that the scene of the meetings is likely to continue in the future. I, on behalf of everyone here, and those who have already had to leave, express our profound admiration and grateful thanks.

Fred Wendorf

Kiekrz, August 26, 1997

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Barbara E. Barich and Fekri A. Hassan

A stratified sequence from Wadi el-Obeiyd, Farafra: new data on subsistence and chronology of the Egyptian Western Desert

Introduction

Farafra Oasis is situated in the central part of the Egyptian Western Desert, on the eastern margin of the Sahara. Its prehistory was virtually unknown before 1987, when the University of Rome Archaeological Mission initiated a programme of prehistoric and geoarchaeological investigation directed by B. Barich in collaboration with F. A. Hassan (1984-87; Barich et. al. 1991; 1992; 1996). From 1987 the research was oriented towards clarifying the Farafra occupation and subsistence pattern using reconnaissance survey and excavation. Parallel to this, a wider study of site transformation and climatic change, together with exchanges to Saharan occupants and contacts with the Nile Valley, was undertaken. Thanks to the 30 radiocarbon dates available today, a more intense, stable, occupation phase from about 7000 to 6000 bp has progressively come into focus. This phase is well documented in the Wadi el-Obeiyd, in the northern region of Farafra, currently the main area of our field-work.

Wadi el-Obeiyd

Wadi el-Obeiyd is an underdeveloped dry bed in the corridor separating the Northern and el-Quss Abu Said plateau, the two main features of the region (Fig. 1). The floor of the Wadi is mostly covered with residual powdery reddish soil, associated with Holocene playa deposits. During the Holocene, limited amounts of rainfall alternating with dry intervals, led to the formation of ephemeral lakes (playas). Based on palaeoclimatic information, the radiocarbon date 6050±75 bp from a hearth layer at el-Bahr, can be taken as the latest possible date for the regional occupation (Hassan 1996). Playa deposits underwent a sequence of ero-

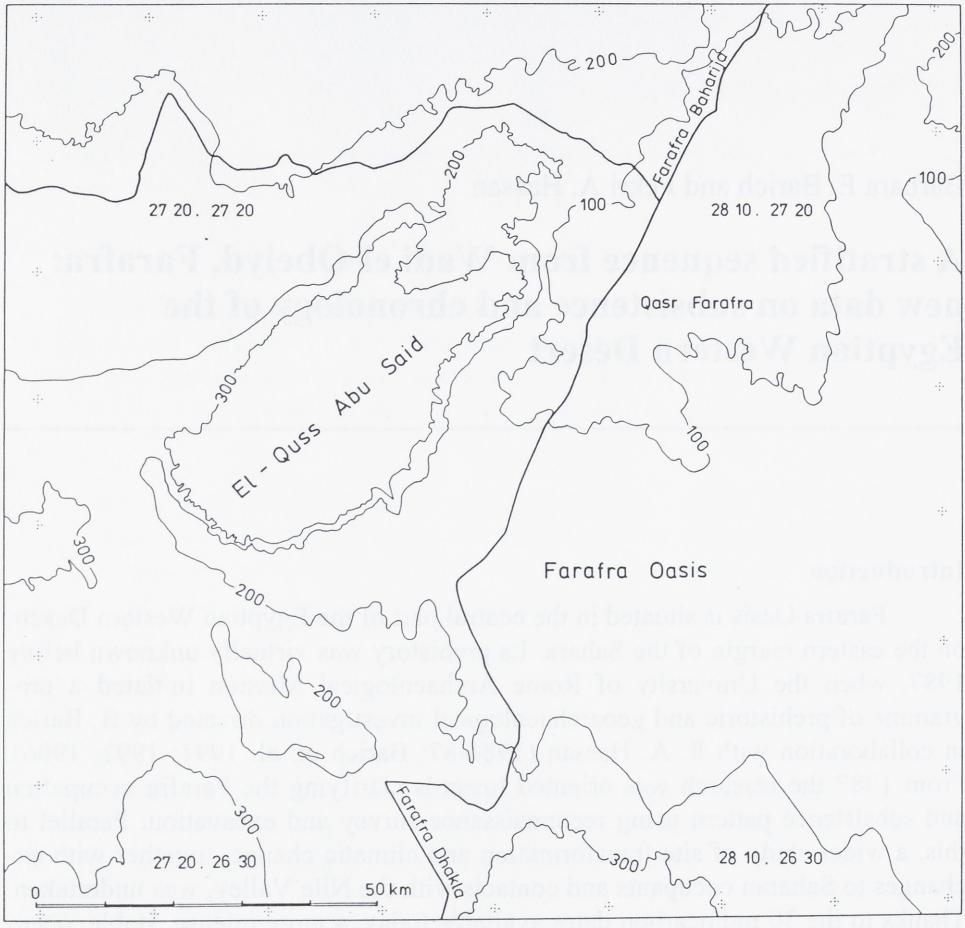
200
Farafra Baharija
200
100
27 20 . 27 20
28 10 . 27 20
Qasr Farafra
El - Quss Abu Said
300
100
300
Farafra Oasis
200
200
Farafra Dhakla
300
27 20 . 26 30
300
28 10 . 26 30
0
50 km

Fig. 1

sional events that ultimate eliminated them.

Prehistoric occurrences in the Wadi el-Obeiyd are plentiful, ranging from assemblages of stone implements, grinding stones to hearths and workshops. In 1991 we discovered a series of stone-lined hut foundations along the shores of what seemed to be an old water zone. It was a small depression, approximately 2 km away from the Farafra/Ain Dalla road which we named Hidden Valley (Barich 1998).

Hidden Valley Village

Hidden Valley runs along a north/south axis about 0.5 km long, surrounded by chalk belonging to the Farafra formation. In the middle of the basin there are still residual remains of lake deposits. The presence of water must have encouraged periodic returns, presumably on a seasonal basis. Sandstone hut-circles were detectable on the northern slope of the basin, facing southward, approximately 2 m above the current level of the basin floor. At the time of the first discovery these structures were barely visible, being almost completely buried in the sand. What originally attracted our attention was the great amount of lithic implements, manly bifacial tools showing a high manufacture standard as well as grinding stones, found all over the surface. We detected the layout of nine hut-circles lined up quite regularly in a E-W direction (perhaps following what may have been the ancient shoreline). At the western edge the row of hut-circles curved southward.

The excavation

The site was mapped and a 20x40 m grid was imposed over the area where structures were mostly detectable, with an extension even towards the centre of the basin (Fig. 2). The first excavation test, limited to 2 m, was opened in 1991 at the eastern edge, where the first hut appeared. In 1995, 1996 and 1997 the excavation was further extended in grid sectors A, E, F and G. The area excavated until now is about 100 m^2, while the area including the systematic surface artefact collection, where the structures were better highlighted, measured 400 m^2. Moreover, tests for geomorphology, sedimentology, and C^{14} sampling were carried out.

Sedimentological cross section

The general cross-section, drawn by F. Hassan, connecting all of the excavated grid sectors, comprises 12 sedimentological units (Fig. 3). Below the surface sand there are two silty and laminated sand units (1-2) with scarce charcoal remains. Further below, there are six units made up of sand, charcoals and ash layers amongst the frequent stone hearths. Unit 5 - between 8.9-9.1 m - is made up solely of stratified deposits with reworked ash. At the bottom of the section, gravel is more abundant. Several mud crusts with varying thickness in the different excavation sectors were recorded, indicating that water had intermittently

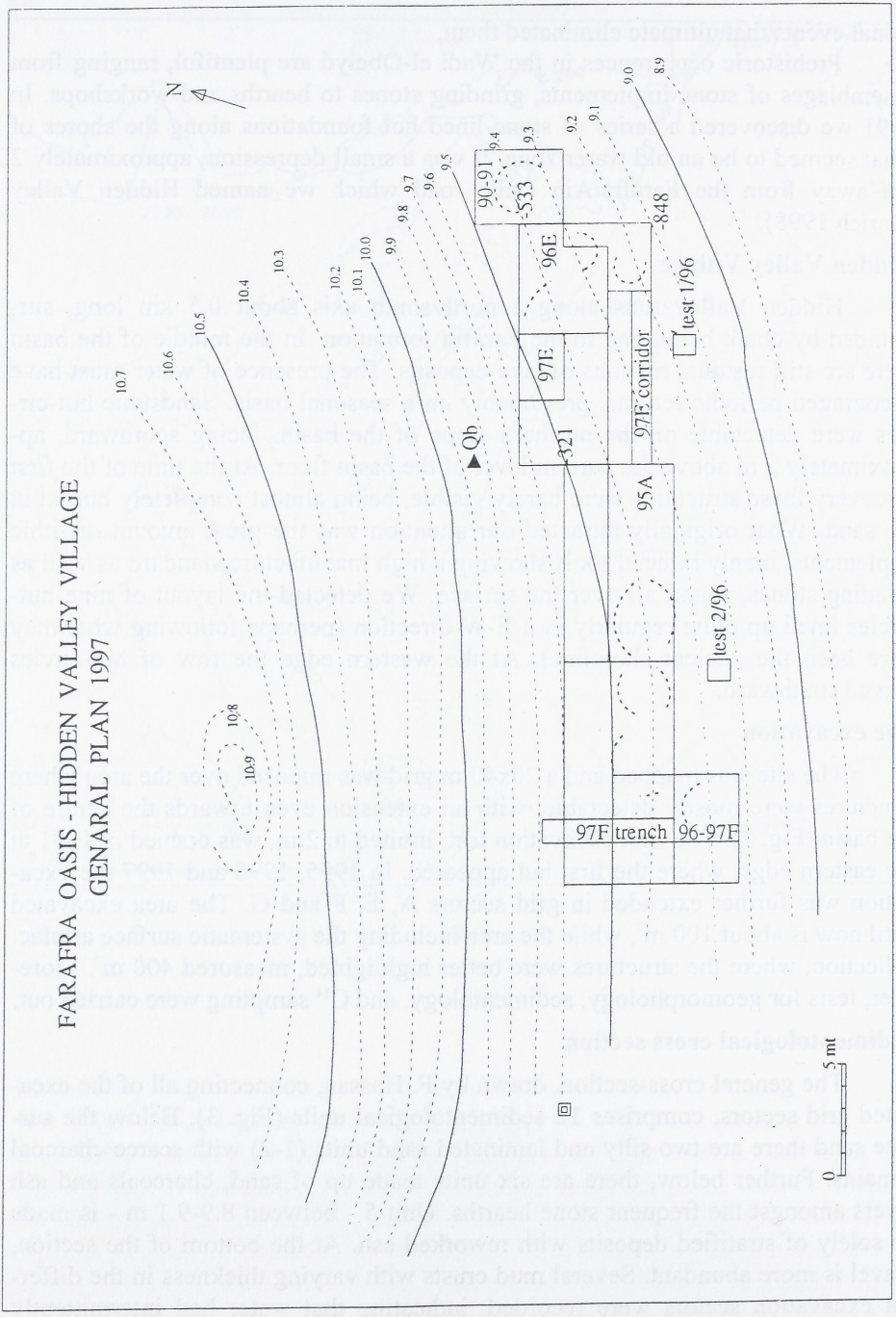
FARAFRA OASIS - HIDDEN VALLEY VILLAGE
GENARAL PLAN 1997
N
Qb
10.7
10.6
10.5
10.4
10.3
10.2
10.1
10.0
9.9
9.8
9.7
9.6
9.5
9.4
9.3
9.2
9.1
9.0
8.9
10.8
10.9
90-91
-533
96E
-848
97E
321
97E corridor
test 1/96
95A
test 2/96
97F trench
96-97F
0
5 mt

Fig. 2

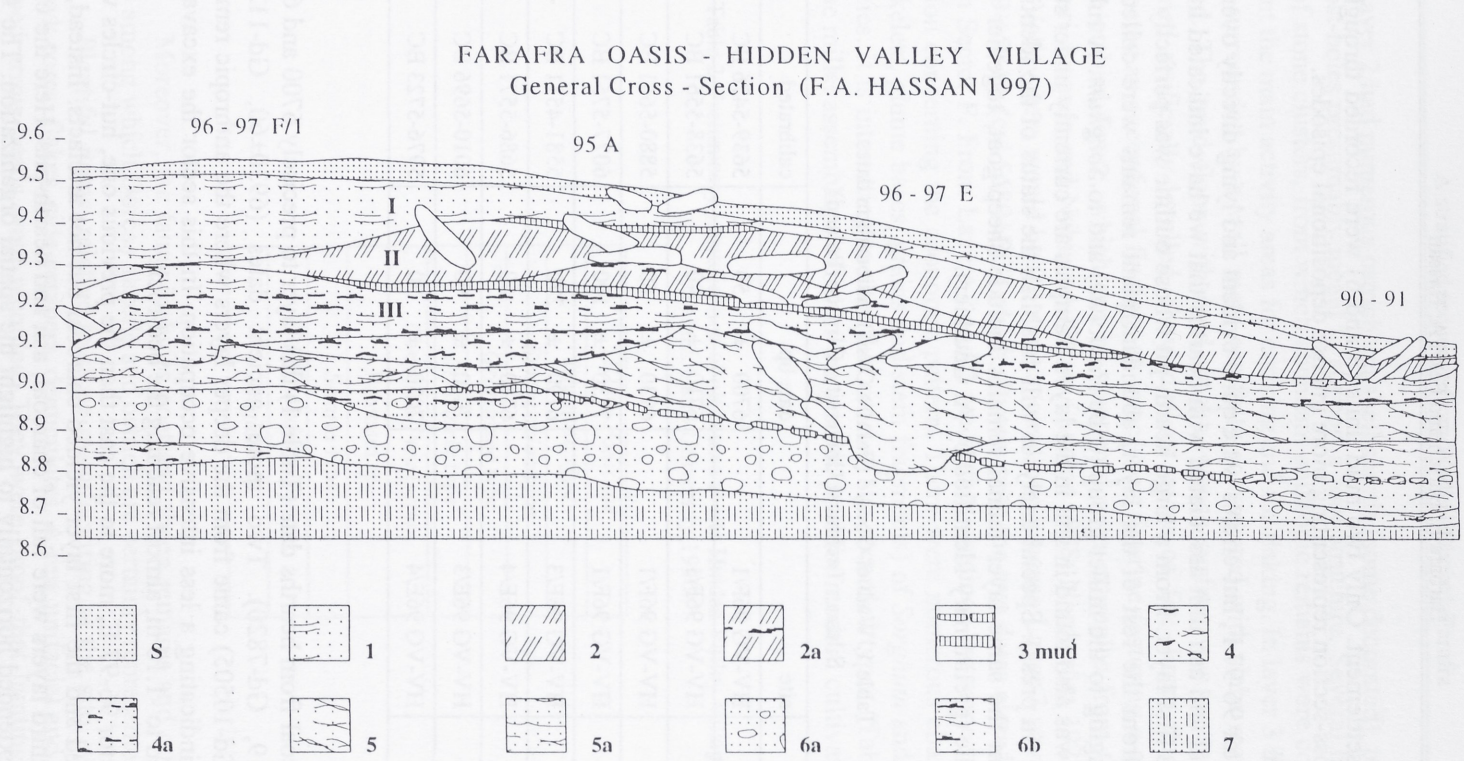
FARAFRA OASIS - HIDDEN VALLEY VILLAGE
General Cross - Section (F.A. HASSAN 1997)
96 - 97 F/1
95 A
96 - 97 E
90 - 91
9.6
9.5
9.4
9.3
9.2
9.1
9.0
8.9
8.8
8.7
8.6
I
II
III
S
1
2
2a
3 mud
4
4a
5
5a
6a
6b
7

Fig. 3

flooded the settlement. Only two mud units (3 and 6) were recorded throughout the entire cross-section representing more intense depositional episodes.

Archaeology

In sector 96-97 F, hut-circles were quite evident and lying directly over the sand, charcoal and ash unit associated with hearths that we have indicated in the profile as the first layer. From a large hearth-pit whose outline was perfectly preserved and from the rest of the layer, abundant plant remains were collected, mostly belonging to the millet group (tribe *Paniceae*) and to *Sorghum*. A rubber for grinding was also found in situ in the layer. Samples are currently under study by A. Fahmi (in press). Special analyses will establish the status of the identified species. From the same layer faunal remains include sheep/goat, together with Dorcas gazelle (preliminary identified by A. Gauthier).

Table 1. Wadi el-Obeiyd (Farafra Oasis) radiocarbon dates.
Silesian Technical University, Gliwice (Poland)

sample	site	date bp	calibrated
Gd 7819	HV-VG 96F/1	6700 ± 50	5639-5476 BC
Gd 7820	HV-VG 96F/1	6710 ± 40	5638-5561 BC
Gd 11281	HV-VG 96F/1	6930 ± 60	5880-5661 BC
Gd 10505	HV-VG 96F/1	7130 ± 100	6077-5751 BC
Gd 9629	HV-VG 96E/3	6190 ± 270	5581-4511 BC
Gd 7823	HV-VG 96E/4	6750 ± 50	5686-5571 BC
Gd 11279	HV-VG 96E/3	7040 ± 90	6010-5696 BC
Gd 11277	HV-VG 96E/4	7030 ± 70	5976-5723 BC

Charcoal from hearths date (Table 1) this layer to precisely 6700 and 6710 bp (Gd-7819, Gd-7820). Two more ancient dates (6930±60, Gd-11281; 7130±100, Gd-10505) came from the deeper layers where the anthropic remains were scant, indicating a less intensive occupation. In this sector the excavation was deepened to -1.10 m, almost reaching the bed-rock.

In sector 96-97 E, more to the east than the previous one, hut-circles were not uncovered and the first layer yielded charcoal but not artefacts. Instead, the second and third layers were full of charcoal, ash and hearth-pits. Here the excavation was extended horizontally to highlight the spatial organization. The floor

of Layer 2 had numerous ostrich eggshell sherds (some decorated), pot-holes and 3 post-holes presumably meant to support a roof structure. Several hearths made up of stone clusters, from which abundant anthropic remains were collected, represent the main activity areas for cooking and for flaking. In layer 3 a large hearth was surrounded by a wall more carefully constructed with slabs regularly juxtaposed. The mud floor with mud cracks, whose surface was so smooth that it seemed artificially levelled, showed clear traces of fire. From this feature we collected an exceptional finding: an intact clay figurine featuring a schematic female or bird figure, which can be compared with examples from the Neolithic Badari, Naqada and Nubian A-Group (Adams 1988; Nordström 1972). The Hidden Valley item would be the most ancient one because Layer 3 gave a dating of 6750 ±50 bp (cal 5680±BC) which clusters with the two dates already mentioned from Sector F. From Layers 2 and 3 we further obtained the same type of information concerning the economic pattern. There were numerous charred remains (spikelets, glume bases, grains and stem fragments) of *Sorghum* and other cereal species. It is interesting to note that most of the recorded types (Table 2) belong to the millet assemblage which is the genetic pool for modern cultivated species.

Table 2. Preliminary identification of plant taxa at site Hidden Valley Village-Farafra. A. Fahmi, Cairo University 1996.

TRIBE *Paniceae*
Digitaria type
Echinochloa type
Gramineae type
Bracharia type
Cenchrus/Pennisetum
Panicum sp.
Setaria type
TRIBE *Andropogoneae*
Sorghum sp

Moreover, the fauna includes goat and sheep remains and other wild species among which Dorcas gazelle and ostrich are certainly represented.

Plentiful items, relative to stone manufacturing at the site, were also collected: cores, flakes, side-scrapers, denticulates. A few unifacial and bifacial leaf-shaped arrow-heads were recorded. They were proof that hunting, along with

herding and cultivation continued to be in use. Ostrich eggshell sherds, some of which were decorated, were frequently found.

Based on the radiocarbon datings available from the 1996 excavation (Gd-9629, Gd-7823, Gd-11279, Gd-11277; Table 1), layers 3 and 2 can be dated between the end of the VIII and the first half of the VII millennium bp. However, an inconsistency must be noted between the date 6750±50 from Layer 3 and the two others, around 7000, which come from Layer 2. This fact allows us to interpret charcoal from Layer 2 as reworked material, washed away from an older deposit contemporary with the lower unit in 96-97 F. A single date, 6190±270 (Gd-9629) is available for the top (first) layer.

Discussion

In the cross-section we have tentatively indicated the correspondence between sedimentological units and occupation horizons. The first horizon would represent the latest occupational phase associated with hut-circles. As the cross-section shows, this horizon diminishes towards the eastern end of the settlement. The chronology of this horizon, for the moment, is based only on the 6190±270 bp date cited before. We also propose dating the previously mentioned bifacially flaked artefacts, systematically collected in the grid areas, to this horizon. Altogether they total several hundred pieces. The type list includes eight tool classes. Particularly significant are the leaf-shaped tools, such as tranchets, drills, arrowheads, knives.

On the other hand, the accumulation phase of the ash and charcoal layers shows a great thickness throughout the entire section. It represents the most intensive occupation phase of the settlement and is characterized by hearths, pot-holes, post-holes, ostrich eggshell deposits. We have distinguished two layers (II and III) which are separated by a mud layer. Three firm dates are available for this occupational phase: 6700, 6710 and 6750 bp. From the basal part of the stratigraphy we had already obtained in 1995 the C^{14} datings 7140±110 (Gd-9518) and 7160±60 (Gd-11221). Charcoals coming from these levels were later on washed away and redeposited as reworked materials over the deposits of the main occupation horizon.

General comment

In light of these results we can infer that the human presence in the Hidden Valley area might have begun at the end of the VIII millennium bp becoming more stable during the VII millennium. Groups were probably attracted by the abundant cereal grasses which ripened at the end of summer. Pot-holes and hearths lead us to believe that roof-arrangements of the same type suggested for Nabta E-75-6 were in practice.

These groups were equipped with bifacial implements. The bifacial technique experimented for the first time on the arrow-heads, firmly dated 6700 bp, was perfected on tools used for tilling soil and reaping cereals (such as gouges, drills, sickles, knives) that we suggested as associating with the settlement's last occupation phase, ending at ca 6200 bp. These tools are also common to the Mid-Neolithic Horizon at Site E-75-8 of Nabta and to Dakhla Bashendi B (Wendorf and Schild 1980; McDonald 1991). The Hidden Valley chronology has allowed for their more precise dating between 6500 and 6200 bp. We must note that the bifacial technique and artefacts of the same type appear in the Nile Valley at least a few centuries later. While ostrich eggshell are numerous, no ceramic vessel fragments have been found. Nevertheless, the finding of the clay figurine rejects the erroneous idea that these groups had no experience with ceramics. Presumably their use was limited, as other Western Desert contexts imply.

Our radiocarbon datings for sheep/goat are consistent with datings from the Nabta Middle Neolithic (Site E-75-8: from 7120 to 6130 bp, Banks 1984: 230) and from Dakhla Site 270 (McDonald 1994). These are the most ancient dates for small livestock known so far in North Africa. The association, both at Hidden Valley and at Nabta, of sheep/goat exclusively with autochthonous cereals would mean that sheep/goat and wheat/barley were not an inseparable "package".

The Hidden Valley chronology confirms that the Western Desert experienced an intensification of subsistence activities between 7000 and 6000 bp. Sheep-goat, probably also cattle herding was then gradually added to the local pre-agricultural economy. Once again these results emphasize the importance of the Western Desert in the transition from hunting-gathering to food production which afterwards exerted a strong influence on the societies of the Nile Valley.

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Heiko Riemer

Regenfeld 96/1 - Great Sand Sea and the question of human settlement on whaleback dunes

The characteristic features of the Great Sand Sea are parallel longitudinal sand dunes running over more than 500 km from SSE to NNW. Crossing the sand ridges in a West-East direction is a difficult undertaking, as Rohlfs' failure in Regenfeld in 1874 has shown (Rohlfs 1875:165-167). It has been argued that the Great Sand Sea must also have been a barrier for man and trade in prehistoric times. However since the beginning of detailed research more and more information about the presence of people in this region has been collected. In recent scientific papers it is being discussed whether the Sand Sea was also favoured by prehistoric people. Rognon argued in 1980 that dune sands store water in areas with minimum and periodical rainfall. This resource gives rise to dense and continuous vegetation (Rognon 1980). At present nomads prefer dunes for pasturing their cattle in dry seasons (Neumann 1989:110).

In 1982 the geologist Steffan collected a lot of prehistoric artefacts on dunes, without giving any information about the exact location or any further descriptions (Steffan 1982:91f.). In addition to this collection some prehistoric sites were discovered on the eastern and western margins of the Great Sand Sea. Haynes reports on various artefact scatters (Haynes 1982) from the so-called "Willmann´s Camp" site (Glass Area 81/61) in the western part of Sand Sea. The artefacts are situated on the top of a so called "whaleback" dune (or Arabic "draa"). Up to now, there is no clear evidence of the origin of these dunes. A pre-Holocene age is suggested (Steffan 1982:22; Pachur 1984:64; Pachur and Röper 1984:261). On the top of the whale back dune prehistoric artefacts are covered by younger active dune sands - the (Arabic) "Seif". The *Seif* originates mostly on the lee-side of a whaleback. In the peripheral zone of the dune crest prehistoric implements sometimes become visible because the sediment-cover is not very substantial. In the eastern margins of the Great Sand Sea some similar sites on

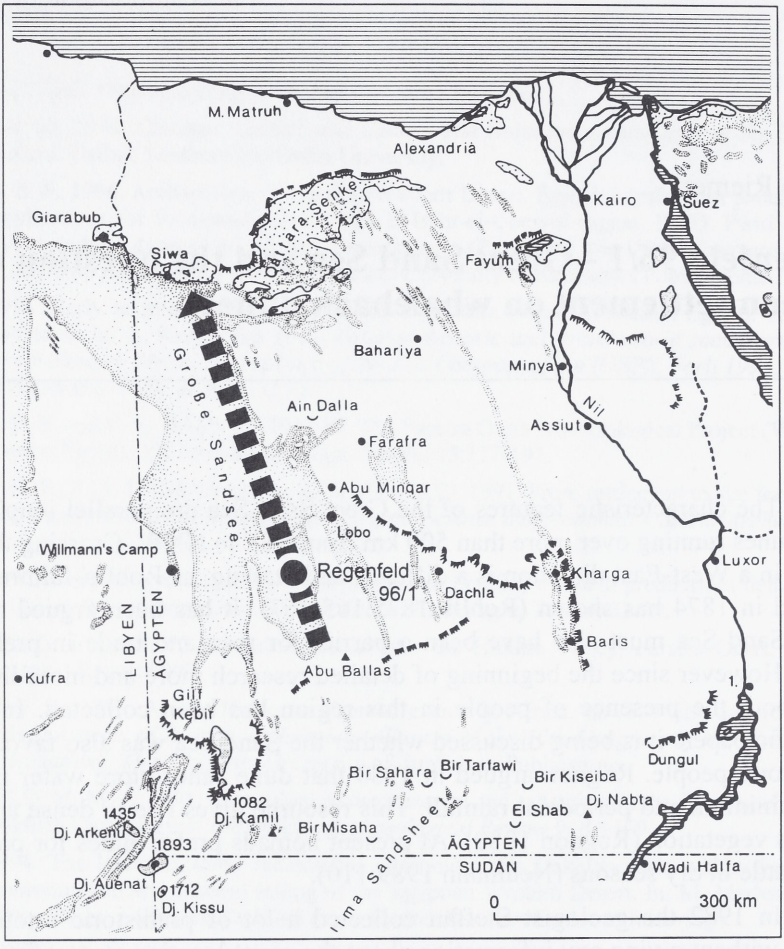

Fig. 1. Location of sites and route of the 1996 expedition.

whalebacks were discovered by the B.O.S. project, for example at Abu Minqar "Lobo" 81/55 (Klees 1989).

In 1995 the ACACIA project started at the university of Cologne, carrying out research into the relation between man and environment in arid Africa. During the first field campaign in Egypt in 1995/96, a combined expedition of geographers and archaeologists crossed the Great Sand Sea (Fig. 1). They moved from Abu Ballas in the south to Siwa oasis in the north and discovered, in March 1996, rich archaeological sites (96/1, 96/19 and 96/20) at a playa mud pan which

lies 50 km north-west of Rohlfs' Regenfeld. After a short inspection of the artefacts, an Early Holocene age was preliminarily suggested. Due to the limited amount of time available during the first visit it was necessary to return for a further exploration trip in autumn 1996.

The site is situated in the central-south of the Great Sand Sea, near 25 degrees of latitude. In this area the inter dune valleys are mostly free of sands, thus uncovering the natural surface. The artefact assemblages of the sites extends over the eastern bottom of the dune surface. The reconstruction (Fig. 2) shows the inter dune valley flanked by whalebacks. The western dune shows an active *Seif* while the eastern one is partially uncovered. Two reddish mud pans or playas which are bordered by very low escarpments are visible. The prehistoric artefacts concentrate on, or on the margins of, the western playa. Different clusters or scatters were recorded on different sediment levels (Fig. 3 and 4). The maximum difference of altitude reaches up to 7 m. Maybe the different situation of the archaeological scatters depends directly on fluctuating sea levels. However whenever the artefacts in the middle of the playa (site 96/20) were deposited it must have been very dry.

As it was pointed out before, an Epipalaeolithic date was suggested for the sites from the first and this was confirmed during our second visit. Two clusters of site 96/20 are situated in the deepest area, in the middle of the playa (Fig. 4). Flakes, chips and microblades are scattered over 15 by 10 m each. It is remarkable that there are many exhausted blade- and microblade-cores. Only a few retouched tools were found, namely backed points and elongated curved points (Fig. 5:1-4). Elongated triangles are unknown. This underlines an Early Epipalaeolithic age of Adam type. A dense ostrich eggshell scatter was found on 4 square meters together with the debitage of stone artefacts. We hope to get further information from radiocarbon analysis.

Another very interesting concentration is situated 300 m further west on the southern margin of site 96/1 (96/1-7). Its extents over 12 by 8 m, in which ostrich eggshells, flakes, microblades and cores of Libyan Desert Glass were found. Cores, microburins, hammerstones and retouched pieces indicate a workshop. Two slim trapezes are remarkable (Fig. 5:5-6). Both are backed and notched as it is well-known from the Epipalaeolithic level of the eastern Sahara site Westpans 85/52 at the Abu Ballas Escarpment from where a radiocarbon date of 8700+/-190 BP is submitted (Kuper 1993:214). A similar piece is also published for the Epipalaeolithic site Foum Seida in the Maghreb (Nehren 1992:303, Taf. 71, 17-18). Radiocarbon dates of ostrich eggshells from 96/1-7 are still being processed.

Most artefacts were found in 96/1 cluster no. 1; nearly 200 retouched stone tools, bone scatters and fireplaces were recorded on the surface. Many stone

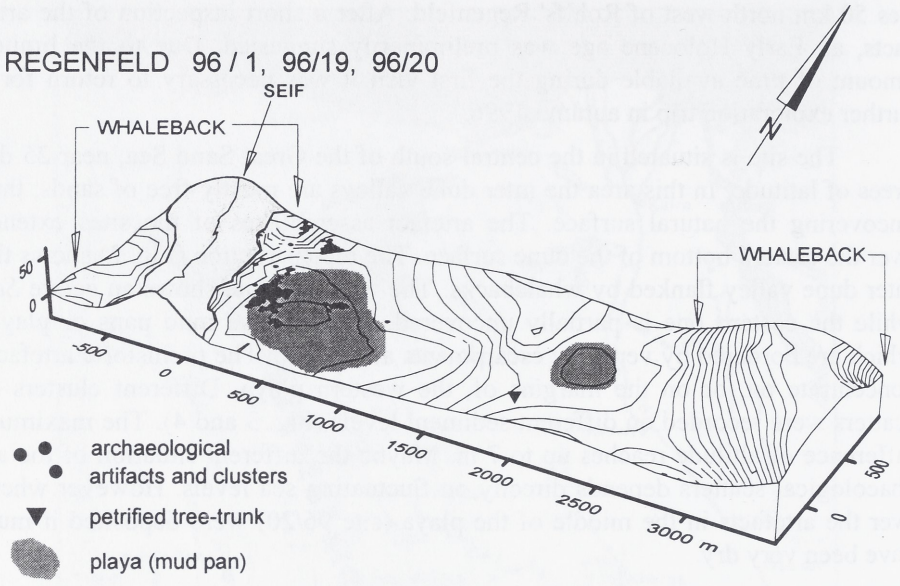

Fig. 2. Reconstruction of inter dune valley and longitudinal dunes.

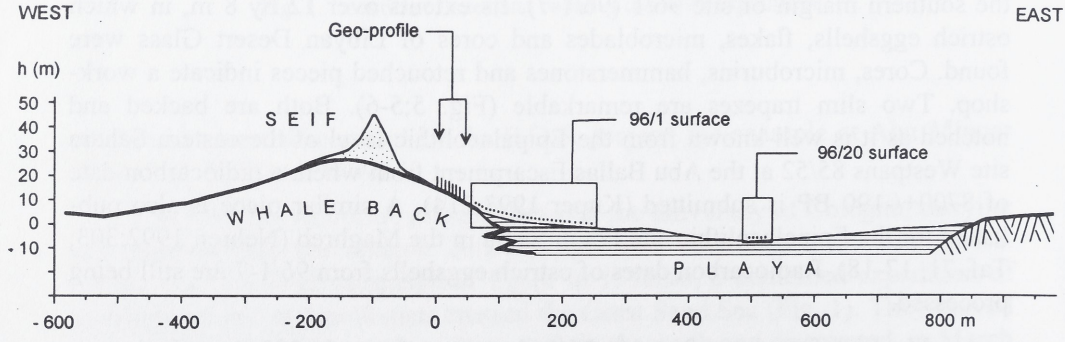

Fig. 3. Regenfeld 96/1 and 96/20: dune profile.

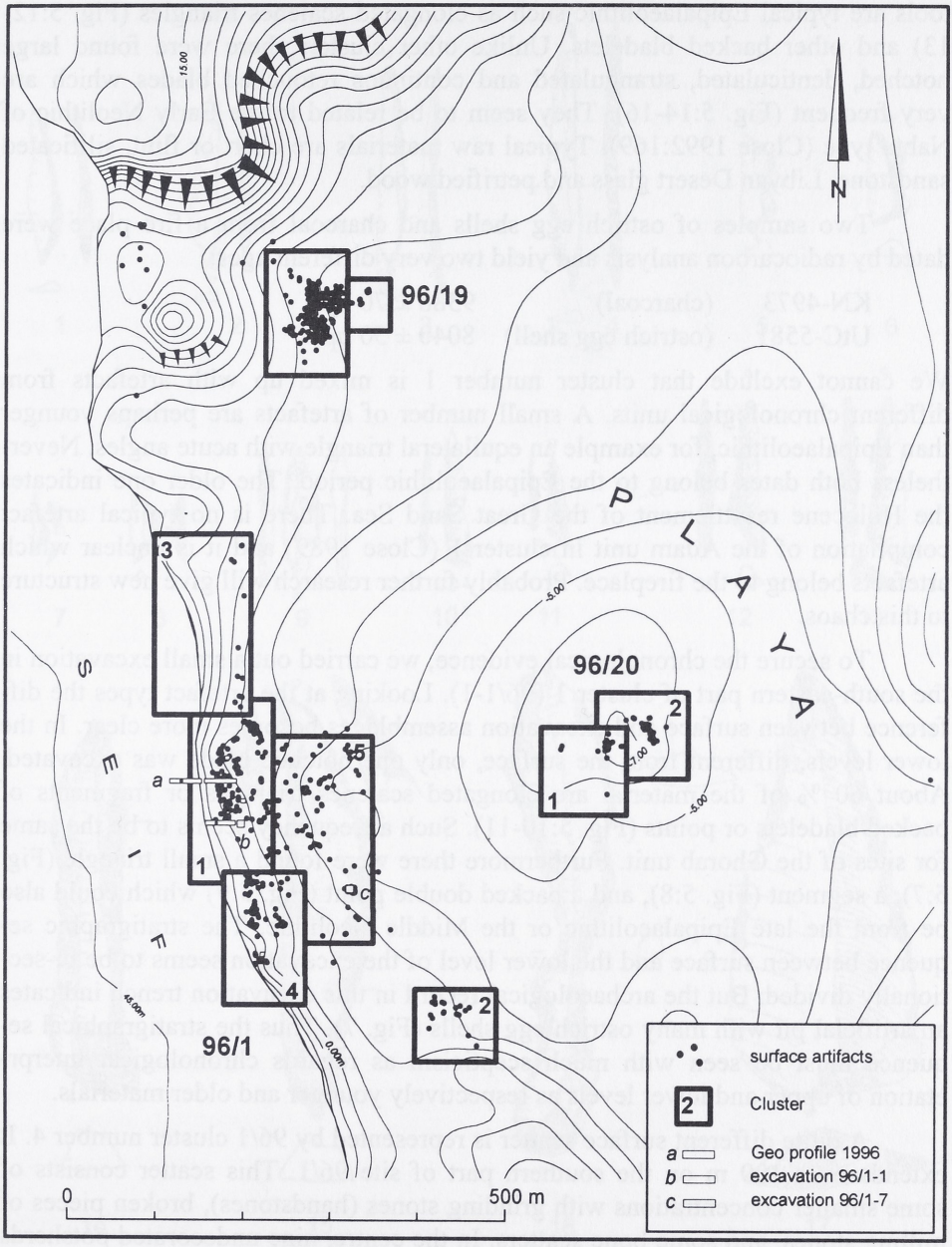

Fig. 4. Topographic map of sites 96/1, 96/19 and 96/20.

tools are typical Epipalaeolithic such as elongated scalenes triangles (Fig. 5:12-13) and other backed bladelets. Unlike other clusters, here were found large notched, denticulated, strangulated and continuos retouched blades which are very frequent (Fig. 5:14-16). They seem to be related to the Early Neolithic of Nabta type (Close 1992:169). Typical raw materials are chert or flint, silificated sandstone, Libyan Desert glass and petrified wood.

Two samples of ostrich egg shells and charcoal from a fire place were dated by radiocarbon analysis and yield two very different ages:

KN-4973	(charcoal)	9388 ± 70 bp
UtC-5581	(ostrich egg shell)	8040 ± 50 bp

We cannot exclude that cluster number 1 is mixed up with artefacts from different chronological units. A small number of artefacts are perhaps younger than Epipalaeolithic, for example an equilateral triangle with acute angles. Nevertheless both dates belong to the Epipalaeolithic period. The older one indicates the Holocene resettlement of the Great Sand Sea. There is no typical artefact compilation of the Adam unit in cluster 1 (Close 1989) and it is unclear which artefacts belong to the fireplace. Probably further research will give new structure to this chaos.

To secure the chronological evidence, we carried out a small excavation in the south-eastern part of cluster 1 (96/1-1). Looking at the artefact types the difference between surface and excavation assemblages becomes more clear. In the lower levels, different from the surface, only one notched blade was excavated. About 60 % of the material are elongated scalenes triangles or fragments of backed bladelets or points (Fig. 5:10-11). Such a frequency seems to be the same for sites of the Ghorab unit. Furthermore there were found a small triangle (Fig. 5:7), a segment (Fig. 5:8), and a backed double point (Fig. 5:9) which could also be from the late Epipalaeolithic or the Middle Neolithic. The stratigraphic sequence between surface and the lower level of the excavation seems to be bi-sectionally divided. But the archaeological record in this excavation trench indicates an artificial pit with many ostrich egg shells (Fig. 7). Thus the stratigraphical sequence must be seen with much scepticism as regards chronological interpretation of upper and lower levels as respectively younger and older materials.

A quite different surface scatter is represented by 96/1 cluster number 4. It extends over 100 m on the southern part of site 96/1. This scatter consists of some smaller concentrations with grinding stones (handstones), broken pieces of milling stones, and some bone scatters. In the centre, nine undecorated potsherds were found, including two rimsherds of different vessels (Fig. 6). All sherds seems to be of identical ware and manufacture and tempered with large chert and quartz pieces.

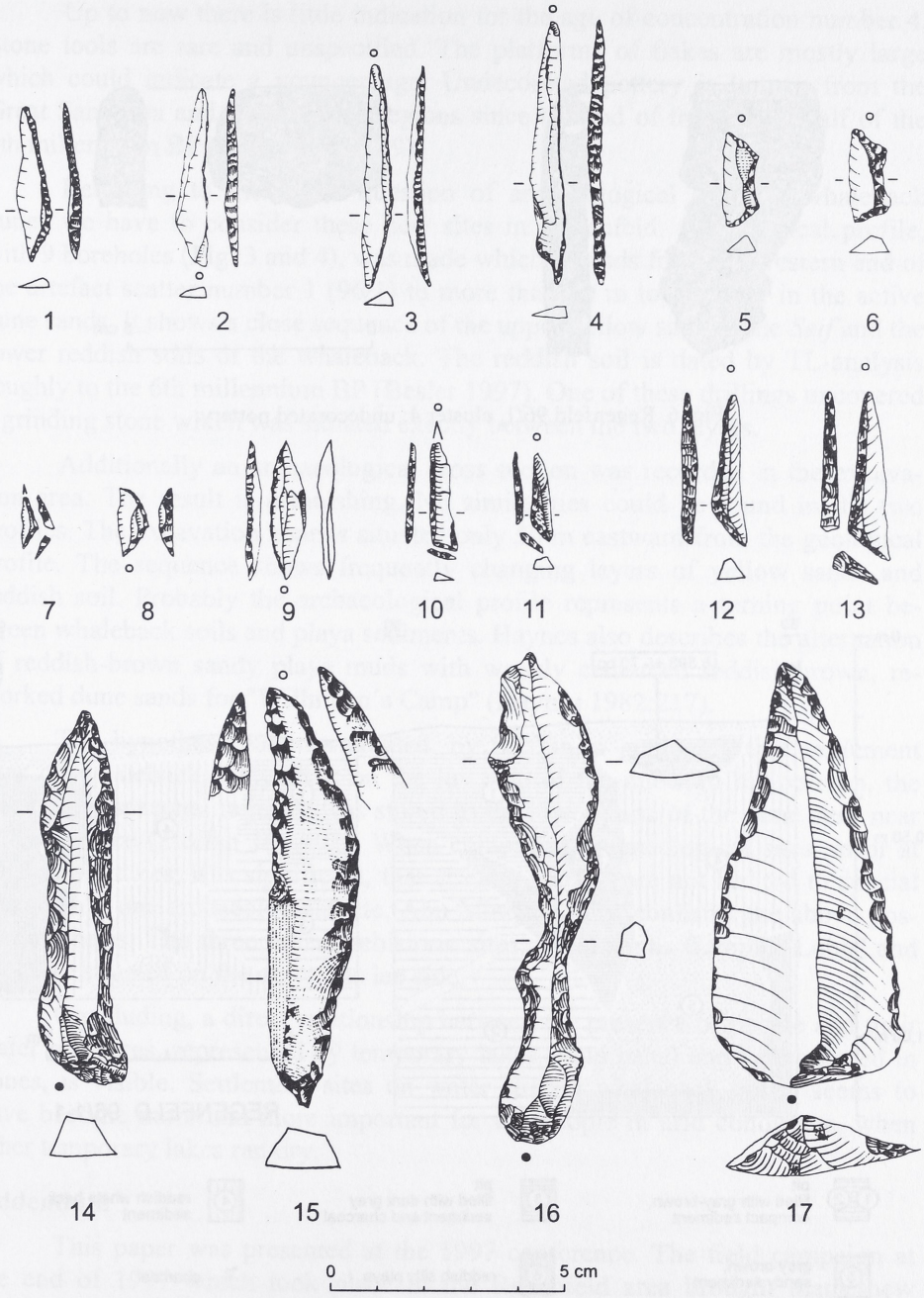

Fig. 5. Epipalaeolithic artefacts from Regenfeld sites:
1-4: 96/20; 5-6: 96/1-7; 7-11: 96/1-1; 12-17: 96/1 cluster 1 (surface).

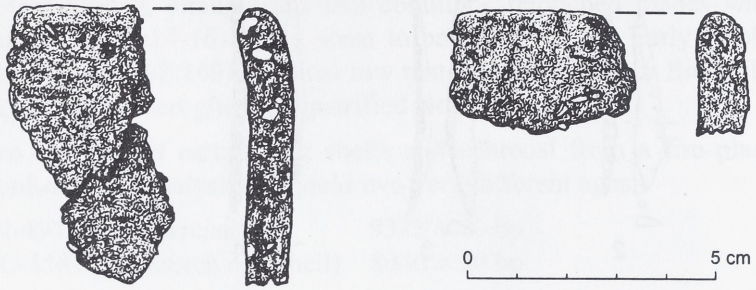

Fig. 6. Regenfeld 96/1, cluster 4: undecorated pottery.

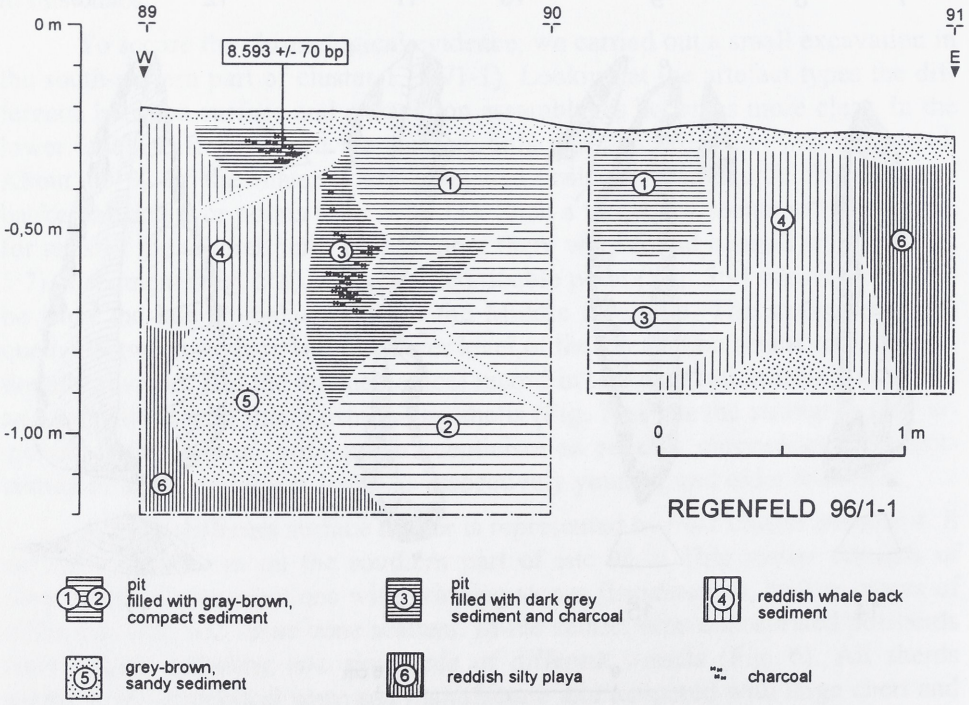

Fig. 7: Regenfeld 96/1-1, profile.

Up to now there is little indication for the age of concentration number 4. Stone tools are rare and unspecified. The platforms of flakes are mostly large which could indicate a younger age. Undecorated pottery is known from the Great Sand Sea and neighboured regions since the end of the second half of the 8th millennium BP (Kuper 1995:129).

Returning to the initial question of archaeological sites on whaleback dunes we have to consider these new sites in Regenfeld. A geological profile, with 9 boreholes (Fig. 3 and 4), was made which extends from the western end of the artefact scatter number 1 (96/1) to more than 50 m to the west in the active dune sands. It shows a close sequence of the upper yellow sand of the *Seif* and the lower reddish soils of the whaleback. The reddish soil is dated by TL-analysis roughly to the 6th millennium BP (Besler 1997). One of these drillings uncovered a grinding stone which was situated exactly between the two layers.

Additionally an archaeological cross section was recorded in the excavation area. The result is astonishing. No similarities could be found in the two profiles. The excavation zone is situated only 50 m eastward from the geological profile. The sequence shows frequently changing layers of yellow sands and reddish soil. Probably the archaeological profile represents a turning point between whaleback soils and playa sediments. Haynes also describes the alternation of reddish-brown sandy playa muds with weakly cemented reddish-brown, reworked dune sands for "Willmann´s Camp" (Haynes 1982:217).

The hypothesis was formulated, by Steffan, a geologist, that settlement sites on whalebacks only exist on the luv side of the dune. In his opinion, the water from seasonal rainfalls was stored in the lower parts of the dune very near to the surface (Steffan 1982:91). When comparing archaeological sites on or at whaleback dunes, it is significant, that artefact scatters are not limited to special areas. Only one archaeological site, Abu Minqar 83/17, confirms the above postulated thesis. The three other prehistoric sites, "Willmanns Camp", "Lobo" and 96/1, are situated on the other, the lee side.

Concluding, a direct relationship between the presence of people and their water resources, represented by temporary lakes (mud pans) and water stored in dunes, is visible. Settlement sites on water storing whaleback dunes seems to have become more and more important for the people in arid conditions, when other temporary lakes ran dry.

Addendum

This paper was presented at the 1997 conference. The field campaign at the end of 1997 which took place in the Regenfeld area brought many new aspects to light: finds and features from new excavation trenches were uncovered. Up to now 11 radiocarbon dates are available for 96/1, 96/19 and 96/20 which

represent human activities from 9300 to 6900 BP. Two dates nearly 9000 BP from site 96/20 confirm the above proposed Epipalaeolithic age:

UtC-7192 9040±60 BP
UtC-7191 8990±60 BP

The Libyan Desert Glass scatter of 96/1-7 is now dated to an age of:

UtC-6534 8690±50 BP

This date corresponds to the above cited site Westpans 85/52. Charcoal from the excavation 96/1-1 was dated to:

KN-5053 8593±70 BP

The younger events are mostly connected with typical artefacts from the Middle Neolithic.

The undecorated pottery in 96/1 cluster 4 (probably connected to UtC-7190: 7186+/-49 BP) and stone artefacts with facial retouch from site 96/19 (date in preparation) are the highlights. Furthermore the botanical and zoological remains are analysed and give an impression of the environment. Wild fauna was found in the butchering places of the Epipalaeolithic as well as in the younger features. No indication of domesticated plants or animals are given.

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Recent Research Into the Stone Age of Northeastern Africa
Studies in African Archaeology 7
Poznań Archaeological Museum 2000

Louis Chaix, Martine Faure, Claude Guerin and Mathieu Honegger

Kaddanarti, a Lower Pleistocene assemblage from Northern Sudan

Résumé

Un assemblage datable du Pléistocène inférieur du nord du Soudan est présenté ici. A côté de restes de mammifères, particulièrement *Palaeoloxodon recki*, ont été retrouvé plusieurs outils attribuables à l'Oldowayen. La datation, entre 1.6 Ma et 0.5 Ka, indique une occupation très ancienne de cette portion de la vallée du Nil.

Introduction

During the winter of 1991, the archaeozoologist of the Swiss Archaeological Mission in Kerma (LC), was alerted by Mr. Hassan Ibrahim who found during a trip along the Nile near his birth place some large fossilized bones which he brought to us. After an initial examination, this material seemed to us very ancient and interesting enough to be more closely examined. Several trips were organized between 1992 and 1997 to return to the site to collect new fossils and also many artefacts.

The site

Kaddanarti is situated in the Northern Province, 60 km north of its capital Dongola. The finds come from two *loci*. The more important one is located near the island of Badin, around 12 kilometres south of the 3rd cataract, on the west bank of the Nile. Last year, we found another *locus*, Kabrinarti, at the same level, but on the east bank of the river (Fig. A).

Bones and artefacts were found in a deposit of coarse pebbles, mainly constituted of quartzite (84%), jasper (15%) and ferrugineous sandstone (1%). The pebbles are clearly rounded. The granulometry shows a dominance of stones

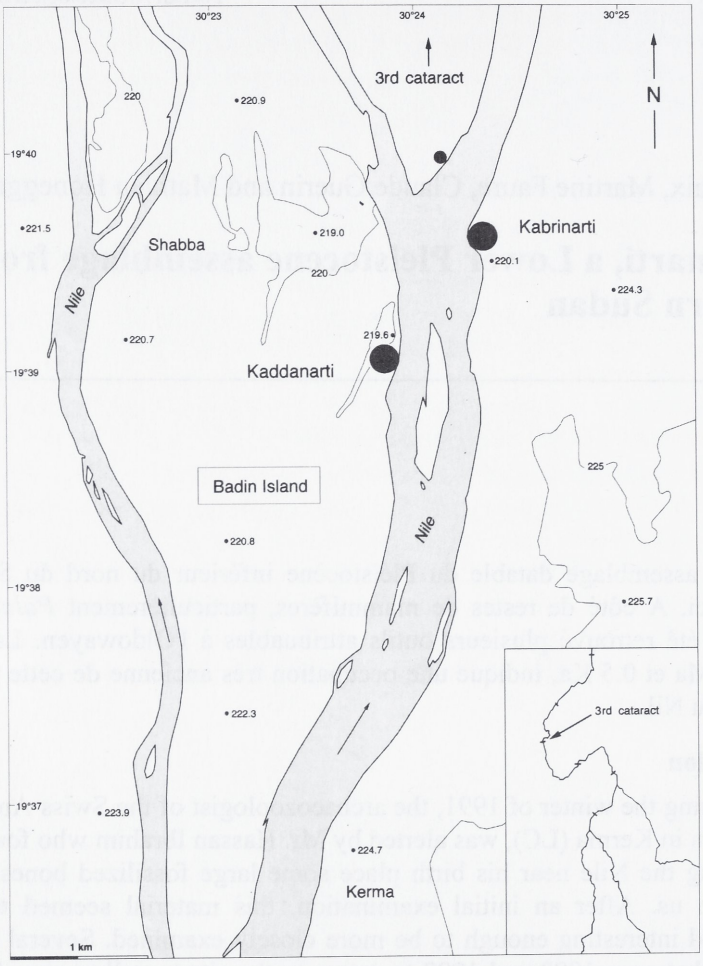

Fig. A.

Situation of the *loci* dating from the Lower Pleistocene. The two main *loci* (Kaddanarti and Kabrinarti) revealed faunal remains and stone artefacts, from coarse pebble layers. The third, northern, *locus* comprises the same coarse pebble deposits situated below the level of the Nile, but so far no investigation has been carried out to check for archaeological remains.

with an average length of 28 mm, against an average width of 20 mm. Some pebbles are larger, up to 120 mm in length and 70 mm in width. The matrix consists of quartzite gravel, with grains less than 10 mm. The thickness of this layer is unknown, because it is mostly under the water level, but it seems thicker

than 1 meter. It is covered by the silts of the Nile, with a thickness of around 5 meters at this place. The fossiliferous level seems to continue under the water-course, because we found it on the west bank, under a sandy island, and on the east bank, at Kabrinarti.

The fauna

Several teeth, bones and fragments of bones were recovered from *locus* 1 and some others from *locus* 2. All the bones are heavily mineralized. Their colour is black. Most of the pieces are eroded and rounded, but in many cases the surface is well preserved. We must also point out that amongst bones belonging surely to the Lower Pleistocene, some few pieces are more recent and indicate that the fossils are not in a primary position.

1. *Hippopotamus amphibius* Linnaeus, 1758

a: material

a canine fragment
part of an upper tooth row bearing M 1/-M3/
an incomplete mandible with partial M /1, the M /2 and roots of the M /3
two mandibular fragments bearing respectively M /2 and M /3

These five pieces are highly mineralized but rolled and poorly preserved. The main dimensions of the last four are given in Table 1 together with the homologous ones for about thirty recent *H. amphibius*.

b: description

Fragments of the maxillary and of the mandibles are too badly preserved for description, but several molars were preserved well enough to be studied. All present a classical Hippopotamid scheme of a brachyodont bunodont type with four main tubercles, each bearing the characteristic trefoil abrasion pattern and a thick enamel layer.

Upper molars show at their basis a thick continuous cingulum, which is frequently observed on recent *H. amphibius* (Faure 1985). Dimensions of M 2/ and M 3/ as well as the length of the molar row (accurate in spite of the fragmentary state of the M 1/) correspond to a rather small *H. amphibius*, not larger than the average of recent ones (Table 1).

Concerning the lower molars, the incomplete M /1 and the two M /2s are slightly smaller than the mean of modern *H. amphibius*. M/3 on the contrary is a little longer and narrower than the largest individual of *H. amphibius* observed (Table 1). Pleistocene and recent species of the genus *Hippopotamus* all possess molars of similar morphology and can be separated only on a biometrical basis. The Kaddanarti ones perfectly correspond to *H. amphibius* and cannot be confused with the much larger *Hippopotamus gorgops*.

c: discussion

Hippopotamus amphibius Linnaeus has an ancestor *H. kaisensis* Hopwood, which is anatomically very similar. *H. kaisensis* appeared about 5 My ago and is very common in the Plio-Pleistocene sediments of the Lake Albert Basin in Uganda (Faure 1994). Surprisingly enough, *H. amphibius* is rather rare as a fossil. The most ancient specimen was found in 1996 at Gafalo, Gobaad Basin, Republic of Jibutti, in a deposit roughly dated from 1.6 to 1.3 My (Faure and Guérin 1997). The species is already known in the lower Omo valley, in the Shungura (above member L, younger than 1.3 My, Harris 1991), Kalam (Gèze 1980) Formations and in the upper part of the Lower Pleistocene levels of the Nariokotome member of the Nachukui Formation, West Turkana (Harris 1991). It was also described from the Kapthurin Formation and from Isenya, Kenya, (Brugal and Denis 1989).

2. Large Bovid, *cf. Syncerus sp.* seu *Pelorovis sp.*

a: material

one upper left M 3/, rolled

the distal part of a left humerus, rolled

b: description

The upper molar has a length of about 37 mm; the most remarkable features are a strong entostyle and the presence of a fold on the posterior side of the prefossette. The distal part of the humerus presents the features of the African Buffalo (genus *Syncerus*) and, following J. Peters (1988), we are able to exclude *Bos primigenius*. The metrical data compares, respectively, with an adult male and an adult female of the largest form of the living African Buffalo (i.e. the South African subspecies *Syncerus caffer caffer*) of which two fine examples are preserved in the Museum National d'Histoire Naturelle, Paris with data as follows:

Minimal transverse diameter of the diaphysis: 50 mm (51; 47);
Antero-posterior diameter of the diaphysis at the same level: 66 mm (60; 51);
Maximal distal transverse diameter: 106 mm (113; 99);
Maximal distal antero-posterior diameter: 98 mm (108; 89).

The large Bovid from Kaddanarti shows the attributes, the dimensions, and the proportions of the African Buffalo. It is less likely that it belongs to the fossil genus *Pelorovis* but this is impossible to exclude totally owing to the absence of comparative material.

c: discussion

The African Buffalo *Syncerus caffer* (Sparrman 1779) is the sole recent Bovini of the Ethiopian biogeographical empire. It constitutes a cline whose extremes (the dwarf forest buffalo and the very large Caffer Buffalo) are

KADDANARTI				HIPPOPOTAMUS AMPHIBIUS					
				N	mean	min	max	st. dev.	var. coeff.
Length of upper molars	138			29	136.07	115	158	8.58	6.31
M1/ L	39			33	42	33	53	4.68	11.14
M1 /l ant.	31.5			33	39.86	36	45	2.66	6.68
M1/ l.post.	35			33	41.89	38	49	2.9	6.93
M2/L	51.5			30	49.43	37	60	4.52	9.15
M2/l ant.	47.5			31	47.85	42	54	3.14	6.56
M2/l post.	48.5			31	46.77	35	53	4.24	9.06
M3/L	50			28	48.61	41	56	3.53	7.26
M3/l ant.	49			26	46.81	38	52	4.06	8.67
M3/l post.	47			21	41.48	34	49	4.42	10.66
Length of the lower molars	~ 141			22	159.16	140	175	9.72	6.11
M1/L	~ 38			25	44.36	35	59	5.73	12.91
M1/l ant.	> 19			24	31.42	27	43	3.22	10.23
M1/l post.	31			25	34.72	29	43	2.98	8.58
M2/L	48.5	54		23	54.63	47	64	4.03	7.37
M2/l ant.	35	35		23	37.91	34	49	3.53	9.3
M2/l post.	36	36		23	39.59	34	47	3	7.58
M3/L			81	23	67.83	57	78	5.98	8.82
M3/l ant.			42	23	38.54	34	45	3.06	7.93
M3/l med.			42	23	37.39	32	43	2.82	7.55
M3/l post.			29.5	19	30.5	21	34	3.38	11.08

Table 1.
Dental measurements of the hippopotamus from Kaddanarti compared with those of modern hippopotami

very different in size (the former with shoulder height less than 1.20 m and weight less than 320 kg, the latter with a height of more than 1.70 m and weight of 800 kg), in general morphology, horn shape and way of life (the biotope ranges from the rain forest to the grassland). The plasticity and adaptability of the genus is remarkable.

The recent species *Syncerus caffer* occurs as a fossil in the Upper Pleistocene of West Turkana and Omo (Kibish Formation). Fossil *Syncerus* species are also known, of which only one has been found in East Africa: the large *Syncerus acoelotus* (Gentry and Gentry 1978) was defined at Olduvai Bed II where it is found along the whole formation (from Bed I up to Bed IV); it was also found at Omo.

From the Middle Pleistocene up to the Early Holocene another large Bovid genus existed in East Africa, *Pelorovis* Reck 1928. It includes very large Bovini with gigantic curved horns. The type species, *Pelorovis oldowayensis* Reck, was defined at Olduvai. It is probably the ancestor of *P. antiquus* (Duvernoy), which is abundant in the Pleistocene of North Africa, and is also known in East Africa, namely at Olduvai Bed IV. *P. turkanensis* Harris is a smaller form defined at the East-Turkana, and found also at the West-Turkana and at Melka Kunture. Recently one hypothesis was proposed, considering *Pelorovis* and *Syncerus* as the same genus (Gautier and Muzzolini 1991; Peters et. al. 1994). Such an interpretation was recently contested by Klein (1994) and was never considered acceptable by the majority of scholars involved in African palaeontology, whose position is founded on the precise and very comprehensive work done in 1967 by A. W. Gentry. Two butchery sites with *Pelorovis* are known in the Early Palaeolithic of East Africa, one at Olduvai (BK II) in Tanzania and another one in the Middle Awash Valley (Ethiopia).

3. Medium-sized Antelopes

a: material

a fragment of a first left upper molar
a fragment of occipital

b: discussion

The molar fragment, with a lingual ectostylid, belongs probably to the tribe of *Reduncini* (genera *Redunca* and *Kobus*), following A.W. Gentry (1978).

The fragment of occipital belongs to a medium-sized antelope. The dimensions and the morphology are comparable with those of the bushbuck, *Tragelaphus scriptus*, or eventually with those of the Hunter's hartebeest (*Beatragus hunteri*) but the piece is eroded and broken, which makes a more precise determination impossible. *Tragelaphus scriptus*, the type species of the genus, was found as a fossil at West Turkana (Nachukui Formation) and a very

similar form is present at Olduvai Bed IV. Other species are known in the East African Plio-Pleistocene. *Beatragus* is sometimes considered as a subgenus of Damaliscus. There is only one recent species, *B. hunteri* (P. L. Sclater 1889); *Beatragus antiquus* Leakey, 1965, from Olduvai Beds I and II, Shungura member G, and Koobi Fora, taller than *B. hunteri*, is probably its ancestor.

4. Equus of non-caballine type, ? cf. *Equus africanus* Fitzinger, 1857

a: material

two isolated lower cheek-teeth

b: discussion

Following V. Eisenmann (pers. comm.), one lower M/1 probably belongs to the wild ass *Equus africanus* Fitzinger, 1857, but it is impossible to exclude another of the numerous African Pleistocene species of non-caballine Equus. These has been known in Africa since 1.8 My. The wild ass was probably found in the Middle Palaeolithic of Bir Tarfawi in Upper Egypt (Wendorf et al. 1993). Another inferior molar, probably M/2, belongs surely to *Equus caballus*, known in Africa since the Aterian age (Upper Pleistocene). This tooth bears witness to the perturbation of the level.

5. *Palaeoloxodon recki* Dietrich, 1915

a: material

the postero-lingual part of a right lower molar, very rolled and incomplete: a little more than a half of its breadth is preserved.

b: description

The attributes of this tooth fragment, as defined by M. Beden (1979, 1987) are:

N = number of laminae: -5 x. A small posterior heel is visible;

L = total length of the fragment: about 85 mm;

l = width of the fragment: 57 mm, the width of the tooth can be estimated to about 70 mm at the level of the third lamina before the end;

e = enamel thickness: 3 mm;

Laminae and enamel folds: a longitudinal horizontal section was made 22 mm beneath the top of the tooth, showing rather strongly folded laminae, and a narrow median sinus (Beden 1979: 503, fig. 92).

L/N = laminar frequency: roughly 17;

100 x H/l = hypsodonty index: estimated to be greater than 170;

Distance betweeen two successive laminae: from 3.5 to 11 mm.

The dimensions and proportions of the tooth, as well as the outline of the laminae are typical of *Palaoloxodon recki*.

c: discussion

Palaeoloxodon recki (Dietrich 1915), was defined at Olduvai and is much more frequent in Plio-Pleistocene deposit than *Loxodonta*, the sole recent Probo-

scidean genus of Africa. It was found in numerous sites in East Africa, namely in Ethiopia, Kenya, Uganda and Republic of Jibutti. It is known also from North Africa, Chad, Namibia and South Africa. Several butchery sites with *P. recki* were discovered in the ancient Palaeolithic of East Africa (Chavaillon et al. 1986, 1987). The extinction of the Reck's elephant about 500,000 years ago could have an ecological cause.

A direct descendent of *Elephas ekorensis* from the oldest East African Pliocene, the lineage of *Palaeoloxodon recki* includes five successive subspecies easily distinguishable owing to their cheek-teeth which become: increasingly tall; with an ever reduced distance between the successive laminae; an increasingly folded enamel which becomes thinner and thinner:

P. recki brumpti Beden, 1980, from 3,7 My to 2,8 My;
P. recki shungurensis Beden, 1980, from 2,3 to 1,7 My;
P. recki atavus Arambourg, 1947, from 1,8 to 1,6 My;
P. recki ileretensis Beden, 1980, from 1,6 to 1,3 My;
P. recki recki Dietrich, 1915, from 1,2 to 0,5 My;

The molar fragment of Kaddanarti can be attributed to one or another of the last two subspecies, more probably to *P.recki ileretensis.*

The lithic industry

Lithic artefacts were collected at the *loci* of Kaddanarti in 1992 and Kabrinarti in 1995 and 1997. The findings comprise several tools and many flakes, which seem to be very ancient, in accordance with the dating proposed for the faunal remains. Most of them are made of relatively good quality brown flint, and some of petrified wood. Pebbles of the same flint can be found at this site. The artefacts are eroded; erosion by wind took place before fluviatile erosion. This industry presents a few pieces of interest: seven choppers and ten worked flakes. The rest is composed of unretouched flakes which are not very characteristic.

Six choppers are worked on the lateral or distal side, with unifacial or bifacial removals (Fig. B. 1-4). One stands out because its removals are obtained in majority from the opposite part of the sharp side. A small number of retouches are made on the sharp edge in order to regularise it (Fig. B. 3). The seventh chopper is quite different from the others: one of its faces is entirely retouched with centripetal removals, whereas the second face presents only a few removals on proximal and distal parts (Fig B. 5). Its profile displays distinctive angles at ist extremities. These characteristics indicate that this could be an unstruck Levallois core, rather than a discoidal tool or core (F. Wendorf, pers. comm.).

As for the flakes, the cortical areas are not so important. Their butts are

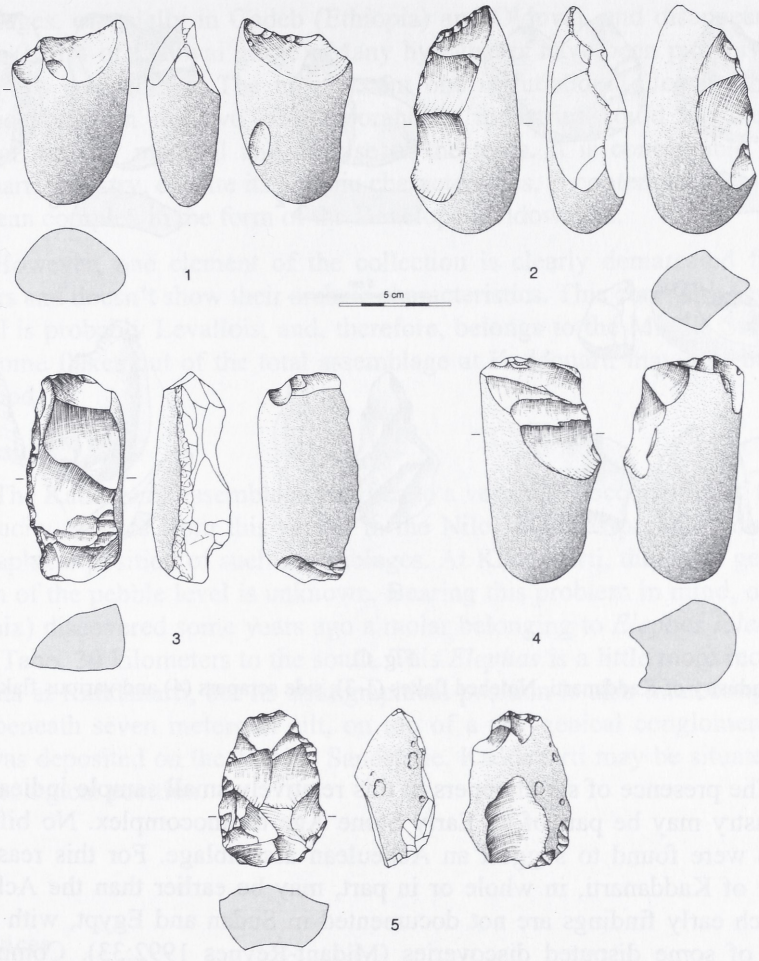

Fig. B.
The lithic industry of Kaddanarti. Choppers (1-4) and nucleus, probably Levallois (5).

generally plain or cortical and their bulbs are pronounced. In some cases, a cone of percussion is visible, indicating that a hard hammer was used. Many flakes present bifacial removals (Fig. C. 1, 3 ,5). Some of these are thicker; these could represent small nuclei. Four flakes display a characteristic morphology: three of them present a single notch, and the fourth is probably a side scraper (Fig. C. 1-4). The morphology of the others is not clear enough to recognise particular implements.

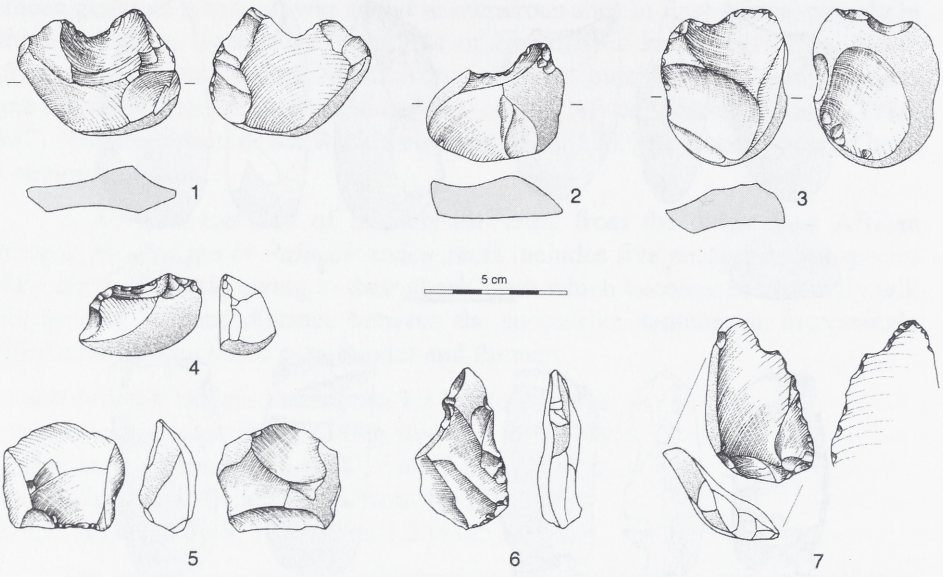

Fig. C.
Lithic industry of Kaddanarti. Notched flakes (1-3), side scrapers (4) and various flakes (5-7).

The presence of six choppers in this relatively small sample indicates that the industry may be part of an Early Stone Age technocomplex. No bifaces or cleavers were found to suggest an Acheulean assemblage. For this reason, the industry of Kaddanarti, in whole or in part, may be earlier than the Acheulean one. Such early findings are not documented in Sudan and Egypt, with the exception of some disputed discoveries (Midant-Reynes 1992:33). Comparisons must be sought in Ethiopia, Kenya or Tanzania, where the Oldowayan industry expands between 2 and 1,4 My, before the rise in number of the bifaces. In this kind of industry, tools such as choppers, polyhedrals, or discoidal cores, as well as protohandaxes and scrapers, are frequent. Kaddanarti's artefacts present some analogies with these assemblages, but the date of 2 to 1,4 My seems very early when compared to those obtained with faunal remains (between 1,6 and 0,5 My).

In Ethiopia, Kenya and Tanzania, the Acheulean industry expands between 1,5 and 0,5 My, while coexisting with another industry which retains Oldowayan characteristics. This Developed Oldowayan is characterised by a large amount of choppers, flake implements, and a few handaxes (see bed 2, 3 and part of 4 of the Olduvai gorge) (Leakey and Roe 1994). It coexists for some time with Acheulean

assemblages, especially in Gadeb (Ethiopia) and Olduvai, and disappears about 0,6 MA (bed 4 of Olduvai gorge). Many hypotheses have been put forwards to explain this coexistence. The most recent one is functional (Jones 1994): the difference between the two contemporaneous industries could be due to the nature of the raw material and the use of the tools. It is conceivable that the Kaddanarti industry, despite its archaic characteristics, is contemporaneous to the Acheulean complex in the form of the Developed Oldowayan.

However, one element of the collection is clearly demarcated from the choppers and doesn't show their archaic characteristics. This core with centripetal removal is probably Levallois, and, therefore, belongs to the Middle Stone Age. Thus, some flakes out of the total assemblage at Kaddanarti may also belong to this period.

Conclusion

The Kaddanarti assemblage testifies to a very early occupation of the area. The paucity of sites from this period in the Nile Valley is probably due to the stratigraphical position of such assemblages. At Kaddanarti, the exact geological position of the pebble level is unknown. Bearing this problem in mind, one of us (L. Chaix) discovered some years ago a molar belonging to *Elephas iolensis* in a well at Tabo, 30 kilometers to the south. This *Elephas* is a little more recent than the fauna at Kaddanarti, but its stratigraphical position is also interesting: it was found beneath seven meters of silt, on top of a polygenical conglomerate. The latter was deposited on the Nubian Sandstone. Kaddanarti may be situated in the same geological position.

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Recent Research Into the Stone Age of Northeastern Africa
Studies in African Archaeology 7
Poznań Archaeological Museum 2000

Philip van Peer and Pierre M. Vermeersch

The Nubian complex and the dispersal of modern humans in North Africa

The role of Northeast Africa in discussions on the archaeological implications of the 'Out of Africa' model for the origins and dispersal of modern humans has up to now been very modest. Although its Middle Palaeolithic is relatively well-known as compared to other African regions, it does suffer from a lack of standardization in its descriptions. Since the work of the Combined Prehistoric Expedition in Upper Egypt and Sudan in the sixties (Wendorf 1968), numerous Middle Palaeolithic sites have been sampled, excavated and classified into a number of industries or groups. This appears to have led to an unwarranted fragmentation of the Middle Palaeolithic record which may seem rather confusing. Inadequate chronological control has not done much to improve this situation. During the last years things have changed. Fieldwork in both deserts adjacent to the Nile, the Eastern Sahara and the Red Sea Mountains (Wendorf et al. 1987, 1993; Vermeersch et al. 1994), has allowed to establish a relative and absolute chronological framework. Efforts have also been spent at a comprehensive synthesis of the Middle Palaeolithic in this part of the world (Wendorf and Schild 1992). New research paradigms finally have led to the accumulation of data on previously unknown aspects of behaviour, e.g. the nature of settlement systems. In this article, we argue that it is no longer possible to disregard the Northeast African Middle Palaeolithic record when a possible African origin of modern humans is discussed. On the contrary, the record evidences the presence of new and complex cultural features from the late Middle Pleistocene onwards.

1. The Nubian Complex

Using classic technological and typological criteria, it is clear that a number of previously separate Middle Palaeolithic entities can be integrated in one techno-complex which we propose to call the Nubian Complex. The entities be

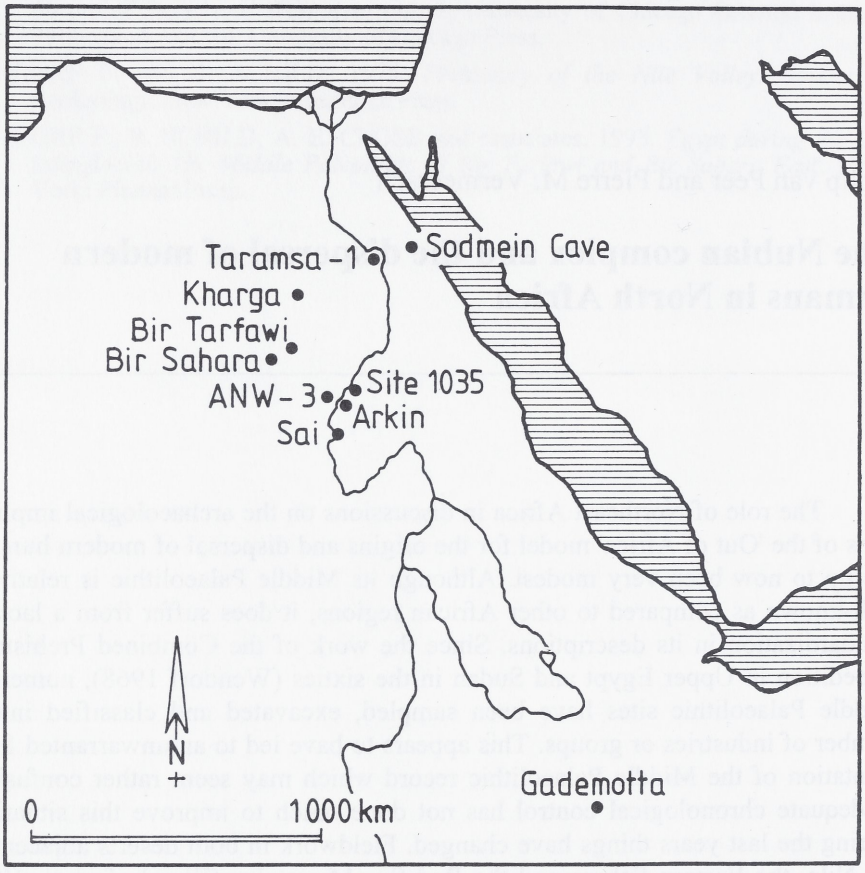

Fig. 1. Map showing location of sites mentioned in the text

longing to it are the Nubian Middle Stone Age or the Nubian Middle Palaeolithic (Guichard and Guichard 1965, 1968), the Nubian Mousterian (Marks 1968a), the N-group (Van Peer 1991a), the Khormusan (Marks 1968b), the 'Denticulate Aterian' as represented in the Eastern Sahara Oases of Bir Tarfawi and Bir Sahara (Wendorf et al. 1987), and the classic Aterian (Ferring 1975). From a technological point of view, all of these groups are characterised by the adoption of the Levallois strategy for blank production. Both flakes and points are produced; the former by the normal centripetal method and the latter by either the Nubian I and II methods (Guichard and Guichard 1965) or the classical point production method (Bordes 1961). In many assemblages, however, the latter method is rarely used as compared to the Nubian methods. In some Nile Valley assemblages, the

Nubian methods are the only ones to occur. Typologically, Nubian Complex assemblages share a number of similarities as well. Common tool types are bifacial foliates, various retouched point types (Fig. 2) including Mousterian and Nazlet Khater points (Vermeersch et al. 1990b), and truncated-facetted pieces (Solecki and Solecki 1970). In addition, they all show the presence of significant proportions of side scrapers, denticulates and a good deal of Upper Palaeolithic types. Absolute numbers of tools and the relative importance of types evidently may vary according to several factors, site function in the first place. Many of the Nile Valley assemblages come from quarry and initial processing sites at which retouched tools are rare altogether.

This Nubian Complex can be contrasted with a Lower Nile Valley Complex in which industries lacking most of the characteristics described above can be grouped together. Point Levallois methods never occur. Bifacial foliates, Nazlet Khater points and truncated-facetted pieces are not attested in any of these assemblages. The Lower Nile Valley Complex consists of the non-Nubian Middle Palaeolithic (Guichard and Guichard 1965, 1968), the Denticulate Mousterian (Marks 1968a) and the K-group (Van Peer 1991a). On the other hand, this complex has its own characteristic technological and typological features, the use of a particular Levallois method of dorsal preparation - the Safaha method - and the presence of lateralized Levallois flakes (Van Peer 1991b).

2. Aspects of complex behaviour

A number of complex behavioural traits can be inferred from the nature of Nubian Complex sites and the characteristics of their associated lithic assemblages.

2.1. The Nubian Complex settlement system

In the Nile Valley, most of the Nubian Complex sites are located on Nile or wadi terraces and inselbergs and must be considered as quarries and workshops. Other site types are rare since old floodplain sediments have been rarely preserved or are not exposed at present. The quarry site of Taramsa-1 on the western Nile bank, opposite the city of Qena (Fig. 1), has been used throughout the Middle Palaeolithic by both Complexes (Vermeersch et al. 1997). Together with Arkin-5 in Nubia, it holds the best evidence of Nubian Complex chert extraction strategies.

2.1.1. Quarry sites

The organisation of chert extraction

Middle Palaeolithic chert extraction strategies are discussed by Vermeersch et al. (1990a). Taramsa-1 is located on a remnant hill the core of which consists of coarse gravels of local origin. The gravel consists for about 90 percent

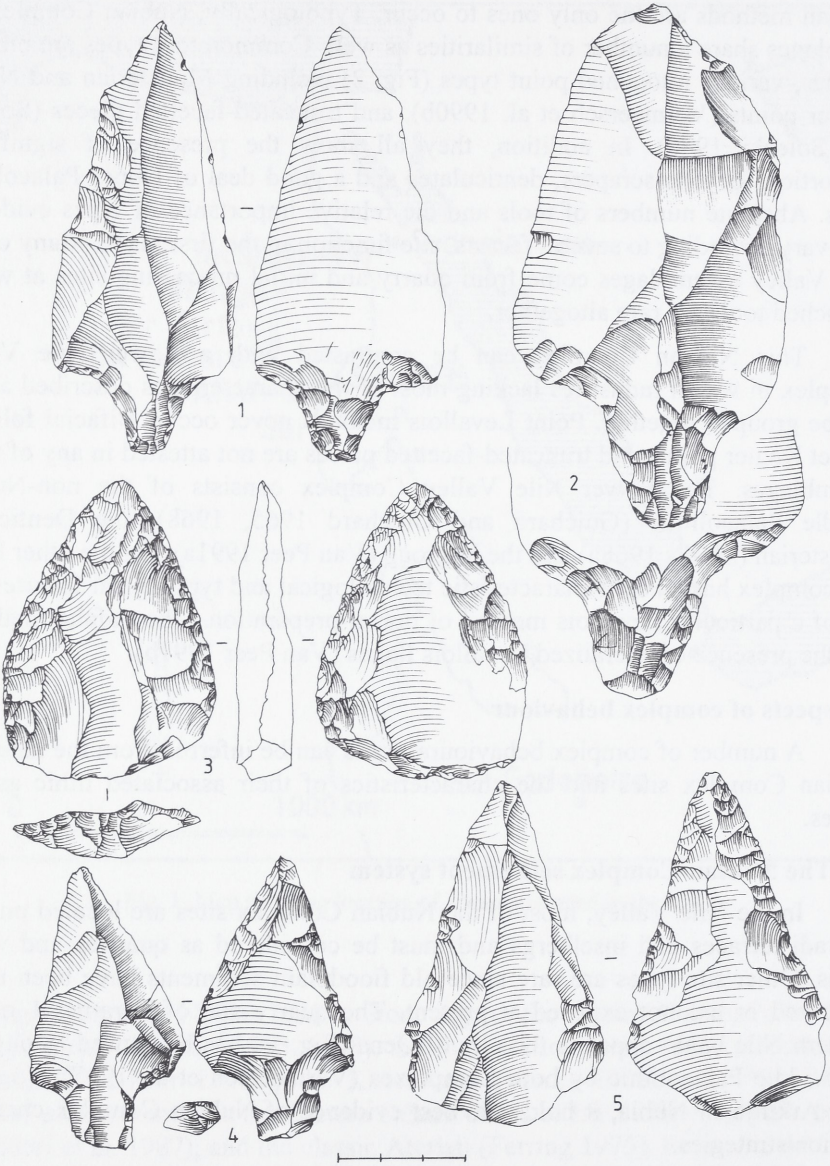

Fig. 2. Points from Nubian Complex assemblages.

1: Tanged Nubian point from Kharga Oasis, Bulaq Pass A (after Caton-Thompson 1952: pl. 88,8);
2: Tanged Nubian point from Foum el Alba 12 (after Tillet 1993: figure 208, 297);
3: Bifacially retouched point from Bir Sahara-13 (after Wendorf and Schild 1980: fig. 2.36, e);
4: Tanged Nazlet Khater point from Tabelbala (after Belaouane 1982: planche 6,1);
5: Nazlet Khater point from Kharga Oasis-Bulaq Pass A (after Caton-Thompson 1952: pl. 87,2).

of chert pebbles which are morphologically suited for flaking. Pits with an asymmetric section were dug into the gravel deposit. The *in situ* gravels were exploited in an almost vertical profile at the base of the pit. Waste matrix was dumped at the opposite side of the pit, creating a gentle access slope to the extraction front. As the exploitation activities proceeded, the original pit was extended or sometimes transformed in an irregular trench. Often, older exploitation features are cut by more recent ones. In such areas, the final depths reached by the most recent activities may be up to 2 m below the present surface, as the dump deposits of the former extraction had to be dug across. At the base of several extraction profiles, isolated bifacial tools - bifaces or foliates - are found which probably served to remove pebbles from their matrix. Other extraction tools - perhaps organic - are not known up to now.

The organisation of debitage activities

Extracted chert pebbles were reduced at the edge of or within the exploitation features, mainly according to the Levallois reduction strategy. In these flaking activities, a degree of spatial organisation can be observed. In several site sectors, concentrations of pebbles were present which apparently served as stocks of raw material waiting to be processed. The actual flaking of these pebbles took place at some distance of these stocks. Intercalated within extraction dump deposits or aeolian sands blown into the pits, dense concentrations of lithic artefacts can be found. Extensive refitting of reduction sequences is generally possible. Completely reconstructed sequences always show the scar of a first large cortical flake. That flake itself, however, is usually absent from the artefact scatter. Extracted nodules were first tested for quality and then transported to the spot where further treatment was to take place. The same reconstructed reduction sequences frequently show that specific products are missing. Mostly, these are Levallois blanks. On the other hand, concentrations of Levallois blanks are found in several areas of the site. These can be considered as products, selected from the waste concentrations for further transportation and use.

Transport of products

Next to blanks, Levallois cores may be lacking from reconstructed sequences. These are always cores for flakes. In point reductions, this feature is never observed. Levallois point reduction sequences appear to be part of a very different dynamic system as compared to Levallois flake reductions. The same divergence appears from a quantitative analysis of both Levallois blank and core samples from quarry sites. At such sites, Nubian Levallois cores are always much more numerous than Nubian points (Van Peer 1991 a). Such cores are clearly waste products, designed to produce blanks for specific and well-anticipated functions. Flake samples, on the contrary, are much more ambiguous. Usually, however, relatively few flake cores are still present as compared to the quantity

of Levallois flakes. This indicates that not only the latter, but (primarily) the former were taken away from these sites.

2.1.2. Other sites

Living sites

Quarry sites are located outside the margins of the Nile floodplain and can therefore be easily found. For other site-types, we should take into account a possible location within or at the edge of the then floodplain. Since such old sediments have only been rarely preserved from erosion, extremely few Middle Palaeolithic living sites are known. In Nubia, however, a few sites have been recorded in the area of the confluence of the Khor Musa with the Nile, which have been grouped in the Khormusan industry (Marks 1968b). These are associated with fluviatile sands and silts, do show a Middle Palaeolithic technology and are beyond the radiocarbon range (Wendorf and Schild 1992: 46). As a consequence, their chronological position cannot be ascertained, nor can their relative position to the Nubian Mousterian quarry sites in that region. As stated before, the Khormusan can be ascribed to the Nubian Complex on technological grounds, in particular the presence of Nubian Levallois products. Furthermore, Levallois flake samples from Khormusan sites show quantitative characteristics which are very close to those of Nubian Mousterian samples (Van Peer 1991a). Even if the contemporaneousness of the Khormusan sites with the Nubian Mousterian quarries cannot be established, they may be considered as representing a particular site type within the general Nubian Complex settlement system. The presence of high proportions of retouched tools, fireplaces and both mammal and fishbones suggest that they are living sites where a range of activities was performed. The Levallois flakes and cores of which the absence is noticed at the quarries were probably transported to sites of this type.

The particular structure of the lithic assemblage from Khormusan site ANW-3 (Van Peer 1991a: tables 1 and 2) indicates the introduction of both Levallois cores and finished Levallois flakes into the site. The general debitage to core ratio (all debitage divided by the total number of cores) is extremely low (6.7) whereas the relative number of Levallois cores in the total cores sample is high. This suggests that prepared cores were brought onto the site. The sample of Levallois flakes produced from such cores was supplemented with a number of introduced flakes. On the basis of the limited number of Levallois flake cores, one would expect less Levallois flakes in the assemblage than are actually present. Also, the mean length of the flake sample is higher than the mean core length (Van Peer 1991a: table 2) which is contrary to the evidence of workshop sites. In between the quarry/workshop and the living sites, we may have to take into account the existence of a 'mixed' site type which takes both spatially and

functionally an intermediate position between the former. Site 1035 (Marks 1968a) is an example. It is located at some distance from its raw material source, but yet outside the floodplain. It was originally classified as Nubian Mousterian by Marks, but appears to exhibit numerous Khormusan characteristics. In this respect as well, it provides a link between the Nubian Mousterian workshops and the Khormusan living sites. Levallois cores appear to have been introduced here in already prepared state, but proportionally few Levallois flakes are present as shown by the very low Levallois flake/core index (Van Peer 1991a: table 1). The latter may have been taken on to floodplain sites.

Special activity places

At none of the Khormusan sites, significant numbers of Nubian Levallois blanks nor retouched Levallois points (of various types) are encountered. The quantities produced at the workshops, therefore, must have been taken to other locations and we must infer the existence of another site type in the Nubian Complex settlement system. Given the probable use of such types as projectiles (Shea 1995), such locations are likely to be short-term hunting camps. They may have been situated close to the river bank or near water-filled depressions within the floodplain. In any case, the chances of finding them at the present time are close to zero. If, however, we turn to the archaeological record of the Eastern Sahara and the Red Sea Mountains where the Nubian Complex is present from the Last Interglacial on (cfr. below), precisely these sites are attested there.

At Wadi Sodmein Cave in the Red Sea Mountains, two Nubian Complex levels consist of low density scatters of lithic objects (Van Peer et al. 1996). In direct spatial association with two ephemeral fire places, a few tools and Nubian points have been found. They have apparently been brought into the cave in their finished states. The formation of these occupation levels has been interpreted as the result of repeated short term visits (Van Peer et al. 1996). Given the strategic location of Sodmein Cave, overlooking a narrow pass through which the wadi Sodmein runs, these short visits may be related to hunting expeditions. In the Bir Tarfawi basin of the Eastern Sahara, Wendorf and Schild (1992: 66-68) describe specific activity areas, related to meat procurement located in lake bottoms. Mousterian points - some of which are Nazlet Khater points - and side scrapers are associated here with bones of large and medium-sized mammals. Moreover, they also report the existence of quarries from which cores seem to have been taken away.

2.1.3. Conclusion

Though the present archaeological record is rather heavily biased towards quarry and workshop sites, it allows to infer a rather complex settlement pattern for the Nubian Complex. It suggests that hunting was an important subsistence

strategy among such groups. Lithic tools associated with hunting activities were the result of a specific production system which evidences elaborate planning.

2.2. Lithic tools

The usual array of Middle Palaeolithic types is represented in Nubian Complex assemblages. The various point types as discussed above, demonstrate that relatively simple forms may result from both complex reduction strategies and production systems. Points were apparently meant for a limited set of functions which were already anticipated at the start of the production process and to which that production system was specifically adapted. From that point of view, they can rightly be called complex tools. Being functionally similar to Upper Palaeolithic and later projectiles, it has been suggested that African Middle Stone Age points do show similar, modern, regional patterning as well (Brooks 1996). In the region under concern here, it is clear that points and the production system behind them, are only present in the Nubian Complex. They are never encountered in Lower Nile Valley Complex assemblages. This material culture patterning indicates more than a superficial functional divergence: it shows that both archaeological complexes represent very different adaptations in terms of subsistence strategies.

In discussing the function of points, the issue of hafting needs consideration as well. Tool hafting is an indication of technological complexity and of a curated mode of tool use in which efforts are spent to maximize the life cycles of tools. Use-wear studies (Anderson-Gerfaud 1990; Shea 1995) have presented evidence of tool hafting in the Middle Palaeolithic. Though it is not confirmed by microwear analyses, several tool types in the Nubian Complex seem to have been morphologically adapted to hafting. This is the case for truncated-facetted pieces and, evidently, the tanged forms of the Aterian. In this context, it may be of interest to report on a tool found in a Nubian Complex level at Wadi Sodmein Cave in the Red Sea Mountains. In Middle Palaeolithic level 4, a large Levallois flake was present of which the medial part is covered with a continuos band of red ochre (Fig. 3). On the dorsal face, the ochre band is partly covered by a calcite crust. The right upper edge of the flake is denticulated. At the distal end a bifacial fracture is visible. The dorsal fracture has a step-like ending, indicating that the fracture resulted from a heavy blow. The large fracture to the left of the former may also have been caused during the same event. Use-wear analysis of the proximal flake part shows a well-developed wood polish, in which striations parallel to the axis of the tool are present. The polish continues up to the lower edge of the ochre band. Possibly the tool was attached here to its haft with an organic substance covered with ochre. This example from Sodmein Cave is another demonstration of the fact that complex tools were used in the Middle Palaeolithic.

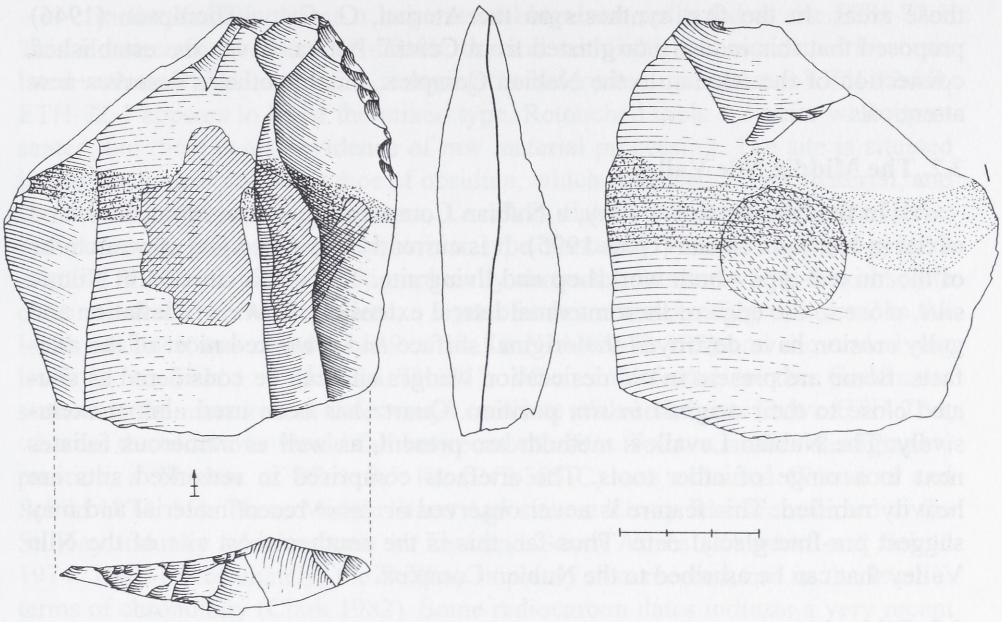

Fig. 3. Levallois flake from Middle Palaeolithic level 4 at Wadi Sodmein Cave. Dotted area represents the central red ochre band. Hatched area on dorsal face: a calcite crust. Hatched area on ventral face: a circular inclusion of different colour in the chert.

3. The origin of the Nubian complex

Having established some complex cultural features of the Nubian Complex, its origin should be discussed. I will review the chronological and geographic evidence, starting from the north and proceeding in southern direction.

3. 1. The Lower Nile Valley

The earliest Nubian Complex occurrence in the Lower Nile Valley is documented at the Taramsa-1 site. Here, the 'foothill concentration' appears to date to the late Middle Pleistocene (Vermeersch et al., in preparation). In Acheulean industries of the Nile Valley, none of which is well dated, Nubian Levallois methods nor Nubian tools are ever present. Apparently, the Nubian Complex is new to this region from the late Middle Pleistocene on. During the Last Interglacial, Nubian Complex groups have dispersed into the deserts east and west of the Nile, which at that time were favourable environments for human occupations. With the onset of arid conditions, Aterian groups remained present in

those areas. In the first synthesis on the Aterian, G. Caton-Thompson (1946) proposed that this industry originated from Central Africa. Given the established connection of the Aterian to the Nubian Complex, this hypothesis deserves new attention.

3.2. The Middle Nile Valley

In the Middle Nile Valley, a Nubian Complex site is present at the island of Sai in Northern Sudan (Geus 1995). It is currently excavated and appears to be of the 'mixed' type - both workshop and living site. The site is situated in Nilotic silts, close to the edge of their maximal lateral extension. However, deflation and gully erosion have destroyed the original surface and reworked most of the artefacts. Some are present in old desiccation wedges and can be considered as situated close to their original *in situ* position. Quartz has been used almost exclusively. The Nubian Levallois methods are present, as well as numerous foliates next to a range of other tools. The artefacts comprised in reworked silts are heavily rubified. This feature is never observed on more recent material and may suggest pre-Interglacial date. Thus far, this is the southernmost site of the Nile Valley that can be ascribed to the Nubian Complex.

3.3. Ethiopia

In the region of Lake Ziway in Ethiopia, a number of Middle Stone Age sites in a local stratigraphic framework have been reported by Wendorf and Schild (1974). The oldest one in the Gademotta area is ETH-72-8B. It is located in a possibly man-made depression within a thick brown soil, at the base of which (a poorly documented) Acheulean occurs. The lithic assemblage is characterized by low frequencies of cores and debitage products, whereas the proportion of tools and re-sharpening spalls is relatively high. The site is interpreted by the authors (1974:152) as a long-occupied base camp. In that sense, it would correspond to the living site-type in the Nubian settlement system. In terms of tool types, various types of Mousterian and bifacial points occur, often elaborated on Levallois blanks; some of them have mainly ventral retouch and are reminiscent of Nazlet Khater points (e.g. 1974, plate XII, 13 - interpreted as a burin by the authors). Many points show re-sharpening scars suggesting their use as knives though a possible projectile function is not excluded (Wendorf and Schild 1974: 79-80). In addition truncated-facetted pieces are well attested (e.g. 1974, plate IV, 4-5). Since unretouched Levallois points and Levallois cores are rare, it is difficult to judge on the presence of the Nubian Levallois methods. Some tool drawings, however, strongly suggest that this is the case indeed (e.g. 1974 plate IX, 4). Given the high quantity of various point types, this site might be alternatively considered as a special activity spot of the nature described above.

In the Kulkuletti area a large assemblage was collected at site ETH-72-1. This is more recent than ETH-72-8b: the soil with which is associated is correlated with a soil at Gademotta, overlying the latter site. In contrast to ETH-72-8B, ETH-72-1 appears to be of the mixed type. Retouched tools are quite well represented, but there is also evidence of raw material processing. The site is situated immediately near an occurrence of obsidian, which was used as raw material, and contains numerous Levallois cores, Levallois flakes and debitage waste. Here, some cores do seem to be of the Nubian type. Certainly, Nubian cores are present at site ETH-72-6 which is stratigraphically above the former two. A few absolute dates are available. At Kulkuletti, a layer of ashes corresponding to layer 7 in the local sequence was dated to 149 + 13 Ka (UAKA-73-132) and the underlying level 11 to 181 + 6 (UAKA-73-131). When transferred to the Gademotta sequence, the more recent date would correlate with sediments above ETH-72-1, whereas the older one would fall between both sites. From a similar stratigraphic position, a TL-date of 97 + 8.5 Ka (P-T-303-C) was obtained (Wendorf and Schild 1974: 55). These Middle Stone Age sites at Ziway lake are referred to the Stillbay industry which occurs in East and South Africa (Wendorf and Schild 1974: 154). Unfortunately, the Stillbay is poorly documented, not in the least in terms of chronology (Clark 1982). Some radiocarbon dates indicate a very recent age. The Ziway dates, however, may indicate that these radiocarbon dates should be used with the greatest caution.

4. Conclusion

In the later Middle Pleistocene, a new technological system appears in the Lower Nile Valley which is profoundly different from the local Acheulean and the Middle Palaeolithic industries issued from the latter. A well-organized settlement system can be inferred from the patterning in that material culture, involving complex raw material procurement strategies, planned production and transportation of particular categories of lithics, and the use of specific locations in the landscape for certain subsistence-hunting activities. This archaeological evidence of change may correspond with the *Out of Africa* model for the dispersal of anatomically modern humans into northern zones of the world. However, it must be taken into account that cultural complexity is characteristic of other Middle Palaeolithic entities as well. Therefore this alone may not be sufficient to identify anatomically modern humans (Van Peer 1998). In order to investigate the possible origin of the Nubian Complex in sub-Saharan Africa, the Stillbay industry should be carefully looked at. It does seem indeed that most techno-typological features of the Nubian Complex are present in southern assemblages which can be referred to the Stillbay. At present, however, there is little evidence to ascertain the chronological position of the latter industry and, consequently, the diachronic relationship with the Nubian Complex. During the initial stage of the

Last Interglacial, groups which had been present in northern reaches of the Nile Valley for a long time, dispersed into the favourable environments of the areas adjacent to the Lower Nile Valley. In the latter, the Nubian Complex disappeared after 60 ka. It remained present in the Eastern Sahara and perhaps the Red Sea Mountains. A technological innovation - the use of various forms of tanged tools in the Aterian - seems to be a response to degrading climatological conditions from isotope stage 4 onwards.

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Recent Research Into the Stone Age of Northeastern Africa
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Preliminary results of the study on Late Palaeolithic chert workshops from Upper Egypt

Introduction

In the years 1967-1969 the Combined Prehistoric Expedition conducted an intensive field research along the Nile valley. The research was concentrated on both banks of the Nile in the area north of Aswan as far as Nag Hammadi. In January 1968 a survey was conducted along west bank of the Nile, north of the Valley of the Kings, about 10 kilometres NE of Luxor (Fig. 1) where few dozens of new archaeological sites have been recorded (Wendorf and Schild 1976; Wen-

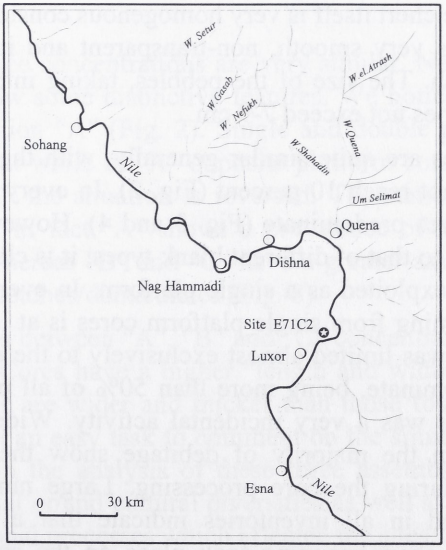

Fig. 1. Map of Luxor area; black circle approximate location of site E71C2.

dorf et al. 1970; Said et al. 1970). The site E71C2 (field designation 68/6) has been recorded in the neighbourhood of the village Nag El-Zamami. It consists of six separate concentrations of archaeological material. Five concentrations ("A-E") were located together in the northern part of the site. Last concentration ("F") was found about 350 m south of the others. Archaeological material from site E71C2 was divided between three research institutions: the Department of Anthropology of the Southern Methodist University, the Institute of Archaeology and Ethnology of the Polish Academy of Sciences and the Geological Survey of Egypt. As a result of the division "A", "B" and "C" concentrations from that site were taken to Poland and are the subject of this paper.

All the concentrations were laying on the deflated surface of an extensive area of dune sands, partially covered by patches of silt up to 50 cm in thickness. Archaeological artefacts were originally deposited within the layer of silt which was later eroded from most of the area. Therefore they may be contemporary with post dune silt accumulation. Several small test trenches dug out in the areas where patches of that silt had been preserved did not yield any *in situ* artefacts (Wendorf and Schild 1976: 98). Concentrations occupied the tops of low knolls standing slightly above the surrounding area. All were oval in shape, with the axes 20 to 50 meters long and parallel to the Nile.

Description of material

The concentrations of artefacts are very consistent from the point of view of raw material and no differences between them were noticed. All specimens are made of chert and the chert itself is very homogenous considering the structure of rock and colour. It is very smooth, non-transparent and its colour varies from brownish to yellowish. The size of the pebbles, taking into account the size of cores and debitage, does not exceed 7-9 cm.

The inventories are quite similar generally, with the exception of cluster "C" where tools do not reach 10 percent (Fig. 2). In every inventory single and opposite platform cores predominate (Fig. 3 and 4). However, comparing cores type data frequencies to that of different blank types, it is clear that in fact double platform cores were exploited as a single platform. In every case percentage of flakes and blades coming from single platform cores is at least 70% (Fig. 5 and 6). Core preparation was limited almost exclusively to the platforms and always lisse platforms predominate, being more than 50% of all platforms. Repair and modification of cores was a very incidental activity. Wide platforms and well distinguished butts in the majority of debitage show the prevalence of hard hammer technique during the core processing. Large number of chunks and cortex material found in all inventories indicate that at workshop sites the complete process of chert knapping took place on the spot starting with raw

pebbles and finishing tool production (Fig. 7).

Flakes clearly predominate over blades in the "A" and "B" concentration while in the case of the concentration "C" the distribution is more balanced. The same types of tools were found within the assemblages, however the composition of particular sets is slightly different (Fig. 8). End-scrapers are the most numerous group of characteristic tools (Fig. 9). Their frequency varies within the concentrations from 13% in "A" to up to 34% in "C". If we omit fan-like forms which are present almost exclusively in "B" the structure of end-scrapers, their size and the way of production are the same.

Another significant tool category is that of notches and denticulates. They vary in form and quantity (Fig. 10:15-16; 11:12-14). The highest frequency is registered in "A" concentration (26%) whereas in "B" and "C" it reaches around 13%. We observed that "A" concentration shows an inverse trend in the frequency of end-scrapers, notches and denticulates if compared to "B" and "C" concentrations (Fig. 8).

Burins are another characteristic group of tools (Fig. 10:1-10, 13; 11:1-2). They are present in all concentration but with different frequency. The most typical are burins on a break. Retouched pieces certainly played an important role as they constitute more than 40% of the whole tool group (Fig. 10:17-18; 11:7-11). Other tool categories are represented by very few items and these are combined tools (Fig. 10:11-12, 14; 11:3), truncations, including micro-truncation (Fig. 10:19-20; 11:4-5) and scaled pieces (Fig. 11:6).

Discussion

In general all three concentrations are very similar. Nevertheless, looking at them closer they show some distinctive features. We notice much higher tool frequency in concentration "A" (Fig. 2). Single and double platform cores predominate in all three but while in "A" opposite platform cores are the most numerous, in "B" and "C" the situation is reversed. The same picture comes out from analysis of tools. In fact "A" shows a prevalence of notches/denticulates followed by scrapers whereas "B" and "C" have a greater amount of scrapers as compared with that of notches/denticulates (Fig. 8).

Other differences between "A", "B" and "C" concentrations concern cores and flake dimensions. Cores have a higher "length and width average value" in assemblage "A". Flakes are wider and thicker than those found in "B" and "C" concentrations. It is not an easy task to comment on the similarities and dissimilarities we registered in the analysis of these three assemblages. They can be determined by functional or/and cultural diversities as well as linked to some extent with post-depositional processes which affected the sites.

Generally speaking, their overall structure reminds of Dishna sites found further to the north, in the Qena Bend (Hassan 1974). Seven concentrations, culturally defined as Isnan sites, share with the three assemblages located close to Nag El-Zamami many common features. The closest analogies concern core reduction strategies and tool production. Single and opposite platform cores, scrapers and notches/denticulates are best represented in Dishna sites, even if proportions are quite different. Single platform cores frequency is much higher in Dishna sites where generally they cover more than 50% of the core sample. They can reach even 80% in some cases, and exceptionally in two or three occurrences they are respectively 44 and 25%. A substantial difference is seen in the case of multiple platform cores which show highest values in Nag El-Zamami concentrations. This clearly come out in the cluster analysis based on data of Dishna sites and those of site E71C2. With these data we built up three Pearson matrixes: for cores, debitage and tools (Fig. 12-14). As shown on Fig. 12 the Dishna sites 2 and 3 share the highest level of similarity with our concentrations. A different picture emerged from the analysis of debitage (Fig. 13) where "A", "B" and "C" concentrations form a well separated cluster.

Cluster analysis of tools (Fig. 14) shows again that "A", "B" and "C" concentrations group together, even if "A" concentration is not directly associated with them. We know in fact that frequency of notches and denticulates is much higher than the scrapers as compared to "B" and "C" concentrations. The same situation is observed in Dishna sites 2 and 5.

We have no direct indications to determine the chronological position of our concentrations, however it can be determined roughly by the analysis of stratigraphic position and dating of other Isnan sites. Around Esna these sites have been registered within two horizons. Older assemblages were located below the upper silt (Sahaba Formation), on the top of lake sediments covered by this silt. Younger sites were recorded in the upper part of the Sahaba Formation silts and above the layer of ashes dated to 10550 ±230 B.C. That is why these younger sites can be dated around 10500 B.C. The beginning of Isnan Industry here is not clear, however it cannot be much older than the beginning of the Sahaba Formation ca. 12000 B.C. (Wendorf et al. 1970).

Isnan industry shows an internal evolution marked by the reduction of notches and denticulates (Hassan 1974), and our sites can be connected with the younger phase of Isnan Industry and dated ca. 10000 B.C. However, if we assume that the differences in the frequency of end-scrapers and notches/ denticulates can be indicators of temporal evolution of Isnan Industry as it was the case with Dishna sites, then we must consider the possibility that our sites represent another facies of development inside this cultural entity. We would like

to point out that other circumstances can be responsible for such diversities, for example a possible functional difference.

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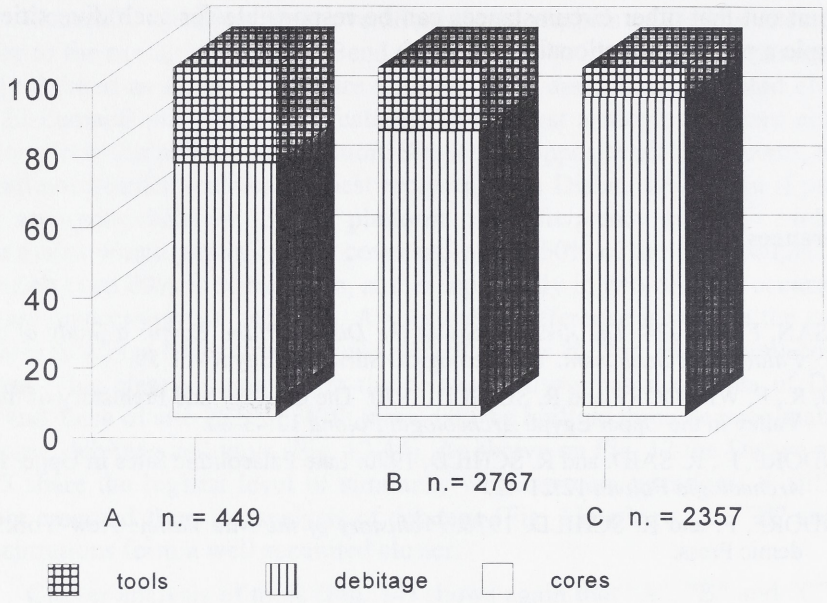

Fig. 2. Site E71C2. General structure of assemblages.

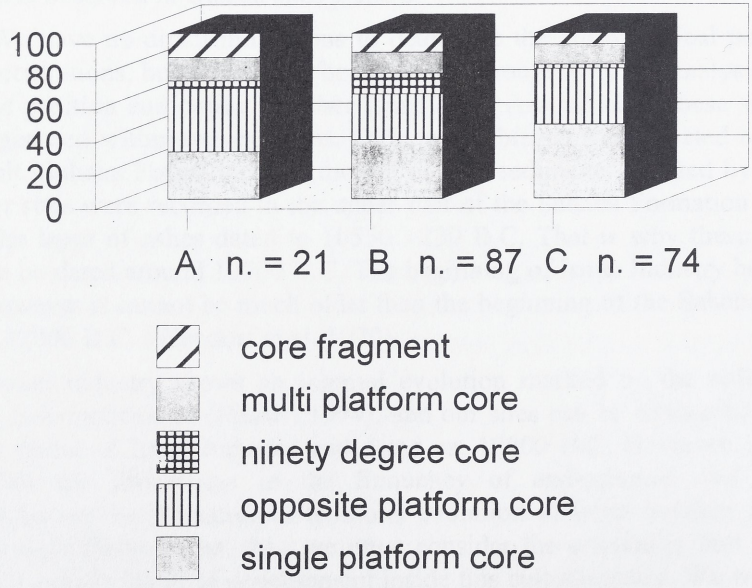

Fig. 3. Site E71C2. Structure of cores.

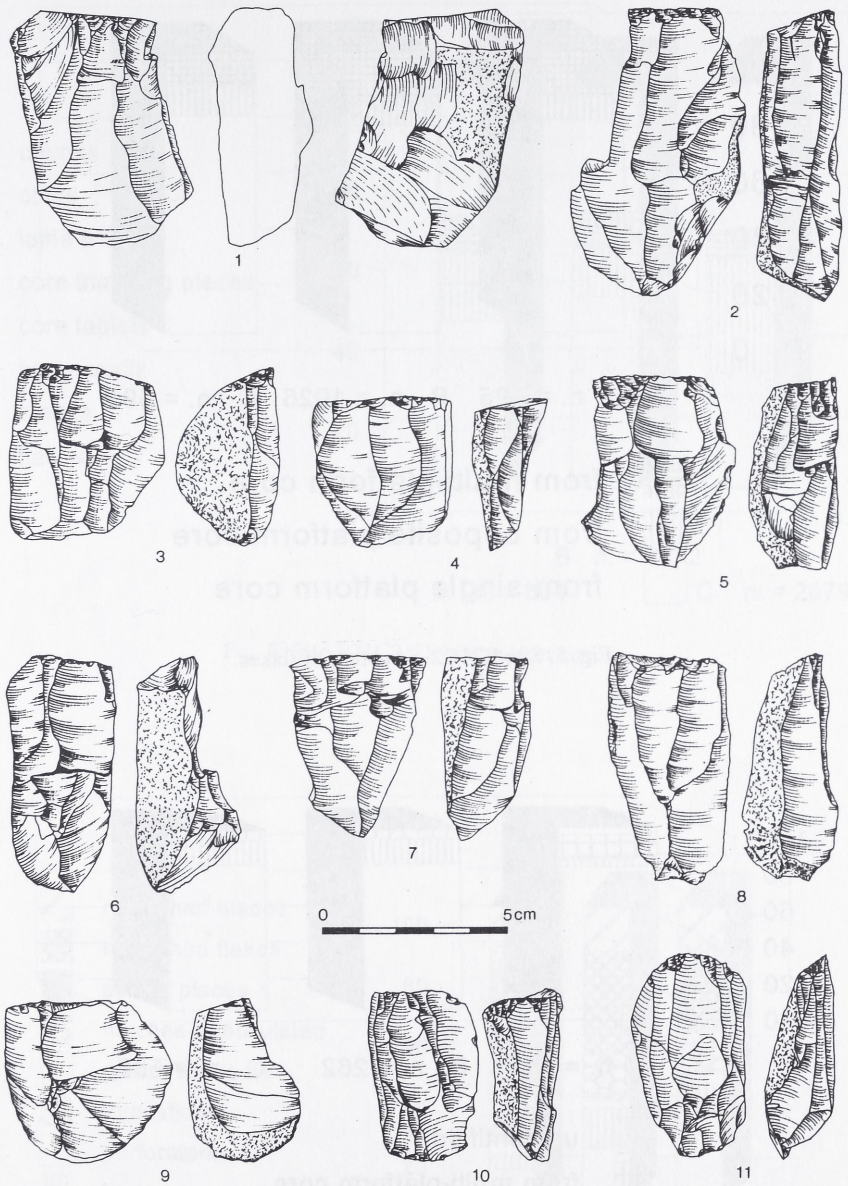

Fig. 4. Site E71C2. Cores: 1-8 - single platform cores for blades; 9 - single platform core for flakes; 10-11 - opposite platform cores for blades.

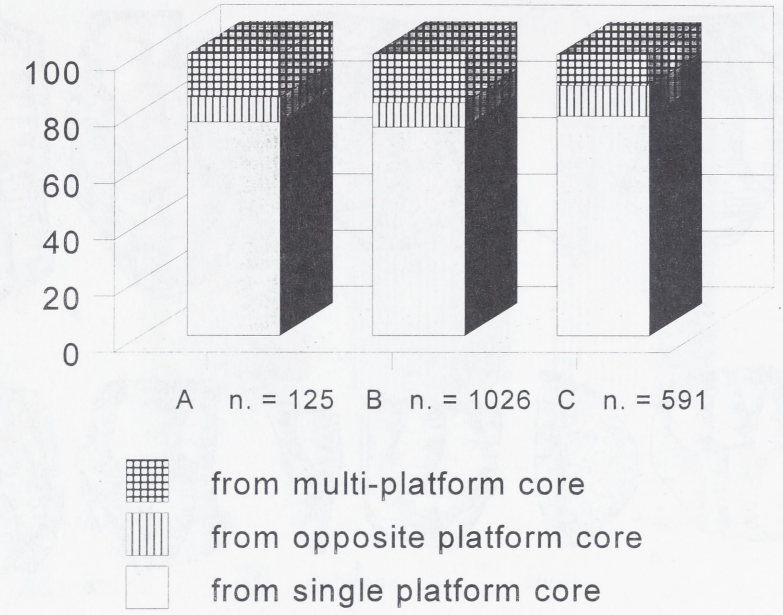

Fig. 5. Site E71C2. Structure of flakes.

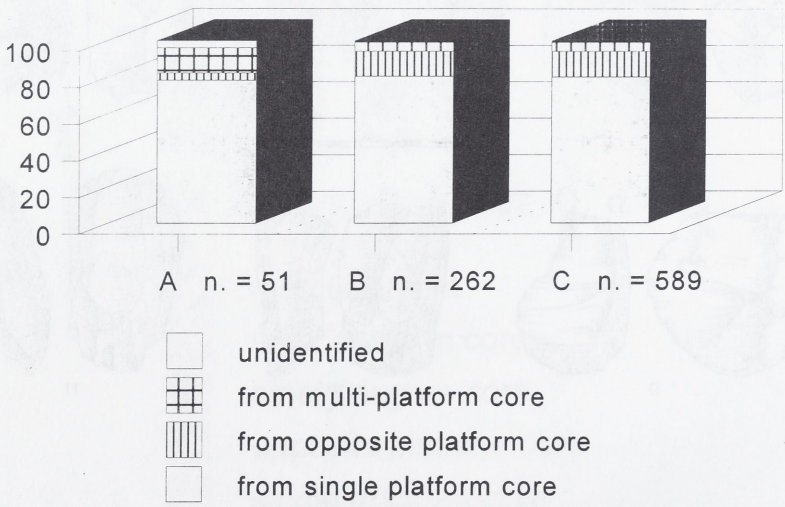

Fig. 6. Site E71C2. Structure of blades.

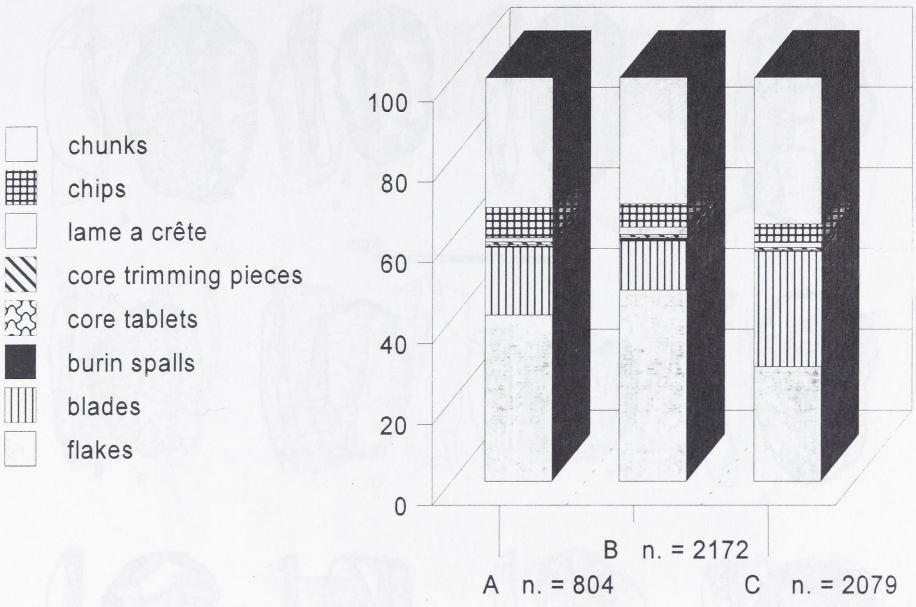

Fig. 7. Site E71C2. Debitage structure.

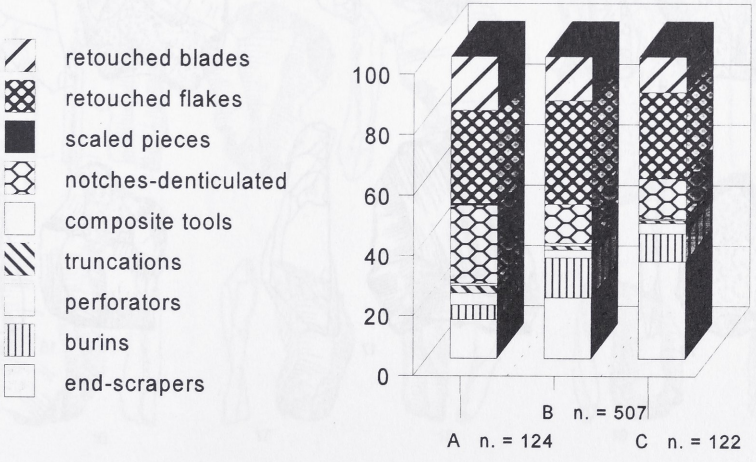

Fig. 8. Site E71C2. Structure of tools.

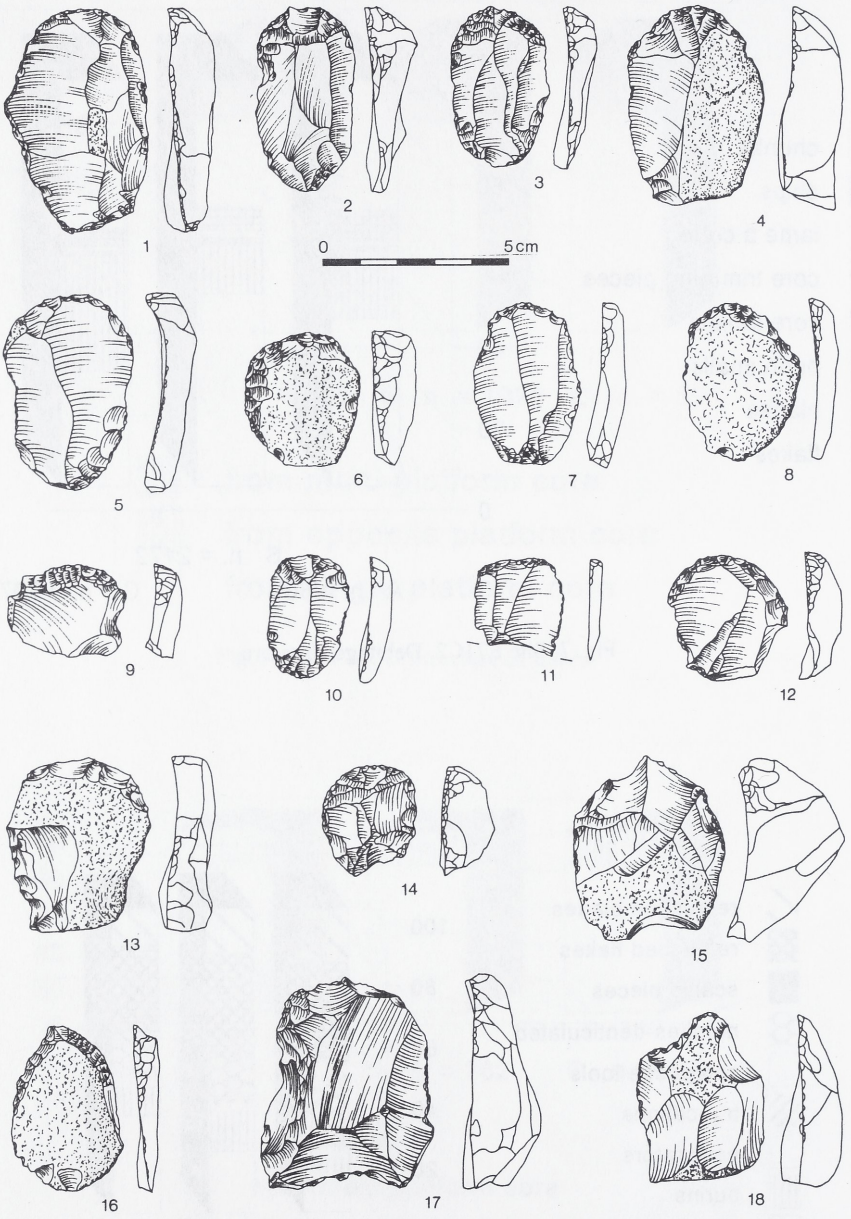

Fig. 9. Site E71C2. End-scrapers.

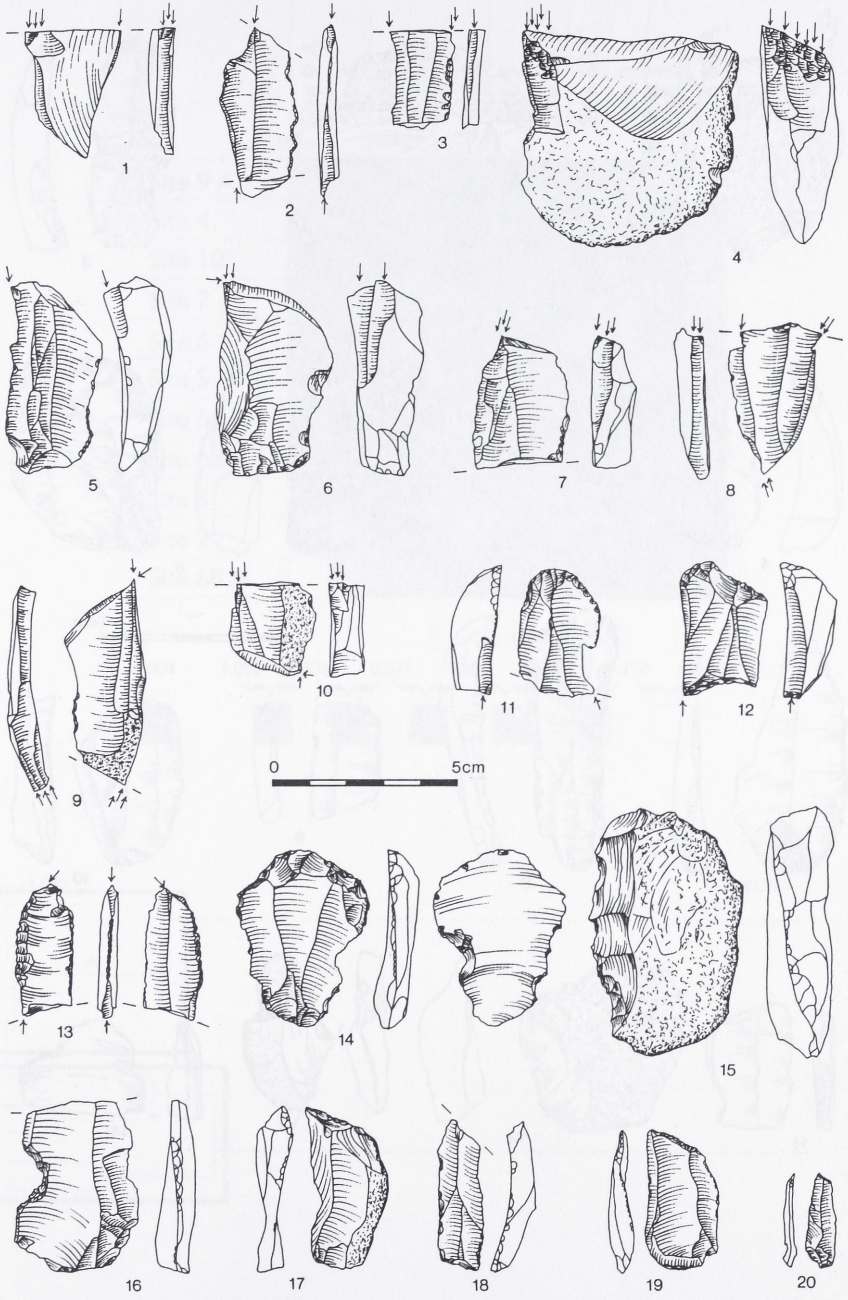

Fig. 10. Site E71C2. Tools.



Fig. 11. Site E71C2. Tools.

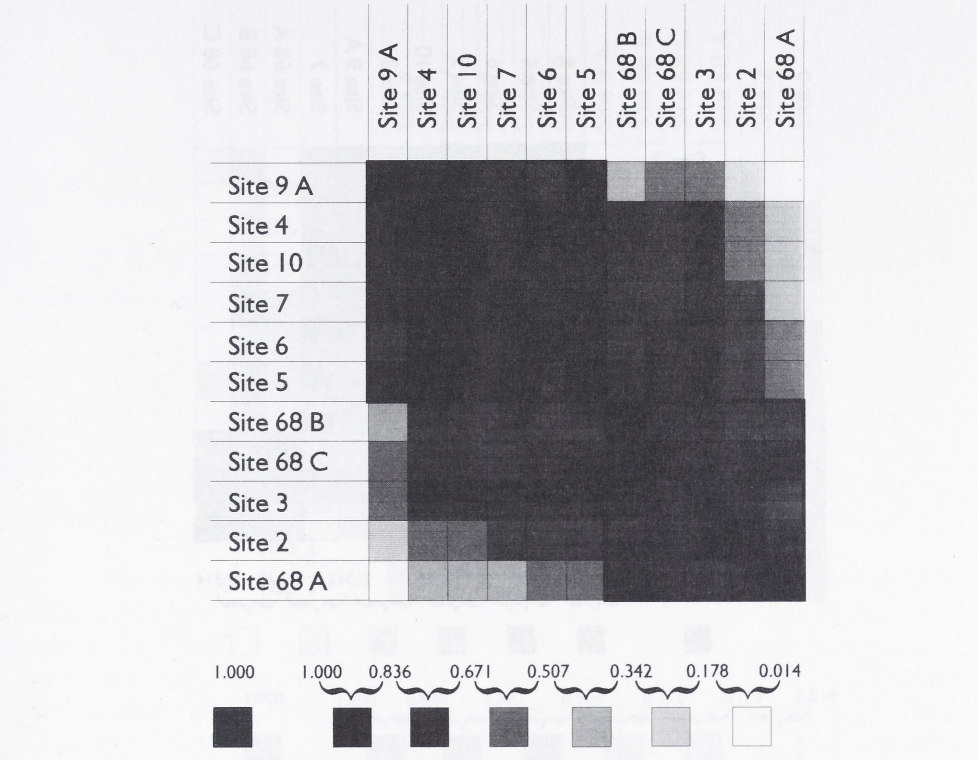

Fig. 12. Cluster analysis of cores based on Pearson matrix..

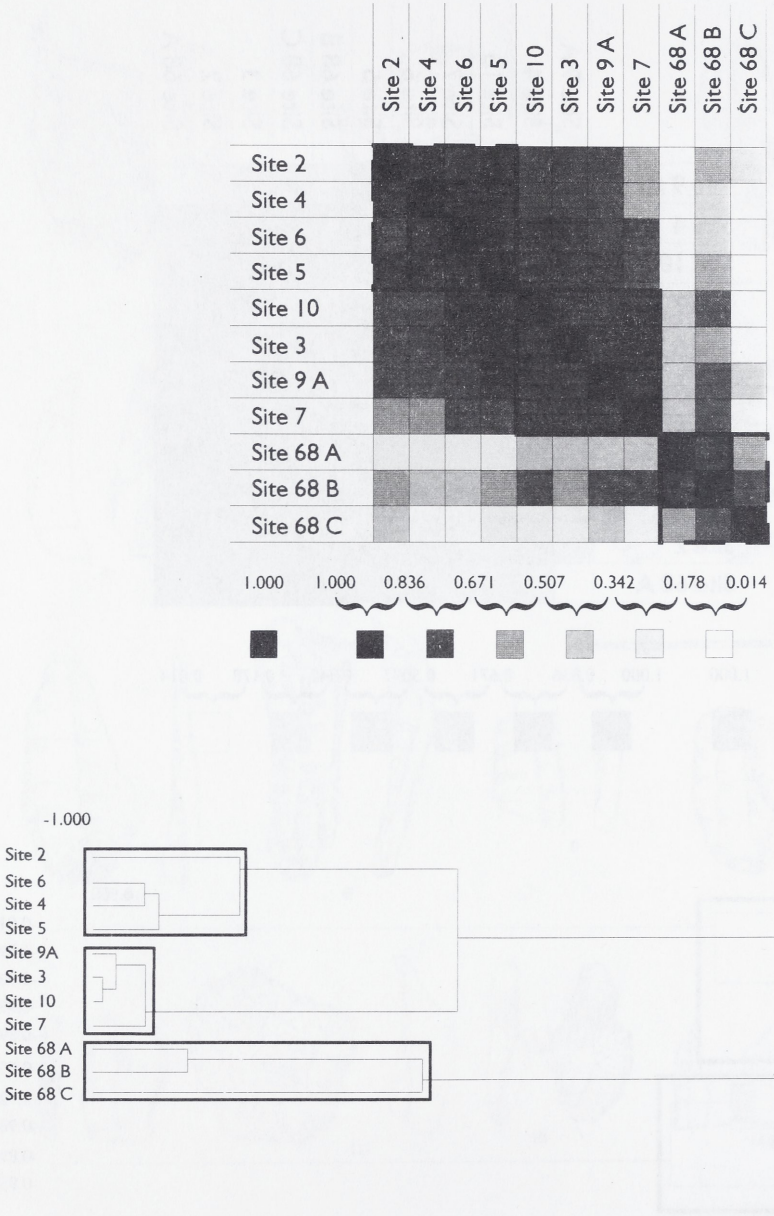

Fig. 13. Cluster analysis of debitage based on Pearson matrix.

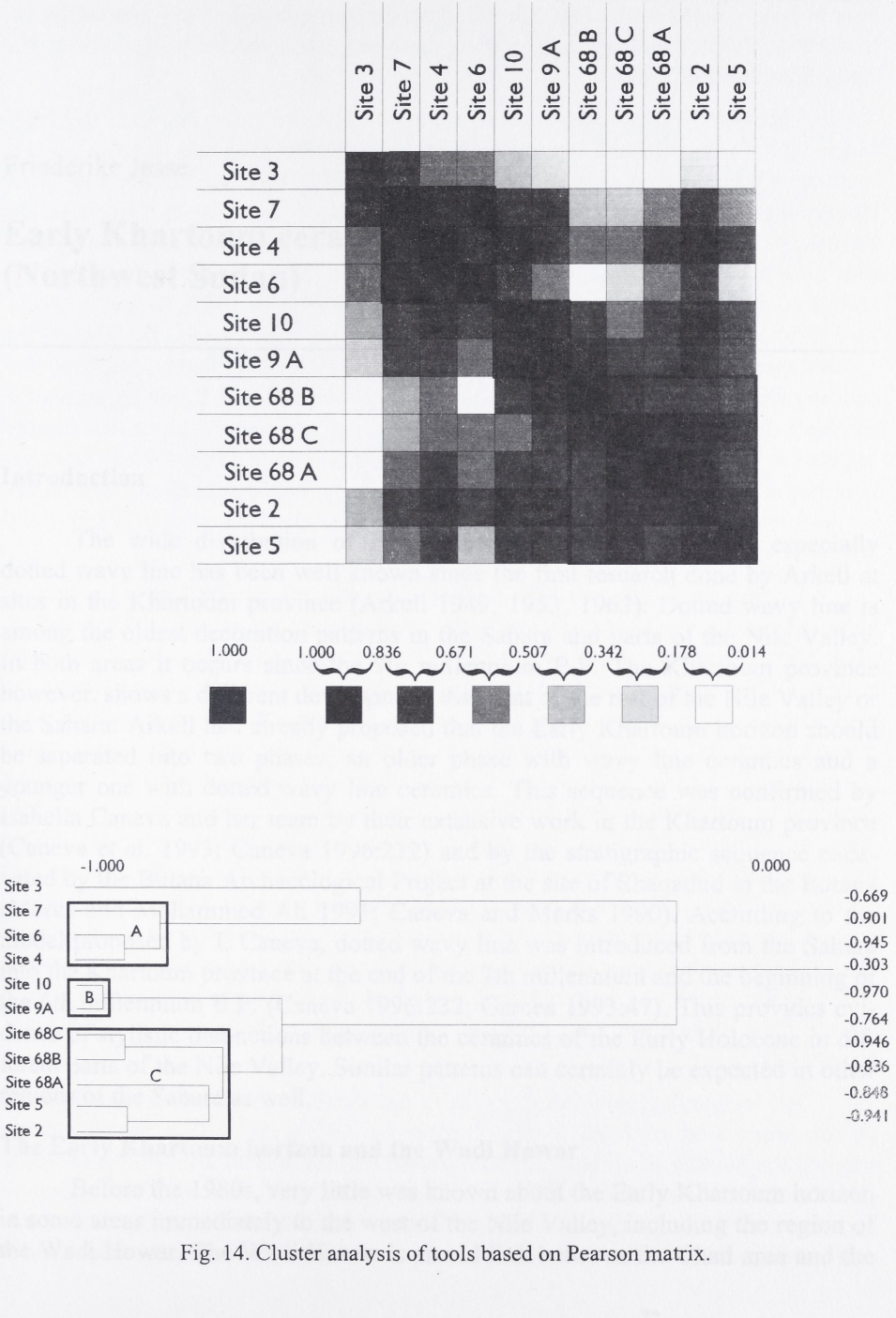

Fig. 14. Cluster analysis of tools based on Pearson matrix.

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Friederike Jesse

Early Khartoum ceramics in the Wadi Howar (Northwest Sudan)

Introduction

The wide distribution of Early Khartoum type decorations, especially dotted wavy line has been well known since the first research done by Arkell at sites in the Khartoum province (Arkell 1949; 1953; 1962). Dotted wavy line is among the oldest decoration patterns in the Sahara and parts of the Nile Valley. In both areas it occurs since the 9th millennium B.P. The Khartoum province however, shows a different development than that of the rest of the Nile Valley or the Sahara: Arkell had already proposed that the Early Khartoum horizon should be separated into two phases: an older phase with wavy line ceramics and a younger one with dotted wavy line ceramics. This sequence was confirmed by Isabella Caneva and her team by their extensive work in the Khartoum province (Caneva et al. 1993; Caneva 1996:232) and by the stratigraphic sequence excavated by the Butana Archaeological Project at the site of Shaqadud in the Butana (Marks and Mohammed Ali 1991; Caneva and Marks 1990). According to the model proposed by I. Caneva, dotted wavy line was introduced from the Sahara into the Khartoum province at the end of the 7th millennium and the beginning of the 6th millennium B.P. (Caneva 1996:232; Garcea 1993:47). This provides evidence of stylistic distinctions between the ceramics of the Early Holocene in different parts of the Nile Valley. Similar patterns can certainly be expected in other regions of the Sahara as well.

The Early Khartoum horizon and the Wadi Howar

Before the 1980s, very little was known about the Early Khartoum horizon in some areas immediately to the west of the Nile Valley, including the region of the Wadi Howar. The Wadi Howar is an old link between the Chad area and the

Nile valley. Analysis of sites located along the route can provide interesting information about exchange and contact between these two regions during the Early Khartoum horizon.

The Wadi Howar originates in the mountainous region between the Jebel Marra and the Ennedi and enters the Nile between the third and fourth cataract, opposite Old Dongola (Pachur and Kröpelin 1987:298). Earlier on the Wadi Howar was believed to terminate in the middle of the Libyan Desert at the mountain chain of Jebel Rahib. In the early 1980s however it was found to connect with the Nile Valley using LANDSAT-scenes (Meissner and Schmitz 1983) and ground-checks (Kuper 1988:136; Pachur and Kröpelin 1987; Kröpelin 1993). The 1050 km wadi course can be divided into three major parts: the Upper, the Middle and the Lower Wadi Howar (Kröpelin 1993:20). Today, the 640 km course of the Upper and Middle Wadi Howar up to the Jebel Rahib traverses the southern fringe of the Sahara and is marked by a stripe of ground-water-fed vegetation up to 11 km wide (Neumann 1989). The Lower Wadi Howar however is rather difficult to distinguish geomorphologically and is separated from its upper and middle course by a 15 m high and 5 km wide dune barrier (Pachur and Kröpelin 1987:298).

During the Early and Middle Holocene climatic conditions were favourable, indications for humid phases in the Wadi Howar are as old as 9300 B.P. A favourable climate persisted until 3000 B.P. (Kröpelin 1993:215-216). The humid conditions during the Holocene permitted an increase in rainfall and a rise in the groundwater table of the area. The wadi at that time must be imagined as a ground-water-fed, continuos chain of wadi sections and permanent pools (Kröpelin 1993:234). "After local rainfalls these experienced seasonal flooding resulting in intermittent river activity and overflows from one sheet of water into the next" (Kuper 1995:129). The climatic conditions during the Holocene shifted the vegetation zones approximately 500 to 600 km to the north. During this period the Wadi Howar was located at the southern frontier of the sahelic zone, with an annual precipitation of about 400 mm per year. Conditions were favourable for savannah type vegetation, great mammals, fish and molluscs (Neumann 1989). Even at the end of the humid period of the Holocene about 3000 B.P. a sahelic type vegetation still persisted and provided environment suitable for human settlement.

All archaeological work done up to the 1980s in the Wadi Howar focused on the areas west of Jebel Rahib. During the 1920s and 1930s several teams reached the Middle Wadi Howar and reported the richness of archaeological finds (Newbold 1924; Newbold and Shaw 1928; Bagnold 1933; Shaw 1936; Frobenius and Rhotert 1934). Forty years later, in winter 1975/76, a team of the University of Khartoum directed by Abbas Mohammed-Ali conducted surveys and several

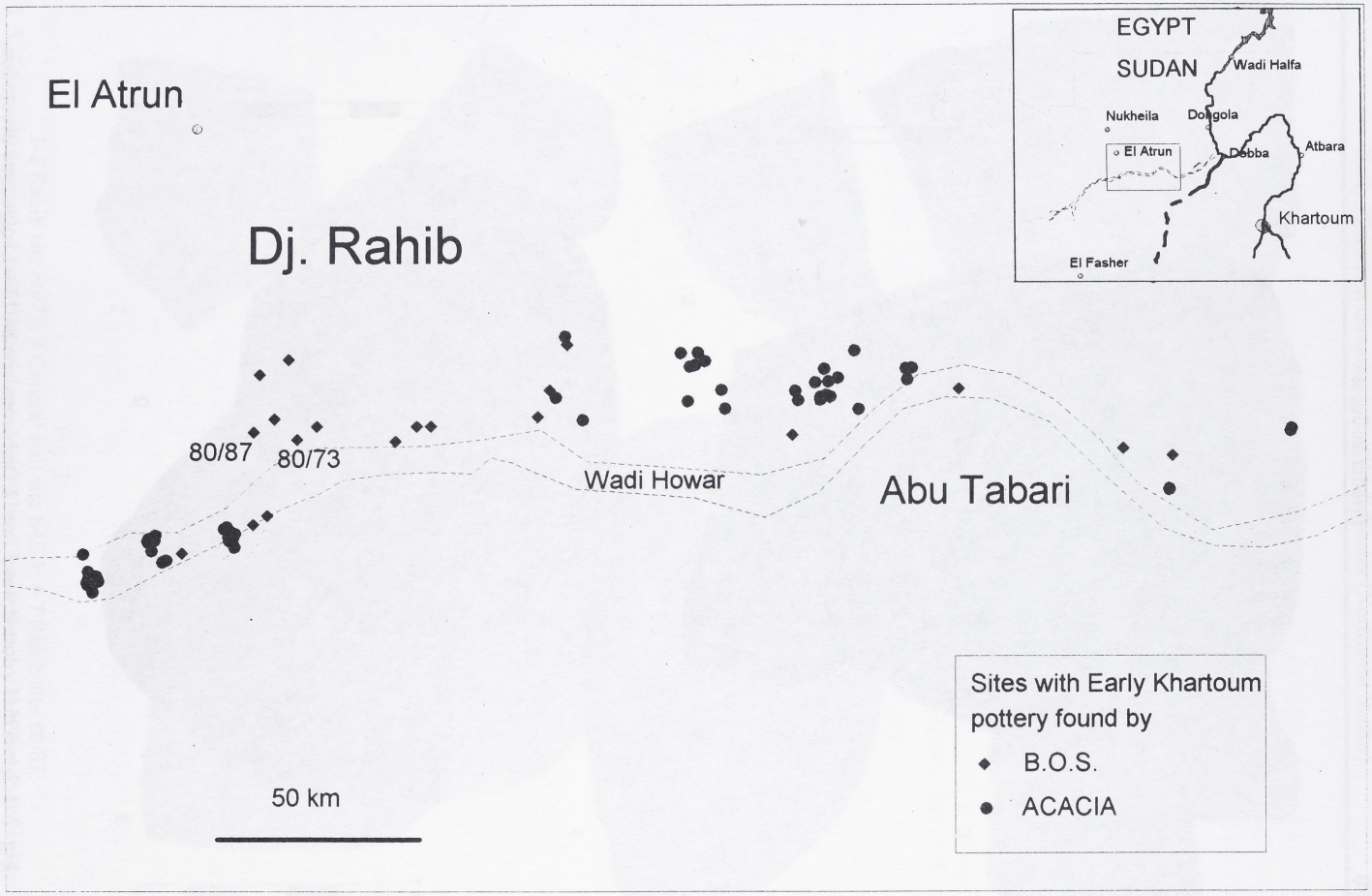

Fig. 1. Sites with Khartoum and Laqiya type pottery in the Wadi Howar.

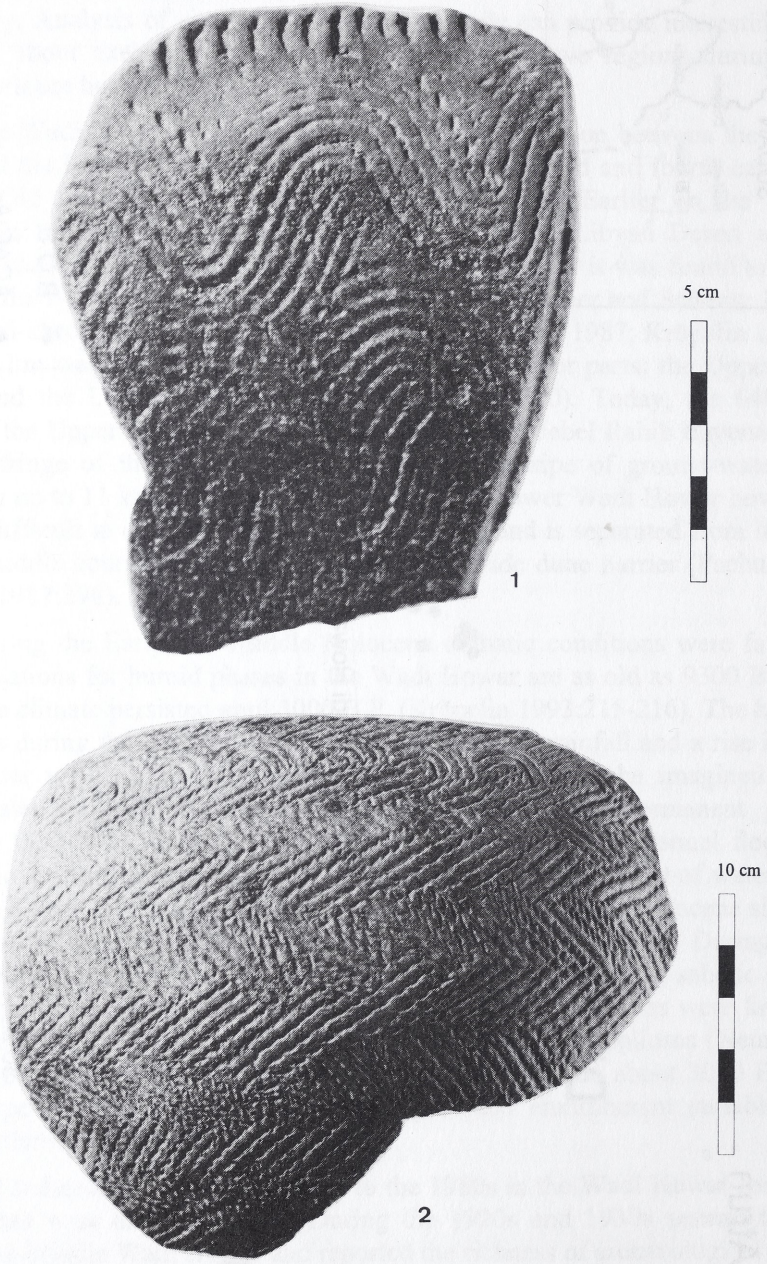

Fig. 2: **1** Site S95/4 - dotted wavy line. **2** Djabarona site 84/13 – Laqiya type decoration.

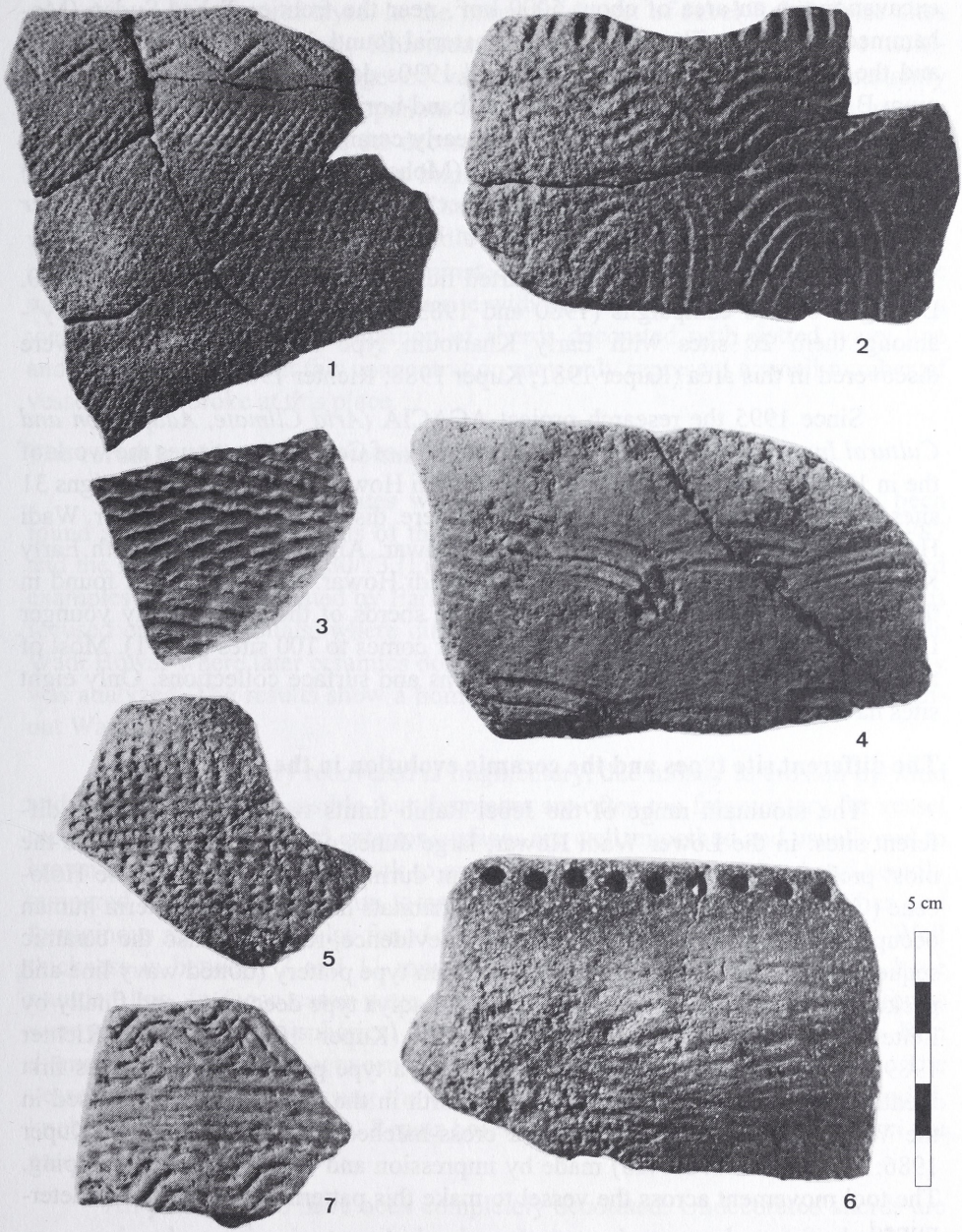

Fig. 3:
1-2 Rahib site 80/73; **3** Conical Hill site 84/24; **4-7** Rahib site 80/87.
1, 3, 5-6, packed zigzag; 2 dotted wavy line; 4 wavy line; 7 dotted wavy line and packed zigzag.

excavations in an area of about 5000 km², near the frontier Tchad-Sudan (Mohammed-Ali 1982). The archaelogical material found during this field campaign and the finds made during the 1920s and 1930s date to the 5th and 4th millennium B.P., a period now known as Leiterband-horizon (Keding 1997), and to an even later time. Only three sites with the early ceramic design style of wavy line were known from the whole Wadi Howar (Mohammed-Ali 1982:102, map 7; 47) before the beginning of the research project B.O.S. (*Besiedlungsgeschichte der Ostsahara*) of the University of Cologne in 1980.

The research project B.O.S. started fieldwork in the Wadi Howar in 1980. During two field campaigns (1980 and 1983/84) over 100 sites with pottery - among them 20 sites with Early Khartoum type material (Fig. 1) - were discovered in this area (Kuper 1981; Kuper 1988; Richter 1989).

Since 1995 the research project ACACIA *(Arid Climate, Adaptation and Cultural Innovation in Africa*) of the University of Cologne continues the work of the in 1993 finished B.O.S. project in the Wadi Howar. In two field campaigns 31 sites with Early Khartoum type pottery were discovered in the Lower Wadi Howar and 18 sites in the Middle Wadi Howar. All in all, 69 sites with Early Khartoum pottery are now known in the Wadi Howar. Adding 31 sites found in the Middle Wadi Howar and yielding some sherds of the only slightly younger Laqiya type ceramic, the total number so far comes to 100 sites (Fig. 1). Most of them are known only by survey descriptions and surface collections. Only eight sites have been excavated.

The different site types and the ceramic evolution in the Wadi Howar

The mountain range of the Jebel Rahib limits two areas with quite different sites: in the Lower Wadi Howar, large dunes of parabolic shape were the most preferred places for human settlement during the Early and Middle Holocene (Gabriel et al. 1985:107). These dune habitats have seen a long-term human occupation - as shown by the stratigraphic evidence, reflecting also the ceramic sequence of the Wadi Howar. Early Khartoum type pottery (dotted wavy line and packed zigzags) is followed by pottery with Laqiya type decoration and finally by Leiterband as well as undecorated pottery (Kuper 1995:130, 133; Richter 1989:434; Gabriel et al. 1985:110). The Laqiya type pottery (Fig. 2.2) was first identified approximately 300 km further north in the area of Laqiya, focused in the Wadi Shaw. It is described as a cross-hatched herring-bone motif (Kuper 1986:131; Schuck 1989:423) made by impression and certainly rocker stamping. The tool movement across the vessel to make this pattern has not yet been determined.

The sites in the Middle Wadi Howar, however show a very different layout than those of the Lower Wadi Howar: they are large surface scatters, with only a

very thin archaeological layer. In the immediate west of Jebel Rahib these sites yield large numbers of Early Khartoum ceramics, but often appear to be multi-component sites with a range of variation in ceramic types, thus certainly reflecting more than one occupation. The Djabarona area further to the west is dominated by later ceramics, the decorations include Leiterband, Crescent Leiterband, geometric patterns and mat impressions (Keding 1997; Richter 1989:435, 437). Only few sherds with Early Khartoum type - or Laqiya type - decorations were found on these sites in the Middle Wadi Howar. There are three known exceptions to this pattern: one site dominated by Early Khartoum ceramics, one site with only Laqiya type pottery, and a site with predominantly Leiterband ceramics yielding however one concentration of sherds decorated with dotted wavy line and packed zigzags, but this concentration may only represent a small number of vessels which broke at this place.

The ceramic of Early Khartoum type in the Wadi Howar

The most important sites with Early Khartoum type pottery have been found at the western foothills of the Jebel Rahib, among them site Rahib 80/87 and the nearby site Rahib 80/73 (Fig. 1). These two sites are the only excavated examples of sites dominated by Early Khartoum ceramics. The other excavations focused on dune habitats, where different ceramic styles occur, and the Middle Wadi Howar where later ceramics dominate. All the Early Khartoum type pottery was analyzed. The results show a homogeneity for this type of ceramic throughout Wadi Howar.

All of the pottery recovered is fragmentary, due mostly to erosion by wind and sand. Refitting is possible, but the pieces are often too fragmentary for vessel reconstruction. Interior and exterior surfaces are well smoothed and usually red to brown in colour, with some black to greys. The pottery is rather hard and heavily tempered with quartz grains up to or slightly exceeding 2 mm in size. Mica and ferruginous materials are also found as temper, but rarely in great quantities. Wall thickness is between 7 and 11 mm. Rim profiles are simple and mostly have rounded lips. In those cases were vessel reconstruction was possible jar forms were globular and hemispherical in shape. Bowls are also present, but rare. Rim diameters generally are between 18 and 30 cm, with some size variation. The vessels were constructed using the coiling technique. Bases are mostly rounded, knobbed bases also do occur. Repair holes and worked sherds also appear in the assemblage.

All pots seem to have been completely decorated. Undecorated sherds are rare and only partly decorated sherds unknown. Impressed motifs dominate, incision is infrequent. The impressed decorations are made by simple impression or rocker stamping. Pivoting stamp with a two-toothed implement is nearly un-

known. Among decorations, different kinds of dotted wavy line patterns - semi-circular waves (Fig. 3.2) as well as curves (Fig. 2.1) - occur as do packed zigzags (Fig. 3.1;3;5-6). Packed zigzags are often made by using an instrument producing dashes, perhaps a cord wrapped implement (Fig. 3.3;6). Combination of dotted wavy line patterns and packed zigzags in zoned bands was also observed (Fig. 3.7). Incised motifs are very rare and usually belong to wavy line patterns (Fig. 3.4). Laqiya type decoration is also present (Fig. 2.2).

Notches arranged in a single horizontal row are rather typical rim decorations (Fig. 2.1; 3.2), as are punctuations which nearly perforate the wall (Fig. 3.6). These nodes then protrude into the interior of the vessel. On site Rahib 80/73 only, a single band of small zigzags was found as a rim decoration (Fig. 3.1).

As seen by stratigraphic evidence, Laqiya type decoration is later than the Early Khartoum type decoration. However, these two decoration styles seem to be at least partly contemporaneous as show some sherds with dotted wavy line decoration concentrated in a single band on the upper part of the vessel near the rim, followed by Laqiya type decorations on the wall (Fig. 2.2) or the appearance of this type of decoration on the Early Khartoum ceramic site Rahib 80/87. Further study is needed to clarify this problem. In general, the existence of dotted wavy line patterns limited to the upper part of the vessel seems to indicate a later occurrence. Site Rahib 80/73 with mostly packed zigzags and seldom dotted wavy line (always in the upper part of the vessel) or packed zigzags made by a cord wrapped implement is an example of this later occurrence.

Summary and conclusion

The Wadi Howar Early Khartoum type ceramics fit well into the established picture - mainly dotted wavy line and rarely wavy line - for this horizon in the Sahara. In the Wadi Howar, ceramics of Early Khartoum type are quite homogenous. Differences occur only in the quantities in which this type of decoration is present: in the Middle Wadi Howar, only a few sherds with Early Khartoum type decoration are found on the large sites dominated by later types of decoration. Sites with important quantities of Early Khartoum ceramics are found in the region immediately west of Jebel Rahib and in the Lower Wadi Howar. These discrepancies may be due to site conservation: the sites with mainly Early Khartoum ceramics in the Middle Wadi Howar may be totally eroded or just covered with sand. In addition, reuse of pottery, as cited for example for Nigeria (Breunig 1995:15), may also bias the sample.

Determining the age of Early Khartoum ceramics in the Wadi Howar is a constant problem. Very few radiocarbon dates exist even though a large number of sites are now known.

The existing radiocarbon dates, taken from bone or snails, place the Early Khartoum type ceramics in the Wadi Howar in the 6th millennium B.P. Compared to the decoration patterns, especially the dotted wavy line motifs, and seeing them in comparison with adjoining areas these dates are in my opinion too young (see also Kuper 1995: 130). The slightly later occurrence at site Rahib 80/73 (where dotted wavy line motifs are rare and concentrated on the part of the vessel near the rim) is also dated to the 6th millennium B.P. This seems acceptable, but points again to the problem of radiocarbon dating the older evidence yielding a larger amount of dotted wavy line patterns as present on site Rahib 80/87.

Parallels to the Early Khartoum type pottery of the Wadi Howar can be found in the Sahara, for example at the sites of Délébo (Bailloud 1969), Gabrong (Gabriel 1981), Wanyanga Kebir (Arkell 1964) and further sites in the Tchad (Courtin 1969) and Jebel Uweinat (Aumassip 1993), as well as in the Nile Valley: at the sites of Khartoum Hospital (Arkell 1949), Shabona (Clark 1989), Shaqadud (Marks and Mohammed Ali 1991; Caneva and Marks 1990), Abudiya (Geus 1979), the Geili-Kabbashi-area (Caneva et al. 1993) and the Atbara region (Haaland and Magid 1995). Even closer are the similarities with pottery of the Jebel Tageru, a small mountain chain approximately 70 km south of the Middle Wadi Howar: there some sites with Early Khartoum and Laqiya type pottery were found during a survey by the B.O.S. mission of 1984. Also very similar are sherds recovered in the area of Wadi Shaw, approximately 300 km to the north of Wadi Howar (Schuck 1989:426; Kuper 1995:133).

Thus, during the Early and Middle Holocene, the Wadi Howar shows connections to the four points of the compass. Regional stylistic development is also found with the appearance of the Laqiya type decoration, at least partly contemporaneous to the Early Khartoum horizon in this region. Laqiya type decoration is only known from the Laqiya area, the Wadi Howar and the area of Jebel Tageru, showing close links between these three regions and the existence of a special regional ceramic phase. During the last millennia B.C., this connection to the north was cut due to degrading climatic conditions. With the appearance of Leiterband and related ceramic decorations the east-west-orientation became more important for the Wadi Howar.

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Birgit Keding

New data on the Holocene occupation of the Wadi Howar region (Eastern Sahara/Sudan)

Introduction

Today, the Eastern Sahara in Egypt and Sudan is one of the most arid regions of the world. In contrast, numerous sedimentological, botanical, faunal and archaeological investigations demonstrate that the environment was favourable for human occupation in prehistoric times. The Wadi Howar is one of the most impressive witnesses of the dramatic climatic changes during the last 12,000 years. Located on the southern margin of the Eastern Sahara, the wadi is a former tributary of the Nile (Fig. 1). During the Early Holocene, the over 1200 km long river connected the mountainous region of the eastern Chad with the Nile Valley which it joined opposite Old Dongola (Meissner and Schmitz 1983; Pachur and Kröpelin 1987). During the Middle and Late Holocene the river was gradually transformed into a chain of freshwater lakes fed by local rainfall (Kröpelin 1993). Hundreds of prehistoric sites along the wadi banks indicate the former favourable ecological situation (Neumann 1989) in this region and its significance as a settlement area and link between the Nile Valley and the Chad in earlier periods.

Since 1995, the Wadi Howar region has been one of the main research areas of the Collaborative Research Centre ACACIA (Arid Climate, Adaptation and Cultural Innovation in Africa) (SFB 389, Kultur- und Landschaftswandel im ariden Afrika) of the University of Cologne. The main emphasis of the project is on the relationship between environmental change and the inhabitants' way of life during the period of increasing aridity in the Holocene. This includes the analysis of climatic change, the impact of man on his surroundings and his reaction to changing ecological conditions. Between 1995 and 1997, the research focused primarily on the classification of the prehistoric groups which occupied this region and on improving the pottery chronology of the area. Consequently,

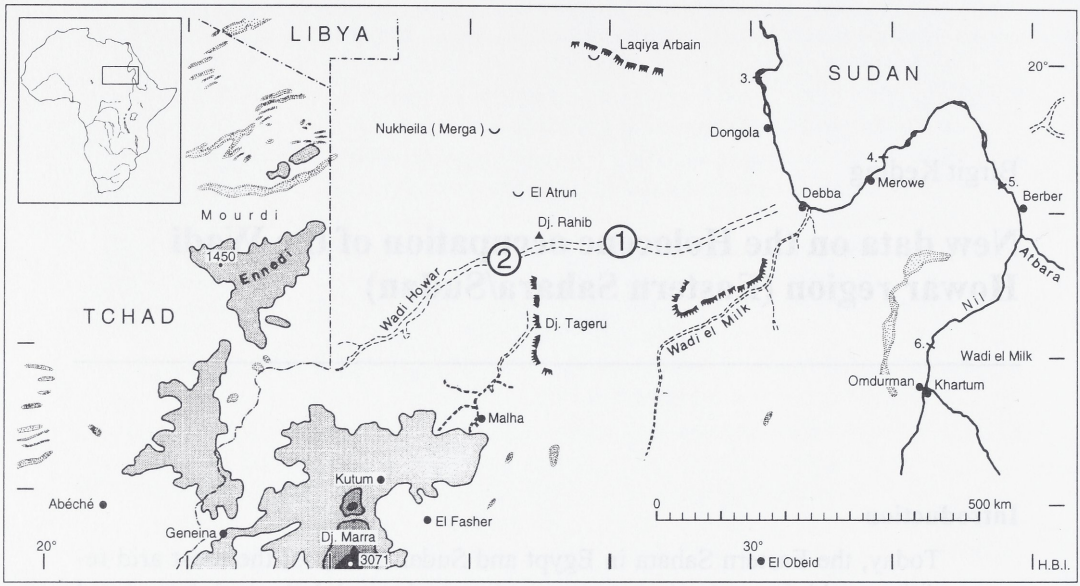


Fig. 1. Map of North-western Sudan: 1 - Lower Wadi Howar, 2 - Middle Wadi Howar.

the archaeological sites, their finds and settlement structures, information on the economy and ecological conditions as well as their gradual modification were recorded. At the same time, research focused on the location of sites with a clear pottery stratigraphy.

Based on the results of the former B.O.S. Project in the 80s (Kuper 1981, 1986, 1988, 1995, Richter 1989; Keding 1993, 1997a, 1997b, 1998) headed by Rudolph Kuper, the fieldwork concentrated on two sections of the wadi course: the Lower and the Middle Wadi Howar. These two areas are separated by a 10,000-year-old dune barrier south of Djebel Rahib and are very different, both in their topography and their archaeological situation.

Dune habitats of the Lower Wadi Howar

The Lower Wadi Howar comprising the 400 km long section west of Djebel Rahib is, today, an uninhabited, featureless 5 to 15 km wide valley with no vegetation and no pronounced embankments. The density of prehistoric sites is less evident than in other areas of the Wadi Howar region. However, the large

dimensions of the nearly 100 recorded sites and the abundant finds indicate an intensive occupation in the Early and Middle Holocene. Two kinds of sites are characteristic: sites in the plains and dune habitats.

The majority of the 44 sites in the plains currently known are located at the foot of the eastern Djebel Rahib. They are situated between dune habitats and appear to be merely surface sites. They cover several square kilometres and are marked by a more or less dense scatter of finds, consisting mainly of stone artefacts with almost no pottery finds.

In contrast to these less specific surface sites, the dune habitats are characteristic features in the landscape of the lower course of the wadi. They are located on the northern wadi banks east of Djebel Rahib and 200 km downstream. The settlements are situated on fossil dunes which had been consolidated around 7000 BC during the climatic maximum (Besler, pers. comm.). Aquatous sediments at their base attest a swampy environment which still existed around 2500 BC, however periodically (Besler, pers. comm.). The surfaces of the dunes are characterized by a dense scatter of pottery, stone artefacts, bones and grinding stones as well as features like burials and different types of stone structures. The large quantity of finds points to long-term or at least repeated stays on these sites. The compact eroded layers of occupational refuse still protect the deeper cultural layers and stabilize the location and form of the dunes. In addition to the 7 dune sites already found during the last two seasons, 43 more sites were discovered.

Surveys of the dune habitats show that the stone artefacts were made of a wide range of raw material which seems to have been mainly supplied by local outcrops. The pottery spectrum is relatively uniform and gives a first hint of the occupational sequence: Dotted Wavy-Line and pottery with zigzag decorations are very common, and there are also small quantities of Leiterband ceramics. In contrast, Laqiya and herringbone pottery only occur in isolated cases.

Up until 1995, the single known stratigraphic sequence in the Wadi Howar was discovered at the dune site Conical Hill 84/24 (Gabriel et al., 1985; Richter 1989: Fig. 2). We therefore expected to find additional cultural sequence on other settlement dunes. Four dune habitats in three different areas between Conical Hill and Abu Tabari were chosen for six test excavations. Due to the instability of the sediment and the large quantities of finds, they were kept small in size. Three of the test excavations yielded stratigraphic sequences up to a depth of at least 1 m.

Pottery sequences

Abu Tabari S95/2, situated 250 km west of the Nile Valley, is the most easterly dune habitat known so far. With a diameter of 750 m and a height of 20 m, this site is the largest of a complex of four dune settlements. Its surface is characterized by a large amount of artefacts with well preserved pottery. Two test

trenches were dug. The first, S95/2-1, covered 6 square metres and was situated on the eastern slope. The surface yielded particularly well-preserved pottery. However, the cultural layer turned out to be only 0.5 m deep and rather disturbed. In contrast, the second test-trench, S95/2-2, was positioned in the centre of the dune plateau and yielded archaeological deposits to a depth of 1.10 m. A total of 458 pottery sherds, representing 392 vessels, were recorded. 275 sherds of 217 vessels were decorated. They provided a pottery sequence beginning with Dotted Wavy-Line pottery, then ceramics with dotted zigzag and double-pronged ornaments, followed by pottery with herringbone, plain zigzag and Leiterband patterns as well as a large quantity of undecorated sherds (Fig. 2; Fig 3). While most of these pottery types are well known and widespread in the Wadi Howar and neighbouring areas, the herringbone decorated ware was registered for the first time in this region (Fig. 4). This pottery is reddish, well-burnished, inorganic tempered and decorated with herringbone, geometric or zigzag patterns. Its technology, form and decoration reveal a general resemblance to pottery of the Nubian Pre-Kerma or A-Group of the Nubian Nile Valley.

A third excavation on this dune site, Abu Tabari S95/2-3, yielded this pottery type in an undisturbed burial. The grave of a young female was discovered on the southern slope of the dune settlement. The deceased was buried in a strongly contracted position lying on her right side, along a north-south axis with her head to the north. Two complete globular herringbone patterned pots, one inside the other, had been deposited close to her pelvis. A shell, a small axe, seven stone artefacts, a small lump of ochre, fish bones and a burnt cattle bones were placed on and around the skeleton. Like the pottery, the grave itself - in particular the position and orientation of the skeleton - shows some similarities with A-Group and Pre-Kerma graves of the Nubian Nile Valley (Nordström 1972: 130). Unfortunately, radiocarbon samples from the skeleton did not yield a date.

Comparable results were obtained from a test excavation on the plateau of the dune settlement S97/1, located 300 km to the west of the Nile Valley. This site, one of a group of four dune habitats, measures approx. 540 by 350 m. The cultural layers were 0.95 m thick and yielded pottery fragments from 862 vessels in an excavated area of only 2 square metres. Even though the stratigraphic sequence of this dune seemed to have been partially disturbed, Dotted Wavy-Line pottery and ceramics with dotted zigzag motifs dominated in the lower levels, whereas herringbone and Leiterband pottery as well as undecorated sherds were found in the upper layers (Fig. 5). Unlike the sequence in the dune further east, Abu Tabari S95/2, some fragments of Laqiya pottery were found, thus fitting chronologically in the early occupation phase.

The pottery sequence is slightly different in the most westerly occurrence of dune habitats, a few kilometres east of Djebel Rahib in the region of Conical

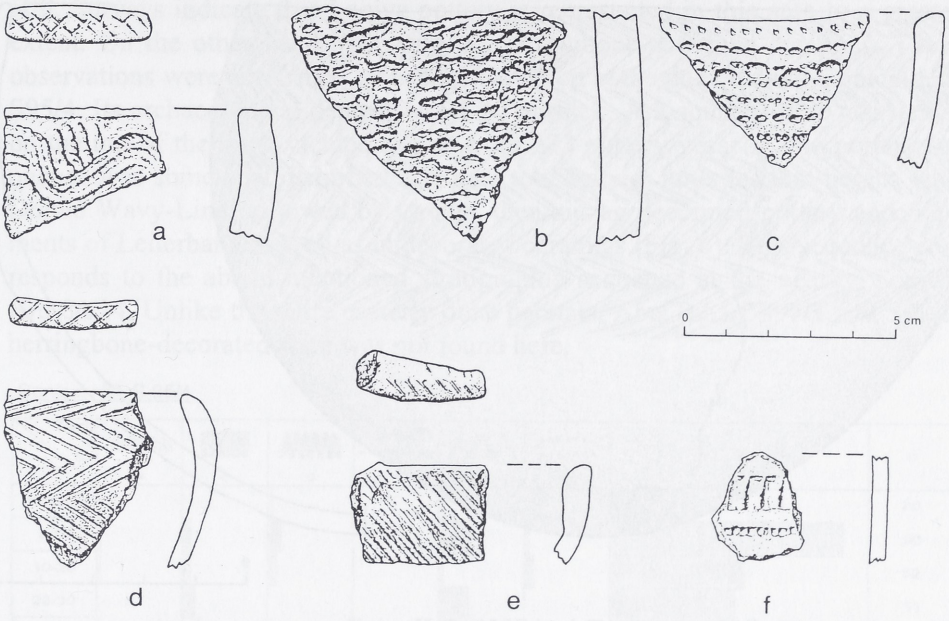


Fig. 2. Lower Wadi Howar, Abu Tabari S95/2-2: **a** Dotted Wavy-Line, **b** Dotted zigzag (flexible (?) implement), **c** Dotted zigzag (rigid implement), **d** herringbone, **e** plain zigzag, **f** Leiterband.

Abu Tabari S 95/2-2

Deco-ration / cm	a	b	c	d	e	f	g	h	n
0-2									34
2-10									67
10-20									80
20-30									57
30-40									67
40-60									50
60-70									22
70-80									14
80-90									2
90-100									1
n	23	68	39	36	15	30	6	175	392

Fig. 3. Lower Wadi Howar, Abu Tabari S95/2-2: pottery sequence: **a** Dotted Wavy-Line, **b** Dotted zigzag (flexible (?) implement), **c** Dotted zigzag (rigid implement), **d** double pronged motifs, **e** herringbone and geometric motifs, **f** plain zigzag, **g** Leiterband, **h** undecorated.

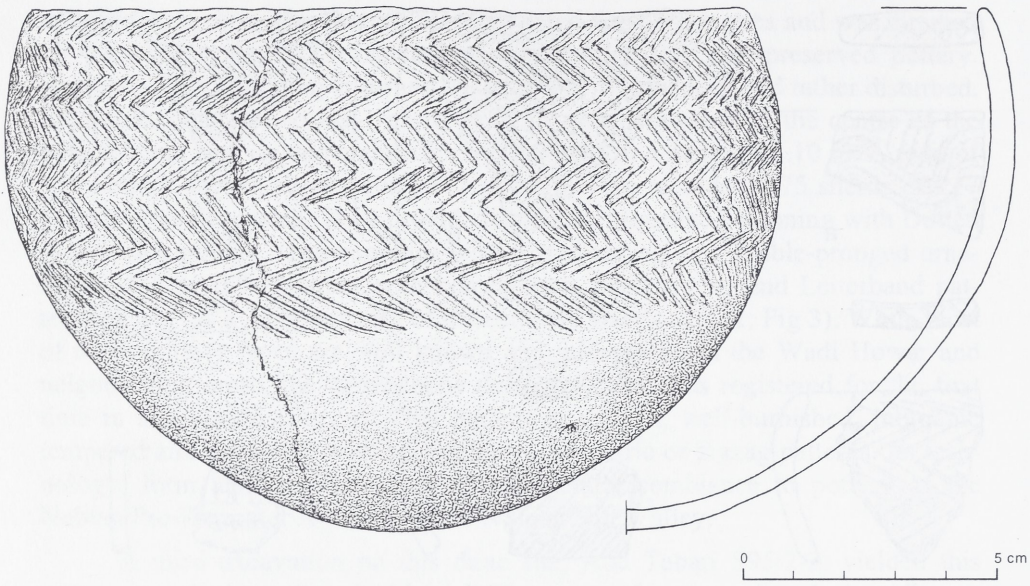


Fig. 4. Lower Wadi Howar, Abu Tabari S95/2-3: Herringbone-patterned pot.

S 97/1

Deco-ra-tion / cm	a	b	c	d	e	f	g	h	n
0-5									173
5-10									120
10-15									65
15-20									48
20-25									46
25-30									49
30-35									40
35-40									21
40-45									14
45-50									8
50-55									8
55-60									11
60-65									10
65-70									6
70-75									4
75-80									3
80-85									10
85-90									3
90-95									1
n	11	3	18	7	21	12	183	385	640

Fig. 5. Lower Wadi Howar, S97/1: Pottery sequence. **a** Dotted Wavy-Line, **b** Laqiya, **c** Dotted zigzag (flexible (?) implement), **d** Dotted zigzag (rigid implement), **e** herringbone and geometric motifs, **f** plain zigzag, **g** Leiterband, **h** undecorated.

Hill. Surveys indicate that Laqiya pottery is represented in this area to a greater extent. On the other hand, there are no herringbone-patterned ceramics. These observations were confirmed by a test excavation at the dune habitat Conical Hill S95/4. Its archaeological deposit was 1.20 m thick. A 2 square metre test trench on the top of the dune yielded sherds from 323 pottery vessels. The pottery sequence was somewhat disturbed but, here too, a series emerges that begins with Dotted Wavy-Line, followed by Laqiya, then zigzag decorated pottery and fragments of Leiterband as well as undecorated ceramics (Fig. 6). This sequence corresponds to the above mentioned stratigraphic sequence at the nearby Conical Hill 84/24. Unlike the more easterly dune habitats, Abu Tabari S95/2 and S97/1, herringbone-decorated ware was not found here.

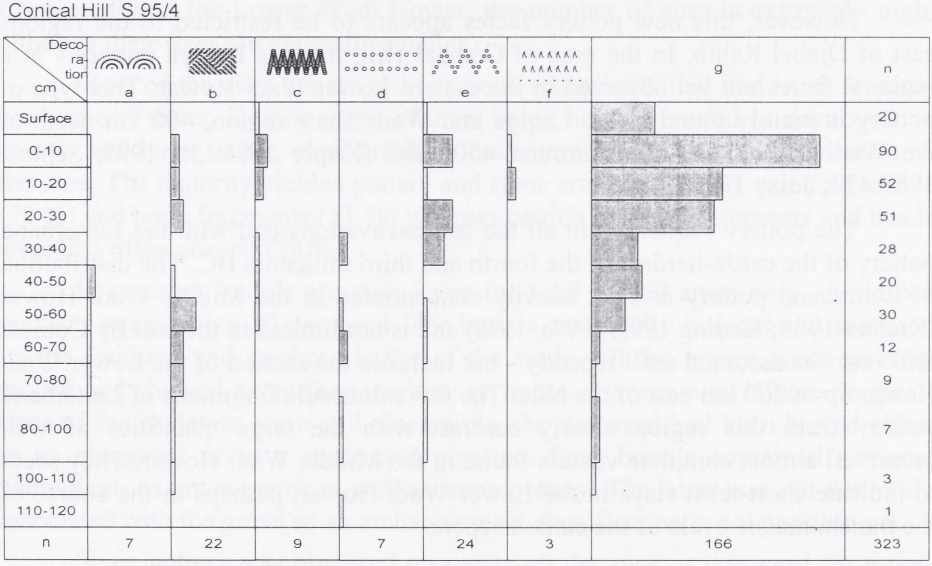


Fig. 6. Lower Wadi Howar, Conical Hill S95/4: pottery sequence. **a** Dotted Wavy-Line, b Laqiya, **c** Dotted zigzag (flexible (?) implement), **d** double pronged motifs, **e** Dotted zigzag (rigid implement), **f** Leiterband, **g** undecorated.

To recapitulate: Although the information from the survey and small-sized text excavations is limited, the dune settlements are currently the only available source of stratified data and they do hint at a broader picture of the chronology and distribution of the different pottery types in the Lower Wadi Howar region. Judging from the finds at the settlement dunes, the Lower Wadi Howar was mainly occupied - and exploited - from the Dotted Wavy-Line phase until the Leiterband phase, between 5000 and 3000 BC (Fig. 9).

While on most of the dune habitats the earliest signs of occupation are

numerous well-preserved fragments of Dotted Wavy-Line pottery, the later pottery in the stratigraphic sequences appears to reflect two different regional developments in the western and eastern regions of the Lower Wadi Howar.

The archaeological deposits of the Abu Tabari region, 200 - 325 km west of the Nile Valley, yielded a pottery type previously unknown in the Wadi Howar, probably belonging to an occupation phase between the earliest Dotted Wavy-Line and the last Leiterband pottery horizons. This newly discovered pottery, often observed on the surface of burial-like structures, is characterized by a high-quality surface treatment and herringbone, geometric and dotted zigzag decorations. Both finds and features could point to cultural links with the Nubian Pre-Kerma or A-Group.

However, this new pottery facies appears to be restricted to the regions east of Djebel Rahib. In the area of Conical Hill, there is Laqiya pottery - in a regional facies not yet observed in the eastern Lower Wadi Howar. This type of pottery is mainly found in the Laqiya and Wadi Shaw region, 400 km north of the Wadi Howar and dates around 4500 BC (Kuper 1986:131, 1995; Schuck 1989:423; Jesse 1998).

The pottery sequences in all the test excavations end with the Leiterband pottery of the cattle-herders of the fourth and third millennia BC. The distribution of Leiterband pottery is most heavily concentrated in the Middle Wadi Howar (Richter 1989; Keding 1993, 1997a; 1998) and is not limited in the east by Conical Hill - as was assumed until recently - but includes the section of the Lower Wadi Howar up to 200 km east of the Nile. The few minuscule fragments of Leiterband pottery from this region clearly contrast with the large quantities of well preserved almost complete vessels found in the Middle Wadi Howar. They seem to indicate short-term stays in the Lower Wadi Howar, perhaps in the course of the transhumance cycle of the cattle keepers.

Surface sites in the Middle Wadi Howar

The environmental setting and archaeological situation are very different in the Middle Wadi Howar, the region west of Djebel Rahib. Here, the Wadi Howar is a shallow 8 to 11 km wide depression with a certain amount of vegetation, still used by some camel nomads from the south. Hundreds of sites cluster along the banks and bed of the wadi. However, in contrast to the Lower Wadi Howar, there are no dune habitats here and the prehistoric sites consist mainly of surface assemblages with no deeper archaeological deposit.

The first two seasons of fieldwork in the Middle Wadi Howar focused on recording the archaeological groups and their pottery facies, the density and position of sites and the economic exploitation of the area through time (Keding 1997b, 1998, in press). The research began with detailed surveys and was contin-

ued with excavations. However, most of the test trenches have not yet been fully analysed. Consequently, only preliminary results of the surveys can be presented here. Three 3 km wide and c. 12 km long transects in an approx. 40 km long section of the wadi with their eastern limits 0.5 km west of the Ku Wad' Lau Lau were surveyed on foot. The transects were 15 km apart. They were positioned across the wadi and included c. 2 km of the southern and northern banks. Within this area of 9 by 12 km, a total of 860 archaeological sites were discovered and their position, size, finds and features were recorded (Fig. 7). The analysis of these data produced the following summarized results.

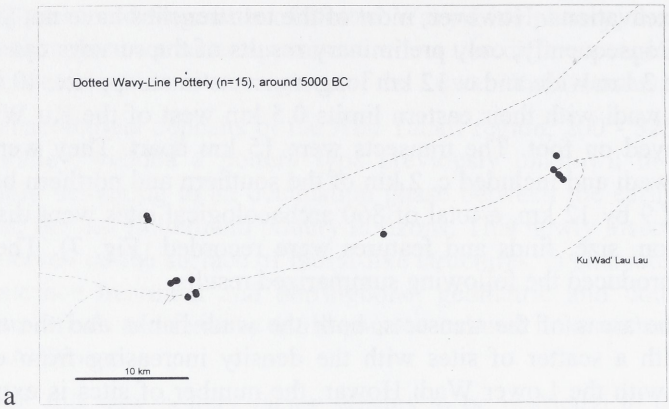
In the areas of the transects, both the wadi banks and the wadi bed are covered with a scatter of sites with the density increasing from east to west. Compared with the Lower Wadi Howar, the number of sites is extremely high, although their sizes are generally smaller.

Most of the sites appear to have been settlements that had been re-occupied several times. Despite some of them being heavily eroded or destroyed by camels and lorry traffic, clear artefact concentrations are preserved on most of the sites. The majority yielded pottery and stone artefacts (98 %), grinding-stones (70 %) and bone fragments (51 %) whereas ostrich eggshell fragments and beads were less often present (28 %).

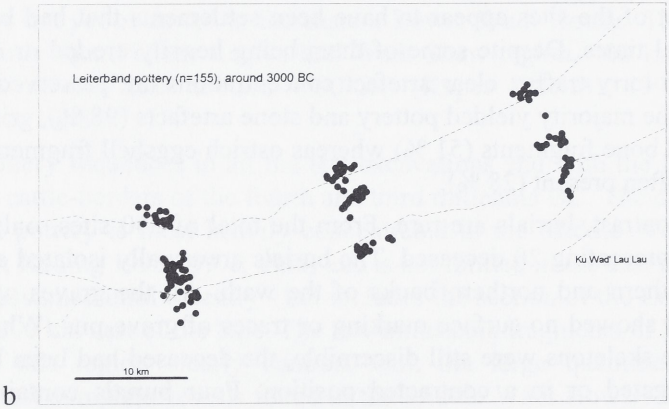
In contrast, burials are rare. From the total of 860 sites, only 16 yielded graves - representing 20 deceased. The burials are usually isolated and scattered on the southern and northern banks of the wadi. All the graves were severely eroded and showed no surface marking or traces of grave pits. Where the positions of the skeletons were still discernible, the deceased had been buried either in an elongated or in a contracted position. Four burials contained personal adornments as grave goods as well as some pottery. The latter was not definitely associated with the grave so an archaeological classification is not possible yet.

Since pottery was observed on nearly all the sites, it was used for a preliminary cultural and chronological classification. At least six pottery types can be differentiated (Fig. 9). Judging from radiocarbon dates as well as from supra-regional stylistic comparisons of the pottery with dated find inventories beyond the Wadi Howar, the sequence covers a period between 5000 and 1500 BC.

The earliest is Dotted Wavy-Line pottery, which was present on 1.7 % of the sites. This pottery is mostly heavily quartz-tempered with globular pots decorated from rim to base with various Dotted Wavy-Line patterns (Jesse 1998, this volume). It fits into the known "Khartoum Horizon Style" (Hays 1971) and its distribution is known from the Sudanese Nile Valley to the Atlantic coast. The few radiocarbon dates place the Dotted Wavy-Line inventories in the Wadi Howar region mainly between 5000 and 4000 BC.



a



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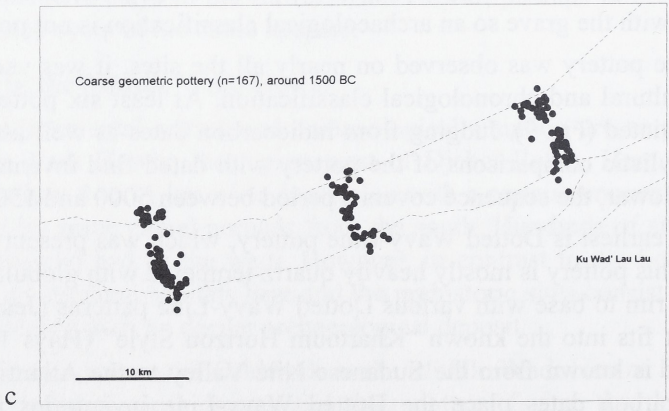

c

Fig. 7. Middle Wadi Howar: site distribution with different pottery types.

The succeeding, and partly contemporaneous, Laqiya pottery was found on 4.8 % of the sites. The quartz-tempered pots are mainly decorated with criss-cross and rockerstamp patterns which cover the whole vessel. It is mainly concentrated in the Wadi Howar, Wadi Shaw and Laqiya area (Kuper 1986:131, 1995:133; Schuck 1989:423, fig. 2:10, 11; Jesse 1998), indicating north-south rather than east-west connections. Judging from the associated bones and other finds, these two earliest pottery types in the Wadi Howar were probably used by hunter-gatherer groups.

Leiterband and Halbmond-Leiterband pottery both appear on 18.0 % of the recorded sites. These two facies of the same ceramic complex, probably with slightly different chronological positions, are characterized by neckless pots decorated over their entire surface with banded rockerstamp patterns which run parallel to the rim. While the earlier Leiterband motifs are formed of straight impressions (Keding 1993: fig. 3:2-5; 4:4) the later Halbmond-Leiterband decorations were impressed using rounded implements (Keding 1997a, 1998: Pl. 2). Nearly complete vessels of Leiterband pottery are often found in eroded pits in association with well preserved cattle-bones, mainly dated between the fourth and the third millennium BC. Since the early phase of the Leiterband sequence shows a strong ressemblance with the pottery of the Khartoum Shaheinab of the Sudanese Nile Valley (cf. Arkell 1953; Caneva 1988), a common origin is assumed (Keding 1997a, 1998: fig. 3a). However, the Halbmond-Leiterband of the later phase can only be linked to pottery of the Chad area (Bailloud 1969) and indicates an increasing regionalization and western orientation of the cattle herders then inhabiting the Wadi Howar region (Keding 1998: fig. 3c)

Fine geometric pottery, recorded on 18.7% of the sites, and coarse geometric pottery, recorded on 19.4% of the sites, represent the last ceramic phases (Keding 1998:10f.). They each have different decorations, vessel-forms and temper and are denoted here - provisionally - as "fine geometric" and "coarse geometric" ceramics. Analyses of the sites excavated at Djabarona S96/2, S96/3, S96/119 and S96/120 will form the base for detailed descriptions of the inventories.

Some typical traits of the "fine geometric" pottery are a brown surface colour, mixed sand and fibre temper, mainly neckless vessel forms and decorations that include criss-cross incisions, impressed triangles and comb impressions which form geometric patterns (Keding 1998: Pl. 5). At first glance, the "coarse geometric" pottery appears to be very similar but clear differences are the reddish-brown surface colour, the nearly pure fibre temper, the broader spectrum of vessel forms including large pots with pronounced necks, and decoration on the inside of the rim (Fig. 8). Initial comparisons indicate that the "fine geometric" pottery tends toward connections with the Wadi Shaw area to the north (Francke

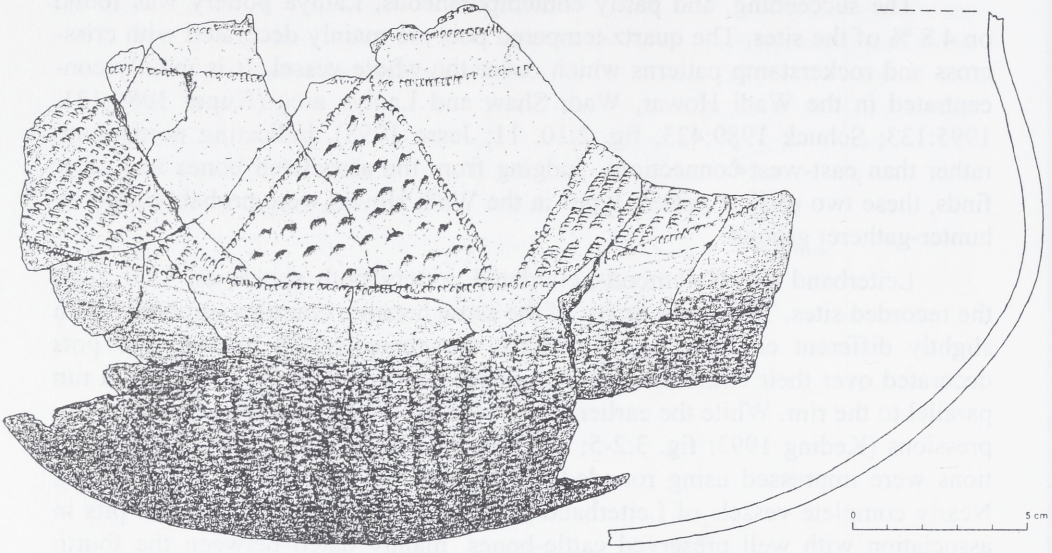

Fig. 8. Middle Wadi Howar, Djabarona S96/3-1: "coarse geometric" pottery.

1986), whereas the "coarse geometric" ware shows a general resemblance to material from more western areas such as the Ennedi Mountains. Both inventories are associated with animal bones, small livestock as well as cattle. The few radiocarbon dates place them mainly between 1500 and 2000 BC. Moreover, at 15 % of the sites, several so far unknown pottery types have been recorded - often represented by just a single sherd.

The pottery sequence of the Middle Wadi Howar corresponds, in its early phases, to the stratigraphic series of the settlement dunes in the western area of the Lower Wadi Howar. However, unlike the Lower Wadi Howar with its principal occupation period between the Dotted Wavy-Line horizon and the Leiterband complex, the Middle Wadi Howar was mainly occupied in the later phases (Fig. 9). During the Leiterband phase, the centre of settlement shifted from the lower course of the wadi to the apparently more favourable area in the middle section. As a result, the Lower Wadi Howar was abandoned, whereas the occupation of the Middle Wadi Howar continued. The final occupation phase has "fine geometric" and "coarse geometric" pottery in addition to Halbmond-Leiterband pottery.

Substantial transformations in the economy (Fig. 9) and the settlement pattern (Fig. 7) took place during the occupation of the Middle Wadi Howar. This can probably be interpreted, at least in part, as a result of the increasing aridity. The various pottery phases are associated with different subsistence strategies. While the processes of change could not be determined - this will only be achieved by excavations - the survey results demonstrate a sequence from hunting-fishing-gathering in the Dotted Wavy-Line phase, to cattle-herding in the Leiterband phase and, finally, additional small livestock keeping - goats and sheep - in the phases with geometric pottery (Van Neer and Uerpmann 1989:331ff., 335; Berke in press.).

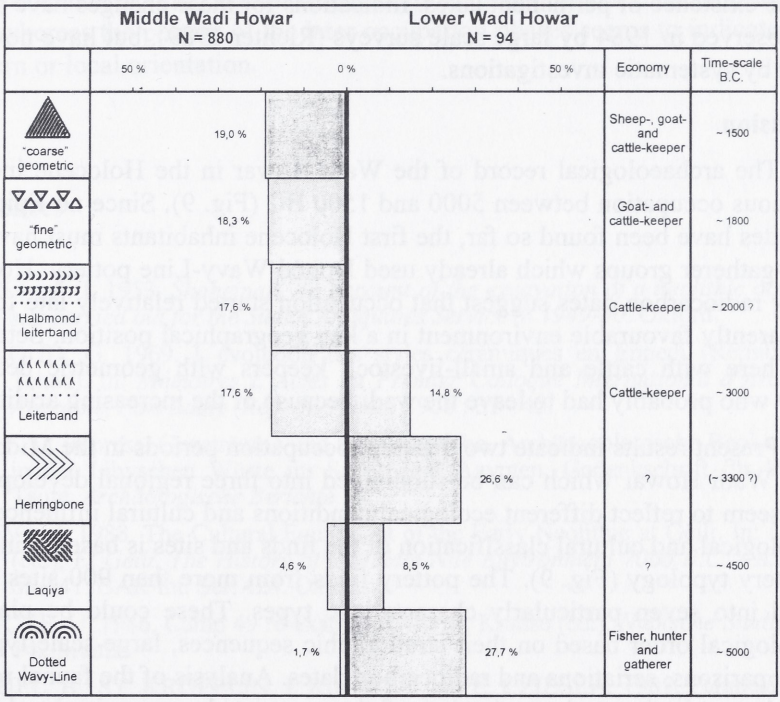

Fig. 9. Occupation periods in the Lower and Middle Wadi Howar.

At the same time, remarkable changes can be observed in the settlement patterns as far as site density, location and size are concerned - probably signs of an increasing aridity. In the earliest Holocene occupation period, characterized by inventories with Dotted Wavy-Line and Laqiya pottery, the site density was extremely low and settlements or just single finds are mainly found on the wadi banks (Fig. 7a). During the later phases, the occupation centres gradually shifted towards the wadi bed. In the Leiterband and Halbmond-Leiterband phases, a

clear increase in the number of sites becomes apparent (Fig. 7b). The sometimes very large sites, often characterized by pits filled with pottery and cattle bones, are distributed on the wadi banks as well as in the wadi bed. Permanent or temporary lakes, which obviously still existed at that time, appear on the distribution maps as zones without sites. During the final settlement phases, characterized by the inventories with the geometric decorated pottery of the cattle and small livestock keepers, the site density remained stable. However, the sites became smaller and the occupation centres were in the wadi bed (Fig. 7c). A map of the site distribution shows such a dense scatter of sites in the wadi depression indicating that there are no longer any white areas left which could point to the possible existence of permanent lakes. Indications for these changes have already been observed in 1984 by large scale surveys (Richter 1989), but have now been proved by systematic investigations.

Conclusion

The archaeological record of the Wadi Howar in the Holocene indicates continuous occupation between 5000 and 1500 BC (Fig. 9). Since no Epipalaeolithic sites have been found so far, the first Holocene inhabitants must have been hunter-gatherer groups which already used Dotted Wavy-Line pottery. However, the few radiocarbon dates suggest that occupation started relatively late for such an apparently favourable environment in a key geographical position. Settlement ended here with cattle and small-livestock keepers with geometric decorated pottery who probably had to leave the wadi because of the increasing aridity.

Present results indicate two different occupation periods in the Middle and Lower Wadi Howar which can be subdivided into three regional developments. These seem to reflect different ecological conditions and cultural influences. The chronological and cultural classification of the finds and sites is based principally on pottery typology (Fig. 9). The pottery finds from more than 900 sites can be divided into seven particularly characteristic types. These could be placed in chronological order based on their stratigraphic sequences, large-scale typological comparisons, seriations and radiocarbon dates. Analysis of the faunal remains allowed a preliminary determination of the associated economic development and documented repeated changes in the economic base. Occupation began with a foraging way of life in a well-watered environment. During the fourth millennium BC, at the latest, it continued with a phase of intensive cattle keeping. Later, small livestock was added and - at the end of the development sequence - hunting became more important.

The archaeological evidence from the areas to the east and west of Djebel Rahib and its adjacent dune barrier seems to reflect different cultural and environmental developments in the Lower and Middle Wadi Howar. This is reflected

in the regional patterns of settlement as well as in their long-range contacts. While Dotted Wavy-Line pottery is still found in both areas with an occupation centre in the Lower Wadi Howar, the predominant ceramics of the younger phases show different facies and a shift of the occupation centre to the Middle Wadi Howar. The Lower Wadi Howar seems to have been abandoned by the third millennium BC, whereas the occupation of the Middle Wadi Howar continued to the second millennium BC. At the same time, an increasing regionalization of the archaeological finds can be observed. The Dotted Wavy-Line pottery is part of the Early Khartoum horizon, spreading in the southern Sahara from the Nile Valley to the Atlantic. The Leiterband complex of the fourth and third millennia BC still shows connections with the Nile Valley, and later with Mali, whereas the pottery of the later occupation phases seems to indicate a more northern or local orientation.

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Recent Research Into the Stone Age of Northeastern Africa
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Maria C. Gatto

The most ancient evidence of the "A-Groups" Culture in Lower Nubia

Introduction

Nordström, in his exhaustive 1972 work on the so-called "A-Group" Culture of Lower Nubia, devides it into three main phases : Early, Classic and Terminal (Nordström 1972).

According to Nordström, the Early A-Group phase is represented by sites located between Kubbaniya, north of Aswan, and the Dakka-Sayala plain, at the mouth of Wadi el Allaqi. This phase is contemporaneous with Kaiser's Egyptian Nag. Ic-IId and can be divided in two sub-phases. Finds related to the initial part of the Early A-Group can be found at Kubbaniya, Cemetery South, and at Khor Bahan, Cemetery 17. The collections belonging to these sites are dominated by Egyptian materials, and for scholars like Junker, Smith and Nordström himself, it could be possible that these are remains of an Amratian colonization in Lower Nubia, even if an indigenous origin of the A-Group seems likely. During the later stage of that phase, contemporary with Nag. IIb-d, the A-Group Culture expands till the Dakka-Sayala plain, and evidence of it can be found in many sites such as Cemeteries 76-79 at Gerf Hussein, 99-102-103 at Dakka, 136-148 at Sayala and at the storage pits at Khor Daud. On the other hand there is another cultural group in the Wadi Halfa reach, the Terminal Abkan, which seems to be somewhat different from the A-Group, even if contemporary with it.

In the new chronology presented by Williams in 1986 (Williams 1986), the Early A-Group phase is dated from Nag. Ib to Nag. IIc and is divided into two stages: stage IA, with Khor Bahan as a type site, when materials in Nubia were indistinguishable from those of Nagada I, and stage IB, with Dakka as a type site, during which the A-Group pottery first acquired a distinct character. These two stages are respectively dated Nag. Ib-IIa and Nag. IIa-c.

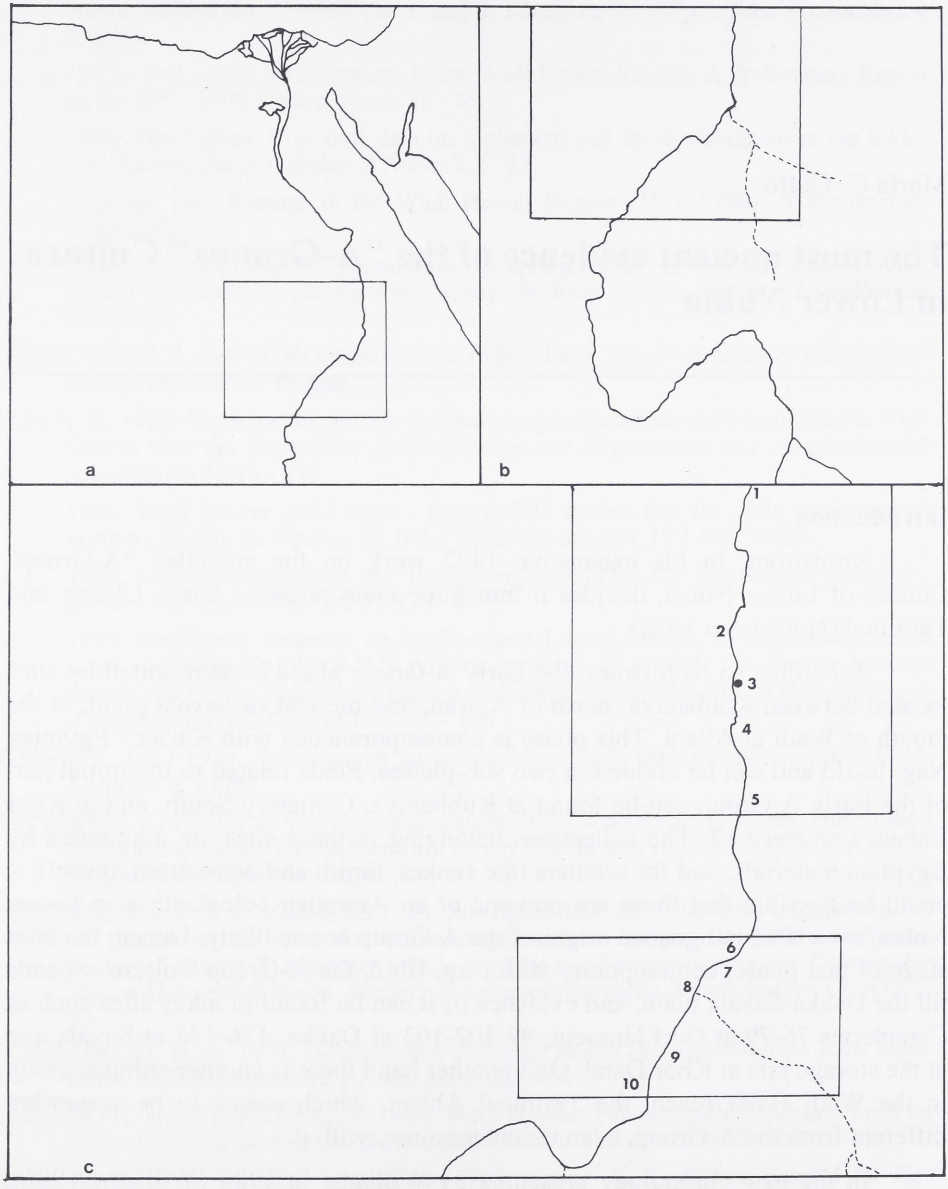


Fig. 1

a: Location of Lower Nubia in NE Africa; b: Location of Lower Nubia in Northern Sudan; c: Early "A-Groups" sites mentione in the text: **1** Gebel el Silsila **2** Kubbaniya **3** Aswan-Elephantine **4** Khor Bahan **5** Matardul **6** Gerf Hussein **7** Khor Daud **8** Dakka **9** Sayala **10** Mediq.

In 1991, Smith (1991) made a new study on the development of the A-Group Culture in Northern Lower Nubia. According to him, there was probably an indigenous group living in that region during the Nagada I phase. During Nag. Ic-IIa, trade relations began between Egypt and Nubia, extending as far as Dakka. This is evident through Egyptian artifacts in Nubian graves and by Nubian incised pottery (Petrie's class N) in Egyptian contexts. Many of the so-called B-Group's tombs could belong to these earliest phases. During Nag. IIb-c, trade expanded up to Sayala and, in all probability, this means that the Early A-Group was exploiting the Eastern Desert, looking for gold. In the Nag. IId-IIIa period, the Early A-Group came in contact with the Abkan peoples of the Cataract Region. This transformed and unified both cultures which then developed into the Classic A-Group.

We can summarize the available data as follows :

- perhaps an indigenous group lived in Nubia, between Kubbaniya and Dakka during Nag. I;
- beginning from Nag. Ic this Nubian group started making contact with the Nagadians of Upper Egypt and evidence of that contact can be found at first in the area of the First Cataract;
- from Nag. IIa, contacts between Nagadians and Nubians reached the Dakka plain;
- during Nag. IIb trade expanded till Sayala;
- in the Nag. IId period the Early A-Group started making contact with the Abkans of the Second Cataract area and developed into the Classic A-Group.

However, in my opinion, some of these points could be changed. In fact, if we analyse the evidence coming from the Early A-Group sites more deeply, we find that there are many differences between sites of the First Cataract and those of the Dakka-Sayala plain, and that the evidence of contacts between the area of Dakka and Upper Egypt are as old as those from the First Cataract. To better explain my point of view, I have selected Cemetery 17 at Khor Bahan and Cemetery 103 at Dakka as case studies but I would like to deal with a general presentation of the Early A-Group site distribution first.

Because of the great differences between the material found in the main areas of Lower Nubia, in this essay I will use the term "A-Groups" instead of "A-Group".

Early "A-Groups" site distribution in Northern Lower Nubia

The upper part of Lower Nubia (Fig. 1) can be divided into two areas: the area of the First Cataract, approximately from Gebel es Silsila to Metardul and the area of Dakka-Sayala from Gerf Hussein to Mediq at the mouth of Wadi el Allaqi, one of the main routes to the Eastern Desert (Gatto 1997; in press).

In the First Cataract area, 15 sites related to the "A-Groups" were recorded. Of these only Kubbaniya South and Khor Bahan have graves of the Early "A-Groups" phase, both Stage 1 and 2 (dated respectively to Nag. Ic-IIa and Nag. IIb-c), while another 8 sites probably contained graves belonging more to the second than to the first stage. Kubbaniya South and Khor Bahan are located very close to Elephantine Island where, recently, a Naqada settlement, dated to the Nag. II-III period, was found (Seidlmayer 1996). At all of the sites, most of the material belongs to the Naqadian tradition, and, as many scholars have already noted, it is very hard to distinguish some of these sites from those found in Upper Egypt (Nordström 1972). As a whole the sites belonging to the First Cataract region have yielded materials of the Naqada tradition.

Thirty-four sites classified as "A-Groups" were found in the Dakka-Sayala area, of these only 18 have graves of the Classic and Terminal "A-Groups" phases. The remaining sites include 4 which can be certainly (and 5 probably) attributed to both the early phase and 7 featuring graves of Stage 2. Moreover, another large site at Dakka - still unpublished - is probably to be dated from the Early to the Terminal "A-Groups" phases. The 4 Early phase sites are located in the central upper part of the area, around Dakka and include cemeteries 99-102-103 at Dakka and all of the numerous storage pits clustered around Khor Daud (Piotrovsky 1967). Half of the archaeological material collected from the Dakka-Sayala plain comes from Upper Egypt, the rest is of local manufacture. However, distribution of the percentage of the two groups of materials differs from site to site.

Cemetery 17 at Khor Bahan

Cemetery 17, excavated by Reisner in 1909 (Reisner 1910) is situated along the northern alluvial terrace at Khor Bahan. Out of the numerous graves of the cemetery 35 are described by Reisner as "Egyptian Early and Middle Predynastic", 29 human graves and 15 animal burials as B-Group. As is well known following Smith, we should attributed all the B-Group's tombs to the Early "A-Groups" phase. Consequently I have considered the entire repertoir as belonging to the Early phase. Therefore we are dealing with 64 human graves and 15 animal burials:

- 34 human graves with an oval or circular shape,
- 11 human graves feature a rectangular shape with rounded corners,
- 18 human graves have been damaged,
- 10 animal burials are commonly oval or circular,
- 4 animal burials are damaged,
- 1 animal burial has a rectangular shape with rounded corners.

The largest human grave is No. 50 (220 /200 cm), the smallest is No. 94 (65/40

cm). The graves are usually lined with mud or matting, and are oriented according to the flow of the Nile. Fifty-one bodies were found: 23 males, 10 females, 4 children and 14 unidentified adults of which only 3 were double graves (2x men, 1x a woman). The most common position of the body is contracted, lying on the left side with the head to the south and the face to the west. Associated with the burials are leather, mats, wooden chests, wooden beds and ochre.

The offerings for the dead are usually personal adorments, such as beads of various shapes and materials (including lapis-lazuli from tomb 15 and silver from tomb 66). Pendants, amulets, bracelets and remains of a fringed leather decorated with small mud or wooden beads, probably from a kind of kilt, associated with a male grave were also found . Moreover the following objects occured:

- stone vessels (11 from tomb 83),
- mortars, grinders and pebbles,
- objects made of bone and ivory,
- copper tools,
- gold objects (from tomb 15),
- lithic artifacts (very numerous in tomb 50),
- 14 mace heads associated with male graves,
- bread models and cakes,
- 23 Egyptian and 8 Nubian palettes,
- minerals and organic remains,
- a seal from tomb 15 (a female burial),
- seeds, shells and sacrified animals.

Of the 15 animal burials, 13 contained dogs (many are multiple burials); one a sheep or goat and 2 contained oxes.

Obviously, the pottery is the most common feature. In my study I referred to the sample previously indicated by Reisner (1910). Of the whole collection (238 vessels) I have considered only the 205 pieces which might be classified as either of Egyptian or Nubian manufacture. After processing the data 85% of products had to be considered Egyptian and only 15% Nubian (Fig. 2). In my study, the Egyptian vessels were grouped in ware classes, following Petrie's typology with only few differences (the term H-Hard Pink was used instead L-Late), and the Nubian pottery was classified according to a new typology which I developed and elaborated and which is primarily based on the treatment of the surfaces.

This new, and very simple, typology was necessary because both Nordström's "Type Groups" and Williams's "Form Groups" (the most comprehensive works on the "A-Groups" pottery) were not based on all the ceramic material but mainly on the Classic and Terminal one. Apart from the terms used in the original

publications, the Early "A-Groups" pottery was briefly classified only by Smith (1991). The following main classes are now tentatively suggested:

BM – Black-Mouthed, Red-Brown Polished, Rippled Ware (Junker: *rotpolierte schwarzgesaümte Ware*; Reisner: EP I, MP I, LP I, LP II, ED I; Firth: RPBM; Emery, Kirwan: XIII, XIV, XVI, XVII, XIX; Nordström: A IX, A X; Williams: II, VI; Smith: RPBM).

BL – Black Ware (Junker: *schwarzpolierte Ware*; Reisner: EP I, MP I, ED I; Firth: RPBM, Black-Brown Polished; Nordström: A V, A VI, A VII; Smith: Black Polished Ware).

RP – Red-Brown Polished Rippled Ware (Reisner: EB II; Firth: Thin Smooth Red or Brown / Red Polished Ware; Emery, Kirwan: XV,XXI; Nordström: A III, AIV; Williams II: VI).

SC – Smooth Coarse Red-Brown Ware (Junker: *Ersatz für dunkelrot polierte Ware*; Reisner: MP IV, LP VII, ED II; Firth: SCRW; Emery, Kirwan: XVIII, XXI; Nordström: A I; Williams: XI; Smith: SCRW).

IN – Incised-Impressed Black-Brown-Red Ware (examples of this ware can be found in many classes of the previous typologies).

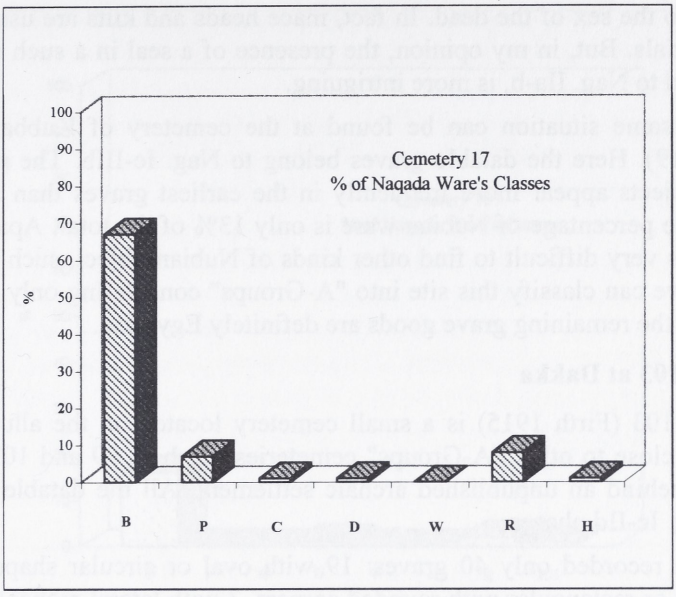
PA – Interior and Exterior Painted Ware (Firth: Thin Red Painted and Polished with Basket patterns; Emery, Kirwan: XII; Nordström: A II, A VIII; Williams: I, V; Smith: Thin Red Ware with Red-Painted patterns; Griffith: Variegated Haematitic Ware).

SF – Simple Fine Ware (Williams VI).

Figure 2 shows that Black-Topped vessels average 67% of the total, while the other six Egyptian classes are much less represented, sometimes with only one item of the class. Concerning the Nubian products, only 4 classes are represented at Cemetery 17, all related to utility ware, apart from 3 vessels decorated with incisions.

Finally, as regards the distribution of pottery into Stages 1 and 2, according to the processed material we can say that during the first stage the Egyptian wares total 82%, the Nubian wares only 18%; however during the second stage most of the pottery (93%) is Egyptian and just a small percentage (7%) is Nubian (Fig. 2).

Regarding the social complexity, it seems that in Cemetery 17 there is no clear social differentiation between the burials. Only 4 seem to be more interesting. These include grave 50, possibly a male burial, containing 41 vessels and many other grave goods; also grave 78, another male burial because of the presence of a kilt. Both are dated to the first stage. Also of interest are grave 15, a female burial with a mud seal, gold and lapis-lazuli and grave 66, a double female burial, both dated to the second stage. Some kind of differentiation seems to



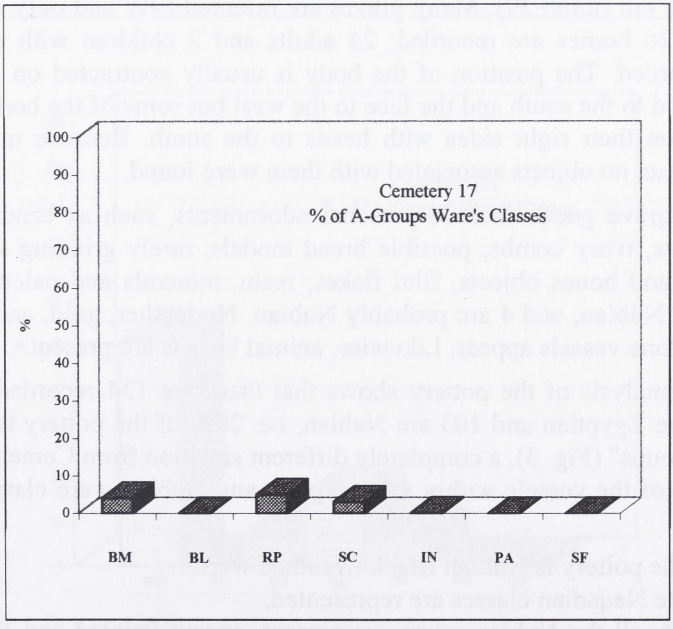


Fig. 2. Percentage of Naqada and "A-Groups" wares in cemetery 17

be related to the sex of the dead. In fact, mace heads and kilts are usually linked to male burials. But, in my opinion, the presence of a seal in a such rich female burial, dated to Nag. IIa-b, is more intriguing.

The same situation can be found at the cemetery of Kubbaniya South (Junker 1919). Here the datable graves belong to Nag. Ic-IIIb. The rare Nubian tradition objects appear more frequently in the earliest graves than in the later ones and the percentage of Nubian ware is only 13% of the total. Apart from the pottery, it is very difficult to find other kinds of Nubian object, such as palettes. Therefore we can classify this site into "A-Groups" considering only the Nubian ware, since the remaining grave goods are definitely Egyptian.

Cemetery 103 at Dakka

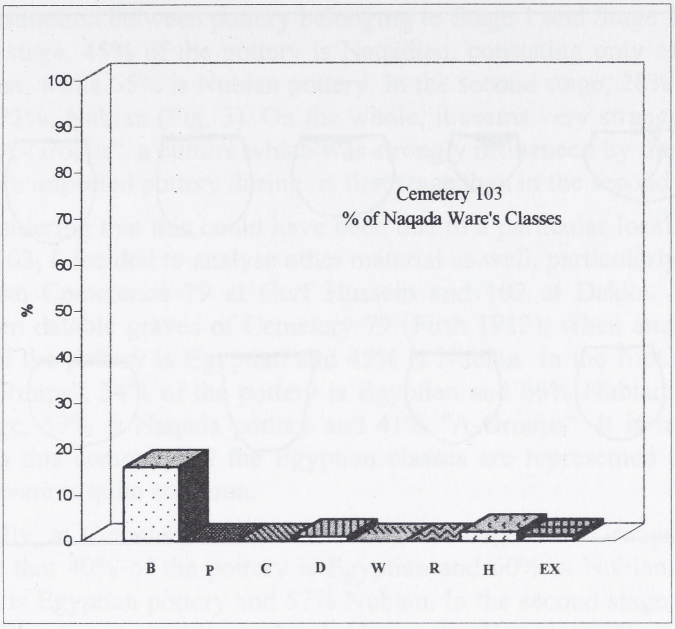
Site 103 (Firth 1915) is a small cemetery located on the alluvial Dakka plain, very close to other "A-Groups" cemeteries (such as 99 and 102), and immediately behind an unpublished archaic settlement. All the datable graves belong to Nag. Ic-IId phases.

Firth recorded only 40 graves: 19 with oval or circular shapes, 17 with oval shapes or rectangular with rounded corners, 3 with lateral niches, and 1 with an undefinite shape. The dimensions of the graves vary from 155/110 cm (tomb 26) to 50/35 cm (tomb 39). Many graves are oriented E/W and only one is lined with mud. 26 bodies are recorded: 24 adults and 2 children with no multiple burials recorded. The position of the body is usually contracted on its left side with the head to the south and the face to the west but some of the bodies are also contracted on their right sides with heads to the south. Because many burials were not intact no objects associated with them were found.

The grave goods include personal adornments, such as beads, bracelets and pendents, ivory combs, possible bread models, rarely grinding stones, pebbles, ivory and bones objects, flint flakes, resin, minerals and palettes. Six are Egyptian, 5 Nubian, and 4 are probably Nubian. No leather, gold, animals, mace heads nor stone vessels appear. Likewise, animal burials are present.

The analysis of the pottery shows that there are 134 recorded vessels of which 26 are Egyptian and 103 are Nubian, i.e. 20% of the pottery is Naqadian, 80% "A-Groups" (Fig. 3), a completely different situation from Cemetery 17. The distribution of the vessels within the Egyptian and Nubian ware classes (Fig. 3) shows that:

1. 51% of the pottery is Nubian Black-Mouthed ware,
2. Not all the Naqadian classes are represented,
3. Practically all the Nubian wares are present, except Painted and Simple Fine wares, which are typical of the Classic and Terminal "A-Groups" phases.



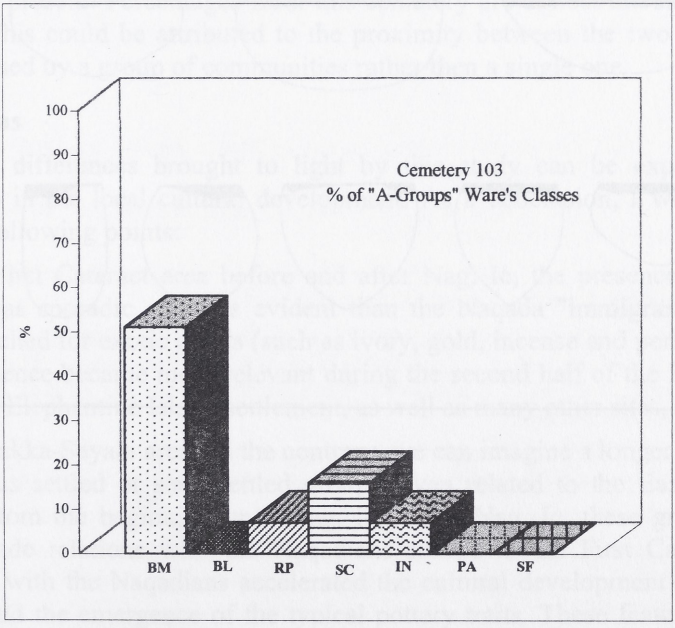


Fig. 3. Percentage of Naqada and "A-Groups" wares in cemetery 103.

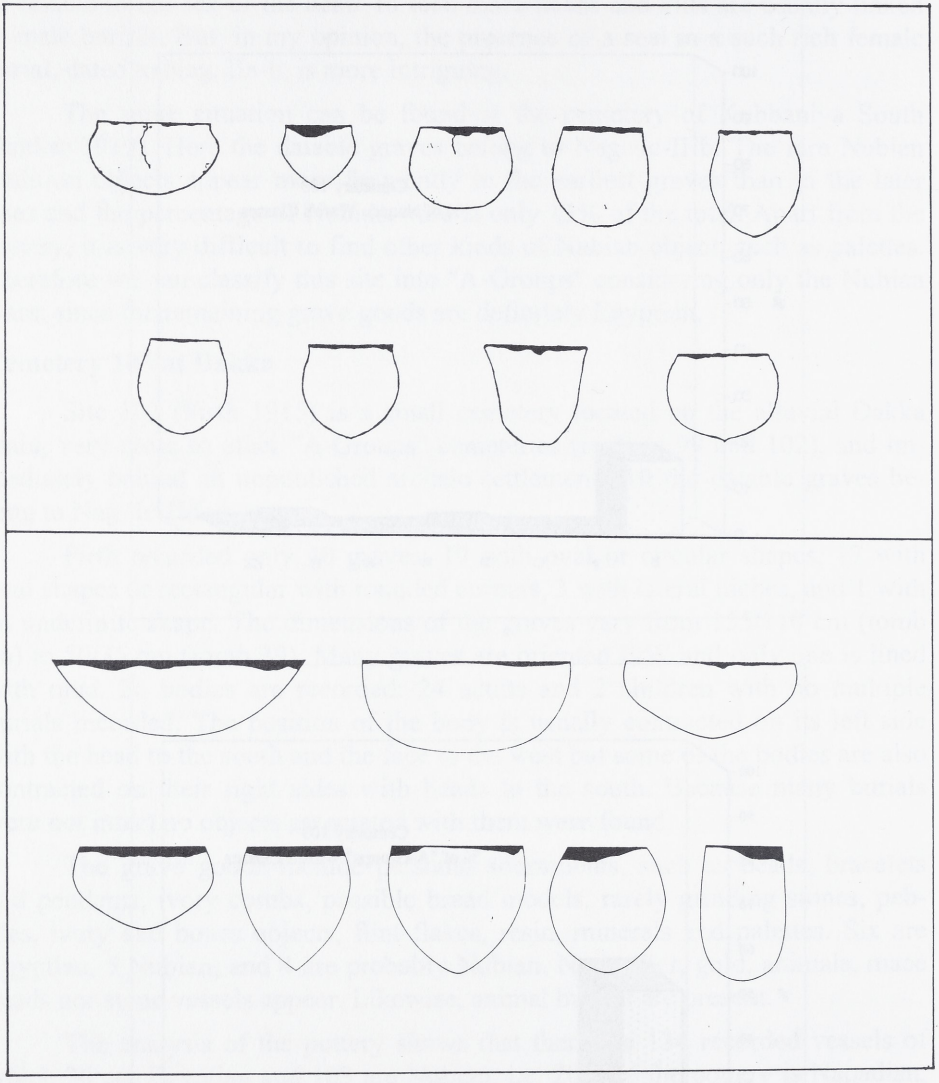


Fig. 4. Examples of Early, Classical and Terminal "A-Groups" BM pottery.

A distinction between pottery belonging to Stage 1 and Stage 2 shows that in the first stage, 45% of the pottery is Naqadian, consisting only of the Black-Topped class, while 55% is Nubian pottery. In the second stage, 28% is Egyptian ware, and 72%, Nubian (Fig. 3). On the whole, it seems very strange to me that the Early "A-Groups", a culture which was strongly influenced by the Nagadians, yielded more imported pottery during its first stage than in the second one.

Considering that this could have been due to a particular local situation in Cemetery 103, I decided to analyse other material as well, particularly the pottery coming from Cemeteries 79 at Gerf Hussein and 102 at Dakka. The vessels coming from datable graves of Cemetery 79 (Firth 1912), when analysed, show that 55% of the pottery is Egyptian and 45% is Nubian. In the first stage of the Early "A-Groups", 34% of the pottery is Egyptian and 66% Nubian. During the second stage, 59% is Naqada pottery and 41% "A-Groups". It is interesting to note that in this cemetery all the Egyptian classes are represented and that the Decorated ware is quite common.

Finally, at Cemetery 102 (Firth 1915), the largest "A-Groups" cemetery, we can see that 40% of the pottery is Egyptian and 60% is Nubian. In the first stage, 43% is Egyptian pottery and 57% Nubian. In the second stage, 39% of the wares are Egyptian and 61% are local. Here as at Cemetery 79, more Nagada classes are present. Percentages from this cemetery are almost the same as from site 103. This could be attributed to the proximity between the two cemeteries, probably used by a group of communities rather then a single one.

Conclusions

The differences brought to light by this study can be explained with differences in the local cultural development. As a conclusion, I would like to make the following points:

1. In the First Cataract area before and after Nag. Ic, the presence of Nubian people was sporadic and less evident than the Naqada "immigrant" presence who searched for exotic goods (such as ivory, gold, incense and perhaps cattle). This presence became more relevant during the second half of the Early phase, when the Elephantine Island settlement, as well as many other sites, developed.

2. In the Dakka-Sayala area, on the contrary, we can imagine a longer presence of indigenous settled or semi-settled groups, even related to the Eastern Desert region, from the beginning until Nag. Ic,. After Nag. Ic, these groups established trade relations with the Naqadians settled in the First Cataract area. Contacts with the Naqadians accelerated the cultural development of the local groups and the emergence of the typical pottery traits. These features include: Black-Mouthed Ware (with shapes different from those of Classic and Terminal phases), Incised-Impressed Ware, Impressed and Polished Ware, Polished Ware

and Coarse Ware (Fig. 4). Moreover there are palettes and the similar typology of graves. During the second stage, the increase of commercial relations and expansion of trade circulation brought about contacts with the Second Cataract. In fact, the material related to the Terminal Abkan phase shows a greater influence from the north. Based on the situation illustrated above, I would like to indicate the Dakka-Sayala area as the area of origin of the cultural "A-Groups" development.

3. Regarding the absolute chronology, unfortunately we have no C^{14} dates for the Early "A-Groups" phase. Therefore the only possibility we have for dating is to correlate the Nubian data with the Naqadian data. Kaiser's Nagada Ic-IIc can be dated (based on C^{14} datings pubblished by Hassan (Hassan 1985, 1988) from about 3750 to 3400 B.C. Recently, Hendrickx (1996) has proposed a new chronology for the Naqadian Culture, according to which the Early "A-Groups" phase can be dated between 3800 and 3500 B.C. Therefore, following Kaiser the two stages of the phases which we have highlighted in this paper should be dated from 3750 to 3600 B.C. (Stage I), and from 3600 to 3400 B.C. (Stage II). Instead, following Hendrickx, the first stage could be dated between 3800 and 3700 B.C., and the second stage between 3700 and 3500 B.C.

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Recent Research Into the Stone Age of Northeastern Africa
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Francis Geus

Geomorphology and prehistory of Sai Island (Nubia): report on a current research project

Sai Island is situated between the second and the third cataract of the Nile, south of the Batn el-Hagar, the «belly of stones», a vast rocky area dividing the valley of the Middle Nile in two parts, now flooded in the southernmost part by Lake Nubia. It is a large island, extending about 12 km from north to south and 5,5 km from east to west, the centre is gravely and barren but the river banks include extensive patches of Nile alluvium suitable for cultivation where the present villages are located (Fig. 1).

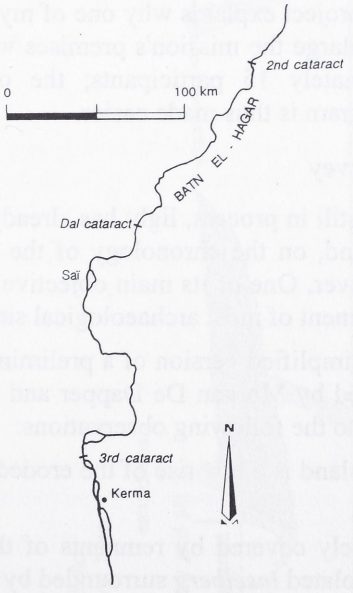


Fig. 1. Location of Sai Island.

Past archaeological work, carried out in the fifties and seventies by Jean Vercoutter (1958, 1972, 1985), was restricted by the license to specific areas. It involved mainly sites of the second millennium BC, including a Pharaonic walled town, two Pharaonic burial sites and an extensive Kerma cemetery, and thus it focused on artefactual and textual remains.

In 1993, when I was granted a license to excavate and survey the entire island, I started a new project which includes archaeological research of a global approach to the site (Geus 1994, 1995a, 1995b 1996). This seemed particularly suited to an island, as it is a closed and well defined unit and because its location south of Lake Nubia, hence close to an area that was explored in detail in the early sixties but without any possibility of further field control.

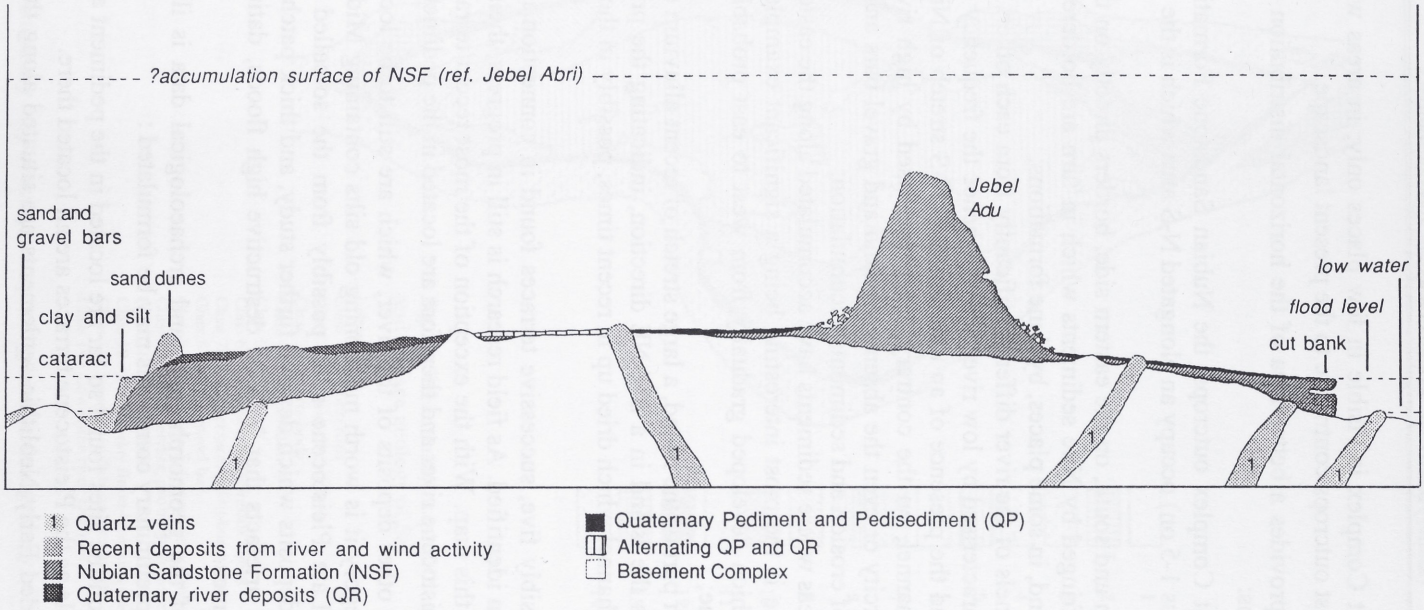
This is the reason why the new project includes a geomorphologic survey and research on the Palaeolithic and Neolithic occupation, organised in collaboration with the Departments of Geography and Geology of Ghent University (Paul De Paepe, Morgan De Dapper and Rudi Goossens), the Laboratory for Prehistory of the Catholic University in Leuven (Philip Van Peer and Frank Herman) and with the *Centre de Recherches Géophysiques* of the French *CNRS* in Garchy (Albert Hesse). This work was undertaken as a complement to the archaeological survey and the excavations of later sites which, for their part, were organised in collaboration with the Laboratory for Physical Anthropology of Bordeaux I University (Bruno Maureille) since Sai includes numerous burial sites. The extend of this project explains why one of my priorities during the former campaigns was to enlarge the mission's premises which can now accommodate teams of approximately 15 participants; the organisation of a multidisciplinary research program is thus made easier.

The geomorphologic survey

Although work is still in process, light has already been shed on the origin and evolution of the island, on the chronology of the Nile terraces and on the recent behaviour of the river. One of its main objective is to understand the reason for the location/placement of most archaeological sites.

Figure 2 shows a simplified version of a preliminary geomorphologic section of the island designed by Morgan De Dapper and Rudi Goossens of Ghent University. It lends itself to the following observations:

1. The basal core of the island is a low rise of the eroded surface of the Basement Complex in this area;
2. The basal core is largely covered by remnants of the Nubian Sandstone, of which Jebel Adu, an isolated *inselberg* surrounded by a pediment, is the largest and most visible outlier on the island;



2. Preliminary section of Sai Island (simplified version).

3. The Basement Complex is visible in few places only, in areas where quartz veins and schist outcrops contribute to the present landscape.

Figure 3 provides a better idea of the horizontal distribution of the geological formations:

1. The Basement Complex outcrops, the Nubian Sandstone Formation and the pediment (class 1-5 on) occupy an elongated N-S area which is the visible core of the island;
2. The area north and south, on the eastern side, borders directly on the river but elsewhere is fringed by Nile sediments which in turn are bordered by recent alluvial clay and, in some places, by dune formations;
3. The two channels of the river differ significantly from each other: the western channel is characterised by low river activity, hence the frequency of sand and gravel bars and the presence of an uninterrupted N-S stretch of Nile deposits; the eastern channel, on the contrary, is characterised by high river activity, hence the scarcity or even the absence of sand and gravel bars and the alteration of areas of erosion and sediments accumulation;
4. Among the areas where sediments have accumulated along the eastern channel, the central one is the most interesting being a significant example of a point bar system which developed gradually from west to east probably since the Early Holocene;
5. In the northern part of the island, a large stretch of recent alluvium (class 10 on fig. 3) crosses the island in a SW-NE direction, indicating the presence of a former river channel which dried up in recent times, possibly in the 1st millennium BC.

Four, possibly five, successive terraces found in connection in a few localities have been identified. As field research is still in progress, their location is not indicated on this map. With the exception of the most recent terrace, they are related to the Pleistocene river and therefore are located in the pediment area.

There are other deposits of the river, which are still to be located on the map. In this category it is worth mentioning old silts containing Middle Palaeolithic artefacts, Late Pleistocene silts, possibly from the so-called Wild Nile, Early Holocene deposits which deserve further study, and thick patches of sandy silts mixed with artefacts that indicate destructive high floods, dating possibly from medieval times.

A comparison of the geomorphologic and archaeological data is illustrated in Figure 4. A few preliminary comments may be formulated :

1. All the Palaeolithic sites found so far are located in the pediment area. This is understandable as the Pleistocene terraces are all located there.
2. All the recorded Early Neolithic settlements are situated along the pediment

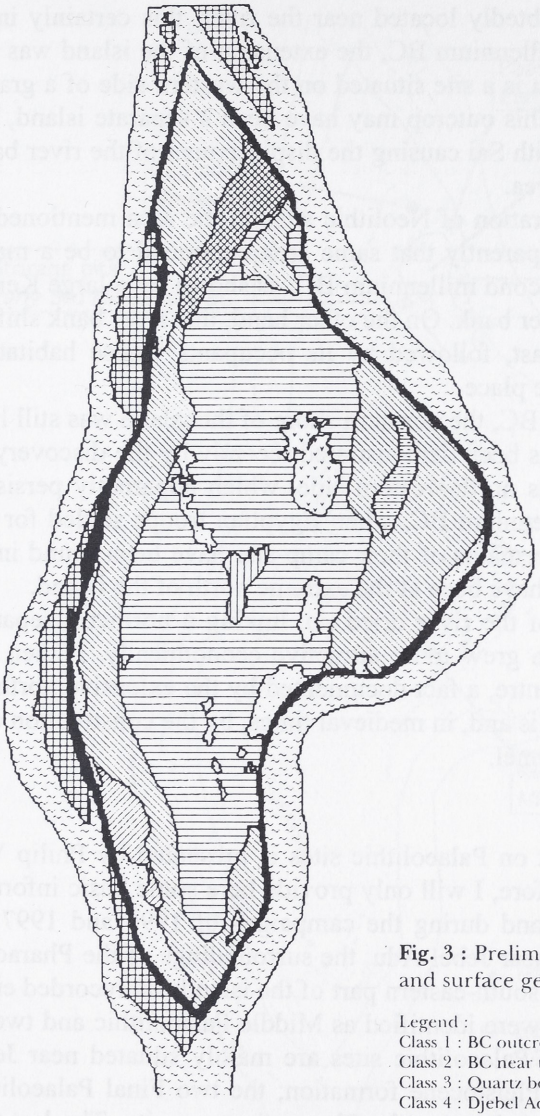


Fig. 3 : Preliminary map of the geomorphology and surface geology of Sai

Legend :
Class 1 : BC outcrops
Class 2 : BC near the surface
Class 3 : Quartz body
Class 4 : Djebel Adou
Class 5 : Pediment
Class 6 : Superficial calcareous banks
Class 7 : River terrace, point-bar system
Class 8 : Major gravel bar
Class 9 : idem Class 7, but under cultivation
Class 10 : River terrace probably younger than Class 7
Class 11 : River dunes
Class 12 : Present-day flood-level silts under cultivation
Class 13 : Low-water bars and cataracts
Class 14 : Low-water river channel

3. Preliminary map of the geomorphology and surface geology of Saï Island.

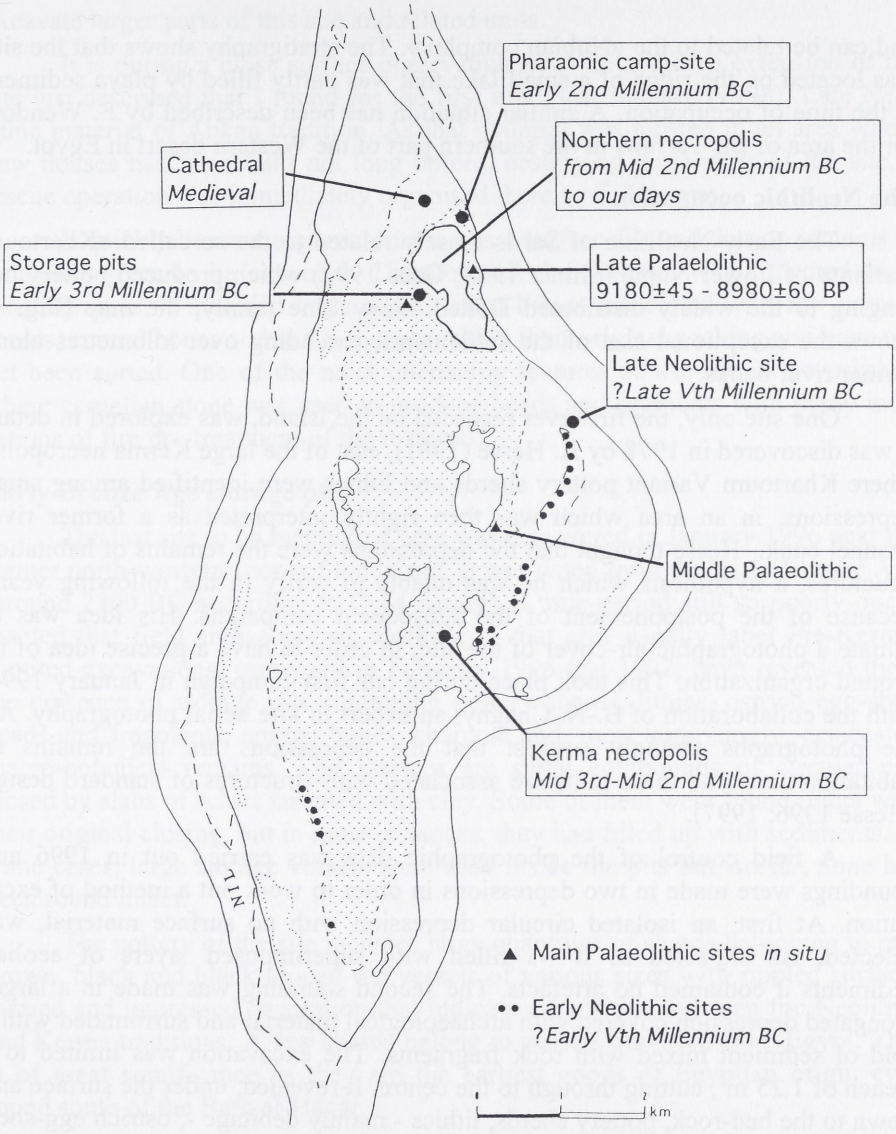
outline. As they were undoubtedly located near the river, this certainly indicates that, in the early 5th millennium BC, the extension of the island was the pediment. The only exception is a site situated on the western side of a gravel outcrop, east of Jebel Adu. This outcrop may have been a separate island, but it may also have linked up with Sai causing the displacement of the river bank east of the pediment in that area.

3. The map indicates a concentration of Neolithic sites in the area mentioned in the preceding paragraph. Apparently that same area continued to be a major population centre until the second millennium BC, as shown by a large Kerma necropolis west of the old river bank. On the other hand, that river bank shifted progressively towards the east, followed by its occupants whose habitation debris were found all over the place.
4. In the early third millennium BC, the northern shore of the island was still limited to the pediment. This has been demonstrated recently by the discovery of pre-Kerma storage pits on its north-western side, which apparently persisted during the early second millennium BC, when Egyptian troops settled for the first time on the island: the remains of their camp-site have been found in an area which must at that time have been at the extreme north of the island.
5. When the northern branch of the river dried up, linking a northern, separate island to Saï, the whole area grew more attractive economically. It then became the main population centre, a fact documented by the extensive northern burial ground of the necropolis and, in medieval times, by the construction of a cathedral in the old river channel.

The Palaeolithic remains

The research carried out on Palaeolithic sites is presented by Philip Van Peer in a separate paper. Therefore, I will only provide here some basic information about his work on the island during the campaigns of 1996 and 1997. In 1996, he surveyed large areas near Jebel Adu, the surroundings of the Pharaonic town site and some areas in the south-eastern part of the island. He recorded eight Palaeolithic sites, six of which were identified as Middle Palaeolithic and two as Final Palaeolithic. The Middle Palaeolithic sites are mainly situated near Jebel Adu, on terrace T4, a Middle Pleistocene formation; the two Final Palaeolithic sites are found in black silt deposits near the Pharaonic town site. The last two have been C-14 dated to 9180 ± 45 BP and 8980 ± 60 BP, a time-period poorly documented in the Nile valley (Connor and Marks 1986).

One of the Middle Palaeolithic site found during the previous season in 1997, was selected for excavation. A total surface of 10 m^2 was excavated in an area where the remains of a hearth containing charcoal and burnt stones was partly cleared. The lithic industry, using almost exclusively quartz, is characterised by a high Levallois index, includes foliates, Levallois points and scrapers,



4. Distribution of the main archaeological sites on Sai Island.

and can be related to the «Nubian complex». The stratigraphy shows that the site was located on the ridge of a small lake that was partly filled by playa sediment at the time of occupation. A similar situation has been described by F. Wendorf for the area of Bir Tarfawi in the southern part of the Western desert in Egypt.

The Neolithic occupation

The Early Neolithic of Sai is closely related to the so-called «Khartoum Variant» of Lower Nubia (Shiner 1968; Geus 1992) which produced pottery belonging to the widely distributed Dotted Wavy Line family; the map (Fig. 4) shows the exceptional size of the settlements, extending over kilometres along former river banks.

One site only, the first ever recorded on the island, was explored in detail. It was discovered in 1978 by A. Hesse (1981), east of the large Kerma necropolis, where Khartoum Variant pottery sherds and lithics were identified among small depressions, in an area which was then rightly interpreted as a former river channel bank. Hesse thought that the depressions were the remains of habitation structures, a hypothesis which he was unable to verify in the following years, because of the postponement of the subsequent campaigns. His idea was to initiate a photographic air-cover of the site, in order to have a precise idea of its ground organization. This took place during our first campaign in January 1994, with the collaboration of B.-N. Chagny, an expert in kite aerial photography. All the photographs strongly suggest that the depressions are the remains of habitation units and these units are associated with structures of standard design (Hesse 1996; 1997).

A field control of the photographic data was carried out in 1996 and soundings were made in two depressions in order to work out a method of excavation. At first, an isolated circular depression with no surface material, was selected. As expected as it ws filled with superimposed layers of aeolian sediments it contained no artefacts. The second sounding was made in a larger elongated depression covered with archaeological material and surrounded with a fold of sediment mixed with rock fragments. The excavation was limited to a trench of 1.25 m^2, cutting through to the centre. It revealed, under the surface and down to the bed-rock, pottery sherds, lithics - mainly debitage -, ostrich egg-shell beads and fragments, fish bones, fresh water molluscs and small pieces of burned clay. Unfortunately, possibly because of the limited extension of the test, the identification of the depression as an habitation structure could not be confirmed. Thus, the question of the nature of the remains is still opened to debate. A. Hesse, who is currently working on the material from his survey and soundings, plans new operations for a coming season and hopefully we will soon be able to

excavate larger parts of this site and related units.

It is during a close surface observation near the southern extension of the site just described that I found for the first time, last January (1998), Late Neolithic material of Abkan tradition. As that material was located in an area where new houses had been built not long before, destroying large parts of the site, a rescue operation was immediately organised there by F. Herman.

It quickly became apparent that it was a surface site and that no remains of structures were to be expected. Therefore all the material was collected from selected areas. It included large quantities of lithics associated with few pottery sherds, animal bones and shells that are still in their original packing and have not yet been sorted. One of the most interesting features of the site is a workshop where carnelian stone was used to produce beads and segments with many indications of fire pre-treatment of the material.

Early Bronze Age storage pits

The last site to be mentioned here was discovered in January 1996 near the former north-western shore of the island. It was dated from the Early Bronze Age (around 2700 BC according to C-14 dating), a time-period still so poorly documented that field archaeologists working in that area usually label Pre-Kerma. Limited excavations, organised in February 1996 and 1997, have revealed there the presence of storage pits containing pottery sherds, lithics, ostrich egg-shell beads and fragments, animal bones, charcoal and, most surprisingly, desiccated macro-botanical remains. The features are small compounds of circular pits closed by slabs of schist fastened with clay. Some of them were found intact with their original closing, but in most instances, they had filled up with sediments. In some cases, large storage vessels were used inside the pits but, so far, none has been found intact.

The pottery of the site includes large quantities of sherds belonging to red, brown, black and black-topped red vessels of various sizes with rippled surface, incised and impressed decoration that indicate a transition between the Neolithic and Kerma traditions. A few sherds belong to vessels imported from Egypt. This is of great significance as they are the earliest goods of Egyptian origin ever found south of the Batn el-Hagar.

The vegetal remains, for their part, include leaves, stalks, thorns and seeds looking so fresh that we first thought that they were intrusive. Thanks to the collaboration of Katharina Neuman and Barbara Zach (*Seminar für Vor- und Frühgeschichte, Archäologie u. Archäobotanik Afrikas, Frankfurt*) all the samples collected so far, including charred material, are in the process of identification. First results indicate the presence of emmer wheat (*Triticum dicoccon*), barley (*Hordeum vulgare*), Ziziphus and acacia.

This quick survey of our current research at Saï shows that the island may be considered a major locality for the study of Nubian Prehistory and Environment in their continuity. A long-term multidisciplinary project is in the works; it has already led to the elaboration of a Sai Geo-archaeological Information System (SAIGAIS) which includes all available archaeological, geographical and topographic data (Goossens et al. 1997). In near term future, new surveys and excavations will be carried out which, I hope, will inspire further research for our next meeting.

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Recent Research Into the Stone Age of Northeastern Africa
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Derek A. Welsby

South from Kadruka: the Neolithic in the Northern Dongola Reach, Sudan

Between January 1993 and February 1996 the Sudan Archaeological Research Society (SARS) undertook four seasons of survey in the Northern Dongola Reach of Sudan on the right bank of the Nile. The area chosen for study lay between those previously and currently being investigated by Jacques Reinold of the French Section of the National Corporation for Antiquities and Museums in Khartoum and the Royal Ontario Museum. This left an 80 km stretch of the river and the survey extended from the river bank to the edge of the plateau, a maximum of 18 km to the east. Prior to the commencement of the study only one site had been recorded in detail, at Kawa, and a few others had been very briefly mentioned. The survey located, and in many cases planned and sampled, over 450 sites, the greatest proportion of which could be dated to the Neolithic and Kerma periods.

Palaeohydrology

Jacques Reinold, working immediately to the north in the area around Kadruka since 1986, had already, by observing the linear distribution of Neolithic settlement sites (1987:44), suggested that they lay along the banks of a branch of the Nile running in the bed of the Wadi el Khowi which lies close to the plateau. Satellite imagery of the area from the Third Cataract to Eimani a little south of Kadruka indicated the presence of several palaeochannels (Marcolongo and Surian 1993). The SARS project has provided additional information on these palaeochannels which are in certain areas highly visible. Their course is most clearly delineated in the Kerma period when their banks were lined with nucleated and often large settlements. In the Kerma period the distribution of sites shows that in the Nortern Dongola Reach the Nile flowed in a braided channel (Fig. 1). In the area under study there were three Nile main channels, one of

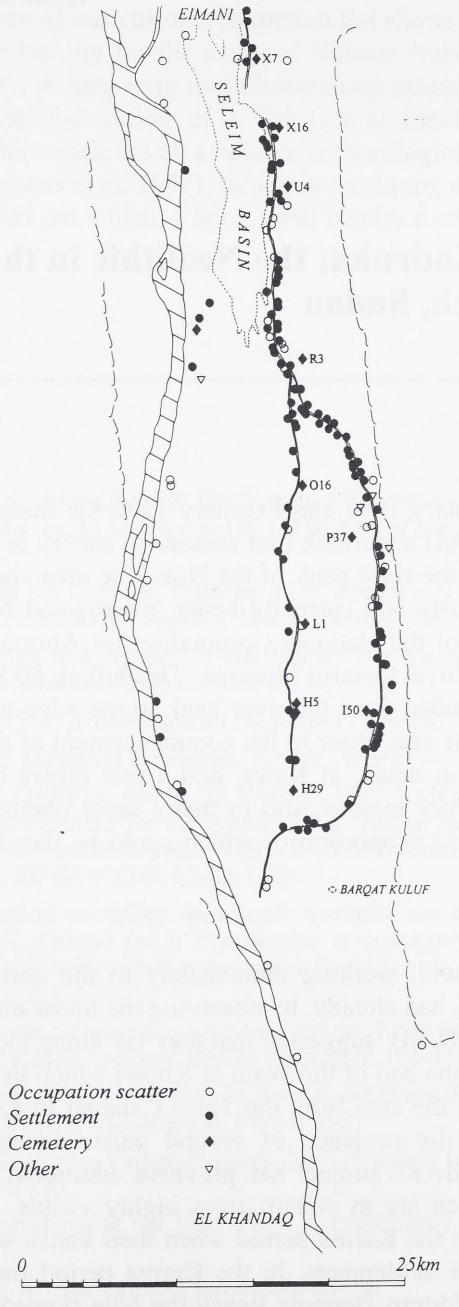

Fig. 1.
Sites on the east bank of the Nile in the Northern Dongola Reach during the Kerma period.

which is the present day river (the Dongola Nile). The point of evulsion was about 19 km north of el Khandag. After about 8 km the eastern channel further divides into two, one channel flowing due north (the Hawawiya Nile) the other (the Alfreda Nile) swinging well to the east close to the plateau edge before flowing north-west to rejoin the central channel 7 km east-south-east of Kawa. The combined eastern stream (the Seleim Nile) then flows north close to the edge of the Seleim basin, a southern extension of the Kerma basin and on into the Kadruka and Kerma regions.

Settlements/occupation scatters

The situation in the Neolithic period is more difficult to assess as the settlements appear to be much more dispersed and are extremely large. They are difficult to define archaeologically as the vast spreads of occupation material gradually fade away in some areas, but in many others their edges are masked by the extensive dune fields. Few areas are devoid of at least some artefacts which may be assumed to predate the Kerma period. However, there is a north-south belt of undulating gravel river terraces between the Hawawiya and Dongola Niles where occupation material was rare or non-existent. The occupation scatters were not recorded systematically except along the main east-west transects through the survey area at intervals of 5 minutes of latitude. Elsewhere only major concentrations were designated with a site code although these are seldom discrete sites. The occupation scatters consist of a mass of pebbles, many of which have been struck, as well as more readily recognisable lithics and polished stone tools such as axes. Evidence for lithic manufacture was noted on some sites where concentrations of cores and debitage were found. However, for many tasks the edge resulting from simply breaking one of the abundant quartzite pebbles will have been a suitable tool. Retouching may seldom have been necessary, it being as easy to discard a worn tool and fashion another from the readily available pebbles. Pottery was also common within some of the occupation scatters and a number of concentrations of sherds were found which appear to be from a small number of pots that were smashed into little pieces and left as they lay. These are frequently found on very low mounds, the sherds having served to inhibit the erosion of the underlying earth.

Cemeteries

The only nucleated features of Neolithic date in this area are the cemeteries. As around Kadruka these invariably are to be found on the prominent natural mounds which are a feature of the region. Not only do they occupy prominent mounds but they appear to occupy every prominent mound which is today not occupied by settlements of later periods. It should be borne in mind that many Kerma settlements may overlie cemeteries, or settlements, of the Neolithic period

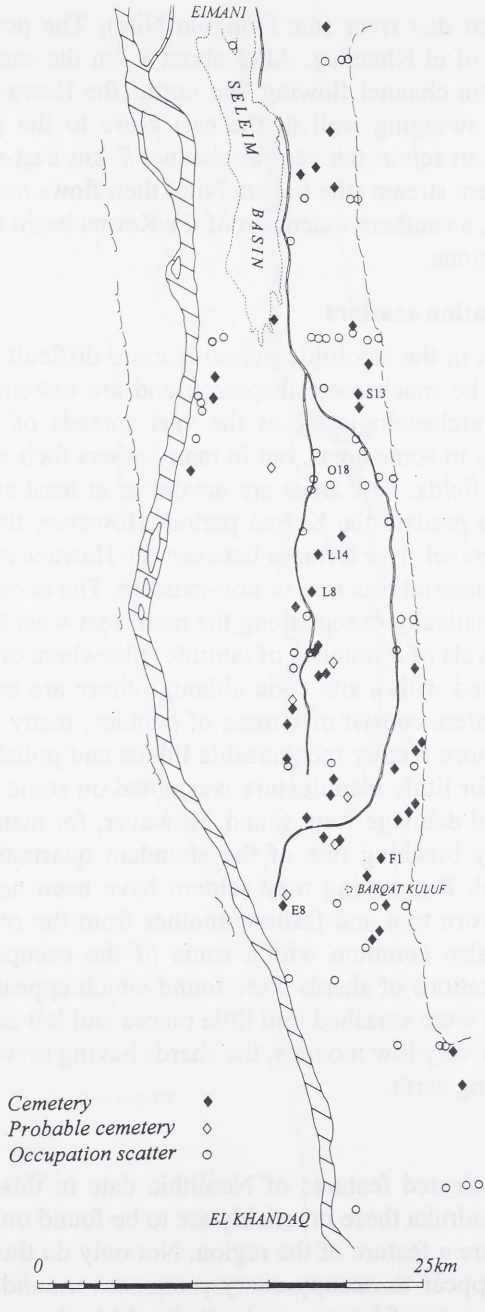

Fig. 2.
Sites on the east bank of the Nile in the Northern Dongola Reach during the Neolithic period.

The distribution of cemeteries, therefore, reflects the location of the natural mounds and cannot be used as good evidence to suggest the location of population centres in the Neolithic period (see Fig. 2). Other raised areas such as the prominent gravel river terraces were not utilised for cemeteries. The cemetery sites were often very rich in artefacts and skeletons were frequently visible on the ground surface. All artefacts were collected from these sites and limited excavation was also undertaken where the imminent destruction of the graves was highly likely.

In cemetery L14 four burials were examined, one of which was disarticulated. The other three contained individuals buried in a contracted position on their right sides with the heads to the east or south facing north or east. They were generally accompanied by pottery vessels. Among these were a number of types found at Kadruka including caliciform beakers, one of which is almost identical in form and decoration to that recovered from Cemetery KDK 2 (cf. Reinold 1987, fig. 11b and Welsby 1997, fig. 2). This had been placed on the body in the pelvic area within grave L14-6. Another vessel closely paralleled from Kadruka is a colander which was found *in situ* at site L8 set within a bowl which was itself set within another (see Reinold 1994, 86; Sjöström 1994, fig. 3.4; Welsby 1997, fig. 7). Nests of bowls were noted in several graves. Surface collections of finds and artefacts recovered in situ indicated that the deceased were also accompanied by bone tools, awls and gouges, often very small polished axe heads, palettes - both large flat pebbles (cf. Lecointe 1987, pl. III.1) and others fashioned from hard stones - and small counters or rubbers. These latter types, which were usually fashioned from hard sandstone, were circular, with convex faces and had a thickness relative to their diameters frequently in the range 49-79 %. Jewellery in the form of beads, stone pendants, and ivory bangles was also recovered. In one grave at L14 was a collection of shells, pebbles (palettes) and axes which may have been contained in a bag (cf. a similar concentration of shells and stone from el Ghaba in Lecointe 1987, pl. III.2). Another grave on the same site had a concentration of mollusc shells placed by the knees of the deceased. A unique find was a fine lathe-turned quartzite jar in the cemetery at site F1 (Welsby 1996, fig. 2). As in the cemeteries excavated at Kadruka, in at least one case burials had been placed one upon another.

Two other sites may possible be of Neolithic date although no dating evidence was available. One is an isolated mound (site O18) 7.3 x 5.8m in size, covered in fragments of elephant teeth (kindly identified by L. Chaix). The other (site M4) is in the plain immediately to the west of the Wadi el Khowi in an area where there are abundant Neolithic occupation scatters. Here there are several concentrations of human bone and one body *in situ*, a crouched inhumation on its right side with the head to the north east.

No evidence for later burials was found on any of the Neolithic cemeteries although immediately to the south of that at site E8 was a large cemetery of Kushite date.

Burnt mounds

The region abounds in what have been termed burnt mounds. The dating of these is unclear but many are found in areas where there appears to have been little occupation since the Neolithic or at least since the Kerma period. Although they are all broadly similar, piles of burnt earth beneath which, in the excavated examples (see Welsby 1997, fig. 5), is a narrow fire-reddened trench dug into the alluvium, there is a range of variation and they may have had a range of functions and be of differing dates. One large, oval, burnt mound (site P8(2)) 15 km south east of Kawa appears to be associated with heavily burnt mud bricks. It is approximately 3.2 x 2.6m in size and stands to a height of 744mm. Another (site L24(8)) several kilometres to the south has lost its 'superstructure' but a fire-reddened sinuous trench, 5.05m long and 600m wide, is clearly visible.

Erosion

Evidence for extensive erosion, largely caused by wind action, has been found in a number of areas in the Sudanese Nile valley. Around Kadruka Reinold has estimated that between 400 and 800mm of earth has been lost since the Neolithic period (1994, 72). The evidence for at least some of the area a little upstream is for much more extensive erosion, between 300mm and well over 2m. This scale of erosion will have totally removed the occupation surfaces and whatever structures there may have been in the Neolithic settlements and has removed the Neolithic ground surfaces (and tomb monuments?) in the cemeteries so that many of the burials now are partly exposed and others may well already have been totally destroyed. Another effect of this erosion in the settlement sites is that, with the progressive removal of occupation deposits, the heavier artefacts - stone tools and pottery in particular - have been concentrated onto the present ground surface giving a false impression of the density of occupation in that period.

Throughout the area modern water pumps, to gain access to the subsurface water, are set at the bottom of holes approximately 4m square and several metres deep. These provide vertical sections through the alluvium and in a number of these earlier features, particularly hearths, are visible within and sealed by the alluvium. This indicates that since human activity began in the region depositional as well as erosional forces have been at work, both of which have conspired to make it difficult, if not impossible, for the archaeologist to reconstruct the pattern of occupation and land use at any time. In the Dongola Reach, as elsewhere in the Middle Nile valley, the only preserved remains of the Neolithic pe-

riod may have to be sought beneath later features, in this case beneath the Kerma settlements. These have been much more resistant to erosion owing to the presence of structures of mud brick and stone which have stabilised the ground surface to some extent.

Neolithic and Kerma period utilisation of the region

The results of the SARS work complements that of the French Unit at Kadruka. It appears that much of the region from the plateau to the present day Nile was occupied in the Neolithic period with the inhabitants utilising the banks of the palaeochannels but probably with a nomadic or semi-nomadic lifestyle based for only a part of the year along the channels. Presumably they did not attempt to return to the exact location of their pervious camp and, hence the vast and dispersed spreads of occupation material. The economy in the Kerma period appears different with permanent nucleated settlements becoming the norm, confined to the immediate vicinity of the palaeochannels and perhaps to be associated with agricultural activities along their banks and also along the edges of the Seleim Basin.

Although the artefact scatters have been described as settlements extending over many kilometres, this may well give a false impression of the character of human occupation in the region in the Neolithic and in the succeeding pre-Kerma period. Although the pottery from the survey has not yet been studied in detail, little ceramic material identified as pre-Kerma has been noted. We should perhaps interpret these vast spreads as delimiting a 'zone of settlement' which, at any one time, may only have been occupied by small groups of people living in seasonal camps.

The presence of the palaeochannels and of the Kerma/Seleim basin will have allowed the utilisation of a much greater percentage of the Nile valley in the Northern Dongola Reach than has been possible at any time in the later Holocene before the very recent past. This area was thus one of the most favoured reaches of the Middle Nile and the large number of cemeteries and the abundance of Neolithic artefacts testify to the relatively large population it will have been able to support. The special features of the reach also offer a plausible scenario for the growth of Kerma during the 3rd millennium BC and will have made a major contribution to its prosperity for a millennium.

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Elena A. A. Garcea

A Late Neolithic site near el-Kurru (Sudan)

The site

A surface survey was carried out in the Napatan Region in the concession area of the Archaeological Mission of the University of Cassino, directed by I. Vincentelli (1996; 1997; in press a; in press b) aiming to identify and map archaeological occurrences from all periods (Garcea and Sebastiani, in press). The archaeology in the area is well-known since the beginning of this century for its Late Dynastic, Napatan, Meroitic, Christian and Islamic evidence (Porter and Moss 1951). As a matter of fact, this area was frequented as early as Acheulean times.

Several sites, including concentrations of chipped lithics, were located along the western bank of this part of the Nile Valley. A high frequency of lithics was identified just south of the Napatan cemetery of El Kurru (10th-8th centuries BC). The site, named Uad Shami (18°24'02"N, 31°45'6"E), is located about 9 km south of Jebel Barkal and 4 km north of the village of Zuma. It is situated along the Khor Uad Shami, on the margin of the Jebel Rufa'a (Fig. 1, site No. 27).

Over an area of 50 m^2, which was divided into two 5x5 m^2 squares, an intensive surface collection was made. The area corresponded to about one-third of the main artefact scatter. No pottery or organic materials occurred at Uad Shami. All the archaeological material was accumulated on the surface and the anthropic deposit was completely eroded. It is likely that the archaeological debris has never been very thick since its formation, as the site was certainly not a permanent settlement.

Debitage

Lithic artifacts were made of a large variety of raw materials of local origin including Hudi chert, brown chert, transluscent flint, variegated agate,

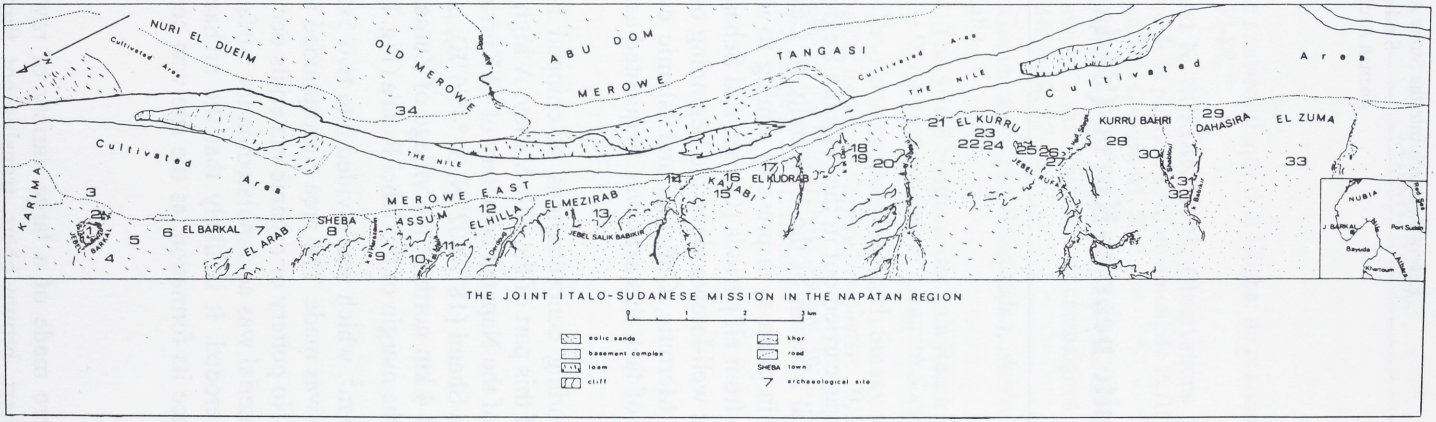

Fig. 1. Map of the surveyed area.

quartzite, quartz, sandstone and petrified wood (Table 1). Hudi chert was yellow-brownish, coarse grained, with gastropods embedded in the rock. Core reduction was made by simple hard hammer technique. Cores with single, opposed and ninety-degree platforms were the most characteristic types for all raw materials (Table 2). *Décorticage* was not really practised: just a few flakes were removed from the cores often leaving more than half pebble unexploited. The presence of cortex did not seem to matter in the final product. Pebbles with more than one-third of cortical surface accounted for over half of the assemblage. Pieces with no cortex had such a feeble frequency that they were certainly not the desired final product (Table 3).

The tool-kit included a wide variety of types (Table 4). Endscrapers were frequent; perforators were important and burins were common (Fig. 2). Notched and denticulated flakes predominated (Fig. 3). Geometric and backed pieces were completely absent. Some bifacially retouched pieces and *galets aménagées* (chopping tools) were also present and, like all other tools, were roughly made.

Results and discussion

As the quantity of cores is equivalent to that of finished tools, it is likely that the knappers from Uad Shami intended to produce one tool from every pebble. Pebbles were simply knapped to sharpen their functional part and to hold them better in the hands.

If we consider that there is an average of about 2 cores and 2 retouched tools per square meter, we may infer that the site was a lithic workshop. If this is so, it is less surprising that no artifacts other than lithics occurred in this place. The area was an optimal location for a lithic workshop. A large variety of raw materials were locally available in the gravel sheet along the Nile. Hudi chert could be found at a distance of no more than 80-100 km. Given this evidence, the site was probably used as a logistic camp for performing stone knapping. Its inhabitants must have practised a nomadic way of life with temporary camps functional to their mixed subsistence economy.

Within the so-called Neolithic horizon, some comparisons may be suggested with other sites in the Dongola Reach (Marks, Hays and de Heinzelin 1967/68; Marks, Shiner and Hays 1968). Similarities appear in the Late Neolithic groups. The El Melik Group, although it is less defined than the other groups, seems to indicate more common traits with the Uad Shami assemblage. Notches and denticulates are the most common class of tools, blades are rare and, as a whole, tool-kits are roughly made. In addition, pottery is normally rare and ground hand stones and querns are uncommon (Marks, Hays and de Heinzelin 1967/68: 190). It should not be ruled out that Uad Shami could be later than 5000 BP and occupy the 5th millennium BP or, if we want to relate it to contemporary

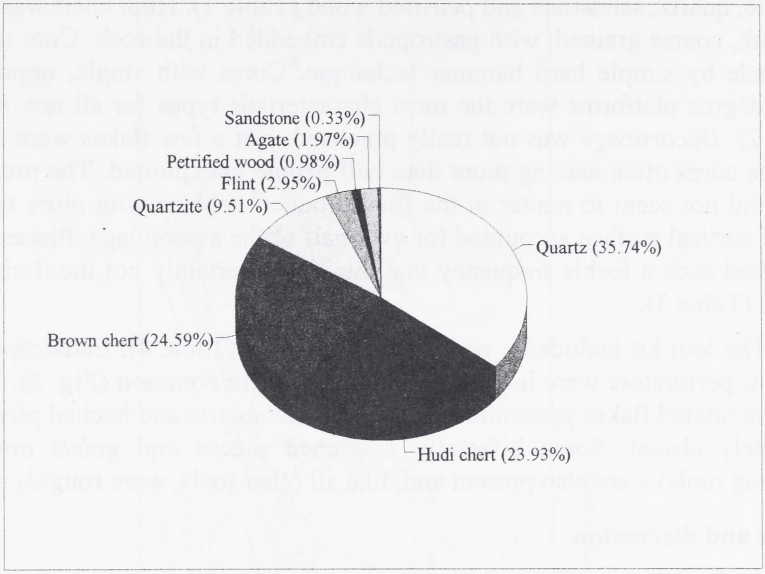

Table 1. Uad Shami: frequencies of raw materials.

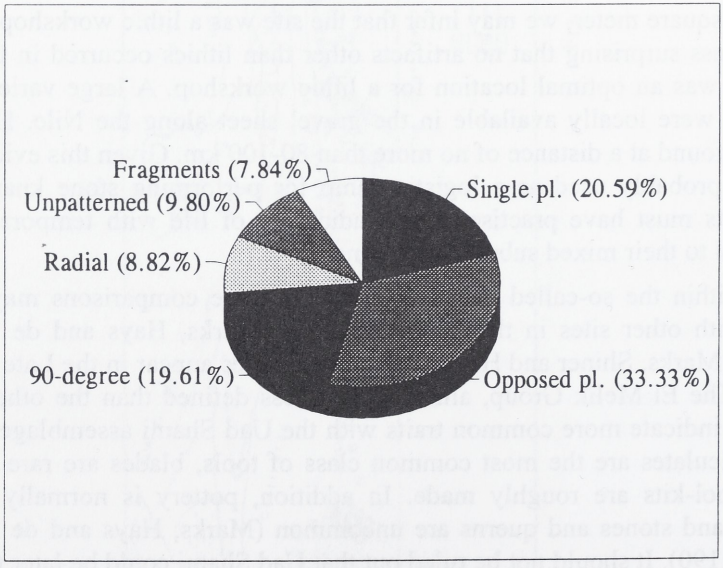

Table 2. Uad Shami: frequencies of cores.

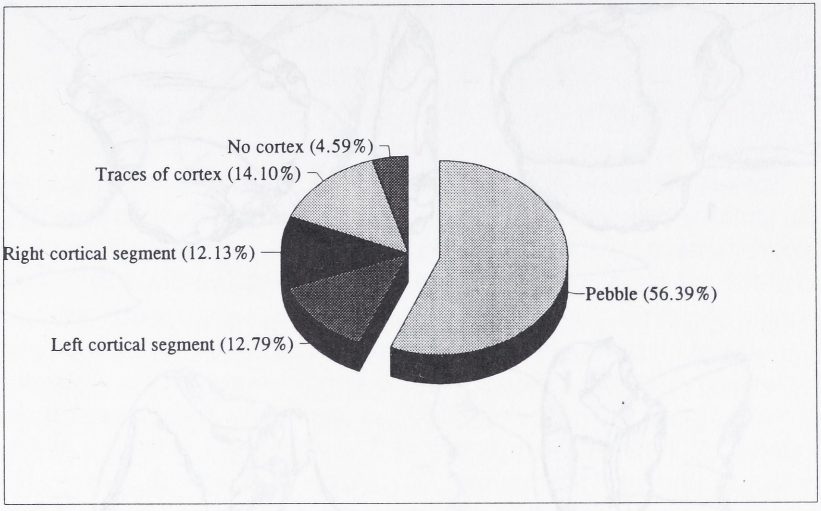

Table 3. Uad Shami: frequencies of cortical pieces.

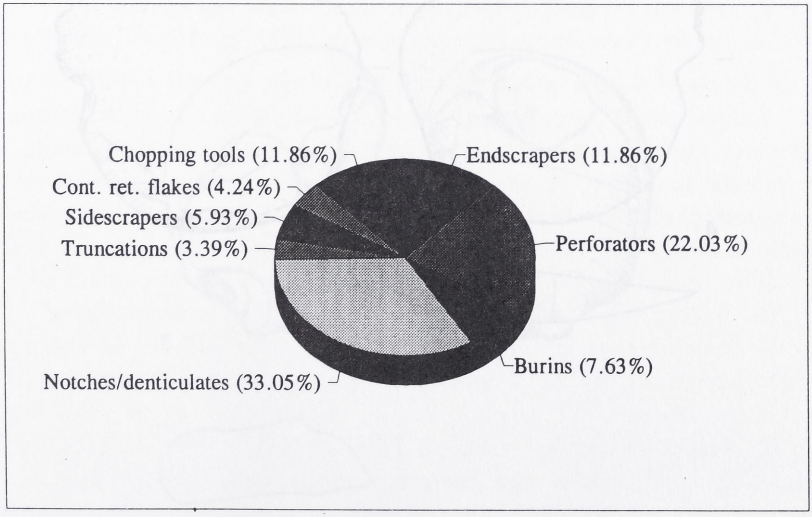

Table 4. Uad Shami: frequencies

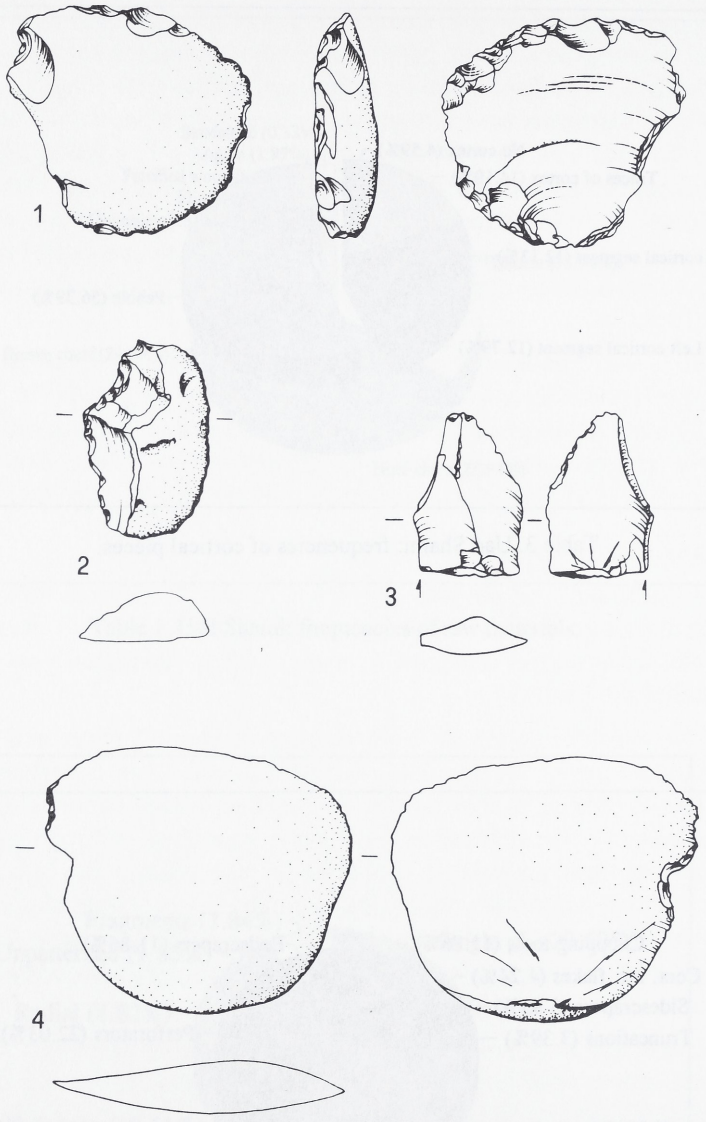

Fig. 2. Lithics from Uad Shami.

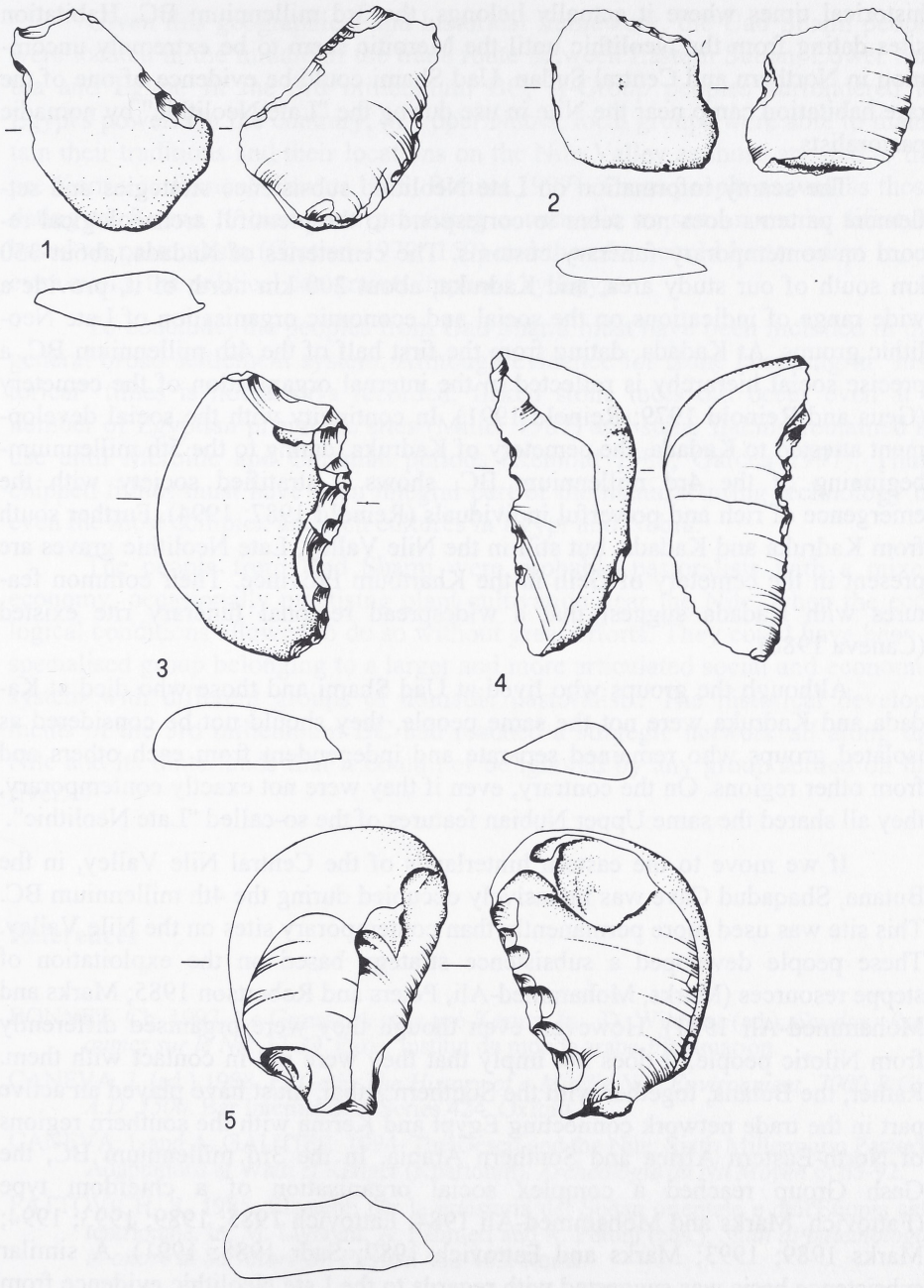

Fig. 3. Lithics from Uad Shami.

historical times where it actually belongs, the 3rd millennium BC. Habitation sites dating from the Neolithic until the Meroitic seem to be extremely uncommon in Northern and Central Sudan. Uad Shami could be evidence of one of the rare habitation camp near the Nile in use during the "Late Neolithic" by nomadic pastoralists.

The scanty information on Late Neolithic subsistence strategies and settlement patterns does not seem to correspond to the plentiful archaeological record on contemporary funerary customs. The cemeteries of Kadada, about 350 km south of our study area, and Kadruka, about 200 km north of it, provide a wide range of indications on the social and economic organisation of Late Neolithic groups. At Kadada, dating from the first half of the 4th millennium BC, a precise social hierarchy is reflected in the internal organisation of the cemetery (Geus and Reinold 1979; Reinold 1991). In continuity with the social development attested to Kadada, the cemetery of Kadruka, dating to the 5th millennium-beginning of the 4rd millennium BC, shows a stratified society with the emergence of rich and powerful individuals (Reinold 1987; 1994). Further south from Kadruka and Kadada, but still in the Nile Valley, Late Neolithic graves are present in the cemetery of Geili in the Khartoum Province. Their common features with Kadada suggest that a widespread regional funerary rite existed (Caneva 1988).

Although the groups who lived at Uad Shami and those who died at Kadada and Kadruka were not the same people, they should not be considered as isolated groups who remained separate and independent from each others and from other regions. On the contrary, even if they were not exactly contemporary, they all shared the same Upper Nubian features of the so-called "Late Neolithic".

If we move to the eastern hinterlands of the Central Nile Valley, in the Butana, Shaqadud Cave was intensively occupied during the 4th millennium BC. This site was used more permanently than contemporary sites on the Nile Valley. These people developed a subsistence strategy based on the exploitation of steppe resources (Marks, Mohammed-Ali, Peters and Robertson 1985; Marks and Mohammed-Ali 1991). However, even though they were organised differently from Nilotic people, it does not imply that they were not in contact with them. Rather, the Butana, together with the Southern Atbai, must have played an active part in the trade network connecting Egypt and Kerma with the southern regions of North-Eastern Africa and Southern Arabia. In the 3rd millennium BC, the Gash Group reached a complex social organisation of a chiefdom type (Fattovich, Marks and Mohammed-Ali 1984; Fattovich 1985; 1989; 1993; 1994; Marks 1989; 1993; Marks and Fattovich 1989; Sadr 1988; 1991). A similar subsistence basis was suggested with regards to the Late Neolithic evidence from El Kenger in the Khartoum province (Caneva and Gautier 1994).

Given this geographical and historical framework, the Uad Shami people were located in the middle of the trade route between Eastern Sudan, Lower Nubia and Egypt. In the 3rd millennium BC, A-Group peoples surrendered to Egypt's power. On the contrary, in Upper Nubia, local groups were able to maintain their traditions and their locations on the Nile Valley as those attested to the pre-Kerma settlement (Privati 1988; Bonnet 1997). These people as well as those dating to *Kerma Ancien* were practising a nomadic or semi-nomadic lifestyle based on pastoralism (Gratien 1978: 159) and therefore could better adapt to, or even avoid, the political constraints imposed by Egypt.

To conclude, the peoples from Uad Shami must have been included in the general broad settlement system. Although evidence for stone knapping in "historical" times is not always recorded, flaked stone tools did occur even at a number of Egyptian pharaonic sites (Miller 1987) and stone flaking remained in use until Meroitic and Christian periods (Reinold 1988; Garcea 1997). Thus, chipped lithics must have been integral part of the manufacturing technology of even the most complex and rich cultures in Egypt and Nubia.

The people from Uad Shami were probably pastoralists with a mixed economy, occasionally practising plant cultivation near the Nile, when the ecological conditions allowed to do so without great efforts. They could have been a specialised group belonging to a larger and more articulated social and economic system with different groups of nomadic pastoralists. The historical developments of the 3rd millennium BC had reached a strategic network all along the Nile and its hinterlands that it could not be ignored by any group settled on the river.

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Mohammed Adel Mohammed Abd El Moneim

Knobbed bowls of the Late Predynastic - Early Dynastic Period

Knobbed bowls are bowls of pottery or stone with a row of cones or projections below the rim. While this type was widespread in Palestine from the Chalcolithic into the Early Bronze Age (Kantor 1942:185-187; Guy and Engberg 1938:22, fig. 21), at the sites of Megiddo (Kantor 1942: pl. 3, 31-32; pl. 72:10-11; Engberg and Shipton 1934: chart 18, fig. 16k), Beth-shan (Fitzgerald 1935), Gezer (Macalister 1912: vol. 3 pl. 149:25), Beth-Yerah (Fitzgerald 1935:5-22), Jericho (Fitzgerald 1936: pl. 37:12), Afula (Amiran 1969: pl. 9, 10; 1936 152-153, pl. I, 7-8), Tell Beit Mirsim (Albright 1932: pl. VI 44-46, 35), only few examples of it are known from Egypt dated to the Late Predynastic-Early Dynastic period (Fig. 1 and 4).

Until recently, this type of bowl was known mostly from Upper Egypt, where some whole examples and some bowl fragments were found at Abusir el-Meleq (Scharff 1926:34, pls. 21:156, XLI: 5), Naqada (Petrie 1921: pl. 15, 5a), Mostagedda (Brunton 1937: pl. 34:15) and Maadi (Rizkana and Seeher 1987: pl. 55, 2). However two pieces are also known from the Delta region: a very fine example of a small basalt bowl with knob ornaments was found by Hamid Yosef and Mohammed Abd el Fatah in 1991 at Tell el-Daba' (Daqahlia), Eastern Delta and the bowl of the Munich collection (Müller 1975:193ff.) which could also have come from the Delta. Continued investigations in the Delta region at Predynastic-Early Dynastic sites could possibly reveal more examples of this type.

The knobbed bowl of the Egyptian collection in Munich (Inv. Nr. ÄS 5985) is a small, very fine bowl with a round base, convex sides expanding to a contracted mouth with a sharp rim ornamented with a row of twenty small knobs just below the rim pierced horizontally (Fig. 2b). It is of hard yellow limestone with red-brown veins (diameter of the rim 11.8 cm, diam. on the knobs 14 cm,

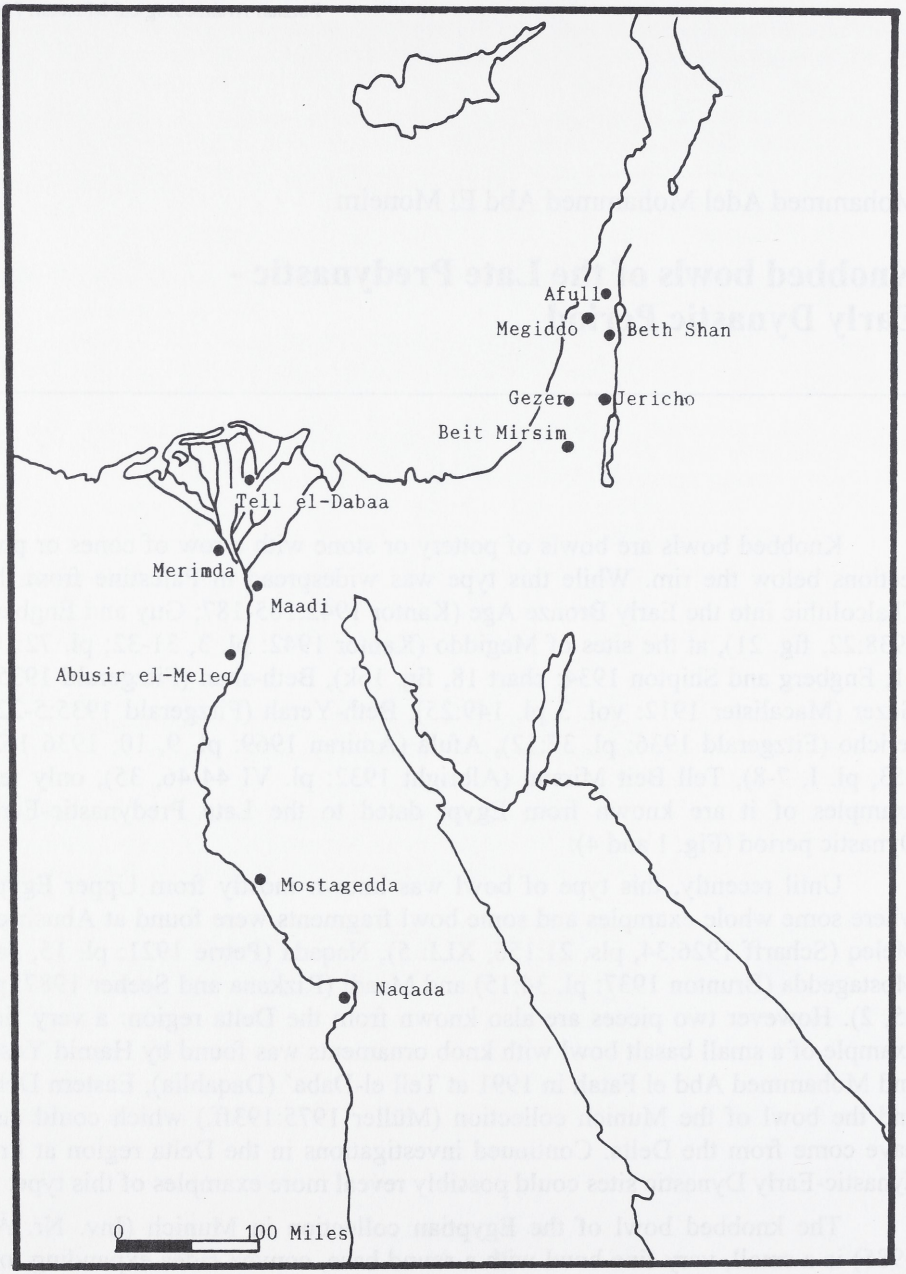


Fig. 1. Sites where "knobbed bowls" were found.

height 5 cm) and is dated by Müller to the Early Dynastic period. It was bought from a dealer in Cairo and its provenance is unknown.

This small knobbed bowl is the only one of stone found in Egypt (except for the new find from Tell el-Daba`) and perhaps also in Palestine where all the examples of knobbed bowls and fragments thereof are made of pottery (except one from Megiddo see below).

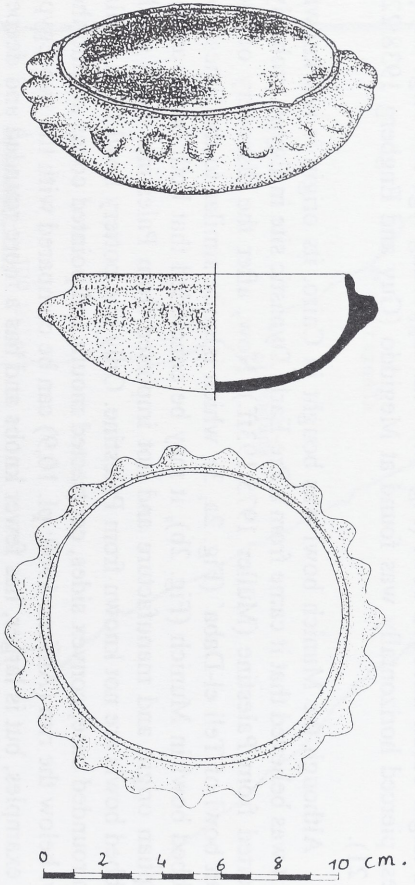
Tell el-Dab`a lies in the province of Daqahlia, 30 km to the east of el-Simbalawen and 4 km north-west of Kafr Sengab. The Tell is surrounded by agricultural land from three sides and from the west side by the Um el-Dieab (Tag el-Aes) drainage canal. Nowadays it stands about 2 to 7 m above the level of cultivation. The basalt bowl, Reg. Nr. 656, was found during excavations carried out by the Egyptian Antiquities Organization in 1991. I should like to thank Mr. Abd el-Halem Rizk, Mr. Hamdi Yosef and Mr Mohamed Abd el-Fatah for helping me with information and photographs concerning this object.

The knobbed basalt bowl of Tell el-Daba´ (Fig. 2b and 3) is a small very fine bowl with round base, convex sides, contracted mouth, ornamented with a row of twenty-one small knobs placed horizontally below the rim (diam. of the rim 10.3 cm, height 4 cm). This bowl can be dated to the beginning of the First Dynasty according to find context within the excavation. The grave type and its contents, such as the presence of the so-called "wine-jars" which were found in many variations (large fatter type and small slender type) as also the other types of pottery jars and stone vessels all indicate a First Dynasty date.

This type of small knobbed bowl is the only one of basalt found in Egypt but a larger basalt knobbed bowl (Fig. 4k) with supporting legs and large sharp cones, pierced horizontally was found at Megiddo (Guy and Engberg 1938:22, Fig. 21).

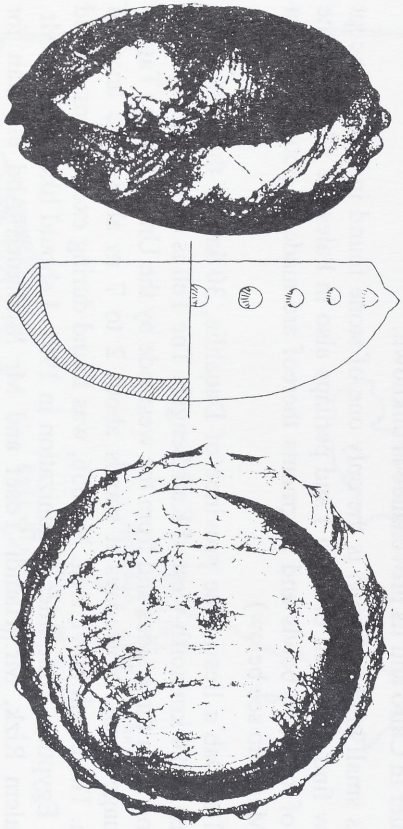
Although the Munich bowl was bought in Cairo, its origin is not known and it was believed that it came from a Pre-Early Dynastic site in Egypt, probably imported from Palestine (Müller 1975:193ff.). Now, after the discovery of the basalt bowl of Tell el-Daba´ (Fig. 2a, 3), which is quite similar to the limestone knobbed bowl in Munich (Fig. 2b), it may be concluded that both bowls are of Egyptian origin and manufacture and not imported from Palestine. Such small knobbed bowls are not known from Palestine. Only one pottery bowl from Afula with rounded base, convex sides, contracted mouth and pointed cones around the bowl below the rim (Amiran 1969: pl. 10,9) can be compared with the two Egyptian examples, but is larger, has fewer knobs and has a more rounded and deeper base (Fig. 4m).

Knobbed bowls were also found at some other Predynastic sites. At Maadi, a deep ceramic bowl (Fig. 4a) with thick external rims and flat base also carries a



a: bowl in the Munich Collection.

Fig. 2.



b: bowl from Tell el-Daba'.

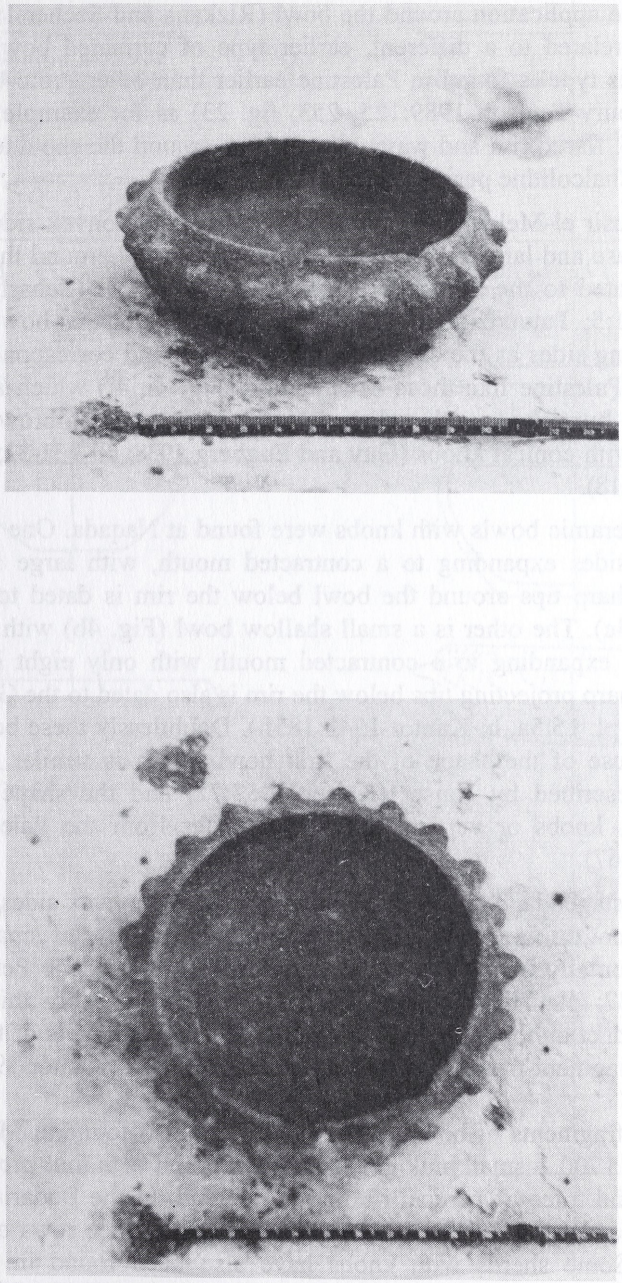


Fig. 3. Bowl found in Tell el-Daba' (Daqahlia).

thick rope-like application around the bowl (Rizkana and Seeher 1987: pl. 55:2) and may be related to a different, earlier type of carinated bowls (Tutundzic 1993:48). This type is found in Palestine earlier than other Proto-Urban pottery groups (Hanbury-Tenison 1989:125, 253, fig. 23) as for example a deep bowl with flat base, flared rim and waving projection around the shoulder from Afula dated to the Chalcolithic period (Fig. 4h).

At Abusir el-Meleq a small bowl (Fig. 4d) with convex sides, contracted mouth, flat base and large projections raised horizontally around the bowl below the rim, is dated to the very late Gerzean or Naqada III (Scharff 1926:34 pl. 26:156; pl. 41:5; Tutundzic 1993:48). The projections of this bowl do not have sharply slanting sides as the examples from Naqada and corresponds to the type known from Palestine like those of Megiddo (Fig. 4i, 4j) which are low, wide bowls, grey burnished, red polished or with a reddish-brown wash and ornamented with conical knobs (Guy and Engberg 1938: pl. 3 31-32; Engberg and Shipton 1934:18).

Two ceramic bowls with knobs were found at Naqada. One with flat base and convex sides expanding to a contracted mouth, with large slanting sides knobs with sharp tips around the bowl below the rim is dated to the Gerzean period (Fig. 4c). The other is a small shallow bowl (Fig. 4b) with flat base and convex sides expanding to a contracted mouth with only eight large slanting knobs with sharp projecting tips below the rim is also dated to the Gerzean period (Petrie 1921: pl. 15:5a, b; Kantor 1942:185f.). Doubtlessly these bowls are local product because of the shape of the first bowl which is similar to P-Ware of Naqada II described by Kaiser (Kaiser 1957:72) and the shape of the large slanting sides knobs or vertical knobs that differ from the Palestinian knobs (Hennessy 1967).

At Mostagedda, a deep red polished bowl with convex sides expanding to a contacted mouth, flat base, ornamented around with row of small knobs protruding horizontally below the rim is dated to the Predynastic Period (Fig. 4e) (Brunton 1937: pl. 34:15; Kantor 1942:187). Most probably this bowl is an Egyptian product although it is similar to the Palestinian bowls of this kind such as the bowl fragment from level XV of EB I at Bet-shan (Kantor 1942:186; Fitzgerald 1935).

Some fragments of bowls with knobs were also found at Mostagedda. In the town area 1700, a small pink grey sherd was found with four projections close to the edge and trace of vertical ribbing at one end. In the Badarian grave 594, fragments of a deep, rough brown bowl decorated by three rows of knobs were also found. Some sherds with knobs have also been found in Pre-Amratian context and Caton-Thompson has published a Badarian sherd with three rough knobs (Brunton and Caton-Tompson 1928).

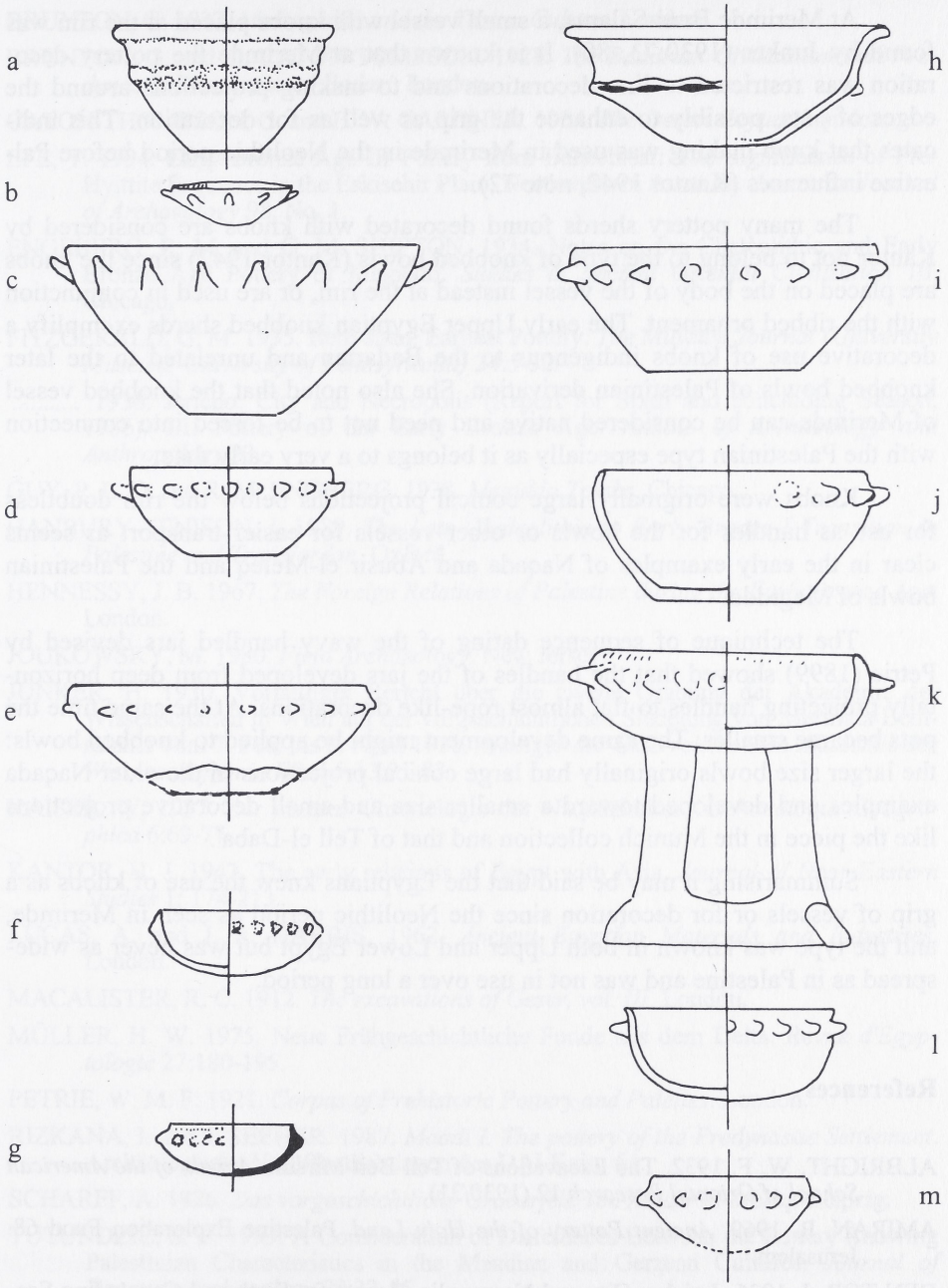


Fig. 4.
a-g: Egyptian bowls; h-m: Palestinian bowls.

At Merimde Beni-Salama, a small vessel with knobs placed at the rim was found by Junker (1930:73, 80). It is known that at Merimde the pottery decoration was restricted to line decorations and to making projections around the edges of pots, possibly to enhance the grip as well as for decoration. This indicates that knob making was used in Merimde in the Neolithic period before Palestine influences (Kantor 1942, note 72).

The many pottery sherds found decorated with knobs are considered by Kantor not to belong to the type of knobbed bowls (Kantor 1942) since the knobs are placed on the body of the vessel instead at the rim, or are used in conjunction with the ribbed ornament. The early Upper Egyptian knobbed sherds exemplify a decorative use of knobs indigenous to the Badarian and unrelated to the later knobbed bowls of Palestinian derivation. She also noted that the knobbed vessel of Merimde can be considered native and need not to be forced into connection with the Palestinian type especially as it belongs to a very early date.

Knobs were originally large conical projections below the rim doubtless for use as handles for the bowls or other vessels for easier transport as seems clear in the early examples of Naqada and Abusir el-Meleq and the Palestinian bowls of Megiddo.

The technique of sequence dating of the wavy handled jars devised by Petrie (1899) showed that the handles of the jars developed from deep horizontally projecting handles to flat almost rope-like decorations. At the same time the pots became smaller. The same development might be applied to knobbed bowls: the larger size bowls originally had large conical projections in the older Naqada examples and developed toward a smaller size and small decorative projections like the piece in the Munich collection and that of Tell el-Daba'.

Summarising it may be said that the Egyptians knew the use of knobs as a grip of vessels or for decoration since the Neolithic period as seen in Merimde, and the type was known in both Upper and Lower Egypt but was never as widespread as in Palestine and was not in use over a long period.

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Social development in Predynastic Egypt: Matmar, a case study

As I pointed out in previous books and papers on general trends in the social development in Predynastic Egypt as exemplified by the cemeteries associated to the settlements belonging to those early communities, which shed some light on several issues (Castillos 1982; 1983a; 1983b; 1991; 1995; 1996; 1997a; 1997b; 1998), the next step in our research had to be an attempt at concentrating on an adequate site in order to make a more comprehensive approach to the subject, as other researchers have already done in recent years (Bard 1988; Anderson 1992; Griswold 1992).

I selected Matmar for several reasons. It is located rather far from major Predynastic sites of Upper Egypt, and it yielded evidence for a clear-cut and continuous evolution (Castillos 1997b). Being the last site published by Guy Brunton after his other excavations in the Badari area (Brunton 1928; 1937), it undoubtedly benefited from the experience he gained elsewhere. The publication (Brunton 1948) was reasonably detailed and included all the relevant tombs he found at this locality. Finally, the soil of the excavated sites was dry enough to preserve easily perishable items such as wood, leather and textiles which usually did not survive in other sites of similar chronology (Petrie and Quibell 1896).

The locality of Matmar seemed to have been continuously occupied in ancient times because cemeteries belonging to periods dating from the Early Predynastic to Late Roman times could be found there. Some Badarian settlements, the remains of a New Kingdom temple and evidence of more Predynastic cemeteries where the ground had been disturbed to the point of almost complete obliteration, were also noted in the area of Matmar (Brunton 1948:2-4).

Generally speaking, the results of my earlier research regarding Matmar has shown that the area was apparently well populated during Badarian times

(123 tombs), had a greatly reduced Amratian presence (24 tombs), again recovered its prosperity in the Gerzean times (34 tombs) and had a certain drop in the Protodynastic (76 tombs; Castillos 1982:129, 137-140). These figures taken from Brunton's publication, may one day be slightly modified due to the presence of 26 other Predynastic graves which could not be precisely dated by him.

Since we do not know the exact duration of each of the Predynastic occupations of the settlements which generated the cemeteries we are studying, I can not be sure about the comments made in the preceding paragraph; future and more accurate chronological estimation may or may not modify the overall picture, but for the time being this is the impression that the site conveys.

The comparatively numerous funerary offerings found in Predynastic Matmar tombs were also useful for our purposes, especially as regards the later periods (Castillos 1983a: Tables 8a and 8b). For intact tombs and for both intact and plundered ones, the Badarian inhumations had the same low average value of 1.5 objects per tomb. In the Amratian inhumations, however this variable jumped to 7.2 for intact graves and 8.0 for all of them. The Gerzean inhumations provided figures ranging from 5.5 and 6.9 respectively and, finally, for the Protodynastic graves the values were 7.8 and 8.3. As these figures show, both sets of values agree quite closely. Another interesting fact is the increasing spatial proximity over time of the richer graves in these cemeteries (Castillos 1983b: Plates V-VII) which illustrates a practice abundantly documented in Egypt in historical times.

Regarding the size of the tombs at Matmar during the Predynastic times, the averages indicate figures of 0.76, 0.86, 1.29 and 1.39 cubic metres for each period. Considering the tomb size distribution (Castillos 1998: histograms 11-14) we can see that the Badarian tombs had more frequently a volume of between approximately 0.3 and 0.6 cubic metres, the Amratian ones between 0.5 and 0.8, the Gerzean graves between 0.5 and 1.4 and the Protodynastic ones between 0.8 and 2 cubic metres (Table 1).

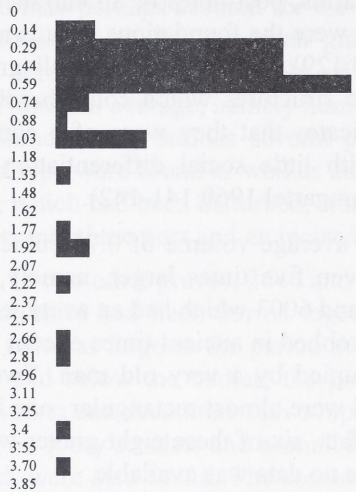
The Badarian

Remains of several Badarian settlements were found by Guy Brunton in areas 2000, 2100, 2400-2700 and 3200. Among the objects recovered there was a fine black topped brown polished pot, rippled all over, which has been frequently praised as a masterpiece of ancient craftsmanship (Brunton 1948:5; Vandier 1952:210; Midant-Reynes 1992:153), but numerous rough cooking vessels as well as other pots, flints and grinding stones were also found in these sites.

The most interesting feature was the presence of several large, roughly circular pits, described by Guy Brunton as granaries. The largest granary had a dia-

Table 1
SIZE DISTRIBUTION HISTOGRAMS

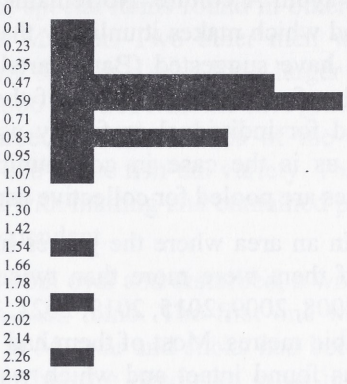
Badarian - Matmar



n: 55

$\bar{x}$: 0.760 s^2: 0.625 s: 0.790
MX: 3.57 MN: 0.07 R: 3.50

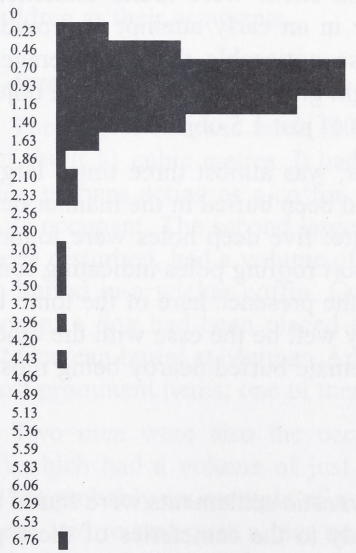
Amratian - Matmar



n: 21

$\bar{x}$: 0.860 s^2: 0.270 s: 0.520
MX: 2.28 MN: 0.17 R: 2.11

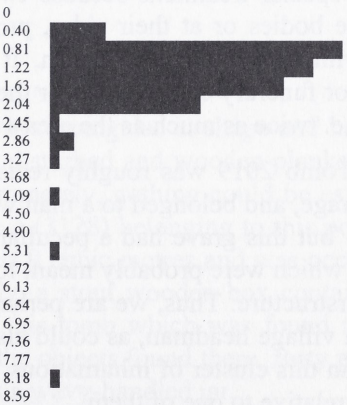
Gerzean - Matmar



n: 106

$\bar{x}$: 1.285 s^2: 2.736 s: 1.650
MX: 11.05 MN: 0.13 R: 10.92

Protodynastic - Matmar



n: 66

$\bar{x}$: 1.386 s^2: 1.375 s: 1.172
MX: 8.01 MN: 0.09 R: 7.92

meter of 2.7 metres and was about 3 metres deep; others were 1.35 metres across and 1 metre deep or 2 metres across and 1.25 metres deep. A few of these objects still had remains of basket-work that originally lined them, similarly to granaries of the Fayum A culture. No remains of hearths, post-holes or an entrance could be found which makes it unlikely that they were the foundations of huts as some authors have suggested (Baumgartel 1960:129). Although few small granaries were also found, the presence of the large structures which could hardly been intended for individual or family use indicates that they were of a communal nature, as is the case in communities with little social differentiation where resources are pooled for collective use (Baumgartel 1960:141-142).

In an area where the graves had an average volume of 0.76 cubic metre, eight of them were more than twice or even five times larger, namely, tombs 2006, 2008, 2009, 2015, 2019, 2021, 3083 and 6003 which had an average size of 2.46 cubic metres. Most of them had been robbed in ancient times except for one that was found intact and which was occupied by a very old man. Two other graves had been more carefully shaped and were almost rectangular, one belonging to a woman and the other to a man. In fact, six of these eight graves were occupied by men, one by a woman and for one no data was available.

Almost all these bodies had been wrapped in matting, the one occupying the largest tomb with an unusual amount of it; they had also been buried with skins, pots, flints, palettes and/or shells. Some of the bodies had been given further special treatment because twigs and sticks were found underneath and over the bodies or at their sides, probably in an early attempt at providing the dead with some sort of a coffin. It is also noticeable that the average extant wealth or funerary endowment for these eight graves was almost three objects per tomb, i.e. twice as much as the area average of just 1.5 objects.

Tomb 2019 was roughly rectangular, was almost three times larger than the average, and belonged to a man who had been buried in the manner described above - but this grave had a peculiar feature: five deep holes were found in the ground which were probably meant to support roofing poles indicating some type of superstructure. Thus, we are perhaps in the presence here of the tomb belonging to a village headman, as could also very well be the case with the other large graves in this cluster of inhumations, the female buried nearby being most likely a close relative to one of them.

The Amratian

Since no later Predynastic or Protodynastic settlements were found by Guy Brunton at Matmar, I will confine my study to the cemeteries of these periods that he brought to light in this locality. Among the Amratian graves found here, a few were remarkable for several reasons. Tomb 2716 was the largest with almost

three times the average size for this period at Matmar. It was rectangular, was occupied by a man and had its sides lined with matting and boards, in a probable attempt to provide a coffin for the deceased. The fact that it had been thoroughly robbed may perhaps account for the lack of special items found in other remarkable although smaller Amratian graves at Matmar. Two other men were also found here buried in oval tombs of roughly similar size, a little larger than the local Amratian average, namely numbers 2666 and 2681. In the first grave, which was found intact, besides several pots three fine flint knives of the common curved type were found as well as another one of the fish-tail variety. The second grave, which had been disturbed, was lined with matting and contained part of an ivory comb, three pots and an incised ivory pendant.

In two other graves, 2646 and 2717, both oval and disturbed, a woman and a small child had been buried together in each tomb. The first one was large, about twice as large as the period average at Matmar and sticks had been placed above and below the bodies; the pottery included a decorated cross-lined bowl and another one decorated with a hippopotamus and crocodile in relief around the rim. Two ivory amulets and a small ivory bangle which had probably belonged to a child, were also found. The second grave had been badly plundered and was a little smaller than the Amratian average here but contained, however, no less than fourteen pots, five of which were cross-lined decorated. The characteristics of these graves place them in a group apart from other contemporary burials and, again, would point to prominent members of their community and to their wives and children as their occupants.

The Gerzean

The largest Gerzean tomb (3072) was rectangular in shape and had a volume of about 11 cubic metres. It had been disturbed and wooden planks covered its sides, perhaps acting as a coffin. Unfortunately, nothing could be established about its occupant. The second largest grave (3128) belonging to this period had also been disturbed, had a volume of almost 9 cubic metres and was occupied by a man buried in a wicker coffin. Curiously, a stout wooden box containing the skeleton of a dog had been placed inside this tomb which was found to be the richest Gerzean burial at Matmar. Among the objects found there, forty pots were the most prominent items; one of them was a wavy-handled jar.

Two men were also the occupants of the next largest disturbed grave (3074) which had a volume of just over 8 cubic metres. It was not a multiple burial but probably an example of a tomb that had been re-used. The lower body had been laid to rest over a bier made of sticks. A total of sixteen objects was found in the tomb, among them were several pots; one of them was decorated.

Two other not so large rectangular graves (3129 and 5105) were both

found disturbed. They had a volume of about 3.5 cubic metres each, both were occupied by a man and both had a large number of funerary offerings; among them was a wavy-handled pot, a pear-shaped alabaster mace-head, two palettes and two stone vases in the former burial and one stone vase and a decorated pot in the latter. Grave 3129 had been provided with a roof and remains of the poles that had supported the structure and of the holes where they had been placed were found in this tomb. A man was also the occupant of a disturbed rectangular tomb of unreported size (3126) from which 21 objects could be recovered, among them sixteen pots; one of them was a wavy-handled jar. This grave had also been roofed with sticks.

Another large, disturbed rectangular grave (3131) had a volume of almost 7 cubic metres, contained a coffin made of 2 cm. thick wooden planks and with many funerary offerings of which ten could be recovered. No remains of its occupant survived but an extraordinary object was brought to light from this grave: a large and heavy copper axe-head that had escaped the robbers' attention because it had been placed under the coffin. It was flat and had a sharp cutting edge.

Several women were also found in rich graves but in all cases but one they were buried in grave pits of smaller size than those occupied by men of possibly similar social status. One of them was buried in a well-cut rectangular tomb 3123, which was found disturbed but still contained eighteen object. Its size was 4.3 cubic metres and had been lined with wooden planks in what seemed to have been a sort of coffin to protect the body of its occupant - an adult woman. Among the objects assigned to this tomb, two ivory bangles, three carved ivory tags and two combs, besides several pots, a palette and other items could be recovered. A woman and a child were laid to rest in another disturbed grave (3111) which had a volume of over 3 cubic metres. It had been provided with a roof made of sticks.

Another woman was found buried alone in a rectangular, disturbed grave (3130) that had a volume of over 2 cubic metres. Among the fourteen objects that could still be found there, many pots were identified, one of them was a decorated vase and other was a wavy-handled jar. A similar tomb 5114, also occupied by a woman, which was rectangular, was disturbed and had a size of 1.6 cubic metre, well over the period average at Matmar. Many objects were recovered from this tomb, among them several pots, one of them decorated.

Finally, an old woman occupied the rather small intact tomb 3005, in which twelve objects were found including five pots and a bowl; a carved wooden rod was placed under one of her arms, but the most interesting item was a decorated pot. A child was buried alone in a small grave 3080 that was also found intact and had been favoured with eleven objects left as funerary offerings, among them a long slate palette, two copper awls and several pots; one of them was decorated.

The difference in size, shape and content of uncommon luxury items set the above tombs apart from the other Gerzean graves and also here they most probably indicate the presence of privileged members of the community to which they belonged.

The Protodynastic

The largest tombs belonging to this period were these of Nos. 224 and 239. Both had been plundered and no data could be recovered about their occupants but enough evidence survived to indicate that they were high status burials. The former grave had a volume of almost 4 cubic metres, its walls were lined with plastered bricks and two alabaster stone vases were its main content; six pots and other minor objects were also found in this grave. The latter grave had a volume of just over 5 cubic metres and although it had been thoroughly robbed of its contents, some beads and a bangle were spared.

Two other graves with unidentified occupant but also with special characteristics were these of Nos. 210 and 211. They both were larger than the Protodynastic average at Matmar, with a volume of just under 2 cubic metres and in both wooden coffins were found. Tomb 210 was intact and included seven pots, an alabaster bowl and other minor items. Tomb 211 had been robbed but a total of eight pots, three alabaster vases, two ivory hair pins, a slate palette and other small objects were recovered. Tomb 221 had also been disturbed, was much larger than the period average at Matmar with a volume of 2.26 cubic metres and the man that had been buried in it was placed in a wooden coffin. Among the funerary offerings that came down to us, three pots and a large slate palette are the most interesting.

A man was also buried in a wooden coffin in tomb 222 which had been robbed and was slightly larger than the period average at Matmar. Its walls were lined with mud-plastered bricks and many objects could still be found in this grave such as six pots, two alabaster stone vases and an ivory spoon. Another man was the occupant of tomb 213 for which no size information is available. It was a disturbed grave, its walls had been lined with mud-plastered bricks and the body was found in a wooden coffin. Six pots and an alabaster saucer were some of the items found therein. Tomb 1065 was also found disturbed, its size was more than twice the period average at Matmar with a volume of just over 3 cubic metres and belonged to an adult woman who was buried in a wooden coffin. Five pots and a bone needle could still be recovered and were part of the original funerary endowment.

In tomb 236, also disturbed and larger than average at almost two cubic metres, another woman was found buried with an assortment of items such as six pots, an alabaster vase, an ivory bangle and a strange flat alabaster object carved at intervals for all its length with a succession of wide notches going from side to

side. The grave originally had a roof supported by poles. An intact tomb of average size, No. 218, contained a pottery coffin in which a woman had been buried. Also present were seven pots (some found inside the coffin, some placed outside it), a long slate palette and several beads. A woman was also the occupant of tomb No. 235, smaller than average but endowed with a wooden coffin made of 1.5 cm thick boards, six pots, a shell bangle and a few beads.

Sub-adults for whom special funerary arrangements had been made were also present in this cemetery. In the intact tomb No. 229, of slightly less than average size, a possibly thirteen year old child was buried in a wooden coffin and with four pots, two ivory pins and a slate palette, besides the usual beads. A roof supported by poles had been provided for this grave. Another child was found in the intact tomb No. 232 which was smaller, less than a cubic metre in size, but which contained one pot, five tortoise-shell bracelets, a slate palette and beads.

Summary

The tombs discussed above were selected mainly because of their size or their wealth in funerary goods but other aspects such as elaborate construction or the presence of luxury items were also taken into consideration.

I am personally very reluctant to accept the principle implicit in some recent publications in which rare or less frequent items in graves were probably more valued by the ancient population (Bard 1994:62, 64). The possible reasons for objects being less frequent are many and not necessarily because they were seen as valuable so that such a criterion - unless it is supported by other relevant evidence such as their repeated association with remarkably large or rich tombs, or the effort its manufacture demanded, or a special value attached to it throughout ancient times and duly recorded in written sources - is not particularly convincing. These tombs clearly differ from the mass of small and poorly endowed contemporary graves situated around them and we will see below to what an extent this was true for each period and how their conditions changed over time.

It is regrettable that Guy Brunton provided just two detailed maps of some of these cemetery areas which prevents us from making a better evaluation of the spatial distribution of graves and their possible shift through time (Brunton 1948: Pl. XIX, XLV). I would also like to emphasize that the conclusions I will be drawing from these sites apply only to a marginal area of Upper Egyptian Predynastic development and do not necessarily imply that the situation here can be extrapolated to represent conditions elsewhere. In my opinion, chronological breakdown per period is feasible in the case of large cemeteries where each subperiod is represented by a substantial number of graves from which statistically valid conclusions can be drawn. As we can see, such a procedure if used for small cemeteries or for incompletely published ones leads to an excessive fragmentation of the data on which no firm conclusions can be based.

Concerning the size of the six Badarian graves I selected as revealing the higher status of their occupants, a wide gap separate them from the other contemporary tombs. The smallest of the group of large burials (1.68 cubic metres) was almost twice as large as the next cluster of five graves which hardly exceeded the size average for this period. Needless to say, an even wider gap separate the size of those six tombs from all the others ranging from between 0.07 and 0.6 cubic metres. As I mentioned above, the average number of objects found in those six large tombs was about twice the period average here, in spite of the fact that all but one had been robbed. This difference becomes even more remarkable if we bear in mind that the majority of the smaller graves were found intact. Also, and with only one exception, it is in the group of six larger graves that we find evidence of more elaborate burial arrangements such as layers of twigs or sticks under and above the body or at the sides and even - in one case - holes in the ground where poles were inserted, probably to support a roof of some kind (Brunton 1928:18; 1937:43).

The Amratian is poorly represented at Matmar but reveals nevertheless a dramatic jump in the number of objects left in the tombs as funerary offerings. The size of the tomb does not, however, indicate a corresponding jump beyond the slight increase mentioned in our introductory remarks. Five in twenty-four graves, to which we might add a sixth (3075), were found robbed and without an identifiable occupant but with a volume of almost 2 cubic metres and as many as twenty-one objects. The fact that some big and/or rich graves were clearly different from the other Amratian burials is made obvious by their average size, 1.4 cubic metres, compared to 0.54 cubic metre for all the rest. Likewise, the number of objects found in this small group of graves and in the other Amratian burials also show a remarkable difference. In the former group an average of 13.2 objects contrasts with just 4.3 for all the others. Because most of these tombs in either case had been robbed, these figures are comparable. In addition to that, we can appreciate in the largest grave here the first attempt at providing the deceased with a proper wooden coffin revealed by the presence of boards on the sides (wooden coffins were apparently not found at Badari and definitely not at Mostagedda before the Protodynastic period; cf. Brunton 1928:53; 1937:82).

In another of the large graves we can verify the continuity with the Badarian practice of placing sticks above and under the body as a simple attempt to protect it beyond the usual wrapping made of mats. The larger number of objects found in the tombs, the appearance of decorated pottery and of wooden coffins and the presence of fine flint implements underline some of the cultural progress brought about by the Amratian and expressed in these cemeteries near Matmar. The Gerzean reveals, on the other hand, what is probably the peak of expression of Predynastic social development in this area.

Out of 134 tombs belonging to this period, 13 stand out as remarkable graves because of their size or their wealth in funerary offerings, or because of both these factors occurring together. Their average size of 4.3 cubic metres and average wealth in objects of 14.5 pieces - in spite of the fact that most of them had been robbed, put them several times above the mass of other less remarkable Gerzean tombs. The sheer size of some of these Gerzean tombs is imposing at about 9 and 11 cubic metres, the largest Predynastic burials in the Matmar area.

Matting progressively disappeared from the tombs. Wooden coffins became more common among the occupants of these larger and better endowed graves, as well as stone vases, fine flint implements, mace-heads, large metal objects such as the superb axe-head which escaped the robbers' attention (Brunton 1948:20-21). The most prominent of these graves was the very large grave No. 3128 which must have belonged to a very important man in his community. In spite of the fact that it had been disturbed, as many as forty pots were found in it. The occupant chose to be buried in a wicker coffin, reserving for a dog - probably his prized possession - a proper wooden coffin made of thick boards.

The practice of providing some of these tombs with a superstructure of supporting poles and probably one or more layers of twigs or sticks on top which started in the Badarian, continued in the Gerzean and is well attested in several of the more remarkable graves.

In the Protodynastic cemeteries I identified thirteen graves which stood out from the rest of the burials because of their size, lavish endowment or construction. As a group, although they are clearly different from the other contemporary tombs, this is not so marked as in the previous period. The average size of these burials is 2.2 cubic metres (tomb 102 was dated by G. Brunton to the Archaic period, in fact to the Dynasties II-III; it had a volume of ca 8 cubic metres. I do not included this burial to the Protodynastic graves) and their average content in funerary offerings was 10.4 objects which although higher, is not so dramatic. The latter figure is comparable to that of the whole Protodynastic at Matmar because the ratio intact to violated tombs was similar for both.

Some of these larger and/or richer Protodynastic graves were lined with bricks which had been plastered or covered with a layer of mud, but the same treatment was applied to other not so prominent graves. The same applies to a small chamber or *loculus* usually dug on the east side of the grave (Brunton 1948: 26). Wooden coffins became more common in the Protodynastic and the ancient practice of providing some graves with poles to support a roof could still be identified in some of the tombs. Stone vases became more common, especially in the more remarkable graves.

The greater care and special features shown in the construction of some of the Protodynastic tombs do not hide the fact that many had not been carefully

shaped and resembled the ancient rough ovals of previous periods (Brunton 1948:26). The progress we can appreciate in the life of the contemporary population and which was expressed in their cemeteries seems more the product of an overall development rather than arising from and stimulated by local conditions. These also do not show a more marked social differentiation.

Finally, the general impression these Predynastic cemeteries convey is one of continuous evolution without any noticeable break in the funerary customs, beyond the not entirely unexpected variations occurring due to the technological and social progress made in these periods and to the enhanced or diminished Predynastic human presence in the area of Matmar at different times. Results of this study, especially these indicating a decline in social differentiation in Protodynastic times at Matmar seem to agree well with the recent research on the subject which uses a different methodological approach (Wilkinson 1996:47-49, 75).

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Renee Friedman

Regional diversity in the Predynastic pottery of Upper Egyptian settlements

Introduction

Since the discovery of the mortuary remains of Predynastic cultures in Upper Egypt a little over a century ago, the pottery found within the numerous graves has been used to date, define and chart the social and technological development of these earliest settled inhabitants of the Nile Valley. The ceramics from the settlements of Predynastic Upper Egypt, however, have hitherto never been fully described, and this diverse body of information has remained an unexploited resource for furthering our understanding of the developments and interactions which led to the establishment of the Dynastic Egyptian state.

During the heyday of Predynastic research in the early part of this century cemeteries were the focus of attention, but some 20 settlements were also identified. Although only a handful of them were excavated, each one produced a huge amount of pottery. Because the early excavators were hampered by the lack of a relevant framework from which to study these settlement assemblages, the ubiquitous rough wares were generally ignored in favour of more familiar and attractive finer wares. It was on the basis of the relatively rare polished wares and their comparable forms in cemeteries that the settlements were dated and their ceramic contents characterized. An examination of the complete ceramic assemblages from the recent excavation within the Upper Egyptian settlements has revealed that many important insights into Predynastic culture and its regional characteristics were overlooked by previous investigators using traditional descriptive methods (Friedman 1994).

Settlement Pottery

In order to describe and compare the full range of diversity found within

the ceramic assemblages of settlement sites over time and space, the pottery from recently excavated portions of various localities within the settlements at Hierakonpolis, Nagada and Hemamieh was examined (Fig. 1). Geographically, the sites furnish ceramic samples from the full extent of what has been considered the heartland of Upper Egyptian Predynastic culture. The northernmost sector of the Upper Egyptian cultural milieu in the Badari region of Middle Egypt is represented by the selective sample from Caton-Thompson's (1928) excavations at Hemamieh now housed in museums in Britain and is supplemented by the results from the recent re-examination of the site (Holmes and Friedman 1994). The complete ceramic assemblages from a number of localities within the large multi-component site of Hierakonpolis supply the evidence to assess the character of settlement pottery at the southernmost border of what is considered pure Upper Egyptian culture (Hoffman 1972, 1982, 1989; Geller 1984, 1992; Harlan 1985; Friedman 1996). The assemblages from excavations in the Nagada region at a series of small villages and hamlets located along the desert edge collectively called the Khattara sites and also at South Town conducted by Hassan in 1980 (Hassan 1981; Hassan and Matson 1989) exemplify the material from the geographical mid-point of the Upper Egyptian cultural expanse, which, since Kaiser's (1956, 1985) influential work, has been considered the nodal point of mainline Upper Egyptian Predynastic culture.

Together, the ceramic assemblages from these three areas span the entire Predynastic period in Upper Egypt. The evidence from over half a million sherds ranging in date from Badarian, the first undisputed ceramic-bearing occupation in Upper Egypt, to the end of the Predynastic period, or late Gerzean (Nagada IId/IIIa), has been examined. Unfortunately, not every phase is well represented in the ceramic samples available from each region. The shaded areas in figure 1 indicate the periods covered by the studied sample. Nevertheless, comparable assemblages from the late Nagada I/early Nagada II period, here called Amratian to avoid confusion with phases determined from the study of the mortuary sphere (Kaiser 1957), and the Gerzean, or Nagada IIc-d, were present at all three sites providing sufficient temporal overlap for meaningful comparison within these two major traditional subdivisions of the Upper Egyptian chronological and cultural sequence.

The examination of the ceramic material utilized a modified version of the taxonomic classification system devised by Hoffman and Berger (1982) specifically to record potsherds. This system places at the primary level fabric as defined by a combination of clay type (Nile silt or marl) and macroscopically visible tempering agents (e.g., organic matter, straw, grog, shale, etc.), which, for the most part, appear to have been purposeful additions to the clay. Shape, as subjectively and empirically determined from the diagnostic sherds, is bound to fabric. The independent variables of surface treatment and decoration are considered in relationship to both fabric and shape.

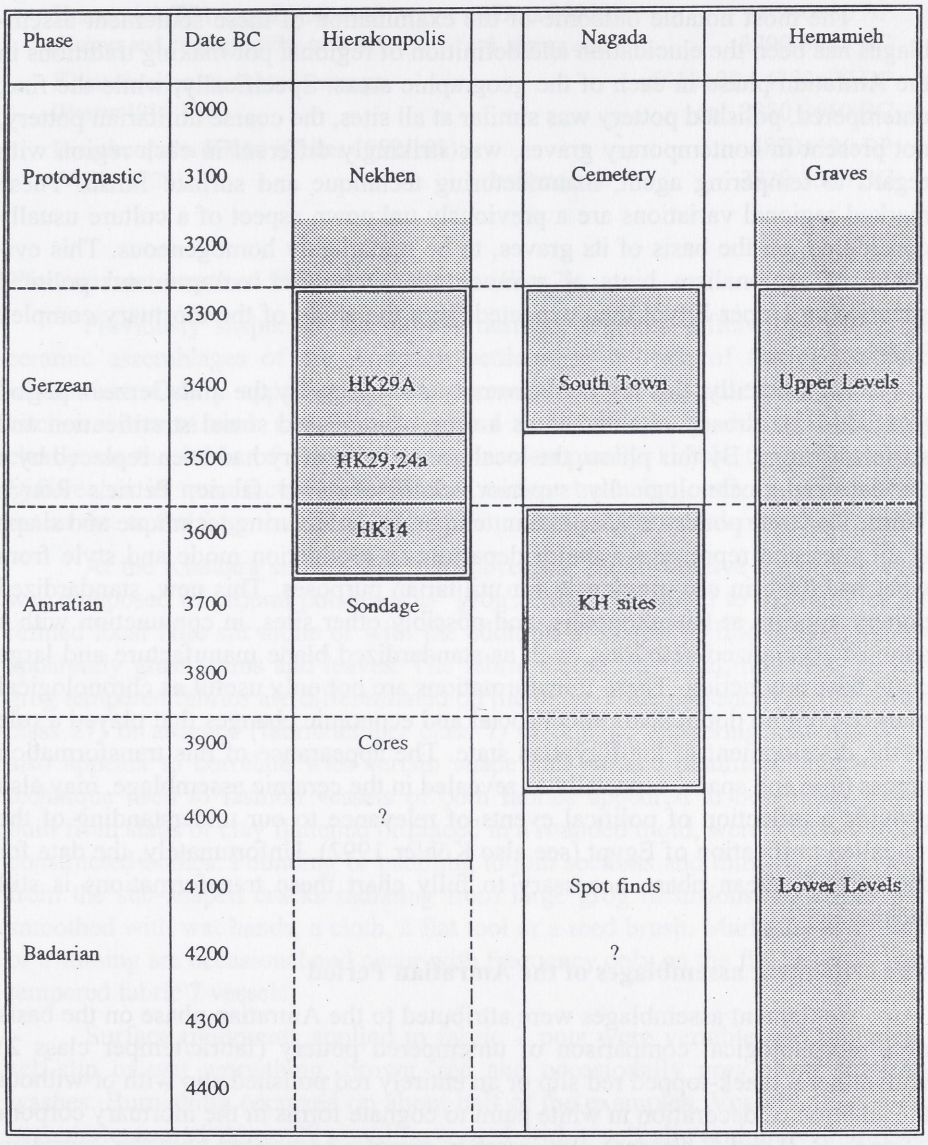

Fig. 1. The temporal range of the Predynastic sites of Hierakonpolis, Nagada and Hemamieh. Shaded areas refer to periods for which the ceramic sample has been examined.

The most notable outcome of the examination of these settlement assemblages has been the elucidation and definition of regional pot-making traditions in the Amratian phase in each of the geographic areas. Specifically, while the fine, untempered, polished pottery was similar at all sites, the coarse utilitarian pottery, not present in contemporary graves, was strikingly different in each region with regard to tempering agent, manufacturing technique and surface finish. These marked regional variations are a previously unknown aspect of a culture usually considered, on the basis of its graves, to be remarkably homogeneous. This evidence of regionalism hints at a much more complex cultural and political situation in Upper Egypt than expected from the study of the mortuary complex alone.

Significantly, this regional diversity disappears by the mid-Gerzean period (Nagada IIc), already established as a time of increased social stratification and societal change. By this phase, the local utilitarian pottery had been replaced by a standardized, technologically superior, chaff-tempered fabric; Petrie's Rough Ware. This new pottery is identical in temper, manufacturing technique and shape at all sites and represents a major departure in production mode and style from what had been in use previously for utilitarian purposes. This new, standardized pottery appears at Hierakonpolis, and possibly other sites, in conjunction with a suite of specialized activities, such as standardized blade manufacture and large scale beer production. These transformations are not only useful as chronological markers, but no doubt also reflect social and economic changes that played a role in the development of the Egyptian state. The appearance of this transformation across time and space, especially as revealed in the ceramic assemblage, may also provide a reflection of political events of relevance to our understanding of the so-called unification of Egypt (see also Köhler 1992). Unfortunately, the data for the early Gerzean phase necessary to fully chart these transformations is still lacking.

The settlement assemblages of the Amratian Period

Settlement assemblages were attributed to the Amratian phase on the basis of a morphological comparison of untempered pottery (fabric/temper class 2) with either a black-topped red slip or an entirely red polished slip with or without the addition of decoration in white paint to cognate forms in the mortuary corpora (Petrie's B, P and C classes). Radiocarbon samples associated with the Amratian assemblages at each site have yielded the dates commensurate with this cultural attribution. The Amratian assemblages however were most clearly distinguished by the distinctive temper of the utilitarian wares which were local to each region which made up from approximately 54% (Nagada) to 23% (Hierakonpolis Locality HK14) of the complete ceramic collection.

Hemamieh TP1 Level 6 internal	(Beta 35823)	4940±80 BP
(Holmes and Friedman 1994: table 10)	1 sigma cal.	3790-3645 BC
Khattara sites, weighted average		5015±80 - 4780±70 BP
(Hassan 1984, 1985)		cal. 3850-3650 BC
Hierakonpolis HK14 (Geller 1992:182)		4820±120 BP
(WSU 1729)	1 sigma cal.	3720-3500 BC

The coarse-tempered Utilitarian Wares (Fig. 2)

Previously suspected, but poorly defined, regional differences within the ceramic assemblages of the Amratian settlements in each of the geographical regions are clearly apparent from an examination of the utilitarian pottery or kitchen wares at each site. Three regional traditions can be distinguished most clearly on the basis of the choice of macroscopically visible tempering agent. Differences in manufacturing technique, surface treatment, and, only to a lesser extent due to the fragmentary nature of the material, shape can also be discerned.

At the Khattara sites of the Nagada region, the distinctive tempering agent was composed of ground potsherds or `grog'. Grog was added to the more or less refined local Nile silt alone or with the addition of coarse to fine organic matter, apparently grass stems and leaves. The fabric recipe was fluid; however, the two grog tempered fabrics are differentiated on the basis of the presence (fabric/ temper class 27) or absence (fabric/temper class 7) of organic tempering material which also appears to correlate with certain shape and surface treatment choices. The technique used to fashion vessels of both fabrics appeared to be similar. Bases, built from slabs of clay flattened or placed in a rounded mold, were attached to coil constructed bodies. Pounding or paddling to join sections and thin walls is evident from the star-shaped cracks radiating from large grog inclusions. Exteriors were smoothed with wet hands, a cloth, a flat tool or a reed brush. Marks from scraping or trimming are occasional and occur with frequency only on the flat bases of grog-tempered fabric 7 vessels.

Surface treatments applied to fabric 7 pots were variable and included a self-slip or wet smoothing, brown, red and occasionally grey-black slips and washes. Burnishing occurred on about half of the examples. Vessels of grog and organic-tempered fabric 27 could be coated with a self slip and either burnished or lightly polished and buffed with a piece of leather or cloth, but were most frequently left untreated and little effort was made to eradicate the surface irregularities. Decoration in the form of incision (while wet) across the top of the rim was applied to a small percentage of bowls and jars of both fabrics. Other forms of decoration are very rare.

Recognizable shapes (Fig. 2) are limited to deep and shallow bowls of

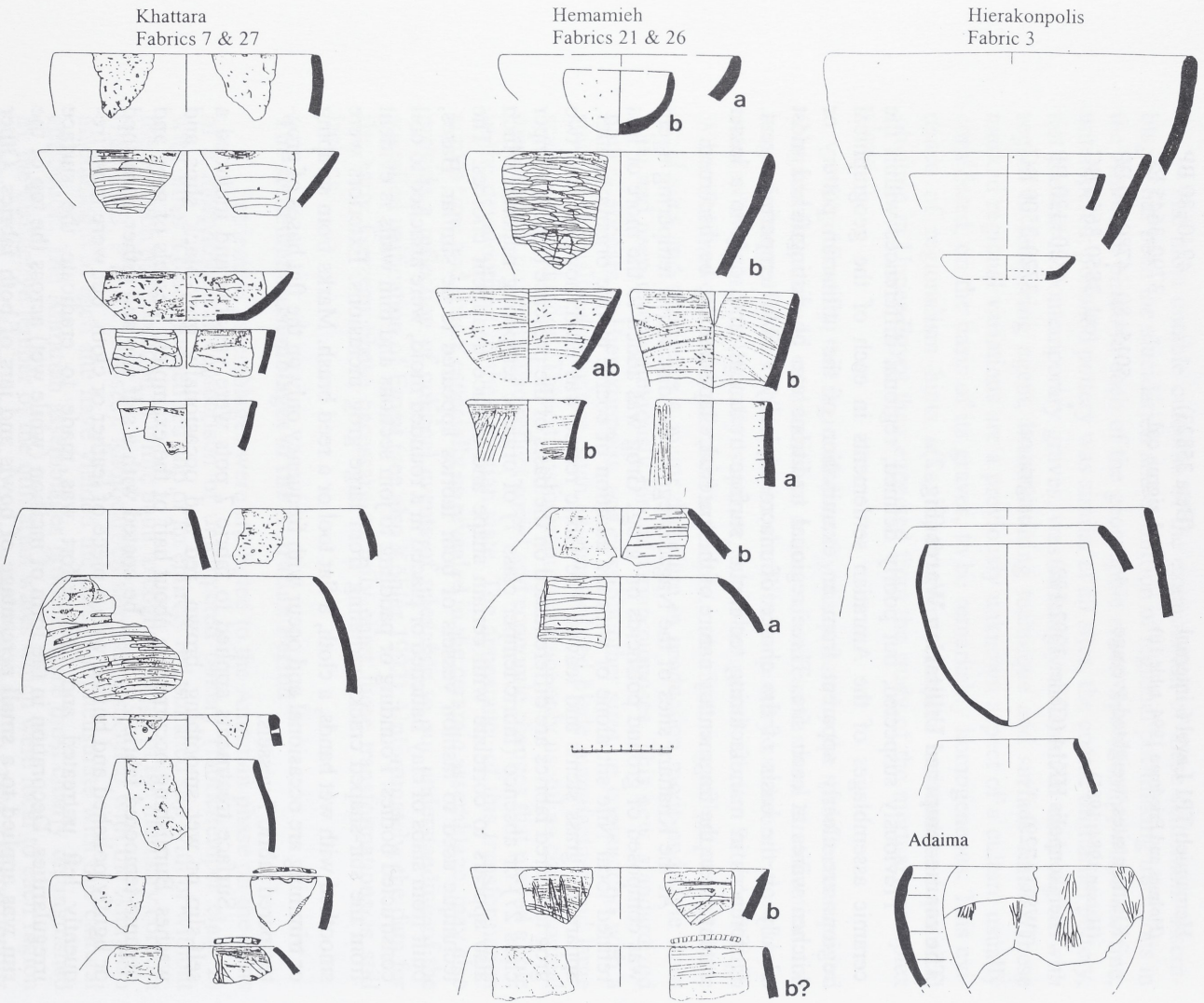

Fig. 2. Coarse-tempered utilitarian wares from settlements of the Amratian period.

various sizes with sloping or curving wall- profiles and globular or bag-shaped hole-mouth jars (a.k.a. deep restricted bowls) with direct rims and relatively unrestricted orifices in relation to the sloping or curving shoulder. Rims, with rare exceptions, are direct and the flattening of the rim top appears to be a regionally significant attribute of the Nagada area. Bowls and jars with modeled rims, and jars with a concave upper body, i.e., jars with S-shaped profiles, are extremely rare and are made almost exclusively of fabric 7. Both flat and round bases were recovered. Rim to base profiles are preserved only for two shallow, flat based bowls. It is assumed that the majority of similar bowls had flat bases, while jars had flat or rounded bases.

At Hierakonpolis Localities HK14, a domestic site, and HK24A, a brewery, the local fabric in the Amratian phase was tempered with shale fragments (fabric/ temper class 3). The surfaces were wet smoothed and occasionally coated with a red ocherous wash, but rarely burnished. It is assumed that the larger vessels were constructed from coils or slabs of clay, although all surface indications have been eradicated. There is no evidence of paddling to smooth joins, although many, but not all, tabular shale inclusions are oriented parallel to the surface. Shapes (Fig. 2) are limited to jars and relatively deep bowls with direct rims, curving wall profiles, and apparently flat bases; however, round bases in this fabric have also been recovered.

The nature of the local variant in the Amratian period in the Badari region is more difficult to define due to limitations of the sample. An Amratian assemblage was only distinguished at the 3'6 level below the surface from Caton-Thompson's (1928) excavation records and only a selective collection of these sherds has been retained in museums. What has been considered Amratian pottery also occurred in deeper levels in conjunction with Badarian pottery (see Caton-Thompson and Whittle 1975; Friedman 1994). The assemblages from the recent re-excavation of Hemamieh suggest that the Amratian utilitarian wares were, in part, a continuation and outgrowth of the wares of the Badarian phase (Holmes and Friedman 1994). The two phases are therefore considered as a unit in this discussion.

In the Badarian period, the local utilitarian pottery is distinguished by the addition of coarse organic matter, apparently chopped grass stems, to the more or less refined Nile silt (fabric/temper class 21 = Brunton's Badarian Rough Brown class). This fabric is part of a continuum which incorporates a fabric characterized by the presence of fine organic material which may be a natural inclusion in unrefined Nile silt (fabric/temper class 26 = parts of Brunton's Badarian Smooth Brown class). These two fabric classes are distinguished here for descriptive purposes and because certain shapes appear to be fabric specific. The number of diagnostic examples from arguably Amratian levels at Hemamieh is admittedly small (see Fig. 2 shapes marked a), but they appear quite similar to the Badarian

examples in fabric, surface treatment and the simplicity of form. The surface treatment applied to the tempered fabrics in both periods was most often a brown or self slip which had been burnished with a pebble while still moist or loosely burnished when leather-hard. None of the limited number of Amratian examples was decorated, but in Badarian levels decoration takes the form of finger channeling and rim top incision.

The fully quantified ceramic samples from the test pits of the recent re-excavation of Hemamieh indicate that vessels of both fabric 21 and fabric 26 continued to be present throughout the Amratian, although in diminishing numbers (Holmes and Friedman 1994: fig. 20). Gradually, these fabrics were supplanted by straw-tempered pottery of still undetermined shape, often coated with a thick black, red, or brown slip which was occasionally burnished. This straw-tempered fabric (fabric/temper class 1) falls within the range of variation of the utilitarian wares of the Badarian phase according to Brunton (1928:23f), and a limited number of fragments were recovered in the Badarian levels of the recent test excavations.

It should be noted that straw-tempered pottery was also reported at Hierakonpolis in all levels of the deep cores at Nekhen which may extend back to the Badarian (Hoffman 1989). Although not common in any of the Amratian assemblages examined for this study, it is only at the Khattara sites of the Nagada region that straw-tempered pottery is conspicuous by its virtual absence. The subsequent popularity of mass-produced straw-tempered pottery does not appear to stem from these early homemade occurrences, but can only be understood in terms of changes in utility pottery acquisition and production in the Gerzean phase.

At all three sites in the Amratian phase, the regionally distinct utilitarian vessels, be they tempered with coarse organics, grog, or shale, were used for essentially the same purposes. Use-related residues indicate that these vessels were often used as cooking pots and in other food preparation contexts. From the technological point of view, each of the regionally distinct temper choices was well suited to the task of cooking. Large pieces of temper of any type, but particularly grog and mineral tempers like shale, will mitigate thermal shock and crack propagation, and promote the transfer of heat to the contents (Rye 1981; Rice 1987). The choice of tempering agent and the range of simple shapes in each fabric were no doubt influenced by functional concerns as well as tradition. The fluid recipe for each regionally defined fabric and the non-standardized range of size and shape of the vessels suggest that the production of these utilitarian wares took place in the household for personal household use.

The untempered Polished Wares (Fig. 3-4)

In contrast to the regionally distinct traditions of household-based utilitarian pottery production, the untempered polished wares (fabric/temper class 2) of the

Amratian phases with black-topped red and entirely red polished surface treatments with and without additional white painted decoration (Petrie's B, P and C wares) at all three sites show a marked similarity in paste preparation, shaping modes, firing technology, surface treatment and decorative choices. This class of pottery has its own repertoire of shapes, mode of manufacture and a developmental trajectory that separates it from the coarse- tempered utilitarian wares. Shapes such as beakers with direct and everted rims, bowls with everted rims, modeled and everted rim jars, and carinated bowls and jars appear to be restricted to the untempered polished wares.

Despite the overall similarities among the untempered polished ware assemblages, minor, but possibly regionally significant, morphological differences are apparent. Thus, distribution from a central source can be ruled out. Local production of this pottery is also attested by the discovery of kilns at Hierakonpolis (Geller 1984) apparently dedicated to the production of untempered pottery, and from the analysis of the silts used to make untempered polished red and black-topped pottery at Armant and Hierakonpolis which shows the sediments to be local to each site (Ginter *et al.* 1985:38; Allen and Rogers 1982). Both sets of evidence suggest that manufacture of this uniform and labor intensive pottery was in the hands of specialists who were well versed in the general fashion prevailing throughout Upper Egypt. All sites exhibit pottery with the same fine level of clay preparation and cleaning; the same care taken to eradicate surface irregularities; the same ideas about surface treatment, finishing and decoration (with certain regional (?) differences); and the same control of the kilning process which usually resulted in well fired red slipped pottery, with or without the secondary black-topping treatment.

Further evidence that this pottery was produced by specialists is supplied by the limited presence of vessels composed of fine organic-tempered, or, more likely, unrefined Nile silt (fabric/temper class 26) at both Khattara and Hemamieh. Some of the vessels of this fabric are clearly amateur attempts at imitating the finer red polished untempered pots. The shapes are often irregular, the walls are thicker, the surface finish is often streaky, and the colour is variable (but most often brown or mottled), indicating poor control of the kiln atmosphere. None of the examples is black-topped. The contrast in quality between the vessels of these two fabrics certainly suggests that those made of fabric/temper class 26 are homemade and home-fired products, made along side the utilitarian wares, perhaps only when the specialists-made vessels were unavailable or unaffordable.

All of the upper body shapes of the untempered polished wares distinguished in the settlement assemblages have parallels among the B, P, C and F ware classes of the mortuary corpora, although not necessarily in the corresponding surface treatment-based ware class. The distinction between surface treatment and

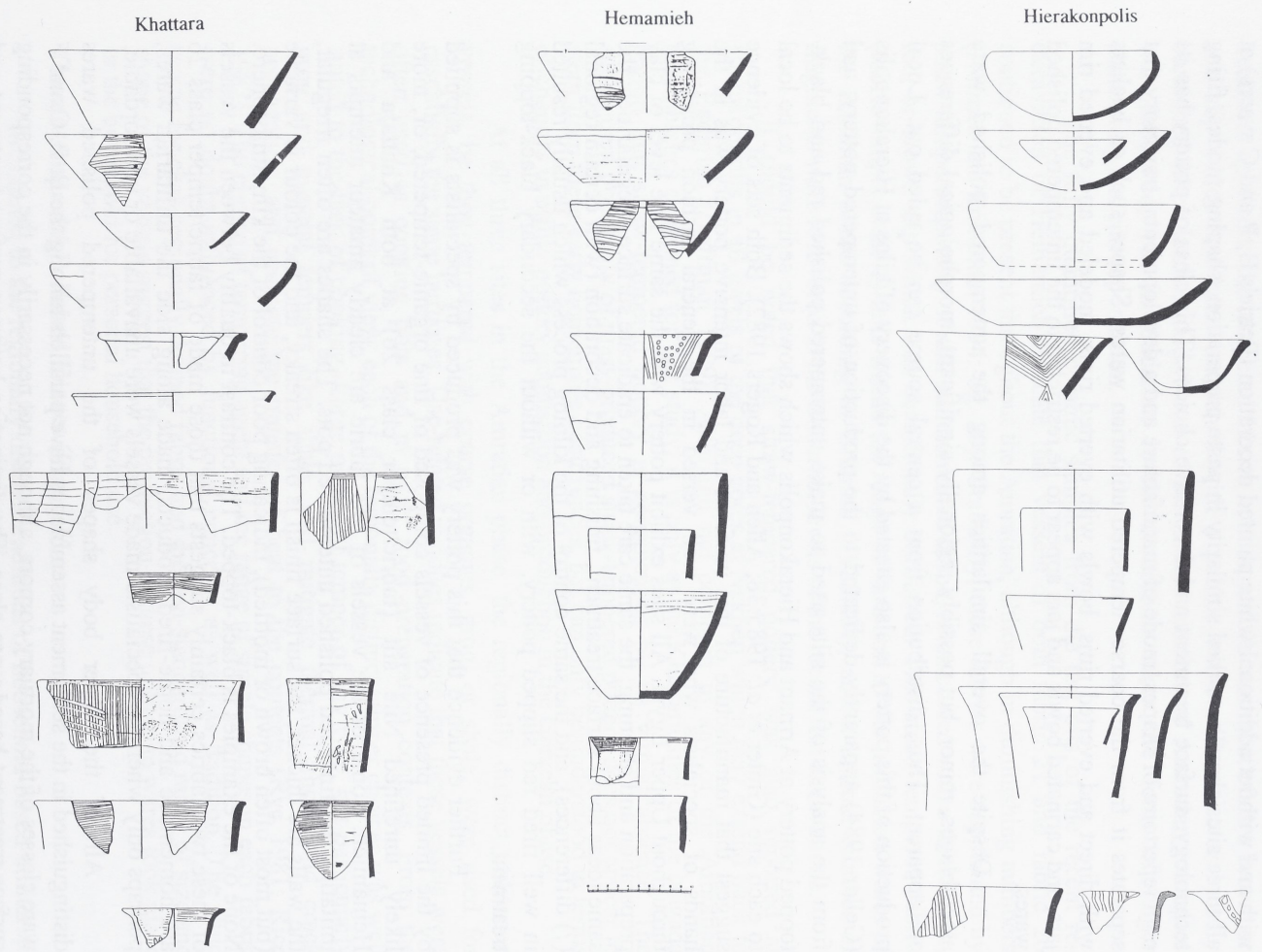

Fig 3. Untempered Nile silt fabric: open forms.



Fig. 4. Untempered Nile silt fabric: closed forms.

shape suggested by the traditional B and P ware mortuary classes does not appear to be so clearly defined in settlement contexts. Although certain shapes occur only with a black-top (e.g., certain beakers and everted rim jars) or only with an entirely red surface (e.g., everted rim and carinated bowls), other shapes may occur with either a black-topped or entirely red-slipped surface and only minor, if any, morphological differences which correlate with the surface treatment choice. This does not mean that surface colour was an arbitrary decision; certain preferences are clear and correspond to those visible in the mortuary corpora. Bowls are most often, but not always, red-slipped and polished, while jars and beakers are most frequently, but not invariably, black-topped. In particular, beakers and jars with very large orifice diameters often occur without the usual black-top, perhaps due to the practical difficulties of manipulating such large vessels during the black-topping process. Only the application of white painted decoration correlates strongly with shape. Within the settlement finds, Petrie's C ware is essentially restricted to red polished bowls and beakers with everted rim, although isolated examples of sloping walled bowls, carinated bowls, and perhaps bottles with white painted decoration have also been found. In order to avoid repetition of the same shape, figures 3-4 illustrate the shape range of the untempered polished wares at each site irrespective of surface treatment.

Regional, as opposed to temporally, distinct features may be seen, for example, in the relatively minor morphological differences between the round based bowls of the Khattara sites and Hierakonpolis. The hemispherical bowls at Hierakonpolis often have an incurving rim, and the wall profile is curved. At Khattara, the wall profile is straight and sloping and the rims, never incurving, are more frequently flattened than at any other site. Further, while the bowls from Hierakonpolis are always clearly burnished with a pebble, the bowls at Khattara are often only polished or buffed with a piece of leather or a cloth. Due to the small size of the sample and the selective retention of sherds at Hemamieh, the regional nature, if any, of red polished bowls at that site cannot be assessed.

Regionalism

The distribution of the diverse coarse-tempered pottery traditions and perhaps certain elements of the untempered polished wares correspond to the regional distinctions observed by Holmes (1989) in the lithic material of the same settlements. While the choice of tempering agent distinguishes the utilitarian pottery from each region, fundamental differences with regard to main lithic blank technology and the predominance of certain tool classes serve to define each region for Holmes. Using the information supplied by both the ceramics and the lithics, it is possible to posit the extent of these regions.

The occurrence of grog-tempered and grog and coarse organic-tempered

pottery at the Khattara sites surrounding Nagada and also at Armant (Ginter and Kozlowski 1994:74, 93) and along the desert road linking Nagada and Armant (John and Deborah Darnell, personal communication) indicates that this regional tradition stretched at least as far south as Armant. Sherds of these fabrics found at Armant are also similar to those recovered from the Khattara sites with regard to the range of forms and surface treatment. Ceramic evidence is lacking for the northern limits of the region, but comparison of the lithic data suggests that the northern border of the region lay in the vicinity of Naga Hammadi (Holmes 1989:329-330).

The Hierakonpolis region is distinguished by the use of shale to temper the kitchen wares. The appearance of shale-tempered pottery in the contemporary settlement at Adaima indicates that the region extended northward at least to the area around Esna (Midant-Reynes *et al.* 1990, 1991). However, the occurrence of small amounts of shale- tempered pottery within the Armant settlements suggests some degree of interaction between these two regions (Mond and Myers 1937:50-1, 178-9, Grit-ware). Thus the Hierakonpolis region may have extended further to the north, perhaps to the historical boundary between the Third and Fourth Upper Egyptian nome located at or near Gebelein (Fischer 1961; Brovarski 1977). The southern boundary of the region remains unknown. Shale tempered pottery has also been identified in the Dakhla Oasis, but its exact relationship to these Nile Valley occurrences remains to be explored (Edwards and Hope 1989; Tangri 1992).

The lithic and ceramic traditions in the Badari region thus far appear to be limited to the 35 km stretch of the Badari realm investigated by Brunton and Caton-Thompson (1928). This apparent restriction is due to insufficient evidence from settlements in the Abydos region to the south (but see Patch 1991) and the apparent lack of habitation in the area immediately to the north. Based on similarities with the decoration of C ware in the Badari region, a certain amount of interaction with the northern sites of the Abydos region, which at present is defined only by its C ware style, is evident. Thus, a boundary between these two regions (if there is one) may eventually be found at some point midway between their currently presumed ranges.

The identification of inter-regional variation in the Amratian period within both the lithic and ceramic assemblages of the Upper Egyptian settlements is a significant addition to an understanding of the Predynastic period on several levels. At the very least, the distinct preferences or traditions surrounding the production of domestic necessities, shared beyond the local level and over a relatively large area, indicate the existence of fairly well defined interaction spheres. As these regional traditions are largely seen in the home-made products of the domestic realm, the transmission of these regional methods involved the interaction of people beyond the level of incidental intercommunity exchange.

While Finkenstaedt (1985) suggests that the regionally restricted motifs on C ware indicate a different cultic focus in the Nagada and Abydos regions respectively, Holmes (1989:328) considers it likely that the inter-regional variability of the lithic industries reflects different Predynastic kingdoms or other socio-political units within pre-unified Egypt. Indeed, the hypothetical map of the proto-states of Upper Egypt produced by Kemp (1989: fig.8) simply by calculating equidistant catchment areas around archaeologically rich centers of importance in ancient Egyptian tradition is remarkably close to the geographic range demonstrated by the distribution of the distinct regional traditions within the material culture of the settlements. Despite the evidence of regional divisions dating back perhaps to the beginning of the Predynastic sequence, the political relevance of these regional interaction spheres before the end of the Amratian (although likely) cannot be demonstrated, and it is not at all clear that towns of later significance always served as early nodal points. Nevertheless, the clear identification of social regions in Upper Egypt on an archaeological basis, which may predate divisions into polities but may have formed the basis for them, is an important new addition to the discussion of the origin and development of the early state in Egypt.

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Karla Kroeper

Corpus of potmarks from the Pre/Early Dynastic cemetery at Minshat Abu Omar (Northeastern Delta, Egypt)

Introduction

The site of Minshat Abu Omar in the N-E Delta was excavated by the Munich East Delta expedition from 1978 to 1990 (Kroeper and Wildung 1985; 1994; in press). The cemetery located on a *gezira* hill was used in two distinct time periods: an older, Pre/Early Dynastic period (ca. 3500-2900 BC) and in the Graeco-Roman time (300 BC - 300 AD). At the almost completely excavated cemetery (only the most northern part of the site which was already destroyed was not excavated), 420 Pre/Early Dynastic graves and 2630 Graeco-Roman burials were recorded. According to anthropological evidence the Pre/Early Dynastic population at this site, which probably owed is existence to the fact that it lay on one of the routes to the Near East, showed no unusual traits and seems to have been a "typical" Egyptian population.

During an examination of the surrounding area by means of a grid of drill-holes up to 6m in depth, a settlement of the Early Dynastic and possibly also of older date was found (Krzyzaniak 1993) covered with up to 5 metres of Nile silt.

The graves of the Pre/Early Dynastic period can be subdivided roughly into an older (ca. 3200-3000 BC) and younger group (3000-2900 BC), distinguishable by the type of grave offerings and by the position of the body.

Statistically, the amount of grave goods added to the burials changed with time here, as it did at other cemeteries of the same period: the older graves have on an average 3.7 offerings and only in one case were 36 offerings placed in the grave. The average offerings for the younger group, on the other hand, lies closer to 15.5 offerings, quite a few graves having over 40 offerings. This change in the

display of wealth in the graves can reflect a change in actual wealth (i.e. a growing group of elite) and also in a social awareness, e.g. a will to display wealth and position in the burial. Little difference was found in the grave groups between female and male graves as regards distribution and/or display of wealth.

Vessels with potmarks

The ceramic vessels (2360 pieces) found in the graves in Minshat Abu Omar represent 69% of all objects, the rest of the finds are more precious objects made of stone, copper and ivory. These more exclusive objects represent a rather high percentage of objects, in comparison to other cemeteries of the same period (Castillos 1982).

In this paper the group of vessels with potmarks found in Minshat Abu Omar is to be presented completely since the 322 marks are a significant addition to the published marks which hail mostly from Abydos, Saqqara, Tarkan, Abu Roash and Tura (van den Brink 1992: fig. 4), cemeteries of the same time period. Still under discussion is the function and meaning of the marks, in particular as regards their importance to the beginning of written language in ancient Egypt (Dreyer 1992; 1993; Helck 1985; 1990; Kaiser and Dreyer 1982:227ff.). In particular the *serekhs* (Horus names of kings) of the "0" Dynasty have aroused great interest and discussion in light of their chronological importance to the unification of Egypt (Dreyer 1998; Kaiser 1990; van den Brink 1996; Vernus 1993).

The corpus (Fig. 1-7, Tables 1-2)

The marks, here presented, are as copied from the vessels, not in an abstracted or standardised form (however due to space, not to scale) and as can be seen even similar signs vary a great deal in execution, indicating a kind of handwriting. Certainly these marks, even those on the same vessel type, were not inscribed on a mass production basis. Whereas a great majority of marks consists of abstract strokes or singular signs some few early inscriptions (i.e. *serekhs* and a collection of signs representing early hieroglyph inscriptions) are also present. In general, it can be said that both abstract signs/strokes and inscriptional evidence is present on the pots from Minshat Abu Omar and that both can occur on vessels in the same grave and are therefore contemporaneous. A strict development from abstract strokes to hieroglyphic signs is therefore not indicated. However, a development from early forms of hieroglyphs (e.g. signs for *k3, nṯr* and *ḥwt*) to the developed form used in the Old Kingdom is indicated. A discussion and analysis of the reading/ interpretation of the individual signs is beyond the scope of this paper and will be presented elsewhere.

Two tables have been prepared for presentation of the potmarks/inscriptions. In Table 1 a-h the marks have been grouped for the sake of easier discussion, according to their occurrence on groups belonging to a simplified ceramic

typology. Typological considerations (Kroeper 1989a, b) concerning hand made ceramic where often accidental modelling and deliberate decoration or attributes are difficult to distinguish are to be discussed elsewhere (Kroeper, in preparation). On Table 2 a-f the potmarks are presented according to a preliminary marks typology.

The 22 ceramic forms (Fig. 1-5) presented here are not an exhaustive or detailed typology of all the ceramics in Minshat Abu Omar which is much more extensive - ceramic types exist on which no potmarks occurred, so they are not mentioned in this context. The slogans used for the types have been chosen as a help to identification of the type, they are not meant to indicate contents or function of the vessels – e.g. the wine vessels did not contain wine but are only named thus due to tradition.

The key to Table 1 a-h on which the potmarks/inscriptions are arranged according to the vessel types on which they occur is as follows:

- the numbering in the squares of the drawings indicates the numbering system used at the excavation and in all publications of Minshat Abu Omar so far:
  the first number stands for the grave number,
  the second number is the running number of the object found in the grave;
  for example 1450/19 means: grave 1450/offering no. 19 in the grave;
- other abbreviations:
  H1= vessel is completely hand made;
  H2= bottom is hand made, top finished with a simple turning device;
- type description:
  1. type name mentioned on the plates;
  2. short description;
  3. ceramic material; method of production.

1. ***serekh*-type**
2. Vessels with serekhs and other potmarks: tall ovoid body with rounded shoulders, short neck, profiled lip, flattened base; made of fine Nile clay with a large amount of lime in the matrix; surface smoothed horizontally on top, diagonally on the lower part of the body; on the shoulders impressed or wiped with finger tips, groups of flat bows (mostly 3x3) or sometimes continuous bows; the edges of the bows are often quite sharp; the shape varies from very slim to rather bulbous bodies; height usually between 45-60 cm; this type is very well made, the surface well smoothed and lightly polished;
3. The matrix is middle-fine to fine Nile clay mixed with much crushed lime; surface colour is usually a dusky-red sometimes mixed with cream coloured patches; H2.

1. ***serekh*-other**

Often similar in shape and size to *serekh*-type vessels. Three major distin-

guishing differences to the *serekh*-type occur together or individually ;
2. The lip is usually rounded, not profiled; the decoration around the shoulder varies from short pinches to indentations and scratches; if the shoulder decoration consists of bows, these are not impressed with the fingers but engraved with a tool.
3. The matrix is mostly marl clay;

1. **ovoid rounded large**
2. Vessels with a large ovoid/conical body, rounded shoulders, short neck, rounded lip, small rounded base; over 50 cm high;
3. Both marl and Nile clays occur; surface smoothed; H2.

1. **ovoid flat large**
2. Large ovoid/conical body with rounded shoulders, short neck, rounded lip; small flattened base; surface smoothed; over 50 cm high;
3. Both marl and Nile clays occur; H2.

1. **ovoid rounded small**
2. Vessels with a small ovoid body, rounded bottom, surface well smoothed often slipped; under 50 cm high;
3. Mostly marl clay is used although some are made of Nile clay; H2.

1. **ovoid flat small**
2. Vessel with small ovoid/conical body with rounded shoulders, flattened base, surface smoothened; under 50 cm high;
3. Both marl and Nile clays; H2

1. **ovoid flat rough**
2. Small ovoid/conical body with rounded shoulders, flattened base and surface left rough; many vertical scratches on bottom half of vessel, very thick walls; under 50 cm high;
3. Made of rough Nile clay; H2.

1. **conical**
2. Shoulders almost horizontal, body almost conical, base rounded; short neck, lip mostly rounded;
3. Both marl and Nile clays occur; H2.

1. **barrel shaped**
2. Barrel shaped body with short, mostly straight neck, and usually flattened projecting lip;
3. Both marl and Nile clays occur; surface very smooth, usually red slip; H2.

1. **"nw"-type**
2. Small ball-shaped vessels; varying from ball shaped to ovoid, bottom rounded sometimes slightly pointed; rounded lip, mostly without neck;

3. Rough Nile clay; hand modelled surface mostly left untreated; H1.

1. **cylindrical**
2. Cylindrical body, projecting rounded lip, flattened base;
3. Mostly marl clays; surface well smoothed; H2.

1. **bowl-flat**
2. Low bowls mostly with rounded base; surface mostly roughly smoothed;
3. Nile clay; mostly rough surface; H1.

1. **bowl-deep**
2. Deep bowls; vessels occur in a great variety of shapes, mostly elliptical with Slightly flattened base;
3. Great variety of matrix (marl and Nile clays) and surface treatment occur; both H1 and H2.

1. **other**
2. Vessels with unusual (occurring only one time) shape;
3. Made of both marl and Nile clays; both H1 and H2.

1. **other-import**
2. Imported vessels with unusual shapes, often with handles;
3. Imported fabric; H1.

1. **other-ovoid rounded rough**
2. Vessel with a small ovoid/conical body, large rounded shoulders, rounded bottom; surface left rough, many vertical scratches on bottom half of the vessel; very thick walls under 50 cm high;
3. Rough Nile clay; H2.

1. **other-"hes"-type**
2. Vessels with slim body and convex curve near base, shoulders almost horizontal, straight neck and profiled lip; base flat; usually decorated with 2x triple-groups of impressed decoration (bows) at shoulder height, wiped with fingers;
3. Fine Nile clay similar to *serekh*-type; surface lightly polished, dusky red; H2:

The following group of **wine type vessels 0-4** shows a great variety of shapes and decoration. The major distinguishing characteristic, besides body shape, is the horizontally applied, or lacking thereof, of rope decorations - ropes applied at various irregular heights on the body of the vessel. These ropes (except in very few cases) are flat and carelessly applied making it difficult in some cases (due to bad surface condition) to say with certainty if a rope decoration is present. In rare cases the ropes are thick and impressed with the fingers to form a kind of thick wavy rope. The size varies from 60-84 cm in height. The wine-type has here been subdivided into 4 groups for the sake of easier presentation. The suggestion made at various times that a chronological development of the wine-

jars is reflected in the amount of ropes applied (3 ropes-older, no ropes- younger) can not be confirmed in Minshat Abu Omar: in graves 1590, 2275 2590, 2900, 3040 wine vessels of all types can be found in one and the same grave.

Another vessel type similar in size, here called ***serekh*-other large**, is often classed with the wine jars in literature although they have a distinctive shape and decoration (see below).

1. **wine-type 0-4;** The vessels have a slim body of tall ovoid shape with slightly rounded shoulder and a small, mostly slightly flattened, base; the rounded or slightly pointed lip sits on a sharp contraction under the lip (no neck).
2. The vessels are made of middle fine Nile clay, mixed with much lime; the surface is usually slipped and smoothed, sometimes rubbed to a buff shine dark red in colour; usually they are rather carelessly made with modelling traces and bumps on the surface; the vessels were made in 3 parts, and the connecting points are usually easily "feelable" on the inside of the vessel; only the upper 3rd of the vessel was finished on a slow turning wheel, the middle and lower part were hand made; H2.

   a. **wine-type 0**
   b. without applied decoration;
   a. **wine-type 1**
   b. one rope at top mostly applied as a flat band around the shoulder area;
   a. **wine-type 2**
   b. two ropes at top, the two bands can be placed at widely differing positions to each other;
   a. **wine-type 3**
   b. two ropes, two on top, one at bottom; in some cases it is difficult to decide if the rope like protrusion near the foot is an applied rope decoration or only a ledge pulled from the foot of the vessel used for handling when the clay was still moist;
   a. **wine-type 4**
   b. one rope at top, one at bottom;

1 ***serekh*-other large**
2. Body more bulbous than wine-type; at the top of shoulder sometimes overlapping, mostly continuous high bows flatly impressed/wiped with fingers; lip rounded, or profiled, base flat;
3. Middle fine Nile clay mixed with much lime; surface well smoothed, sometimes rubbed to a buff shine; more similar in general shape to the *serekh*-types although much larger (70-90 cm) and the production is not of such a high quality as with the *serekh* vessels. The shoulders are wider and the bows applied with a finger are less deeply impressed; H2.

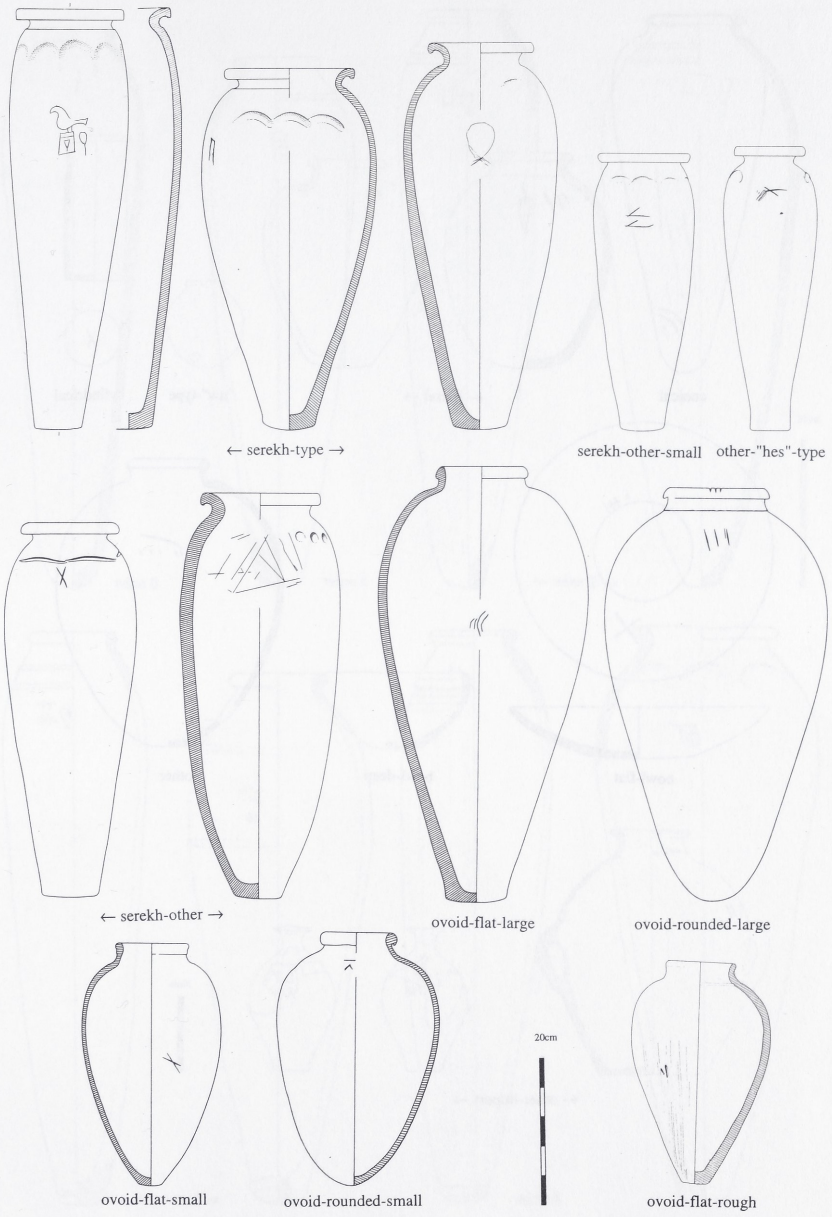


Fig. 1. Ceramic types.

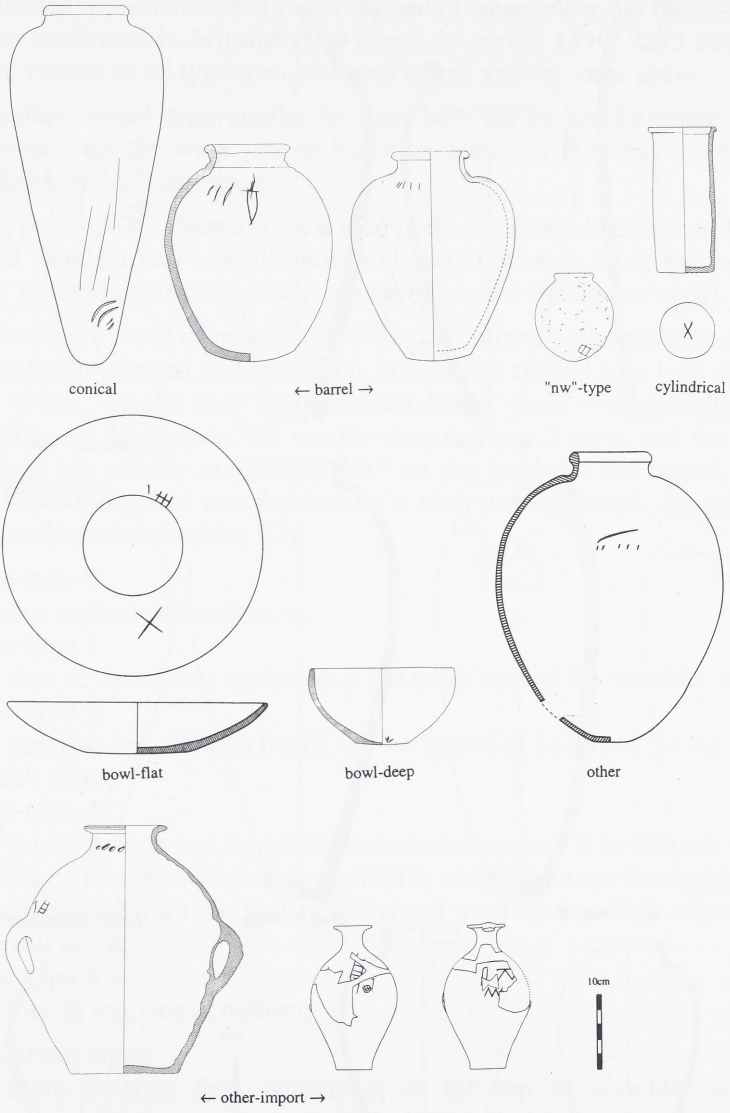


Fig. 2. Ceramic types.

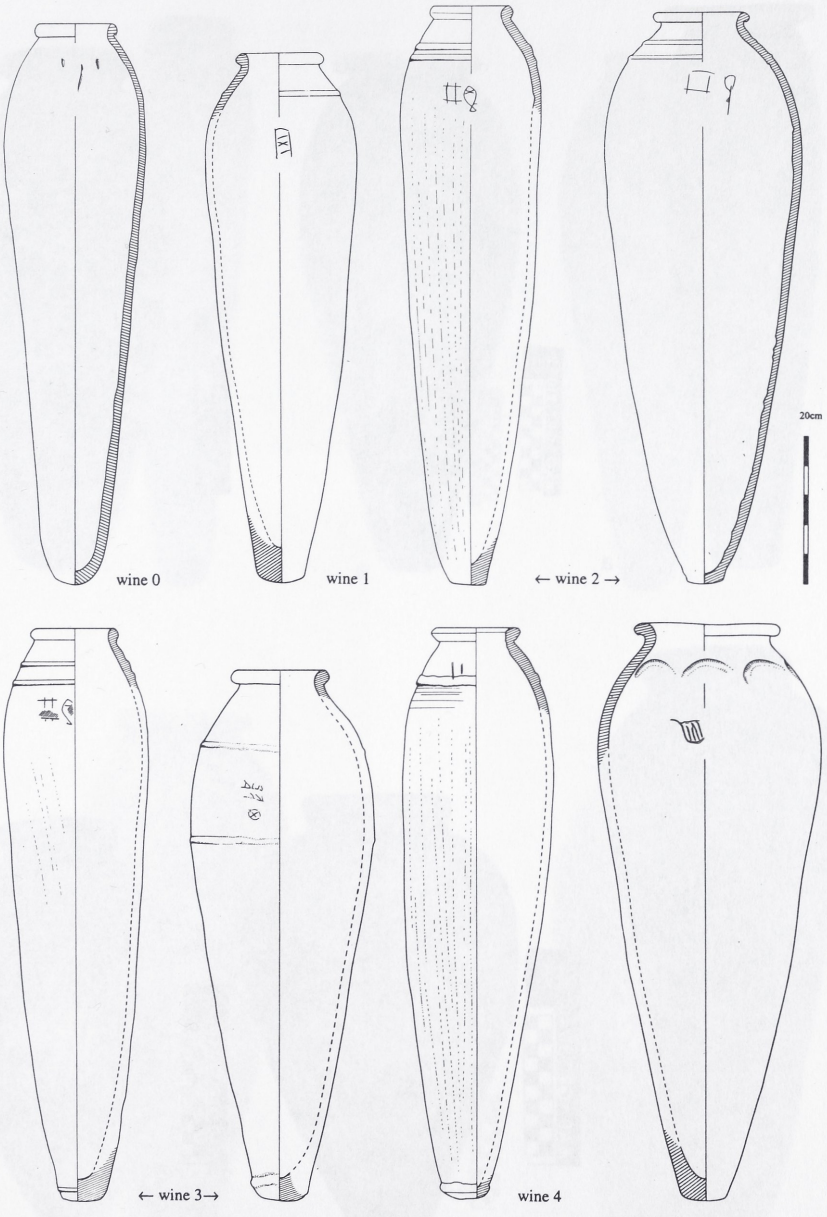


Fig. 3. Ceramic types.



Fig. 4. Ceramic types.

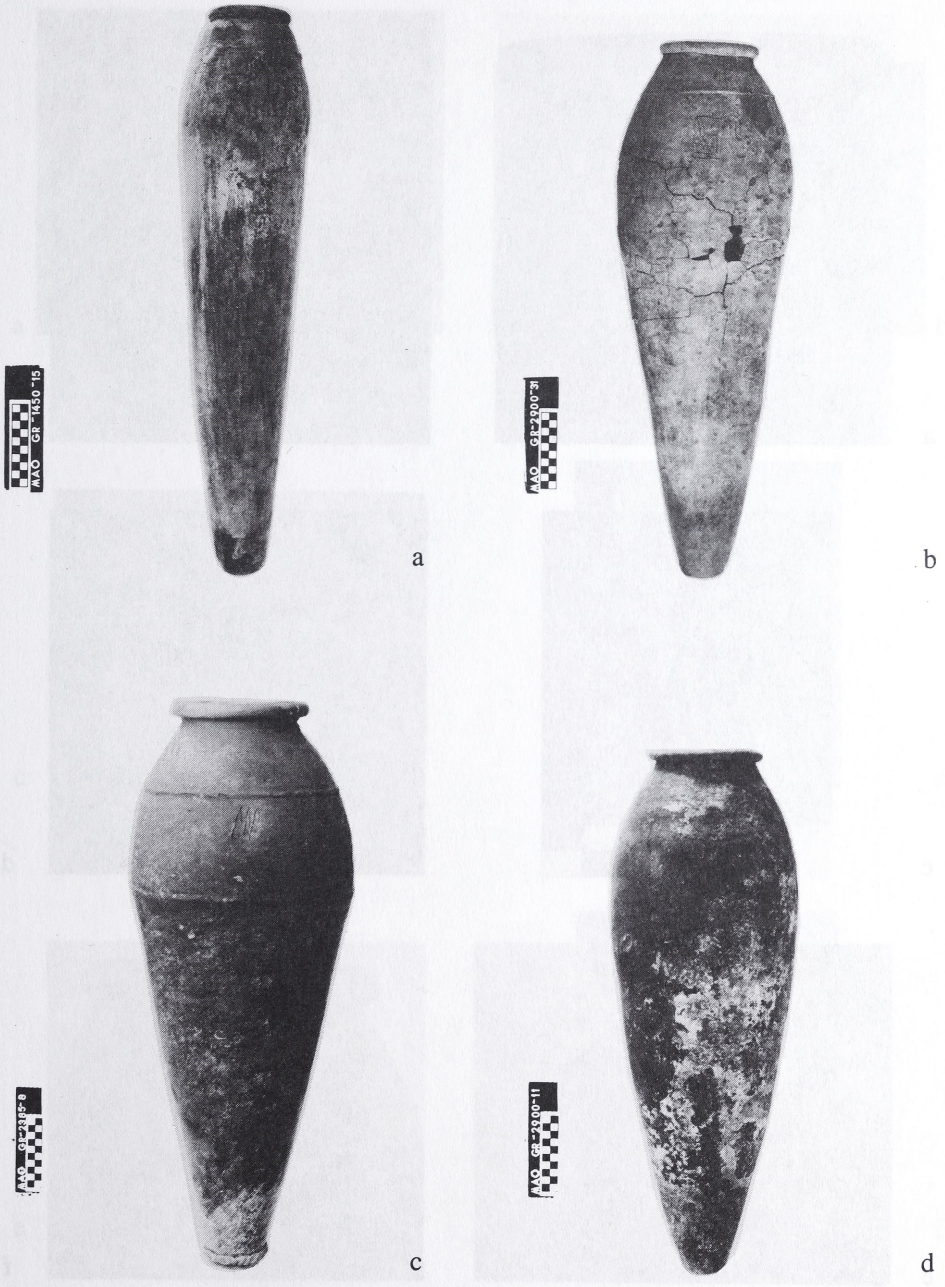


Fig. 5. Ceramic types.



a



b



c



d



e



f

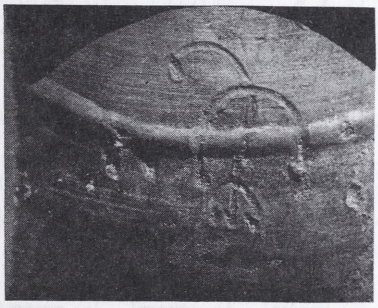
Fig. 6. Potmarks.



a



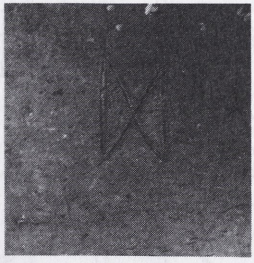
b



c



d



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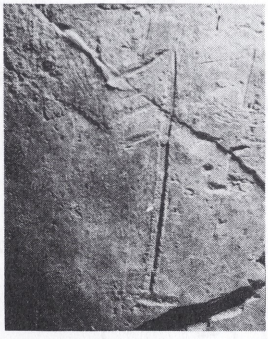


f

Fig. 7. Potmarks.

Table 1 a.
Corpus of potmarks from the Predynastic/Early Dynastic cemetery of Minshat Abu Omar (Egypt).

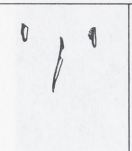
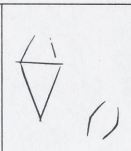
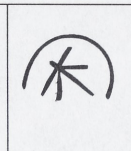
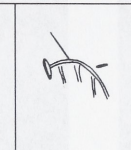
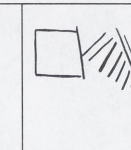
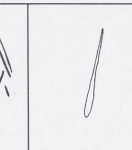
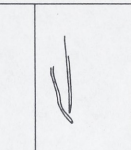
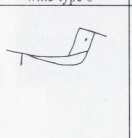
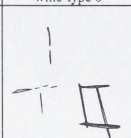
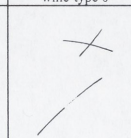
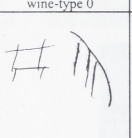
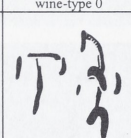
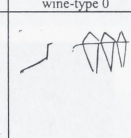
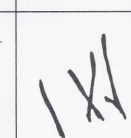
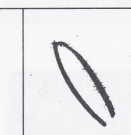
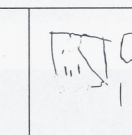
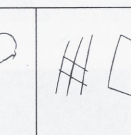
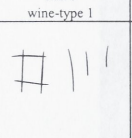
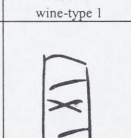
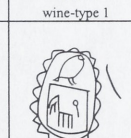
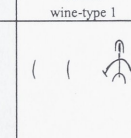
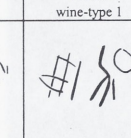
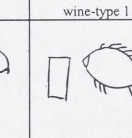
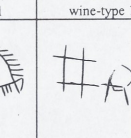
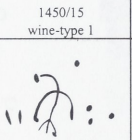
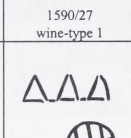
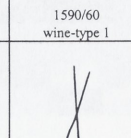
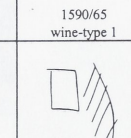
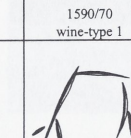
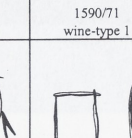
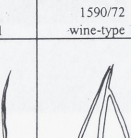
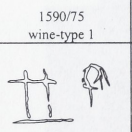
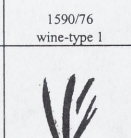
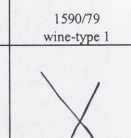
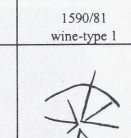
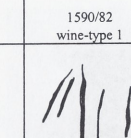
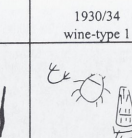
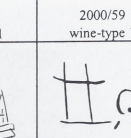
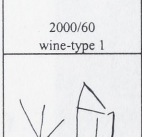
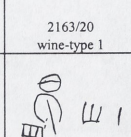
 800/12 wine-type 0	 1450/19 wine-type 0	 1590/66 wine-type 0	 1590/73 wine-type 0	 1590/77 wine-type 0	 2780/13 wine-type 0	 2900/34 wine-type 0
 2990/17 wine-type 0	 3040/15 wine-type 0	 3040/16 wine-type 0				
 886/8 wine-type 1	 1030/13 wine-type 1	 1147/6 wine-type 1	 1147/8 wine-type 1	 1288/9 wine-type 1	 1363/36 wine-type 1	 1430/22 wine-type 1
 1450/15 wine-type 1	 1590/27 wine-type 1	 1590/60 wine-type 1	 1590/65 wine-type 1	 1590/70 wine-type 1	 1590/71 wine-type 1	 1590/72 wine-type 1
 1590/75 wine-type 1	 1590/76 wine-type 1	 1590/79 wine-type 1	 1590/81 wine-type 1	 1590/82 wine-type 1	 1930/34 wine-type 1	 2000/59 wine-type 1
 2000/60 wine-type 1	 2163/20 wine-type 1	 2275/106 wine-type 1	 2275/107 wine-type 1	 2275/110 wine-type 1	 2275/114 wine-type 1	 2275/119 wine-type 1
 2400/19 wine-type 1	 2400/21 wine-type 1	2590/7 wine-type 1	2590/9 wine-type 1	2600/22 wine-type 1	2600/23 wine-type 1	2700/4 wine-type 1

Table 1 b.
Corpus of potmarks from the Predynastic/Early Dynastic cemetery of Minshat Abu Omar (Egypt).

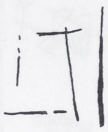
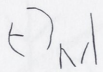
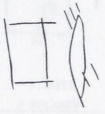
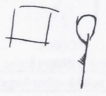
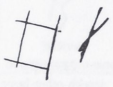
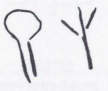
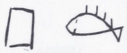
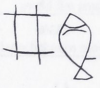
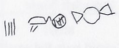
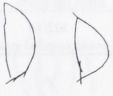
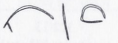
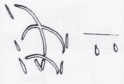
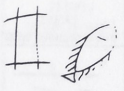
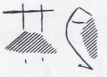
 2700/8 wine-type 1	 2780/15 wine-type 1	 2897/25 wine-type 1	 2897/26 wine-type 1 ?	 2897/56 wine-type 1	 2900/9 wine-type 1	 2900/19 wine-type 1
 2900/29 wine-type 1	 2900/31 wine-type 1	 3009/1 wine-type 1	 3040/14 wine-type 1	 3040/17 wine-type 1	 3040/28 wine-type 1	
 1000/14 wine-type 2	 1000/15 wine-type 2	 1000/17 wine-type 2	 1030/12 wine-type 2	 1040/14 wine-type 2	 1290/11 wine-type 2	 1590/67 wine-type 2
 1590/68 wine-type 2	 1590/83 wine-type 2	 2000/2 wine-type 2	 2000/4 wine-type 2	 2000/26 wine-type 2	 2000/53 wine-type 2	 2235/10 wine-type 2
 2275/108 wine-type 2	 2400/18 wine-type 2	 2400/20 wine-type 2	 2600/20 wine-type 2	 2600/21 wine-type 2	 2700/2 wine-type 2	 2900/32 wine-type 2
 1145/2 wine-type 3	 1363/35 wine-type 3	 1363/37 wine-type 3	 1590/58 wine-type 3	 2275/116 wine-type 3	 2385/8 wine-type 3	2590/5 wine-type 3
2590/10 wine-type 3	3040/36 wine-type 3					

Table 1 c.

Corpus of potmarks from the Predynastic/Early Dynastic cemetery of Minshat Abu Omar (Egypt).

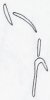
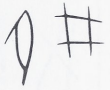
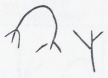
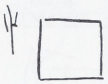
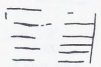
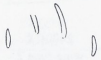
 1450/18 wine-type 4	 2163/21 wine-type 4	 2590/3 wine-type 4	 2780/12 wine-type 4	 2900/30 wine-4	 2163/18 wine-type 4	 1590/61 wine-type 4
 2275/104 wine-type 4	 2590/6 wine-type 4	 2780/14 wine-type 4	 3040/12a wine-type 4	 3040/12b wine-type 4	 3040/56 wine-type 4	
 1590/63 serekh-other-large	 1590/64 serekh-other-large	 1590/78 serekh-other-large	 2275/115 serekh-other-large	 2295/32 serekh-other-large	 2900/8 serekh-other-large	 2900/11 serekh-other-large
 2900/33 serekh-other-large						
 322/13 ovoid rounded small	 322/14 ovoid rounded small	 590/4 ovoid rounded small	 800/10 ovoid rounded small	 883/1 ovoid rounded small	 883/2 ovoid rounded small	 883/6 ovoid rounded small
 900/7 ovoid rounded small	 900/18 ovoid rounded small	 1030/24 ovoid rounded small	 1147/10 ovoid rounded small	 1150/1 ovoid rounded small	 1150/2 ovoid rounded small	 1277/10 ovoid rounded small
 1281/3 ovoid rounded small	 1290/15 ovoid rounded small	 1346/13 ovoid rounded small	 1346/14 ovoid rounded small	1365/23 ovoid rounded small	1590/17 ovoid rounded small	1590/25 ovoid rounded small
1590/30 ovoid rounded small	1590/42 ovoid rounded small	1590/45 ovoid rounded small	1590/47 ovoid rounded small	1590/48 ovoid rounded small	1590/90 ovoid rounded small	1590/94 ovoid rounded small

Table 1 d.

Corpus of potmarks from the Predynastic/Early Dynastic cemetery of Minshat Abu Omar (Egypt).

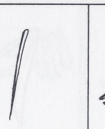
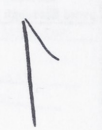
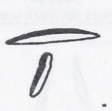
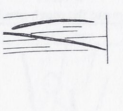
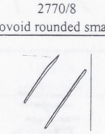
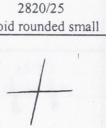
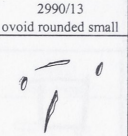
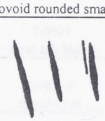
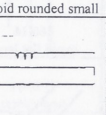
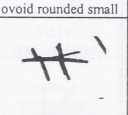
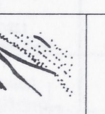
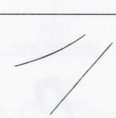
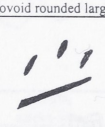
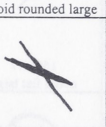
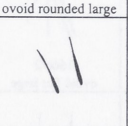
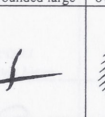
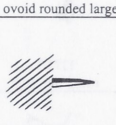
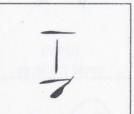
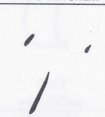
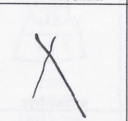
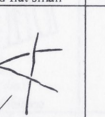
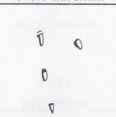
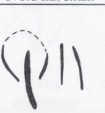
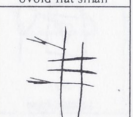
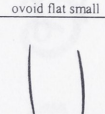
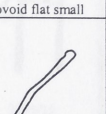
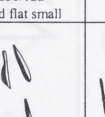
 1705/7 ovoid rounded small	 1710/4 ovoid rounded small	 2110/10 ovoid rounded small	 2254/2 ovoid rounded small	 2295/10 ovoid rounded small	 2354/4 ovoid rounded small	 2770/6 ovoid rounded small
 2770/8 ovoid rounded small	 2820/25 ovoid rounded small	 2990/13 ovoid rounded small	 2990/14 ovoid rounded small	 2990/15 ovoid rounded small	 2990/16a ovoid rounded small	 2990/16b ovoid rounded small
 3009/21 ovoid rounded small	 3040/37 ovoid rounded small	 3040/40 ovoid rounded small				
 1127/1a ovoid rounded large	 1127/1b ovoid rounded large	 1705/1a ovoid rounded large	 1705/1b ovoid rounded large	 1705/1c ovoid rounded large		
 44/10 ovoid flat small	 1030/8 ovoid flat small	 1150/11 ovoid flat small	 1295/4 ovoid flat small	 1346/12 ovoid flat small	 1365/20 ovoid flat small	 1375/3 ovoid flat small
 1640/5 ovoid flat small	 1710/1 ovoid flat small	 2230/10 ovoid flat small	 2230/12a ovoid flat small	 2230/12b ovoid flat small	 2354/6 ovoid flat small	 2385/11 ovoid flat small
 2400/14 ovoid flat small	 3020/7 ovoid flat small	 3040/26 ovoid flat small	 3040/30 ovoid flat small	3040/41 ovoid flat small	3040/44 ovoid flat small	3040/46 ovoid flat small
3040/47 ovoid flat small	3040/53 ovoid flat small	3040/54 ovoid flat small				

Table 1 e.

Corpus of potmarks from the Predynastic/Early Dynastic cemetery of Minshat Abu Omar (Egypt).

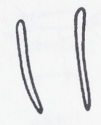
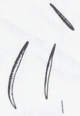
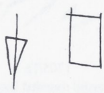
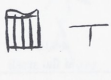
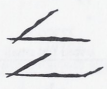
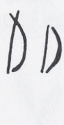
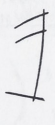
 2780/17 ovoid flat rough small	 2899/10 ovoid flat rough small	 2899/12 ovoid flat rough small	 2899/42 ovoid flat rough small	 2899/50 ovoid flat rough small	 2899/59 ovoid flat rough small	 2899/71 ovoid flat rough small
 2900/15 ovoid flat rough small	 2900/36 ovoid flat rough small	 3040/9 ovoid flat rough small				
 109/2 ovoid flat large	 126/1 ovoid flat large	 126/4 ovoid flat large	 128/2 ovoid flat large	 415/1 ovoid flat large	 866/14 ovoid flat large	 1050/1 ovoid flat large
 1050/2 ovoid flat large	 1050/4 ovoid flat large	 1111/1 ovoid flat large	 1590/59 ovoid flat large	 1666/2 ovoid flat large	 1666/17 ovoid flat large	
 44/3 serekh-type	 109/3 serekh-type	 127/7 serekh-type	 160/1 serekh-type	 480/1 serekh-type	 490/3 serekh-type	 520/3 serekh-type
 570/4 serekh-type	 570/5 serekh-type	 590/6 serekh-type	 674/3 serekh-type	 674/4 serekh-type	 740/7 serekh-type	 741/2 serekh-type
 758/8 serekh-type	 1210/1 serekh-type	 1210/2 serekh-type	1210/5 serekh-type	1210/7 serekh-type	1210/9 serekh-type	1210/13 serekh-type

Table 1 f.

Corpus of potmarks from the Predynastic/Early Dynastic cemetery of Minshat Abu Omar (Egypt).

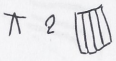
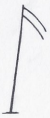
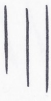
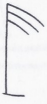
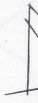
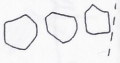
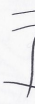
 1210/15 serekh-type	 1210/18 serekh-type	 1210/21 serekh-type	 1210/22 serekh-type	 1210/30 serekh-type	 1210/39 serekh-type ?	 1326/5 serekh-type
 1455/10 serekh-type	 1513/2 serekh-type	 1594/11 serekh-type	 1640/10 serekh-type	 1640/12a serekh-type	 1640/12b serekh-type	 1640/13 serekh-type
 1640/14 serekh-type	 1640/17 serekh-type	 1640/21 serekh-type	 1640/22 serekh-type	 1666/3 serekh-type	 1666/16 serekh-type	 1705/9a serekh-type
 1705/9b serekh-type						
 1709/1 serekh-type	 1800/4 serekh-type	 1800/7 serekh-type	 2030/3 serekh-type	 2105/1 serekh-type	 2200/5 serekh-type	 2254/4 serekh-type?
 2295/8 serekh-type	 2295/15 serekh-type	 2295/16 serekh-type	 2295/17 serekh-type	 2800/3 serekh-type	 2820/24 serekh-type	 2990/11 serekh-type
 127/8 serekh-other	 400/7 serekh-other	 434/14 serekh-other	 740/1 serekh-other	1050/5 serekh-other	1111/6 serekh-other	1127/10 serekh-other

Table 1 g.

Corpus of potmarks from the Predynastic/Early Dynastic cemetery of Minshat Abu Omar (Egypt).



Table 1 h.

Corpus of potmarks from the Predynastic/Early Dynastic cemetery of Minshat Abu Omar (Egypt).

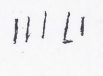
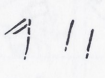
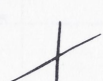
 1859/4 bowl-flat	 1930/24 bowl-flat	 1930/25 bowl-flat	 2000/6 bowl-flat	 2400/5 bowl-flat		
 322/20 bowl-deep	 800/4 bowl-deep	 1143/3 bowl-deep	 1277/2 bowl-deep	 1337/1 bowl-deep	 1362/1 bowl-deep	 1590/23 bowl-deep
 900/29 cylindrical	 900/36 cylindrical	 1287/3 cylindrical	 1345/7 cylindrical	 1513/1 cylindrical	 1594/1 cylindrical	 1594/5 cylindrical
 73/9 other	 1290/7 other	 1859/5 other	 2110/4 other	 2200/18 other		
 1590/93a other-import	 1590/93b other-import	 2275/121 other-import				

Table 2 a.
Potmarks and inscriptions - type-groups.

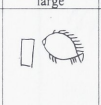
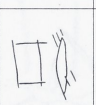
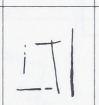
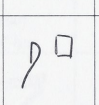
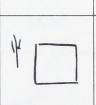
serekhs with and without Horus	 44/3 serekh-type	 160/1 serekh-type	 1800/7 serekh-type	 1640/13 serekh-type	 1590/60 wine-type 1	 520/3 serekh-type	 1210/22 serekh-type		
imported ware - marks applied after firing	 1590/93a other-import	 1590/93b other-import	 2275/121 other-import						
longer inscriptions	 2163/21 wine-type 4	 2400/20 wine-type 2	 2400/21 wine-type 1	 2275/114 wine-type 1					
houses/*hwt*	 2900/33 serekh-other-large	 2400/19 wine-type 1	 2900/31 wine-type 1	 3009/1 wine-type 1					
prl hwt with fish	 1590/71 wine-type 1	 2780/15 wine-type 1	 3040/17 wine-type 1	 1290/11 wine-type 2	 2275/108 wine-type 2	 2275/116 wine-type 3	 1363/37 wine-type 3	 1590/61 wine-type 4	 1590/63 serekh-other-large
prl hwt with second elements	 1930/34 wine-type 1	 2897/25 wine-type 1	 2000/2 wine-type 2	 1590/58 wine-type 3	 1590/78 serekh-other-large	 1450/15 wine-type 1	 1000/14 wine-type 2	 3040/12a wine-type 4	 1590/59 ovoid-flat-large
	 1000/17 wine-type 2	 1590/68 wine-type 2	 2780/14 wine-type 4	 2275/115 serekh-other-large	1590/70 wine-type 1	1590/77 wine-type 0	886/8 wine-type 1	1590/81 wine-type 1	1590/67 wine-type 2
	1000/15 wine-type 2	2900/11 serekh-other-large	2600/21 wine-type 3	2600/20 wine-type 2	1430/22 wine-type 1	2900/8 serekh-other-large	3040/15 wine-type 0	1590/72 wine-type 1	2000/26 wine-type 2

Table 2 b.
Potmarks and inscriptions - type-groups.

	 2000/60 wine-type 1	 2275/119 wine-type 1						
ḫwt ?	 401/2 "nw"-type	 128/2 ovoid-flat-large	 800/10 ovoid-rounded-small	 1254/1 "nw"-type	 415/1 ovoid-flat-large	 1590/64 serekh-other-large	 1513/4 serekh-other	
harpoons and other hooks	 674/3 serekh-type	 1513/2 serekh-type	 2105/1 serekh-type	 740/7 serekh-type	 2385/8 wine-type 3	 2820/25 ovoid rounded-small	 1111/1 ovoid flat large	 674/4 serekh-type
kꜣ	 1640/14 serekh-type	 590/6 serekh-type	 1705/10 barrel	 1590/82 wine-type 1	 2900/32 wine-type 2	 2590/6 wine-type 4		
with *njwt* (?)	 1363/36 wine-type 1	 1590/76 wine -type 1	 2897/56 wine-type 1	 3040/36 wine-type 3				
angles, triangles, segments	 883/2 ovoid rounded small	 1168/1 bowl flat	 1455/10 serekh-type	 883/6 ovoid rounded small	 2000/59 wine-type 1	 2000/53 wine-type 2	 2235/10 wine-type 2	 1594/11 serekh-type	 2254/4 serekh-type
	 2600/22 wine-type 1	 1363/35 wine-type 1	 1450/19 wine-type 0	 758/8 serekh-type	2000/4 wine-type 2	2700/2 wine-type 2			
tall narrow signs	1210/1 serekh-type	1210/21 serekh-type	1277/8 barrel	1594/1 cylindrical	2900/9 wine-type 1				
animal/like	1590/73 wine-type 0	1147/6 wine-type 1	1590/83 wine-type 1	2990/17 wine-type 2	2295/32 serekh-other-large	127/7 serekh-type			

Table 2 c.
Potmarks and inscriptions - type-groups.

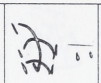
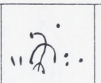
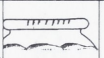
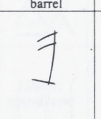
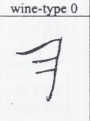
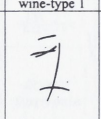
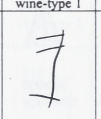
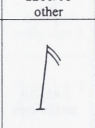
plant/like	 2590/10 wine-type 3	 900/5 bowl-flat	 1145/2 wine-type 2	 1590/75 wine-type 3	 1590/65 wine-type 1	 1040/14 wine-type 2	 2780/12 wine-type 4	 1295/1 serekh-other	 1030/13 wine-type 1
	 434/14 serekh-other	 1030/12 wine-type 2	 2590/3 wine-type 4	 3040/28 wine-type 1	 2900/30 wine-type 4	 570/5 serekh-type	 2770/6 ovoid rounded small	 1590/23 bowl-deep	 1143/3 bowl-deep
	 2163/20 wine-type 1	 2200/5 serekh-type							
simple impressions/ cuts on the lip	 400/7 serekh-other	 1127/1b ovoid rounded large	 1150/1 ovoid rounded small	 1640/21 serekh-type					
sṯb/star	 1030/9 barrel	 1590/66 wine-type 0	 2275/107 wine-type 1	 2900/29 wine-type 1	 2163/18 wine-type 4	 2200/18 other	 1859/5 other	 1666/2 ovoid flat large	
nṯr	 1210/2 serekh-type	 1210/5 serekh-type	 1210/9 serekh-type	 1800/4 serekh-type	 1210/13 serekh-type	 1326/5 serekh-type	 1640/10 serekh-type	 1640/22 serekh-type	1666/3 serekh-type
	2030/3 serekh-type	2400/12 barrel	2899/42 ovoid-flat-rough	2899/50 ovoid-flat-rough	2400/5 bowl-flat	2295/15 serekh-type	570/4 serekh-type	1362/1 bowl-deep	1590/25 ovoid-rounded-small
	2275/110 wine-type 1								
mr-hoes	123/1 bowl-flat	1210/7 serekh-type	1210/15 serekh-type	1513/1 cylindrical	2230/12a ovoid flat small				

Table 2 d.
Potmarks and inscriptions - type-groups.

circle and circular	 490/3 serekh-type	 1210/18 serekh-type	 1709/1 serekh-type	 2990/11 serekh-type	 1050/4 ovoid flat large	 1705/9b serekh-type	 2295/8 serekh-type	 109/3 serekh-type	 1705/9a serekh-type
	 741/2 serekh-other								
crosses	 1127/10 serekh-other	 1640/12a serekh-type	 740/1 serekh-other	 1640/12b serekh-type	 3040/37 ovoid rounded small	 1030/24 ovoid rounded small	 2770/8 ovoid rounded small	 1346/13 ovoid rounded small	 1420/2 "nw"-type
	 1590/79 wine-type 1	 2275/106 wine-type 1	 2700/8 wine-type 1	 3040/56 wine-type 4	 2230/10 ovoid flat small	 1594/5 cylindrical	 900/29 cylindrical	 73/9 other-"hes"-type	 1030/8 ovoid flat small
	 1295/4 ovoid flat large	 1147/10 ovoid rounded small	 322/14 ovoid rounded small	 1277/2 bowl-deep	 800/4 bowl-deep				
cross + other sign	 1710/1 ovoid flat small	 2295/17 serekh-type	 2897/26 wine-type ?	 3040/16 wine-type 0	 1290/3 plate	 1147/8 wine-type 1	 1450/18 wine-type 4	404/1 plate	
single stroke	44/9 conical	1346/12 ovoid flat small	1346/14 ovoid rounded small	2235/5 conical	3020/7 ovoid flat small	2254/2 ovoid rounded small	2295/16 serekh-type	2780/13 wine-type 0	1277/3 bowl-flat
	590/4 ovoid rounded small	1287/3 cylindrical	2700/4 wine-type 1	2820/24 serekh-type					
two strokes or dots	322/11 bowl-flat	480/1 serekh-type	866/14 ovoid flat large	1111/6 serekh-other	1150/11 ovoid flat small	1290/15 ovoid rounded small	1326/7 conical	1337/1 bowl-deep	1363/27 barrel

Table 2 e.
Potmarks and inscriptions - type-groups.

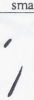
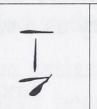
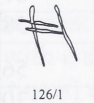
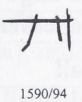
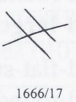
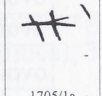
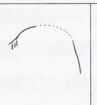
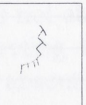
	 1590/18 bowl-flat	 1590/30 oval rounded small	 1590/48 oval rounded small	1666/16 serekh-type	 1710/4 ovoid rounded small	 1705/1c ovoid rounded large	 1930/24 bowl-flat	 1930/25 bowl-flat	 2275/104 wine-type 4
	 2400/14 ovoid flat small	 2780/17 ovoid flat rough small	 2800/3 serekh-type	 2899/10 ovoid flat rough small	 2899/71 ovoid flat rough small	 2900/15 ovoid flat rough small	2900/36 ovoid flat rough small	3009/21 ovoid rounded small	 3040/9 ovoid flat rough small
	3040/44 ovoid flat small	 1281/3 ovoid rounded small	 1288/9 wine-type 1	 2295/10 ovoid rounded small	2000/6 bowl-flat	 2990/15 ovoid rounded small	 2899/59 ovoid flat rough small	 2990/16b ovoid rounded small	 2990/14 ovoid rounded small
3 lines and /or dots	 800/12 wine-type 0	 1640/5 ovoid flat small	 126/4 ovoid flat large	 280/10 conical	 1050/5 serekh-other	 1326/9 serekh-other	 900/36 cylindrical	 1127/1a ovoid rounded large	 1640/17 serekh-type
	 2600/23 wine-type 1	 2900/34 wine-type 0	 2990/16a ovoid rounded small	 3040/41 ovoid flat small	1590/47 ovoid rounded small	2899/12 ovoid flat rough	3040/30 ovoid flat small	3040/47 ovoid flat small	3040/53 ovoid flat small
	3040/54 ovoid flat small	900/7 ovoid rounded small	900/18 ovoid rounded small	2295/9 serekh-other-small	1143/6 plate	322/20 bowl-deep	434/6 conical	1365/23 ovoid rounded small	1265/3 conical
	1277/10 ovoid rounded small	1590/42 ovoid rounded small	1590/45 ovoid rounded small	1705/7 ovoid rounded small	2230/12b ovoid flat small				
4 strokes and/or points	109/2 ovoid flat large	400/1 conical	1150/2 ovoid rounded small	1590/17 ovoid rounded small	1590/51 bowl-flat	1590/90 ovoid rounded small	2275/9 barrel	3040/40 ovoid rounded small	3040/46 ovoid flat small

Table 2 f.
Potmarks and inscriptions - type-groups.

	 1705/1b ovoid rounded large	 44/10 ovoid flat small	 2354/4 ovoid rounded small	 3040/26 ovoid flat small	 1375/3 ovoid flat small	 1345/7 cylindrical	 2990/13 ovoid rounded small	 2110/4 other	 2354/6 ovoid flat small
more than 4 strokes and or dots	 883/1 ovoid rounded small	 1290/7 other	 1365/20 ovoid flat small	 1430/18 plate	 1859/4 bowl-flat	 2275/15 barrel	 3040/12b wine-type 4		
criss-cross	 126/1 ovoid-flat-large	 3040/14 wine-type 1	 2030/1 conical	 322/13 ovoid rounded small	 1050/1 ovoid flat large	 127/8 serekh-other	 1590/94 ovoid rounded small	 1666/17 oval flat large	 1705/1a ovoid rounded large
	 2110/10 ovoidl rounded small	 2385/11 oval flat small	 2590/9 wine-type 1						
singular	 866/9 conical	 1050/2 ovoid flat large	 1590/27 wine-type 1	 2400/18 wine-type 2	 2590/7 wine-type 1	 2900/19 wine-type 1			
fragmentary	 2590/5 wine-type 3	 1210/30 serekh-type	 1210/39 serekh-type?						

Statistical analysis

The distribution of amount of marks on the different ceramic types and overall percentage in the cemetery as a whole is shown in the following chart:

vessel type with potmarks	amount with marks	total amount	% type-groups with potmarks
serekh-type	55	139	39%
serekh-type-small	1	7	14%
***serekh*-types together**	56	146	38%
serekh-other	10	28	36%
ovoid-flat-large	13	23	57%
ovoid-rounded-large	2	3	67%
ovoid-large together	15	26	58%
ovoid-flat-small	24	43	56%
ovoid-rounded-small	43	144	30%
ovoid-small together	67	187	36%
other-ovoid-rounded-rough	1	53	2%
ovoid-flat-rough-small	10	412	2%
ovoid-rough together	11	465	2%
conical	10	48	21%
barrel	7	39	18%
"nw"-type	3	372	1%
cylindrical	7	243	3%
bowl-deep	7	125	6%
bowl-flat	12	50	24%
plate	4	22	18%
other-"hes"-type	1	63	2%
other	3	72	4%
other-import	2	17	12%
wine-type 0	10	15	67%
wine-type 1	48	65	74%
wine-type 2	20	24	83%
wine-type 3	10	10	100%
wine-type 4	12	18	67%
serekh-other-large	8	9	89%
total wine and *serekh*-other-large	108	143	76%

Numerically and by percentage the highest amount of marks is found on the large "wine" vessels (108 pieces) which seems directly related to the increase

in offerings in the graves of this time period (Dynasty 1) and corresponds to the statistics of other cemeteries. In second place appear the ovoid-rounded and flat vessels with 67 marks which mostly occur together with the wine-vessels, and thirdly the *serekh*-type with 56 marks (dated to the "0" Dynasty).

Only in three cases can potmarks be assigned to the older group of graves (before 0 Dynasty), showing that potmarks became significant only at a later (chronologically) period (namely 0-1 Dynasty) which happens to corresponds to the overall increase in the amount of offerings placed in the burials.

The distribution of the amount of signs is somewhat different from other sites: 1 sign occurs in 125 cases which is equal to 39% of the total; 2 signs occur 114 times - equal to 35%; 3 signs occur 55 times - equal to 17% and more than 3 signs occur 30 times which equals about 9% of all potmarks.

The most frequently occurring signs are the *ḥwt* signs (squares) occurring together with a second sign (41 times), two lines (34 times), crosses (30 times), 3 lines (20 times) and *nṯr* signs (19 times).

Of the total amount of 2360 ceramic vessels found in the cemetery, 322 were engraved with potmarks representing 14% of the total volume. These vessels with potmarks were found in 100 graves; 320 more graves had ceramic offerings but none of these carried any potmarks. The distribution of potmarks in the graves of males (32 cases) and females (41 cases) might be significant, however since in 19 cases the sex of the body was not able to be determined and in 6 other cases no bones were present, interpreting this difference must be approached with caution. Potmarks are practically absent from children graves:

sex groups	number of graves containing potmarks	total amount of graves in cemetery	distribution of graves with marks in the whole cemetery according to sex groups
no bones	6	31	1%
?	19	93	5%
child	2	86	0%
male	32	107	8%
female	41	103	10%
total	100	420	graves containing potmarks 24%

The amount of vessels with one or more potmarks found in the graves also varies a great deal; interestingly the highest amount of marks was not found in the grave with the highest amount of offerings:

No. of graves	vessels with pot-marks in the grave	Nr. of graves	vessels with pot-marks in the grave
32	1	3	7
29	2	1	8
16	3	3	12
8	4	1	19
3	5	1	36
3	6		

Summary

The theories about the meaning of the marks have varied from interpretations as potter marks, contents description, tax marks, and ownership marks (for a summary see van den Brink 1992: note 4). That tax marks where added to cylindrical vessels in the 0-1 Dynasty is indisputable, however they are always written in ink on the vessels (Kaplony 1963-1964). All the marks from Minshat Abu Omar (except for 9 pieces) were engraved before firing. Of nine marks scratched into the surface after firing two sets are on imported vessels, seven others were scratched into the surface of locally made ware. That marks on imported ware are practically always scratched into the surface after firing was also confirmed by a study of Adams and Porat (1996: 98ff.) of imported vessels found in Abydos.

The possibility that the marks may be an indication of contents seems rather small since most marks were already applied at the ceramic workshop/s, and similar marks are found on different vessel types. Further it was noted that the 27 (of 322) pots with potmarks found in Minshat Abu Omar, which actually had remains of contents in them (mostly consisting of animal and fish bones, botanical remains and shells in a mixed context), could not be associated in any consistent way with the marks on the pots. That a distribution or collection place might be indicated by some of the marks is more likely. In particular the large amount of double signs consisting of squares (*ḫwt*) with fish or other signs may indicated a place of origin from some centre of distribution in the Delta, especially as some main estate names in the Delta known from the Old Kingdom contain a fish sign in the name (Bietak 1975:149-177; Zibelius 1978; Kaplony 1981). The vessels with marks consisting of simple strokes of various lengths and numbers have been numerically tested as to vessel size and volume using the method proposed by Nordström (1972:79). Parallels could not be found as regards volume or size and the amount of strokes or points scratched into the surface of the vessels.

Many questions are still open as regards to the meaning of the potmarks, however by eliminating some of the proposed interpretations a final solution may be in sight.

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Recent Research Into the Stone Age of Northeastern Africa
Studies in African Archaeology 7
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Ian Shaw

The evidence for amethyst mining in Nubia and Egypt

Introduction

This paper examines the archaeological and textual evidence for the mining of amethyst in Nubia and Egypt from the Predynastic period onwards. The study is based primarily on fieldwork undertaken at two sites: Wadi el-Hudi (Shaw and Jameson 1993) and Gebel el-Asr (the so-called "Chephren diorite quarries", Harrell and Brown 1994; Shaw et al. forthcoming).

Amethyst is a translucent violet-coloured, macrocrystalline form of quartz (silicon dioxide, Si02) in which the colour is produced by the presence of trace amounts of ferric oxide. The term "amethystine quartz" is sometimes used to describe a form of amethyst that is streaked and banded with milky quartz. It is difficult to determine the precise character of the amethyst mined at Wadi el-Hudi and Gebel el-Asr, since the stone is now completely worked out, but judging from the surviving Middle Kingdom jewellery incorporating amethyst beads, it was of a dark violet hue. It should be noted, however, that the amethysts reported by Engelbach at the Gebel el-Asr gneiss quarries appear to be of a much paler colour, and according to Ogden (1982:107) "some Egyptian amethysts are so pale they could almost pass for rose quartz".

Amethyst is primarily used as a gemstone, and it was almost entirely restricted to items of jewellery dating either to the Middle Kingdom or the Roman period, although there are a few instances of its use for beads and small vessels between the late Predynastic period and the end of the Old Kingdom. It was, however, also occasionally used for small vessels (in the Predynastic and Early Dynastic periods) or small amulets (mainly in the Old Kingdom). There is a certain amount of evidence for the trading of amethyst with Crete from at least the Middle Kingdom onwards (perhaps in exchange for such products as animal horns, oils and lichen, see Warren 1995:5-10). In the New Kingdom, amethyst

was less commonly used for personal adornment, and it is even possible that there was a temporary dearth of known sources. By the Roman period, however, they had apparently regained their popularity (or availability), and, apart from site 12 at Wadi el Hudi, there are Roman amethyst quarries in the Safaga region near Gebel Abu Diyeiba (midway between the phosphate mines of Wasif and Umm Huetat, see Fig.1), where the amethyst has formed in cavities in the red granite following the courses of quartz veins reportedly extending for hundreds of metres. In modern Egypt the natural reserves of amethysts appear to have been virtually exhausted, and they now have to be imported from South America.

The Wadi el-Hudi mines

The Wadi el-Hudi region, covering an area of c. 300 square kilometres in the Eastern Desert, c. 35 km south-east of Aswan, was the primary location for amethyst mining in Egypt from the 11th Dynasty until the end of the Middle Kingdom, during which time the use of amethysts in jewellery reached a peak of popularity (see Fakhry 1952; Sadek 1980-85; Shaw and Jameson 1993). It has been exploited for its minerals (including barytes, gold, amethyst and possibly also mica) since at least the early 2nd millennium BC, and modern miners and quarriers are still extracting hematite and building stone from the immediate area. The amethyst occurs in cavities in the granite.

The mines at Wadi el-Hudi were rediscovered by the geologist Labib Nassim in 1923 (Nassim 1925), but the first proper archaeological examination of the site did not take place until 1939, when it was visited by G. W. Murray and Ibrahim Abdel AI of the Egyptian Topographical Survey (see Rowe 1939). Sites 5, 6 and 9, in the western part of the region, constitute an area of intense Middle Kingdom mining activity (see Fig. 2).

Site 5 consists of a hilltop miners' settlement and an adjacent amethyst mine. The L-shaped amethyst mine at site 5 - perhaps better described as an open-cut quarry - is located at the southern end of the hilltop settlement. The deposits of amethyst appear to have been completely worked out in the Pharaonic period. Incorporated into the walls of the adjacent settlement are numerous rock-carvings and inscriptions, five of which are securely dated to the first two years of the reign of Nebtawyra Mentuhotep IV, the last ruler of the 11th Dynasty. The pottery, present in large quantities throughout the settlement, also dates mainly to the early Middle Kingdom. Site 9 is a large rectangular stone-built fort, probably dating to the l2th Dynasty. To the north-east of the fort are two amethyst mines, while to the north-west there is a short, well preserved section of ancient road. Roughly midway between sites 5 and 9 is a conical hill, the summit of which is decorated with many inscriptions and rock-carvings, mainly dating to the Middle Kingdom (site 6).

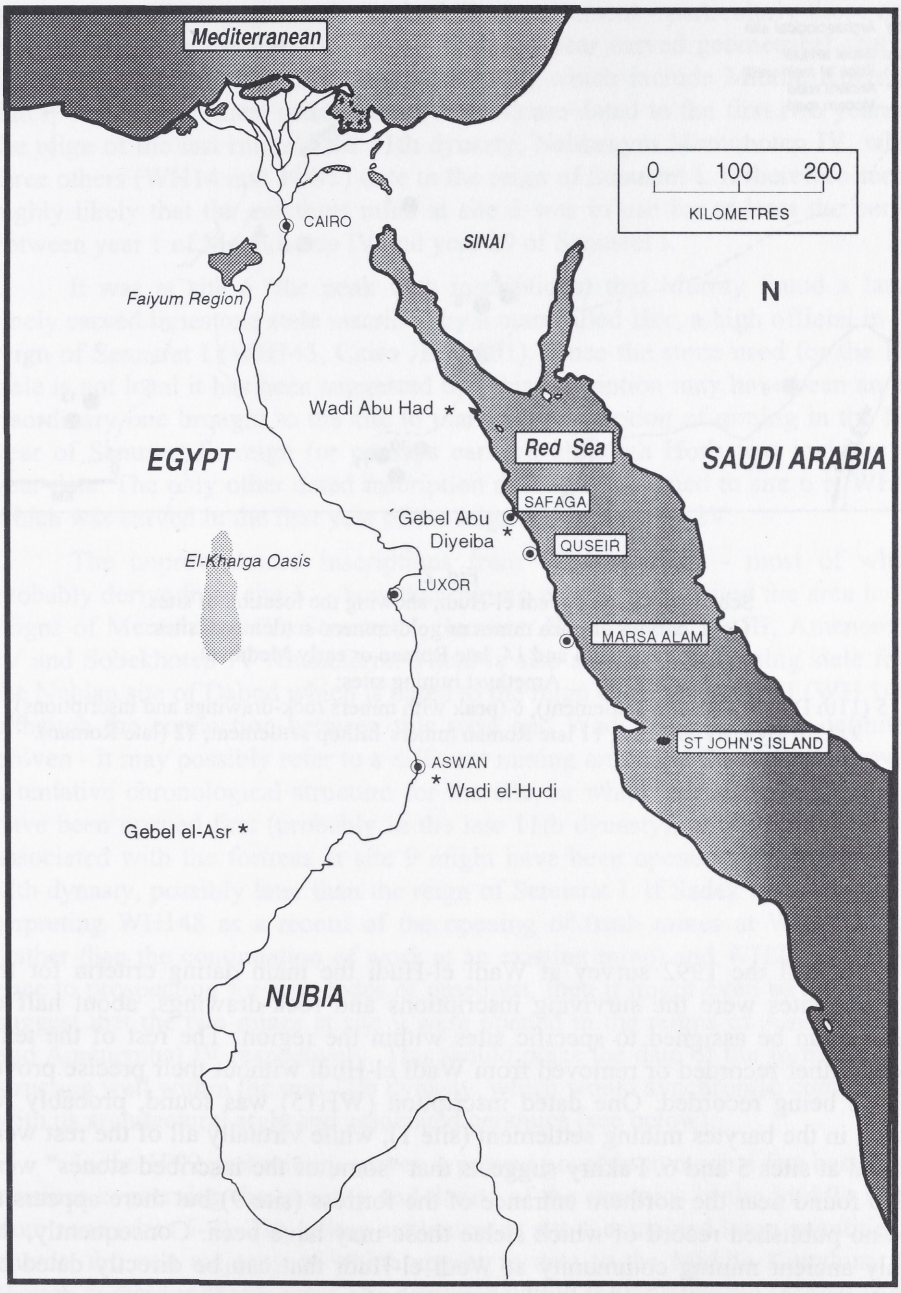

Fig. 1. Map of Egypt and Nubia showing the locations of identified amethyst mines.

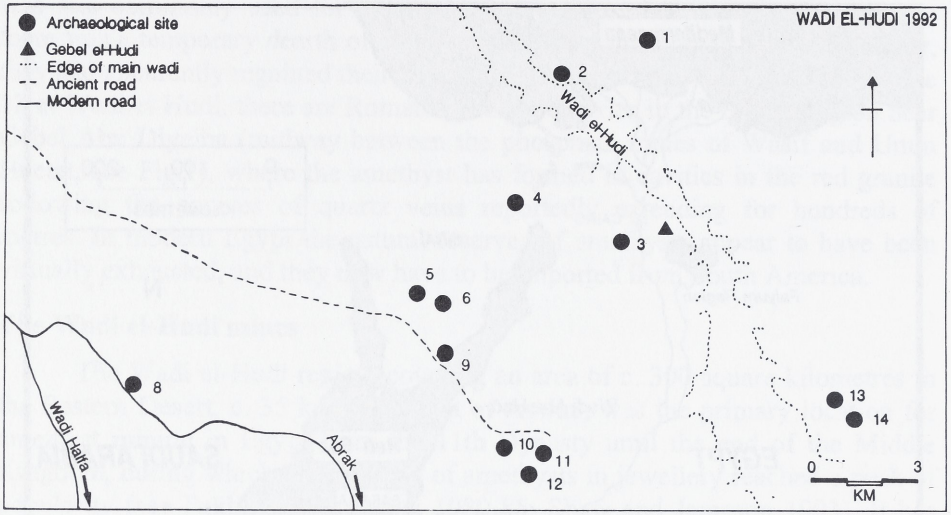

Fig. 2.
Schematic map of Wadi el-Hudi, showing the location of sites.
Gold, barytes or mica mines or gold-miners' settlements sites:
1-4, 8, 10, 13 and 14, late Roman or early Medieval.
Amethyst mining sites:
5 (11th Dynasty hill-top settlement), 6 (peak with miners rock-drawings and inscriptions),
9 (12th Dynasty fortress), 11 late Roman miners' hilltop settlement, 12 (late Roman).

Until the 1992 survey at Wadi el-Hudi the main dating criteria for the various sites were the surviving inscriptions and rock-drawings, about half of which can be assigned to specific sites within the region. The rest of the texts were either recorded or removed from Wadi el-Hudi without their precise provenance being recorded. One dated inscription (WH15) was found, probably re-used, in the barytes mining settlement (site 1), while virtually all of the rest were found at sites 5 and 6. Fakhry suggests that "some of the inscribed stones" were also found near the northern entrance of the fortress (site 9) but there appears to be no published record of which stelae these may have been. Consequently, the only ancient mining community at Wadi el-Hudi that can be directly dated by textual evidence is the hilltop settlement at site 5.

Many of the larger rocks in the hilltop settlement - particularly those near the summit or on the eastern side of the hill - bear carved geometrical shapes, figures and hieroglyphic inscriptions, seven of which include Middle Kingdom dates. The three earliest inscriptions (WH2-4) are dated to the first two years of the reign of the last ruler of the 11th dynasty, Nebtawyra Mentuhotep IV, while three others (WH14 and 144-5) date to the reign of Senusret I. It therefore seems highly likely that the amethyst mine at site 5 was in use for at least the period between year 1 of Mentuhotep IV and year 29 of Senusret I.

It was at site 6 (the peak with inscriptions) that Murray found a large, finely carved limestone stele inscribed by a man called Hor, a high official in the reign of Senusret I (WH143, Cairo JE 71901). Since the stone used for the Hor stele is not local it has been suggested that this inscription may have been an extraordinary one brought to the site to mark the resumption of mining in the 17th year of Senusret I's reign (or perhaps earlier), although Hor's text includes no year-date. The only other dated inscription definitely assigned to site 6 is WH 1, which was carved in the first year of the reign of Mentuhotep IV.

The unprovenanced inscriptions from Wadi el-Hudi - most of which probably derive from site 6 - show that mining expeditions visited the area in the reigns of Mentuhotep IV, Senusret I, Senusret III, Amenemhat III, Amenemhat IV and Sobekhotep IV Khaneferre. There is also an amethyst-mining stele from the Nubian site of Dabod which is dated to the reign of Amenemhat II (WH 148), although the connection between this stele and Wadi el-Hudi is not definitely proven - it may possibly refer to a different mining area. The inscriptions provide a tentative chronological structure for the site, in which the site 5 mine would have been opened first (probably in the late 11th dynasty), while the two mines associated with the fortress at site 9 might have been opened some time in the 12th dynasty, possibly later than the reign of Senusret I. If Sadek is correct in interpreting WH148 as a record of the opening of fresh mines at Wadi el-Hudi (rather than the continuation of work at an existing mine) and WH21 as a reference to prospection for new lodes of amethyst, then it might even be possible to suggest that the two mines at site 9 were opened in the reigns of Amenemhat II and Amenemhat IV respectively. This would place the date of the fortress's construction well within the mid-12th dynasty, which would synchronise comfortably with its architectural style and associated ceramics (see below).

In the 1992 preliminary survey it proved possible to reach a few basic conclusions concerning the quantity and dating of the ceramics in the Middle Kingdom zone (sites 5-9). The hilltop settlement at site 5 contained large quantities of sherds, the vast majority of which appear to date to the Middle Kingdom. Although numerous sherds were also scattered within the walls of the fortress at site 9, there were far fewer concentrations compared with the hilltop settlement. The

pottery scattered inside the fortress included pharaonic sherds (probably of late Middle Kingdom date) as well as some sherds considered to date to the Roman period, suggesting that there may have been a later re-use of the fortress. The ceramic evidence so far obtained is therefore broadly in line with that of the inscriptions. There already appears to be a small amount of ceramic data to suggest that the hilltop settlement was in use earlier than the fortress, but this suspicion can only be corroborated by a much more detailed analysis of the ceramics at both sites.

There is some evidence for the continued exploitation of amethyst at Wadi el-Hudi after the Middle Kingdom: site 12, for instance, is almost certainly an amethyst mine of the Roman period. During the late Middle Kingdom the principal Egyptian amethyst mines were probably located at the northern end of the Gebel el-Asr gneiss quarries (see below).

The quarrying of gneiss and quartz at Gebel el-Asr

The Gebel el-Asr gneiss and quartz quarries, 65 kilometres northwest of Abu Simbel, were rediscovered in 1932 (see Engelbach 1933, 1938; Murray 1939). The gneiss quarries, dating from the late Predynastic period to the Middle Kingdom, are usually described as the "Chephren diorite quarries" because they are the source of the blue-grey metamorphic rock from which the magnificent seated statue of the 4th-Dynasty pharaoh Chephren (2520-2494 BC) was carved. Our 1997 survey of the site was the first archaeological expedition to the quarries since 1938, when Reginald Engelbach undertook his second season of survey and excavation in the region, including a detailed examination of the ancient road leading to Tushka. More recently, the geologists James Harrell and Max Brown produced a more detailed map of the area and examined the geological, aesthetic and religious significance of the type of gneiss exploited at the site.

In 1997 we examined all the principal sites in the region (the locations of which are shown in Fig. 3), taking GPS readings and making small EDM surveys, as well as sketch plans. We focussed particularly on the area at the north-eastern end of the site, surrounding Stele Ridge, where Engelbach (1933:69) and Little (1933:77) had reported the existence of a set of amethyst mines possibly dating to the Old Kingdom, at the northern end of the quarries. These would be the earliest amethyst mines in Egypt, predating the Middle Kingdom Wadi el-Hudi mines. In our 1997 survey, however, we were able to identify only Middle Kingdom and Roman pottery in the Stele Ridge part of the site, suggesting that this area of amethyst and multi coloured quartz mines may not have been used as early as the Old Kingdom and instead were probably roughly contemporary with - or perhaps even slightly later than - the Wadi el-Hudi mines.

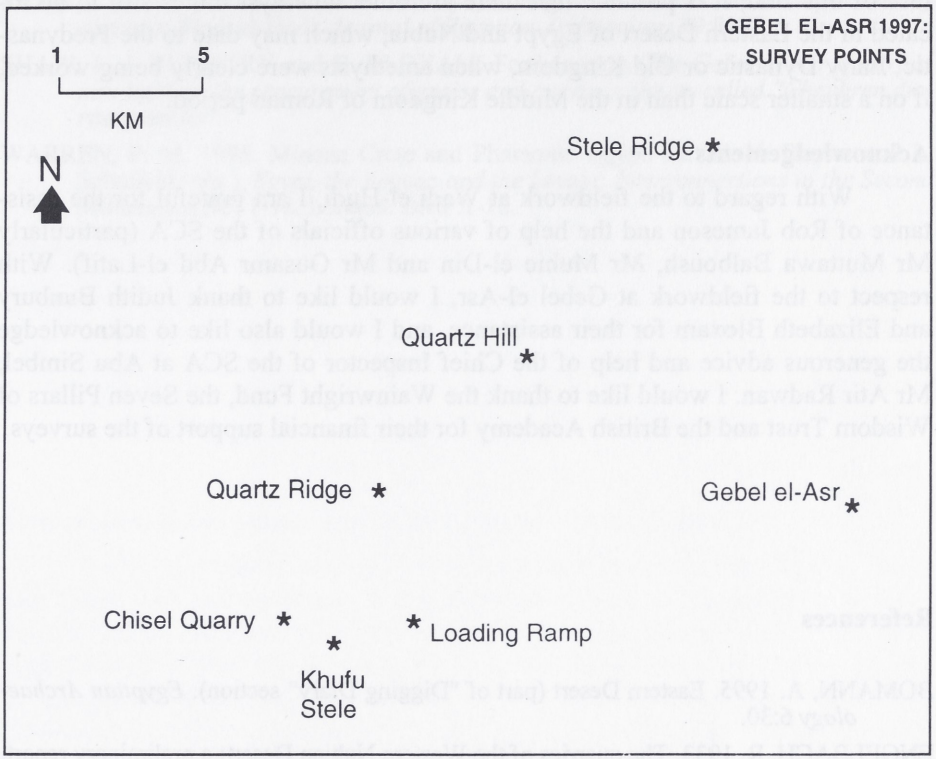

Fig. 3.
Sketch-plan of the Gebel el-Asr region, showing locations of the principal regions of gneiss procurement (Kufu Stele, Quarz Hill, chisel quarry) and the quarz mines (Stele Ridge).

Although Stele Ridge has very recently been rather badly affected by construction work associated with the new road to Gebel Uweinat, there are nevertheless sufficient surviving traces of cairns, ceramics and quarried stone to provide a good indication of the date and major characteristics of the site.

Pre-Middle Kingdom Egyptian and Nubian sources of amethyst

Amethysts were being used for jewellery and small vessels from the late Predynastic period onwards, but the principal identified mines described above date to the Middle Kingdom or the Roman period. However, in recent years another source, dating at least as early as the 1st Dynasty (judging from the associated pottery), has been revealed in the course of a survey of the Wadi Abu Had, in the northern part of the Eastern Desert (Bomann 1995). Given the chance na-

ture of this find, it is possible that there are other amethyst mines still to be located in the Eastern Desert of Egypt and Nubia, which may date to the Predynastic, Early Dynastic or Old Kingdom, when amethysts were clearly being worked, if on a smaller scale than in the Middle Kingdom or Roman period.

Acknowledgements

With regard to the fieldwork at Wadi el-Hudi, I am grateful for the assistance of Rob Jameson and the help of various officials of the SCA (particularly Mr Muttawa Balboush, Mr Muhie el-Din and Mr Ousamr Abd el-Latif). With respect to the fieldwork at Gebel el-Asr, I would like to thank Judith Bunbury and Elizabeth Bloxam for their assistance, and I would also like to acknowledge the generous advice and help of the Chief Inspector of the SCA at Abu Simbel, Mr Atir Radwan. I would like to thank the Wainwright Fund, the Seven Pillars of Wisdom Trust and the British Academy for their financial support of the surveys.

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Recent Research into the Stone Age of Northeastern Africa
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Mauro Cremaschi, Savino Di Lernia and Elena A. A. Garcea

First chronological indications on the Aterian in the Libyan Sahara

Geo-archeological research in south-western Fezzan (Libya)

Recent systematic surveys were carried out in the Tadrart Acacus mountain range and surroundings, which covered an area of approximately 8,000 square kilometres. More than fifty sites (Fig. 1) could be attributed to the Stone Age: 29 sites of the Early Stone Age/Middle and Late Acheulean phases, 15 sites of the Middle Stone Age/Mousterian, and 14 sites of the Middle Stone Age/ Aterian phases (Cremaschi and Di Lernia 1996; in press). The Aterian phase, in particular, with the increase of formal tools, mostly tanged artefacts, burins and end-scrapers, holds an important role: its exact chronological collocation is crucial to comprehend in this region the relations with both the Middle Stone Age cultures (Mousterian) and the earliest Holocene occupation ("Early Acacus" or "Epipalaeolithic"). The regional approach to the study of human past in the Acacus and surroundings, led us to isolate two main items, as regards Pleistocene archaeology, which need to be further investigated (Cremaschi and Di Lernia, 1996; in press):

1. The absence of an Upper Palaeolithic lithic industry, *sensu strictu*;
2. The presence of a defined Aterian phase in this area of the Sahara, which has to be considered the last Pleistocene human occupation, before the onset of hyperarid climatic conditions.

The excavations at Uan Tabu and Uan Afuda, two sites located in the central Tadrart Acacus, provide detailed information as regards lithic organisation: the lack of organic matter led us to have OSL and TL analyses undertaken on the sand (Martini et al., in press), which constitute the first chronological indications for the Aterian phase in the Central Sahara (Cremaschi, Di Lernia and Garcea, in press).

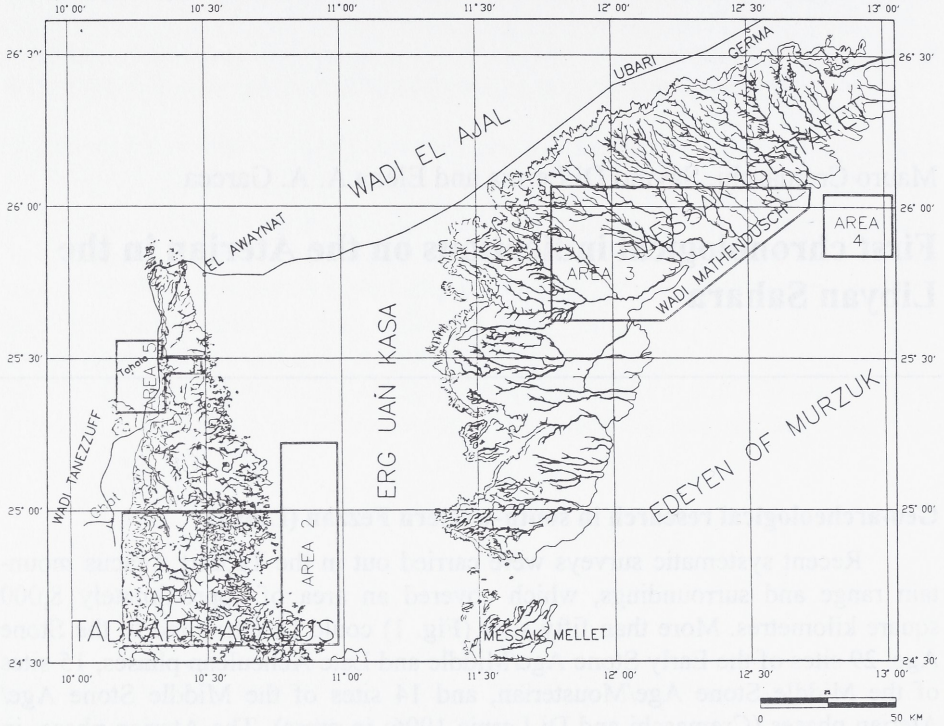

Fig. 1.

The Tadrart Acacus and Messak Settafet mountain ranges. Numbers indicate the survey areas.

Uan Tabu

The lowest unit (Unit IV) of the thick stratigraphy was markedly different from the upper layers which were radiocarbon dated to the 9th millennium BP (Garcea 1996; in press). This unit alone had a maximum thickness of one meter and contained Aterian lithics up to the last 4-5 cm which consisted of sterile loose sand (Fig. 2a). This uppermost part of the unit suggested an increase of aridity and a discontinuity in the occupation of the site in the Late Holocene. The sterile aeolian sand must have accumulated after the Pleistocene human occupation as it covered some sandstone blocks which collapsed from the vault of the shelter.

The archaeological unit contained a considerable quantity (3109 pieces) of flaked stones with several Aterian tools but no organic matter. Levallois flakes, blades and points made up 62.6% of the tool-kit (Fig. 3). Side-scrapers (7.1%) were much more frequent than end-scrapers (0.7%). Tanged pieces were of different types but represented only 3.6% of the tool-kit. The high frequency of modified pieces including 9.04% of retouched tools and 24.57% of cores, suggested that intensive knapping activities were taking place on the spot. The deposit was dated by OSL to 61,000±10,000 years BP.

Uan Afuda

Some tens of artefacts were collected in the aeolian sand-Unit 3 at Uan Afuda cave, in the central Acacus (Cremaschi and Di Lernia 1995). This Unit consists of around 2 metres of sands, laying on a paleosol developed on the bed-rock (Fig. 2b). The aeolian sand-Unit 3 is part of a dune deposited into the large porch of the cave and clearly related to desert environment including several boulders. They represent the collapse of the vault during short pauses of the aridity, resulting in a slight increase of humidity and a rest of the dune progradation. The thickness of sands between the Holocene sequence and the collapse overlying the Middle Stone Age artefacts is more than 1 meter. Within the aeolian sand-Unit 3, two layers were recognised - 8 and 9. The former, which lays on the collapse is sterile of archaeological findings, whereas the latter, under the collapse, features a cluster of artefacts. These artefacts are characterised by archaic technology and were struck from unpatterned cores of silicified sandstone. They show a very fresh state of preservation, and in some cases a few flakes refit (Fig. 4). This kind of situation points to a very short occupation, probably linked to specialised functions. No organic matter was found.

TL and OSL datings were performed on the sands laying on the collapse, giving consistent results: TL analysis gave 70,000 ± 9,500 and 73,000 ± 10,000 years BP; OSL gave 69,000 ± 7,000 years BP. These dates provide a *terminus ante quem* for the Middle Stone Age artefacts. An OSL determination was also obtained for the sands below the lithics, with a result of 90,000±10,000 years BP.

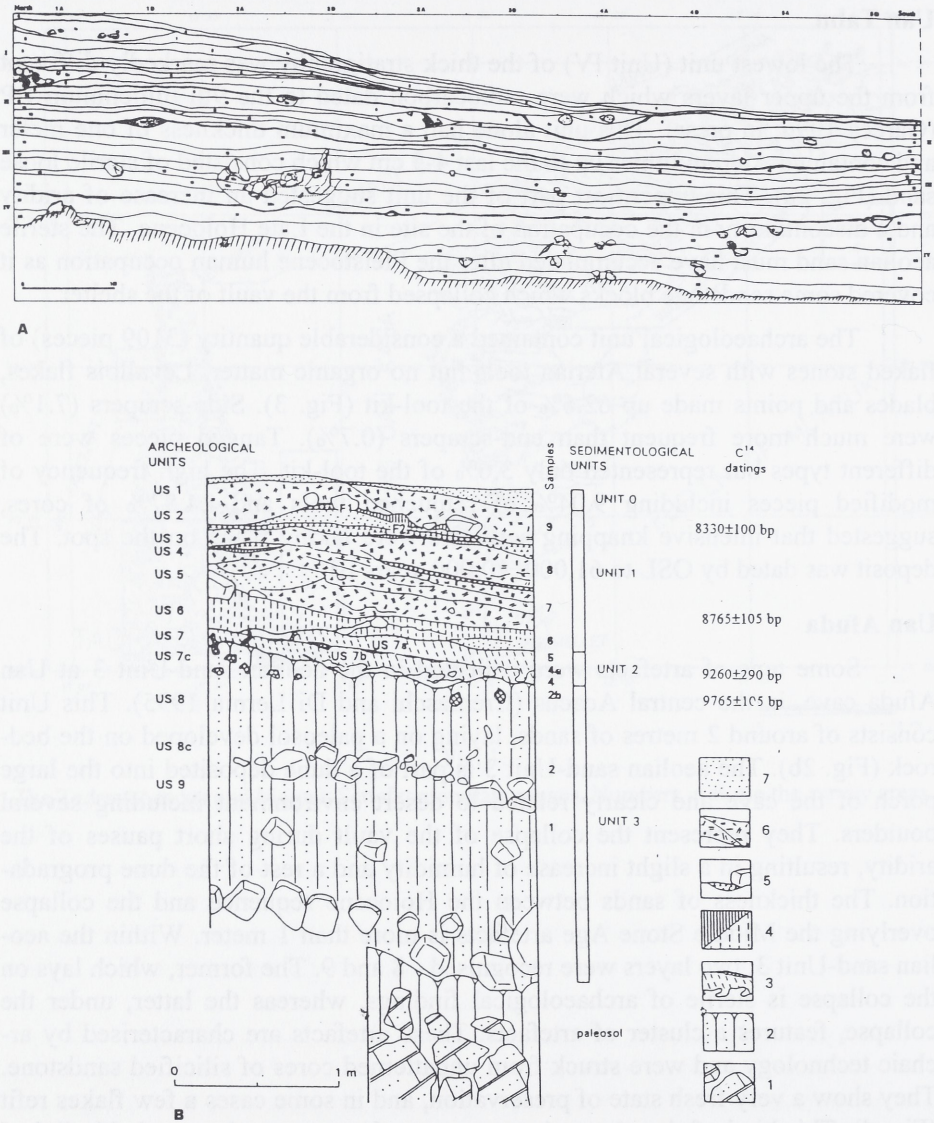

Fig. 2. a: Section from Uan Tabu. Fig. 2b: Section from Uan Afuda.
1: collapsed blocks with gypsum concretions; 2: Unit 3, aeolian sand, weathered at the top, including bioturbation pedotubules; 3: Unit 2, colluviated sand including gypsum concretions; 4: Unit 1, loose sand rich in charcoal and organic matter; 5: Unit 1, ash lenses and stones related to hearths; 6: Unit 1, lenses of undecomposed plant remains; 7: Unit 0, aeolian loose sand.

Therefore, Middle Stone Age artefacts were left in the Uan Afuda cave between 69,000 and 90,000 years BP.

Unfortunately, no diagnostic Aterian tools (i.e. tanged tools) were unearthed at Uan Afuda, and the attribution of these Middle Stone Age artefacts to the Aterian horizon is speculative. Nevertheless, Uan Afuda shares with Uan Tabu stratigraphic position and technological organisation of the lithic industry: the difference of around 10,000 years between the two dates referred to Uan Afuda and Uan Tabu could be related either to intrinsic technical reason in the dating method or to different phases of occupation of the Aterian groups. Furthermore, the stratigraphic section of Uan Afuda cave no doubt shows a hiatus between the Middle Stone Age occupation and the Holocene occupation, which is dated at Uan Afuda from 9,765±105 BP (GX-20750) up to 8,000±100 years BP (GX-18104). This hiatus is documented by 1 meter of sterile aeolian sand, whose top was weathered at the end of Pleistocene (Cremaschi and Di Lernia 1995).

Discussion

Based on radiocarbon datings, Aterian was thought to have an age older than >40,000 and to last until 20,000 years BP. However, it has recently been observed that not only was the method applied inappropriate but also the dated materials were of questionable reliability and/or from uncertain contexts. In addition many deposits with Aterian lithics contained no organic matter which could be dated by the C14 methods.

The stratigraphic evidence from Uan Tabu and Uan Afuda sites shows an impressive hiatus between the Middle Stone Age occupation and the earliest Holocene occupation. This hiatus is also confirmed by the extensive survey performed in the 1991-1996 field seasons: no Upper Palaeolithic sites were found. A recent study on travertine formations in the Acacus reveals an early onset of wet conditions, probably as early as 14,000 years BP (Cremaschi and Di Lernia 1996; in press).

Although there is evidence for earlier Acheulean and Mousterian occupations, the first well documented phase is the Aterian, now dated around 90,000-60,000 years BP. It is characterised by a moderately arid climate, as indicated by the rest of dune progradation at Uan Afuda and Uan Tabu. The following phase shows severely dry climatic conditions and high deflation, and occurs during the Final Pleistocene, when no human occupation is documented: this phase should correspond to the expansion of the desert (60,000-15,000 years BP). A phase of more intensive occupation of the region dates from the beginning of the Holocene (10,000-3,500 years BP).

Relations between Mousterian and Aterian phases are still unclear, and we can hardly say when and how a transition took place. From a stratigraphic point

of view it can be said that both Mousterian and Aterian artefacts were included in the "red fossil dune formation", mainly in the area of the central Acacus and is also attested in the stratigraphic contexts of Uan Tabu and Uan Afuda (Cremaschi in press). The deposits including Aterian artefacts were dated between 90,000 and 61,000 years BP. No datings are available for the Mousterian contexts: therefore, relationships between Mousterian and Aterian "phases" need to be further investigated, since for the most part they tend to share similar technological and typological organisation. Site distribution of the Aterian finds show the use of a large territory and diversified environments. Such behaviour points to high mobility of these groups, which may be related to a severer environment and probably drier climate. Based on the present evidence from the Sahara, Aterian people probably lived during a subarid episode which can hardly be referred to the hyperarid period dated between 65,000 and 15,000 BP. They must have occupied the previous phase dated between around 90,000 and 65,000 years BP. The dating 90,000-61,000 BP could be related to an earlier phase of the MSA/Aterian, according also to the evidence from the Nile Valley (Wendorf and Schild 1992) and the oasis in the Western Desert (Kleindienst et al. 1996).

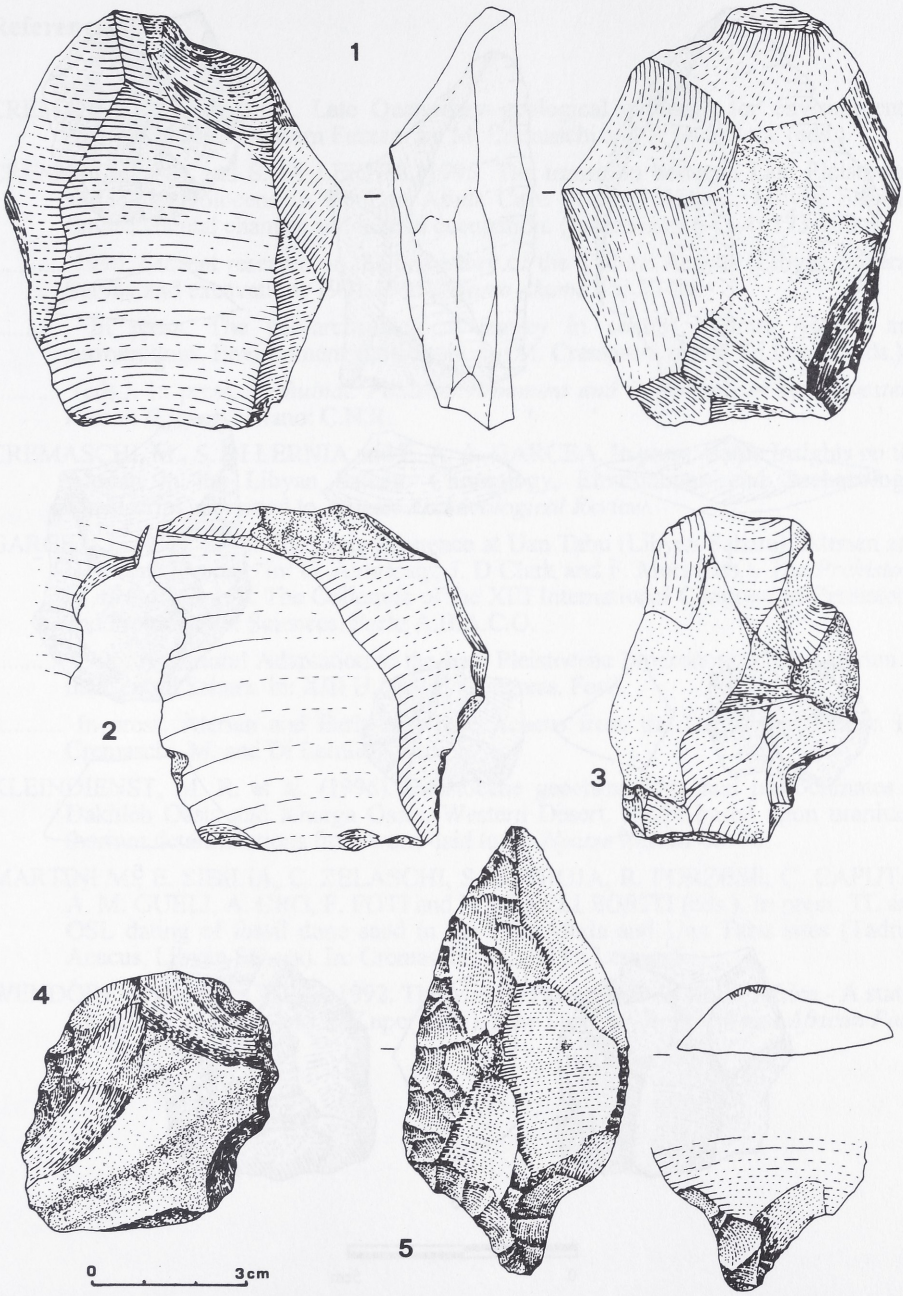

Fig. 3. Uan Tabu: 1. backed knife; 2-4. tanged points; 5. *hachereu*.

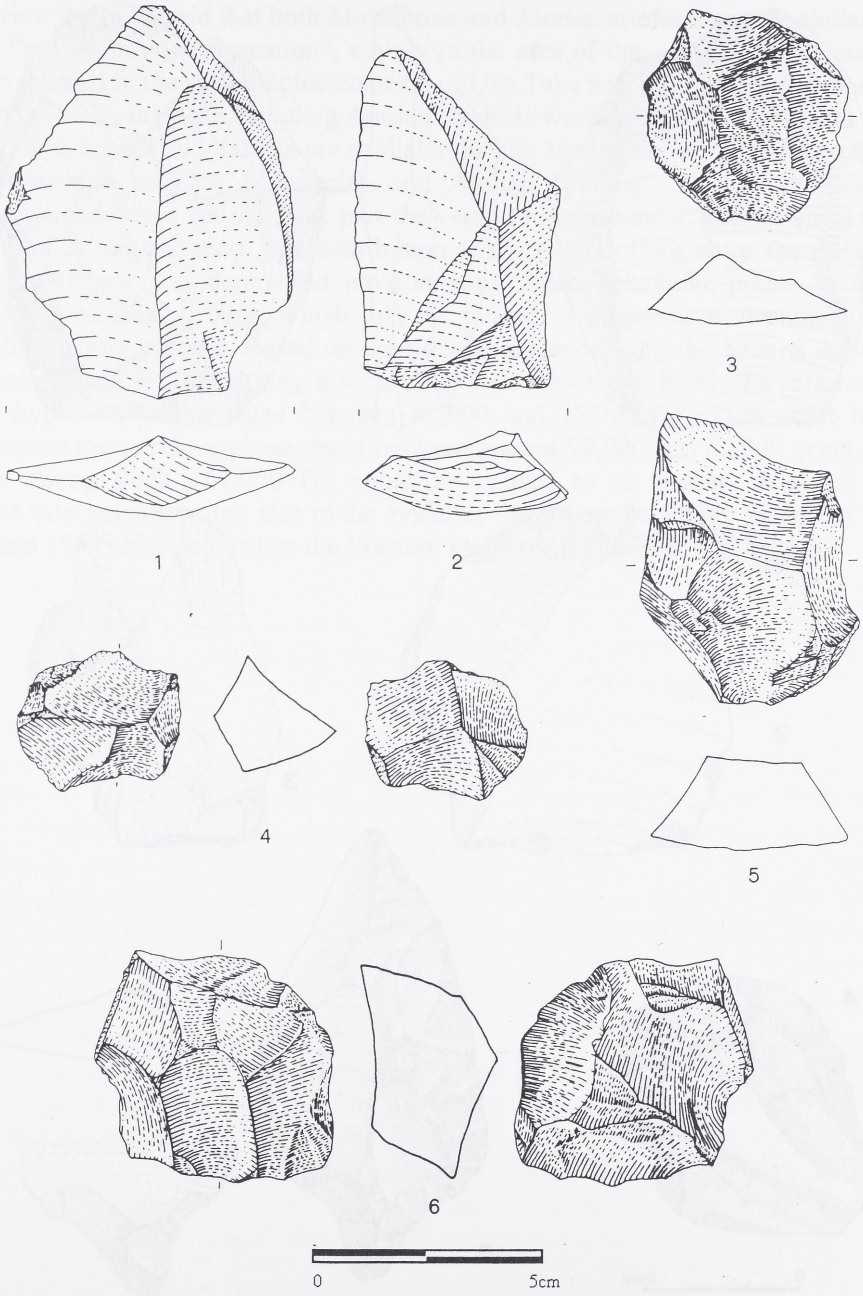

Fig. 4. Uan Afuda: 1-2: pseudo-Levallois flake (refit).

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Samuel Gotilogue

État de recherches archéologiques en République Centrafricaine

Introduction

Le recherches archéologiques en RCA ne sont pas aussi développées que dans les autres pays de la sous-région d'Afrique Central. Débutées dans les années 1960 dans la région de Bouar (Vidal 1969), elles ont lentement mais progressivement couvert aujourd'hui une majeure partie des 623 000 km^2 du territoire national. Il s'agit dans cette note, de présenter les résultats acquis au cours des 3 dernières décennies en Préhistoire et Age du fer et de dégager ensuite les perspectives d'avenir.

I. Préhistoire

Jusqu'à la veille de l'indépendance (1960), on ne savait pas grand-chose sur cette période malgré quelques collectes effectuées par les géologues et les administrateurs de l'époque. De 1966 à nos jours, des recherches systématiques ont permis de diagnostiquer les industries en deux grandes phases chronologiques: le paléolithique et le néolithique.

Paléolithique

Pour le paléolithique, les premiers travaux du genre menés par Bayle des Hermens (1975) ont fourni un cadre chronologique réparti en 3 âges successifs: Age de la pierre ancien (*Old Stone Age*), Age de la pierre moyen (*Middle Stone Age*) et Age de la pierre récent (*Late Stone Age*).

Préacheuléen et Acheuléen (Fig. 1)

Les industries Age de la pierre ancien proviennent de l'ouest et de l'est du pays ou elles ont été trouvées soit dans des graviers de base des rivières associées au diamant, soit en surface aux flancs des collines bordant ces cours d'eau. Elles

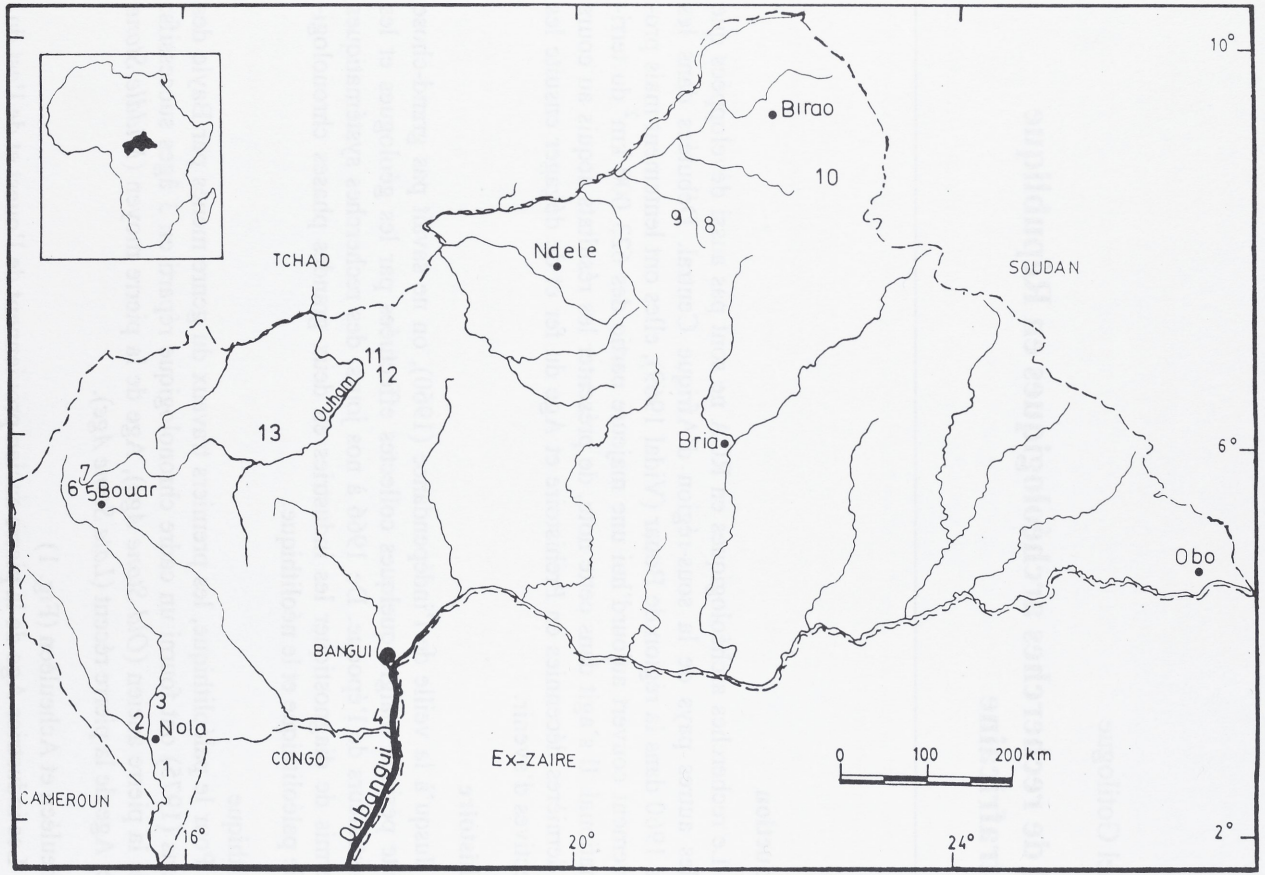

Fig. 1.
Sites: Préacheuléens - ○; Acheuléen - ●; Sangoen - Δ.

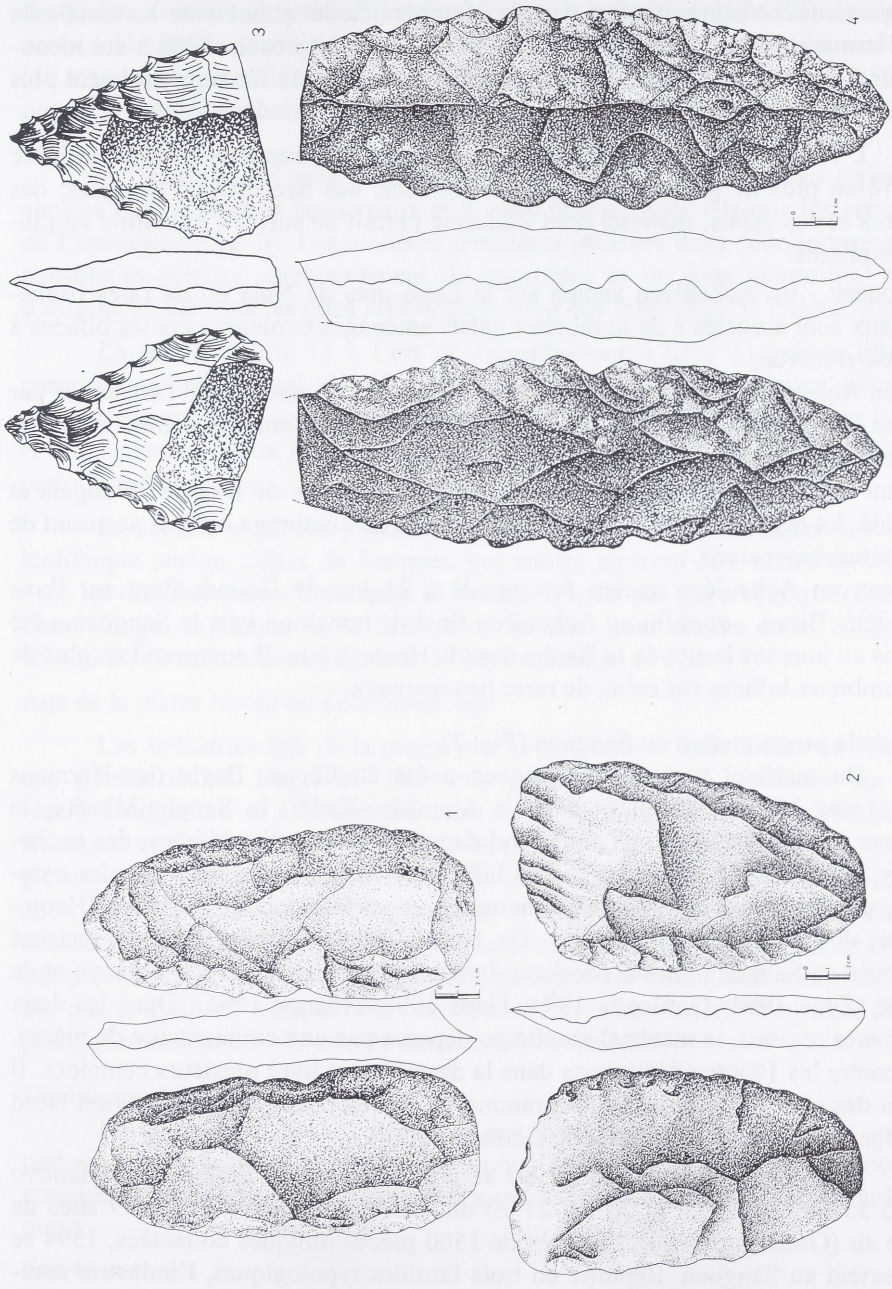

Fig. 2. Industries du Sangoen della Monovo: 1 - biface; 2 - hachereau; 3 - pic; 4 – armature.

sont particulièrement présentes dans la Mambéré-Kadéi et la Haute-Kotto (Bayle des Hermens 1975; Lanfranchi et Clist 1991). Mais le préacheuléen a été identifié sur 4 gisments de l'ouest ou les galets aménagés recueillis représentaient plus de 80% du matériel étudié.

L'Acheuléen provient aussi de ces régions. Une trentaine de sites recensée a livré en plus de galets aménagés, des bifaces, des hachereaux; des pics; des racloirs et des éclats, matériel dont l'analyse permit de suivre l'évolution en plusieurs phases:

A l'ouest: - un Acheuléen ancien sur la Lopo près de Nola ou de rares hachereaux sont associés à de nombreux galets aménagés évoluant vers les bifaces à base réservée;

- un Acheuléen moyen sur les sites de Sana et de Ngoéré-Ngolo caractérisé par une prédominance de hachereaux, de bifaces et d'un nombre infime de galets aménagés;

- un Acheuléen de transition connu dans les secteurs de Batouri, Mangala et Bolé. Là les hachereaux se raréfient au profit de nombreux bifaces accusant de petites dimensions.

A l'est: un Acheuléen ancien fut signalé à 21 km de Gounda-Pont sur l'axe Ndélé- Birao. - et enfin un Acheuléen final de transition vers le Sangoen a été mis au jour sur le site de la Banka dans la Haute-Kotto. Il comprend en plus de nombreux bifaces sur éclat, de rares hauchereaux.

Age de la pierre moyen ou Sangoen (Fig. 2)

Du matériel typique du Sangoen a été étudié par Bayle des Hermens (1975) sur 15 sites localisés dans la Mambéré-Kadéi, la Sangha-Mbaéré, la Lobaye et la Haute-Kotto. Il comprend dans l'ensemble, des bifaces, des hachereaux, de nombreux pics, des pièces bifaciales hachoirs, des racloirs, des core-axes, des armatures de grandes dimensions et parfois comme à Nzako (Haute-Kotto) de petits galets aménagés. De 1990 à 1996 plusieurs sites de surfaces attribués au Sangoen ont été localisés dans les régions de Nola, de Mobaye et de Ndélé (Zana 1994; Gotilogue 1994; Gapa 1995; Ndanga 1996). Dans les deux premières régions, le matériel récolté ne dépasse pas une cinquantaine de pièces. Par contre les 10 sites découverts dans la dernière ont livré plusieurs centaines. Il s'agit des sites de la base du Programme de Développement de la Région Nord de Manovo (PDRN) et de celui de Gounda-Pont.

Les prospections de 1991-1992 autour de la base du PDRN de la Manovo (8°15'35''–8°30'35''N et 20°51'-21°E) ont permis de mettre au jour 9 sites de plein air (Gotilogue 1994). Sur près de 1500 pièces lithiques collectées, 1394 se rapportent au Sangoen. Répartie en trois familles typologiques, l'industrie comprend: des nucleus (127) en majorité discoides, des éclats et fragments (819) et des outils (448). La liste type comprend 16 types du paléolithique moyen au sein

desquels on note une prédominance des pièces bifaciales (17.55%) sur les les coches (10.9%)les armatures de grandes dimensions et les éclats retouchés (10.6%) les core-axes (10.37%) les éclats utilisés (8.35%) les racloirs (7.5%) les pièces bifaciales hachoirs (5.7%) les pics (4.32%) les bifaces (4.03%) les hachereaux (2.3%).

A l'intérieur de cette industrie de type Sangoen subsistent des types plus anciens dont bifaces et hachereaux et d'autre plus évolués tels que les armatures du Lupembien (Fig. 3). Les matières premières utilisées dans cette industrie sont constituées presque exclusivement de quartzites et de grès quartzites, roches d'origine locale dont les gîtes affleurent le long des rebords de la rivière Manovo.

La saline de PK 15 à l'est de Gounda-Pont a livré 11 pièces lithiques parmi lesquelles on peut identifier un nucleus globuleux, deux éclats, deux percuteurs, une molette, un pic, un galet amenagé de petite dimension, deux bifaces et un hachereau. Cette industrie du Sangoen est mieux conservèe que celles des périodes précédentes.

En somme si aucune précision ne peut être portée sur les industries du paléolithique ancien, celles du Sangoen par contre peuvent être mises en relation avec les données paléoclimatiques et radiométriques des pays voisins comme les deux Congo, le Gabon et le Cameroun ou elles sont datées entre 100,000 et 15,000 BP (Lanfranchi et Schwartz 1990; Lanfranchi et Clist 1991).

Age de la pierre récent ou *Late Stone Age*

Les industries âgé de la pierre récent sont encore méconnues en République Centrafricaine. Bayle des Hermens (1975) a étudié 7 gisements sur l'axe Ndélé-Tiringoulou et à Wakouma dans le Nord-est et ceux de la Maboké, de Boukoko et de Mbad'ki dans le Sud-ouest. Dans la première région, les 387 pièces collectées comprennent des petits galets aménagés, des racloirs, des coches, un couteau, un grattoir, un core-axe et une pièce bifaciale hachoir. Dans la deuxième on note la présence de petits racloirs, des éclats retouchés, des coches, des percuteurs et enfin de petits galets aménagés. La diminution morphologique des pièces étudiées marque bien leur évolution vers les microlithes mais aucune pièce géométrique n'a été décrite dans cette collection.

Néolithique (Fig. 3)

En dehors des haches polies et des pierres perforées collectées un peu partout dans le pays et attribuées par concordance d'opinion à cette periode, il convient de présenter ici les sites à outils polis fouillés et les mégalithes du Nord-ouest.

Sud-Ouest

Dans cette région, les données sur le néolithique émanent du site de Batalimo (03°24' N, 18°32' E) dans le Lobaye. Situé à 16 km de Mongoumba, ce

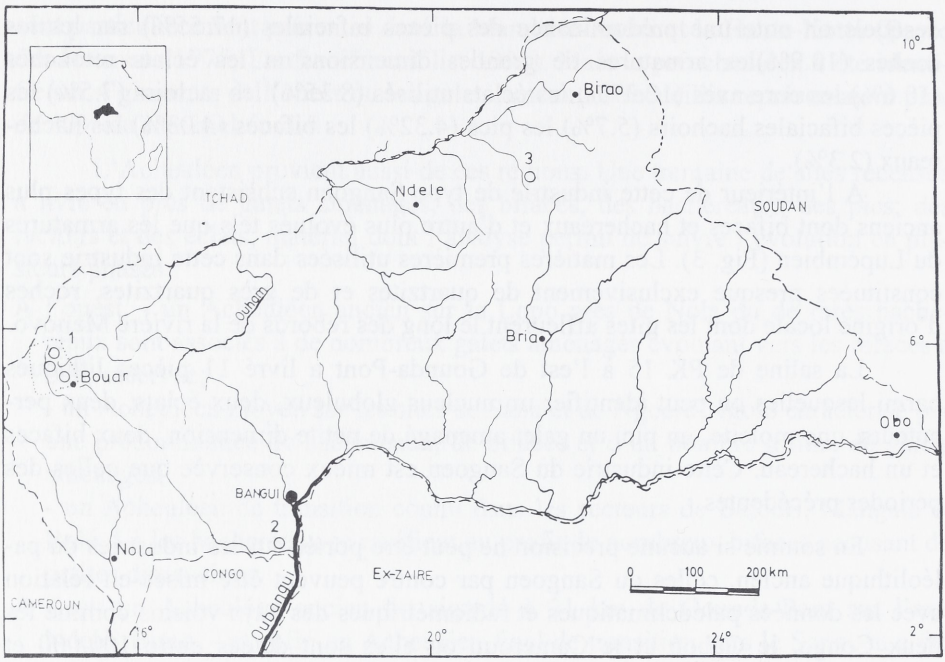

Fig. 3. Sites néolithiques fouillés:
1. Monuments mégalithiques du nord-ouest. 2. Batalimo. 3. Ogrotoulou.

Pièces		Matières premières								Classes			
		N	%	quartz	quartzite	grès	grès-quartzite	argilite	indéterminé	128	64	32	16
Galets	entiers	13	0,87	11	2						3	6	4
	cassés	74	5,00	68	4	2				1	7	62	4
Débitage	nucleus	28	1,89	9	8		10		1	9	9	10	
	éclats	300	20,27	179	93		28			3	82	163	52
	frag-déch	1008	68,10	847	134		26		1	4	51	695	258
Outils	p.bifaciale	1	0,06		1						1		
	p.hachoir	1	0,06				1			1			
	racloirs	1	0,06				1				1		
	coches	7	0,47	3	4					1	1	5	
	denticulés	1	0,06		1						1		
	E. retouch	3	0,20	1	2					2	1		
	E. utilisés	1	0,06		1						1		
	percuteurs	3	0,20	1	2					2	1		
	molettes	4	0,27		2		2			3	1		
	palettes	13	0,87		1	10	2			11	2		
	colorant	22	1,48					22		1	10	11	
TOTAL		1480	100	1119	255	12	70	22	2	38	172	952	318

a

Pièces	Nombre	Pourcentage
galets	87	05,87
débitage	1336	90,27
outils	57	03,85
TOTAL	1480	100

b

Fig. 4. Analyse typologique, pétrographique et dimensionnelle de l'industrie lithique d'Ogrotoulou et pourcentage de chaque famille typologique.

site a successsivement été fouillé par Bayle des Hermens (1975), Vidal (1992) et Kote (1992). Les niveaux néolithiques datés du IIIe siècle avant au IVe après notre ère contiennnent une industrie de pierre taillée ou les haches parfois polies, sont largement majoritaires ainsi qu'une céramique à fond plat décorée à la roulette.

Nord-Est

A l'est de Ndélé, l'abri sous roche d'Ogrotoulou (8°35' N, 21°51'10" E) fouillé en 1990 (Moga sous presse) a livré deux niveaux d'occupation archéologique, un de l'Age du fer, l'autre, néolithique. Ce dernier, épais de 20 à 40 cm de puissance a fourni en plus de la céramique décorée à la roulette tressée, des noix de karité (*Butyrospermum paradoxum parkii*), des graines de tamarinier (*Tamarindus indica*), des coquilles de gastéropodes, des ossements d'animaux et deux squelettes aux quels s'ajoute une industrie lithique de 1480 pièces. Celle-ci comprend de petits galets de rivière entiers ou cassés (5.8%) un nombre écrasant de débitage bipolaire (90.27%) et quelques outils (3.85%) dont l'analyse a déterminé 11 types: pièce bifaciale, pièce bifacial hachoir, racloir, coche, denticulé, éclats retouchés et/ou utilisés, percuteur, molette, palette et colorant (Fig. 4a, b). Diverses matières premières ont été utilisées; la majorité revient au quartz (75.6%) suivi de quartzite (17.25%), de grès quartzite (4.75%), de grès (0.86%) et d'argilite (1.54%). Des charbons de bois prélevés en deux points dans la couche II ont été datés. Les dates, LV. 1880=3390±100 BP et LY.5949=2655±30 BP, soit en âges calibrés (2 sigma, 95% probabilité), situent cette occupation, en tenant compte des extrêmes, du début IIe millénaire au VIIIe siècle avant notre êre. L'examen du matériel exhumé montre en lui même la prévalence d'une économie de prédation fondée sur l'usage de la pierre taillée et parfois polie (molette, palette, colorant) et la production de la céramique. L'industrie lithique elle, s'inscrit dans un Age de la pierre récent finissant dont les caractéristiques connues en Afrique Centrale présentent généralement un pourcentage élevé du débitage (plus de 90%) et un nombre très faible d'òutils avec au moins une dizaine de types (Clist et Lanfranchi 1988). Mais l'association de celle-ci à des outils polis et à de la céramique décorée à la tresse semble marquer un stade de transition vers le néolithique.

Nord-Ouest

Dans le Nord-ouest, les mégalithes de Bouar ont été les mieux étudiés. Connus sous l'appellation de Tazunu ou "pierre dressée", ces mégalithes se trouvent sur la ligne de séparation des eaux des bassins du Congo et du Tschad à cheval sur le nord-ouest de Bouar et le Cameroun. Les études faites des années 60 à nos jours, ont fourni plusieurs variantes architecturales classées en trois phases chronologiques allant du néolithique à l'Age du fer (Vidal 1969; David 1982;

Zangato 1991, 1995): une phase ancienne de 800 BC marquée par la construction des Tazunu sans chambre, caractérisée par des buttes anthropiques sur lesquelles les pierres dressées sont disposées en rangées parallèles. Ces buttes sont bordées de coffres; - une phase transitoire de 850 à 200 BC voit l'apparition d'un type de Tazunu à chambre à l'intérieur des rangées de pierre; - une phase récente à partir de 500 de notre ère; au XIe siècle apparaît un autre type de Tazunu ou les pierres dressées sont disposées en cercles concentriques laissant le centre de la structure totalement vide.

Dans un seul cas, une hache polie en granite se trouvait parmi la pierraille à la base du ciste n° 3 de Tazunu Balimbe II. Trois échantillons de charbon de bois datés par N. David (1982) situent la construction du monument au VIIIe siècle avant notre ère.

L'organisation des sols, la densité de l'implantation des mégalithes dans la région (plus de 5000), leur localisation à la tête des cours d'eau plaident en faveur des sociétés sédentaires organisées. N'étant pas de constructions funéraires comme à toujours été le cas ailleurs, les mégalithes du Nord-ouest centrafricain seraient, selon les hypothèses avancées jusqu'à nos jours, destinés non seulement à "capter" symboliquement l'eau pendant les périodes xériques, mais aussi des marqueurs territoriaux claniques ou chaque groupe de famille circonscrirait son espace. Ainsi seuls les sites de Batalimo, d'Ogrotoulou et les mégalithes de Bouar ont fourni en fouille des éléments caractéristiques du néolithique pour l'heure en RCA.

II. Age du Fer

Contrairement aux périodes précédentes ou les trouvailles archéologiques sont rares et limitées dans l'espace, les recherches sur la métallurgie du fer ont fourni d'importants résultats à travers le pays (Fig. 5). Entamées indirectement en 1966, elles ont connu de 1970-80 un début de travaux systématiques avec la publication des résultats des fouilles de Nana-Modé et de Toala dans le Nord-ouest (David et Vidal 1977; Vidal et al. 1983). Suite aux travaux universitaires des années 80, le CURDHACA a entrepris depuis 1990 avec l'aide de la CCE puis de l'UE, une vaste campagne de prospections et d'enquêtes orales sur la sidérurgie. Le résumé est ici présenté sous forme de bilan suivant les 4 quadrans du pays: NW, NE, SW, SE.

Nord-Ouest: Nana-Mambéré, Ouham-Pendé, Ouham, Nana-Gribizi.

Dans cette région, les premiers témoins d'une production du fer proviennent de fouilles de mégalithe de Bouar (Vidal 1969) et du site de Nana-Modé au nord-ouest de Bouar (David et Vidal 1977). Il s'agit pour le dernier site d'une série de 46 buttes anthropiques correspondant à d'anciens fonds de case répartis sur 5 hectares. Les fouilles ont montré l'existence de 8 niveaux d'occupation au

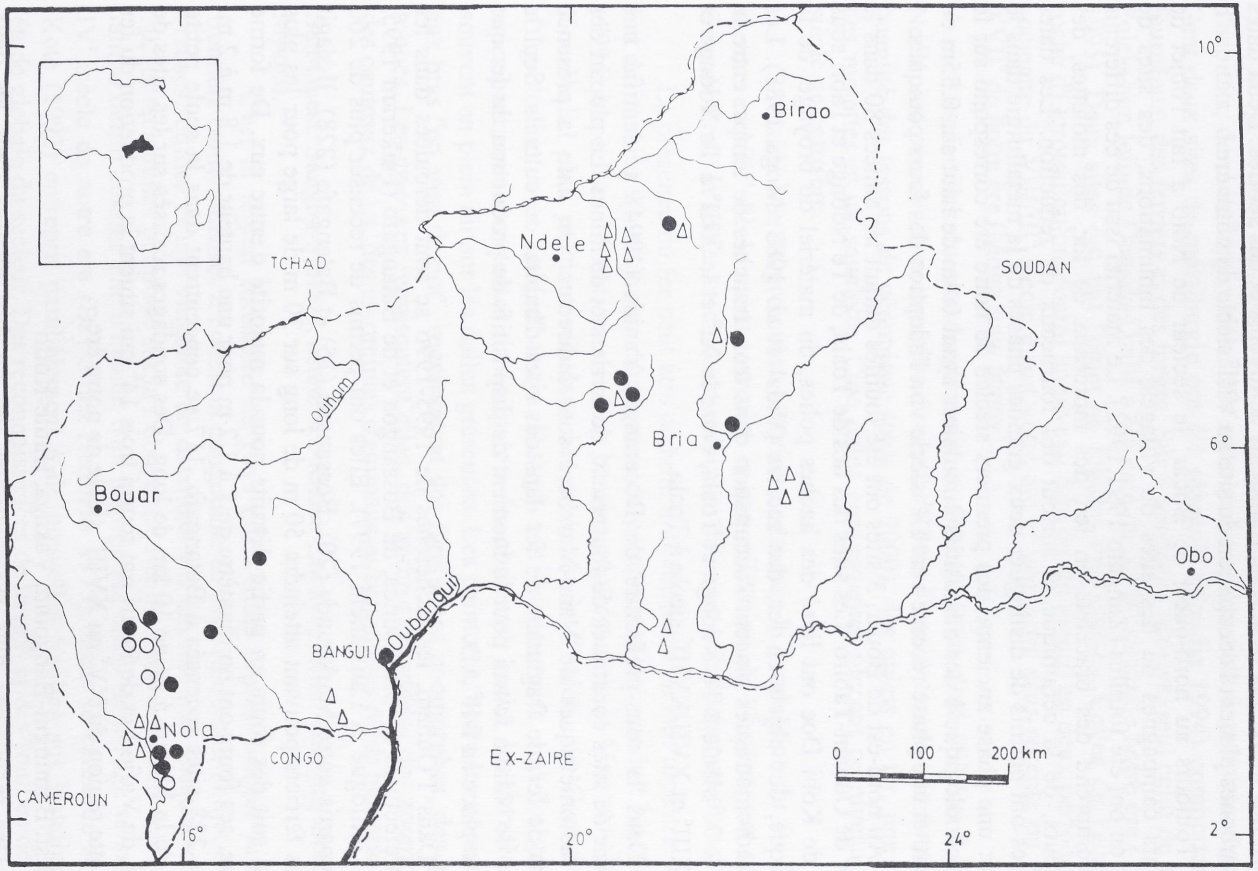

Fig. 5. Principeaux sites datés de l'Age du fer: 1 - Sabele; 2 - Becare; 3 - Ngara; 4 - Batalimo et ses environs; 5 - Nana-Mode; 6 - Ndio; 7 - Toala, Te Ndonge et Kobi Doe; 8 - Abri d'Ogrotoulou; 9 - Gounda-pont; 10 - Polele; 11 - Vafio; 12 - Ouassi; 13 – Bouri.

sein desquels l'activité métallurgique est représentée par des bracelets, des douilles, des morceaux de fer, de fragments de tuyères et des scories. Deux dates radiocarbones placent l'occupation du site au VIIIe siècle de notre ère.

Toujours au nord-ouest de Bouar, le secteur de Ndio a fait l'objet de plusieurs campagnes ou des sites de villages, des inhumations, des sites de réduction ont été fouillés (Zangato 1991,1992). Le matériel issu de ces différents sites comprend des bracelets en fer, des morceaux de fer, des molettes, des percuteurs, de la céramique et surtout des fourneaux de réduction. Les dates obtenues ont permis de distinguer deux grandes phases de la métallurgie dans le secteur: une phase ancienne des premiers siècles de notre ère correspond sur le plan technologique à des dispositifs circulaires ayant 0.4m de haut sur 0.55m de diamètre et une phase récente vers IXe siècle voit l'adoption des fours coniques.

Au nord-est de Bouar, 3 sites ont été fouillés durant les années 80 dans le secteur de Ouham-Tabiro. Les sites des îles de Toala, de Te Ndonge et l'abri sous roche de Kobi Doe ont livré des haches polies, du matériel de broyage, de la céramique, des objets en fer, des scories (Vidal et al. 1983; Moga 1988). Les dates radiomètriques placent l'occupation dans trois tranches de temps: entre le VIe et le Xe siècle à Te Ndonge et Toala, entre le XIe et le XIIIe à Te Ndonge et entre XIIIe et XVII/XVIIIe siècle à Toala.

Dans la sous-préfecture de Bocaranga, Yanida (1994) a identifié une vingtaine de sites constitués de fourneaux, de ferriers et de mines. La plupart des dates radiométriques de Nana-Mambéré sont indirectes. On date la présence d'objets de fer, de fragments de fer dans des sites d'habitat ou cultuels. Seul le secteur de Ndio a fourni pour le moment de dispositifs de production du fer que Zangato place au I-IIe AD.

Dans l'Ouham, les recherches de 1995-1996 se sont déroulées dans les sous-préfectures de Markounda, de Bossangoa et de Batangafo (Feikeram 1995, 1997; Gotilogue et Lanfranchi 1997). Elles ont permis de recenser plus de 260 sites répartis entre Markounda (20), Bossangoa (15) et Batangafo (228). Il s'agit soit des ferriers pouvant atteindre 50 m de long sur 30 m de large pour les plus grands; soit des fours en partie détruits pour la majorité d'entre eux. De forme conique, ces fours ont un diamètre de 1 à 1,2 m pour une hauteur de 1,8 m à 2 m. Sur les 228 sites recensés à Batangafo, 117 se concentrent dans la seule petite vallée de la Mégué à peine 10 km de long. Des sondages réalisés sur les sites de Ouassi, de Vafio I et de Bouri ont fourni trois 14^{C} qui situent la production du fer dans cette région du XVe au XVIIIe siècle de notre ère.

Nord-Est: Bamingui-Bangoran, Vakaga, Haute-Kotto

Des recherches plus systématiques ont pu être menées dans les deux premières régions grâce à l'aide que le PDRN a apporté au CURDHACA. De

prospections et fouilles ont été faites dans les secteurs de Manovo, de Gounda-Pont, d'Ogrotoulou, de Sergobo et à Ouanda-Djallé: elles ont porté sur des sites d'habitats, de métallurgie, des abris sous roche et des sites à gravures rupestres. Cent deux sites de métallurgie ont été récensés (Yandia 1994) comportant des fourneaux, des ferriers et des forges. Sur 8 sondages réalisés, seul celui du site de Polele non loin de Ouanda-Djallé a été daté du XVIIe siècle de notre ère (Yandia 1995). Deux sites ont fait l'objet de fouilles importantes. Celles de l'abri sous roche d'Ogrotoulou ont fourni un niveau Age du fer réparti en deux périodes: une ancienne du VIII/IIIe siècle avant notre ère et une autre plus récente du XV au XVIIe de notre ère (Moga sous presse).

Les fouilles du site de plein air de Gounda-Pont situé 103 km à l'est de Ndélé ont permis de reconnaître 3 couches dont l'une a fourni une importante quantité des tessons de céramique (plus de 9000), des objets en fer, une meule, des molettes et un squelette. Cinq dates convergentes placent ce niveau au Ve siècle de notre ère.

Ainsi le site d'Ogrotoulou autorise à admettre la production du fer dans le secteur au VIIIe siècle avant notre ère et son utilisation au Ve après sur celui de Gounda-Pont: la seule structure de réduction datée est elle beaucoup plus récente.

La présence du fer peut être déduite indirectement de l'art rupestre. Au début des années 90, plusieurs campagnes de prospection ont conduit Ngouamene (1994) à recenser 14 stations dans les bassins supérieurs de la Manovo-Gounda-Koumbala, plus précisement dans les secteurs de Toulou, de Gounda-Pont, d'Ogrotoulou et de Yangoubakoya. Il s'agit soit des peintures, soit des gravures, si les premières sont toutes sur les parois des abris sous roche, les dernières sont souvent en plein air sur les dalles gréseuses. Les peintures, outre les personnages aux bras "en anse de pot", représentent des figurations zoomorphes, des géométriques. Les gravures représentent elles, des anthropomorphes, des zoomorphes, des couteaux de jet, des empreintes d'animaux et surtout des pieds humains.

Sud-Ouest: Sangha-Mbaéré, Mambéré-Kadéi, Lobaye, Kemo-Ibingui, Ombella-MPoko.

C'est la région forestière du pays qui s'étend depuis Bangui jusqu'à la frontière camerounaises à l'ouest et congolaise au sud. Elle a fait l'objet de nombreuses fouilles et une vingtaine de datations y a été réalisée. Jusqu'aux années 90, les recherches ont porté sur la Lobaye. Le site de référence étant celui de Batalimo défini comme site d'habitat d'un néolithique tardif dont l'âge se situait au IVe siècle de notre ère (Bayle des Hermens 1975). Dans le cadre de sa thèse, Kote (1992) entreprit parallèlement à de nouvelles fouilles sur Batalimo, une étude globale du secteur. Des reconnaissances de terrain et des fouilles de 1987 à 1990 ont permis la découverte de 10 sites dont 3 d'habitat spécialisés dans la pro-

duction de la céramique et d'industrie lithique et 7 d'atelier/habitat comprenant en plus de la céramique et d'industrie lithique, du fer. Mais si l'auteur a pris soin de décrire les 7 sites, il n'a pas précisé dans son analyse stratigraphique les niveaux d'échantillons prélevés, ni leur degré d'association qui pourraient informer sur le caractère direct ou indirect des 19 datations réalisées. Parmi celles-ci, 9 situent la technologie du fer en 3 phases:

- la première, du VII-VIII AD concerne les sites de Bobele et de Sikilongo ou sont attestées des structures de production du fer;
- la seconde, du XII-XVe siècle est attestée à Lingbangbo et Mondongué;
- la troisième phase s'échelonne du XVIIe au XXe à Mondongué. Si Bobele et Sikilongo attestent de la production du fer entre VII-VIIIe siècles, les autres sites se présentent comme zones de consommation du fer à partir du XIIIe.

Plus- à l'ouest dans l'île de Ngara sur la Mambéré en amont de Bania, un niveau archéologique (Mamyledane 1994) contenant des tessons de céramique, des scories et des fragments de tuyères a été daté de Cal AD 1443-1635. L'île a donc été occupée entre XVe et XVIIe siècle de notre ère. Mais d'autres résultats intéressants proviennent plus au sud de Bania, de la forêt dense ou des savanes incluses qui la parsèment (Zana 1994; Ndanga 1996; Lanfranchi et al. 1977). Dans la ville de Nola, le site de Bécaré a fourni la base d'un four effondré et des fragments des tuyères formant un cercle. Des charbons de bois prélevés au coeur de cet ensemble a été daté de Cal AD 55 à 390, soit IIe et IIIe siècle de notre ère. Au village de Beya sur le plateau de Baboungué dans une grande savane incluse, on a découvert des ferriers qui se confondaient avec les termitières. Dix-neuf ont été recensés dans un rayon de 4 km.

Un ferrier isolé, Sabele I a été fouillé. Il s'agit d'un anneau de scories au sein duquel se trouve la base d'un four circulaire. Des charbons collectés ont donné comme date Cal AD 1278 à 1411. A 600 m de Sabele I, un autre sondage sur un four, Sabele 11, a permis d'avoir une date comprise entre Cal AD 1222-1387. Les deux sites sont donc contemporains et peuvent être datés du XIIIe et du XIVe siècles de notre ère.

Sud-Est: Ouaka, Basse-Kotto, Mbomou et Haut-Mbomou

Les prospections archéologiques dans cette région restent ponctuelles et seuls les sites d'art rupestre peuvent être mis en rapport avec l'Age du fer.

Dans le Mbomou, Bayle des Hermens (1975) a décrit les sites de Lengo et de Mpatou près de Bakouma ou à plus de 500 figurations constituées de couteaux de jet, des lances, des flèches, s'ajoutent des représentations anthropomorphes, zoomorphes, de géométriques, d'empreintes de pied et de cupules. Au nord et à l'est de Bangassou plusieurs stations rupestres ont été décrites (Dampierre 1967; Zangato 1984). On y trouve toujours des armes, des couteaux de jet, des em-

preintes de pied et une représentation anthropomorphe. De même 3 stations rupestres à couteaux de jet et aux empreintes de pied ont été signalées par Nangbanda (1988) dans le Haut-Mbomou.

Dans la Basse-Kotto une dizaine de sites rupestres a été identifiée dans la sous-préfecture d'Alindao (Ngouamene 1990; Nguerede 1996). Là encore il s'agit de gravures de couteaux de jet, de lances, d'anthropomorphes et de cupules. Autour de Bambari, dans la Ouaka, Komboro-Ngbalet (1984) a étudié une dizaine de sites rupestres ou il a enregistré là aussi des couteaux de jet, des lances, des flèches et des zoomorphes. Dans ces 4 préfectures les gravures rupestres sont très fréquentes sur les *lakéré* (cuirasses). On rencontre d'une façon majoritaire (80% des figures) des figurations de couteaux de jet d'une grande variété. Elles sont accompagnées de lances, d'épées ainsi que de sortes de bouclier.

Conclusions et perspectives

Pour la préhistoire ancienne, les travaux de Bayle des Hermens ont jeté les bases d'une chronologie relative sur laquelle viennent se greffer les recherches récentes sur le paléolithique. Les industries connues de cette période en RCA semblent se rapporter essentiellement à l'Acheuléen et au Sangoen et, de ce fait peuvent être situées approximativement entre 300,000 et 15,000 BP. La majeure partie de ces industries a été découverte dans les alluvions lors de l'exploitation de celles-ci pour les diamants. Par contre la plupart des sites du Sangoen se rencontrent en surface. Pour l'heure, on ne connaît aucun gisement du paléolithique ancien (OSA), moyen (MSA) et final (LSA) *in situ*. Cette difficulté incite désormais à orienter les recherches vers les cavrnes ou l'on espère trouver un cadre chrono-stratigraphique et paléoclimatique. Il s'agit par exemple dans le nord-est de:

- 10 abris sous roche autour de celui d'Ogrotoulou (8°35' N-21°51'10"E) partiellement fouillé en 1990;
- 3 abris sous roche et une grotte dans le secteur de Gounda-Pont (8°38'10"N-21°26'40"E);
- 9 abris autour du principal peint de Toulou (8°31' 24"N-21°07'32"E);
- 2 abris et une grotte au bas des mamelons gréseux de Mougnou à l'est de Ouanda-Djallé.

Pour la préhistoire récente, les sites néolithiques fouillés se confinent dans les régions du sud-ouest (Batalimo), du nord-ouest (mégalithes) et du nord-est (Ogrotoulou). Mais dans tous les cas les structures socio-économiques caractérisant ces néolithiques ne sont pas clairement prouvées même si dans celui des

mégalithes du nord-ouest les imposantes constructions militent en faveur des sociétés organisées.

Age du fer:

Les recherches sur la métallurgie du fer ont progressivement couvert la moitié du territoire. Les résultats acquis montrent l'omniprésence des dispositifs de réduction du fer dans tout le pays et conduisent à saisir la profondeur historique du travail du fer. L'ensemble des dates obtenues autorisent une première esquisse de cette histoire. La date de Becare à Nola semble indiquer une progression vers le sud-est des migrations bantoues le long des cours d'eau. Cette date se place entre les dates anciennes du Cameroun (de Maret 1992), du Gabon (Peyrot et Oslisly 1987; Digombe et al. 1988; Clist 1990) et celles plus récentes de la Lobaye (Kote 1992; Vidal 1992). Elle montre que très tôt, la foret a été pénétrée par des populations maîtrisant le fer.

Au début de l'age du fer récent, la même région est occupée au XIIIe siècle de notre ère par des populations installées sur le plateau de Baboungué et pratiquant une sidérurgie intense comme le prouvent les nombreuses buttes de ferriers. Dans l'Ouham, plus particulièrement autour de Batangafo, les datations se regroupent autour des XVe et XVIIe siècles. Or l'histoire a montré par ailleurs (Kalck 1974) que le groupe Sara a migré depuis son foyer tchado-soudanais vers les rives de l'Ouham vers XVIe siècle. Au sud de la préfecture, autour de Bossangoa, la date de Bouri est plus récente mais antérieure à l'arrivée des Gbaya que Kalck (1974) et Penel (1984) placent aux XIXe siècle. Dans toute la région, la métallurgie a perduré jusqu'au milieu de ce siècle.

En somme la date la plus ancienne pour l'Age du fer provient du nord-est, de l'abri d'Ogrotoulou ou le niveau est daté du VIIIe au IIIe siècle BC (Moga sous presse). Au début de notre ère Zangato signale des fours de réduction dans le secteur de Ndio au nord-ouest de Bouar.

Le site de Becare est pour l'instant le plus ancien dans l'ouest du pays. La seconde moitié de l'Age du fer ancien est beaucoup plus répresentée dans l'ouest avec les sites de Nana-Modé (VIIIe siècle AD) et ceux de la Lobaye (VIIe-VIIIe siècle AD). Dans le nord-est, seul le site de Gounda-Pont a fourui des dates analogues (V-VIIe siécle).

Cette série de dates permet d'individualiser deux axes de pénétration en RCA à l'Age du fer ancien, l'un vers le nord-est, l'autre vers l'ouest en empreintant les rivières Sangha et la Lobaye. A partir du XIe l'Age du fer récent apparaît dans l'ouest du pays: région de Bouar, région de Nola, cours inférieur de la Lobaye. Puis à partir du XVe siècle le fer se généralise dans tout le pays. Toutes les régions étant concernées ce qui semble correspondre aux multiples migrations qui conduisent au peuplement actuel de la RCA.

L'hypothèse actuelle de deux voies de pénétration du fer en RCA est suggérée par une partie des 87 dates radiométriques obtenues au cours des trois dernières décennies (cf. annexe). Plus de 95% de ces dates se rapportent à l'Age du fer dont la majorité à l'Age du fer récent (XIe-XVIIIe siècle). Ces acquis sont le résultat d'un artifice de recherche que les fouilles de nombreux sites de réduction déja répertoriés dans le nord-est, le nord-ouest et le sud-ouest (Lanfranchi et Gotilogue, sous presse) apporteront des modifications au canevas proposé. Mais la RCA souffre de chercheurs travaillant réellement sur terrain et plus particulièrement sur les périodes préhistoriques. Le CURDHACA entend tisser des accords avec d'autres institutions nationales et internationales oeuvrant en Afrique en vue de promouvoir les recherches archéologiques dans cette partie de la sous-région d'Afrique centrale. La position de ce pays, au coeur du continent, lui confère son rôle de couloir de migration des hommes et des cultures entre le nord et le sud, l'est et l'ouest.

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TABLE DE DATATION RADIOCARBONES			
Bdy-252	MONDONGUE, Lobaye	moderne	
Bdy-253	MONDONGUE, Lobaye	140 ± 240	
Bdy-254	LINGBANGBO FP, Lobaye	moderne	
Bdy-255	LINGBANGBO FP, Lobaye	430 ± 180	
Bdy-301	BATALIMO Z III, Lobaye	1890 ± 130	
Bdy-303	SIKILONGO, Lobaye	870 ± 210	
Bdy-304	BATALIMO Z IV, Lobaye	1730 ± 120	
Bdy-306	BATALIMO Z III, Lobaye	1990 ± 210	
Bdy-311	TE DONGE, Nana Mambere	670 ± 160	céram/fer
Bdy-312	TE DONGE, Nana Mambere	810 ± 190	céram/fer
Bdy-315	TAZUNU GBAYOYO, Nana Mambere	2490 ± 240	mégalithe
Bdy-347	NDIO, Site 50, Nana Mambere	1210 ± 110	structure fer
Bdy-354	BOUBOUN-KPOGBERE site 57	420 ± 80	case
Bdy-358	BOUBOUN-KPOGBERE site 57	180 ± 80	case
Bdy-461	EYO, Lobaye	1200 ± 120	
Bdy-462	BATALIMO Z VI, Lobaye	240 ± 75	
Bdy-463	LINGBANGBO sd, Lobaye	70 ± 120	
Bdy-464	LINGBANGBO sd, Lobaye	110 ± 80	
Bdy-465	BATALIMO Z VI, Lobaye	1270 ± 125	
Bdy-579	EYO, Lobaye	1020 ± 115	
Bdy-581	BATALIMO Z VI, Lobaye	1798 ± 101	
Bdy-582	LINGBANGBO sd, Lobaye	559 ± 77	
Bdy-583	BOBELE II, Lobaye	1200 ± 100	
Bdy-584	TAZUNU BALIMBE 8, Nana Mambere	2430 ± 130	
Bdy-588	MBILI 1 site 55, Nana Mambere	170 ± 170	
Bdy-594	TAZUNU DOKOKO, Nana Mambere	400 ± 160	
Bdy-597	TAZUNU DOKOKO, Nana Mambere	3010 ± 220	
Bdy-598	BOUBOUN site 58, Nana mambere	570 ± 130	case
Bdy-601	MBILI 2, site 64, Nana Mambere	1760 ± 180	structure fer
Bdy-641	MBILI 2, Nana Mambere	1740 ± 180	structure fer
Beta-88.067	BECARE, Sangha	1870 ± 70	fer
Beta-97.284	OUASSI, Ouham	290 ± 50	ferrier
Beta-103.857	VAFIO, Ouham	410 ± 60	ferrier
Beta-104.810	BOURI, Ouham	220 ± 70	ferrier
Gif-1636	TAZUNU BEFORO I, Nana Mambere	7440 ± 170	lithique
Gif-1637	TAZUNU TIA I, Nana Mambere	1920 ± 100	mégalithe
Gif-1887	TAZUNU BE YOLE, Nana Mambere	2520 ± 110	mégalithe
Gif-1888	TAZUNU BE YOLE,Nana Mambere	2200 ± 110	mégalithe
Gif-1889	TAZUNU ZUPAYA, Nana Mambere	2400 ± 110	mégalithe
Gif-1890	TAZUNU ZUPAYA, Nana Mambere	6700 ± 140	mégalithe
Gif-2673	TAZUNU BETUME, Nana Mambere	190 ± 90	mégalithe
Gif-5209	KO BI DOE, Ouham Pende	moderne	céramique
Gif-5211	TOALA, Ouham Pende	220 ± 80	céramique
Gif-5212	TOALA, Ouhwn Pende	410 ± 100	
Gif-5666	TOALA, Ouhaina Pende	650 ± 60	céramique
Gif-5667	TOALA, Ouham Pende	1200 ± 60	céramique

Gif-5668	TOALA, Ouham Pende	390 ± 70	céramique
Gif-5669	TOALA, Ouham Pende	1560 ± 80	céramique
Gif-5894	BATALIMO, Lobaye	1590 ± 90	céramique
Gif-7517	TAZUNU GBAYOYO, Nana Mambere	2500 ± 60	mégalithe
Gif-7518	TAZUNU GBAYOYO, Nana Mambere	2430 ± 60	mégalithe
Gif-7519	TAZUNU BALIMBE 2, Nana Mambere	3430 ± 80	mégalithe
Gif-7564	TAZUNU BALIMBE 2, Nana Mambere	2390 ± 80	mégalithe
Gif-????	TAZUNU BALIMBE 8, Nana Mambere	2040 ± 40	mégalithe
Gif-????	TAZUNU BALIMBE 8, Nana Mambere	2480 ± 50	mégalithe
Lv-1872	TE DONGUE, Ouham Pende	880 ± 70	
Lv-1873	TE DONGUE, Ouham Pende	950 ± 60	
Lv-1874	TE DONGUE, Ouham Pende	1370 ± 70	
Lv-1875	GOUNDA PONT site 7, C IB 2	1440 ± 60	
Lv-1876	GOUNDA PONT site 7 C IIB 1	1490 ± 70	
Lv-1877	GOUNDA PONT site 7 C IIIB 2	1510 ± 50	
Lv-1878	OGROTOULOU surf A6	380 ± 70	
Lv-1879	OGROTOULOU CI	2360 ± 60	
		±	
Ly-4782	TAZUNU BALUfflE 9, Nana Mamabere	430 ± 70	
Ly-5919	NGARA A2, Sangha	330 ± 45	céramique
Ly-5920	SABELE I, Sangha	moderne	fer
Ly-5921	SABELE I niveau 2, Sangha	630 ± 45	fer
Ly-5922	SABELE H, Sangha	715 ± 35	fer
Ly-5945	GOUNDA PONT C II,	1470 ± 55	
Ly-5946	GOUNDA PONT C III,	1475 ± 55	
Ly-5947	OGROTOULOU surf. C I	220 ± 50	
Ly-5948	OGROTOULOU C II	2350 ± 50	
Ly-5949	OGROTOULOU C II	2655 ± 30	
Si-2538	NANA MODE, Nana Mambere	1235 ± 60	céram/fer
Si-2539	NANA MODE, Nana Mambere	1250 ± 60	céram/fer
Si-2655	TAZUNU BETUW, Nana Mambere	2485 ± 60	mégalithe
Si-2658	TAZUNU BETUME, Nana Mambere	3975 ± 80	pré-mégalithe
Si-2659	TAZUNU BETUME, Nana Mambere	2485 ± 40	mégalithe
Si-2661	TAZUNU BETUME, Nana Mambere	4340 ± 80	pré-mégalithe
Si-2662	TAZUNU BALIMBE 2, Nana Mambere	2785 ± 100	mégalithe
Si-2663	TAZUNU BALIMBE 2, Nana Mambere	2400 ± 60	mégalithe
Si-2664	TAZUNU BALIMBE 2, Nana Mambere	2220 ± 60	mégalithe
Si-2665	TAZUNU BALIMBE 2, Nana Mambere	2560 ± 70	mégalithe
Si-2666	TAZUNU BALIMBE 2, Nana Mambere	2565 ± 50	mégalithe
Xxxxx	POLELE	260 ± 45	fer
DATATION TERMOLUMINESCENCE:			
OxTL-154a	BATALIMO, Lobaye	AD 380± 220	céram/poli

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Laurel Phillipson

A functional consideration of Gudit scrapers from Aksum

Introduction

Gudit scrapers are highly standardized stone tools found in Aksumite contexts at sites in Aksum, Ethiopia and its near vicinity. Their uniformity and asymmetry provoke a question which might well be asked of all stone tools: for what were they used? Evidence presented here, including their circumscribed spatial and perhaps temporal distribution, indicates their use only in limited contexts which, to judge from their abundance, must have been of considerable economic importance.

The scrapers are found at a major site, Mai Ayne, in the plain west of Aksum, which it is hoped will be the subject of future investigation, in small quantities in excavated Aksumite residential areas within and near the modern town of Aksum, in the top levels of Gobedra Rockshelter, and at a site or sites investigated under the direction of Rudolfo Fattovich and Kathryn Bard at Beta Giyorgis Hill, overlooking Aksum. Their most abundant occurrence is on the surface of a small portion of the Gudit Stelae Field, west of Aksum town (Fig. 1).

In 1996 in an attempt to protect the stelae field, Ethiopian authorities enclosed it within a permanent fence, with a main entrance to the road opposite the site of Dungur, a much visited Aksumite building complex. This has had the unfortunate effect of ensuring that visitors to the stelae walk across the locus of the scrapers' densest distribution, which lies within and very near the entrance to the stelae field. As it was apparent that under these conditions their main occurrence could not long endure, collections of the scrapers and their few associated lithic artefacts were made in November and December 1966 and are here reported.

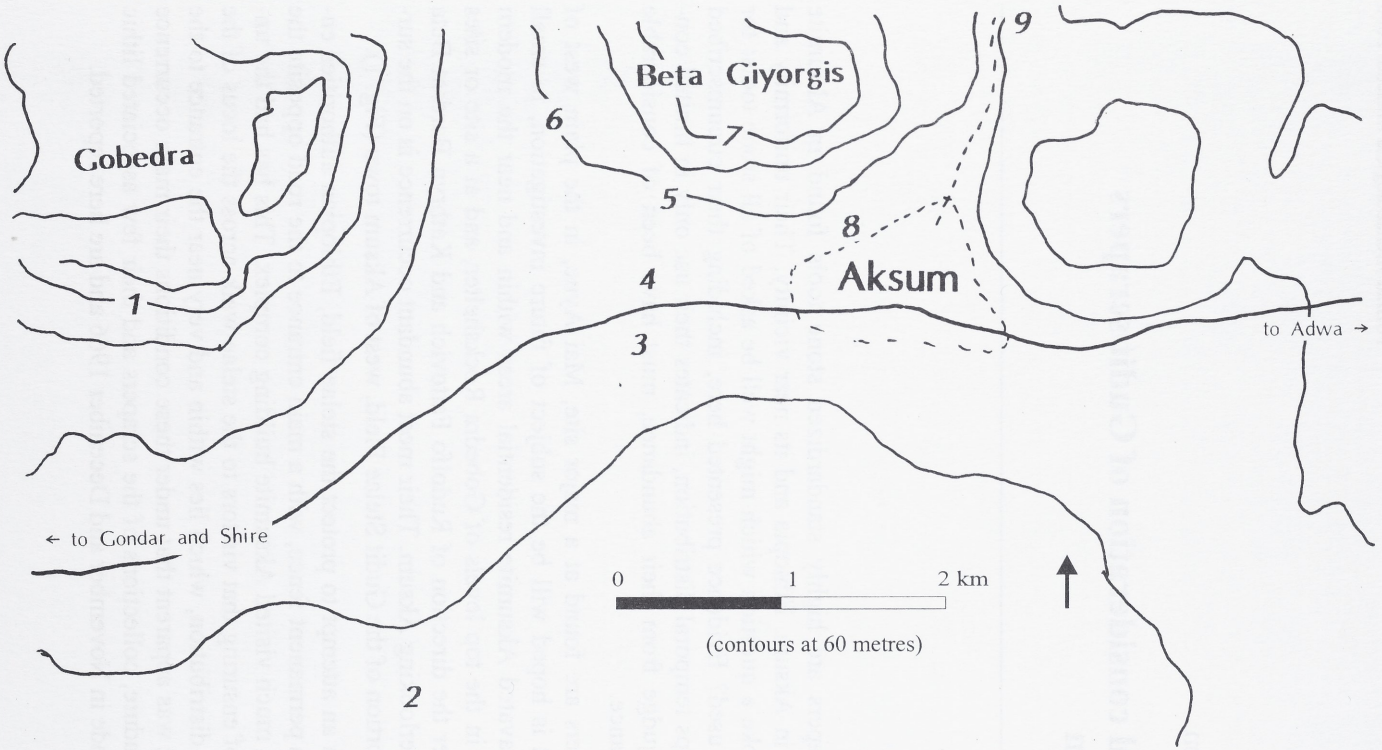


Fig. 1.
Location of sites mentioned in the text: 1, Gobedra Rockshelter; 2, Mai Ayne; 3, Gudit Stelae Field, surface collections A and E; 4, Dungur; 5, site of surface collection B; 6, findspot of chert block; 7, site(s) on Beta Giyorgis; 8, Kiros excavation site; 9, Domestic excavation site.



Fig. 2.
Surface collection A: scrapers. Dotted lines indicate extent of retouch/utilization scars.

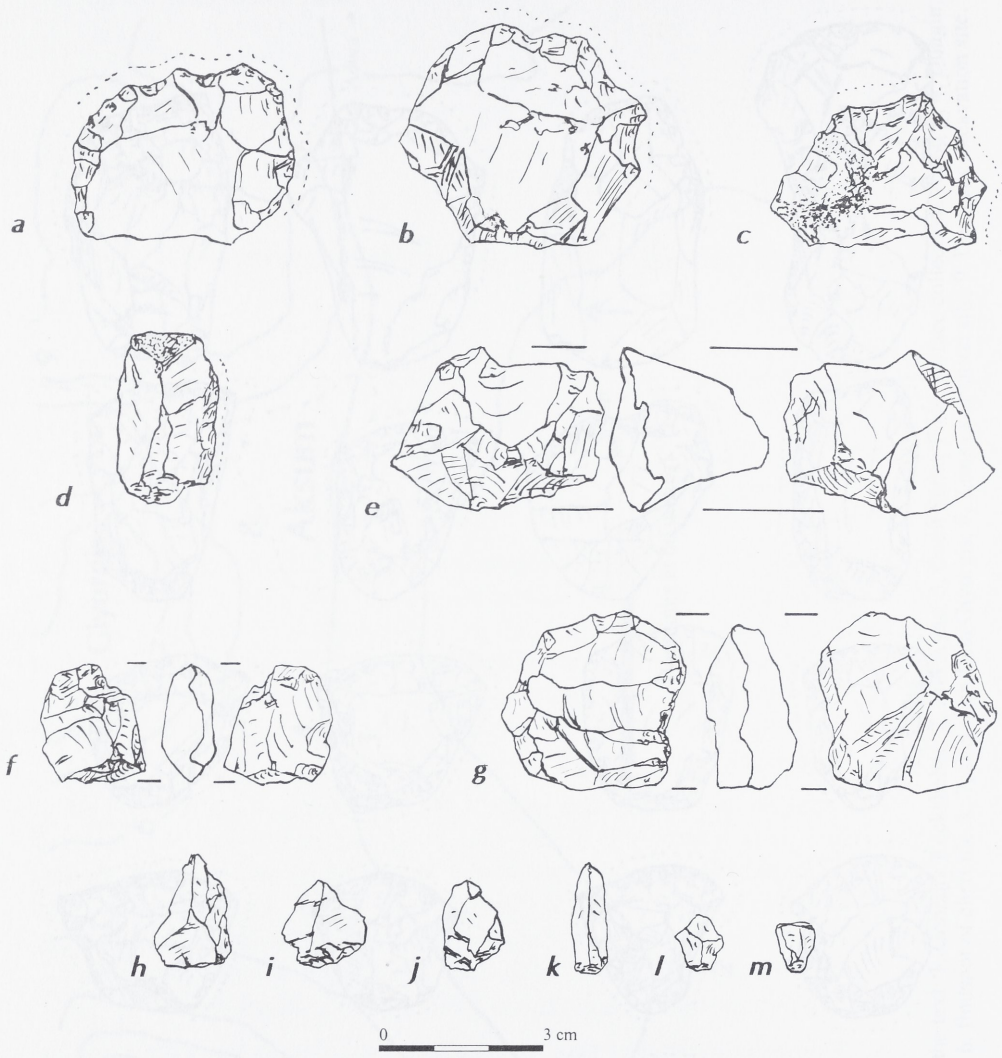


Fig. 3.
Surface collection A: a - c, denticulate scrapers; d, sidescraper; e - g, cores; h - m, resharpening/trimming flakes.

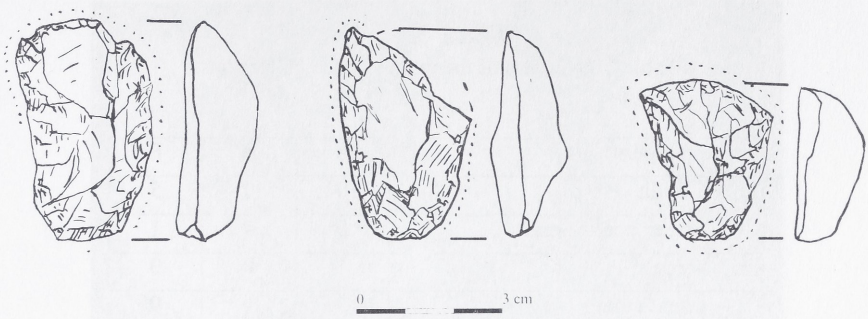


Fig. 4. Gudit Stelae Field surface finds: scrapers with narrowed butts.

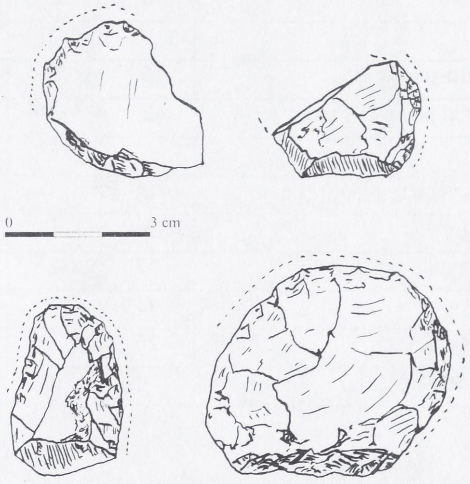


Fig. 5. Surface collection B: scrapers.



Fig. 6. Chert block, presumed import for scraper production.

Table 1. Synopsis of the main surface collections.

Flake scrapers	A	B	E
Gudit	104	0	5
steep convex end	0	1	1
side	1	0	0
denticulate	3	1	0
notched	0	1	0
convex	0	1	0
Cores			
multi-platform	6	9	0
radial plano-convex	2	3	0
Flakes			
rejuvenating	14	-	-
endstruck	9	-	-
irregular	67	-	-
Flake fragments	43	-	-
Chips and chunks	26	-	-
unsorted debitage	-	19	69

Table 2. Sample dimensions af Gudit scrapers from surface collection A.

length mm	breadth mm	thickness mm
58	41	24
57	29	19
39	25	16
33	38	16
27	21	11
22	27	07
21	22	11

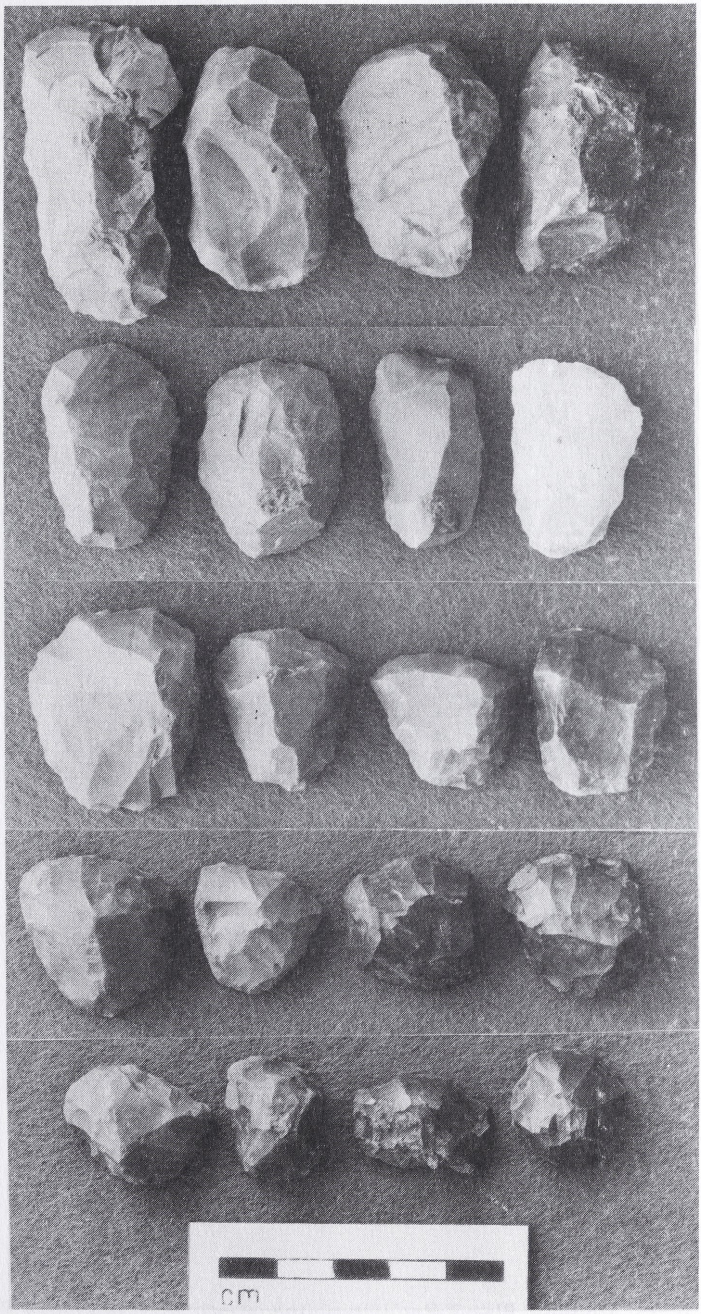
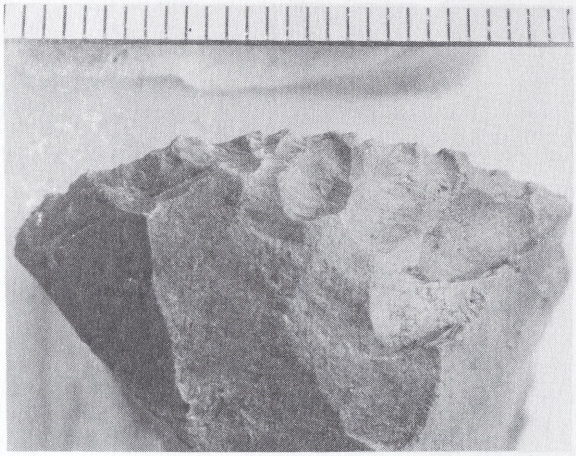
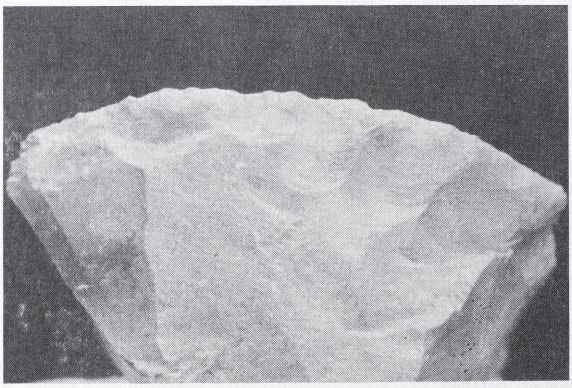


Plate 1. Gudit scrapers from surface collection A.



A

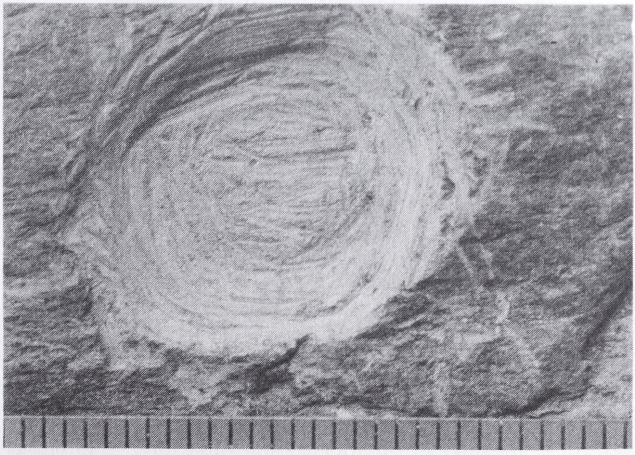


B

Plate 2. Replication experiments:
a, Gudit scraper after second resharpening; b, Gudit scraper after working soapstone.



A

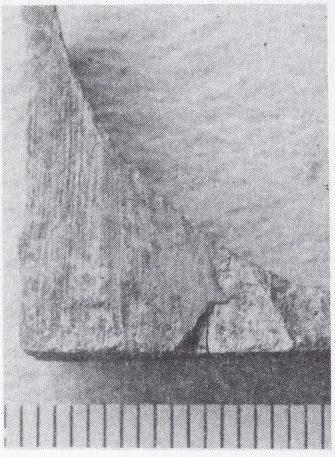


B

Plate 3. Replication experiments: a, tool marks on Aksumite soapstone seal; b, soapstone carved by scraper shown in plate 2.



A



B



C

Plate 4. Replication experiments: a, tool marks on reverse of an Aksumite ivory plaque; b, tool marks on Aksumite ivory turning waste; c, tools marks on eucalyptus wood shaped by scraper shown in plate 2.



Plate 5. Detail of Aksumite ivory furniture panel; V-shaped cuts retaining narrow ridges in their depths indicate the use of metal carving tools.

The collections

Two separate surface collections were made in the Gudit Stelae Field. The first of these, collection A, was over an area of 18.0 metres by 8.5 metres (153 square metres), 15 metres west of trench G3 excavated by Ayele Tarakegn in 1995 and 1996. All lithic artefacts within the designated area were collected; Aksumite pottery of several periods was noted but not collected; no other artefacts were encountered. This collection comprised 108 scrapers, 104 of which were of Gudit type, 8 cores, and 159 flakes and fragments (Plate l; Figs. 2,3).

Collection E was made over an area of 0.25 square metre adjacent to the area of collection A. This encompassed a dense distribution of minute flakes and fragments which had become exposed by several days of unseasonal rain. It comprised 68 flakes and fragments with maximum dimensions of 28 mm to just 4 mm. In addition, six scrapers were noted but not collected and not all the very smallest flake fragments were collected owing to the shortage of time available for the purpose. No other artefacts were encountered.

Elsewhere in the Gudit Stelae Field, a systematic search revealed a slight scatter of lithic material in its northern portion and rather more abundant Aksumite pottery in some parts of the site. There were no other lithic concentrations. Few cores and no implements other than steep scrapers on thick flakes were found. The only slight variant of the scrapers in collection A were three specimens of Gudit scrapers, 34 mm to 46 mm long, with slightly constricted butts, which could perhaps have been hafted for use as composite tools (Fig. 4). This surmise is only based on the fact that a slight narrowing at the butt end could have facilitated hafting.

A third collection, collection B, was made over an area of 100 square metres at the foot of Beta Giyorgis, north of the Dungur building complex site. This comprised 34 lithic artefacts, 12 of which were cores. In its greater range of scraper types as compared with the material from Gudit Stelae Field and in the presence of many cores, collection B material seems to resemble that from Mai Ayne, which will not be discussed here (Fig. 5).

Yellow chert flakes and occasional Gudit scrapers were also noted in the much disturbed spoil heaps among the Dungur ruins. These were not collected.

The artefacts

The composition of the three main surface collections is summarized in Table l. Sample dimensions of Gudit scrapers from surface collection A are given in Table 2. From these figures it may be noted that diminution in breadth and thickness of the scrapers is not proportionate to their diminution in length. Although some of the smaller scrapers have breadths equal to or slightly greater

than their lengths, sufficient dorsal scars remain to indicate that they are none-the-less endscrapers made on thick flakes of approximately triangular cross section, most of which have scars originating from a longitudinal dorsal ridge. Such flakes are often termed "core rejuvenating"; in this instance they appear to have been deliberately produced as blanks for scraper manufacture. The multi-platform and occasional radial cores in collections A and B could easily have produced such flakes.

Maximum dimensions of the cores in both collections were from 50 mm to 23 mm. They appear to have been worked by a bi-polar percussion technique to the point where they could no longer produce usable flakes. Maximum flake dimensions in collections A and E, those made within the Gudit Stelae Field, were 28 mm to 4 mm. In collection B, from the foot of Beta Giyorgis, maximum flake dimensions were much larger at 42 mm to 17 mm. Two facts may be deduced from these dimensions. First, cores tended to be fully worked and only discarded when no more usable flakes could be derived from them.

Second, the Gudit scrapers were frequently resharpened. No activity other than resharpening, most probably by pressure flaking with a narrow metal point or edge, is likely to have produced the numerous very small, shallow flakes and flake fragments found associated with the scrapers in collections A and E. The highly circumscribed distribution of the minute flakes which constitute collection E may well have resulted from a single incident of tool resharpening. The larger flakes in collection B, however, would have been by-products of the several stages of core reduction and scraper manufacture.

As defined by D. W. Phillipson in 1977, Gudit scrapers are characterized as steep, convex endscrapers with a slightly asymmetric plan shape and a rounded angle or point at one corner, usually the left when the scraper is viewed from the dorsal face with the scraper edge uppermost. That this plan shape is most characteristic of the smaller specimens, and most especially those recovered from Gudit Stelae Field, suggests that the shape is a deliberate result of the resharpening process applied to scrapers which, like the larger specimens in collections A and B, were originally produced with less distinctive convex edges.

When collection A scrapers were seriated according to their overall length, the progression from convex to typically Gudit to irregularly convex scraper edge plans was readily apparent (Fig. 2). This deliberately produced asymmetry and variable curvature of the working edge indicates that they must have been used without a haft or mounting as only direct manipulation by the thumb and fingers permits the minor adjustments of holding position which are necessary to take full advantage of the tool's subtle shape. A preponderance of acute angles on the

left corner of the scrapers probably correlates with the incidence of righthandedness among their users.

Raw material

All of the scrapers and their associated flakes and cores were made of homogeneous siliceous rocks with micro- or cryptocrystalline structure, among which chert, chalcedony and a translucent white stone were common. A distinctive, homogeneous ochre-yellow tabular chert was particularly abundant. Among the smallest flakes and fragments in collection E, 5 were of a red chert/chalcedony with yellow mottling which apparently derived from a single piece of stone, as did another 5 of brown-grey chert, 2 of olive-grey chert and 2 of dark grey chert. Thirty-nine fragments of ochre-yellow chert likewise appeared to have derived from a single source.

Tabular chert outcrops at the base of Beta Giyorgis and homogenous ochre -yellow chert is abundant to the north of this hill, about an hour's walk from Aksum. Other silicates were most likely obtained in the form of geodes eroded out from the underlying basalts and found in superficial deposits and river gravels. It was noted that a surface site with apparently Late Stone Age and/or more recent lithic material located a little more than 10 km east of Aksum had no artefacts of ochre-yellow chert, but did have some of an equally distinctive red tabular chert. Neither is yellow chert listed among the artefact materials recovered from Gobedra Rockshelter (D. W. Phillipson, personal communication).

A significant find of yellow chert as a raw material was made at a small Aksumite knoll site on the edge of the valley between the hills of Beta Giyorgis and Gobedra, about 3 km from Gudit Stelae Field. This is a triangular, wedge-shaped block of very homogeneous, fine, ochre-yellow tabular chert measuring 122 mm by 103 mm by 71 mm, with several flakes removed from a battered edge of the block (Fig. 5). The site where it was found lies along what was apparently a major communication route between a number of important Aksumite sites and settlements.

The block itself looks like something imported for the purpose of stone tool production. So far as could be ascertained visually, it was the same material as that of many of the Gudit scrapers and flakes.

Generally, the smaller Gudit scrapers tended to be made of the finer materials. This would have resulted from the less satisfactory specimens - those made of coarser or less homogeneous stone - having been resharpened less frequently and discarded sooner than the finer pieces, which were more likely to have been retained and resharpened until they became too small to use.

Replication experiments

Some information about the probable use of Gudit scrapers can be deduced from their morphology. The frequency with which they were resharpened suggests use on a tough, homogeneous, perhaps fibrous material that would tend to blunt rather than flake or chip the scraper edge. The steepness of the edge indicates a task involving a considerable degree of force applied to a resistant material, while the need for a constantly resharpened edge and the subtle, variable edge plan imply a task sometimes requiring fine or delicate work. The nearest analogue among modern tools is a set of wood-carver's gouges, which differ chiefly in that they are used with a pushing rather than a drawing motion and in that a variety or curvatures are not incorporated in a single tool. There is now abundant evidence that wood, ivory and soapstone were finely worked in Aksumite times, and it seems most probable that Gudit scrapers were used in some stages of shaping these materials.

As a partial check on this inference, a series of simple replication experiments was undertaken. A characteristically shaped, moderately fresh Gudit scraper was used first to carve soapstone for 15 minutes, then to scrape a goat long bone for 10 minutes. Working the soapstone put some wear on the scraper while making a considerable effect on the soapstone (Plate 2b). Scraping the bone was stopped when the scraper became so worn as to have no "bite" and to merely slide along the surface of the bone. Effect on the dry bone, which was harder than fresh ivory would have been, was minimal.

The scraper was then resharpened by applying heavy pressure with a narrow steel edge before being used to work a piece of dry eucalyptus timber along and across the grain. After 15 minutes the wood was well shaped and the tool noticeably blunted, but still usable. Where it had been used along the grain, the wood developed a pattern of semi-parallel striations corresponding to the minute denticulations and notches of the scraper edge (Plate 4c).

After a second resharpening (Plate 2a), the scraper was used to remove adhering bits of flesh from the still-wet hide of a recently slaughtered sheep. For this purpose the scraper was effective but not at all efficient as fibrous bits of flesh caught in and clogged the teeth of the scraper edge. These had to be removed by wiping the scraper edge clean after every 20 to 25 strokes. Furthermore, once it had become damp and slippery with use, the scraper proved to be inconveniently small to hold. This problem did not arise when dry materials were worked.

Fifteen minutes work cleaned an area of wet hide of about 400 square centimetres while producing little visible change to the scraper edge. Use of a Gudit scraper on dry hide tended to cut and scratch the skin.

At the start of these replication experiments the scraper measured 37.8 mm long, 27.1 mm broad, and 16.6 mm thick. Two resharpenings and a combined total of 45 minutes use on stone, bone, wood and hide reduced the scraper by 0.3 mm in length and 0.1 mm in breadth. The median edge angle was marginally increased to 80 degrees. These experiments demonstrated that a Gudit scraper can be used to rough-out or plane down shapes in soapstone, wood and, by inference, fresh ivory. It was ineffective on hard, dried bone and notably messy and inefficient when used on fresh hide. The pointed corner of the scraper successfully carved an approximate circle in soapstone and drilled a small dimple in wood, but a more acute edge would have been required to carve any finer detail in either material.

Examples of carved soapstone and ivory from excavated Aksumite contexts were examined for traces indicative of the tools by which they had been worked. It was found that some soapstone seals had working marks very similar indeed to these produced in the replication experiments (Plate 3a, b). Also, the reverse of a rectangular ivory plaque or gaming piece and waste scrap from a turned ivory object, both dated to the mid 6th century, have parallel striations similar to those produced by the Gudit scraper on wood and on soapstone (Plate 4a, b, c). However, the finest ivory carvings recovered from Aksum, such as the elaborate third century furniture panel, could only have been fashioned with metal blades (Plate 5).

Dating evidence

At present it is only possible to say that the manufacture and use of Gudit scrapers was contemporaneous with at least some phases of the Aksumite civilization. Presumably their presence at the Gudit Stelae Field postdates the use of that area as a place of burial, suggesting a date range relatively late in the Aksumite chronology. Sufficient specimens of these tools have been recovered from excavated deposits, particularly from the Domestic and Kiros sites, to locate them firmly within an Aksumite context.

Discussions with local informants including two carpenters and a carver of soapstone curios elicited a little recent knowledge of the use of stone tools for woodworking. Sharp unretouched syenite spalls are used to smooth plough shafts. Until recently they were also used for the rough shaping of furniture legs and broken bottle glass was used for woodworking and also for haircutting. It was mentioned that the "yellow stones" which could be collected from Gudit Stelae Field were better than glass for some purposes. Continued discussion and direct questioning elicited no knowledge of any techniques for shaping or resharpening stone tools. It was said that they were so plentiful at the Gudit site that when the ones being used became dull they were thrown away and more were

fetched. This information suggests that the incidence of flakes and scrapers was once greater than the 1.8 artefacts per square metre recovered in the area of surface collection A. The several informants had no knowledge of the use of sharp stones and broken glass except in connection with woodworking, haircutting and shaving.

Conclusions

It is now possible to construct a processual account of the manufacture and use of Gudit scrapers. At dispersed sites within a few kilometres of the *locus* of collection A, chunks of tabular chert and other siliceous stone were worked by a bipolar technique to produce stout flakes of approximately triangular cross section. Cores were worked until they had maximum dimensions of not more than 50 mm or until nothing remained but a few shattered fragments. Core remains and flakes too small or fragile to fashion into scrapers were discarded where they fell. Usable flakes were trimmed to produce steeply retouched convex end scrapers about 30 mm to 60 mm long. No evidence was found for the production of chert/chalcedony tools other than scrapers. (A few very delicate obsidian flakes and tools made from them have, however, been excavated from the Domestic Site. As their production and use seems to have been quite separate from that of the Gudit scrapers, they will be reported separately.)

As the Aksumite economy was apparently trade and market based, it is probable that the procurement of raw materials and the production of scrapers were done by separate individuals. These scrapers were used, probably by crafts specialists other than the scraper manufacturers, working at sites other than those where the scrapers were produced, for the planing and shaping but not the more detailed carving of wood, soapstone and ivory. While some of this scraper use occurred at dispersed residential locations, it was markedly concentrated in the area of surface collection A.

During the course of their use, the scrapers were repeatedly modified and refined in edge plan and profile by resharpening with a narrow metal tool, the more skilfully retouched specimens being made to assume a characteristic convex edge of variable curvature with a pointed corner. After about 100 resharpenings, representing perhaps 50 hours' use, a scraper would have been reduced in length by about 30 mm and then discarded as no longer useful.

Not only was the greatest concentration of discarded scrapers and retouching debris found in the vicinity of surface collection A, this was also the area with the greatest proportion of well shaped specimens. Sites elsewhere had more irregular Gudit and simple convex scrapers. Thus, while use of the scrapers was not confined to a single site or to a very limited sector of the population, it seems to have been particularly developed by specialist craft workers whose main

workshop area was located in the Gudit Stelae Field immediately south of the Dungur building complex.

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