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Abu Gerara: Mid-Holocene sites between Djara and Dakhla Oasis (Egypt)

Location and geographical background

This paper describes the first results of a geo-archaeological survey in the area of Abu Gerara located on the Egyptian Limestone Plateau or Abu Muhariq Plateau (or Libyan Plateau). It focussed not only on prehistoric finds but on the question of human land use between the oases and the Nile at a supra-regional level. By this it will complete the more detailed but also local study of the settlement area of Djara (Kindermann, this vol.). The survey was conducted in the frame of the Cologne's Collaborative Research Centre 389 "ACACIA", subproject A1 "Climatic Change and Human Settlement between the Nile Valley and the Central Sahara". On the way from the Dakhla Oasis to the sites of Djara, some 120 km north of Abu Gerara (Fig. 1), the fields along the routes have been prospected for prehistoric sites, vegetation habitats, drainage systems, soils etc. over a number of campaigns between 1996 and 2000 (Fig. 2). After discovering several sites north of the Roman ruins of Abu Gerara, some 80 km north-east of Dakhla, a number of localities were selected for surface collections and test excavations. Since 2001 the archaeological investigations focused on localities south of the Abu Gerara escarpment.

The geographical background of the Abu Gerara sites is formed by the hilly country between the Abu Gerara scarp in the south and the less favoured Hamada plains in the north (Fig. 2 & 3). The Hamada is essentially plantless except for a small number of wadis and basins dotting the plains. Prehistoric remains are mostly restricted to vegetated localities, but in total, archaeological sites are less frequent. The hilly country, characterized by the Eocene El-Rufuf (Tetr) formation (Thebes Group), is covered with myriads of small wind-shaped limestone hills and small basins in between containing playa-like deposits,

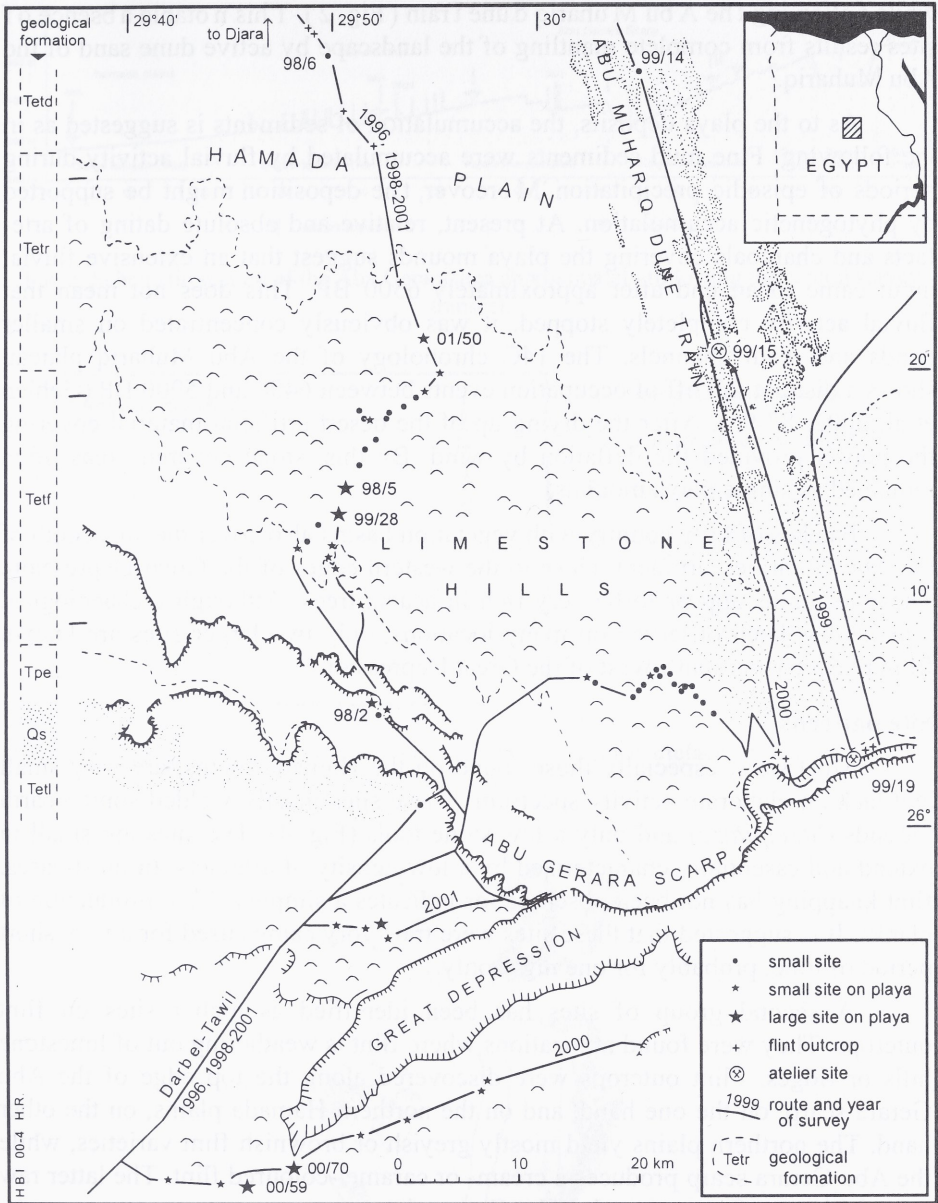


Fig. 2. Map showing the Abu Gerara area with prehistoric sites.

while following the Abu Muhariq dune train (Fig. 2). This notable absence of sites results from complete mantling of the landscape by active dune sand of the Abu Muhariq.

As to the playa deposits, the accumulation of sediments is suggested as in the following. Fine mud sediments were accumulated by fluvial activity during periods of episodic precipitation. Moreover, the deposition might be supported by phytogenetic accumulation. At present, relative and absolute dating of artefacts and charcoals covering the playa mounds suggest that an extensive fluvial input came to an end after approximately 6500 BP. This does not mean that fluvial activity completely stopped, it was obviously concentrated on smaller ponds and wadi channels. The ^{14}C chronology of the Abu Muhariq plateau shows a distinct fall off of occupation events between 6400 and 5900 BP (Gehlen et al. 2002: 87-95). After the drying up of the desert artificial material covering the playas provided the deflation by wind. By this, stone covered areas often remained as single playa mounds.

Patches of hilly country with vegetation basins also cover the area south of the Abu Gerara escarpment, close to the western edges of the Great Depression. These locations appear to be very rich in acacia trees. Although archaeological remains has been observed on many locations, only two larger sites are known from playa basins south-west of the Great Depression.

Site patterns

Most sites, especially those found on the Hamada plains, are very small and lack an elaborate activity spectrum. These sites mostly yielded some hearth mounds (*Steinplätze*) and only a few stone tools (Fig. 4). The sites are small in extent and essentially characterized by a low density of artefacts. In most cases, flint knapping has not been observed, or indicates a simple *ad hoc* production of blanks. It is suggested that these sites were transitory camps used for a very short period of time, probably for one night only.

A second group of sites has been identified as atelier sites on flint outcrops. They were found at locations where flint is weathering out of limestone hills or ridges. Flint outcrops were discovered along the top edge of the Abu Gerara scarp, on the one hand, and on the northern Hamada plains, on the other hand. The northern plains yield mostly greyish or brownish flint varieties, while the Abu Gerara scarp produces a cream- or caramel-coloured flint. The latter raw material is very frequent on the Abu Gerara sites.

One of the atelier sites of the northern plains was discovered close to the Abu Muhariq dune train (Fig. 2; Abu Gerara 99/15). There greyish flint nodules were weathered out of a small limestone rock. The surrounding surface was covered by naturally fractured flint shatter and nodules. Primary testing and less

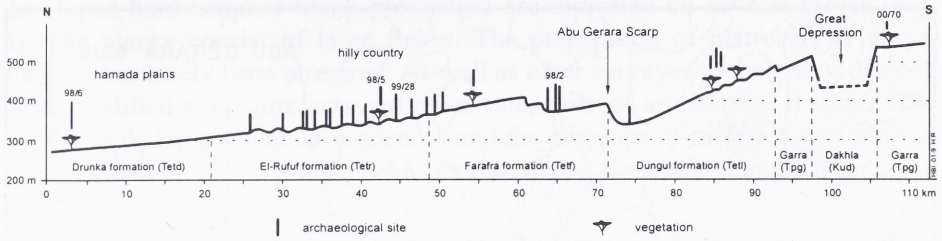


Fig. 3. Schematic section of the Abu Gerara area approximately following the central survey transect.

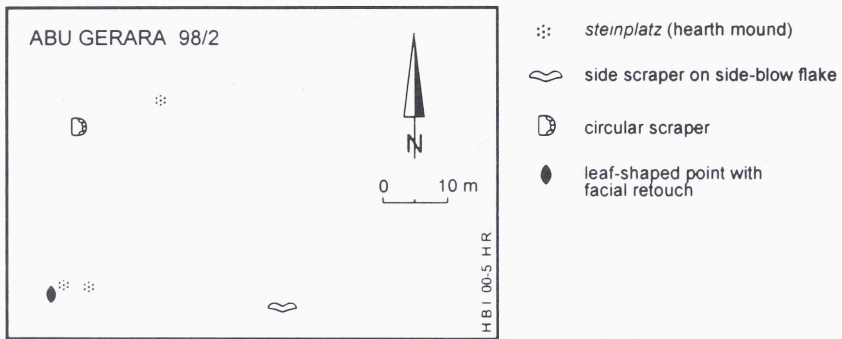


Fig. 4. Abu Gerara 98/2: distribution of hearth mounds and stone artefacts on a small transitory camp site.

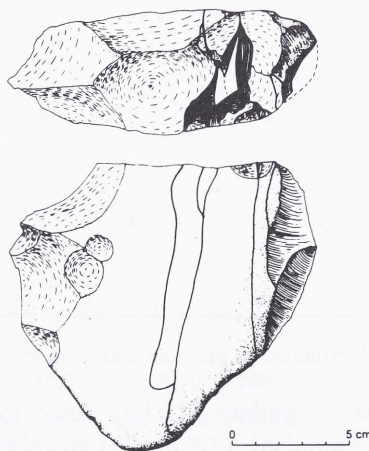


Fig. 5. Refitted blank reduction sequence from the atelier site Abu Gerara 99/15.

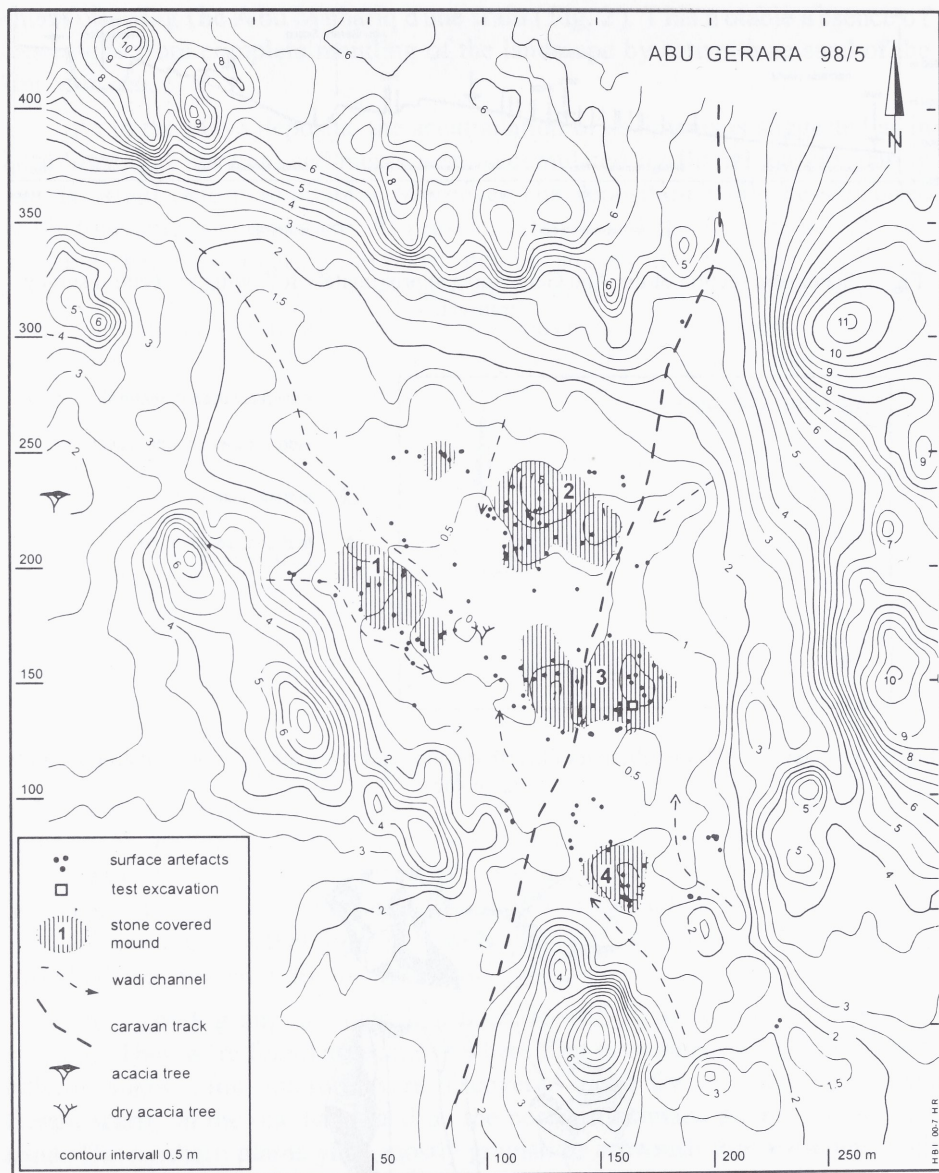


Fig. 6. Abu Gerara 98/5: distribution of playa mounds and artefacts on a large base camp site.

developed hard-hammer blank production are indicated on several pieces (Fig. 5). The blanks consist of large flakes. The preparation of platforms or dorsal surfaces has rarely been observed. As well as other surveyed atelier sites, this one lacks modified stone artefacts and other categories of artefacts or features. The principles of the production sequences and the presence of different manufacturing activities on specific sites have been analysed by Kindermann (in press) in detail.

The third type of sites is restricted to the basins of the hilly country. These base camps for a particular season, are relatively large in extend and show dense artefact scatters (Fig. 6). Stone artefacts, pottery, ostrich egg shells, bones, and remains of fireplaces or *Steinplätze* are frequent indicating the whole spectrum of activities. The artefact scatters cover low mounds of playa deposits cut by wadi channels and shallow basins. The mounds consist of silty sediments. In all cases, artificial remains have not been observed in the subsurface material.

A number of temporary base camp sites have been surveyed including collections of surface tools and test excavations. The largest collection was produced by site 98/5. It will be presented in detail in the following chapters.

The lithic assemblages

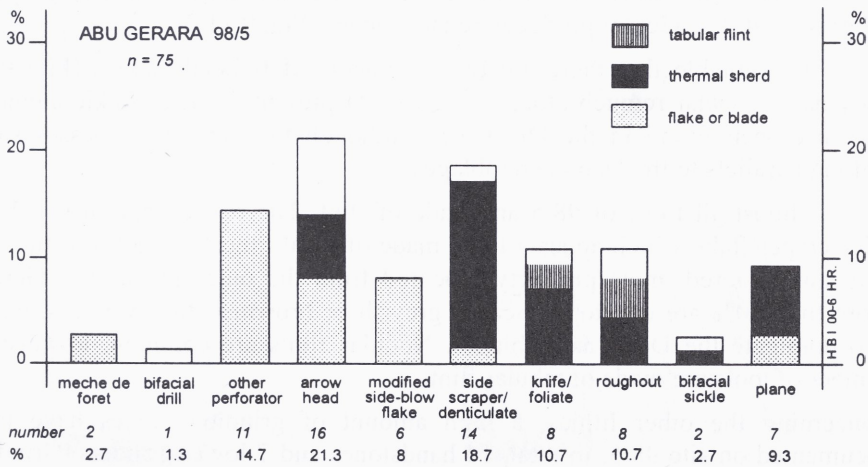


Fig. 7. Abu Gerara 98/5: frequencies of lithic tool classes and tool blanks.

The lithic collection from site Abu Gerara 98/5 consists of 75 knapped tools (Fig. 7), a number of cores, and 21 grinding elements. The most frequent tool class (21%) are arrowheads (Fig. 8.5-8), including leaf-shaped and tanged points. With the exception of one edge retouched specimen, all are made by bifa-

cial retouch. Almost all arrowheads are of small size never exceeding 50 mm in length, and with an average of about 30 mm. Perforators are frequent, among them two *mèches de forêt* (Fig. 8.2-3) and a rod-shaped fine bifacial (Fig. 8.4) which has probably been used as a drill. Apart from the predynastic parallels (Holmes 1989:415: so-called "bifacial drill") they were observed in Abu Minqar "Lobo" 81/55 and on sites in Djara.

The predominant tool classes are side-scrapers, denticulates and knives/foliates. While the side-scrapers and denticulates were mostly made of thermal weathered sherds (Fig. 9.4-5) and, less frequent, of flakes the knives/foliates consist of weathered sherds (Fig. 9.7) and tabular flint (Fig. 9.8). A number of pieces were classified as "roughouts". They obviously include pre-forms of knives. This is underlined by the fact that the roughouts are predominantly made of tabular flint and weathered sherds. Edge-retouched or pointed side-blow flakes appear as a special kind of side-scrapers, knives, or multi-functional tools combining perforator and edge modification (Fig. 9.3).

The collection of 98/5 contains seven adzes with facial retouch (Fig. 9.11-12). They were manufactured on thermal fractured sherds, with the exception of two pieces. The latter are made of flakes, however, they are of a quite uncharacteristic type; in both cases, they may represent circular scrapers. There is only one adze from 98/5 which obviously represents a characteristic piece (Fig. 9.12). Other sites of Abu Gerara produced reliable adzes (Fig. 9.11).

It is notable that there are two fragments of bifacial sickles (Fig. 9.6). They have a scalar retouch along one edge. At present, bifacial sickle elements have not been found in the Djara area, although the other tool classes show striking parallels to the Djara assemblages.

Almost all tools of 98/5 are made of flint. The one exception is a large side-scrapers flake which appears to be made of local limestone. 30% of the flint is cream-coloured, most probably procured from the outcrops of Abu Gerara. More than 50% are due to unspecific greyish or brownish flint variants, which also dominate the Djara assemblages. Nodular flints are common, however, a number of tools are made of tabular flint.

Concerning the other lithics, a high amount of grinding stones have been documented on site 98/5, in total, 14 handstones and 7 lower grinders. Grinding equipment has also been recorded from the Mid-Holocene Djara, but there, lower grinders mostly consist of local limestone. This is most likely caused by the difficulties of acquiring and transporting the quartzitic sandstone which does not occur on the Limestone Plateau.

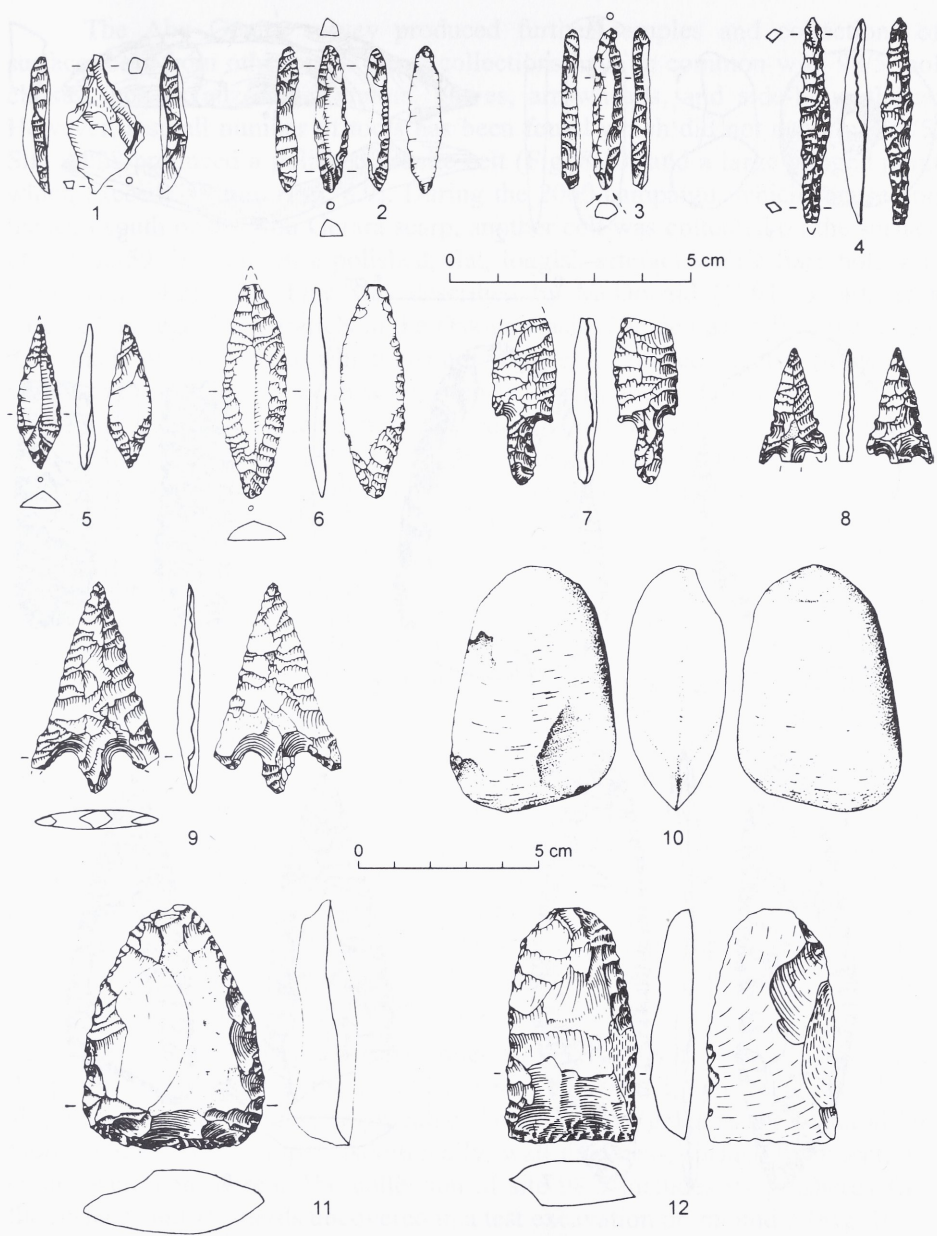


Fig. 8. Lithics of Abu Gerara: 1-3: perforators; 4: bifacial drill; 5-8: arrowheads; 9: large winged point; 10: polished celt; 11-12: adzes.

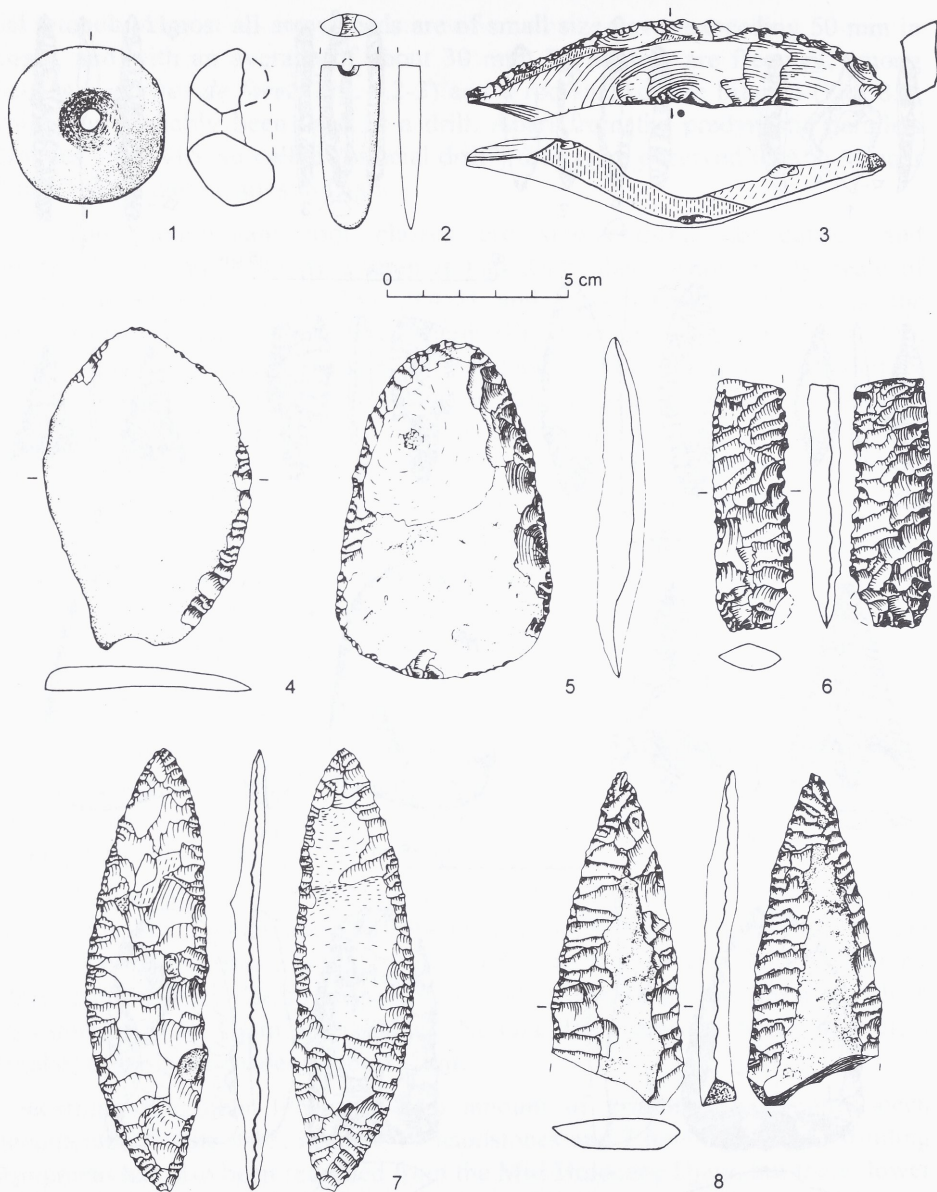


Fig. 9. Lithics of Abu Gerara: 1: conical mace-head; 2: toggle-shaped polished stone; 3: side-blow flake; 4-5: side-scraper; 6: bifacial sickle; 7-8: knives.

The Abu Gerara survey produced further samples and collections of surface tools from other sites. These collections have in common with 98/5 tool classes such as adzes, perforators, knives, arrowheads, and side-blow flakes. However, a small number of tools has been found which did not occur on 98/5. Site 99/28 produced a polished granite celt (Fig. 8.10) and a large winged point which exceeds 59 mm (Fig. 8.9). During the 2000 campaign, which focused on the area south of the Abu Gerara scarp, another celt was collected on the surface of site 00/59. In addition a polished, flat, longish artefact with a bore-hole was found (Fig. 9.2). This type was described by McDonald (1991:46, 49) as a "toggle", in regard to parallels in the Dakhla Oasis. The celt as well as the toggle were made of green stone which has not yet been identified exactly. Some kilometres to the east, at the south-western end of the northern "Great Depression", a number of similar surface scatters were discovered on site 00/70. A collection from a playa mound yielded a conical mace-head made of sinter (Fig. 9.1). It is comparable to a siliceous limestone mace-head found in the Fayum (Caton-Thompson and Gardner 1934: 33; pl. 30.2)

The pottery

Numerous potsherds have been collected from the playa mounds of 98/5 and 99/28. Pottery has also been observed on other larger sites of the hilly country, as well as from sites south of the Abu Gerara escarpment. Although there is a high grade of parallelism between the assemblages of Abu Gerara and Djara, they clearly differ in the presence or absence of pottery. During several years of intensive surveys and excavations in Djara, only two sites have produced small samples of prehistoric ceramics, containing less than 10 sherds. At the first glance, this picture was believed to represent the state of research, or at least the poor preservation in Djara. During the past years, both the extensive study of the Djara sites and the discovery of the Abu Gerara pottery sites led to a different picture. Therefore, the Djara sites rather represent an 'a-ceramic' occupation, while pottery was common in Abu Gerara.

When classifying the pottery collected in Abu Gerara we had to deal with the problems that, firstly, the ceramics were undecorated, and, secondly, almost all pottery remained highly fragmented. Therefore, we grouped the material into fabrics indicated by temper. Additionally, wall thickness, surface treatment, and colour were considered. The collection of site 98/5 includes 97 potsherds from the surface, and 16 sherds uncovered in a test excavation on mound 3 (Fig. 10).

Fabric 1 represents a group of well standardized pottery with small thin-walled (4-6 mm) shapes (Fig. 11.2). The surface colour ranges from reddish brown to pale brown and grey (5-10YR6-7/3-6). The core colour is mostly grey. In many cases, it has been observed that the brownish surface was completely

abraded by wind and sand. Thus many sherds show a wind-polished grey surface. The paste consists of a homogenous, fine silt or clay with a closed matrix. As to the temper, two different kinds have been observed. Fabric 1A has a light organic temper indicated by black-burned voids combined with a light sand temper (Fig. 11.2.). Fabric 1B is exclusively tempered with sand; it often shows a reddish burnished surface (10R4-5/7). The core colour ranges from grey to reddish brown. Parallels as to both varieties came from Eastpans 95/2, about 100 km south of Dakhla. This site produced 14C-dates around 6000 BP (Gehlen et al. 2002: 96-98).

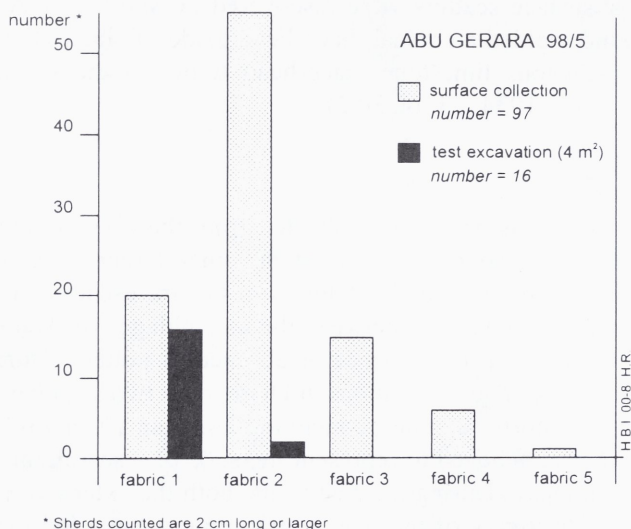


Fig. 10. Abu Gerara 98/5: frequencies of pottery fabrics.

The second fabric is represented by a large amount of medium-walled (c. 5-8 mm) potsherds. Surfaces and cores were of homogenous light, pale, or yellowish brown colour (7.5-10YR6/3-4). The paste is predominantly tempered with sand and fine greyish shale (< 1 mm in length). It also contains red grains (c. 0.5 mm length). As to the amount of temper (density), sand and shale appear in various proportions. Normally sand is frequent (10-20 per 0.5cm²) while shale appears frequently or very frequently (>20 per 0.5cm²). A middle sized bowl has been refitted (Fig. 11.1).

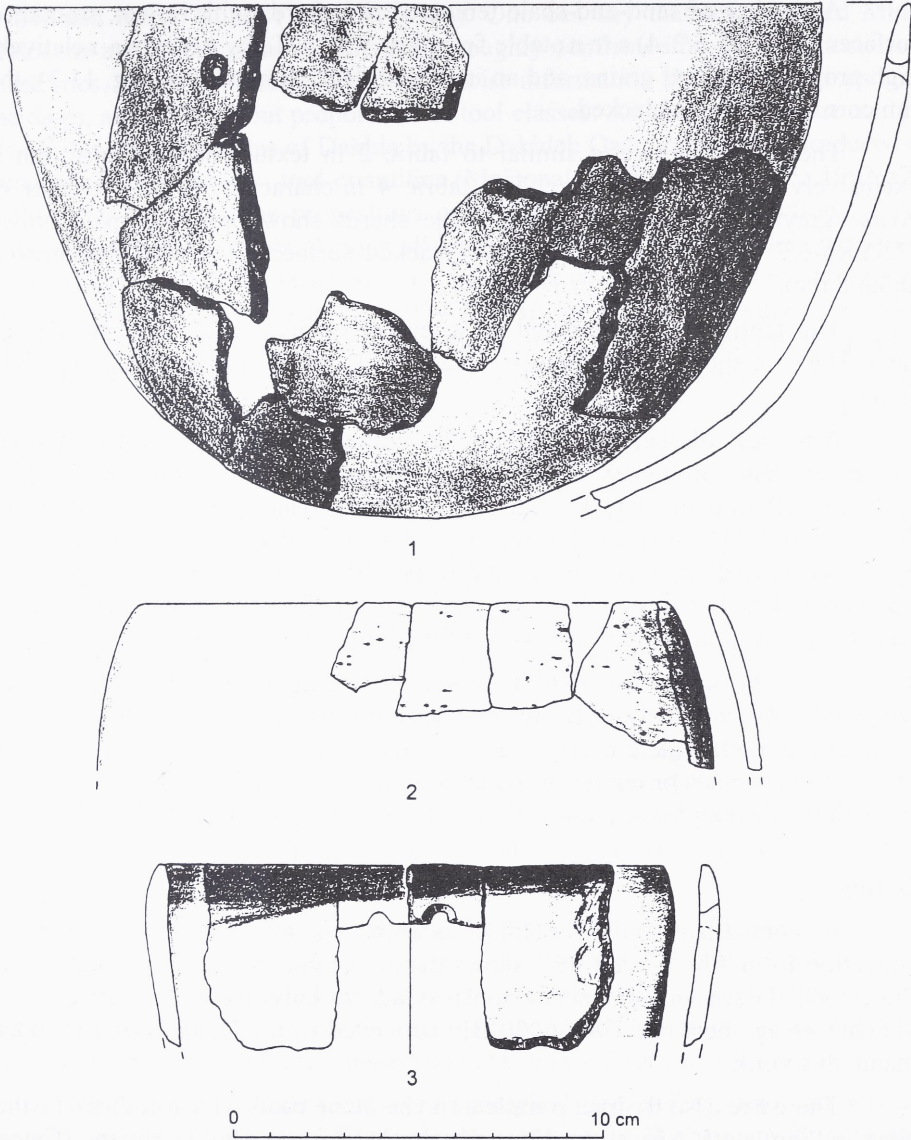


Fig. 11. Pottery of Abu Gerara: 1: fine shale-and-sand tempered (fabric 2); 2: thin-walled (fabric 1A); 3: shale-and-sand tempered (fabric 2) with blackened rim.

A number of sand-and-shale tempered rim-sherds with brown, smoothed surfaces (7.5YR5-6/3-4) are notable from site 99/28. They contain a relatively high proportion of red grains, and an irregular black-smoked rim (Fig. 11.3); the rim core has not been blacked.

The fabric 3 is quite similar to fabric 2 in texture and porosity, but it exclusively shows sand temper. The fabric 4 is characterized by a temper of coarse greyish shale (up to 8 mm). The sherds show brown or pale brown (7.5YR5-6/7 or 10YR6/5) or partially blacked surfaces. The wall-thickness is about 8 mm.

The fabric 5 is represented by a temper of organic fibres ('straw') and sand. The core shows a high porosity and a black colour, due to the burned away fibres.

A number of sherds and perforated ceramic disks have been found at the western margins of site 98/5 belonging to the so-called "Clayton rings" which probably fall into the late Predynastic or Early Dynastic (Riemer and Kuper 2000; Gatto 2001). Nevertheless, they can be subsumed as varieties of fabric 2 or 3 (= Clayton rings type B, Riemer and Kuper 2000), and fabric 5 (= type A). A fragmented Clayton ring with coarse shale temper (fabric 4) was recently found on another site at the northern margins of the hilly country.

As to the spatial distribution on site 98/5, Clayton rings and coarse shale tempered potsherds (fabric 4) are obviously not associated with the scatter of lithics, other pottery, and hearths on the playa mounds. They were mostly found in the wadi channels or on the surrounding limestone hills. The fabrics 1, 2, and 3 show rather distinct association with the lithics within the same surface clusters.

Dating

In comparison with the lithic assemblages from the Djara sites, the collection from Abu Gerara 98/5 shows distinct similarities. The percentages of lithic tool classes and diagnostic tools as adzes, knives and side-blow flakes indicate an age between 7000-6000 BP associated to the Djara B unit (Kindermann, this vol.).

There are also distinct parallels to the stone tools of a number of other sites in Northeast Africa, as Haua Fteah (McBurney 1967), Fayum (Caton-Thompson and Gardner 1934; Kozłowski and Ginter 1989), Siwa (Hassan 1976; 1987; Cziesla 1989; 1993), Bahariya (Hassan 1980), Farafra (Barich and Hassan 1988; 2000), Abu Minqar (Klees 1989), Dakhla (McDonald 1990; 1991; 1992; 1999), Kharga (Caton-Thompson 1952; Holmes 1991), and Abu Tartur (pers. comm. S. Eickelkamp). A smaller amount of parallels also occurs in the southerly sites of Bir Kiseiba/Nabta (Wendorf and Schild 1980; Wendorf et al.

1984) and lower Nubia (Wendorf 1968). One can say that the assumed Mid-Holocene age of the Abu Gerara sites is roughly confirmed by the inventories of these sites. However, there is a lack of precise information about the contexts and the dates, as well as about proportions of tool classes. As an exception, the analysis of Mid-Holocene sites of Dakhla by the Dakhleh Oasis Project has produced a number of site lists with tool quantities (McDonald 1990:31; 1991:45; 1992:57; 1999:118). Although the proportions of tool types vary, the collections show fairly representative trends. Among all inventories, arrowheads are the major tool class ranging from 1.2% to about 5.4% for the Bashendi A sites (c. 7600-6850 BP), while a Bashendi B site (c. 6500-5200 BP) produced 9%. Adzes and side-blown flakes only appear on the Bashendi B site. The one exception is an adze from the late Bashendi A site 174 (McDonald 1999:118) situated on the Southeast Basin. Bashendi B also includes polished celts and toggle-shaped items (McDonald 1991:46; 1992:59; 1999:119). Therefore, the assemblages of Abu Gerara 98/5 clearly show characteristics of Bashendi A and Bashendi B sites.

This assumed age is roughly confirmed by the pottery of Abu Gerara. Thin-walled pots are generally suggested to be a characteristic of the "Late Neolithic" (Kuper 1995:130) and firstly appear in the "Bashendi B" unit (Hope 1999:239). This corresponds well with Eastpans 95/2 which produced a number of 14C-dates about 6000 BP (Gehlen et al. 2002: 96-98). Concerning the fine sand-and-shale tempered fabrics, however, parallels may also originate in the Late Bashendi A unit (c. 7100-6850 BP) (Hope 1999:239f.; Tangri 1999:216f.). On the other hand, the coarse shale temper seems to be a characteristic of the Sheikh Muftah period (Hope, personal communication 1997) as well as the irregular blackening of the rim. The latter appears as a local product of the Oasis "[...] displaying nothing of the control exhibited by the Nile Valley potters in the manufacture of black-topped wares" (Hope 1999:218).

Taking into account all parallels mentioned above, Abu Gerara shows rather a similarity to the Late Bashendi A and Bashendi B units. As to the later Late Neolithic/Sheikh Muftah unit, there are only very few remains in Abu Gerara. This picture corresponds well with the general climatic trend. After the drying up about 6000 BP, the desert has not been used for subsistence.

According to these relative-chronological approaches, two radiocarbon dates from site 98/5 and 99/28 fall into the hiatus of the Bashendi A-B transition, c. 6850-6500 BP (Table 1).

This corresponds well with the 14C-chronology of the Djara B unit, which started after 7000 BP and came to an end after 6400 BP (Gehlen et al. 2002: 110). Only one date about 6000 BP is available for the time after the desert dried up. Incidentally, it is notable that the bulk of dates from Djara and Abu Gerara fall into a time period, when Dakhla does not show any settlement activities.

Table 1.

Site	Material	Lab. no.	14C-years BP	Years cal BC ²
Abu Gerara 98/5-mound 3	OES ¹	UtC-9459	6597 +/- 42	5547 +/- 50
Abu Gerara 99/28 (hearth)	OES ¹	Erl-2858	6605 +/- 74	5549 +/- 60

1 OES = ostrich egg shell (burned).

2 calculated by 2-D Dispersion Calibration Program Version Cologne 2001 (B. Weninger, 14C laboratory, University of Cologne).

Subsistence patterns

Only very limited faunal remains were recovered. A hearth of site 99/28 (cf. Erl-2858) produced a sample of burned and therefore well-preserved bones belonging to *Gazella leptoceros* (survey by H. Berke). Some larger bone fragments collected from 98/5, south of mound 3, appeared too fresh for a prehistoric age. The analysis by N. Pöllath has shown that the sample included camel, and therefore it assigns a much younger date related to the caravan track which crosses the site. The survey of plant remains from a number of excavated hearth mounds (*Steinplätze*) of 98/5 is still in progress (by S. Nussbaum). At present, the evidence concerning the subsistence patterns of the Abu Gerara people is very limited. Although grinders and arrowheads suggest plant utilisation and hunting as major components during the Mid-Holocene, the introduction of live stock and herding remains unclear. However it is likely that herding completed the traditional economic base during the Djara B unit because of the growing pastoral component in the Late Bashendi A unit of Dakhla (McDonald 1999), and the first appearance of small livestock in Djara during the Djara B unit (Berke 2001: 243; Kindermann, this vol.).

As to the hunting of wild animals, there are notable differences between the arrowheads of the Fayum and the oases on the one hand, and the desert sites of Djara and Abu Gerara on the other hand. The arrowheads produced by the collections of Djara and Abu Gerara were very small indicating the faunal resources of the desert, as hare or small gazelle. Very large points – especially the hollow based variant of the Fayum – were not observed.

Only a small number of sickle elements was observed in the plateau desert. This most probably shows that only wild cereals were collected.

Distribution and contacts

The question of whether the pottery and lithics were imported as finished artefacts, or produced on site is difficult to resolve without more reliable information. On the basis of analysing the raw materials used for artefacts and their

proveniences, there are indications of a multi-dimensional origin. In many cases, the flaked lithics are made of local flint. Concerning the granite celt and the shale tempered fabric of pottery, a small number of artefacts were clearly brought there from the Dakhla-Kharga-oases region, or further from the south. This is also suggested for the grinders made of quartzitic sandstone because this material does not occur on the Limestone Plateau.

A different matter is how the artefacts were distributed. We take into account that all known sites outside the oases were non-permanent camp sites because of the limited water supply. It is reasonable to suggest that the distribution on the Abu Muhariq Plateau took place by direct access. The oases may have played a role as central market for the exchange of "elite" goods as granite, molluscs etc.

Far ranging contacts connecting the oases and the Nile Valley have been evidenced by remains of the Nile mollusc *Aspatharia rubens* in Djara (Kinnermann, this vol.) and Abu Gerara. The parallels to the lithic tool kit around the Limestone Plateau, as bifacial retouch, adzes, side-blow flakes, to name but a few, suggest a network of contacts. On the other hand, the Hamada barrier between the vegetated localities of Djara and Abu Gerara is more than 100 km wide, and therefore this gap as others had to be crossed by human beings. With regard to this, pottery was only present on the southern plateau while it was rare or completely missing in Djara. Taking into account that the distribution of artefacts was strictly related to the seasonal or episodic rounds of the prehistoric groups, it is worth mentioning that, apart from interregional contacts, regional traditions have played the major role. Therefore Abu Gerara may have had closer contacts to the southern Dakhla-Kharga region while Djara could have served as stepping stone between the Nile Valley and the Oases.

After the drying up

About 6000 BP the drying up irreversibly stopped the episodic occupations of the desert by prehistoric dwellers. The drop-off in the number of 14C-dates just after 6400/6300 BP reflects the beginning of the drying trend towards hyper-arid conditions which led to the depopulation of the desert after 6000 BP. This essential climatic change has generally been accepted (Kröpelin 1993; Nicoll 2001; Gehlen et al. 2002: 109) underlined by the cut-off of playa and mud deposits in the deserts and the oases. By this, it is not astonishing that little remained from the Sheikh Muftah unit or the Dynastic period in the desert areas. On the other hand, we observed a considerable number of pottery along the old trade routes, as the Darb el Tawil or the Darb el Khashabi. Especially the passes or bottle-necks at escarpments or through rough grounds yielded higher proportions of pottery from Dynastic, Roman, and Islamic times. Moreover, there are

obviously routes which sank into oblivion, only visible by isolated spots of pottery. It is likely that the growing desertification does obviously not cut off the prehistoric networks after 6000 BP, but they became more concentrated on specific routes and regions. In any case, life based on the rare desert sources was no longer possible, but still changed into the mode of the caravans crossing the deserts.

Summary

Although data on the Early Holocene reappearance of humans in the plateau region is still very limited, the recent investigations have shown that the Abu Gerara area still has a large number of Mid-Holocene sites containing lithics and pottery. Due to the study of the Djara area on the central Abu Muhariq Plateau, the Abu Gerara survey has clearly shown that the plateau desert between the oases and the Nile Valley was far from being an unsettled desert. As to diagnostic artefacts and tool quantities, an age between 7000 and 6000 BP (comparable to Djara B or Late Bashendi A/Bashendi B) is proposed. Two radiocarbon dates from Abu Gerara about 6600 BP fall into this period. The bifacial technique and the tool classes show distinct parallels to both the Djara region and the Fayum in the north and the oases in the south and west, indicating interregional contacts throughout the Abu Muhariq Plateau desert. These similarities suggest that Abu Gerara was part of a northern cultural province characterised by this technological tradition (Caton-Thompson 1952). However, there are a number of notable differences, among these the absence of pottery in Djara. As a final result, pottery and other lithic goods represent more frequent regional contacts to the southern oases of Dakhla and Kharga. Moreover, a number of lithic tool classes well known from the Fayum and the oases were not observed or rarely found on sites of Djara and Abu Gerara, such as sickle elements and large arrowheads. This might reflect different patterns of subsistence.

Addendum

The Abu Gerara survey has continued in 2001 and 2002. In 2002 a third transect was made in the western part of the hilly country. It produced a number of sites on playa basins in the Abu Gerara scarp-land. Moreover, the surface artefacts of site 00/70 were collected for a detailed analysis.

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