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## **Middle and Late Neolithic in the Wadi Bakht region (Gilf Kebir, Egypt)**

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### **Introduction**

This paper contributes to the chronological discussion of the Neolithic Phase in the Eastern Sahara assuming that the symposium title “Culture Markers” also means “Chronological Markers”. As such markers, used for a chronological assignment of sites, in general the artefact types, ceramic decoration or evidence of domesticated species were usually understood. It has become obvious that a chronological analysis made with such kind of markers can often lead to questionable results. Mixed inventories or the appearance of comparable types in a different context (convergence) can be a source of misunderstanding. In order to create a more precise image of an archaeological group or culture, we should also consider the systemic features, e.g. stone tool production sequences, mobility patterns or other indications of land use strategies. In such a context the single markers are already combined in a more complex and distinctive tool for describing and comparing sites or cultures.

An overview of the recent work in the Gilf Kebir will be presented here to illustrate this idea. Over the past 20 years the upper reaches of several wadis have been subject to archaeological research by teams from the University of Cologne (research projects B.O.S. and ACACIA). While some results of B.O.S. fieldwork in the Gilf Kebir have already been published (Schön 1996), a detailed examination of the Wadi Bakht material still needs to be done.

In the context of the most recent project “Arid Climate, Adaptation and Cultural Innovation in Africa” (ACACIA) the Wadi Bakht material became again of interest. The project deals with the ability of humans to adapt to arid African environments. The Gilf Kebir with its wadis offers good conditions to address this question. It was a refuge area for different human groups during the Neo-

lithic wet phase because of its special characteristics and the settlement of extensive areas of the Eastern Sahara seems to have been reduced to the Gilf Kebir and its surroundings in times of bad climatic conditions. In this paper the well represented phases of the Middle and Late Neolithic will be defined on different levels ranging from single sites up to a large area of settlement according to artefact material, site size, site structure, raw material acquirement and site distribution. In addition, both phases will be compared in relation to environmental and climatic information.

### Study area

The plateau of the Gilf Kebir is situated 650 km west of the Nile Valley having the same latitude as the Aswan lake. In the north it disappears under the Great Sand Sea, while in the south its steep cliffs rise about 150 m above the surrounding plains (Fig. 1). Here the plateau is intersected by broad wadis. One of them is the Wadi Bakht. It is of special interest for geographers and archaeologists because of the unique geomorphologic situation of the so-called barrier dune. Nineteen kilometres above the Wadi mouth, this barrier dune blocks this Wadi. Their dune sands come exclusively from the Great Sand Sea to the north of the Gilf Kebir (Kröpelin 1989).

The remains of the barrier dune which are visible today consist of a late Pleistocene dune, topped by a recent lee dune (Fig. 2). Over a period of several millennia, playa sediments accumulated behind this barrier which was acting as a dam. The lacustrine sediments cover an area of 6,600 m<sup>2</sup>. At about 3,800 BC the playa sediments become so thick that the dam was broken after heavy rainfalls. The break is located in the middle of the barrier and allows an insight into a sediment body more than eight metres high.

### What has already been done?

Starting in 1930s all field investigations were limited to the area close to the barrier dune because of its good accessibility and the richness of archaeological material (Bagnold et al. 1939; Wendorf and Schild 1980; McHugh 1982). The surrounding areas of the plateau and the eastern foreland have never been subjected to closer observation (Fig. 3). The accumulation of finds in the valley implied that mountains were not suitable for human settlement.

The archaeological material of the valley was roughly divided into two phases (Hallier 1996; Linstädter 1999) named Middle and Late Neolithic, consistent with the common nomenclature of the Eastern Sahara (Wendorf et al. 1984: 6-8). Taken together both phases cover a time span of about 2.000 years, from 5.500 to 3.500 BC (cf. Fig. 5).

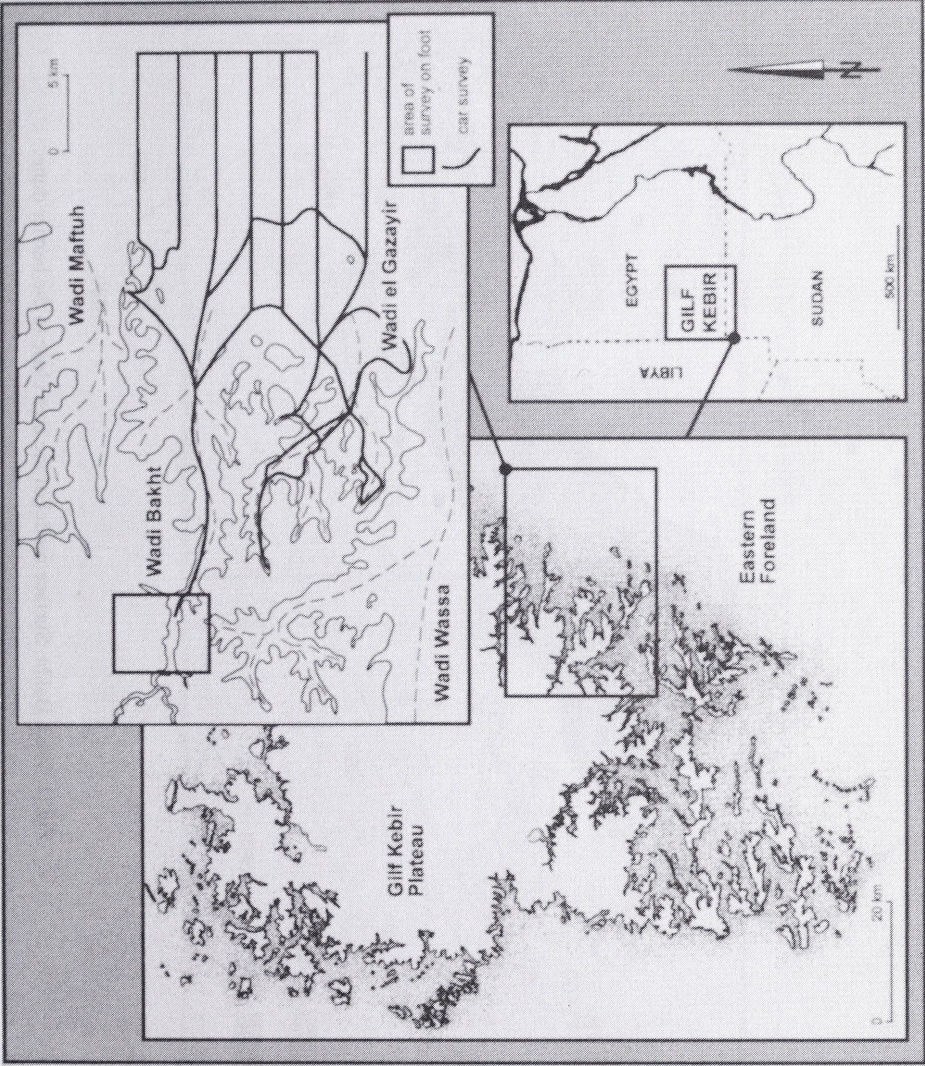


Fig.1. Wadi Bakht. Study area.

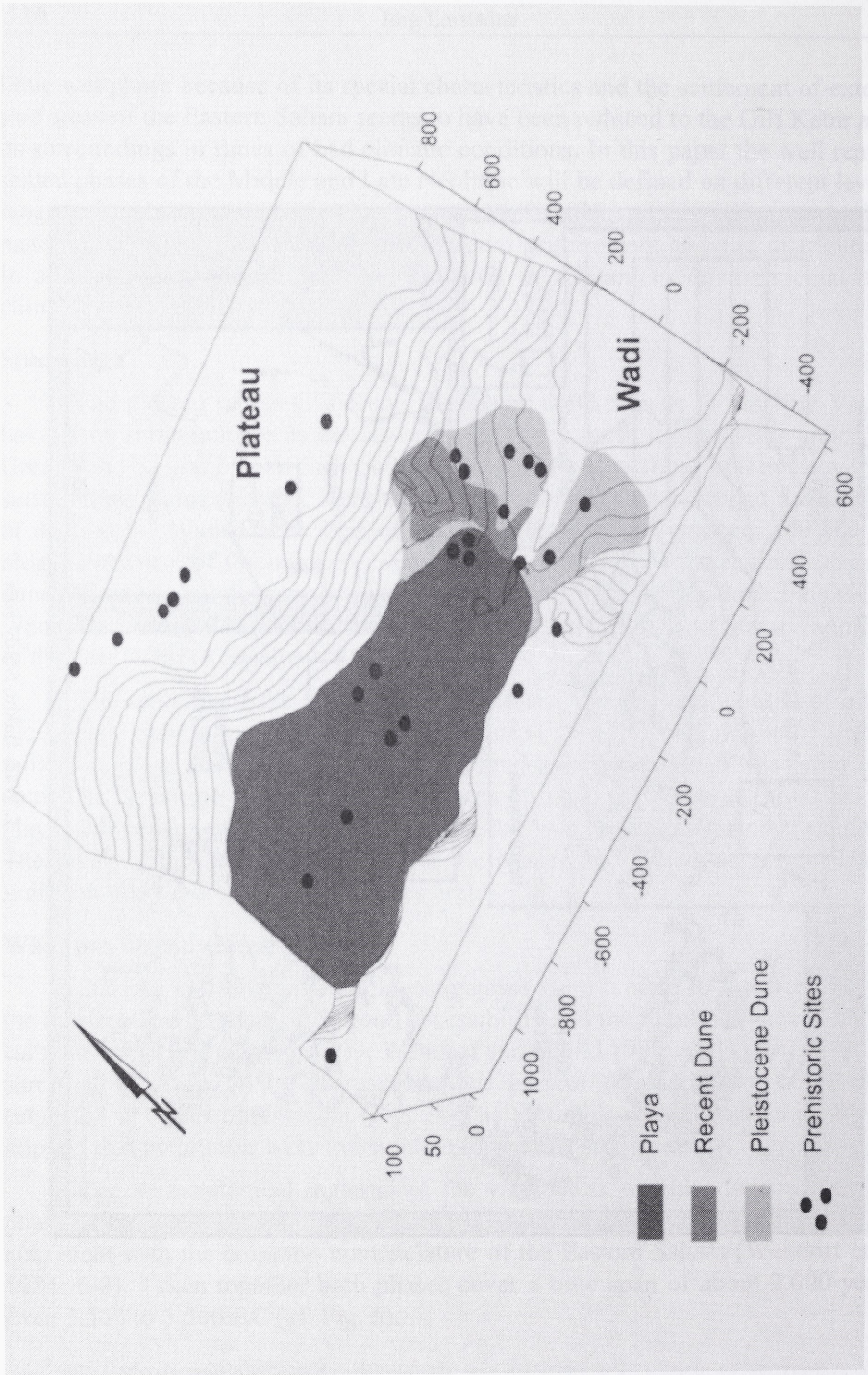


Fig. 2. Wadi Bakht. Surface model of the area close to the barrier dune.

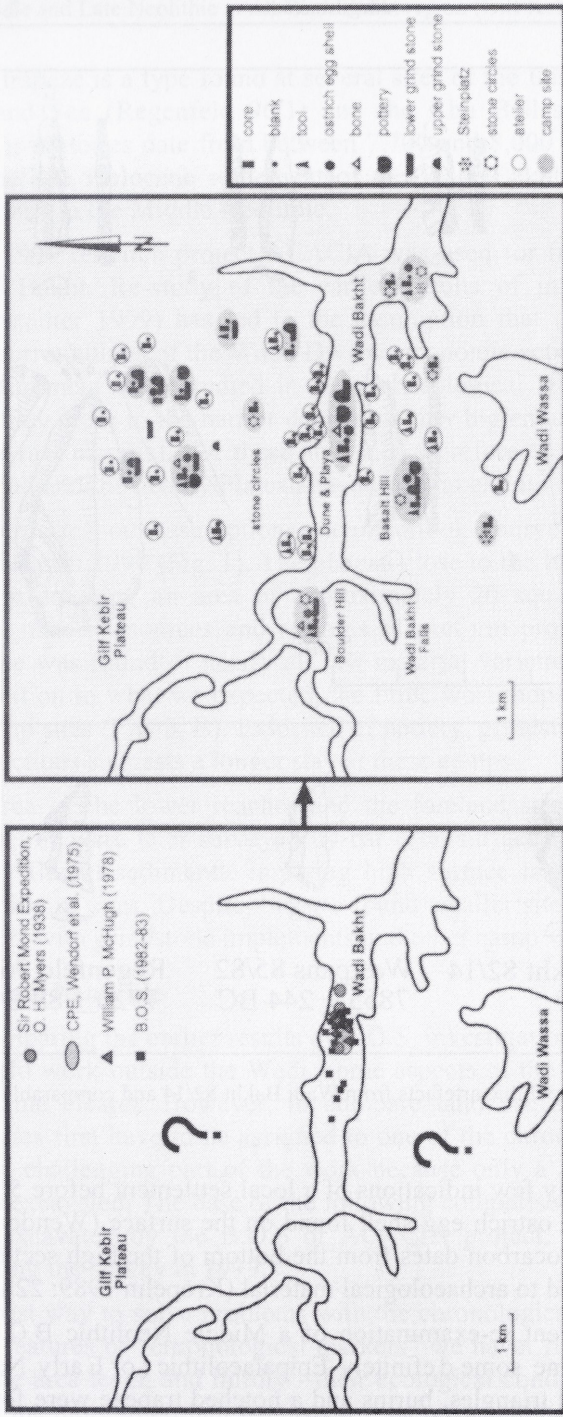


Fig. 3. Sites of the middle reaches of the Wadi Bakht before (A) and after (B) 1999 field season.

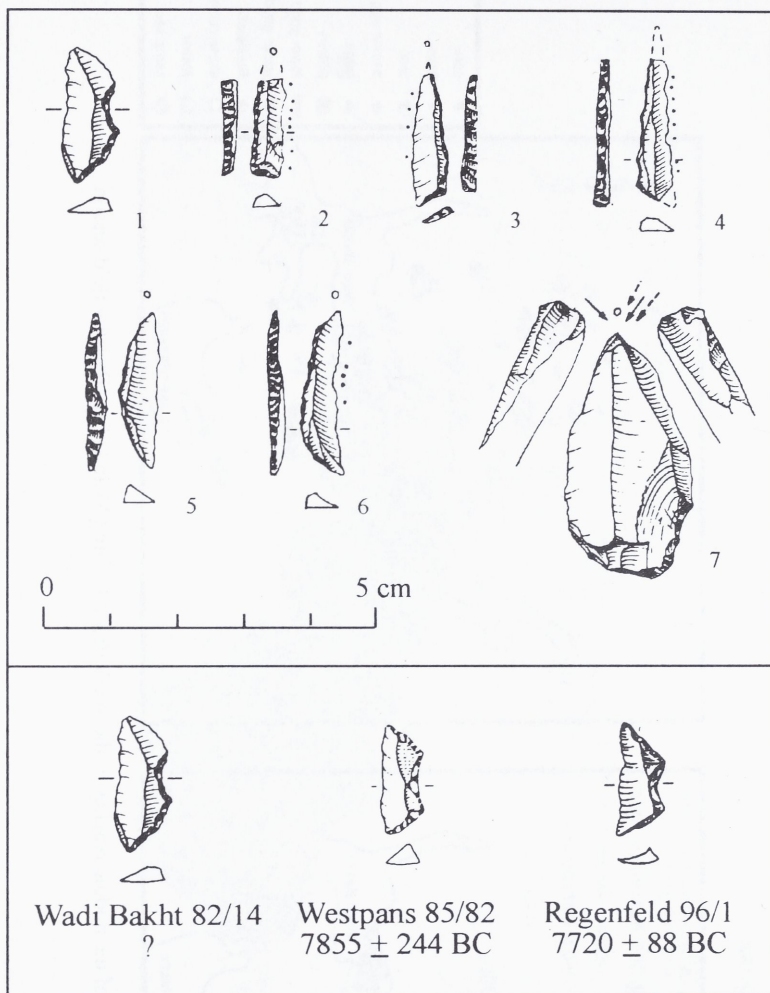


Fig. 4. Epipalaeolithic artefacts from Wadi Bakht 82/14 and comparable forms.

There are only few indications of a local settlement before 5.500 BC, like a  $^{14}\text{C}$ -date from an ostrich egg shell found on the surface (Wendorf and Schild 1980: 218) and radiocarbon dates from the bottom of the high section which are not clearly connected to archaeological material (Kröpelin 1989: 228 fig. 33).

During a recent re-examination of a Middle Neolithic B.O.S. inventory from the barrier dune some definitely Epipalaeolithic (or Early Neolithic) tool types like elongated triangles, burins and a notched trapeze were found (Fig. 4).

The notched trapeze is a type found at several sites of the Eastern Sahara, e.g. in the Great Sand Sea (Regenfeld 96/1) and the Abu Ballas region (Westpans 85/52). Both inventories date from between 7,700 and 8,000 BC. These tools let us assume that the Holocene settlement of the Wadi Bakht might have begun much earlier than in the Middle Neolithic.

Since 1999 research project ACACIA was used for further examinations of the Wadi Bakht. Re-study of the earlier results of investigations B.O.S. material (Linstädter 1999) has led to the assumption that there is more to be found in the surroundings of the Wadi. Diverse economic activities including raw material procurement were studied in the archaeological record. However, the part of the valley close to the barrier dune is neither big enough nor does it have the necessary raw material. For these activities therefore the lower reaches, the eastern foreland and the nearby Plateau have to be taken into consideration.

In order to test our assumptions, we undertook a survey of the plateau and the eastern plains in 1999 (Fig. 1). The plateau close to the barrier dune was surveyed by foot covering an area of approximately 20 square kilometres. The expected raw material sources and remains of preform processing were found here. Evidence was found of nearly all raw material varieties used down in the valley. In addition to what we expected, the lithic workshops were accompanied by proper camp sites (Fig. 3, B). Evidence of pottery, grindstone implements and house constructions suggests a longer stay at these camps.

The area of the lower reaches and the foreland stretching over several square kilometres were later surveyed by car. The surface in the survey area is dominated by fluvial sediments, implying high surface instability leading to a bad preservation of sites. Despite this, we found smaller sites like workshops as well as scatters with grindstone implements and other camp site indicators.

### **Middle vs. Late Neolithic**

By comparing the earlier results of B.O.S. investigations in the valley with the recent field work outside the Wadi, some aspects of the prehistoric land use systems became clearer. However, to compare land use systems of different phases, the sites first have to be assigned to one of the chronological units. This was the most challenging part of the work because only a few of the sites had already been excavated. The base of the following comparison are the inventories of 21 sites excavated by the B.O.S or ACACIA project, as well as 64 sites recorded during the survey in 1999.

The best way to solve problems with the chronological classification is to compare all features or "chronological markers" we have: firstly - the site level, secondly - the area level, and thirdly - their ecological conditions (Fig. 5). From this list only the more important features will be presented here in detail. Most of

|  | Middle Neolithic   |                    | Late Neolithic  |
|--|--|--------------------|---|
| chronological frame                    | 5.500 ----- 5.000 BC<br>6.600 ----- 6.050 BP   |                    | 4.000 ----- 3.500 BC<br>5.200 ----- 4.770 BP                        |
| <b>Sites</b>                           |  |                    |   |
| site size                              | up to 10.000 sqm   |                    | 80 to 100 sqm   |
| inventory                              |  | <b>1.000 YEARS</b> |   |
| lithic technology                      | typical site: 456 artefacts/sqm<br>"blade industry"  |                    | typical site: 7-15 artefacts/sqm<br>"flake industry"                |
| lithic tool kit                        | microliths (segments, triangles, trapezes), burins, perforators, scrapers, notched pieces                              |                    | segments, retouched pieces  |
| ceramic                                | undecorated, thick walls   |                    | decorated & undecorated, well fired, thin walls                     |
| decoration                             | ostrich egg shell beads, frequent  |                    | ostrich egg shell beads, rare                                       |
| spatial organisation                   | activity zones!, dwellings & burials? (stone constructions)  |                    | activity zones!, dwellings & burials? (stone constructions)         |
| duration of stay                       | a single stay is difficult to extract from the large sites!  |                    | single events (some weeks?)   |
| <b>Area of settlement</b>              |  |                    |   |
| site location                          | Wadi (on the Dune), Plateau rims   | <b>OF</b>          | Wadi (on the Playa), Plateau  |
| site location to each other            | concentric   |                    | "net-like"  |
| <b>Reconstruction of the landscape</b> |  |                    |   |
| archaeobotany                          | Tamarix spp., Ziziphus spp., Acacia spp.   |                    | Tamarix spp., Acacia spp., Maerua crassifolia, Balanitis aegyptiaca |
| archaeozoology                         | surface collection: giraffe, hyena, fox, ostrich, small birds, bos, goat<br>wild fauna: oryx, addax turtle, hare, frog | <b>GAP</b>         | wild & domesticated fauna: dorcas, sheep/goats                      |
| sedimentology                          | change of pelits and aeolic sands in the Playa section   |                    | continous deposits of Playa sediments                               |
| precipitation                          | < 150 mm/a   |                    | < 150 mm/a  |
| precipitation regime                   | arid, Monsoon summer rain with rare heavy rain falls   |                    | trend to semiarid, Mediterranean influence?                         |

Fig. 5. Chronological Markers of the middle and Late Neolithic.



the data is based on the two M. A. thesis (Hallier 1996; Linstädter 1999) presented at the University of Cologne.

Site size: while Late Neolithic sites have an extension of 80 to 100 m<sup>2</sup>, the Middle Neolithic inventories comes from large artefact scatters with an area up to 10.000 m<sup>2</sup>.

Inventory – lithic technology: the scope of the lithic inventory of both phases differs considerably. While Late Neolithic sites excavated on the playa surface yielded between 7 blanks/m<sup>2</sup> (82/24) and 15 blanks/m<sup>2</sup> (82/15), a Middle Neolithic site (82/21-1) renders up to 456 blanks/m<sup>2</sup>. This clearly indicates a different length or intensity of settlement.

For the Middle Neolithic blank production a production sequence (*chaîne opératoire*) was reconstructed (Fig. 6). Final products are small bladelets with an average length of 30 mm, mainly produced from unipolar cores. The main raw material is quartzite. A standard production is guaranteed by large-scale preparation techniques. The first phase of preform acquisition and preparation is shown on the left side of Fig 6. This phase was expected and in 1999 verified for the Gilf Kebir Plateau. The middle of this diagram shows the different ways to produce blades or flakes on the base of prepared preforms. As shown on the right hand side, these blanks now are preforms themselves for the final tool production.

The comparatively poor lithic inventory of the Late Neolithic complicates a reconstruction of a comparable sequence. The main aim of the simple production strategy was probably the production of large flakes.

Inventory – lithic tool kit: a Middle Neolithic inventory consists of a differentiated standard tool kit of geometric microliths (sometimes several hundreds), as well as burins, perforators, scrapers and notched flakes and blades (Fig. 7, A). The Late Neolithic tool kit shows a very different composition. It is dominated by large retouched flakes, accompanied by some segments (Fig. 7, B).

Inventory ceramic: the few pieces of pottery found on Middle Neolithic sites are heavily withered and, with the only exception of some rim notches, completely undecorated (Fig. 7, A). There are different fabrics; organic as well as anorganic temper has been observed. The average wall thickness is about 8 mm. Late Neolithic pottery is thin walled and well fired. The upper part of the mostly bowl shaped vessels are frequently decorated with a heringbone motive (Fig. 7, B).

Internal organisation of the sites: for almost every site activity zones can be reconstructed by means of records and artefact distribution. Stone structures were found only on plateau sites. Their chronological assignment has not yet been proven. The features range from simple wind shelters and circular constructions to complex dwellings of several units.

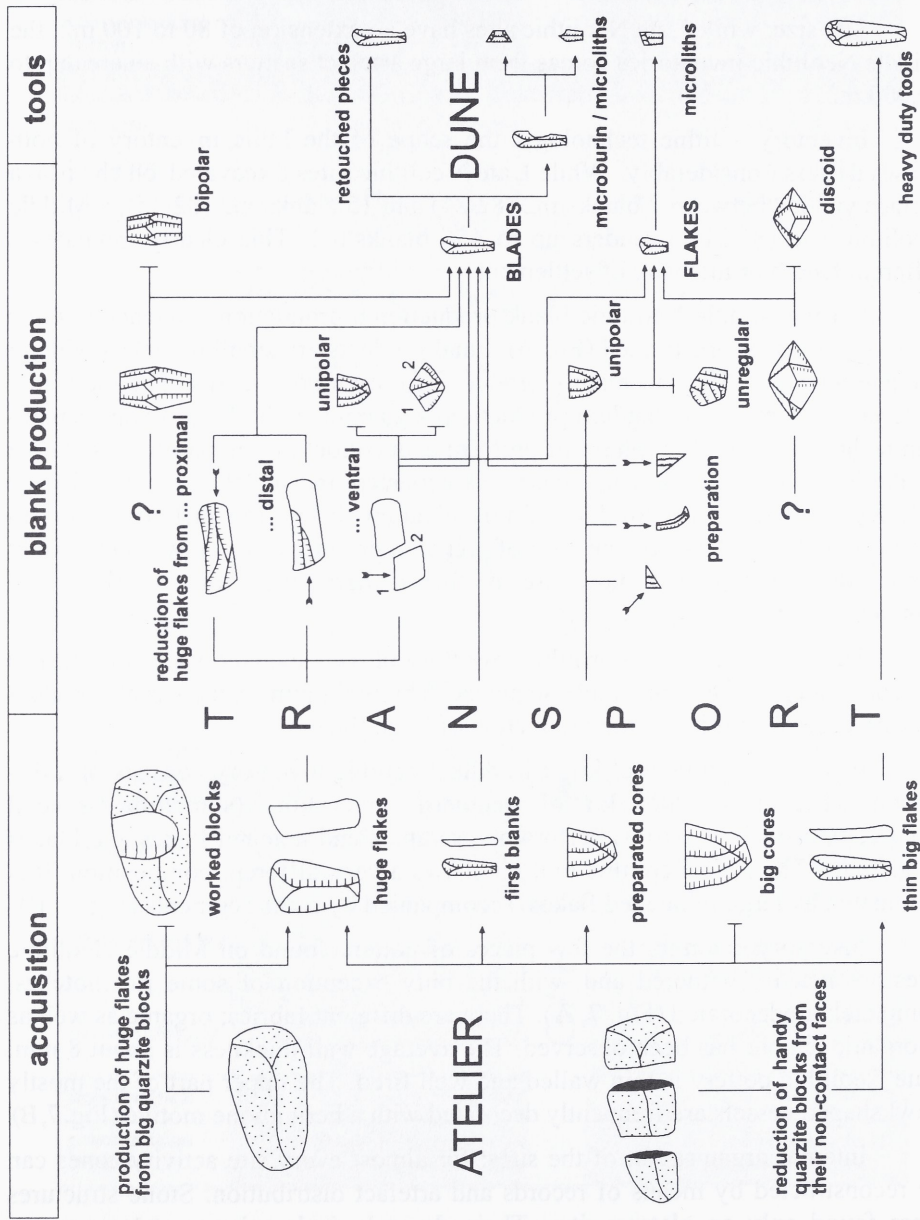


Fig. 6. Production sequence of the Middle Neolithic stone industry.

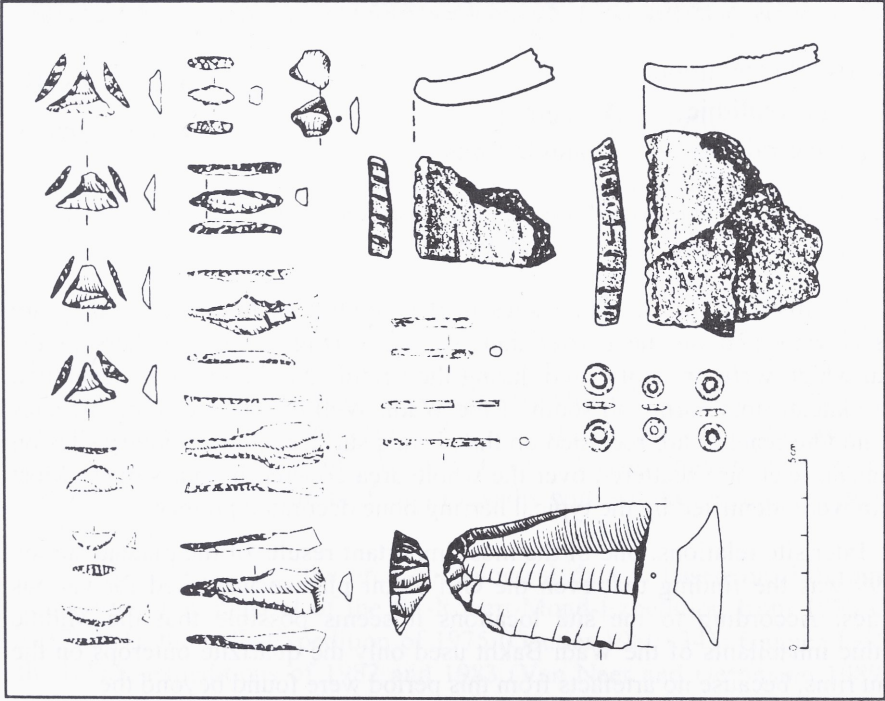
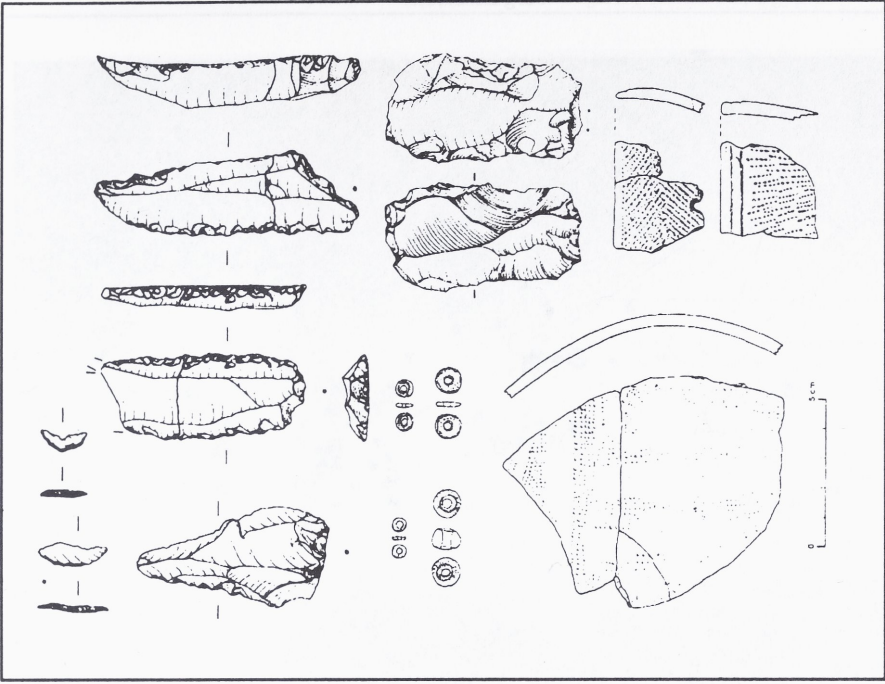


Fig. 7. Examples from typical Middle (A) and Late (B) Neolithic inventories.

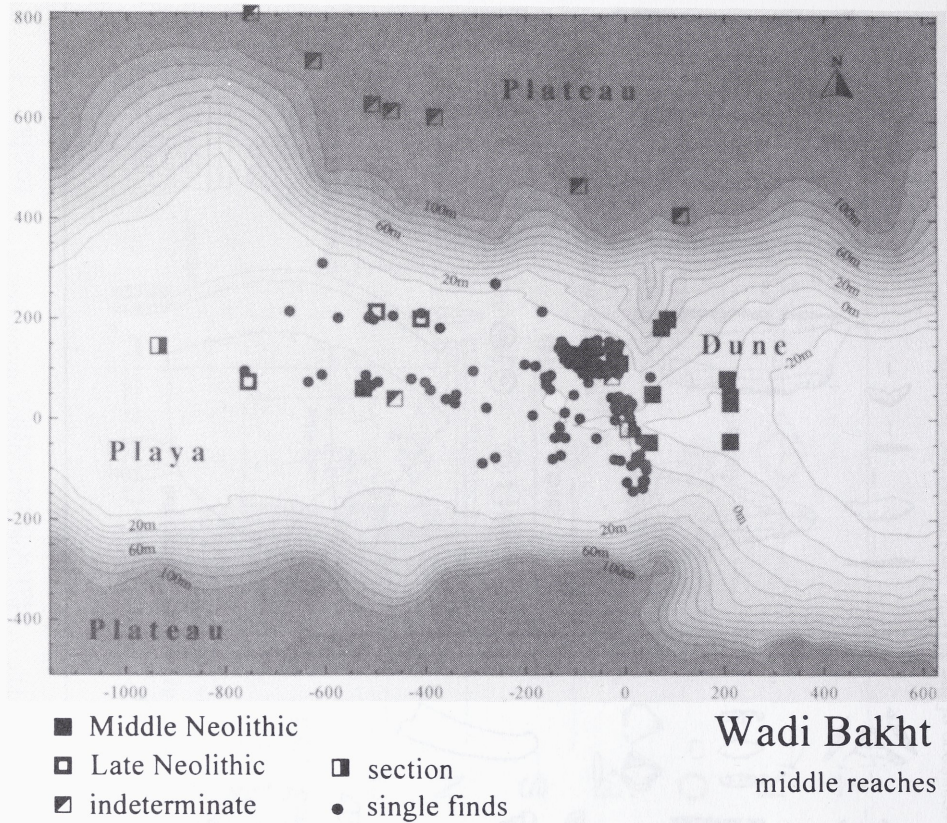


Fig. 8. Distribution of excavated sites and single finds recorded by B.O.S. and ACACIA missions.

Site distribution: the older sites in the middle reaches of the valley are exclusively located on the barrier dune's surface (Fig. 8). The ateliers of the plateau which were probably used during the Middle Neolithic are concentrated on the plateau rims north and south of the Wadi. Well dated Late Neolithic sites in the middle reaches are recorded on the playa's surface. Contemporary sites on the plateau itself are scattered over the whole area covered by our survey. Most of them were identified by the typical herring bone decorated pottery.

Inter site relations: one of the most important results of the plateau survey in 1999 was the finding that even the Gilf Kebir plateau was used for various activities. According to the site locations it seems possible that the Middle Neolithic inhabitants of the Wadi Bakht used only the quartzite outcrops on the plateau rims, because no artefacts from this period were found beyond the

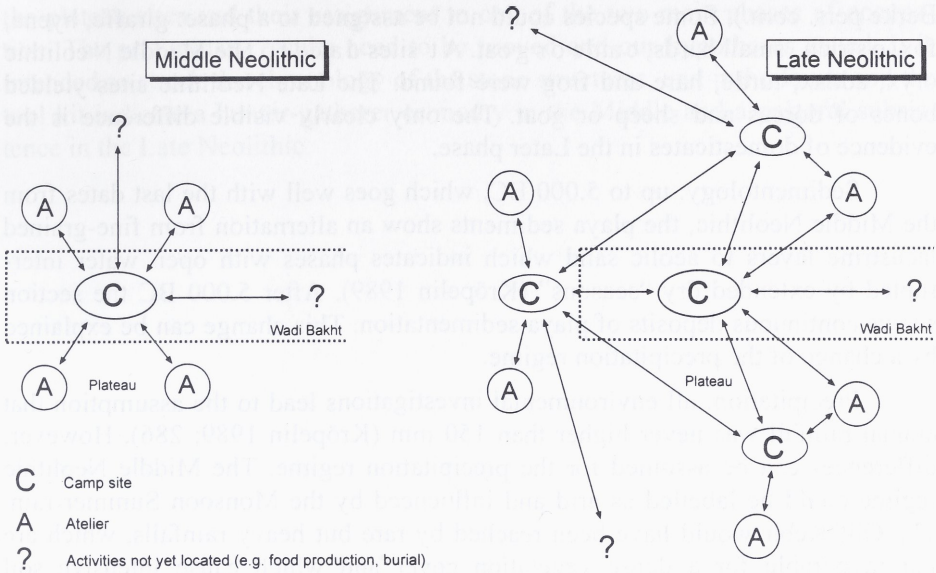


Fig. 9. Proposed land use systems of the Middle and Late Neolithic.

plateau edges (Fig. 3, B). However, Late Neolithic pottery was found on several plateau sites. According to this site distribution a concentric system for the Middle Neolithic, with the barrier dune in the centre and workshops at the periphery is proposed here (Fig. 9). The Late Neolithic site distribution shows a more “net like” feature with several camp sites and workshops alongside.

**Archaeobotany:** in charcoal samples of the Middle Neolithic sites three different woody genera were recognised (Fig. 5). All taxa is widely distributed in the arid desert and steppe regions of northern Africa. The Late Neolithic samples rendered four taxa. *Maerua crassifolia* is a typical species of arid to semi-arid grasslands which is today mostly restricted to the Sahel region. The tree species *Balanites aegyptiaca* is to be found in wadis with similar vegetation (Neumann 1989, 116 ff.).

**Archaeozoology:** the archaeozoological data is based on different bone inventories: the material of the Sir-Robert-Mond-Expedition from 1939 (Peters 1987: 254), the CPE-Expedition of 1975 (Gautier 1980: 341; Gautier 1982) and the B.O.S.-expeditions of 1982 and 1983 (Van Neer and Uerpmann 1989: 328;

Berke pers. com.). Some species could not be assigned to a phase: giraffe, hyena, fox, ostrich, small birds, cattle or goat. At sites dated to the Middle Neolithic oryx, addax, turtle, hare and frog were found. The Late Neolithic sites yielded bones of dorcas and sheep or goat. The only clearly visible difference is the evidence of domesticates in the Later phase.

**Sedimentology:** up to 5.000 BC, which goes well with the last dates from the Middle Neolithic, the playa sediments show an alternation from fine-grained lacustrine layers to aeolic sand which indicates phases with open water interrupted by extended dry “seasons” (Kröpelin 1989). After 5.000 BC the section shows continuous deposits of playa sedimentation. This change can be explained by a change of the precipitation regime.

**Precipitation:** all environmental investigations lead to the assumption that annual rainfall was never higher than 150 mm (Kröpelin 1989: 286). However, differences can be assumed for the precipitation regime. The Middle Neolithic regime could be labelled as arid and influenced by the Monsoon Summer rain. The Gilf Kebir would have been reached by rare but heavy rainfalls, which are not favourable for a dense vegetation cover and which cause intensive soil erosion. In the following period, the Gilf Kebir seems to have been influenced by a Mediterranean climate. The estimated annual precipitation was not higher but the rains came as light showers allowing a thin but continuous vegetation cover. This cover also prevented a deflation of the fine grained material, reflected by the continuous playa deposits on top of the barrier dune’s section. The change of climatic conditions could be an explanation for the change of land use systems on the Gilf Kebir Plateau.

### **Conclusions and future research programme**

By combining these single features, an initial image of the Middle Neolithic inhabitants of our study area can be obtained. During the rainy season the groups came always back to their places on the barrier dune, where the large amount of artefacts shows extensive settlement. Only the edges of the plateau were used for the raw material acquirement. Several indications (e.g. the archaeozoological evidence) suggest a hunter-gatherer economy.

The Late Neolithic people always had their camps on the playa surface. Remains of a single stay have been identified. Earlier camps might be covered by the playa deposits. The Plateau was integrated in the subsistence activities, even far from its edges. The reason was perhaps a different precipitation regime or a change of subsistence strategies. The existence of domesticated livestock has been proved.

The field work in Wadi Bakht region will be continued. In addition to an enlargement of the survey area on the plateau the main aim will be the dating of

the plateau sites and their assignment to one of the two main phases of occupation. The preliminary results need to be proved and our hypotheses tested. It is intended to check the chronology of the stone structures, and if the fauna and the tool kit indicate a hunter-gatherer economy in the Middle and a pastoral subsistence in the Late Neolithic.

## References

- BAGNOLD, R. A., O. H. MYERS, R. F. PEEL and H. A. WINKLER. 1939. An expedition to the Gilf Kebir and Uweinat 1938. *The Geographical Journal* 93: 281-313.
- EL-BAZ, F. and M. A. MAXWELL (eds). 1982. *Desert landforms in Southwest-Egypt: A basis for comparison with Mars*. Washington.
- GAUTIER, A. 1980. Contribution to the Archaeozoology of Egypt. In: Wendorf, F. and R. Schild (eds): 317-351.
- ..... 1982. Neolithic faunal remains in the Gilf Kebir and the Abu Hussein Dunefield, Western Desert, Egypt. In: El-Baz, F. and M. A. Maxwell (eds): 335-339.
- HALLIER, M. 1996. Zwei keramische Fundplätze am Übergang vom 5. zum 4. Jahrtausend vor Christi Geburt in Südwest-Ägypten: Wadi Bakht 82/15 und 82/24. M.A. dissertation, University of Cologne.
- KRÖPELIN, S. 1989. Untersuchungen zu Sedimentationsmilieu von Playas im Gilf Kebir (Südwest-Ägypten). In: Kuper, (ed.): 183-305.
- KUPER, R. (ed.). 1989. *Forschungen zur Umweltgeschichte der Ostsahara*. Africa Praehistorica 2, Cologne.
- LINSTÄDTER, J. 1999. Leben auf der Düne. Der mittelpaläolithische Siedlungsplatz Wadi Bakht 82/21 im Gilf Kebir (Südwest-Ägypten). *Archäologische Informationen* 22/1:115-124.
- McHUGH, W. P. 1982. Archaeological Investigations in the Gilf Kebir and Abu Hussein Dunefield, Western Desert, Egypt. In: El-Baz, F. and M.A. Maxwell, (eds): 301-334.
- VAN NEER, W. and H.-P. UERPMANN. 1989. Paleocological significance of the Holocene faunal remains of the B.O.S. missions. In: Kuper R., (ed.): 307-341.
- NEUMANN, K. 1989. Zur Vegetationsgeschichte der Ostsahara im Holozän. Holzkohlen aus prähistorischen Fundstellen. In: Kuper R., (ed.): 13-181.
- PETERS, J. 1987. The faunal remains collected by the Bagnold-Mond Expedition in the Gilf Kebir and Gebel Uweinat in 1938. *Archéologie du Nil moyen* 2: 251-264.
- SCHÖN, W. 1996. *Ausgrabungen im Wadi el Akhdar, Gilf Kebir*. Africa Praehistorica 8. Cologne.
- WENDORF, F. and R. SCHILD (eds.). 1980. *The Prehistory of the Eastern Sahara*. New York.
- WENDORF, F., R. SCHILD and A. CLOSE (eds.). 1984. *Cattle keepers of the Eastern Sahara: The Neolithic of Bir Kiseiba*. Dallas.