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Pastoral Groups in the Southern Libyan Desert: The Handessi Horizon (c. 2400 – 1100 BC)

Introduction

The southern Libyan Desert has long been an archaeological no-man's land. Research started rather late: the first expeditions crossed the region and reported archaeological finds only in the 1920s and 1930s (Hinkel 1979). Early on, however, it was noted that the pottery found by the "11. Deutsch-Innerafrikanische Forschungs-Expedition, DIAFE XI", led by Leo Frobenius and Hans Rhotert on the north bench of Wadi Howar in 1933, was similar to the pottery of the Nubian C-Group (Hölscher 1955: 55).

Intensive fieldwork only started in 1980, when the University of Cologne began its B.O.S. ("Besiedlungsgeschichte der Ost-Sahara") research project, followed, since 1995, by the interdisciplinary ACACIA ("Arid Climate, Adaptation and Cultural Innovation in Africa") project (Kuper 1981, 1986, 1988, 1995; Richter 1989; Schuck 1989; Keding 1997, 1998, 2000, 1998-2002; Hoelzmann et al. 2001; Jesse 2003, 2005; Jesse et al. 2004; Lange 2005). More than 2400 archaeological sites are now known in the southern Libyan Desert (Fig. 1). As a result of this research, it has been possible to establish a cultural sequence beginning in the 6th millennium BC (Keding 1998; Hoelzmann et al. 2001; Keding & Vogelsang 2001; Jesse 2004). The final cultural horizon, starting at the end of the 3rd millennium BC, was simply called the „Geometric Pottery Horizon“ after the typical geometric patterns used to decorate the vessels. Birgit Keding distinguished two chronological phases based on differences in the pottery styles: they were called, provisionally, „fine geometric“ and „coarse geometric“ (Keding 1998: 10). New research under the aegis of the ACACIA project (Jesse et al. 2004; Lange this volume) clearly indicates that the pottery was subject to regional differentiation within a wider northeast African technocomplex of the 3rd

and 2nd millennia BC that is characterised by geometric patterns (cf. Manzo 1999). To better account for these regional differences in the southern Libyan Desert – and because the term „Geometric Pottery Horizon” was always considered as only provisional – the name „Handessi Horizon“ is now proposed: „Handessi” (hándasijj) is an Arabic word for „geometric”. The term Handessi A would therefore replace the former „fine geometric” pottery horizon; Handessi B the former „coarse geometric” pottery horizon. The main features of this regional cultural complex are outlined below.

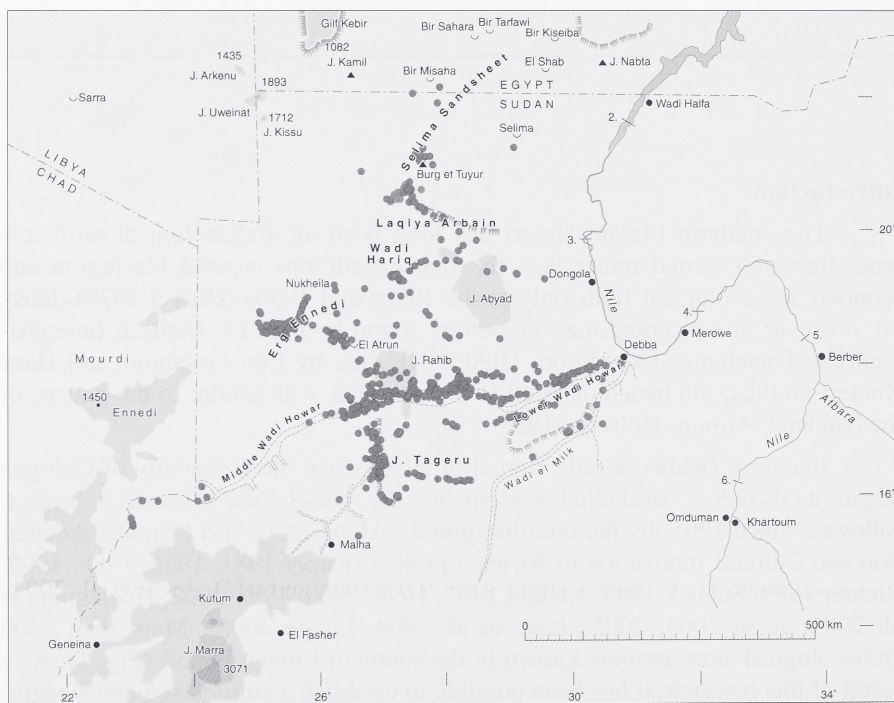


Fig. 1. The southern Libyan Desert with the sites discovered by the Cologne research projects B.O.S. and ACACIA.

The ecological background

The 3rd and 2nd millennia BC were marked by increasing aridity in the whole region but a Sahelic type of vegetation (*Acacia* desert scrub and thorn savannah) still persisted (Neumann 1989: 146-150) and allowed human settle-

ment in areas like the Laqiya region, Wadi Hariq and Middle Wadi Howar. Tundub (*Capparis decidua*), *Acacia* sp., *Tamarix* sp., *Maerua crassifolia* and a few remains of *Salvadora persica*, cf. *Grewia tenax* and *Boscia* cf. *senegalensis* were identified among the charcoal samples from the Laqiya region (Neumann 1989: 134-135). In Wadi Hariq, charcoal samples attributable to that period only allowed the identification of *Acacia* sp. and *Tamarix* sp. (Jesse et al. 2004). In Lower Wadi Howar, there were also *Acacia* sp., *Tamarix* sp. and single examples of *Capparaceae* and *Ziziphus* sp.

The bones of various wild (e.g. giraffe, gazelles, addax, wild ass) and domestic (cattle, sheep, goat, donkey and dog) species have been identified (Van Neer & Uerpmann 1989; Berke 2001; Jesse et al. 2004; Pöllath this volume). Whereas in the Laqiya region wells already had to be dug at around 2000 BC (Francke 1986a: 138), temporary pools of water still existed in Middle Wadi Howar. Fishing in shallow water is attested for the Djabarona area in the 2nd millennium BC (Peters et al. 2002).

Handessi Horizon sites – geographical distribution and layout

Handessi pottery has so far been found on nearly 400 sites. These are concentrated in areas that are still ecologically favourable: Middle Wadi Howar, Jebel Tageru and the valley systems of Wadi Hariq as well as the Laqiya region (Fig. 1). Middle Wadi Howar, in particular, must have been densely populated as can be seen from the large number of sites in this area (Keding 2004: 104). They are mainly found on the banks and, especially, in the wadi bed (Keding 1997: 37). Most of the Handessi Horizon sites are known from survey reports; excavations have been carried out at about 20 sites in the Laqiya region (Camp 49; Francke 1986a and b), Middle Wadi Howar (Djabarona 84/1, 84/4, 84/19, 96/2, 96/3, 96/5, 96/119 and 96/120; Günther 1995; Keding 1997, 1998-2002; Prill 2000) and Wadi Hariq (Wadi Hariq 97/5, 97/7, 01/1 and 01/4; Jesse et al. 2004; Lange this volume).

The sites differ in shape but they all have a more or less dense scatter of archaeological material on the surface: concentrations of bones and/or pottery are visible, and concentrations of lithics can often be interpreted as knapping areas. Excavation revealed features such as hearths, but no traces of post holes or other kinds of dwelling were found (Keding 1997: 38; Jesse et al. 2004). In the Laqiya area, at Camp 49 (Wadi Shaw 82/31), excavation revealed stratigraphic sequences of about 60 cm or more. Several hearths, indicated by ash lenses, were found during the excavations. The repeated use of this site over at least 200 years is confirmed by radiocarbon dates (Francke 1986a: 137-138; Francke 1986b: 18-20) (Tab. 1). A large well was dug at Camp 49 (Wadi Shaw 82/30) at around 2000 BC (Schuck 2002: 253) (Tab. 1) and rectangular stone structures nearby

have been interpreted as watering places for the animals (Francke 1986b: 16; Schuck 1989: 427). Smaller sites, such as a pottery concentration at Djabarona 96/2, represent special purpose sites; in this case an interpretation as a vessel depot, probably used for the storage of food, is favoured (Prill 2000).

Table 1: The radiocarbon dates of the Handessi Horizon.

The dates were calibrated using CALPAL (Cologne Radiocarbon Calibration & Palaeoclimate Research Package), Version 2004, by Bernhard Weninger, Olaf Jöris and Uwe Danzeglocke, Radiocarbon Laboratory, University of Cologne).

Site	Material	Lab.No.	14C-years bp	Years cal BC	Context
Djabarona 84/1	bone	KN-3523	3250±60	1530±70	
Djabarona 84/4-1	bone	KN-3962	3130±250	1370±310	grave
Djabarona 96/2	pottery	UtC-9882	3760±41	2170±80	
	pottery	UtC-9883	3779±41	2210±60	
	pottery	UtC-9886	3700±50	2090±70	
	bone	UtC-9887	3668±42	2050±70	
Djabarona 96/3*	pottery	UtC-9885	3339±40	1610±60	
Djabarona 96/5-2	bone	KIA-12419	3335±300	1650±390	cattle
Djabarona 96/119	bone	UtC-5941	3320±60	1600±70	
	charcoal	UtC-5942	3294±38	1580±50	
Djabarona 96/119-10	pottery	UtC-9884	3496±41	1820±60	
Wadi Hariq 97/5-11	bone	KN-5318	3560±150	1920±200	donkey
Wadi Hariq 97/7-1	charcoal	KN-5327	3675±40	2060±70	hearth
	charcoal	KN-5447	3785±40	2220±60	hearth
Wadi Hariq 01/1-1	faeces	KIA-17543	3385±25	1690±40	hearth
	charcoal	KIA-17510	3355±25	1640±40	hearth
Wadi Hariq 01/4-1	charcoal	KIA-17508**	3430±25	1720±30	hearth
Wadi Shaw 82/29-3	charcoal	KN-3411	3700±50	2090±70	hearth
Wadi Shaw 82/29-11	charcoal	KN-4281	3970±90	2470±140	
Wadi Shaw 82/30	charcoal	KN-4327	3620±70	1990±100	
Wadi Shaw 82/30-1	charcoal	KN-3099	3410±170	1740±210	well
Wadi Shaw 82/31	charcoal	KN-3172	3330±110	1630±130	hearth

Wadi Shaw 82/31-1	charcoal	KN-3082	3910±280	2400±390	hearth
	charcoal	KN-3139	3870±60	2340±90	hearth
	charcoal	KN-3084	3790±60	2230±100	hearth
	charcoal	KN-3185	3650±120	2030±170	hearth
	charcoal	KN-3148	3540±120	1890±160	hearth
Wadi Shaw 82/31-2	charcoal	KN-3439	3850±55	2320±90	hearth
	ostrich eggshell	KN-3143	3820±55	2280±90	
	charcoal	KN-3362	3820±55	2280±90	hearth
	charcoal	KN-3169	3670±55	2050±80	hearth
	charcoal	KN-3105	3660±55	2040±80	hearth
Wadi Shaw 82/31-3	charcoal	KN-3100	3880±60	2350±90	hearth
Wadi Shaw 82/32-9	charcoal	KN-3146	3520±120	1860±160	hearth
Wadi Shaw 82/32-9	charcoal	KN-4282	3950±70	2440±110	hearth
Wadi Shaw 83/110-14	bone	KN-3354	3860±150	2320±210	grave
Wadi Shaw 83/110-15	bone	KN-3460	3900±60	2370±80	grave
Wadi Shaw 83/110-18	bone	KN-3438	3410±180	1740±220	grave 18/2
	bone	KN-3437	3200±120	1470±140	grave 18/1

* Charcoal from a hearth (Djabarona 96/3-1) has been dated to 1472±45 bp (UtC-5584).

** The sample has given two rather different results: 3430±25 bp (fulvic acids, 2.2 mg C) and 1610±35 bp (humic acids, 0.6 mg C).

Compared to the number of settlement sites, burials are rare. In Wadi Howar, the deceased were simply buried within the settlement area; no super-structures were visible. So far, only interments attributable to the Handessi B phase have been excavated. The dead were buried in a flexed (with a north-south orientation) or elongated (with an east-west orientation) position. Grave goods were not common. Actual cemeteries have not been found, although the location of the interments at Djabarona 96/120 perhaps indicate the first use of formal burial grounds (Jesse & Keding 2002).

In the Laqiya area, stone tumuli cover the burials. The dead were buried in a flexed position. Four graves, which can be attributed to the Handessi Horizon by their C14 dates (Tab. 1), have been excavated. The grave goods consisted of personal adornments, mostly beads made of ostrich eggshell. The remains of organic material indicate that the deceased were either buried with a leather wrapping or were placed on a piece of leather (Schuck 2002).

Chronology

The stylistic analysis of the pottery has already distinguished two phases (cf. Keding 1998: 10-11): “fine geometric”, now called Handessi A, and “coarse geometric”, now called Handessi B. The available radiocarbon dates confirm this sequence (Tab. 1; Fig. 2). Handessi A started at about 2500 BC in the Laqiya region and appeared a little later in Wadi Hariq and Wadi Howar. In the Laqiya region, settlement activities ended at around 1600 BC. Handessi B followed Handessi A from about 1800 BC in Wadi Hariq and Wadi Howar, but no trace of Handessi B has yet been found in the Laqiya region, certainly due to the deteriorating ecological conditions there.

A rather late date of 1500 BC (KN-3523; Tab. 1) for Handessi A pottery at Djabarona 84/1 (Keding 1998: 10; Keding Ms) indicates a certain complexity and the probable coexistence of several groups in Middle Wadi Howar during the Handessi B phase. Another totally different pottery style, characterised by a red ware and geometric decorations limited to a small band in the rim zone, was found at Djabarona 96/5 (Keding 1997: 38) and dated to about 1650 BC (KIA-12419, Tab. 1). This, too, points to a rather complex situation in Middle Wadi Howar during the 2nd millennium BC.

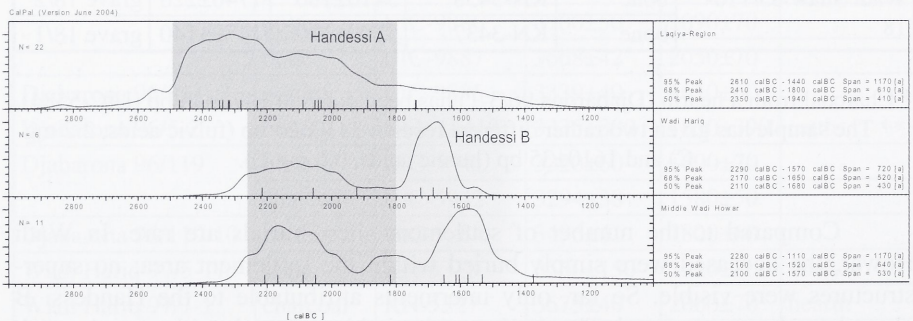


Fig. 2. Probability distributions of the radiocarbon dates of the Handessi Horizon. The dates were calculated and plotted using CALPAL (Cologne Radiocarbon Calibration & Palaeoclimate Research Package), Version 2004, by Bernhard Weninger, Olaf Jöris and Uwe Danzeglocke, Radiocarbon Laboratory, University of Cologne.

The archaeological material

Pottery

New decorative patterns appear with the Handessi Horizon: geometric ornaments and, later – in the Handessi B phase – mat impressions. There is a great variety of vessel forms (globular forms but also curved profiles) and a

change in the type of temper can be observed: organic material was commonly used, often combined with sand (Keding 2000: 99; Keding & Vogelsang 2001: 274). Impression is still the most important decoration technique. Compared to previous periods, rocker stamping decreases while simple impression or mat impression becomes more important (see Günther 1995: 128-129; Jesse in press). Incision and impression are often combined.

Handessi A is characterised by decoration limited mostly to the upper part of the vessel, the top of the rim and the general rim zone (Fig. 3). Decoration on the body is seldom seen. The rim-top decoration can be quite varied (incised vertical lines, incised criss-cross patterns, vertical or oblique impressions; Francke 1986b: 81; Prill 2000: 62). The decoration of the rim zone typically consists of simple impressions made with a single-pronged implement, which result in one or more bands of triangular impressions, bouton decorations (bouton: small lumps protruding on the exterior of the vessel due to punctuations that almost perforate the wall), incised patterns (e.g. criss-cross) and simple comb impressions (Keding 1998: 10; Prill 2000; Francke 1986a: 138 and 142, fig. 2.3-4; Jesse et al. 2004). If there is any decoration on the body, it is often a complex geometric design such as hanging triangles filled with impressions or other geometric forms (see Francke 1986a: 142, fig. 2.1; Prill 2000, plate 10.2 and plate 16).

In general, rocker stamping is not a major decorative technique on Handessi A pottery. However, at Djabarona 84/1, zigzag patterns made by rocker stamping with either a comb or a spatula, are an important type of wall decoration (Prill 2000: 76-77).

Clay was used to make objects of art as well as vessels. In the Laqiya region, a small figurine of a bovid was found: this is, however, a unique piece so far (Francke 1986a: 138 and 142, fig. 2.2).

The later phase, Handessi B, is marked by a larger range of vessel forms (e.g. curved profiles are more often found), complex geometric patterns and, most prominently, by the appearance of mat impression (Keding 1998: 11) (Fig. 4). The rim zone is still the most important zone of decoration, although rim-top decoration is rare (Günther 1995: 144). Geometric patterns, e.g. hanging triangles filled with impressions, are a common decoration (Keding 1998: 11, plate 6). Mat impression is mostly found on the vessel body; in some cases applied from the rim downwards (Günther 1995: 141; Jesse et al. 2004: 143, fig. 15). Decoration on the interior of the vessel is frequent (Keding 1998: 11). Here, oblique rows of simple comb impressions are found as are incised or impressed criss-cross patterns or herringbone patterns.

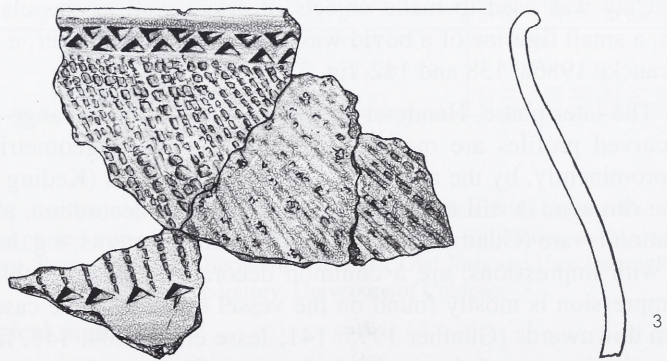
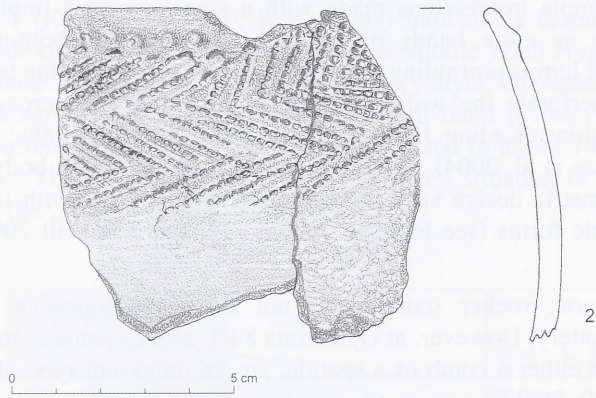
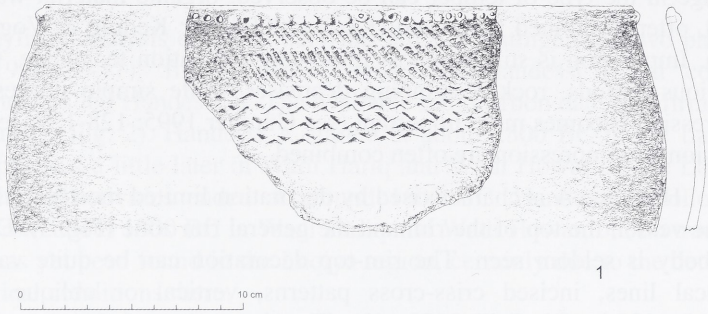


Fig. 3. Pottery of the Handessi Horizon: Examples for Handessi A.: 1 – Wadi Shaw 82/31; 2 – Wadi Hariq 97/7; Djabarona 96/2 (Middle Wadi Howar).

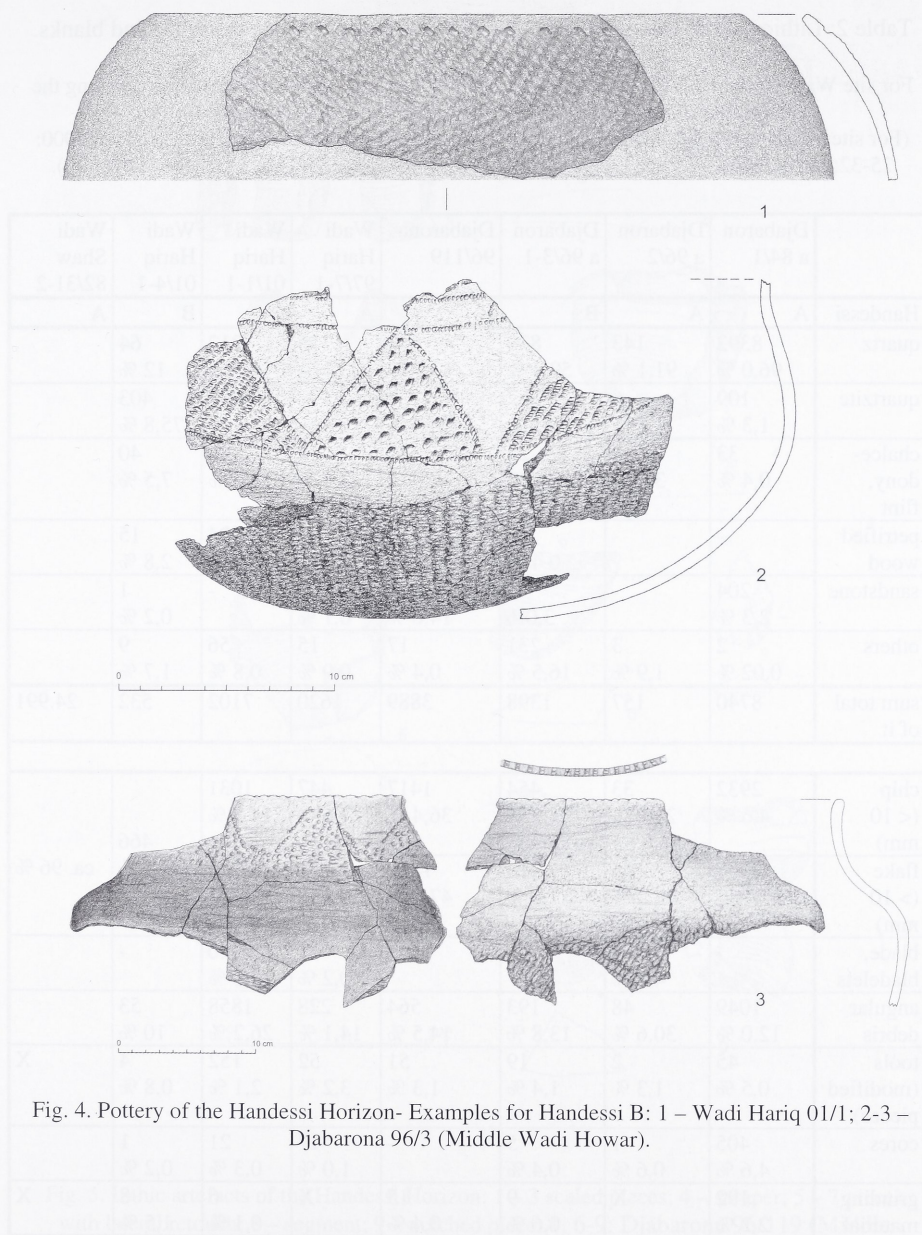


Fig. 4. Pottery of the Handessi Horizon- Examples for Handessi B: 1 – Wadi Hariq 01/1; 2-3 – Djabarona 96/3 (Middle Wadi Howar).

Table 2: Lithics of the Handessi Horizon: The distribution of raw materials and blanks.

For site Wadi Hariq 01/1-1 tools, cores and grinding material hav also been counted among the blanks, therefore the sum total of the percentages given exceeds 100 %.

(For sites Djabarona 84/1, 96/3 and 96/119 see Keding in prep; Djabarona 96/2 see Prill 2000: 25-32; Wadi Hariq 97/7 see Lange this volume; Wadi Shaw 82/31 see Francke 1986b: 20).

	Djabaron a 84/1	Djabaron a 96/2	Djabaron a 96/3-1	Djabarona 96/119	Wadi Hariq 97/7-1	Wadi Hariq 01/1-1	Wadi Hariq 01/4-1	Wadi Shaw 82/31-2
Handessi	A	A	B	B	A	B	B	A
quartz	8392 96,0 %	143 91,1 %	830 59,4 %	533 13,7 %	373 23,1 %	212 3 %	64 12 %	
quartzite	109 1,3 %	6 3,8 %	267 19,1 %	2728 70,2 %	1172 72,4 %	6281 88,4 %	403 75,8 %	
chalce- dony, flint	33 0,4 %	5 3,2 %	22 1,6 %	35 0,9 %	58 3,6 %	44 0,6 %	40 7,5 %	
petrified wood	-	-	6 0,4 %	8 0,2 %	-	524 7,4 %	15 2,8 %	
sandstone	204 2,3 %	-	42 3,0%	568 14,6 %	2 0,1 %	-	1 0,2 %	
others	2 0,02 %	3 1,9 %	231 16,5 %	17 0,4 %	15 0,9 %	56 0,8 %	9 1,7 %	
sum total of it	8740	157	1398	3889	1620	7102	532	24.991
chip (< 10 mm)	2932 4,6 %	33 21,0 %	454 32,5 %	1417 36,4 %	447 27,6 %	1031 14,5 %	466 87,6 %	ca. 96 %
flake (> 10 mm)	4117 47,1 %	66 42,0 %	718 51,4 %	1842 47,4 %	851 52,5 %	4203 59,2 %		
blade, bladelets	-	7 4,5 %	-	-	3 0,2 %	10 0,1 %	-	
angular debris	1049 12,0 %	48 30,6 %	193 13,8 %	564 14,5 %	228 14,1 %	1858 26,2 %	53 10 %	
tools (modified pieces)	45 0,5 %	2 1,3 %	19 1,4 %	51 1,3 %	52 3,2 %	152 2,1 %	4 0,8 %	X
cores	405 4,6 %	1 0,6 %	5 0,4 %	-	17 1,0 %	21 0,3 %	1 0,2 %	
grinding material	192 2,2 %	X	9 0,6 %	15 0,4 %	X	6 0,1 %	8 1,5 %	X

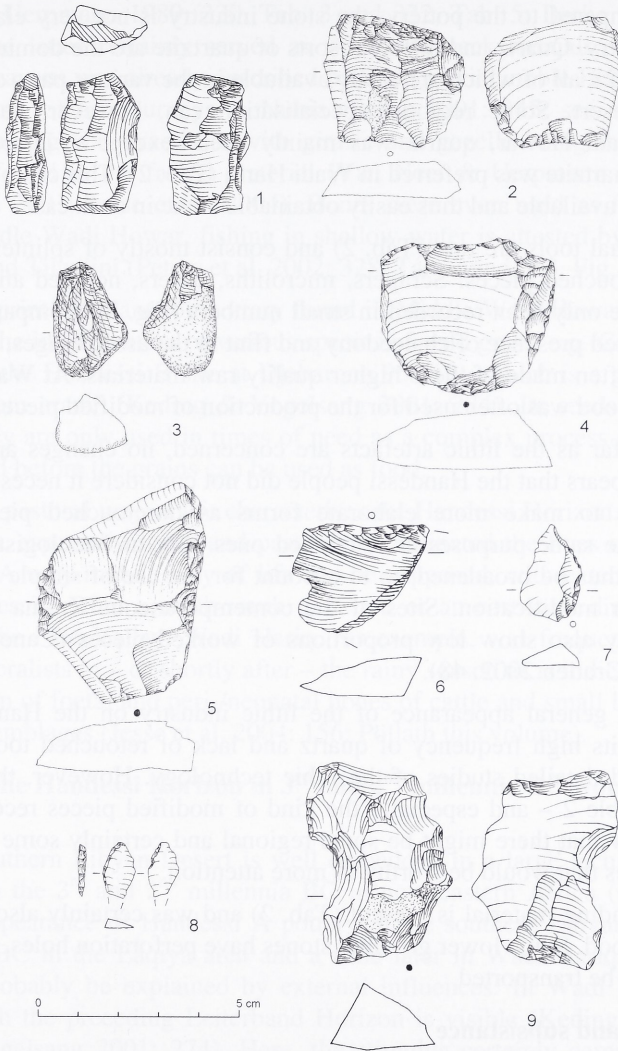


Fig. 5. Lithic artefacts of the Handessi Horizon: 1 – 3 scaled pieces; 4 – scraper; 5 – 7 pieces with lateral retouch; 8 – segment; 9 – notched piece. 1, 6-9: Djabarona 96/119 (Middle Wadi Howar); 2-5: Wadi Hariq 97/7.

Lithics

Compared to the pottery, the stone industry is not very elaborate. It is a flake industry. Quartz and different sorts of quartzite are the dominant raw materials (Tab. 2), all of which are easily available in the various parts of the southern Libyan Desert. Some regional specialisation can, however, be observed. In Middle Wadi Howar, quartz was mainly used (except at Djabarona 96/119) whereas quartzite was preferred in Wadi Hariq (Tab. 2). This can be explained by the locally available and thus easily obtainable stone in each case.

Actual tools are rare (Tab. 2) and consist mostly of splintered pieces and simply retouched pieces. Scrapers, microliths, borers, notched and denticulated pieces have only been recorded in small numbers (Fig. 5). Compared to the generally limited presence of chalcedony and flint in the assemblages, worked pieces are quite often made of these higher quality raw materials. At Wadi Hariq 01/1, petrified wood was often used for the production of modified pieces.

As far as the lithic artefacts are concerned, no changes are visible over time. It appears that the Handessi people did not consider it necessary to modify the blanks to make more elaborate forms as unretouched pieces obviously fulfilled the same purposes as retouched ones. The archaeologist's notion of a tool must thus be broadened up to account for the use of simple flakes without any further modification. Sites of the contemporaneous Kerma Culture in the Nile Valley also show low proportions of worked pieces (Caneva 1990: 137; Bracco & Gratien 2002: 48).

The general appearance of the lithic industry on the Handessi Horizon sites with its high frequency of quartz and lack of retouched tools has not yet encouraged detailed studies of the lithic technology. However, the data assembled in Table 2 – and especially the kind of modified pieces recorded for each site – show that there might be some regional and certainly some specific intra-site features that would be worthy of more attention.

Grinding material is present (Tab. 2) and was certainly also used to process plant food. Some lower grinding stones have perforation holes, indicating that they could be transported.

Economy and subsistence

The Handessi Horizon as a whole indicates a pastoral way of life based on the herding of cattle and small livestock. Sheep and goats were added to the herds as a reaction to increasing aridity (Berke 2001: 245; Keding and Vogelsang 2001: 274). Of all the livestock, cattle are the most important: cattle bones can represent up to about 50 % of the identifiable mammal bones on the sites whereas sheep and goats make up only about 20 % (Berke 2001: 250 and Tab. 2-

3; Jesse et al. 2004: 153 and 144, Tab. 7). Dogs and donkeys are also attested (Van Neer & Uerpmann 1989: 330, Tab. 3 and 332, Tab. 5; Berke 2001: 246-247, 252). The latter certainly served as work and pack animals. The use of donkeys in caravans was already described by the Egyptian noble Herkhuf in the famous accounts of his journeys to Nubia (Berke 2001: 245; see also Manzo 1999: 11). Hunting was practised, with giraffe and gazelle being the principal wild species found in the faunal material (Van Neer & Uerpmann 1989: 330, Tab. 3; Berke 2001; Jesse et al. 2004). Bones were even used as fuel (Berke 2002). In Middle Wadi Howar, fishing in shallow water is attested by the bones of Clariidae and Tilapiini (Peters et al. 2002: 328, Tab. 1 and 333, Fig. 4).

The imprints of plants on pottery found in Middle Wadi Howar and Wadi Hariq permit the identification of various species of wild grass, e.g. *Cenchrus* sp. (on sherds of the Handessi B site at Djabarona 96/119), which is a grass better known as “cram cram” (Keding & Vogelsang 2001: 274). Its seeds are edible but, today, they are only used in times of need as a complex process of preparation is required before the grains can be used as food.

Thus, a pastoral way of life characterises the Handessi Horizon. The needs of the animals, especially water and pasturage, dominated the lives of the Handessi groups. A very mobile way of life can be supposed, with extensive transhumance cycles in either a north-south direction or an east-west direction that incorporated the Nile Valley. Wadi Hariq, for example, was frequented by the Handessi pastoralists in – or shortly after – the rainy season as is indicated by the high proportion of foetal and peri-/neonatal bones of cattle and small livestock in the faunal assemblages (Jesse et al. 2004: 156; Pöllath this volume).

The place of the Handessi Horizon in 3rd and 2nd millennia BC Northeastern Africa

The southern Libyan Desert is well embedded in a large technocomplex that existed in the 3rd and 2nd millennia BC in northeastern Africa (see Manzo 1999). The appearance of Handessi A pottery in the southern Libyan Desert at around 2500 BC in the Laqiya area and a little later in Wadi Hariq and Wadi Howar can probably be explained by external influences. In Wadi Howar, no continuity with the preceding Leiterband Horizon is visible (Keding 1998: 10; Keding & Vogelsang 2001: 274). Here, the stimulus certainly came from the northeast, the Nubian Nile Valley and the Laqiya region. Incised decoration and complex geometric patterns are recorded for the Nubian cultures of the 3rd and 2nd millennia BC and the triangular impressions and bouton decorations of Handessi A also find their counterpart in C-Group and Kerma ceramics (e.g. Bietak 1968; Gratien 1986). Contacts between the desert dwellers – probably the “Temehu” mentioned in several Egyptian texts – and the cultures in the Nile

Valley can be supposed (Francke 1986b: 127; Jesse et al. 2004: 158). Egyptian pottery found in the Laqiya region indicates the existence of exchanges between the two regions (Francke 1986b: 119-120). Contact with the Nile Valley – via the Laqiya region and Wadi Hariq further to the south, to Wadi Howar and Jebel Tageru – can be seen, especially with regard to the decorative patterns on the pottery. The slightly later appearance of Handessi A in Wadi Howar might be explained by such contacts.

In the Handessi A phase, an extensive network of contacts seems to have covered the whole of the southern Libyan Desert (Fig. 6). In the Laqiya region, permanent settlement must have come to an end at around 1600 BC (see Francke 1986b: 127) as no Handessi B has been found there. The increasing aridity was certainly a reason for the shift of the settlement areas to the south.

The development from Handessi A to Handessi B cannot yet be sufficiently explained as far as pottery styles are concerned. A new component appears with the arrival of mat impression. Mat impression is present on utility vessels from the Kerma Moyen period onwards, i.e. from about 2000 BC (Gratien 1986: 397), but the stimulus may also have come from the west. This question is still awaiting further research. The network of contacts shifted (Fig. 7), obviously excluding the Nile Valley and the Laqiya region. Close contacts can be seen, however, between Wadi Hariq and Middle Wadi Howar, again especially as far as the decorative patterns on the pottery are concerned.

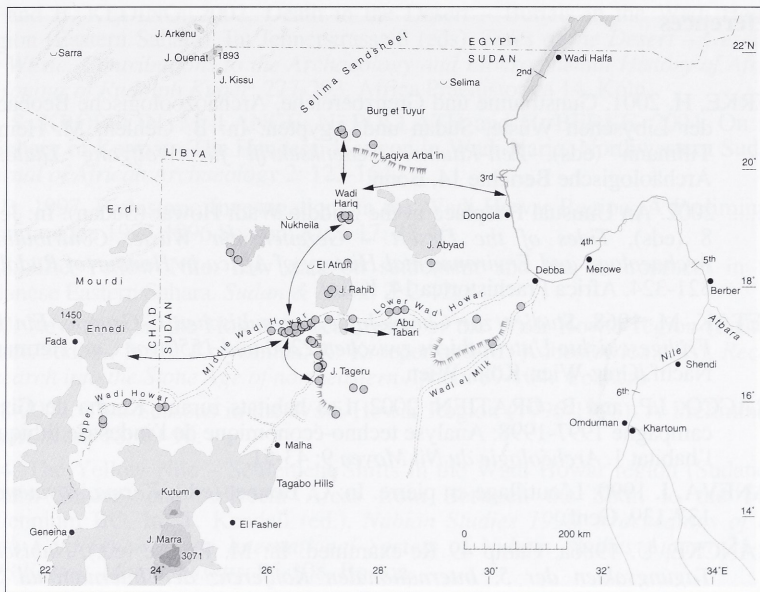


Fig. 6. Networks and contacts during the times of Handessi A.

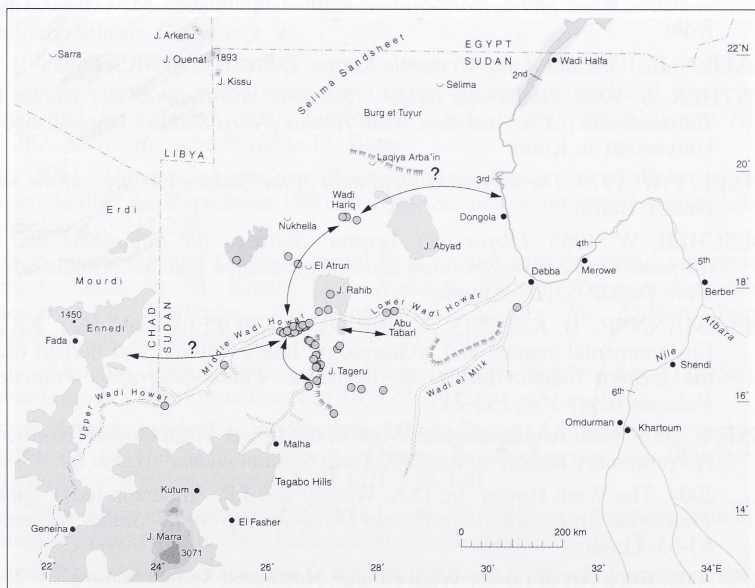


Fig. 7. Networks and contacts during the times of Handessi B.

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