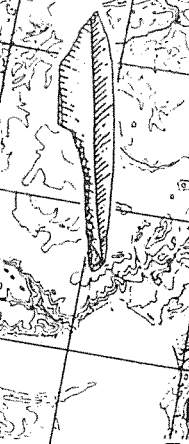

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NEO-LITHICS 2-3/00

A Newsletter of Southwest Asian Lithics Research

map by the *Tübingen Atlas of the Near East*

Editorial

This issue (*Neo-Lithics* 2-3/00) appears as a combination of two issues, as is reflected in the relative thickness of the publication. There are several reasons that we have combined them, which brings up the focus of this editorial.

When *Neo-Lithics* began in 1994, the newsletter was intended to be a means to communicate issues of lithic analysis: it was to be a forum where approaches to analysis could be proposed, explained, and modified as a consequence of friendly exchange among researchers dealing with common interests. *Neo-Lithics* has provided this channel of communications, but it is clear that the progress of lithics analysis did not proceed at a rate at which an annual newsletter was worth publishing.

As a consequence, the role of *Neo-Lithics* was expanded by the co-editors to include brief reports on current Neolithic (and even late Epipaleolithic) field work and aspects of non-lithic research as a means of rapid exposure of what is being examined by excavation projects and what is being pursued in the laboratory in addition to lithics analysis.

We have been able to cobble together some useful newsletter issues in the past as a result of the cooperation of field directors and laboratory researchers. It is pleasing for us to note, for example, that many recent publications cite reports in *Neo-Lithics* in their bibliographies simply because other avenues of publication are more time-consuming before other reports eventually emerge.

But we would also like to point out that the publication of *Neo-Lithics* is not an easy task. Both of the co-editors are fully employed in academic work and research projects themselves, and while we are very happy to produce this newsletter, we desperately need the cooperation of our colleagues. We very much appreciate the manuscripts that have been submitted for past issues (repeatedly by some colleagues, which we admire). We have appealed via email and other avenues for others to contribute manuscripts, and we have received several responses to these appeals.

It is in this regard that we raise the question of future issues of *Neo-Lithics*. We want to reserve *Neo-Lithics* as a primary communications vehicle for discussion of lithics analysis. But we realize that research projects on lithics analysis per se will not produce manuscripts on a predictable basis, so other aspects of Neolithic (and late Epipaleolithic) research are also encouraged as foci for publication in *Neo-Lithics*.

We ask again that short reports on research be submitted to *Neo-Lithics* when the opportunity arises. It might be the case that we have to reduce the current number of three issues per year to two (as is the situation for *Neo-Lithics* 2-3/00).

What has been written above are the views of the co-editors. What is not present there, or anywhere else, are the views that you as the subscribers might hold. We can easily establish a "Letters to the editors" column to include comments and criticisms that you might wish to communicate on a "less-than-article" means. Let us know.

Gary Rollefson & Hans Georg K. Gebel

Deadline for the coming issue of *Neo-Lithics* is
May 1st, 2001 (next deadline: Sept. 15th, 2001)

Please, note that the text of contributions should be send directly to Dr. Gary Rollefson (Email: rollefgo@whitman.edu or to the Department of Anthropology, Whitman College, Walla Walla, WA, 99362 USA). Illustrations should be sent separately to H.G.K. Gebel at the Berlin address (Free University of Berlin, Hüttenweg 7, D-14195 Berlin, Email: hggebel@zedat.fu-berlin.de).

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Dr. Mujahed al-Muheisen
Rahmatu Allahi Aleik
A Personal Obituary

Dr. Mujahed al-Muheisen, born in Tafila, devoted his academic life to Jordan's prehistory. He died in Irbid in July 2000 at the age of 46. His family lost a caring and loving father and husband, and we who knew him and worked with him have lost a friend, an expert in chipped lithics analysis, and a colleague who demanded high standards of research from himself and others.

Dr. Mujahed taught prehistory at the Institute of Archaeology and Anthropology at Yarmouk University, Irbid, Jordan, a tenure interrupted by a period as curator at the Museum of National Heritage at Yarmouk University. He was the excavator of Epipaleolithic Kharaneh IV and co-director of the Basta and 'Ain Rahub Joint Archaeological Projects, in which he represented his institute, shared the direction of the excavations and analyzed the chipped lithic materials that were recovered. He was also involved in many other projects, both in analysis of materials and excavation.

Dr. Mujahed finished his studies in 1988 with the *Doctorat d'État* in Bordeaux, France, using materials from his excavations at Kharaneh IV.

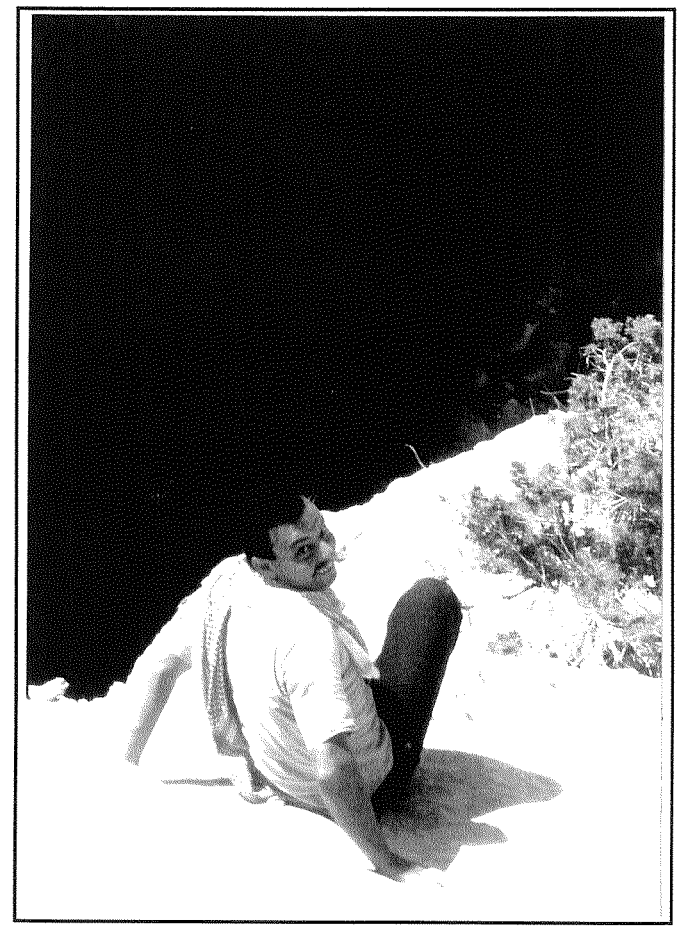

Fig. 1. Dr. Mujahed Muheisen visiting Ba'ja in 1987.
<photo: H.G.K. Gebel>

Mujahed was my dear friend for 19 years. I met him first in 1981 when he was appointed as the Department's representative for my first surveys in the Petra area. Something one immediately noticed about him was that he liked to joke, and one of his favorite phrases was "No problem!" when real problems occurred. But already by 1981, when we dreamed of working together on an Arabic-English-French-German dictionary of chipped lithics terminology, in order to promote more Arab specialists in the field, he often withdrew from others to take rest in the shade; he did not talk about the severe headaches he suffered. These signs were not understood when he sought medical help in France, where he worked on his *Thèse du Troisième Siècle* until 1986. By 1985, we excavated together at 'Ain Rahub, a time that was one of his most productive. One year later, Mujahed was – among others – instru-

mental for arranging the *Basta Joint Archaeological Project,* carried out by the Department of Antiquities, the Institute of Archaeology and Anthropology at Yarmouk University and Prof. Hans Nissen of the Free University of Berlin.

Mujahed was *dugri-dugri.* Sometimes he did not seem very cordial, for he was unwilling to compromise when he dealt with problems of archaeological research and policy formulation. He followed up cases of violations of the Antiquities Law and unceasingly demanded respect for national integrity in the making of decisions concerning Jordanian archaeology. In his classes he dared to test religious feelings when lecturing about human evolution, but he nevertheless remained conservative in his understanding of social and family life. He was a true al-Muheisen.

When I saw Mujahed for the last time in May 1999, his illness had taken over control of his body and had overridden his ability to communicate, but his intellectual and spiritual constitution was as alert as ever. I will not forget that moment: Mujahed and I were holding hands, deeply emotional, and for the first time in our friendship, I noticed him trying to say *la ilaha illa Allah.* This was his last achievement, *alhamdulillah.*

Mujahed left his wife Moona and three daughters Batul, Fida', and Isra', who accompanied their father's last years with deep love, care, trust and sorrow. May Allah help them and give them consolation.

Hans Georg K. Gebel

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Sickle Blade Design and Hafting Strategies at Tabaqat al-Buma, a Late Neolithic Farmstead in Wadi Ziqlab, Northern Jordan

Matthew Peros (York University, Toronto)

Introduction

Banning and Siggers (1998) argue that many of the differences between Pre-Pottery Neolithic and Late Neolithic stone tool assemblages are responses to a shift in subsistence strategy. If Late Neolithic populations were heavily dependent on cereal cultivation, and if harvest was temporally restricted, it seems probable that some tools would have been designed to increase harvesting productivity, and that techniques to expedite the manufacture and repair of these tools would have been adopted. To evaluate this hypothesis, the sickle element assemblage from Tabaqat al-Buma was the focus of a study in tool morphology.

Tabaqat al-Buma is a Late Neolithic farmstead in the Wadi Ziqlab drainage basin, northern Jordan, which was occupied ca. 5600 to 5100 cal BC (Blackham 1997, 1999). The sickle element assemblage from Tabaqat al-Buma appears highly standardized by comparison to similar artifacts of the same cultural tradition (*cf.* Costin 1991). Almost all the sickle elements have well defined denticulations along one edge and are steeply backed along the opposite edge. The steep backing on the sickle elements suggests the blanks may have been elongated flakes rather than blades or blade segments. The ends of the sickle elements are either retouched or have snap terminations, and they are almost always perpendicular to the denticulated edge (Fig.1). Late Neolithic sickles generally consisted of several sickle blades hafted end-to-end in a wooden or bone handle (Bohrer 1972, Cauvin 1973).

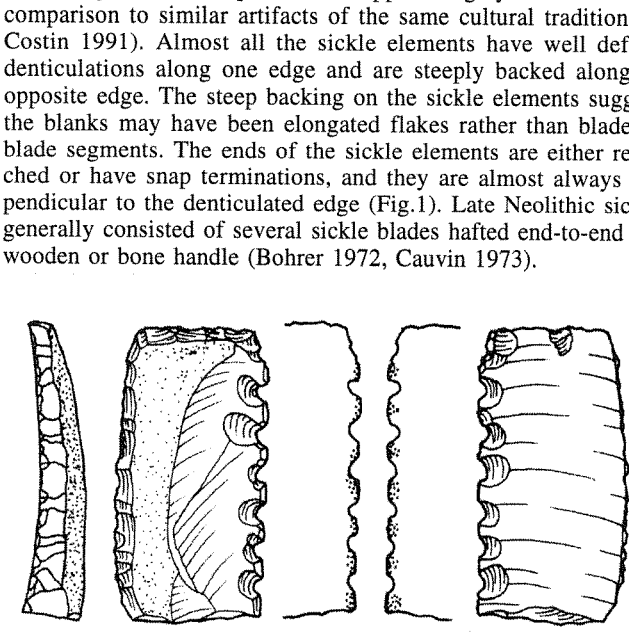

Fig. 1. A sickle element from Tabaqat al-Buma (maximum length 37 mm). Notice the curved longitudinal axis, the truncated proximal end, the retouched distal end, and curved backing of the dorsal and ventral surfaces.

Methods

On each sickle element, measurements were made on attributes important for the manufacture and repair of a sickle. All measurements are to the nearest 0.5mm, and were made with plastic calipers to avoid scratching the lithics. The mean, standard deviation, and standard error were calculated for all ratio-scale measurements, and the frequency (percent) was calculated for all nominal-scale data on the entire assemblage. Measurements were made on the:

1. Maximum length.
2. Maximum width at both ends and the centre of each element. The mean width for each element was then calculated from these three measurements.
3. Maximum thickness at both ends and the centre of each element. The mean thickness for each sickle element was then calculated from these three measurements and is referred to as the conventional thickness.
4. Hafting thickness (Fig. 2). This was measured with a precision height gauge on a flat table.
5. Difference between hypothetically straight backing and the actual backing when viewed from the dorsal surface (Fig. 3). This measurement is equivalent to the rise (maximum difference between the chord and associated arc) of a circle, and can therefore be expressed in terms of the radius of a circle:

$$r = (a^2 + h^2)/2h \qquad (1)$$

where r is the radius, a is half the length of the sickle element, and h is the rise (Eshback 1952). The mean radius of sickle elements with a rise greater than zero was calculated to estimate the degree of curvature of the backing for all curved sickle elements. No sickle elements have concave backing.

6. Nature of the ends; whether they are retouched or have snap terminations (truncations).

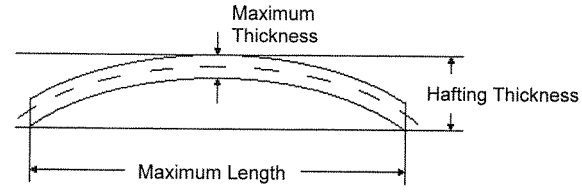

Fig. 2. Schematic of the longitudinal axis of a sickle element. A similar maximum thickness measurement is also taken at either end of the sickle element to yield the conventional thickness. The dashed line represents the longitudinal curvature of the sickle element.

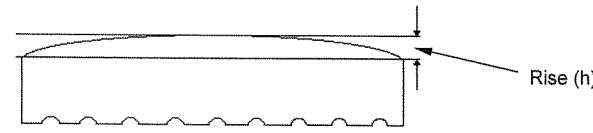

Fig. 3. Schematic of the dorsal surface of a sickle element. The rise is the following measurement:

Results

The Assemblage

A total of 187 sickle blades was included in the sample from Tabaqat al-Buma. The results for all ratio-scale measurements are in Table 1. When ,n' does not equal 187, measurement was impossible because of breaks, etc. One hundred and seventy-six (94.1%) sickle elements are made of grey-brown chert, and one of quartzite. Other colors of chert include brilliant pink, dark brown, brownish purple, and grayish-white, and some may represent local material that was heated to increase fracture predictability. Five (0.03%) sickle elements have evidence of burning, identified by blackening or potlidding. One hundred and forty-four (77.0%) elements have sickle sheen on both dorsal and ventral surfaces of the denticulated edge. A calcareous substance, fixed to 134 (71.1%) of the sickle elements, might be a hafting medium such as lime plaster (Endlicher and Tillman 1997). However, since carbonates often precipitate in soils in arid regions (Birkeland 1999) – and this substance is also present on other artifacts from

Tabaqat al-Buma, such as the pottery – a post-depositional origin is also very possible. Finally, 124 (66.0%) sickle elements have symmetrical convex backing (when viewed from the dorsal surface).

Table 1. Selected assemblage data in mm or degrees. S.D. = standard deviation, and S.E. = standard error.

	n	Mean	S.D.	S.E.
Maximum Length	187	28.7	7.8	0.60
Conventional Thickness	187	4.8	1.6	0.10
Hafting Thickness	187	7.1	1.8	0.20
Mean Width	187	13.7	2.6	0.20
Curvature of Backing	127	53.8	28.95	2.57

Hafting Thickness

Variation in the hafting thickness (ht) of a sickle element is a function of three interdependent variables: (1) the degree of longitudinal curvature (c), (2) the length of the element (l), and (3) the conventional thickness (t) (Fig. 2). This relationship can be expressed as a function equation:

$$ht = f(c, l, t) \qquad (2)$$

For example, if the length of a sickle element increases and the degree of longitudinal curvature and mean thickness remain the same, then its hafting thickness will increase. Likewise, decreasing the mean thickness, while keeping the degree of longitudinal curvature and length constant, will decrease the hafting thickness.

The maximum length and hafting thickness results for the Tabaqat al-Buma assemblage are shown in Table 2. The divisions are based on the nature of the ends: "0 breaks" are sickle elements with both ends retouched, "1 break" are those with one truncated and one retouched end, and "2 breaks" have both ends truncated. These results show that sickle element length varies proportionately with hafting thickness (while the difference between 0 and 2 breaks is only 1.01 mm, this represents over a 12% reduction in hafting thickness). In other words, assuming the conventional thickness and degree of longitudinal curvature remain unaltered, shortening the length of a sickle element will reduce its hafting thickness. As will be shown, this has important implications for hafting strategies at Tabaqat al-Buma.

Table 2. Number of breaks (nB), length (l) and hafting thickness (ht). ("*" and "**" are significantly different at a 0.05 confidence level).

		Mean		Standard Error	
nB	n	l (mm)	ht (mm)	l (mm)	ht (mm)
0	88	30.5*	8.01**	0.79	0.21
1	78	27.3	7.87	0.78	0.20
2	21	25.8*	7.00**	0.75	0.30

Sickle Curvature

It may be possible to speculate on the shape of a typical sickle handle at Tabaqat al-Buma, assuming that the shape of the backing can be used as a clue to the curve of a handle. If the mean backing curve radius of 53.1 is used in equation (1), a curved sickle handle 50 cm long would deviate at the center roughly 5 cm from one that was straight. However, since 60 (32.1%) sickle elements have straight backing, both straight and curved handles may have been used. Moreover, some curved sickle elements could probably still fit into straight handles, while many curved handles could likely house straight blades. Other functional or stylistic reasons may also exist for the curved backing.

Discussion

The morphology of the sickle elements from Tabaqat al-Buma suggests that the manufacturers may have a) used curved sickles to increase harvesting productivity, and b) truncated the ends of the individual sickle elements to expedite the manufacture and repair of the sickles.

Harvesting Productivity

The sickle elements from Tabaqat al-Buma appear to represent a tool kit designed for a high level of harvesting productivity. Korobkova (1981) has shown experimentally that a curved-handled stone sickle is good for harvesting approximately 1.85 ha of wild cereal per hour, compared to 1.52 ha per hour for a straight-handled stone sickle. This suggests that curved sickles would have been preferred where cereal cultivation was fairly important. In addition, the mean length of the sickle elements from Tabaqat al-Buma (28.7 7.8 mm) is significantly shorter than the mean length of PPNB sickle elements from Jericho and Yiftahel (49.6 23.8 mm) (Unger-Hamilton 1989). The shorter sickle elements from Tabaqat al-Buma could accommodate curved handles better than those from the PPNB sites, since shorter elements would interfere less with the curve (Siggers 1997). This does not mean that all sickles were necessarily straight during the Pre-Pottery Neolithic, but that a greater emphasis on curved handles may have existed during the Late Neolithic, reflecting an increased reliance on cereal cultivation and greater attention to harvesting efficiency.

Manufacture and Repair Efficiency

The truncated ends on a large proportion of the sickle elements from Tabaqat al-Buma may reflect a strategy for modifying the hafting thickness. This attribute is critical for the efficient manufacture and repair of a sickle because it determines how well an element fits into the groove of the handle. To ensure a secure fit, an ideal sickle element would have a hafting thickness exactly equal to the width of the groove. However, minor variation in hafting thickness would still be expected from random errors during knapping.

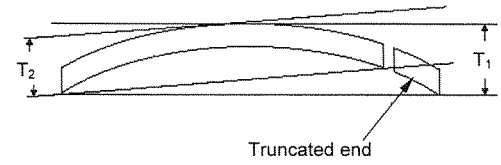

Fig. 4. T_1 is the hafting thickness before truncation. T_2 is the hafting thickness after truncation. Since $T_1 > T_2$, hafting thickness decreases with truncation.

This presents a problem, assuming that the width of the groove was constant along the length of the sickle. Sickle elements slightly thinner than the groove width would have to be shored, which would take more time and might result in a less durable tool, while those that were thicker than the groove would not fit into the handle, unless either the groove or the element was modified. However, since the hafting thickness of a sickle element will decrease when its end is truncated, a thicker element could be thinned by snapping off a portion of its end (Fig. 4). Given the large proportion of sickle elements with broken ends in the assemblage, the aim may have been to produce sickle elements equal to or slightly thicker than the width of the groove in the intended handle. Those that fit securely into the handle could be hafted immediately, while thicker elements could be quickly truncated, and thus thinned, as needed. While functional sickles could be built in the off-season, the replacement of dull or broken sickle components would surely have been required during the harvest, and suitable replacement pieces would be almost immediately available with this method. The lack of snapped-off ends in the lithic assemblage suggests that sickle elements may have been truncated in the fields, where because of the extremely low artifact density, traditional surveys would be unlikely to find them. In short, truncation may represent a technique to minimize sickle construction and repair time, which would be desired where cereal cultivation was important.

Conclusions

This was a study in the morphology of sickle elements from Tabaqat al-Buma, northern Jordan. The results suggest that individual sickle elements may have been designed to increase harvesting productivity, and that techniques to expedite sickle manufacture and repair were developed. The adoption of these strategies may have been prompted by an increased dependence on cereal cultivation in the Late Neolithic. Future research should assess what proportion of truncations are from use, rather than intentional breaks, and the degree to which craft specialization played a role in the design of the sickle elements.

Acknowledgments: This research is part of the Wadi Ziqlab Project at the University of Toronto. I would like to thank Dr. E.B. Banning and David Lasby (Department of Anthropology, University of Toronto) for supervision and comments. In addition, Dr. John Tomenchuk (Department of Anthropology, Royal Ontario Museum) provided useful advice, while Matthew Betts provided valuable comments on an earlier draft. I am solely responsible for any errors, omissions, or misinterpretations.

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An Early Neolithic Settlement in the Center of Şanlıurfa, Turkey

Bahattin Çelik (Harran University)

In 1997 evidence for a stratified Early Neolithic settlement was found on Yeni Yol Street in the central part of Şanlıurfa (Urfa), towards the southwestern part of town near the surrounding city wall (Fig. 1). In 1993, during construction of a building complex to the east of this area, a limestone statue of a male nearly 1.90 m high was recovered (Fig 2). A comparison of this statue with the large sculptures excavated at Nevalı Çori indicate that it also belongs to the Early Neolithic (*cf.* Hauptmann 1993). Both of these finds constitute the first verification of Early Neolithic occupation under the city of Şanlıurfa.

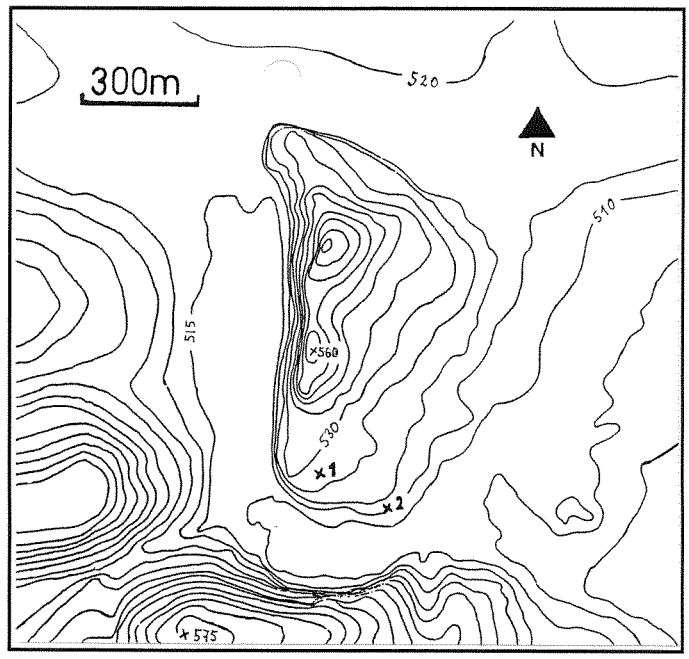

Fig. 1. Topographic map of the Şanlıurfa city area. 1: Profile in Yeni Yol Street. 2: Location of human statue.

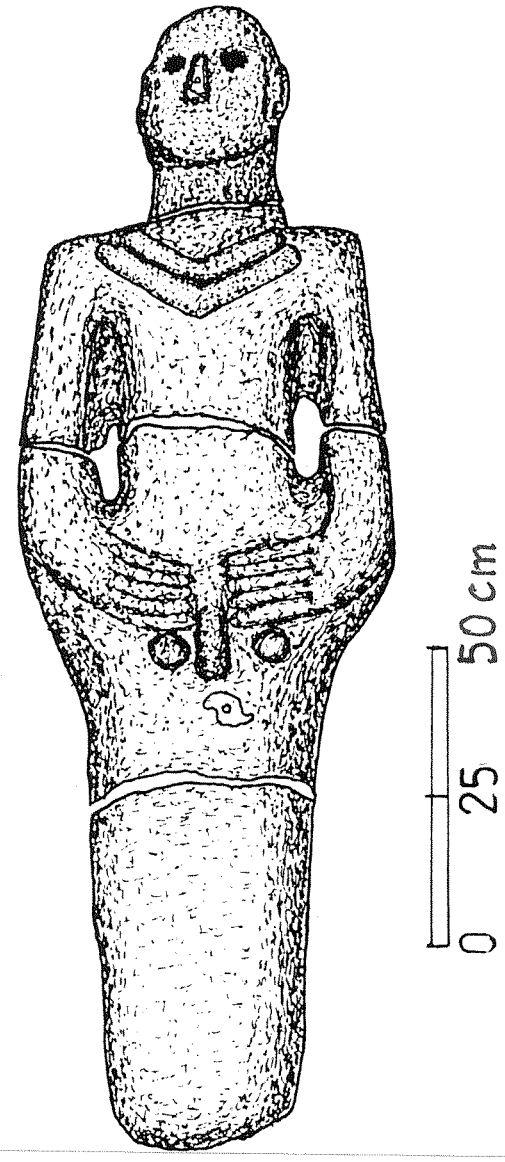

Fig. 2. Şanlıurfa, Yeni Yol Street: The human statue (drawn from a photograph).

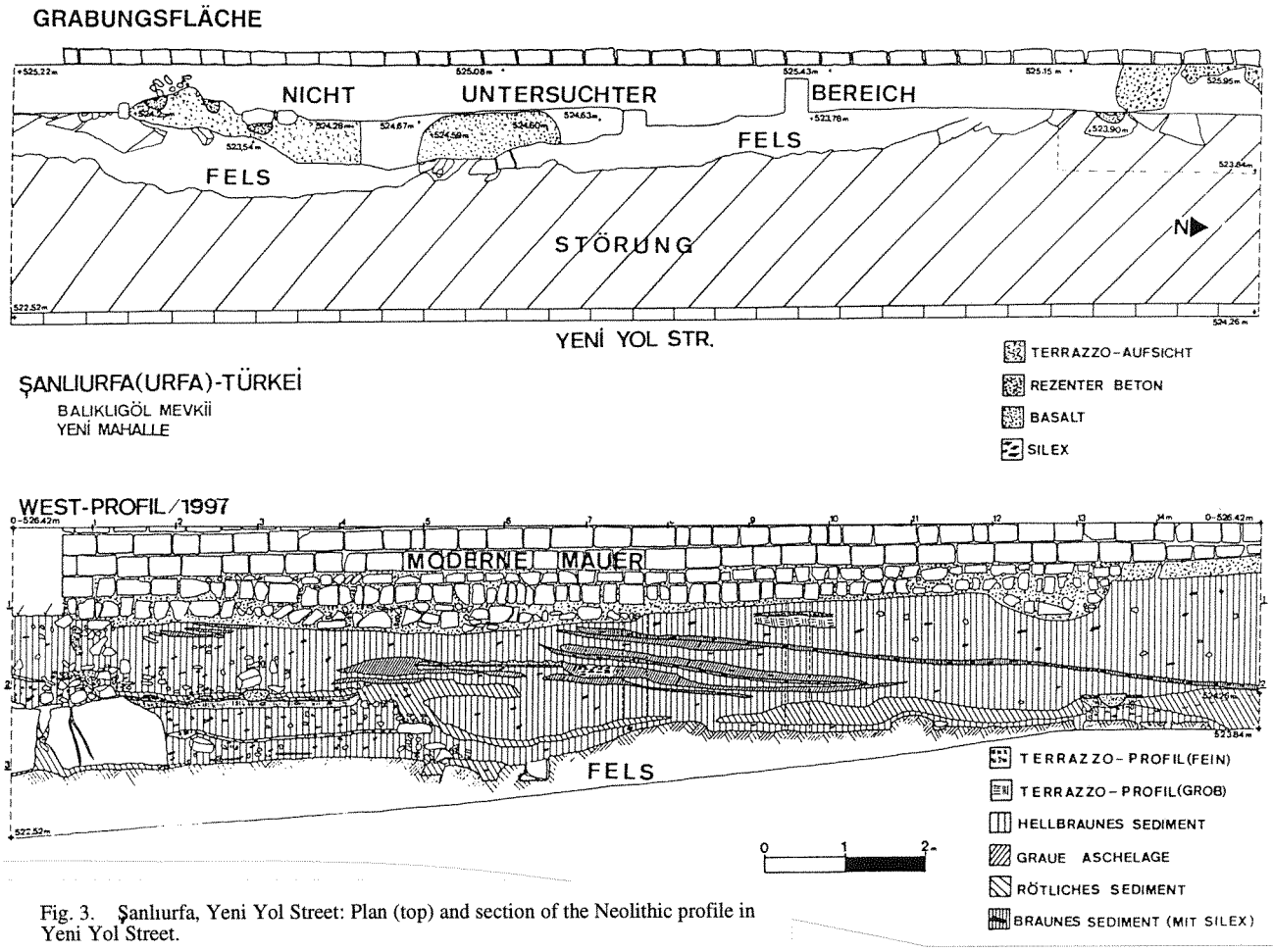

Fig. 3. Şanlıurfa, Yeni Yol Street: Plan (top) and section of the Neolithic profile in Yeni Yol Street.

The old city of Şanlıurfa was constructed near the Karakoyun River (Dayshan-Skirtos) before the Justinian period (527-565 a.d.), and at that time there were some lakes that were considered to be holy. To the south of the city were high rocky hills, and the broad Harran Plain lies to the east; there is a large open area that climbs in elevation to the north of the city. The strategic advantages made this an ideal location for early Neolithic settlement.

Yeni Yol Caddesi is a narrow street that climbs northward from the southern edge of the city in a section of town called Yeni Mahalle. During reconstruction of the street in 1993, when it was lowered and widened, a stratigraphic section nearly 2m high and 70m long appeared. Most of the thickness of the profile is datable to the Early Neolithic, with Hellenistic, Roman, Byzantine, and Islamic material appearing in the upper reaches. There is no sign of Bronze Age occupation in this profile.

In 1997 an in situ section of this profile 15m long and 0.5m wide was investigated (Fig. 3). There were no Neolithic potsherds, but many lithics artifacts were recovered, including 239 flint tools and 15 tools made of obsidian. The tools included projectile points, perforators, burins, endscrapers, and sidescrapers. Some bone tools also occurred here, as well as basalt stones that perhaps used as weights to anchor tents or tent poles. The profile also contained four terrazzo floor areas similar to those at Çayönü, Göbekli Tepe, and Nevalı Çori (*cf.* Hauptmann 1993; Özdoğan1995).

An Early Neolithic age can be assigned to these layers based on typological analysis of the tools. One projectile point (Fig. 4: 2) is a variant of the Helwan point and may be dated to the PPNA. Others (Fig. 5: 3-5) show close similarities to El Khiam and Nevalı Çori points dated to the PPNA and Early PPNB periods (Schmidt 1996). No Palmyra points (Schmidt and Beile-Bohn 1996) or Çayönü Tools, ascribable to later PPNB periods, were found. Compared to the Nevalı Çori stratigraphy (which is some distance away), the Şanlıurfa material seems to fall between Strata I and III1.

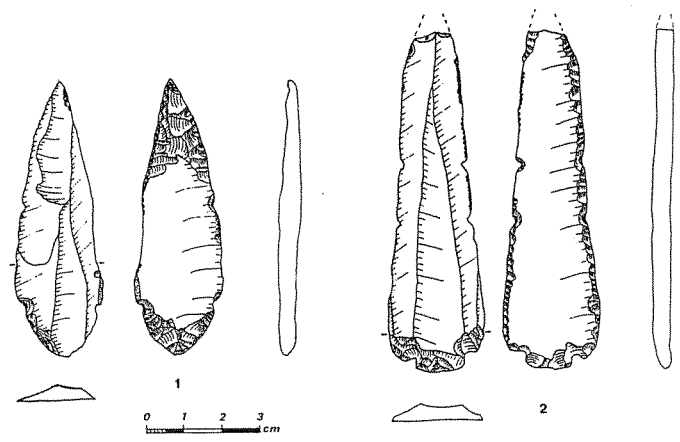

Fig. 4. Şanlıurfa, Yeni Yol Street: Flint arrowheads from the 1997 examination of the Yeni Yol profile.

The profile is currently under the city wall and modern buildings, but a basalt grinding stone could be seen and examined. The presence of terrazzo floors and the larger-than-life human statue indicate at least one special building.

Göbekli Tepe is a site located atop a mountain not far from Şanlıurfa (Beile-Bohn *et al.* 1998). Although there are ritual aspects to Göbekli Tepe (Schmidt 1998), there are no holy springs or ponds as there were at Şanlıurfa. This might indicate that Şanlıurfa played a greater role in terms of ritual activity. With additional excavations at the Şanlıurfa site, a better idea of its layout can be obtained and a more reliable comparison with Göbekli Tepe can be achieved.

Note 1. A detailed study of the finds from Şanlıurfa is being carried out as part of continuing postgraduate work.

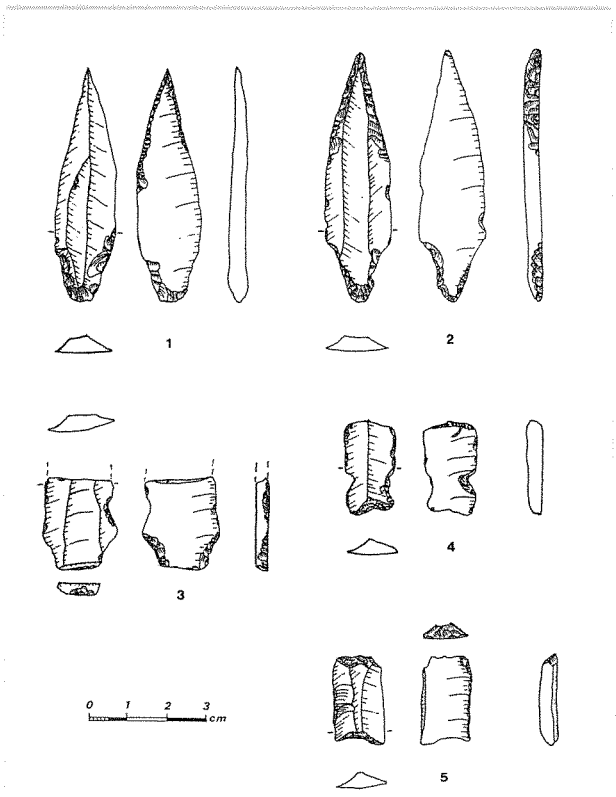

Fig. 5. Şanlıurfa, Yeni Yol Street: Flint arrowheads, and notched and retouched pieces from the 1997 examination of the Yeni Yol profile.

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A New Early-Neolithic Settlement: Karahan Tepe

Bahattin Çelik (University of Harran)

Karahan Tepe lies some 63 km east of Şanlıurfa (Urfa), southeastern Turkey in an area called Tektek Dağları (Tektek Mountains). Some 266 *in situ* pillars were observed in the fields on the northern and eastern slopes of the hill. Since this area, which was discovered by the author in 1997, was not named on the maps, it was thought to be suitable to name the site "Karahan Tepe" after a hill nearby (Footnote 1)

Geomorphologically, the Tektek Mountain area in the vicinity of the Karahan Tepe settlement in the southeast part of Harran plain is more of a range of high hills rather than mountains (Güzel n.d.: 170-171). It is a dissected Eocene and Miocene limestone formation whose valleys which were formed by erosion during interglacial and post-glacial periods under humid climatic conditions (Atalay 1994: 280-282). There is no basalt in Tektek Dagları; the nearest basalt source is 15 km to the north of the settlement. Flint probably was obtained from the nodules found in the limestone of the area. The region has an average altitude of between 600 m and 800 m. It is a rural area where people today are

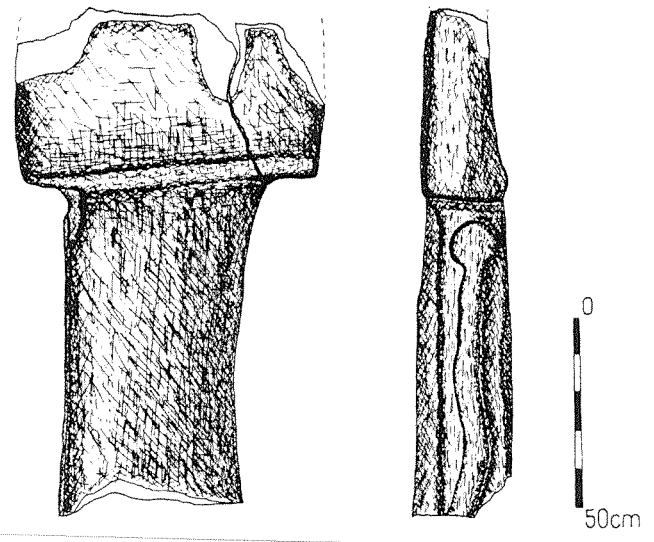

Fig. 1. The limestone "T"-shaped pillar with a snake relief. <drawing: B. Çelik>

involved primarily in animal husbandry and some agriculture. This poorly watered area was also settled in Antique Age (Sinclair 1990: 183-184). It is still observed in the autumn that nomadic families come down from Karacadağ Mountain in northern Şanlıurfa to stay in the Tektek Mountain area during winter and graze their animals on the pasture. The vicinity is also very rich in wild

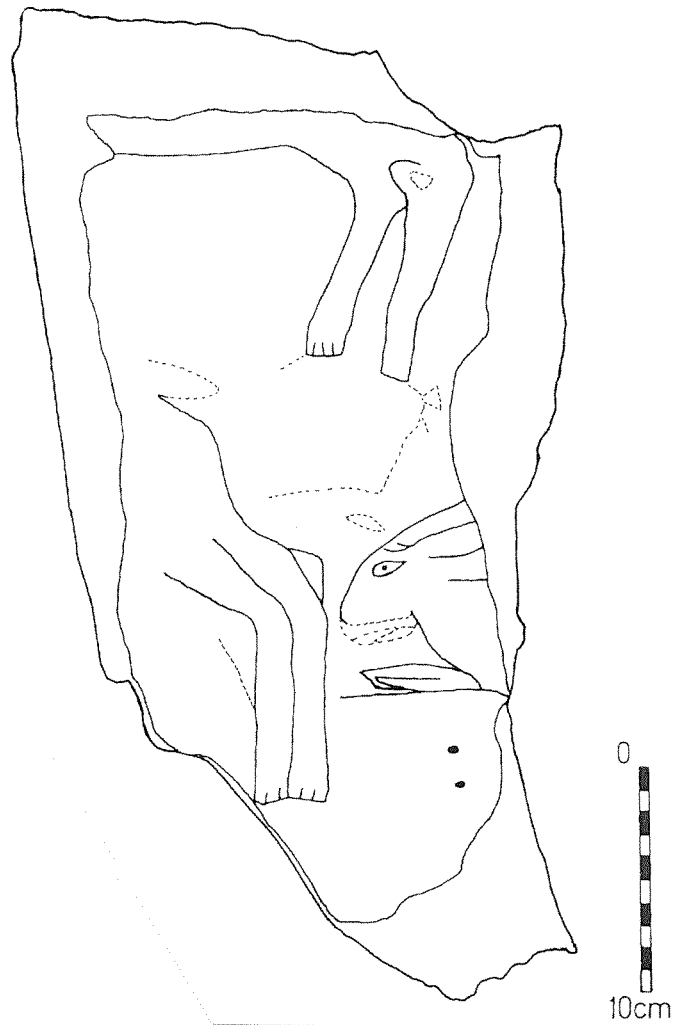

Fig. 2. Part of a limestone pillar decorated with animals. <drawing by B. Çelik>

game and is a locally popular hunting area even today. Except towards the NW end, where pistachio trees (*Pistacia khinjuk*) are present, there is no woodland on Tektek Dağları, (Güzel n.d.: 203-204).

On the 1:5000 maps of Karahan Tepe, the height of the hill is 705 m. The eastern terrace, where the settlement is located, has an average height of 680 m (Note 2). The southern and western slopes of the hill are very steep and rocky, and the settlement mostly occurs on the eastern and northern slopes. The eastern part of this settlement ends at a rocky plateau. There is a dry streambed along a north-south line and a terrace to the west. To the north there is a hill known as Keçili Tepe and an eponymous little village.

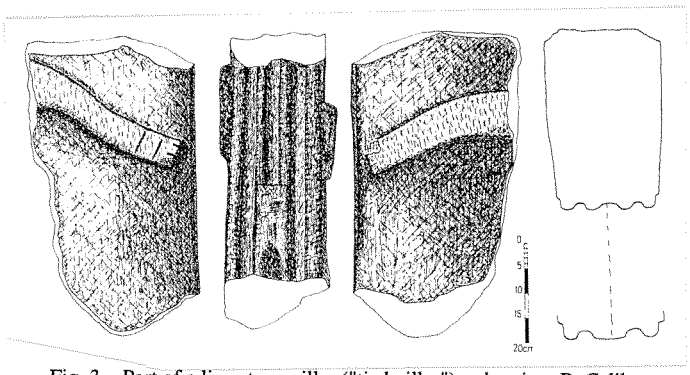

Fig. 3. Part of a limestone pillar ("tied pillar"). <drawing: B. Çelik>

Karahan Tepe ruins covers an area of 325,000 m² (32.5 ha). Except for the agricultural field in the east, surface is almost wholly covered with still-stranding pillars peering about 50-60 cm above ground level. These pillars occur at a distance of 1.5 - 2 m from each other. These "T-shaped pillars" are similar to the others found in upper levels of Göbekli Tepe, Nevalı Çori, and at Hamzan Tepe approximately 10 km south of Şanlıurfa (Schmidt 1998b: Fig. 15; Hauptmann 1993: Figs. 7,15; Çelik n.d.: Fig. 1).

In some areas near the pillars it is possible to see clearly the upper sides and corners of Neolithic walls. Some cavities 30cm in diameter and 10-15 cm depth were carved into the bedrock to create pools, also known from Göbekli Tepe and Hamzan Tepe (Beile-Bohn *et al.* 1998: Fig. 20, Çelik n.d.: Fig. 2, DAI 1996: Fig. 3).

In one exposure west of Karahan Tepe, a 4.5 m long T-shaped pillar is ready to be removed from the parent bedrock, similar to a situation at Göbekli Tepe (DAI 1997: 551-553; Schmidt 1998a: 1-5, 1998c: 17-49). In other cases, there is "totem-pole"-like statue of superimposed animals, part of a pillar engraved with animals, some animal patterns engraved into groundstone, and a T-shaped pillar with a snake relief similar to those from Nevalı Çori and Göbekli Tepe (Hauptmann 1993: Fig. 19, Schmidt 1999: Fig. 5). There are two side-by-side pillars 1.5 m distant from each other in a ruined sector partly destroyed by treasure hunters. On one of these broken pillars there is a relief of a snake at least 70 cm long, with a round head and a wavy body (Fig. 1). Examples of stairs also have been seen on the platform of a nearby rock exposure. And what is most interesting here is that on both corners of the rock there are two 40x70 holes that might have been pillar bases. This is likely a ceremonial area.

The snake relief on this pillar is different in size compared to the ones from Göbekli Tepe. It resembles the snakes on flat engraved stones from Jerf el-Ahmar (Stordeur *et al.* 1996: Fig. 5) The snake pillar has dimensions of 130 x 50 x 30 cm. Dimensions of this pillar and the pillars of lions from Göbekli Tepe are almost the same (DAI 1997: 551-553). In addition, except for the agricultural field of Göbekli Tepe, pillars that have been found there *in situ* have the same dimensions.

Some animal motifs carved on a smoothed limestone base were detected as a surface find. Across ca. 40 cm of this 86 cm stone, on a smoothed place, there are the figures of a rabbit's head and feet, long back feet and tail of a gazelle, and evidently the back feet of another animal (Fig. 2). Even today it is possible to see these animals in the vicinity. Due to the danger of extinction, gazelles are under a protection program on the State Production Farm in the east of Tektek Mountains. For the very first time we have found a part of a tied pillar with reliefs of animal feet.

We have one piece of a tied pillar that bears animal legs on the sides. Pillars found at Nevalı Çori and Göbekli Tepe had human arms and legs on both faces and human fingers figured on the side with a tie (Hauptmann 1993: Fig. 16, 1992/1993: Fig. 21; Schmidt 1999: Fig. 9). Although Karahan Tepe example has some similarities to the those specimens, this pillar has a different form of the tie. We have a great difficulty to interpret this, since the feet of the animals were made in different directions (Fig. 3).

There is no pottery at this site, but there are many flint tools (Fig. 4a), a "normal" proportion of obsidian finds, stone bugles, animal bones, little axes, basalt grinding stones, a large basin carved into limestone as at Göbekli Tepe, and a stone bowl (Fig. 4b) also known from Hallan Çemi (Rosenberg 1992: Fig. 8) and Göbekli Tepe (Schmidt 1999: Fig. 26). Although terrazzo floors are not visible so far, natives of the nearby village claimed that they had seen terrazzo floor-like structures, so they must be at the underlying levels.

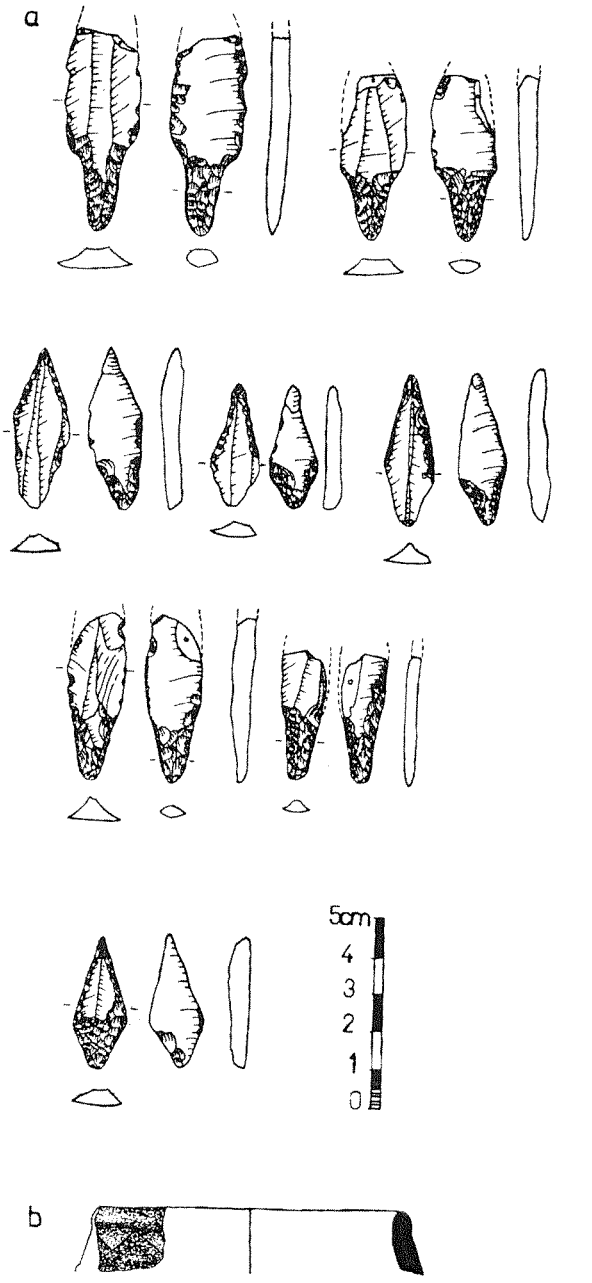

Fig. 4. Selection of flint arrowheads (a) and carved stone bowl (b). <drawings: B. Çelik>

In the light of all these finds it seems that Karahan Tepe, the upper levels of Göpekli Tepe and Nevalı Çori III (Schmidt 1998b, 1998c: Fig. 1) are contemporaneous. Since there are not any Palmyra Points (Schmidt 1996) or Çayönü Tools at the Karahan settlement, it is possible for us to date this settlement as MPPNB.

The in situ pillars detected on the surface of the site provide us an unprecedented opportunity in the Şanlıurfa region. Future excavations at this site will prove very enlightening.

Note 1. This place was earlier named "Keçili Tepe" by colleages.
Note 2. According to the *Tapu ve Kadastro Genel Müdürlüğü*'s 1975 map.

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Architecture from the 1999 Excavations at Tell Sabi Abyad II, Syria

Marc Verhoeven (Leiden University)

As reported earlier in *Neo-Lithics*, Tell Sabi Abyad II, located in the Balikh Valley in northern Syria, is a small mound dating between ca. 7550-6850 BC (calibrated), i.e. the Later Pre-Pottery Neolithic B period (Figs. 1 and 2; Verhoeven 1997; Verhoeven and Akkermans n.d.). So far, the remains of eight main levels of occupation have been unearthed in nine 9 x 9m squares. Here I will focus on the architecture as encountered in 1999 in one of the upper levels: Level 3, to be dated at ca. 6850 BC, and which has been unearthed over an area of ca. 540 m^2. Architectural features consisted of 13 rectangular, multi-roomed buildings made of pisé, as well as a large platform in the north. The level consists of three (early, middle and late) building phases (respectively levels 3C, 3B and 3A: Verhoeven n.d.). These sublevels were closely related: taken together they represent one settlement that gradually expanded in the course of time. Whereas some buildings remained in used during the entire Level 3 sequence, others were abandoned.

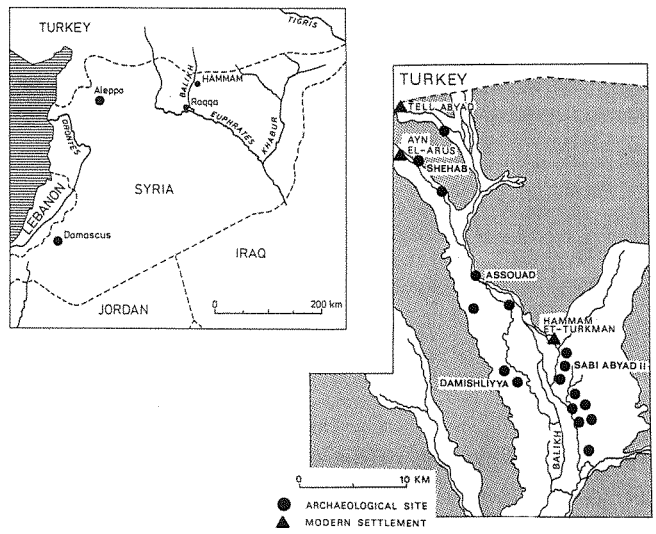


Fig. 1. Map of the Balikh valley and the location of PPNB sites.

All buildings are rectangular and consist of small, more or less square or rectangular rooms (Fig. 3). The buildings are closely spaced, with only small open areas or courtyards between them. The buildings are oriented NNW-SSE in Levels 3C and 3A but N-S in Level 3B. Characteristic is the irregular appearance of most of the buildings. The walls of the various buildings were generally 30 to 35cm wide and they were made of orange-brown pisé slabs. Floors were difficult to recognize but it seems that they consisted of tamped loam. All buildings were simply founded on earth. Mud or lime plaster on the walls was observed in a few instances only. In general the doorways were marked by small buttresses. Occasionally, buttresses were found at the corner of walls or along the wall façades. Some doorways had simple clay thresholds. Although the walls of the various buildings were generally preserved to a height of ca. 50cm, many rooms gave no evidence of doorways. Probably these chambers were accessible from an opening high in the wall or, even more likely, from the roof. Features inside the houses were sparse. There was a cluster of ovens in one building (No. IX), but most of the other buildings lacked ovens and hearths. The only other interior architectural features were low mud benches. The main architectural features outside of the buildings are the large platform in the north of the village and an extended platform in the west.

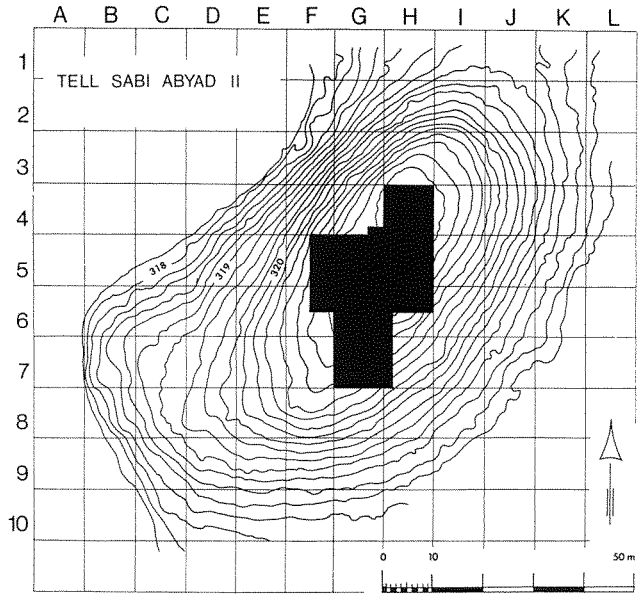
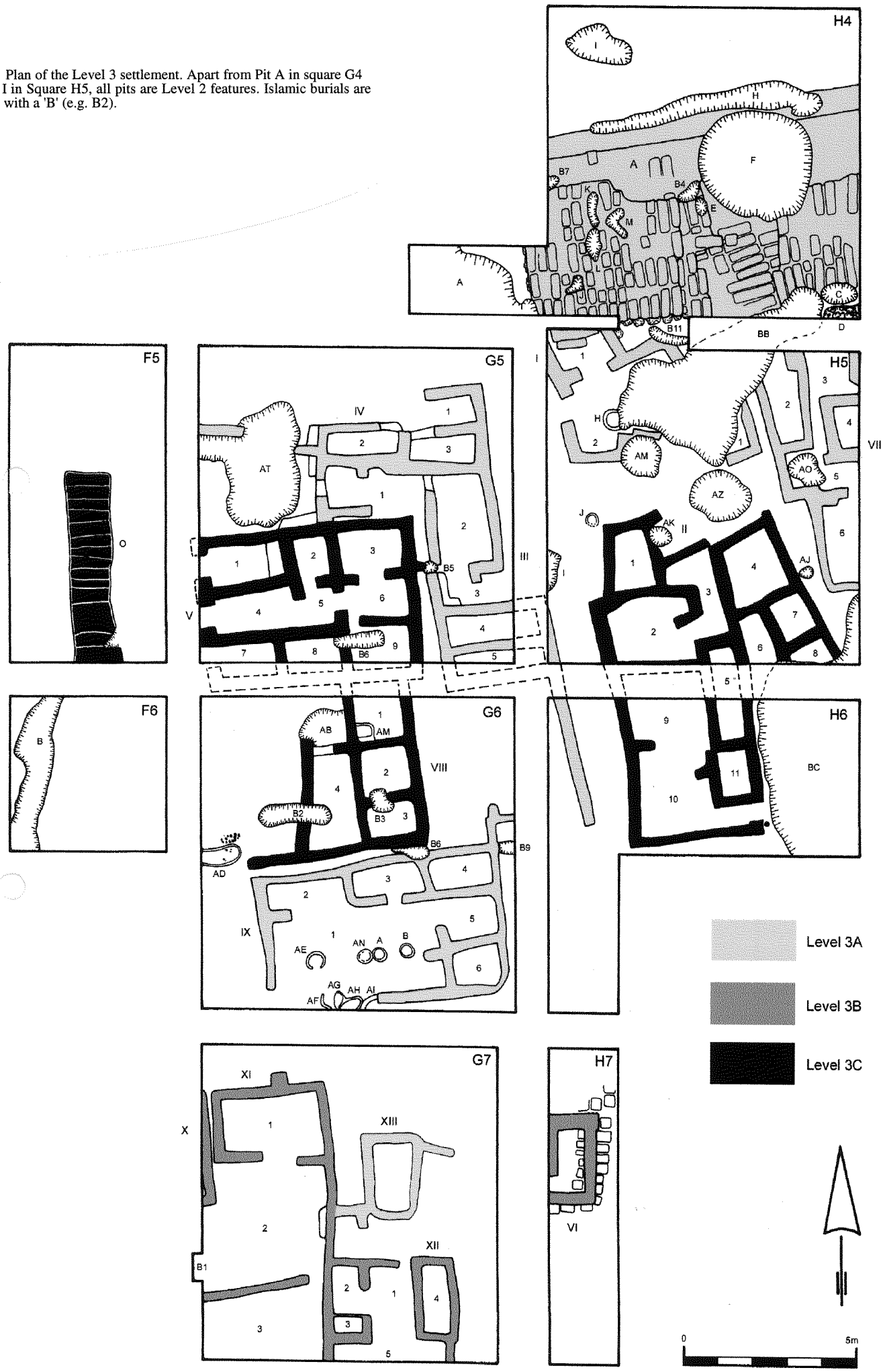


Fig. 2. Contour map of Tell Sabi Abyad II with the areas of excavation.

At first glance, the plan of the settlement in its late phases seems to have been characterized by buildings very irregular in

Fig. 3. Plan of the Level 3 settlement. Apart from Pit A in square G4 and Pit I in Square H5, all pits are Level 2 features. Islamic burials are marked with a 'B' (e.g. B2).



layout, on the whole lacking any preconceived planning. However, this picture is partly derived from the rather complex sequence of building, with some structures added and others demolished whenever the need arose, largely hiding any basic regularity from view. A clear example is the agglomeration of Buildings III, IV, V and VIII, which either stood for a series of independent units or for a single large domestic unit that gradually expanded through time. Construction began with the rather small (ca. 7 x 5m) Building V in Level 3C, which had a regular, tripartite layout

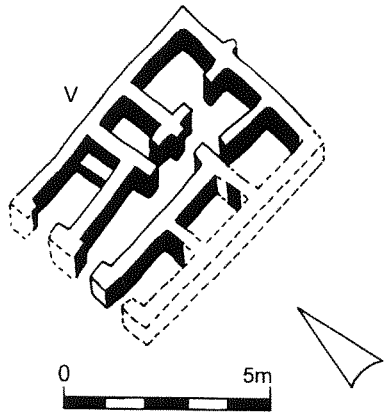


Fig. 4. Axonometric reconstruction of Building V of Level 3C.

and many small rooms without any installations except for a low bench in one room (Fig. 4). Each of the entended rows of rooms was accessible from the west through doorways marked by buttresses, although passage was not continuous. The entrances on the side wings each gave access to a single room only, whereas the doorway in the middle allowed access to the central rooms 4 and 5, which were connected to all other rooms in the back through further interior passages. The neighbouring Building VIII seems to have been constructed together with Building V and consisted of a series of rectangular or square rooms. Remarkable was the presence of an oven in one of the rooms - one of the few ovens found in a room in any of the Level 3 structures. At a somewhat later stage (Level 3A), a series of much more irregular rooms (Buildings III-IV) was added against the walls of the central tripartite structure, leaving this building wholly intact in its original state. There were no newly made doorways directly connecting Building V with the added structures. The virtual absence of ovens or hearths, as well as the paucity of other finds, make it difficult to assess the use of the buildings, but it seems reasonable to assume that at least some of the larger rooms were used as living space, whereas many of the smaller ones may have served primarily for storage. In this respect, it may not be without significance that in layout and location of entrances, our Building V resembles some of the tripartite houses found in the later levels at Bouqras in eastern Syria, although these were generally much larger and provided with all kinds of domestic installations.

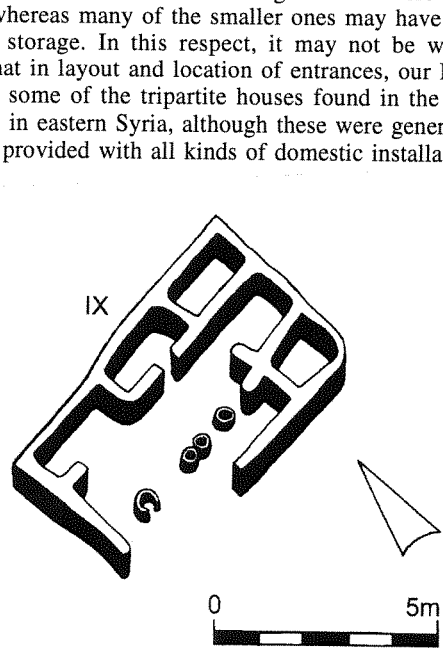


Fig. 5. Axonometric reconstruction of Building IX of Level 3A.

Another rather regular structure, although wholly different in layout, is Building IX of Level 3A, constructed more or less at the same time as the additions to Building V. It consists of a relatively large courtyard (ca. 4.75 x 2.50m) with circular ovens or *tannurs*, surrounded by an L-shape of small rectangular or square rooms (Fig. 5). There were no domestic features other than the ovens, which each seem to have been in use for a short period only, the one rapidly replacing the other. Bread baking seems to have been the main activity, suggesting that the building with its peculiar layout (resembling some of the houses in the lower levels at Bouqras) was yet another type of domestic architecture at the site. Alternatively, it is also possible that the concentration of ovens here and their near absence elsewhere in the settlement refers to some sort of communal workshop, where most if not all members of the community prepared their food.

The other Level 3 buildings were much more diverse and inconsistent in layout, although each of them seems to have had at least one large room, perhaps used for daily living. Still, many more rooms were of such a small size that they cannot have been used for purposes other than storage. Most rooms had narrow doorways, sometimes provided with buttresses, low thresholds or pivot-holes, indicating that these entrances were occasionally closed by wooden doors. However, the smallest rooms had no passages at floor level, suggesting that access was either from the roof or from high in the wall.

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Some Reflections on the Neolithic in the Central Desert of Yemen

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Introduction

Prehistoric research first developed in Yemen less than 20 years ago, at a time when the country was split in two (the Yemen Arab Republic and the Yemen Democratic and Popular Republic), and conditions were such that it was nearly impossible to undertake excavations. Located in the southernmost part of the Arabian peninsula, Yemen is a vast and geographically diversified country. It is spanned by a north-south volcanic range, which rises above 3000 meters and separates a tropical plain bordered by the Red Sea and oriented toward Africa, from a central desert occupied by a complex of sand dunes and opening out onto the Rub al-Khali, the great Arabian desert. Bordering the Indian Ocean, the limestone plateau of the Hadramawt extends over hundreds of kilometers and is cut by numerous wadis frequented by prehistoric people from the lower Palaeolithic onwards.

From 1993, after the reunification (actually in 1993, 1996 and 1998, during years with no civil war nor political unrest), the French Archaeological Jawf-Hadramawt Mission focused on the

quest for prehistoric settlements in the central desert of the Ramlat as-Sabatayn and on its margins (Fig. 1).

The Setting

Why choose this territory? As a matter of fact, the initial research undertaken by the French mission around the ancient capital of Shabwa, in the direction of the desert, revealed the potential presence of an earlier prehistoric occupation. In particular, there is a not inconsiderable density of "Neolithic" surface sites: the first site was then dated to the 5th millenium, 5330 ± 70 BP (4510-4240 BC) (Inizan and Ortlieb 1987). However, the archaeological levels cannot be reached, as they are buried under the silt deposits related to the ancient irrigation systems, sometimes 20m deep in the wadis. The capitals (and the fields) of the southern Arabic kingdoms that farmed large expanses of agricultural land were situated at the mouths of large wadis, whose waters are today swallowed up in the central desert of the Ramlat as-Sabatayn. The rock shelters investigated along the wadis did not produce any archaeological levels.

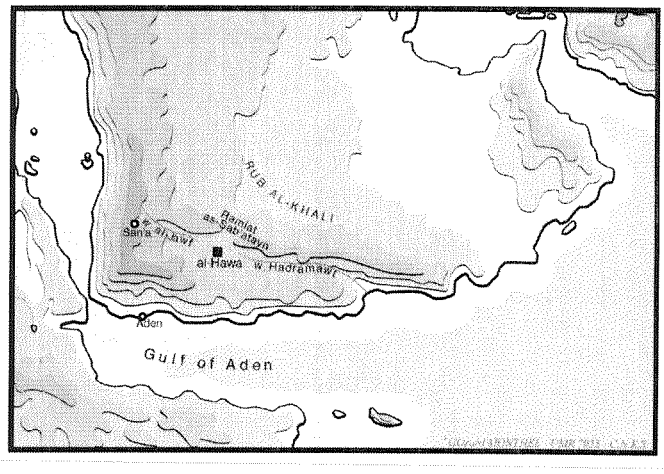

Fig. 1. Location of al-Hawa.

Since the region had never been mapped, a programme of satellite imagery interpretation was launched in close cooperation with B. Marcolongo, who carried out the analysis at the IRPI of Padua (Italy). The exploitation of the data obtained through the new Landsat, Soyouz and Spot satellites, put into service at the end of the 1980s, enabled us to plan an extremely precise survey programme, for which the use of a GPS was essential. This initial thematic cartography showed that the region had in former times been a river basin where the main Markha, Bayhân, Dhana and Irmah wadis originating in the mountains merged into a single watercourse formed by the Jawf and the Hadramawt wadis (Cleuziou *et al.* 1992). The nature of the remains identified in small surface concentrations along the banks of the fossil river, as well as the discovery of a paleolacustrine depression in 1993, bore witness to a prehistoric occupation dating back to the Pleistocene. This was indicated by Acheulian-type handaxes and remains of a fossil fauna no longer present today, such as a large ox (*Bubalus*) and a tooth of an extinct horse. However, the Holocene occupation is much denser and the spatial patterning clearer. The paleolacustrine depression is lined with numerous heavily eroded stone hearths, but no dwelling features could be recognized.

An interdisciplinary research was set up in the central basin of al-Hawa in order to assess the chronology of the sites and define their paleoenvironments in connection to sedimentary sequences. At the time, the only available frame of reference concerning the climatic changes in the south of the Arabian peninsula was the work of McLure on Lake Mundafan in Saudi Arabia (McLure 1976). The study of the outcrops and of the drill cores sampled during the 1996 mission in the al-Hawa basin provides the first dated continental sequence of the recent Quaternary hydroclimatic episodes in the south of the Arabian peninsula. Taking place in an arid context, the filling-in of the depression began at 8,700 BP and led to the formation of a perennial fresh water lake, enduring at least 500 years (Inizan *et al.* 1998, Lézine *et al.* 1998). This lacustrine phase can therefore be likened to the one identified in the Rub al-Khali during the early Holocene, between 8,800 and 6,100 BP (McLure 1976). Another achievement of the 1996 mission has been to double the number of detected sites. These are testimony to an occupation reaching back to the Lower Palaeolithic and extending into the Bronze Age, for which latter period hundreds of stone-constructed funerary structures have been recorded at the site of Ruwaik (Steimer 1999).

It is suggested that animals may have been domesticated by the 5th millenium, when traces of bovid husbandry appear (Fedele 1990); no firm date has hitherto been put forward for the domestication of plants.

The Lithic Industry

A Few Cautionary Words

In the absence of excavations, the available material comes from surface finds. Their collection is very subjective and far from being exhaustive, yet these industries are informative provided some problems are explicitly stated. Because lithic remains are better preserved through time than any others, one is in danger of overestimating their importance. In addition to this, collection may be biased in favour of the most remarkable pieces, such as arrowheads. I also wish to stress the following point: there is a tendency to oversimplify the classification of the "Neolithic" lithic industry of the Arabian deserts, known as *Arabian Bifacial Tool* or *ABT*. In the first place, the bifacial character generally applies only to the projectile points, and while this type of artifact does imply hunting, it cannot be used alone to define a culture. Secondly, in 1999, during a survey, the very same projectile points have also been found next to the Indian Ocean, far from the deserts.

Context of Finds

Along the course of the paleoriver and lining the paleolake, there are loose scatters of lithics, flakes and knapped pieces in derived contexts. GPS points were plotted, and the material was examined but not collected. In dune valleys small concentrations (under a hundred pieces) of non-rolled material with some conjoining flakes were recorded and collected because of their coherence. The decision was thus taken to retrieve the material lying close to a hearth (ABR1-3), dated to 7120 ± 140 BP, in spite of the fact that the stone hearths were raised by erosion, thus clearly showing that the artifacts were not in primary context.

Some General Results

Holocene sites, contrary to Palaeolithic sites, are characterized by imports of exotic material such as obsidian and sea shells (especially cowries and *Engina mendicaria* shells). Two other recurrent traits can be mentioned: the presence of grinding equipment and the absence of pottery.

Raw Material Acquisition

Raw materials are not available locally, but siliceous rocks are abundant within a 50km radius, and their quality is excellent: various types of flint; sandstone and quartzite, mainly used for the grinding equipment; some jasper, and obsidian.

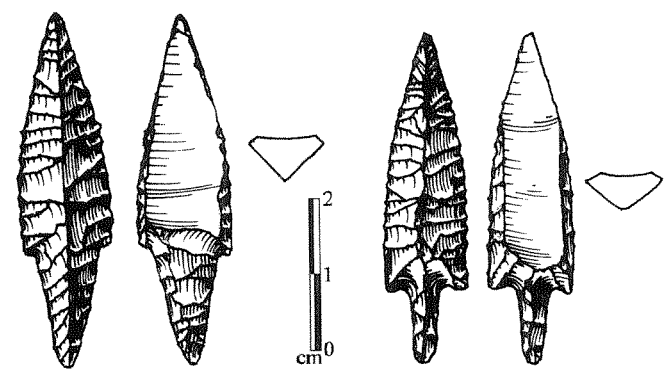

Fig. 2. Fluted projectile points.

Obsidian Imports

Obsidian raises an interesting and unexpected problem. Yemen does have sources of obsidian suitable for knapping, located in the Isbîl and al-Isî mountains, and it is a fact that obsidian

was widely used throughout the Neolithic and the south Arabian civilization. This material has been characterized and sourced by V. Francaviglia (1989; 1995), and his preliminary conclusions state that the obsidian present on some sites, including Neolithic sites, does not have a Yemeni origin, but an Ethiopian one! This would imply some type of trade relations across the Red Sea.

Knapping (Debitage and Tools)

The raw material was roughed out at the sources of supply before being transported to the sites where it was knapped, using a hard hammer, to produce the flakes that serve as tool blanks. Obsidian alone is associated with a percussion debitage of bladelets. No Levantine influence can be perceived, contrary to what has been noted on the Gulf shores for the naviform debitage associated with Amuq points (Inizan 1988). The tools were manufactured on the sites, as shown by the knapping accidents. Bifacial pieces are numerous, but sidescrapers are also very well represented, and their count is sometimes higher.

Pressure retouch (and probably heat treatment) is strikingly well mastered on certain projectile points and some sidescrapers, but it is not yet possible to ascertain when this technique appeared. It is noteworthy in this respect that there is no evidence for pressure debitage.

Evidence for *fluting* has recently been discovered (Charpentier and Inizan n.d.) (Fig. 2). This is an original shaping technique, used for thinning a bifacial piece by the lengthwise removal of a flake termed "channel-flake". It has hitherto only been documented in the North American Paleo-Indian period, for which it is a specific technical marker. Channel-flaking or fluting can be carried out by direct or indirect percussion, or by pressure-flaking. On Paleo-Indian points the removal originates from the base, whereas on Arabian points the fluting is in the opposite direction, stemming from the future pointed end towards the base or the tang (Fig. 2). Experimental work has demonstrated the high level of skill involved in fluting, and this is an inducement to search for this technique and to describe it where it occurs.

Bifacial projectile points, whether fluted or not, have a predominantly plano-convex or triangulo-convex section (Fig. 2), which is probably related to the type of bow used.

The intentional removal of a plunging flake in order to thin ovate bifacial pieces (Inizan and Tixier 1978), which is a technical marker on the Gulf shores and in Oman, has not been documented in Yemen. Conversely, fluting does not seem to be part of the Gulf traditions.

In conclusion, the technological analysis of the lithic industries of the prehistoric cultures settled in the south of the Arabian peninsula for the last 8,000 years points to the existence of relations with East Africa (Ethiopia, Eritrea, etc.) rather than with the cultures of the Near East.

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Shumlya GBS—an Arabian Bifacial Tradition Assemblage from Hadramawt Province, Yemen

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In 1998 the RASA project (Roots of Agriculture in Southern Arabia) conducted an archaeological survey, geological sampling, and excavations in the Wadi Sana, which flows into Wadi Hadramawt (southern Yemen) from the southern Jol highlands. Results from surface collection and excavation point to substantive mid-Holocene occupation by peoples with typological links to the widespread Arabian Bifacial Tradition (ABT). Because sites and occupations from this period have not been previously identified and described in the southern Jol, lithic evidence from Wadi Sana represents a new geographical marker for highland adaptations of peoples using ABT technology.

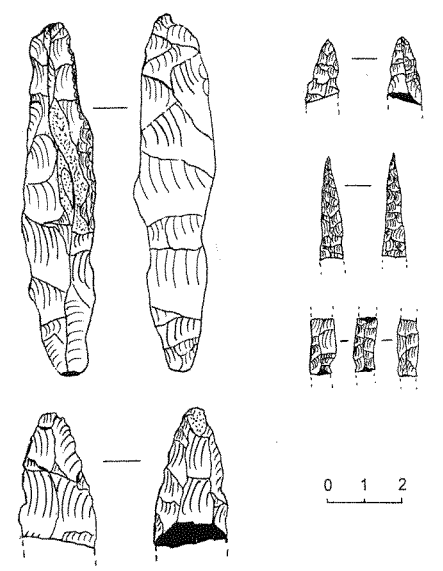

Fig. 1. A selection of Neolithic tools from Shumlya GBS, Hadramawt Province, Yemen. <drawings by Dawn E. Walter>

RASA test excavations and surface survey have focused on sites in Wadi as-Shumlya, a tributary in the mid-reaches of Wadi Sana. The area's archaeological potential was first identified in 1993 during an archaeological survey sponsored by Canoxy-Yemen (Vogt and Sedov n.d.). In 1998, RASA concentrated on a small site, henceforth the " Shumlya Gravel Bar Site" (Shumlya GBS), distinctive for its surface scatter of lithics over a thick layer of water-deposited gravel. The Shumlya GBS gravel deposit today rises four meters above the level of the underlying silt beds in the ancient Wadi as-Shumlya channel. Furthermore, the gravel, which only contains lithic debris in the uppermost centimeter, surrounds and caps a jumble of large, tabular limestone blocks originally transported to the site by humans. After deposition of the gravel on the alluvial silts, the flow of the wadi channel shifted, leaving an isolated mound of gravel-covered silt. This mound, no longer affected by wadi flow, was subsequently used as a location to manufacture stone tools during the mid-Holocene.

The 1998 RASA team conducted a systematic surface collection on Shumlya GBS to determine whether lithic material represented in-situ knapping episodes or whether the lithics were instead transported secondarily to the site through stream channel processes and slope wash from the surrounding escarpments. Surface collection concentrated primarily on the crest of the gravel bar and recovered a representative sample of the types of lithic material (tools, flakes and microdebitage). Surface materials clearly indicate the presence of flakes and manufacturing debitage of varying sizes that represent various stages of lithic reduction. Both lack of size-sorting and the presence of numerous reduction stages suggest that the assemblage is not the product of water deposited materials from the surrounding slopes and escarpment. This conclusion, based on internal characteristics of the lithic assemblage, also agrees with a geomorphological observation that there is very little angular, clastic gravel that could have washed down from adjacent slopes. The assemblage from Shumlya GBS therefore derives from in-situ knapping and manufacturing episodes.

In addition, the RASA team excavated three units on the crest of Shumlya GBS where the sediments contained limestone blocks. Excavations firmly established that the lithic material overlies and post-dates the gravel (and the limestone blocks), which contained only the debris of lithic material that had settled into the surface.

Chipped Stone Assemblage

Analysis considered a sample of 67 tools and 1045 pieces of manufacturing debitage recovered from Shumlya GBS. The tool assemblage includes 24 bifacial foliates (broad and narrow), 20 trifacially worked tools, 11 trihedral drills/rods, 6 borers, 3 cores, 2 side scrapers and one retouched flake (Table 1; Fig. 1).

Table 1: Chipped stone tools recovered from the Shumlya Gravel Bar Site.

Class	n	%
Bifacial foliate	24	36
Trifacial foliate	20	30
Trihedral drill/rod	11	16
Borer	6	9
Core	3	5
Sidescraper	2	3
Retouched flake	1	1
Total	67	100

Several small fragments (n= 6) are tentatively identified as blade fragments. Nevertheless, their fragmentary condition prohibits positive identification. Approximately 80 percent of the bifacially and trifacially worked tools (trifacial foliates and trihedral drills) are fragmentary, while a high percentage of the broken items appear to be basal/proximal portions of the implements (Fig. 2).

The tools and debitage from Shumlya GBS are typical of a bifacial reduction strategy, as characterized the "Neolithic period" in Southern Arabia. (Here "Neolithic" should be understood in its original sense as a characteristic stone tool assemblage unassociated with any particular economic strategy). The Shumlya GBS assemblage fits within the Arabian Bifacial Tradition (Edens 1982, 1988) and is comparable with "Neolithic" assemblages from sites in Wadi Hadramawt and Mahra (eastern Yemen) (Amirkhanov 1995, 1997), in Dhofar and eastern Oman (Zarins 1996; Uerpmann 1992, Inizan 1988, Charpentier 1996), in the northwestern highlands of Yemen (de Maigret et al. 1988; Kallweit 1997), and at sites within the Rub al'Khali desert (Edens 1982,1988; Di Mario 1999).

The manufacturing debitage consists of flakes from all stages of bifacial reduction, including initial reduction flakes, biface thinning flakes and bifacial finishing flakes and/or microdebitage associated with retouch, sharpening and maintenance. Bifacial thinning flakes and bifacial finishing flakes dominate the debitage assemblage, comprising approximately 50 percent of the assemblage. The high frequency of bifacial thinning flakes suggests that knappers were engaged in middle-to-late-stage biface reduction, while the biface finishing/microdebitage suggests that later-stage finishing, retouch, and sharpening also occurred. Approximately 20 percent of the debitage flakes retain cortical material and are initial reduction/primary flakes, suggesting that initial-stage manufacture used previously unworked pieces of raw material transported to this location. Shumlya GBS has a full range of biface reduction stages.

Fourteen different varieties of chert materials have been identified at Shumlya GBS. Most of the raw materials at the site are local cherts available in the wadi system and from the upland regions of the plateaus. Tools and debitage appear to be from the same local cherts, suggesting that the tools were being made from raw material available within the vicinity of the site. Although analysis has not included re-fitting, the presence of tools (complete or broken) in close spatial association with knapping debris of the same raw material indicates that tools were most likely manufactured on site.

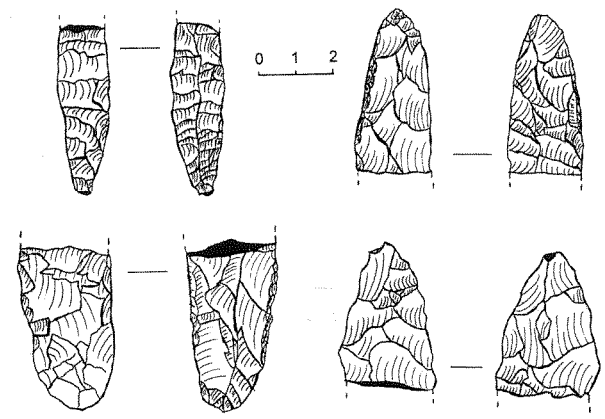

Fig. 2. A selection of Neolithic tools from Shumlya GBS, Hadramawt Province, Yemen. <drawings by Dawn E. Walter>.

Conclusions

Until recently, sites and occupations from the mid-Holocene with the ABT tradition have not been identified and described in the southern Jol region of Yemen. Therefore, the analysis of the lithic assemblage from Shumlya GBS reported here allows archaeologists to extend geographical range of the ABT into the upland Hadramawt. The assemblage appears to have typological similarities to other sites in the southern Arabian Peninsula, and Shumlya GBS is typologically dated to about 5000 years, but independent absolute dating is needed for this assemblage. Further studies will explore the economic context and adaptations of peoples who made and utilized these tools. Particular efforts will be made to contextualize the Jol ABT assemblage from Wadi Shumlya in a long-term environmental history and chronological sequence of human technological adaptations.

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A Third Season of Excavation at Tor al-Tareeq (WHS 1065), an Early and Middle Epipaleolithic Site in the Wadi al-Hasa, Jordan

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The survey of the south bank of the Wadi al-Hasa drainage in west-central Jordan by Burton MacDonald recorded Tor al-Tareeq, an open-air site on a hillside in a small tributary to the Wadi al-Hasa (MacDonald *et al.* 1983). During its occupation it was adjacent to a Pleistocene lake and marsh. The site was first tested in 1984 by Geoffrey A. Clark (Fig. 1). The excavation of a 44m by 1m trench produced a cross-section of the site and showed how the colluvial deposits interfaced with the marls at the edge of the lake. The site is situated in the upslope portion of the hillside, in Step Trench A, B, and C, or the uppermost 15m (Clark *et al.* 1988). Field analysis of the lithics identified an Early Epipaleolithic containing narrow backed nongeometric microliths and abundant evidence of the microburin technique. This assemblage is present in most deposits in Step Trenches A and B, as well as in the lower deposits in Step Trench C. Several hearths yielded dates from 16,500 to 15,500 bp. Overlying the Early Epipaleolithic in Step Trench C is a Middle Epipaleolithic with wide geometrics, mostly lunates and some trapezes; there are relatively few microburins. This later occupation is analogous to Kharaneh IV Phase D in the Azraq region of Jordan (Muheisen and Wada 1995) and to the Geometric Kebaran of the western Levant (Bar-Yosef 1990). No materials for dating this Middle Epipaleolithic occupation were recovered in 1984. Fauna includes gazelle and *Bos* (Clark *et al.* 1988).

Further excavation by Michael Neeley occurred in 1992 (Clark *et al.* 1992). Two 2m by 2m units were dug to refine the occupational history and to create a larger horizontal exposure in Areas B and C. This testing confirmed the sequence identified in 1984. The Early Epipaleolithic assemblage is present in the lower deposits of Unit C, while the assemblage from Unit B is almost exclusively Early Epipaleolithic. Microburin technique and numerous examples of narrow backed microliths (principally curved, pointed, backed and truncated) and truncated bladelets are characteristic of the earlier occupation. The Middle Epipaleolithic is present in the uppermost level of Unit B and in the upper levels of Unit C. This assemblage contains narrow backed forms such as curved, backed and truncated, and truncated bladelets, but its most distinguishing characteristics are wide geometrics ("Hasa" lunates, atypical trapezes), double truncated bladelets, and backed and bitruncated bladelets (Neeley *et al.* 1998). Neeley identified an earlier, relatively mobile phase and a later less mobile phase within the Early Epipaleolithic. The Middle Epipaleolithic occupation at the site is described as ephemeral.

The 2000 field season, reported here and in Olszewski *et al.* (n.d.), sought a better understanding of the Middle Epipaleolithic occupation because this type of configuration is rare in Jordan and it is the only known example in the Hasa region. A second goal was to obtain samples for radiocarbon dating for the Middle Epipaleolithic. Five 1m by 1m squares (Squares B1, C1, C2, C3, and C4) were excavated. Square B1 is about 1m west of Step Trench B; it was excavated to serve as a control for the Early Epipaleolithic which is the predominant phase in the B area of the site. Squares C1 and C2 are two meters east of Step Trench C, and Squares C3 and C4 are situated to the west of Step Trench C and south of Unit C (dug in 1992). The squares placed in the C area of the site were excavated to recover materials from the Middle Epipaleolithic occupation and the underlying Early Epipaleolithic.

Square B1 was excavated to bedrock, about 64 cm below modern ground surface. There are two natural layers, a less complex stratigraphy than recognized in the B area of the site in 1984 and 1992 (Clark *et al.* 1988; Neeley *et al.* 1998), suggesting that the area west of the step trench is at the limits of the site occupation. Natural Layer I is a loosely compacted, coarse sandy silt. Cobbles and small boulders are typical inclusions. Natural Layer II is a dry, loose, pale brown silt with minimal inclusions. Rodent disturbance is present in the eastern half of the square in Natural Layer II. The lithic assemblage in both natural layers is Early Epipaleolithic. Microliths are the most common tool class with numerous narrow backed forms including curved, backed and truncated, and pointed bladelets. Rare La Mouillah points are also present, as is microburin technique. Other tools are endscrapers, burins, notch/denticulates, truncations, and retouched pieces. Four wide lunates were recovered; they are likely incidental. Fauna was not well preserved. The presence of abundant cobbles and small boulders in Natural Layer I, the packing of artifacts and bone around these rocks, and the vertical placement of some of the lithics within the deposits all suggest that downslope movement of materials has occurred in this area of the site. Lithic edges are fresh, however, indicating that the materials have not traveled far from their original location. The rarity of Middle Epipaleolithic lithic materials in Square B1, as well as in Step Trench A and B, and Unit B, further suggests that the main Middle Epipaleolithic occupation at the site was situated farther south and east than the area tested by Square B1.

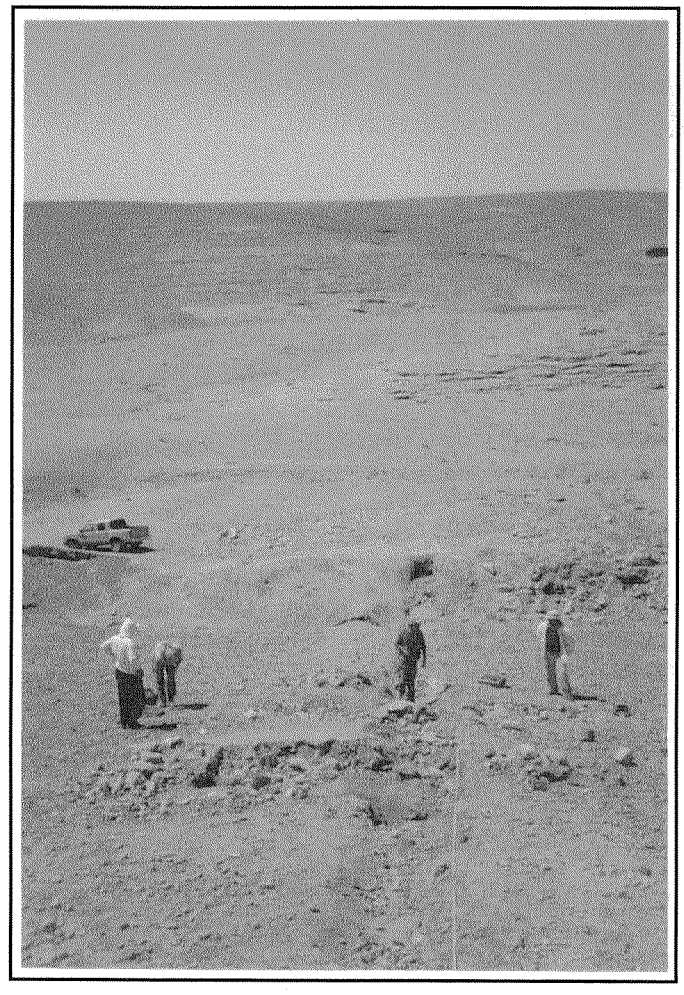

Fig. 1. Setting up at Tor al-Tareeq (WHS 1065) in 2000. Note 1984 trench and 1992 excavation units to right and left of trench.

The most complex stratigraphy excavated this season occurred in Squares C1 and C2. Six natural layers were identified extending about 1.10 m below modern ground surface. Bedrock was not reached. The stratigraphy is analogous to the eastern profile of Step Trench C in 1984 (Clark *et al.* 1988; Neeley *et al.* 1998). Natural Layers I and II are mixed deposits; Natural Layers III and IV contain Middle Epipaleolithic microliths, and Natural Layers V and VI have Early Epipaleolithic assemblages.

Natural Layer I is a thin, loose, dusty, sandy silt. It is the trampled modern ground surface and represents the top portion of Natural Layer II. Inclusions consist of cobbles, pebbles, and gravels. The cultural assemblage is a mixture of Early Epipaleolithic artifacts and more recent materials such as glass and a tang from a Neolithic Byblos point. The sediment from Natural Layer II is a loose, fine, dusty sandy silt with a moderate amount of gravel, and few cobbles and pebbles. The lithic assemblage is Early Epipaleolithic and includes narrow curved, backed and truncated, and truncated bladelets, as well as microburins. Other tools are moderately frequent retouched pieces, and rare endscrapers, burins, backed pieces, sidescrapers, and truncations. There are several Middle Epipaleolithic wide lunates and a few ceramic sherds as well. A piece of dentalium shell and several small fragments of vesicular basalt ground stone were recovered. Faunal remains were fragmentary. This Early Epipaleolithic lithic assemblage overlies a Middle Epipaleolithic assemblage, the same phenomenon observed in Step Trench C in 1984. This is due to downslope displacement of Early Epipaleolithic materials from an occupation situated a few meters upslope (Clark *et al.* 1988).

Natural Layer III is a relatively loose, sandy silt with moderate gravels, cobbles and a few small boulders. The rock inclusions are more abundant than in Natural Layer II. This sediment contains small compacted chunks; these may have developed from the percolation of water into the sediments. Natural Layer III has relatively frequent wide lunates and wide trapezes. There are also narrow backed microliths such as curved, backed and truncated, pointed, and truncated bladelets, along with a few microburins. The tang from a Neolithic Amuq point was also recovered, but it may derive from the southwestern quad of Square C2 where there is a downward intrusion of Natural Layer II sediments (known to be mixed). The lithic assemblage also contains a moderate frequency of endscrapers, truncations, notch/denticulates, and retouched pieces, as well as rare burins and perforators. Other finds include yellow ochre and a possible piece of vesicular basalt ground stone. Faunal remains are fragmentary, but include an increasing number of identifiable pieces. The assemblage from Natural Layer III is interpreted as Middle Epipaleolithic in age.

Natural Layer IV appears to represent a colluvial episode; Squares C1 and C2 were the only area to document this during the 2000 field season. This colluvial episode was also recorded two meters to the west in Step Trench C in 1984 (Clark *et al.* 1988). The sediment in Natural Layer IV is a moderately compact, sandy silt with very abundant cobbles and small boulders, as well as abundant gravels and pebbles. Some of the sediment is compacted as in Natural Layer III as the likely result of water percolation. The faunal assemblage is comparatively well-preserved and includes many large fragments in the size range of *Bos*, as well as probable *Bos* teeth fragments. Fire-affected and burned rock was observed. Lithics are Middle Epipaleolithic, with common wide lunates and wide trapezes. There are also narrow backed and truncated, and truncated bladelets. Microburin technique is rare. Other tools include a moderate frequency of endscrapers, truncations, and retouched pieces, and rare notch/denticulates. Cores are abundant compared to other layers in the sequence. Other finds of interest include yellow ochre, a dentalium shell, and a possible ground stone fragment of vesicular basalt. Evidence of downslope displacement of cultural materials is shown by the wedging of lithics and bone among the rocks present in this layer.

Although there is evidence for colluviation in Natural Layer IV, this natural layer contained one *in situ* hearth (Feature A). The top of the hearth was approximately 40cm below the modern ground surface. It had an oval to circular shape and a funnel-like cross-section. The maximum diameter was 70cm (E-W) and 50cm (N-S). At the base of the hearth the diameter was 30cm (E-W) and 35cm (N-S), with a total depth of 26cm. The hearth was capped by several large cobbles and small boulders, some of which were burned on the bottom. The fill contained loose and compact ash, as well as charcoal, several samples of which were recovered for radiocarbon dating. The sediment surrounding the hearth was fire-affected. A few lithics and bone pieces were recovered from the hearth. The hearth appears to have been constructed near the end of the colluvial episode responsible for Natural Layer IV. On this basis, the hearth should be Middle Epipaleolithic in age.

Natural Layer V is present in Square C1 and in the northern half of Square C2. The sediment is a moderately compact, clayey silt with few cobbles but abundant gravels; compaction is more noticeable than in upper deposits. Insect disturbance and a couple of rodent burrows were noted. A few fire-affected and burned rocks were observed. The lithic assemblage is Early Epipaleolithic with abundant narrow backed microliths including curved, backed and truncated, truncated, and pointed bladelets. There are also a couple of wide lunates; these may have migrated downward through the deposits as a result of the insect and rodent disturbance. Other tools include a moderate frequency of burins, truncations, notch/denticulates, and retouched pieces, and rare endscrapers, backed pieces, and sidescrapers. Cores are moderately abundant. Some pieces of bone are quite large.

The last depositional unit is Natural Layer VI. It is a somewhat more compact clayey sand than the previous layer, and it includes moderately abundant gravels and pebbles, a few cobbles, and at the base of excavations, an occasional small boulder. Insect and rodent disturbance is present. The lithic assemblage is Early Epipaleolithic, containing narrow curved, truncated, and backed and truncated bladelets. There are also some wide lunates and wide trapezes, which may have been displaced downward through insect and rodent activities. Other tools include a moderate number of retouched pieces, and rare endscrapers, burins, truncations, and notch/denticulates. Microburin technique is common.

Squares C3 and C4 represent the final area of the site to be excavated. Bedrock was not reached. Four natural stratigraphic layers were identified. These generally correspond to the natural layers identified in Unit C in the 1992 excavations (Neeley *et al.* 1998), except that Natural Layer I (Squares C3 and C4) comprises the two upper layers of the 1992 Unit C and Natural Layer IV is a cobble intrusion at the base of the excavation in the eastern half of Square C3. The natural layers in Squares C3 and C4 are more or less horizontal; this contrasts with Squares C1 and C2 where the natural stratigraphy generally follows the slope.

Natural Layer I is characterized by a loose, silty sand with pockets of more compact sediment. Abundant cobbles and pebbles are the major inclusions. The lithic assemblage is Middle Epipaleolithic and contains common wide lunates as well as wide trapezes. Narrow backed microliths include backed and truncated or truncated bladelets. Microburin technique is rare. Other tools consist of abundant retouched pieces, moderately frequent notch/denticulates, truncations, and endscrapers, and rare burins. Faunal remains are not well preserved. The high density of lithic artifacts in Square C4 (Arbitrary Levels 1 and 2) may indicate downslope movement although the horizontal profile of Natural Layer I suggests that it is an ancient intact surface that has been truncated more recently.

The sediment from Natural Layer II is a silty sand with an increased presence of gravels, cobbles, and small boulders. Rodent activity is present in the eastern half of Square C4. Bone preservation is poor. Wide lunates and wide trapezes are present, as are narrow backed microliths such as backed and truncated, curved, and truncated bladelets. Microburins are characteristic as well. Other tools include a moderate frequency of retouched pieces, and rare endscrapers, burins, borers, truncations, and notch/denticulates. The horizontal stratigraphy suggests that Natural Layer II is an *in situ* ancient occupation surface.

Natural Layer III is a more compact, clayey silt with fewer pebbles, cobbles, and small boulders. The lithic assemblage is Early Epipaleolithic and includes a few narrow curved backed bladelets. One wide lunate was also recovered. Other tools consist of rare endscrapers, burins, truncations, notch/denticulates, and retouched pieces. The horizontal stratigraphy suggests an ancient *in situ* deposit, with perhaps a trickle-down effect of artifacts from an occupation horizon above. The cobble and small boulder area in the northwestern quad of Square C3 was identified as Natural Layer IV.

In the 2000 field season, the five squares that were excavated yielded a total of over 39,000 lithic artifacts representative of the

Early and Middle Epipaleolithic periods. Compared to excavations during the seasons in 1984 and 1992, the field season in 2000 reconfirmed an Early Epipaleolithic occupation with at least two phases (the earliest emphasizing increased mobility compared to the later phase), and the presence of a Middle Epipaleolithic occupation. The results of this season, however, suggest that the Middle Epipaleolithic is relatively in situ in areas west of the 1984 step trench and may have moved slightly downslope in areas east of the step trench. The Feature A hearth from Square C2, Layer IV, appears to be associated with the Middle Epipaleolithic occupation, and results of radiocarbon analysis of charcoal from the hearth should prove informative. Analyses of faunal, phytolith, pollen, and macrobotanical remains from this season will provide additional information necessary for a more complete understanding of the prehistoric occupations here.

Acknowledgements: Funding for the 2000 field season was provided by the National Science Foundation (SBR-9618766), National Geographic Society (Grant #6695-00), United States Information Agency/American Centers for Oriental Research, and the Joukowsky Family Foundation. This is EHLPP Contribution No. 15.

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Chert Raw Material Survey in the Wadi al-Hasa, Jordan: Preliminary Findings

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A survey for sources of chert raw materials that could have been exploited by Upper Paleolithic and Epipaleolithic hunter-gatherers in the Wadi al-Hasa was conducted in the summer of 2000 (Olszewski *et al.* n.d.). It was accomplished through systematic sampling of 16 transect areas and nonsystematic sampling of six transect areas both north and south of the Wadi al-Hasa drainage. The transects excluded portions of the drainages that would have been covered by wadi sediments during the Late Pleistocene.

Most of the areas selected for sampling (n=15) were chosen because of their proximity to Upper Paleolithic and Epipaleolithic sites that have been tested by the Wadi Hasa Paleolithic Project (WHPP) and the Eastern Hasa Late Pleistocene Project (EHLPP) since 1984. Others (n=6) were chosen on the basis of available exposures of three of the main formations present in the Wadi al-Hasa area. The final transect was in the Wadi Ali, a major tributary to the Wadi al-Hasa, and coincides in part with the Middle Paleolithic site of 'Ain Difla (WHS 634) (Clark *et al.* 1988; Lindly and Clark 1987). Nonsystematic survey transects were designed to obtain an impression of available knappable materials in the immediate vicinity of archaeological sites or in areas of relatively close proximity. Systematic sampling involved spacing the individual surveyors at intervals of 50 to 150m, depending on topographic conditions, and having each surveyor sample all in situ occurrences of knappable and unknappable raw material in their transect line.

Areas surveyed to the north/northeast of the Wadi al-Hasa include three sections of the main Wadi al-Hasa or its small tributaries, one area of the Wadi al-Misq and its tributary, and four sections of the Wadi Khasra (Abu Kurrath) and its tributaries (Fig. 1). Transects representing areas surveyed on the south/southwest section of the main Wadi al-Hasa consist of three sections of the main Wadi al-Hasa, one area of the Wadi Ali, four sections of the Wadi Ahmar, two portions of the Wadi er-Ruwayhi, three areas along the Wadi Abu ad-Diba, and one section of the Wadi er-Riwaq (ar-Ruwi).

Three major formations characterize the Wadi al-Hasa region; all yield cherts. The following descriptions are adapted from Moumani (1997). The formations are Cretaceous in age. From oldest to youngest, they are the Wadi Umm Ghudran (WG), Amman Silicified Limestone (ASL), and Al-Hasa (al-Hisa) Phosphorite (AHP) Formations. The WG Formation contains various limestone, sandstone, and quartzite occurrences. There are also brecciated cherts and chert lenses. The ASL Formation is a series of large, hard chert beds that yield a steep slope topography. Brecciated cherts are especially common in the sequence; there are also bedded cherts, phosphatic cherts, dolomite cherts, coquinas, phosphates, and coquinal limestone. The phosphate increases toward the top of the ASL Formation. The AHP Formation is composed of three members in the Wadi al-Hasa area. These are the Sultani Phosphorite (SP), the Bahiya Coquina (BC), and the Qatrana Phosphorite (QP). In general, the AHP contains phosphate, phosphatic chert, phosphatic limestone, chert, microcrystalline limestone, and a prominent oyster shell coquina (the BC).

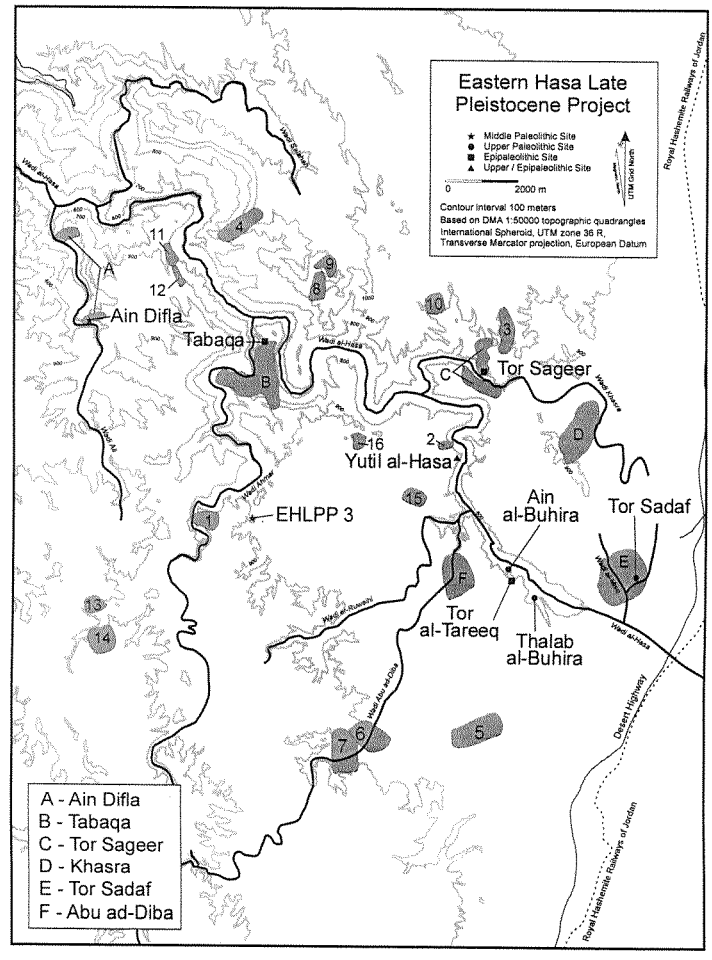

Fig. 1. Map of the Wadi al-Hasa region showing raw material transects.

Knappable rock is common in all three formations. Examples include quartzite, bedded chert, nodular chert, phosphatic chert, siliceous phosphorite, and siliceous coquina. Of some interest is the fact that most raw material encountered is knappable, even some portions of the brecciated cherts. The range of colors is relatively extensive, although most cherts, phosphatic cherts, and siliceous phosphorites tend to be various shades of gray. There are also some examples of whitish chert, and others with ring bands of purple to pink within a gray matrix. A creamy beige chert that tends to occur most frequently within the QP was also observed. An almost translucent gray chert is found in some of the bedded and brecciated cherts from the ASL, as well as from nodules (not *in situ*). The majority of the knappable chert we found has a matte or dull finish; more rarely were glossy-finish cherts seen or collected in the transects. The cherts in the transect surveys in the WG Formation tend most frequently to be matte, while those from the ASL Formation are somewhat more fine-grained and include glossy and translucent types. A total of 17 examples of raw material sources were recorded using a Global Positioning System (GPS). It is stressed that these were recorded to serve as examples rather than single source points for raw material. Knappable chert is simply so common throughout the Hasa region that, with one possible exception discussed below, the entire area could be called a source.

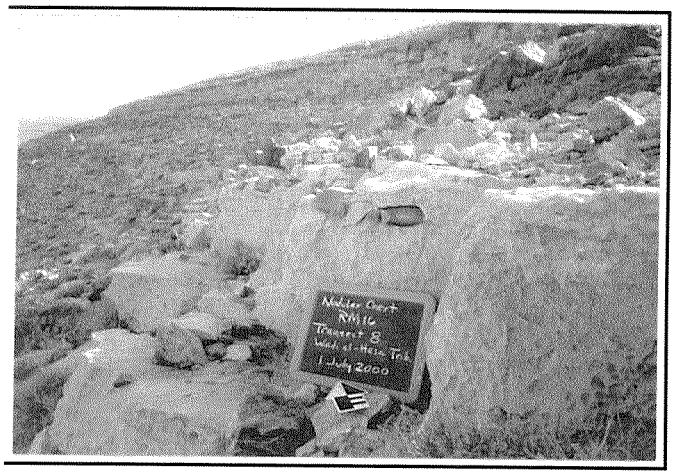

Fig. 2. RM 16, *in situ* nodular chert in the ASL Formation, Transect 8.

Nearly all transect surveys had instances of chert nodules that had rolled downslope from unknown point sources. Such nodules are usually characterized either by a smooth, thin, orange desert varnished surface or a thicker, whitish limestone cortex. When broken open, the nodules often yield high quality chert of a type analogous to that frequently exploited by prehistoric groups. The transect surveys noted two *in situ* exposures of nodular chert. These were encountered in several of the transects indicating that this type of nodular chert is widespread in its distribution. The first example of nodular chert in limestone bedding is from the WG Formation, the other is in the ASL Formation (Fig. 2). A similar *in situ* nodular chert is probably also part of the AHP Formation, but the transect surveys did not find it *in situ*. Both instances of *in situ* nodular chert encountered in the transect surveys occur relatively high in their respective sequences within the WG and ASL Formations. Elevations were obtained using a GPS unit, but the numerous faults throughout the Wadi al-Hasa region mean that the layers within these formations can have significant elevational difference masl from one area of the Hasa to another. For example, the *in situ* nodular chert in the ASL Formation occurred at 1030 masl in Transect 4, but the same *in situ* nodular chert is at 856 masl in the Khasra Transect.

Narrow bands (ca. 15 to 30cm) of bedded chert, brecciated chert, phosphatic chert, siliceous phosphorite, and siliceous coquina occur widely throughout the Hasa region (Fig. 3); they are often stacked directly on top of one another. The majority is characterized by a desert varnish surface in the color range of light orange to dark orange to black. Less common is a thin, light yellowish limestone cortex. Obtaining moderate sized blocks of these raw materials can be quite easy because they usually are fractured in place. They often can be pulled away from their bedding by hand or can be loosened with a hammerstone and then pulled away. Once a block of material has been removed from the bedding, it is easily knapped, although some pieces are riddled with flaws and break in unpredictable ways. These types of raw material are the most ubiquitous in the landscape.

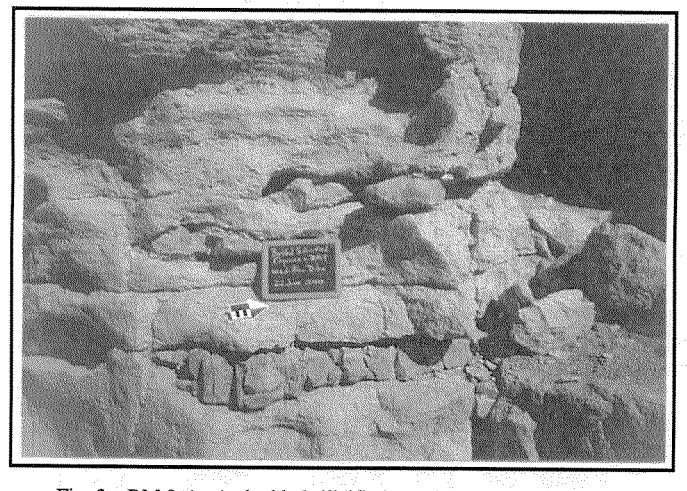

Fig. 3. RM 9, *in situ* bedded silicified coquina in the BC Member, Wadi Abu ad-Diba Transect.

A third source type observed on transects in the AHP, or its constituent phosphorite members, are those blocks of chert raw material that can be recovered directly from the surface. Many of the layers of the SP and QP members occur as rubble across the landscape where these members are widely exposed, for example, in the areas south and southwest of the Wadi al-Hasa drainage in the transects in the Wadi Abu ad-Diba and Wadi er-Riwaq. By fortuitous happenstance, during the drive to a transect spot along the Wadi Ahmar, a particularly outstanding area with abundant light orange desert varnished rock scattered amidst black desert varnished materials was noticed (Fig. 4). A brief examination revealed a Lower/Middle Paleolithic quarry site (EHLPP 3) not recorded by earlier survey of the area (MacDonald *et al.* 1983). Numerous Levallois flake and point cores, as well as a biface and debitage, of the light orange desert varnished chert were observed associated with numerous blocks of unworked light orange desert varnished chert. Given the age of the formation (Cretaceous), it is likely that this rubble raw material source has been available in its current form for the entire period of prehistoric occupation of the Hasa region.

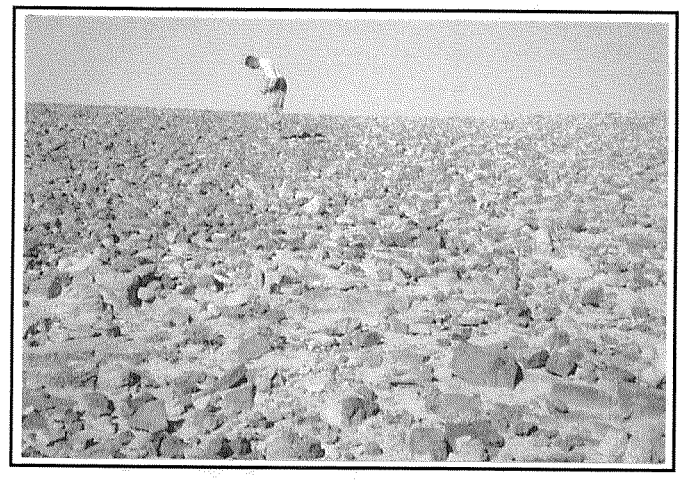

Fig. 4. EHLPP 3 (Lower/Middle Paleolithic quarry site) and RM 13, rubble surface chert raw material from the QP Member near the Wadi Ahmar.

Finally, many of the tributary wadis, for example, the Wadi Ahmar, the Wadi Abu ad-Diba, and the Wadi Khasra, are characterized today by cobble-filled courses. These cobbles were tested at random. Despite their battered and rolled exteriors, many of the cobbles yielded high quality chert. Although some were flawed and broke unpredictably, most were usable. They are generally a shade of gray in the interior and quite often had a glossy appearance when knapped. Basalt cobbles were frequent in the Wadi

Ahmar, probably deriving from the southern basalt flows west of Jurf ed-Darawish. These were not, however, vesicular basalt but a much denser type of basalt. Other known occurrences of basalt are in the Wadi Ali and in the Wadi al-Hasa west of the King's Highway. These are columnar in structure and do not appear to have been used for ground stone tools at sites of the Upper or Epipaleolithic in this region.

The preliminary results of the chert raw material survey suggest two observations of relevance to prehistoric behavior concerning raw material decisions in the Hasa region. In the first instance, in nearly all areas proximate to the archaeological sites excavated by the EHLPP and WHPP projects, knappable, good quality chert is within 50 to 100m of each site. Slope topography of the Hasa region observable today above the sites has probably not changed appreciably since their occupation. This suggests that these raw materials were not buried and thus unavailable. It is probable, however, that vegetation cover was more extensive during the Pleistocene, and this may have affected the visibility of some of the raw material. Generally speaking, the wide availability of raw material indicates that it should not have been a major variable in lithic technology decisions or even in choice of site location.

Secondly, examination of the artifact raw materials at the sites of Tor Sageer (Early Epipaleolithic), Yutil al-Hasa (late Upper Paleolithic, Early and Late Epipaleolithic), and Tabaqa (Late Epipaleolithic) by one of us (DIO) indicates, not surprisingly, that preferences for chert typify each site and often different temporal occupations. This may also be true for Tor al-Tareeq (Early and Middle Epipaleolithic) and Thalab al-Buhira (Early Upper Paleolithic), based on casual examination during field laboratory analyses. For example, both the Late Upper Paleolithic and Early Epipaleolithic occupations at Yutil al-Hasa show a marked preference for light to medium gray matte cherts. This contrasts with the Early Epipaleolithic at Tor Sageer, which is characterized by a high frequency of either finer-grained gray cherts or almost translucent, glossy gray to gray-brown cherts. Both of these examples, in turn, contrast with the Late Epipaleolithic (Early Natufian) occupations at Yutil al-Hasa and Tabaqa, where the preferred raw materials are a finer-grained glossy gray chert and a chalcedenous, light gray glossy chert. Cortical surfaces on cores and debitage, regardless of the site or the temporal period, are most frequently either a thick, whitish limestone cortex or a smooth, orange desert varnish; both indicative of nodular cherts rather than bedded cherts.

The preferences expressed at each site, with the possible exception of the chalcedenous raw material discussed below, appear at the moment to be dependent on which chert is in the closest proximity to the site. For example, if a matte chert source is closest to the site, then prehistoric groups did not venture another hundred meters or so farther upslope to obtain somewhat finer-grained cherts, nor did they travel farther afield to exploit the very fine-grained, almost translucent, glossy cherts. This might be an instance in which using artifact raw material as a variable to assess relative level of mobility at sites has little relevance. For example, the lithic technologies in the Hasa for these periods appear to be similar to those from regions were raw material was less widely available.

The chalcedenous material commonly used during the Early Natufian in the Hasa was not encountered on any of the transect surveys, although some portions of bedded cherts in several of the transects yielded chalcedenous chert at the outer edges of the beds. Cortical surfaces for lithic artifacts of this material from Tabaqa and Yutil al-Hasa suggest that prehistoric groups here were using nodular forms of this raw material, some of which was derived from wadi cobbles. It is possible that the chalcedenous chert occurs only in a single or a few highly localized spots either within the Hasa region or further away.

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New Excavations at the PPNB site of Yiftahel, Israel

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(Israel Antiquities Authority)

Introduction

New excavations at the PPNB site of Yiftahel , in the Jezreel Valley, were conducted by a team from the Israel Antiquities Authority during 1997. The new area of excavations, labeled Area E, is located between the previous areas excavated in previous years (Lamdan and Davies 1983; Braun 1998; Garfinkel 1987). The new area of excavation (12 x 6 m), was opened ca. 75m from areas B and C and ca. 15m from area D. The main aims of the excavations in Area E were to complete the picture given by the earlier PPNB excavations and to establish a correlation between them and the newly excavated area.

Stratigraphy

Four superimposed levels belonging to the Middle-Late PPNB horizon were found under the top soil and a mixed layer containing remains of the Early Bronze and the Pottery Neolithic. The levels were labeled from C1 to C4 (from the top to the bottom). The common characteristics of all the occupation levels are plaster floors, waste pits, hearths, and installations.

A female burial (T30) was found associated with floor level in Level C3. The burial was excavated in a shallow depression into the floor, and intruded into the reddish-brown sediment which belongs to the earlier level C4. The skeleton was found articulated and headless, with the legs in a flexed position. The arms were not found attached to the skeleton.

In C4, the best preserved of the levels, a broad structure was encountered, built of mudbricks and stones (Fig. 1). In the SE portion of the structure several piles of hundreds of charred seeds were found (L39). We suggest that they were probably originally stored in baskets whose ephemeral organic material disappeared. The 14C dating of the seeds (measured by I. Carmi and D. Segal, Weitzman Institute) give us a range between 8885 35 and 8665 35 bp for level C4. Furthermore, two oval installation were found. One of them (L45) was probably a kiln for lime production.

Archaeozoology and Archaeobotany

The faunal assemblage, researched by Francesca Alhaique (Università di Roma "la Sapienza"), is dominated by gazelle remains (10.7%), followed by caprines (8.0%), bovids (6.0%) and wild boar (5.7%); cervids are poorly represented (0.1%). These data confirm that animal exploitation during the PPNB at Yiftahel was based mainly on ungulates with caprines and gazelles representing the main resource, as in Areas C and D (Horwitz 1997).

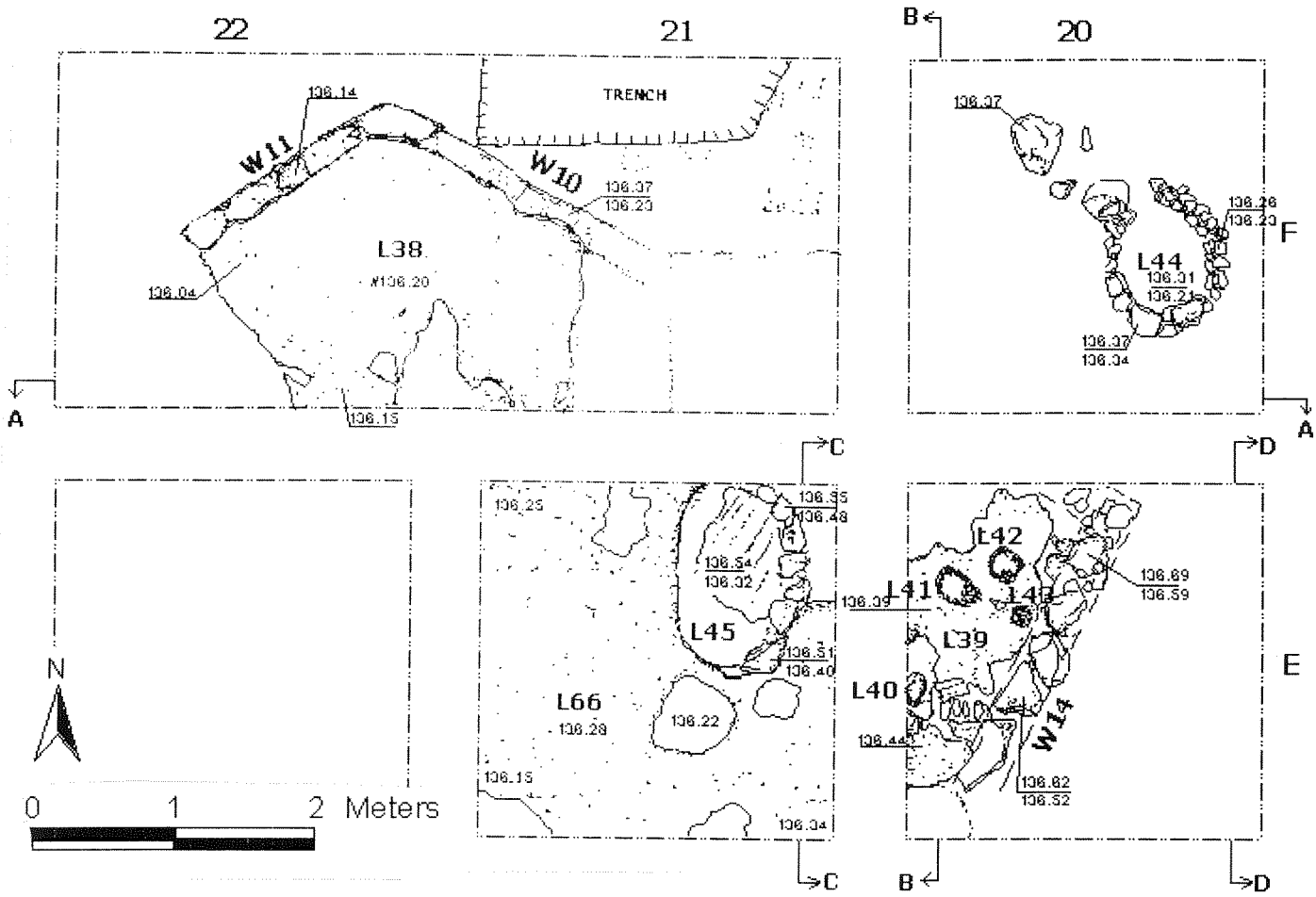

Fig. 1. Plan of Level C4.

Differences between levels in the frequency for the various species may have been produced by changes in human behavior, economic variations or/and temporary climatic fluctuations. Differences with other areas are visible in the caprines, which are smaller than those from areas C and D (where most of the goats were large sized; Horwitz 1997).

The seeds were identified by Uri Baruch (IAA) as horsebeans (*Vicia faba L.*), the same as found in the excavations in Area C by Garfinkel (Kislev 1985). The absence of grains such as wheat or barley corresponds, roughly, with the fact that almost no grinding stones were discovered.

Flint industry (Fig. 2)

Thousands of flint implements were retrieved during the excavation. Naviform technology is clearly dominant. Some 70% of the cores are naviform, representing the different steps in the reduction sequence. These frequencies are even higher when we consider that many of the cores for flake production were originally naviform cores (*cf.* Wilke and Quintero 1994).

The fact that the proximity of the site to high quality raw material sources allowed the knapper the flexibility of choice in size, quality and forms of blanks. As a result, the knapping activities appear to be "uneconomical" behavior. This is reflected in high frequencies of debitage, of primary and naviform cores, as well as in the small quantities of multiple tools and recycled sickle blades. The tool/core ratio (average 3:1) and the high densities of cores per excavated m3 support the idea that cores were relatively minimally exploited. At Abu Gosh, for instance, where the sources are not relatively close to the site, the tool/core ratio is ca. 10:1 (Khalaily, Marder, and Bankirer n.d.). The presence of naviform cores in high densities could indicate that the site was a craft-specialized one, oriented to the production of blade blanks not only for local use but also for exchange (Quintero and Wilke 1995).

The tool composition is typical of the Middle-Late PPNB industries in the southern Levant. The characteristic types of arrowheads are large. Those of Amuq type have tangs fashioned by

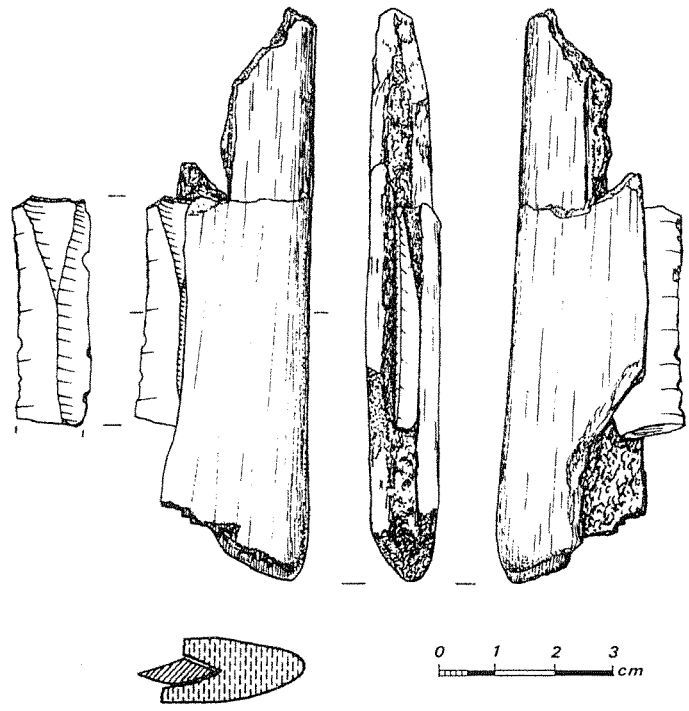

Fig. 3. Sickle from Level C4. <Fig. 2. on next page>

Abu Gosh retouch. The sickle blades (11.1%) have a fine denticulate retouch, mainly on their ventral surfaces. The arrowhead frequencies are low (2.2%), as in other areas at Yiftahel, and there is a clear difference with the arrowhead frequencies from Kfar Hahoresh (Goring Morris *et al* 1994-5: Table 3).

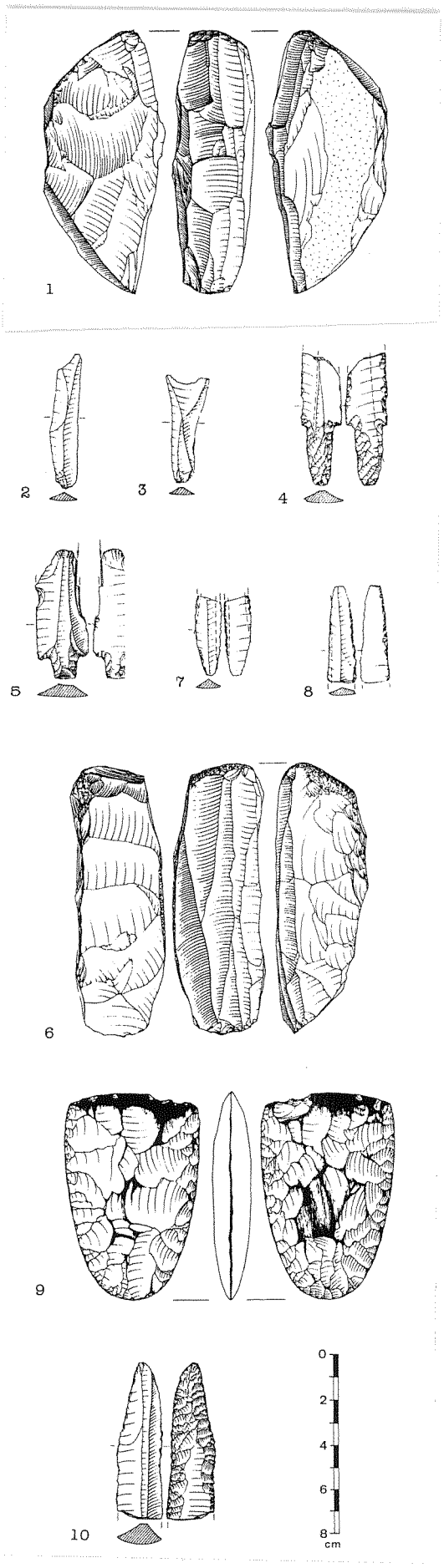

Fig. 2. Selection of PPNB flint artifacts

Among the tool groups it is worth mentioning the high frequencies of burnt and damaged arrowheads and sickle blades. This trend is more apparent when one considers the low frequency of burnt tools among the other tool classes. This phenomenon is well known from other Middle-Late PPNB sites (Khalaily, Marder and Bankirer n.d.). This fact can be explain either as result of heating flint during the process of hafting in order to insert the tools in side of the handle or that hafting activities took place near the hearth, and after discard the tools were accidentally burned.

It is worth mentioning that a sickle fragment comprised of a bone haft and a flint blade (Fig. 3) was found in level C 4 (L38). The haft was made of a rib shaft fragment of *Bos primigenius*. The exterior part of the haft was finely polished, with a probable heat treatment on one of its sides. The blade was found stuck in the main segment of the haft, in the groove of the bone where remains of a dark colored adhesive were found.

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The 2000 Season at Late PPNB Ba'ja

Hans Georg K. Gebel[1] and Bo Dhal Hermansen[2]
([1] Institut für Vorderasiatische Altertumskunde, Freie Universität Berlin; [2] Carsten-Niebuhr Institute, Copenhagen University)

The third season of excavations at the early Neolithic mountain village of Ba'ja, Petra-Region, was carried out in collaboration with the Department of Antiquities, Amman, under the auspices of *ex oriente* at the Free University of Berlin. It lasted from 5 April -15 May, 2000. Director of the Ba'ja Neolithic Project is Hans Georg K. Gebel, the deputy director is Bo Dahl Hermansen (Note 1). A team of 24-27 members from 8 countries supported the success of the 2000 excavations. Up to 25 workmen from local tribes joined the efforts with dedicated cooperation. In the 2000 season, wall conservation was started with the support of the German Foreign Ministry, Berlin; the work of the Swiss conservator Ueli Bellwald, working at Petra, was essential for the preservation and removal of an unexpected fresco. Important reports so far include Gebel *et al.* 1997; Gebel and Hermansen 1999; Hermansen and Gebel 2000; and Gebel *et al.* n.d.

Ba'ja gained more importance in both academic and non-academic consideration of Near Eastern neolithisation, especially because of its unique and dramatic setting (Fig. 1) as well as the extraordinary finds of the spring season in 2000. Enclosed by vertical gorges and rock formations, the site covers ca. 1.2-1.5 ha on a steeply sloped intramontane basin at 1140-1175 m a.s.l. The basin is completely covered by a *pueblo*-like architecture, extending out onto flat bedrock areas at the site's fringes. The 2000 season

showed that all the space on the steep-sloped terrain was densely built by early Neolithic man. The settlement has only one "comfortable" access, through a gorge incised as deep as 70 m into the sandstone mountains and today filled with huge fallen rocks that require ropes or ladders to pass through. The conditions of excavations are severe and more dangerous than usual, and this requires a special consideration for project logistics. To maintain two camps (base camp and dig camp) is a logistic necessity, requiring a special person (logistics director: Jürgen Baumgarten).

Here we only can present a brief summary of the major results of 2000. Even after the third season we obtained more spectacular and unexpected results, from which we can generate essential and new research strategies, proving a hitherto inexhaustible potential for early Neolithic insights at Ba'ja in the southern Levant. In general, we did not reach the stage in the fieldwork in which we reproduced results already obtained in previous campaigns.

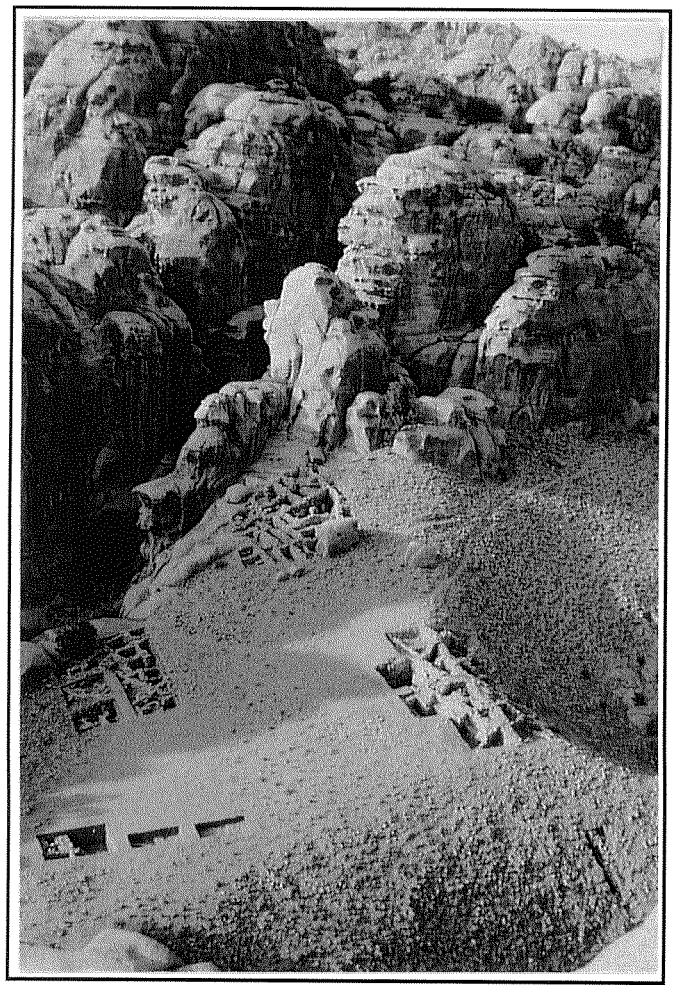

Fig. 1. Exposed LPPNB architecture in Ba'ja, May 2000.
<photo: B. Borowski>

From the material culture it is becoming increasingly clear that we should expect at Early Neolithic Ba'ja a society of lineages most likely headed by a chief (possibly a "flat-hierarchical" chiefdom with village life regulated by a consensus of the heads of leading lineages). Clear evidence exists for magic practices and ritual, mostly related to "caching" of items and humans. An economic wealth of the site might have been related to the manufacture and distribution of one of the luxury goods of the period: sandstone rings, produced in a sophisticated *chaîne opératoire,* and providing information about the dawn of social hierarchies. In addition to common domestic and hunted animals for the area and period (the herding of ovicaprines was the dominant source of animal protein), we have some evidence of fur production (leopard, fox, hyrax). Buildings, with walls preserved up to 4.20 m (!), show structural pre-planning of terraced central room/ courtyard houses of the Basta- type, executed with at lease two superimposed storeys. We now might have evidence for also three true storeys.

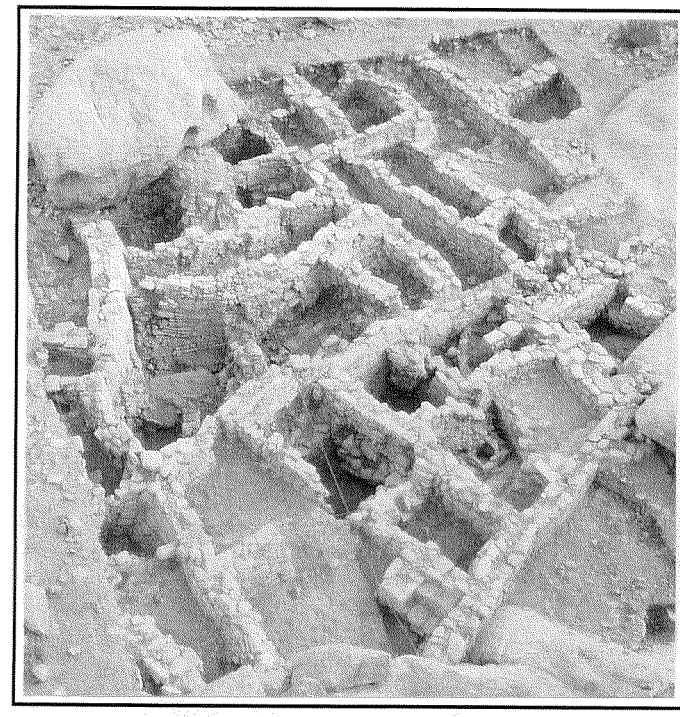

Fig. 2. LPPNB house in the summit area of Ba'ja.
<photo: H.G.K. Gebel>

The major results of the 2000 excavations included:

1) Topographic conditions in the *siq* were studied, and there may have been excellent possibilities for water storage using simple dams. Just below the site, two spots of the gorge's course are right-angled and have vertical steep sides that immediately stop the water from flushing down from the drainage catchment. After these natural right-angled barriers, the course goes through extremely narrow passages (1-2m), easy to block by a dam. One of the situations allows for easy storage of a larger qunatity of water (180 m^3, provided there was a similar topography as today). Our considerations have reached a point where we do not exclude Neolithic water dams below Ba'ja, adding a new aspect to our understanding of why this „extreme" site setting was chosen. However, Ba'ja is also a protected setting, and we continue to search for evidence for arguments related to territorial stress as a reason to choose the location.

2) An additional 300 m^2 of the 1.2-1.5 ha settlement were investigated in 2000. Excavations revealed clearly that all the space of the site's setting was densely occupied by structures, including even extremely sloping terrain (*ca.* 45°) with walls preserved up to 3.70 m (Test Unit 5 in 2000). Area D shows that ground plans extended onto flat rock surfaces immediately above the vertical walls of gorges.

3) Workshops for the production of sandstone rings are now known from all the domestic areas, indicating that each household contributed to this source of wealth for the settlement. They seem to have flourished in the basements, as indicated by the waste and extremely thin layers of sandstone dust deposited during grinding the rings' surfaces. The waste material witnesses to a more complex *chaîne opératoire* than thought before, including "individualized" features and failure management.

4) More evidence for the practice of caching objects such as celts and small stone bowls in and between walls and floors was found, as well as a case of arranged human bones sealed off by a basement's floor plaster, and animal remains arranged between two walls. The meaning of the "magic caching" remains unclear and needs additional evidence to be considered on a broader basis.

5) In the 1999 opened Area D on the site's summit more of the basement of the large building (Fig. 2) - covering some 75-80 m^2- was exposed. The central room/ courtyard of the two-storeyed house built on two different terraces/levels contained small rooms in its earlier phase. If climate was tolerable, daily life would be expected to have mainly used the upper story and roof; the lower rooms have evidence of sandstone ring workshops and animal bone disposal. The house contains, like others, remains of indoor staircases, and along its western side a narrow lane leading to the

edge of the gorge to the north (here, and down in the clefts of the gorge, we found huge LPPNB garbage layers; Test Unit 2).

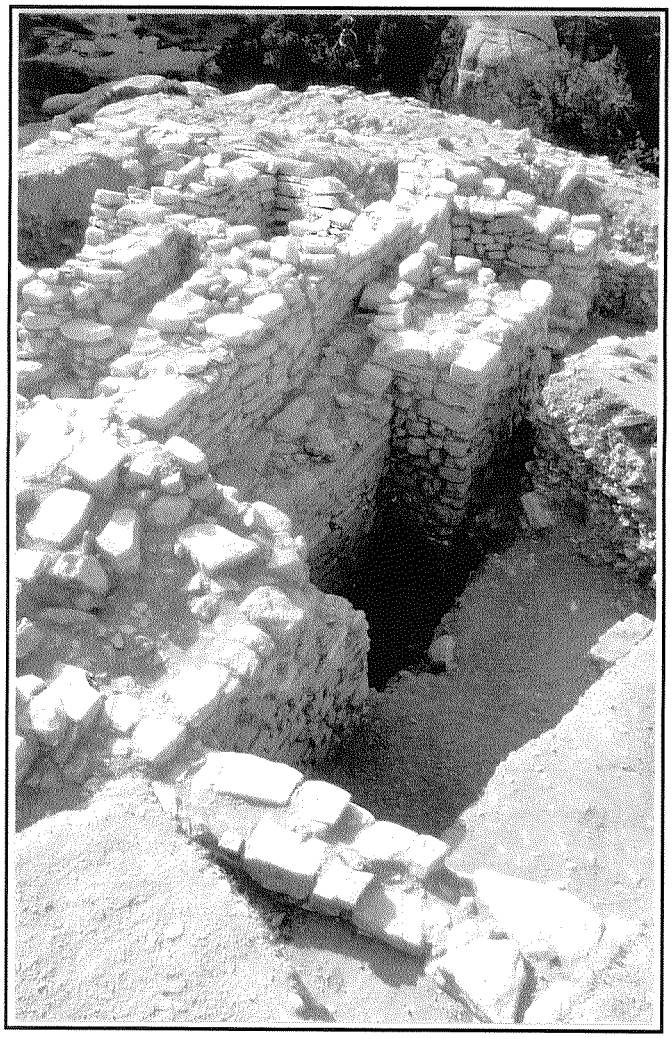

Fig. 3. Buttressed LPPNB house wall bordering the Ba'ja communal space. <photo: H.G.K. Gebel>

6) The admixtures of plaster is much more diversified and specialized to purposes than expected (analysis by the *Wilhelm Dyckerhoff Institut für Baustofftechnologie, Wiesbaden*).
7) In the flat central part of the otherwise steeply sloped settlement evidence of a *plaza* was found. It is bordered in the east by at least one regularly buttressed house front (Fig. 3), and it was accessible through a gate-like structure in a topographically "strategic" position in the west. The deep sounding in Area C exposed what now clearly is a stairwell attached to the outside of the (buttressed) house, leading from/to the plaza in the later phases of the building (Fig. 3). Here there is likely red-stained plaster evidence on the exterior house walls, too. The access to the plaza in the west is some 1.5m wide with the (broken) lintels still *in situ*. The distance between both spots (NE-SW- axis of the supposed *plaza)* is ca. 35 m.
8) A true burial chamber was encountered in one of the houses. It is very small (*ca.* 0.6 m^2) and contained in its upper layer the remains of at least 7 skulls, together with post-cranial bones that partly still rested in the anatomic order of the burial position. Bones (or the bodies) were partly strewn with red pigments. Arrowheads stained in red, parts of necklaces, and a beautiful mother-of-pearl paillette (below the head of a newborn) were found in the grave. The position of the chamber makes clear that repetitive burying inside the house's basement must have taken place during its inhabitation.
9) One of the burial chamber walls was intentionally set in front of a figurative wall painting in fresco technique (red pigments from crushed/ soaked sandstone painted in the wet suface of the wall plaster), which depicts fragments of abstract motifs with radiating rays (coming out of a human figure?) and a ladder-like image (Fig. 4).

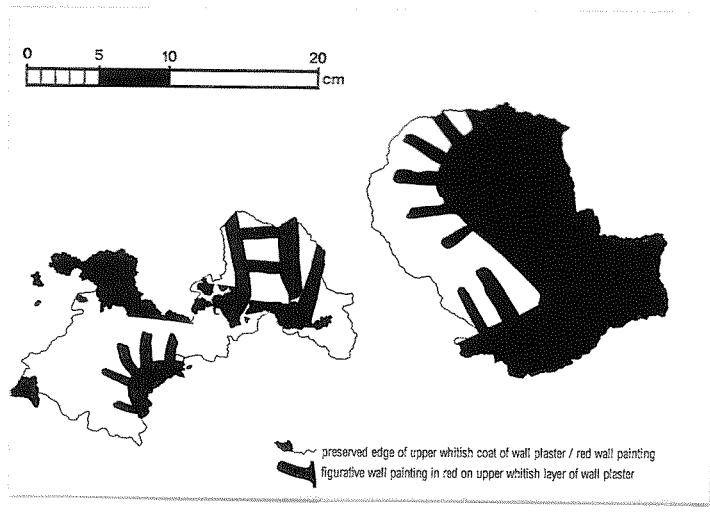

Fig. 4. LPPNB wall fresco from Ba'ja (detail from upper layer of painted plaster). <drawing: H.G.K. Gebel>

The prestigious character of the architectural layout, the burial chamber hiding a fresco with mysterious symbols, and other features, lead us now to think that Ba'ja is more than just a rural settlement involved in long-distance exchange of sandstone rings. This last season of excavations has opened exciting insights into the world of beliefs and rituals of these early herders and farmers. The most pressing question now puzzling us is whether the wall painting connected with the multiple burial contains information on mortuary beliefs some 9000 years ago in Ba'ja, and: Do we really not have settlement systems with various levels in the LPPNB of the area? Plans for our next season have started.

Note 1. The first campaign of large-scale excavations in 1997 was carried out under the auspices of the German Protestant Institute of Archaeology at Amman and ex oriente, in collaboration with the German Archaeological Institute Berlin, Orient- Abteilung.

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Gebel H.G.K. and Hermansen Dahl B. *et al.*
n.d. Ba'ja hidden in the Petra Mountains, II. Preliminary results of the 1999-2000 investigations. In: H.-D. Bienert, H.G.K. Gebel, and R. Neef (eds.), *Central Settlements in Neolithic Jordan*. Studies in Early Near Eastern Production, Subsistence, and Environment 5. Berlin, ex oriente (forthcoming).

Gebel H.G.K. and Hermansen Dahl B.
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Hermansen Dahl B. and Gebel H.G.K.
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Notes and News

Short Note on the Mini-Symposium: *Magic Practices in the Near Eastern Neolithic (Copenhagen, May 2000)*

Charlott Hoffmann Jensen[1] and Hans Georg K. Gebel[2]
([1] Carsten-Niebuhr Institute, Copenhagen University; [2] Institut für Vorderasiatische Altertumskunde, Freie Universität Berlin)

In May 2000 the 2nd International Congress on the Archaeology on the Ancient Near East was held in Copenhagen. During the congress a number of workshops on specific topics were organized. One afternoon was scheduled to host the mini-symposium entitled "Magic Practices in the Near Eastern Neolithic",

organized by Charlott Hoffmann Jensen and Hans Georg K. Gebel. Contributions at the minisymposium included:

- Mohammad Najjar: Symbolism in the iconography of south Jordanian Neolithic from Faynan
- Alison Betts: Dhuweila rock art, shamans and the question of "hunting magic"
- Hans Georg Gebel: Walls as magic depots?
- Michael Morsch: Magic figurines? A view from Nevalı Çori
- Trevor Watkins: Memes, memeplexes and the emergence of religion in the Neolithic
- Mikko Louhivuori: Neolithic Cultic buildings from the Levant: A semiotic approach to the interpretation of symbols and signs
- Marc Verhoeven: Ritual and its investigation in prehistory

Hans Georg Gebel and Charlott Hoffmann Jensen acted as chairpersons.

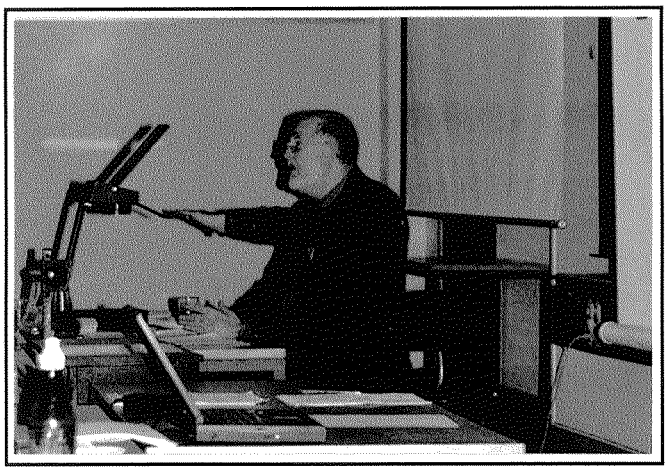

Fig. 1. Trevor Watkins lecturing at the mini-symposium *Magic Practices in the Near Eastern Neolithic* (Copenhagen, May 2000)

Very interesting and fruitful discussions followed each paper, which required that the minisymposium was extended to include the following afternoon as well, where the session was ended with a general discussion, with special reference to the definition of "magic" as related to that of "ritual".

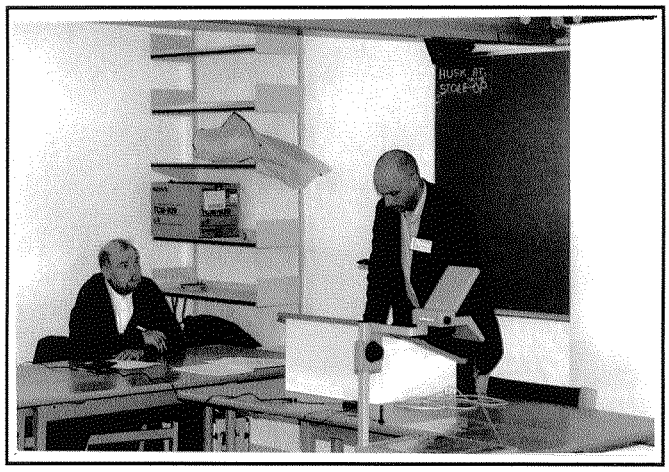

Fig. 2. Marc Verhoeven raises the issue "ritual" and "magic" at the mini-symposium *Magic Practices in the Near Eastern Neolithic*

The symposium was well attended and quite a few from the audience contributed to the discussion, among others Zeidan Kafafi, Michael Chazan, Ted Banning, Bo Dahl Hermansen and Kim Duistermaat.

The contributions will be published in a volume of the *Studies on Early Near Eastern Production, Subsistence, and Environment* series, and will include other papers relevant for the topic written by, among others, Nigel-Goring Morris & Anna Belfer Cohen, Klaus Schmidt, Ian Kuijt, Akira Tsuneki, and Zeidan Kafafi. The editors of the volume invite all colleagues who could not attend the meeting but wanted to contribute for joining the publication:

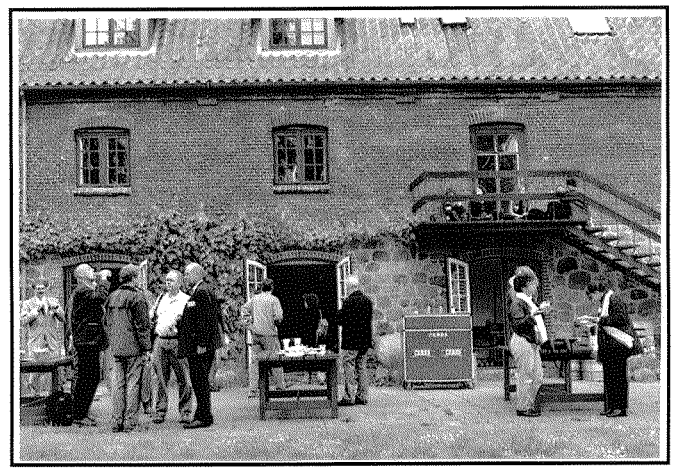

Fig. 3. A break at the mini-symposium *Magic Practices in the Near Eastern Neolithic* (2nd meeting in Moesgaard)

Call for Contribution for the publication: *Magic Practices and Ritual in the Near Eastern Neolithic*

December 2000

Dear Colleague,

our mini-symposium "Magic Practices in the Near Eastern Neolithic" held in the framework of the 2nd International Congress on the Archaeology of the Ancient Near East (Copenhagen, 23-27 May, 2000) was very successful and vivid, and had attracted a large audience that took part in the discussions.

We now invite all colleagues working in the subject to contribute to the publication

Magic Practices and Ritual in the Near Eastern Neolithic
edited by Hans Georg K. Gebel & Charlott Hoffmann Jensen
to appear as Vol. 8
in the *Studies of Production, Subsistence and Environment* (2001)

since we feel that it should not contain only the communications delivered in Copenhagen, but also from those who could not attend the meeting.

The deadline to deliver contributions was 20th of November, but we are ready to negotiate late deadlines during the editorial work next months. Please, do contact us a.s.a.p. (*cf.* below).

For the format style of your contribution, please, consult volumes 3 or 4 of the *Studies of Production, Subsistence and Environment*, or ask us to send you the rules of format style of SENEPSE. Please, avoid to send digital versions of illustrations.

Please, understand that no language etiting is done by us and that only contributions edited by a native speaker are accepted. All contributions will underwent a peer review process.

Although the volume is aimed to enlarge the number of published records of magic practices and ritual from the Near Eastern Neolithic, we especially would welcome contributions that emphasize problems of theoretical and approaches from other disciplines such as history of religion or ethnography. We also suggest contributions that pay critical reference to the question of shamanism.

Please, forward all announcements of contributions or correspondence after December 2000 to Hans Georg K. Gebel (address below).

Cordially yours,

Hans Georg K. Gebel & Charlott Hoffmann Jensen

Addresses:
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Charlott Hoffmann Jensen & Bo Dahl Hermansen, Carsten Niebuhr-Institute, University of Copenhagen, Snorresgade 17-19, DK- 2300 Copenhagen, tel. +45 35 32 89 08, fax +45 35 32 89 26, email: charlott@hum.ku.dk

A New Series Devoted to Final Publications of Neolithic Excavations in Southwest Asia
bibliotheca neolithica Asiae meridionalis et occidentalis

Hans Georg K. Gebel and Gary O. Rollefson

In the continuing efforts of *ex oriente* e.V. to promote Neolithic research in the Near and Middle East, we have founded a new series exclusively devoted to final publications of Neolithic sites in Southwest Asia. The *bibliotheca neolithica Asiae meridionalis et occidentalis* (Library of Neolithic Excavations in Southwest Asia) offers a venue for publication of all Neolithic excavations. All teams from all nations contributing to Neolithic research in Southwest Asia are invited to place their final publication on this shelf. The structure of the *bibliotheca* is aimed to enable rapid, high quality publication by accepting "modules" of excavation series (*cf.* below) representing the individual excavation project.

Structure

Each field project has its independently structured excavation series in the *bibliotheca* and decides about formats and style (from the design and colour of the cover to the formal styles of text, etc.). This ensures an individual identity for a publication project. Only the hardcover and paper quality and the page formats are fixed by *bibliotheca* standards. There will be also no serial numbers within the *bibliotheca* series, although we expect that excavation reports would appear in a series format, as in the following example (The following list of volumes and titles/contents is offered as an example only, and does not represent a fixed *bibliotheca* format for a final publication.).

Site Name Vol. I Human Ecology
Site Name Vol. II Stratigraphy and Architecture
Site Name Vol. II.1 The Stratigraphy and Architecture of Area X
Site Name Vol. II.2 The Stratigraphy and Architecture of Area Y
Site Name Vol. III The Burials and Human Remains
Site Name Vol. IV The Industries
Site Name Vol. IV.1 Chipped Industries
Site Name Vol. IV.2 Ground Stone Industries
Site Name Vol. IV.3 Vessel Industries
Site Name Vol. IV.4 Plaster and other Moldable Material Industries
Site Name Vol. IV.5 Ornament Industries
Site Name Vol. V The Subsistence Economy
Site Name Vol. VI Miscellaneous and Special Studies
Site Name Vol. VII The Neolithic Village of Site Name. Conclusions

Quick Publication

The structure of the *bibliotheca* publications specifically considers the difficulties many projects have with publishing planned comprehensive monographs. Usually such publications are delayed, even by decades, because some of the contributors do not finish while the others who comply with scheduled deadlines face the risk that their work will be out-dated when it is eventually published (or that they will have to rework their material years later). In order to foster communication of Neolithic knowledge, the *bibliotheca* provides the opportunity to publish in "modules" (which should have at least 180 printed pages). For example, if the responsible editor(s) realize that a large monograph on, say, "The Finds"cannot be produced as scheduled, but that part of the chipped lithics are ready for publication, they can release this section for print as *e.g. Vol. IV.1.1: The Chipped Lithic Industries. The Primary Production*, as a module of *Vol. IV: The Industries*. If next the architecture and stratigraphy of Area Y is ready, it may appear -according the excavation series plan- as *Vol. II.2: The Stratigraphy and Architecture of Area Y*, representing a part of *Vol. II: The Stratigraphy and Architecture*. However, the plan of the excavation series should consider a final or interim volume that summarizes excavation results, perhaps as the proceedings of a symposium held for that purpose.

Editors and Responsibilities

Editing responsibilities remain completely with the individual excavation project. Editors of the volumes of an excavation series are solely responsible for the excavation's publication. They provide the camera-ready version of the publication to the editors of the *bibliotheca* (Hans Georg K. Gebel and Gary O. Rollefson). No extra work -either technical or editorial- will be accepted by the *bibliotheca* editors for the publication of volumes. However, we might be of assistance in some cases to overcome specific difficulties.

It is obligatory that each volume or module that is delivered for print is accompanied by three peer reviews by distinguished colleagues not involved in the publication project. Neither the general editors nor *ex oriente* can arrange for a peer review process. The editors of the *bibliotheca* have the right to demand further independent reviews and even to reject individual parts of an excavation series in the worst case, if improvement demands are not followed. Natural sciences contributions need to be reviewed by specialists from the appropriate fields.

In order to protect the reputation of the *bibliotheca*, prior to agreeing to publish an excavation series, a publication program must be presented by the site report editor(s) that shows that agreements with contributors have been arranged. However, we are well aware that in one case or another such a program might not develop as originally planned, or even that a volume (or a part of one) might never appear. We will also consider the possibility of producing single-volume site monographs in the *bibliotheca.*

Publishing House

The publisher is *ex oriente*, Berlin. Copyrights become the property of *ex oriente* e.V. if no other (prior) arrangements are made.

Publishing Quality / Costs

We publish A4 hardbound on 115 gr. paper. The quality of books is standard throughout the *bibliotheca* series. Colour photos, folding plans, etc. represent additional costs and are possible if costs will be covered by the editors of the excavation series.

If a camera-ready version is provided, the *biblioteca* will not ask for printing costs from the publication project. Any work necessary by the *biblioteca* to produce a camera-ready version for the printing will be billed to the site report editors by *ex oriente.* Since publishing in the *bibliotheca* is cost-free, only 5 free copies will be given to the main editor of the excavation series. Further copies can be obtained with a discount of 30% off the selling price. *Ex oriente* advertises and distributes the books, organizes book reviews, etc.

The First Volume

The first volume in the *biblioteca* series will appear by March 2001:

Zeidan Kafafi (ed.)
2000 *Jebel Abu Thawwab (Er-Rumman), Central Jordan. The Late Neolithic and Early Bronze Age I Occupations.* With contributions by Nizar Abu-Jaber, Bo Dahl Hermansen, Zeidan Kafafi, Ilse Koehler-Rollefson, Reinder Neef, Nabil Qadi, Raeda Quraan, Ziad al Saa'd, Danielle Stordeur, & Hisahiko Wada. *bibliotheca neolithica Asiae meridionalis et occidentalis* (2000). Berlin, ex oriente.
(217 pages, 58 figures, 20 B&W plates, 2 colour plates, 22 tables).

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New Dissertations, Theses, and Books

M.L. Inizan, M. Reduron-Ballinger, H. Roche, and J. Tixier
1999 *Technology and Terminology of Knapped Stone.* Préhistoire de la Pierre Taillée 5. Nanterre, C.R.E.P. ISBN 2-903516-05-7

The *Préhistoire de la Pierre Taillée* 5 is an unabrigded translation of the entirely revised French edition of the *Technologie de la Pierre Taillée* 4

published in 1995, and so also replaces the earlier English version from 1992 (out of print). Amongst other additions, a chapter devoted to graphic expression was included and the multilingual lexicon was enlarged by a Portuguese section.

Cauvin, J.
2000 *The Birth of the Gods and the Origins of Agriculture.* Cambridge, Cambridge University Press.

Bienert H.D.
2000 *Kult und Religion in prähistorischer Zeit. Eine Studie anhand von Fundmaterial epipaläolithischer und früh-neolithischer Gesellschaften/ Kulturen Südwestasiens. (12.-6. Jt. V.u.Z.).* Microfiche version of 1995 doctoral dissertation, University of Tübingen. Available from H.D. Bienert.

Coinman N.R.
2000 *The Archaeology of the Wadi al-Hasa, West-Central Jordan, Volume 2: Excavations at Middle, Upper and Epi-paleolithic Sites.* Arizona State University Anthropological Papers No. 52. Tempe, Arizona State Univ.

Kuijt I. (ed.)
2000 *Life in Neolithic Farming Communities. Social Organization, Identity, and Differentiation.* Fundamental Issues in Archaeology. New York, Kluwer Academic/ Plenum Publications.

Al Nahar M.
2000 *The Upper and Epipaleolithic Transition in the Southern Levant: Microlith Typology Versus Technology.* Tempe, unpublished doctoral dissertation, Arizona State University.

de Contenson H.
2000 Ramad. Site Néolithique en Damascène (Syrie) aux VIIIe et VIIe Millénaires Avant l'Ère Chrétienne. Bibliothèque Archéologique et Historique, Tome 157. Beirut, Institut Français d'Archéologie du Proche Orient.

Forthcoming Publications by *ex oriente*

Hans-Dieter Bienert, Hans Georg K. Gebel & Reinder Neef (eds.), *Central Settlements in Neolithic Jordan.* Studies in Early Near Eastern Production, Subsistence, and Environment 5, 1998 (2001). Berlin, ex oriente. <ISBN 3-9804241-4-6> TO APPEAR MARCH 2001

René T.J. Cappers, Sytze Bottema & Uri Baruch (eds.), *The Dawn of Farming in the Near East. Proceedings of the International Workshop in Groningen 1998.* Studies in Early Near Eastern Production, Subsistence, and Environment 6, 1999 (2001). Berlin, ex oriente. <ISBN 3-9804241-5-4> TO APPEAR IN 2001

Marion Benz, *Die Neolithisierung im Vorderen Orient. Theorien, archäologische Daten und ein ethnologisches Modell.* Studies in Early Near Eastern Production, Subsistence, and Environment 7 (2000). Berlin, ex oriente. <ISBN 3-9804241-6-2> TO APPEAR JAN. 2001

Hans Georg K. Gebel & Charlott Hoffmann Jensen (eds.), *Magic Practices and Ritual in the Near Eastern Neolithic.* Studies in Early Near Eastern Production, Subsistence, and Environment 8 (2001). Berlin, ex oriente. <ISBN 3-9804241-9-7> TO APPEAR IN 2001

Zeidan Kafafi (ed.), *Jebel Abu Thawwab (Er-Rumman), Central Jordan. The Late Neolithic and Early Bronze Age I Occupations* (with contributions by Nizar Abu-Jaber, Bo Dahl Hermansen, Ilse Koehler-Rollefson, Reinder Neef, Nabil Qadi, Raeda Quraan, Ziad al Saa'd, Danielle Stordeur, and Hisahiko Wada). *bibliotheca neolithica Asiae meridionalis et occidentalis & Monographs of the Institute of Archaeology and Anthropology, Yarmouk University* 3 (2000). Berlin, ex oriente. <ISBN 3-9804241-8-9> TO APPEAR MARCH 2001

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New Web Sites

From Ted Banning, Toronto University: The URL for the new Wadi Ziqlab Project web site is:

http://www.chass.utoronto.ca/~banning/Ziqlab/

From Danielle Stordeur, I.P.O CNRS: Le site du M.A.E. consacré à Jerf el Ahmar est à présent disponible sur le web à l'adresse suivante :

http://www.diplomatie.fr/culture/france/archeologie/ind_jerf_el_ahmar.html

bonne navigation sur le nouveau lac..., et surtout bonne année 2001.

From J. Baumgarten, H.G.K. Gebel, K. Traulsen, *ex oriente*: The web address of the ex oriente site (under construction) is:

www.ex-oriente.de

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4th Workshop on PPN Chipped Lithic Industries (First Circular, 5/6/00)

Dear Colleagues,

As was decided in Venice, we have the pleasure to invite you to the "4th Workshop on PPN Chipped Lithic Industries". The workshop will be held in Nigde (Cappadoica, Turkey) from 4-8 June, 2001, just after the 23rd International Symposium of Excavations, Surveys and Archaeometry in Turkey".

We suggest four main themes of discussion:

1) Obsidian production and exchange from late Epipalaeolithic to Pottery Neolithic
2) PPN lithic technology
3) Integrative studies of PPN technical systems
4) PPN lithic cultural markers: spatial, social and symbolic.

Excursions to Neolithic sites and obsidian sources in the region are included in the program.

We kindly ask you to confirm your participation, indicating which theme(s) you would like to contribute to, before 1st November 2000. We would like to allocate most of the time to discussion and we suggest that there be short communications of strictly 10-15 minutes or posters.

In view of these proposals we would like you to send us before 15 February 2001 a digest of 5 to 10 pages long with 1 or 2 plates.

With our best wishes, Nur Balkan-Atli & Didier Binder

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