

RUDOLPH KUPER

Sahel in Egypt: environmental change and cultural development in the Abu Ballas area, Libyan Desert

In order to complete the planned transect between the Mediterranean and the Sahel zone (Kuper 1988; 1989a), B.O.S. fieldwork in 1985 and 1987 was concentrated upon the area of Abu Ballas, in southwestern Egypt, about 500 kilometres west of the Nile. The region is named after a small, conical hill which, curiously enough, can be found even on large scale maps. Among thousands of similar hills this one has the advantage of being named by John Ball, who passed through this practically unknown part of the Libyan Desert during a geological survey in 1918 (Ball 1927: 122). At the foot of that inconspicuous sandstone cone – approximately 200 kilometres southwest of Dakhla Oasis – he discovered over one hundred big jars, which led to the Arab name of the site: "Father of Jars" or "Pottery Hill". The ceramic material has been dated by different authors partly to the Late Predynastic or Early Dynastic period, partly to the Ramesside Dynasty of the 12th century B.C. Recently French excavations at Balat near Dakhla uncovered jars of a quite similar shape in mastabas of the VI Dynasty. At the time of discovery the pots were still lying well arranged in a closed band at the northern foot of the hill. The Frobenius Expedition of 1935 (Rhotert 1952: 70) found the original arrangement already destroyed, and in 1985 nearly all of the complete jars had disappeared (Kuper 1989b: 19).

Pharaonic Egyptian influence can also be detected in two rock engravings below the top of the hill, which were discovered by Prince Kemal el Din in 1924 and later recorded by Hans Rhotert (Rhotert 1952: Table XXXVI; Kuper 1989b: 20). The first, showing a hunter aiming at a gazelle, strongly resembles Egyptian wall paintings – an impression which is particularly stressed by the costume of the man. The same can be stated in the case of the nearby engraving of a cow suckling its calf, a motif quite popular in Early Dynastic Egypt. If this most barren part of the Desert was still included in the Egyptian world at a time when

desertification was already far in progress, then the more remains from the Neolithic could be expected there.

On his way from Dakhla to the Gilf Kebir in 1932, Ralph Bagnold passed through that area following a southwest oriented escarpment which has not yet

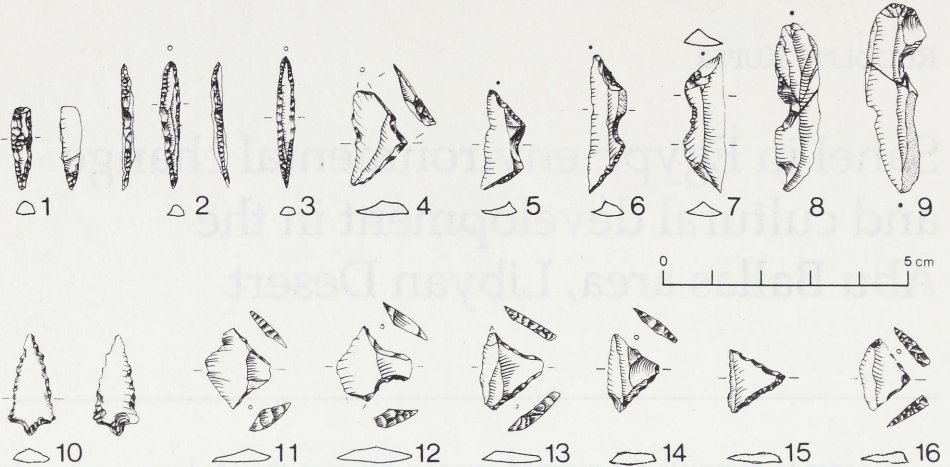


Fig. 1. Site Westpans 85/52. 1 - 3: perforators; 4: isosceles triangle; 5 - 7: notched trapezes; 8 - 9: refitted microburins.

Site Mudpans 85/50 - 1. 10: pendoculated arrow head; 11 - 13: trapezes; 14 - 16: isosceles triangles.

been reported on topographic maps but is clearly visible on satellite images. In his report he mentions a "chain of ancient lakes" that he describes as "one nearly continuous Neolithic site" (Bagnold *et al.* 1939:283). While the western part of the escarpment is formed by high cliffs with picturesque yardangs at their foot, this range is much lower further eastwards and altered by erosion into thousands of inselbergs.

It was here that members of the B.O.S. expedition of 1983 – on their way back from the Gilf to Kharga – rediscovered by chance one of Bagnold's sites in a position where, from his observation, the term "mud pans" is printed on the old British 1 : 1,000,000 map. Since finding a name for a prehistoric site in the desert is always a problem, this term was chosen for the main excavation field there. Another smaller pan, lying in a similar topographical position 50 km further west, was named "Westpans".

Although only limited work has been done there, this short overview has to start with Westpans site 85/52 which technologically had an Epipalaeolithic appearance and, by its radiocarbon date of $8,700 \pm 190$ b.p. (KN 3671; corrected, not calibrated), represents the oldest archaeological complex in the Abu Ballas area so far. The site consisted of four relatively well defined accumulations of artefacts and bone splinters. The 952 stone artefacts, mainly made of chert, were analyzed by Andrea Hahn and comprised 75 microliths and 117

microburins (Hahn 1990). This observation, and the fact that more than 30 percent of different raw materials could be refitted, support the interpretation of this place being a hafting and retooling site. Special mention has to be made of a specific type of trapeze, characterized by a broad notch (Fig. 1: 5 - 7). Comparable types appear sporadically in the Capsian culture but do not allow any further conclusions (Vaufrey 1955: 199, 317; Cadenat 1963: 98 - 99; Mateu 1970: 162).

At "Mudpans" the main excavation was situated at the northern edge of the playa where most of the sites are between or on top of the inselbergs on the slope of the escarpment. Within the mapped area of 800 to 350 m (Fig. 2) four separate settlement areas have been studied, all covering a timespan of more than 2,000 years.

Site 83/39 on the edge of the playa is the oldest one within the whole excavation area. There is a quite limited test excavation followed the surface layer of artefacts up to 20 cm into the playa sediment. Apart of a single bone of a giraffe, hare and gazelle could be identified among the faunal remains. The stone artefacts are not very diagnostic and consist mainly of small flakes. Only a few retouched blades and bladelets could be found, and among these only two triangles. Three radiocarbon measurements date this site to about 8,200 b.p.

Just slightly larger was the test area at site 85/56, some 500 metres further north, but it provided a much greater amount of different material and even some unexpected settlement features. At 20 cm below the surface the excavation uncovered quite clearly defined circular structures, which could be traced down to 1 metre depth. It was clearly visible that the relatively soft sandstone had been broken by following its natural cracks and structures. In one case carvings and scratch-marks in the sandstone might well be interpreted as traces of these activities. With a diameter ranging from 2.5 to 3 metres the dimension of these holes correspond close to other settlement structures like the systematically arranged features at Nabta Playa site E 75 - 6 (Wendorf and Schild 1980: 131). Both might have served as the lower parts of dwellings whose superstructures left no traces.

The sediment consisted mainly of loose, grayish sand mixed with sandstone fragments, rubble and cultural remains. No clear stratigraphy could be identified, but near the bottom a burnt layer has been found. Artefacts appeared throughout the whole sequence, but in remarkably higher frequency in the uppermost levels. Bones and charcoal are relatively well preserved. Among all 1600 bones analyzed by Wim van Neer, *Gazella dorcas* and *dama* are dominant, followed by *Oryx* and, to a much smaller extent, ostrich, turtle, hare and fox; domestic animals are missing. Besides a series of radiocarbon dates grouped around 7,500 b.p. (not calibrated) the charcoal identified by Katharina Neumann provided some instructive information about the vegetation of this phase.

The other organic material comprises ostrich eggshell beads and fragments, which are partly decorated, some of them obviously the orifice fragments of

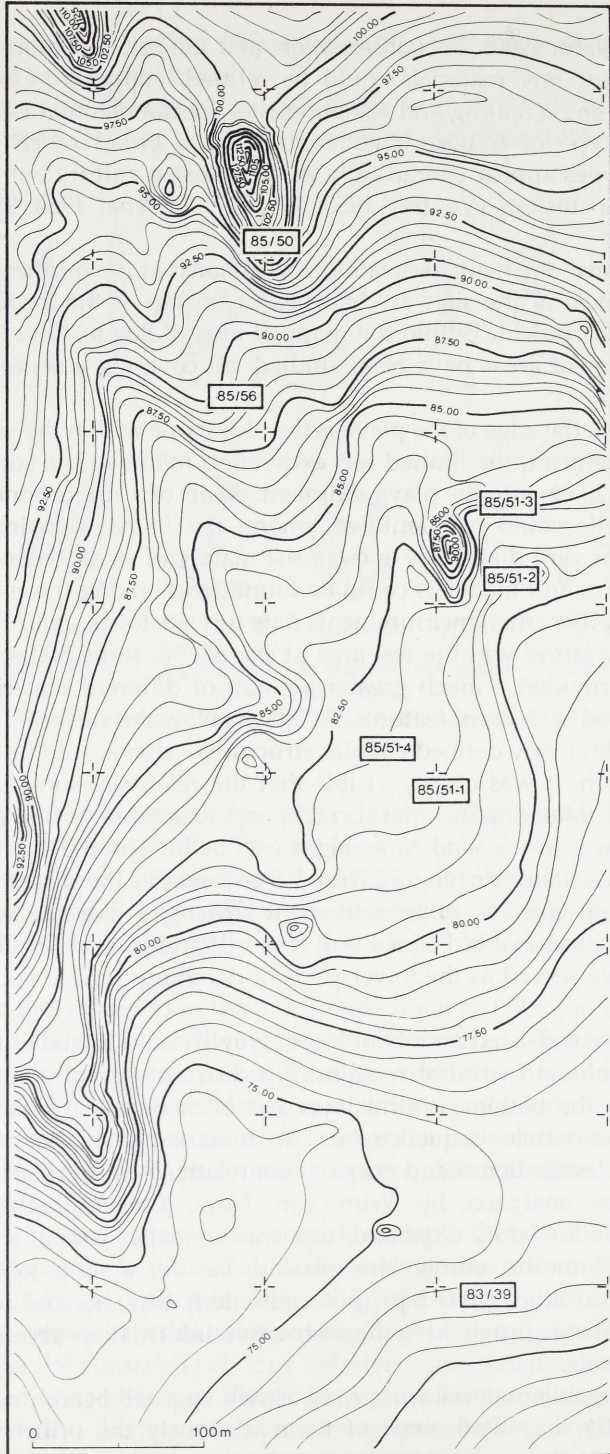


Fig. 2. Topographic map showing excavated sites in the Mudpan area.

eggshell bottles (Fig. 3: 7 - 12). Some *Aspatharia* shells from the Nile and some modified Cowrie shells from the Red Sea indicate connections over more than 700 kilometres to the East.

The pottery shows mainly complete decoration of the surface applied in a rocker stamp technique by using a square toothed comb instrument (Fig. 3 and 4). So far it seems to be the northernmost outpost of this Khartoum-related type of decoration, otherwise found in the Nile Valley, for instance at the Dongola Reach (Shiner 1968: 773, 784; 1971: Fig. 17), and also on some sherds from Nabta

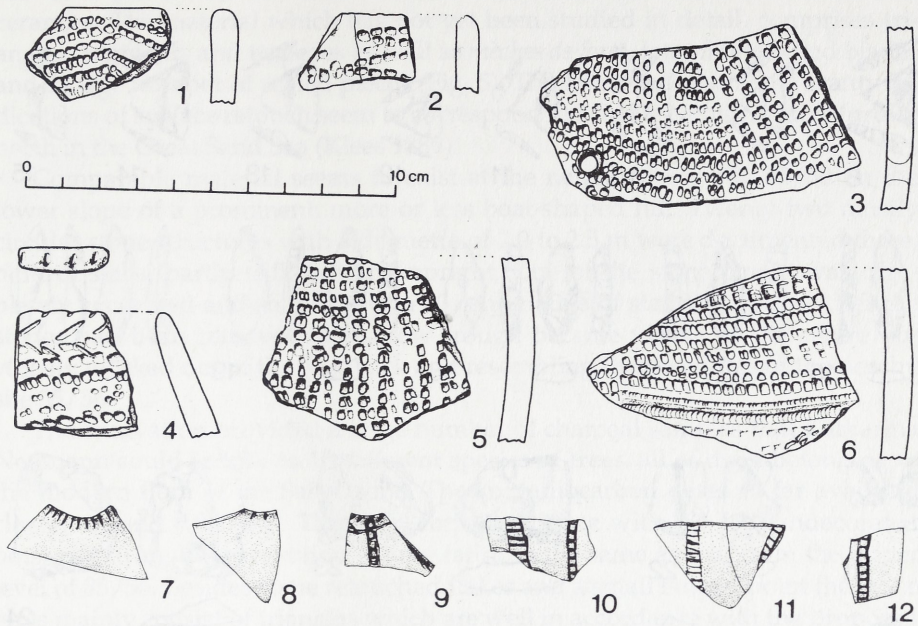


Fig. 3. Site Mudpans 85/56. 1 - 6: decorated potsherds; 7 - 12: decorated ostrich eggshell.

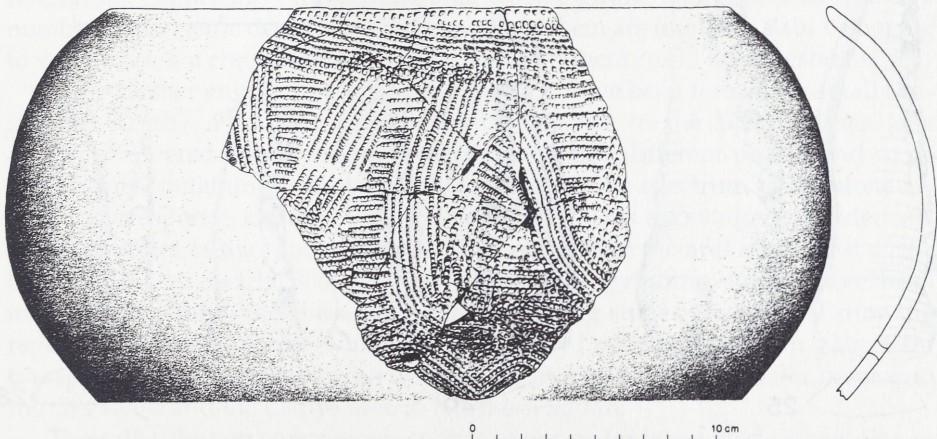


Fig. 4. Site Mudpans 85/56. Decorated vessel fragment.

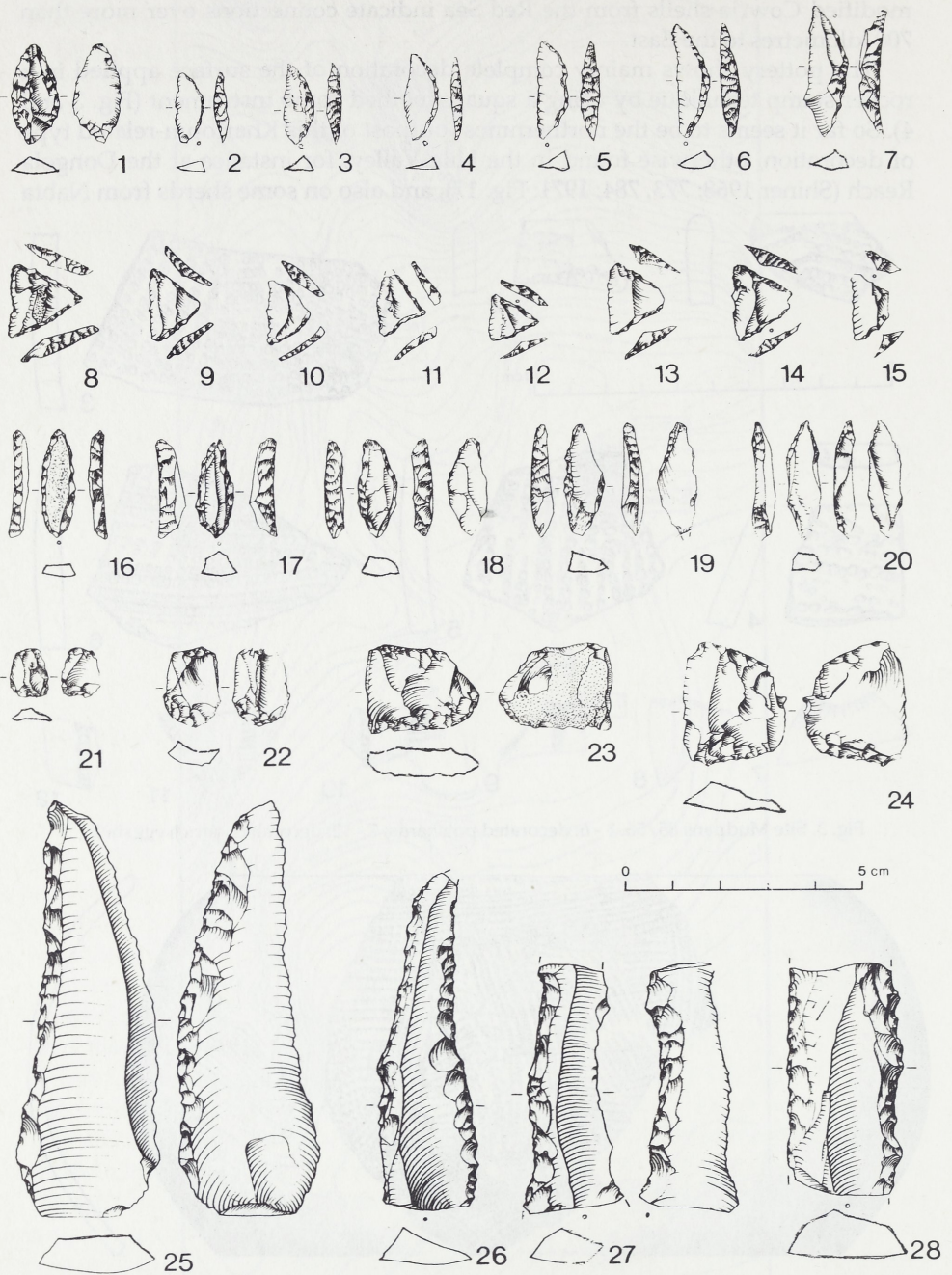


Fig. 5. Site Mudpans 85/56. 1: arrow head; 2-7: segments; 8-13: isosceles triangles; 14-15: trapezes; 16-20: perforators; 21-24: scales pieces; 25-28: bilaterally retouched blades.

Playa sites E-75-7 and E-75-8 (Wendorf and Schild 1980: 149, 156). These are obviously of a much coarser fabric and dated somewhat later, to the Middle Neolithic around 6,800 b.p. While the decorated sherds appear throughout the whole sediment, the undecorated ware is limited to the upper strata. Its fabric and the notched rim may allow us to ascribe them to a later phase, which also seems likely for a small part of the stone artefacts.

About 65 percent of these were found on surface and subsurface while the rest of it came from lower levels, associated with the bulk of the decorated ceramics. The material which has not yet been studied in detail, comprises triangles, segments and trapezes as well as *mèches de foret*, lateral retouched blades and a large number of scaled pieces (Fig. 5). The latter and also some scanty indications of surface retouch seem to correspond to Middle Neolithic sites further north in the Great Sand Sea (Klees 1989).

Comparable material seems to exist at the neighbouring site 85/50 on the lower slope of a prominent, more or less boat-shaped hill. Twenty two mostly circular stone structures with a diameter of 2.0 to 2.5 m were documented there, built of slabs, partly still standing upright. One of the stone circles was completely excavated and showed up to 60 centimetres of standing walls. After the stones had been removed, a shallow trough became visible in the centre obviously worked out of the base rock and resembling the dwellings of the nearby site 85/56.

The excavation provided a large number of charcoal samples that Katharina Neumann could ascribe to 10 different species of trees, all of them belonging to the modern flora of the Sahel zone. The six radiocarbon dates so far available cluster around 6,800 b.p. This is in correspondence with the few undecorated potsherds from the excavation, whose fabric is the same as that from the upper level of 85/56. Besides some retouched flakes and a small tanged point the stone tools mainly consist of triangles which are well in accordance with the proposed Middle Neolithic age of the site (Fig. 1: 10 - 16). In addition the hill bears 28 different rock engravings representing animals like giraffe and gazelle as well as a number of geometric designs. Although some of them are found on slabs belonging to stone circles, a chronological relation between them could not be established.

Some further engravings, especially giraffes, have been found at a small conical hill nearby. Four test excavations carried out in the surroundings (site 85/51) uncovered a knapping site representing two different phases and some eroded pits containing a larger number of bones. The spectrum of the stone artefacts corresponds closely to that of site 85/56. This excavation provided the youngest dates of the Mudpans area. They come from the area southwest of the hill where also nearly 300, mostly fragmentary, grinding stones have been mapped. Together with these several large milling stones were found showing regular notches at the rim, which could possibly have served for lying them for transportation. Those slabs with notches are also known from a later context in the Gilf Kebir and the Laqiya area in Northern Sudan.

Their distribution corresponds to that of our so far latest artefact complex in the Abu Ballas area which leads us again to Westpans. Here on the extended

surface site 85/54 we were able to map more than 15 specimen of that special type of grinding stone, that is characterized by a carefully shaped handle and has been named the "Gilf" type (Kuper 1981: Fig. 29; Schuck 1988: Fig. 4), because it was found there first and in considerable number (Fig. 6). In the Gilf Kebir it covers the time range of the Late Neolithic burnished pottery of the sixth millennium b.p., whose decoration mainly consists of a horizontal herring bone pattern, applied by a fine comb instrument (Kuper 1988: Fig. 3). Like the grinders this can also be found in the Laqiya area in the Northern Sudan (Schuck 1988: Fig. 2: 1), where it persists for more than 1000 years longer and can be followed into the A-Group of the Nile Valley, providing good new evidence for the discussion of its origin.

Turning back from the later development in the South to the early settlement of the Abu Ballas region, in the area of Mudpans its evidences can be followed through more than two millennia from about 8,500 to 6,500 b.p. (Fig. 7). Our summary of the Holocene sequence starts at site 83/39 at the playa border. Dated to the time of El Ghorab (Wendorf, Schild and Close 1984: 7) its artefacts are too scarce to allow any detailed comparison, while the limited information that comes from the botanical remains seems to indicate a moister, but cooler climate than in the following period.

This subsequent period is somewhat better known from the rock-dwelling at site 85/56. It seems to reflect a growing influence from the South, as far as the botanical remains are concerned, but also with respect to the ceramics which connect this site to the Khartoum complex. The Sahelian environment is even more present in the following phase, represented by site 85/50, where the charcoal

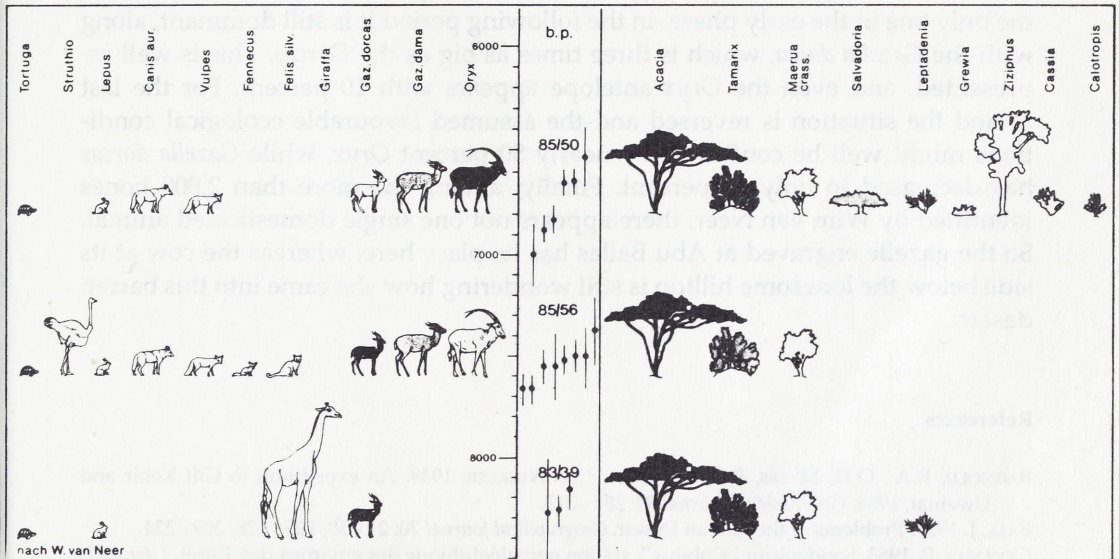


Fig. 7. The archaeozoological and botanical results from the excavations at Mudpans arranged according to their radiocarbon dates demonstrate the environmental change in the Abu Ballas area between 8,500 and 6,500 b.p. (dates not calibrated).

remains comprise several southern species, obviously as a consequence of a warmer climate with sufficient rainfall. This might have been preceded by a period of lower precipitation shortly before 7,000 b.p., which is indicated by climatic data from elsewhere, and by a general lack of dates in our radiocarbon list.

For this final part of the Mudpan sequence, the reconstruction of the environment at around 6,800 b.p. as it has been proposed by Katharina Neumann (Neumann 1989a: Fig. 37; 1989b: Fig. 7), shows that the acacia desert scrub, which represents today the typical vegetation for the latitude of Khartoum, reached into southern Egypt. At the same time Abu Ballas was enjoying a contracted vegetation similar to that of today's Wadi Howar, some 800 kilometres further south. But these favourable climatic conditions do not seem to have lasted very long. There are strong indications that they end in a new arid period starting around 6,000 b.p. The dearth of radiocarbon dates suggests that from this time on a break of settlement must have happened from the Siwa area southwards through the whole of western Egypt. According to the vegetation map for the time around 5,700 b.p. (Neumann 1989a: Fig. 39; 1989b: Fig. 8), wetter conditions did not return to this part of the Libyan Desert where the prehistoric settlement came to a definite end. Only in the Gilf Kebir was the deadline somewhat postponed, while in the Fayum and in the Nile Valley Neolithic life started to flourish.

What do the Mudpan results tell us about the environmental impact on the economic development in the Libyan Desert? As Figure 7 shows, the animal bones comprise mainly the typical prey of desert hunters like hare, antelope and gazelle. With respect to gazelle, however, the total of faunal remains shows a remarkable change in the proportion of different species: while *Gazella dorcas* is the only one in the early phase, in the following period it is still dominant, along with the *Gazella dama*, which is three times as big as the *Dorcas*. This is well represented, and even the *Oryx* antelope appears with 10 percent. For the last period the situation is reversed and the assumed favourable ecological conditions might well be confirmed by nearly 50 percent *Oryx*, while *Gazella dorcas* has decreased to only 15 percent. Finally: among the more than 2,000 bones identified by Wim van Neer, there appears not one single domesticated animal. So the gazelle engraved at Abu Ballas has its place here, whereas the cow at its side below the lonesome hilltop is still wondering how she came into this barren desert.

References

- BAGNOLD, R.A., O.H. MYERS, R.F. PEEL and H.A. WINKLER. 1939. An expedition to Gilf Kebir and Uweinat, 1938. *Geographical Journal* 93: 281 - 313.
- BALL, J. 1927. Problems of the Libyan Desert. *Geographical Journal* 70: 21 - 38, 105 - 128, 209 - 224.
- CADENAT, P. 1963. Sondage au "Cubitus", station épipaléolithique des environs des Tiaret. *Libyca* 11: 75 - 122.
- HAHN, A. 1990. Ein Beispiel für das Erneuern mikrolithischer Einsätze in geschäfteten Geräten. *Archäologisches Korrespondenzblatt* 20: 131 - 135.

- HAYS, T.R. 1971. The Karmakol industry: part of the "Khartoum Horizon-Style", In: J.L. Shiner (ed.), *The Prehistory and geology of northern Sudan*. Report to the National Science Foundation. Dallas.
- KLEES, F. 1989. Lobo: a contribution to the prehistory of the Eastern Sand Sea and the Egyptian oases. In: L. Krzyżaniak and M. Kobusiewicz (eds.), *Late Prehistory of the Nile Basin and the Sahara*: 223 - 231. Poznań: Poznań Archaeological Museum.
- KUPER, R. 1981. Untersuchungen zur Besiedlungsgeschichte der östlichen Sahara. Vorbericht über die Expedition 1980. *Beiträge zur Allgemeinen und Vergleichenden Archäologie* 3: 215 - 275.
- 1988. Neuere Forschungen zur Besiedlungsgeschichte der Ostsahara. *Archäologisches Korrespondenzblatt* 18 (2): 127 - 142.
- 1989a. The Eastern Sahara from North to South: Data and dates from the B.O.S. Project. In: L. Krzyżaniak and M. Kobusiewicz (eds.), 1989. *Late Prehistory of the Nile Basin and the Sahara*: 197 - 203. Poznań: Poznań Archaeological Museum.
- 1989b. Ägypten am Rande des Sahel. Ausgrabungen in der Abu Ballas-Region. *Archäologie in Deutschland* 2: 18 - 22.
- MATEU, J. 1970. Un gisement neolithique des environs de Béni-Abbés. *Libyca* 18: 155 - 176.
- NEUMANN, K. 1989a. Zur Vegetationsgeschichte der Ostsahara im Holozän. Holzkohlen aus prähistorischen Fundstellen, In: R. Kuper (ed.), *Forschungen zur Umweltgeschichte der Ostsahara*: 12 - 181. Köln.
- 1989b. Holocene vegetation of the Eastern Sahara: charcoal from prehistoric sites. *The African Archaeological Review* 7: 97 - 116.
- RHOTERT, H. 1952. *Lybische Felsbilder*. Darmstadt.
- SCHUCK, W. 1988. Wadi Shaw - eine Siedlungskammer im Nord-Sudan. *Archäologisches Korrespondenzblatt* 18 (2): 143 - 153.
- SHINER, J.L. 1968. The Khartoum variant industry. In: F. Wendorf (ed.), *The Prehistory of Nubia* 2: 768 - 790. Dallas: Fort Burgwin Research Center and Southern Methodist University.
- VAUFREY, R. 1955. *Préhistoire de l'Afrique* 1: *Maghreb*. Tunis: Publications de l'Institut des Hautes Etudes de Tunis 4.
- WENDORF, F. and R. SCHILD. 1980. *Prehistory of the Eastern Sahara*. New York: Academic Press.
- WENDORF, F., R. SCHILD and A.E. CLOSE (eds.). 1984. *Cattle-keepers of the Eastern Sahara. The Neolithic of Bir Kiseiba*. Dallas: Southern Methodist University.