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NEO-LITHICS 3/97

A Newsletter of Southwest Asian Lithics Research

Editorial

A glance at the contents of this issue reveals that the field reports do not properly represent the intensity of late Epipaleolithic and Neolithic field research in the Near and Middle East over the past half-year: some areas are more heavily emphasized than others, while other regions are not represented at all. We hope it is clear that this sampling bias is not a consequence of the editorial policy of *Neo-Lithics*. We can only state that we include contributions that are submitted to us (within the limits of the deadlines necessary for publication), and we appeal here publicly that short field reports -not only from the Southern Levant- be sent to *Neo-Lithics* as soon as possible after the close of field seasons. There is an eager audience among our readers for immediate information concerning research projects (whether from the field or laboratory settings), and it is worthwhile for all of us to know what is under way, even if recently concluded or in-progress programs are at very preliminary states of reporting. We would like to emphasize that "field reports" should not be taken to include only excavations, but also any preliminary findings of post-season analysis that researchers feel may be of interest - and that might benefit from communication and contacts - to the subscribers of *Neo-Lithics*.

Gary O. Rollefson and Hans Georg K. Gebel

Diana Kirkbride-Helbaek (1915 - 1997)

Diana Kirkbride-Helbaek passed away in Aarhus, Denmark, on August 13, 1997, at the age of 81. She was raised in Norfolk and Southampton, England, and after obtaining a degree from the Institute of Archaeology, University of London, she went on to become one of the best-known and most active archaeologists in the Near East. Diana-Kirkbride Helbaek was part of small but very influential group of women scholars who carved out successful archaeological careers after World War II. Among the positions she held during more than 30 years of active research included Archaeologist for the Department of Antiquities in Jordan (1956-1957); Research Associate, Institute of Archaeology, University of London (1958-onward); Wainwright Fellow of Near Eastern Archaeology, University of Oxford (1965-1974); and Director of the British School of Archaeology in Iraq (1970-1975). Few archaeologists of any generation had as extensive and diverse a range of field experience. The Southwest Asian projects she participated in spanned virtually the full breadth of human occupation. These included Paleolithic excavations at 'Ain al Assad, Jordan 1956; Madamagah Rock-shelter, Jordan, 1958; Adlun Caves, 1958-1964 (Co-Director with D. Garrod); Jazira Survey, Iraq, 1970 (Co-Director with L. Harding), Neolithic excavations at Jericho, West Bank, 1952-1958 (K. Kenyon, Director); Abu Suwann, Jordan, 1956; Beidha, Jordan, 1958-1967, 1983; Çatal Höyük, Turkey, 1963 (J. Mellaart, Director); 'Ain Abu Nekheileh, Jordan, 1964; Labweh, Lebanon,

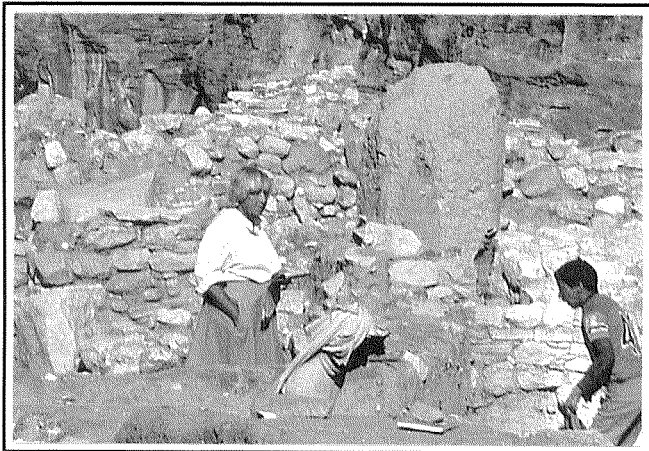


Fig. 1. Diana Kirkbride-Helbaek excavating at Beidha, during the 1983 season (photo by Brian Byrd).

1969; 'Ard Tlailil, Lebanon, 1969; and Umm Dabaghiyah, Iraq, 1971-1974, to the historic era site of Jerash, Jordan, 1956; Petra, Jordan 1957; Riskeh, Jordan, 1963; and Rumm Nabatean

Temple, Jordan, 1963. It was during the fieldwork at Beidha that she became acquainted with and ultimately married Hans Helbaek, the pioneering Danish paleoethnobotanist.



Fig. 1. Diana Kirkbride-Helbaek visiting Beidha with two former workmen during 1988 (photo by Brian Byrd).

Diana Kirkbride-Helbaek produced over 70 publications on the archaeology of the Near East in edited books, final reports, and journals such as *Annual of the Jordanian Department of Antiquities*, *Antiquity*, *Archaeology*, *Bulletin of the Institute of Archaeology*, *Discovery*, *Harvard Theological Review*, *The Illustrated London News*, *Iraq*, *Mélanges de l'Université Saint-Joseph*, *Palestine Exploration Quarterly*, and *Revue Biblique*. However, she is best known for her articles on the prominent excavations at Beidha and Umm Dabaghiyah. At both sites, she focused on investigating the economy and intra-site spatial patterning of two moderately-sized prehistoric sites through broad horizontal excavations. This fieldwork yielded large numbers of excavated buildings with well-preserved architecture and features, providing rare glimpses into community layout and organization. Undaunted by a stroke after the final field season at Beidha, she initiated a major project in 1987 to publish monographs on the Natufian and Neolithic occupations at the site. Although the final reports on Beidha and Umm Dabaghiyah are not yet published, they will represent an enduring part of her legacy. Vibrantly individualistic with strong views on archaeological research and appropriate methods, and that rare gift for choosing just the right site, her passing leaves a void in Near Eastern archaeology that won't be filled.

Brian F. Byrd

Tamar Noy (1926 - 1997)

Tamar Noy died on August 14, 1997 in Jerusalem at the age of 71. She was born in Kfar Yehoshua, where she was raised and where she graduated from high school. She studied archaeology and geography at the Hebrew University and wrote her Ph.D. under Prof. Stekelis. Being among the first Israeli prehistorians and to specialize on chipped Neolithic industries, she started her career by building up the first prehistoric exhibition at the newly opened Israel Museum at Jerusalem in 1965, where she served as the curator for the prehistoric periods until her retirement in 1992. Here she curated the permanent prehistoric exhibition and published its catalogue. One of her permanent interests was the symbolic artifacts coming from the Pre-Pottery Neolithic. Excavations at three important sites were carried out by her: Nahal Oren, Netiv Hagdud, and Gilgal, making her a prominent figure in Neolithic research in the Holy Land. Her last project, the study of the human representation in the prehistoric art of the Holy Land, will soon be published by the Israel Museum. Tamar was a special person in many respects; above all we remember her permanent engagement and motherly warmth.

On Sunday, 14 Dec., the day of the unveiling of Tamar's tombstone, the Israel Museum will have an evening in her memory. Yael Yisraeli from the Israel Museum will eulogize her, and there will be five papers presented by leading prehistorians in Israel honouring her (A. Ronen: The Yir'on Site - Two and a Half Million Years Old; A. Gopher: Nahal Hadera 5, a Kebaran Site on the Coastal Plain; S. Rosen: The Beginnings of Pastoral Mobil-

ity - An Overview from the Negev; N. Goring-Morris: News from the Kfar-Hahoresch Excavations; B. Arensburg: The New Paleoanthropology).



Fig. 1. Tamar Noy in April 1995 (with Y. Nishiaki), during the 2nd Workshop on PPN Chipped Lithic Industries held in Warsaw (photo by Frank Hole).

On Thursday, 25 Dec., the Israel Prehistoric Society will have a session in Tamar's memory during the Annual Conference of the Israel Prehistoric Society, taking place this year at Haifa University (organized by Mina Evron). Tamar will be eulogized by Abraham Ronen, and four papers will be presented in her honour: D. Nadel (on Nahal Oren), O. Zakheim (on ochre origins in the Natufian complexes from El-Wad, Hayonim and Eynan), N. Goring-Morris (on Kfar Hahoresch excavations), and A. Belfer-Cohen (on unique finds in the excavations of the Natufian layers at Hayonim Cave, summer 1997).

Neo-Lithics, editors

On Its Own Account: The Distribution of *Neo-Lithics* by *ex oriente*

Due to problems concerning subscriptions, administration, and postage costs, we have to restructure some aspects of the distribution services:

- 1) *Neo-Lithics* from now on can only be ordered for a minimum of 6 issues. Already beginning in 1997, *Neo-Lithics* will appear three times a year.
- 2) One's subscription status is indicated in the individual address field of the envelope; *with the last paid issue subscribers automatically receive an invoice for the next 6 issues*. No additional invoices will be sent to subscribers who already paid years ahead.
- 3) If an invoice is not paid after three months, it is understood that the subscription will be terminated.
- 4) Payments a) should be by Euro/ Mastercard or b) by checks drawn on a German (made out to *ex oriente*) or a US (made out to Gary O. Rollefson) bank accounts.
- 5) We cannot guarantee that subscribers will receive issues by airmail, since cost calculation is based on German surface mail fees. However, we will try to make arrangements to speed mail delivery.
- 6) Please send subscription orders to Bernd Müller-Neuhof, *ex oriente*, email: bemuneu@zedat.fu-berlin.de, or fax: 0049 30 8314252.
- 7) Due to the increased size and number of issues, *the subscription price must be raised* for the 6 issues/two year subscription to 48 DM/ or 30 US\$.

Bernd Müller-Neuhof

The Use of Acorns as Food Among the Modern Kurds of Northern Iraq

Ralph S. Solecki and Rose L. Solecki
Texas A&M University

This paper presents data on the use of acorns as food in the modern Near East, specifically among the tribal Kurds of northern Iraq. We hope that this information will prove useful in the continuing discussion on the role of acorns in the earliest village settlements in the Near East, and to the question of the beginnings of agriculture in the region (see OLSZEWSKI 1993 for an overview of these problems).

Two types of information are presented here. First are the important data provided by an elderly Zibari Kurd now living in the United States, but whose home village is some 20 miles from Shanidar Cave in the Zagros Mountains of northern Iraq. Also presented here are observations recorded by Ralph S. Solecki on the Shirwani Kurds who were living in Shanidar Cave while he was excavating at the site.

The Kurdish informant is Azziz Zibari, aged about 80. He reported that acorns were used in times of stress and food shortages. They peeled the outer shells from the acorns and then boiled them to remove the inner shells. The latter process probably made them less bitter. Then they pounded the acorns into a meal and made this meal into cakes or small breads. If they had any wheat or barley flour at all, they mixed it with the acorn flour, for even a little of the grain flour made a much better tasting bread. They also tried to eat the acorn bread with something sweet. The informant mentioned sweet grape sauce, but honey or anything sweet would do. However, even with the sweet sauce the acorn cakes were still somewhat bitter tasting.

The senior author was able to observe some of the food preparation methods used by the Shirwani Kurds resident in Shanidar during the winter or colder months. It was the task of the Shirwani women and girls to prepare the vegetal foods. There was a large boulder mortar located toward one side of the cave (Figs. 1, 2). Next to it was a modern rotary quern for grinding grain. The boulder mortar and a stone pestle were used for pounding the acorns into meal or flour. A young girl prepared the acorn flour as follows. She spat on her hands, grabbed the stone pestle about the middle in both hands, and raised it high over her head. She brought it down on the acorns, emitting a long *ssssh* sound, punctuated by the thud of the heavy stone on the meal in the mortar. The crushed acorn meal was collected in a pan when the work was completed and stored for future use.

The boulder mortar was a block of limestone, evidently detached from the cave ceiling, that measured about 80 x 80 x 80 cm. The mortar hole had a smooth interior surface with a rounded base and slightly tapering sides. The hole was about 15 cm deep and 13 cm in diameter. The stone pestle was an ordinary smooth-surfaced river cobble measuring about 30 cm long and 10 cm at its greatest diameter. There were abrasion pits and marks on the ends.

Modern Iranian villagers also used acorns by roasting them in addition to pounding them into a meal for making cakes (WATSON 1979). Possibly Proto-Neolithic inhabitants of Shanidar Cave (ca. 10,000 years ago) also prepared acorns for food by roasting them. Eight stone pavements, made up of small limestone rocks with abundant evidence of burning, were recovered from the Proto-Neolithic deposits at Shanidar Cave. Similar stone pavements have been recorded at other roughly coeval sites in Iraq, such as Karim Shahr.

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Interpretation, Data and the Khiamian of the South-Central Levant

Ian Kuijt

Brandeis University, Tufts University

"Assemblages from the terraces of El-Khiam or Nahal Oren cannot be included in their entirety in the Sultanian and probably most of their microlithic tool group is due to natural mixture." (Bar-Yosef 1981: 562)

"To conclude, I would like to emphasize that it is very difficult to differentiate between Khiamian and Sultanian assemblages. The range of variability of both entities (in typological and technological terms) is wide and overlaps in many cases. Caution is advised when assigning an assemblage to each." (Nadel 1996: 134)

In many ways the successful description and classification of all data in the natural and social sciences depends upon the identification and acceptance of what is, or is not, held to be representative of a particular phenomenon. The creation of archaeological cultural-historical sequences relies, at least partially, upon the identification of type sites with demonstrably different material culture, produced by cultural processes that are generally understood, and that are held to inform us as to regional typological and technological changes through time. Within the confines of this process, however, exists variability in material culture that can be the by-products of different occupational periods at individual settlements and/or variation in the types of activities occurring on site, both of which that can result in inter- and intrasite variation that confuses the process of understanding the past. Ultimately, the challenge faced in the process of generating cultural-historical sequences based upon lithic technology is the question of how and why do we identify and accept some archaeological patterning as representative but not others. One example of such debate and discussion, albeit a rather esoteric one, is seen in series of recent discussions on the cultural-historical sequence of the Pre-Pottery Neolithic A period of the south-central Levant, and specifically, how the facies of the Khiamian and Sultanian have been defined on the basis of select phenomena (see CROWFOOT PAYNE 1976, 1983; GARFINKEL and NADEL 1989; GOPHER and BARKAI 1997; NADEL 1990; SHILOH and BAR-YOSEF 1997). As an expansion of this on-going discussion, in this paper I want to briefly touch upon several aspects of this topic, including clarifying some misunderstandings by Gopher and Barkai (1997) of the excavations and interpretation of the PPNA sites of 'Iraq ed-Dubb and Dhra' (KUIJT 1994, 1996; KUIJT *et al.* 1991). Focusing the discussion in new directions, I want to consider briefly the historical and intellectual foundations of the construction of the Khiamian and Sultanian, reflect upon some of the implications of this awareness, describe what I see as three problems in the articulation of this cultural-historical scheme with current archaeological data, and briefly outline for further discussion some of the possible models to account for existing data patterning.

Reflection, Interpretation, and Archaeological Data

As with many active discussions about cultural-historical sequences, debate often centers upon two dimensions of archaeological research: the presentation of archaeological data and the interpretation and reflection, at various points, of the cultural and temporal affiliation of such data to the past. Noting the importance of this distinction, I am thankful that Gopher and Barkai (1997) drew attention to a few instances in which I should have either been more explicit in my use of terms, or in which I was in need of correction, specifically in my incomplete description of the lithic materials from 'Ain Darat and Gesher. Just as importantly, they are correct in calling for the use of explicit terms, such as lunates vs. microliths, in such discussions. In light of the issues raised by Gopher and Barkai, I believe it is important to clarify some aspects of the content and scope of the original *Paléorient* (1991) article and implications of the later research notes on 'Iraq ed-Dubb and Dhra' in *Neo-Lithics* (1994, 1996).

The original article focusing on the work at 'Iraq ed-Dubb (KUIJT *et al.* 1991) presented preliminary observations of the kinds of materials, including lithics, recovered during excavations in 1989 and 1990. This paper included a discussion of the kinds of tools such as Khiam projectile points, sickle blades, Hagdud truncations, and small lunates, with only preliminary observations and interpretation of how these materials appeared to fit within the context of the existing cultural historical scheme of the PPNA. In light of the on-going nature of these excavations at the time, no quantitative data were presented of the number, percentages, or metrics of different tool types, either for the entire site or through detailed analysis of lithic materials by stratigraphic unit. Nor were any final stratigraphic or chronological divisions published in this report, as excavations had yet to extend below the residential structures of the PPNA (into what later turned out to be Late Natufian deposits in the cave) and only one radiocarbon sample had been processed. Presentation of such data, let alone speculation of the potential implications, would have been both premature, unwise and potentially misleading to interested researchers. As is usually the case for reports during on-going excavations, there was no intention of providing pre-laboratory quantification, stratigraphic placement, or analysis of excavated lithic materials in this article.

Preliminary reports provide a valuable means for insight into the on-going results of excavations and the chronological placement of recovered materials. As is exemplified by the short 1994 *Neo-Lithics* report for 'Iraq ed-Dubb, however, it is necessary for other researchers to keep in mind that such interpretations are preliminary and subject to subsequent revision on the basis of detailed laboratory analysis. In this case, subsequent stratigraphic and laboratory analysis of lithic material, in conjunction with processed radiocarbon dates, has caused me to re-think some of the preliminary chronological and cultural interpretations made in the 1991 *Paléorient* report. Specifically, there is no question that there is clear evidence for a Late Natufian occupation, followed by some kind of PPNA occupation in the cave dated to c. 10,000 bp (uncalibrated). Not surprising in a cave site, certain contexts exhibited mixing of materials from the Natufian and PPNA occupations. As discussed in Kuijt (1994), detailed consideration of vertical and horizontal spatial distributions suggests that the point types and Hagdud truncations predominately came from the PPNA deposits, and the small lunates were predominately recovered from either mixed contexts or from the Late Natufian strata. This distinction, coupled with excavation results from Dhra' and comparisons with other regional patterning, has led me to reconsider the interpretation that these PPNA materials should be labeled as Khiamian. Whether correct or not, I strongly believe that such interpretive reflection on regional chronological sequences and the labels we apply to excavated cultural materials is both warranted and required in our work. Such reflection is not, however, a modification of basic facts and data.

Historical Dimensions of the Khiamian and Sultanian Facies of the PPNA

Echoing some of the concerns expressed by others (e.g. GARFINKEL and NADEL 1989; NADEL 1988, 1990), over the last several years I have become concerned that the existing chronological model of the Khiamian and Sultanian as articulated by Crowfoot Payne (1976, 1983) no longer satisfactorily accounts for the data we have on regional technological and typological patterning in the south-central Levantine PPNA in general, and specifically for the large settlements in the Jordan Valley. Moreover, I believe that post-1990 archaeological research or publication of data from Netiv Hagdud, Salibiya IX, Gilgal I and Dhra' illustrate that: 1) data from new and publication of previous excavations do not fit the technological, typological, and chronological explanatory model of two facies; and b) we neither clearly understand the reasons for, nor processes by which, technological and typological variability was created in PPNA lithic assemblages. For these reasons, it is important to consider briefly the original comparative foundations for two facies of the PPNA, and subsequent reflection as to the suitability of these as type sites, articulated through the original works of Echegaray (1966) and Crowfoot Payne (1976, 1983).

Starting with this premise, I would like to outline a number of relevant points that I believe require us to at least redefine

technologically and typologically the Khiamian without reference to the PPNA sites of El-Khiam and Nahal Oren, and perhaps even reconsider the extent to which there is evidence for two facies that chronologically follow each other. First, echoing the arguments of Bar-Yosef (1981) at the start of this paper, I believe that much, if not most, of the microlithic components (including lunates) from El-Khiam and Nahal Oren may well be from Natufian occupations. Second, I think that most researchers would agree that Crowfoot Payne's original interpretive framework for the PPNA Jericho lithic materials was strongly influenced by, and originated in opposition to, the excavated materials from El-Khiam and Nahal Oren, the only other comparative PPNA lithic assemblages available in the south-central Levant in the late 1950s and 1960s. Third, it should be noted that Crowfoot Payne's original grounds for separating the Jericho materials from those of Nahal Oren and El-Khiam relied only on projectile points: later research emphasized the importance of other dimensions of lithic technology, such as microliths, lunates, bifacially flaked axes and sickle blades. Moreover, I believe that her original perception of differences between Jericho, Nahal Oren and El-Khiam, as expressed in the number and percentages of projectile points, was seriously overstated and has more to do with archaeological sampling issues, such as the lack of screening and speed of excavation, than they do with any real cultural phenomena. In sum, I suggest that the lack of radiocarbon dates and possible, if not demonstrated, stratigraphic mixing at El-Khiam and Nahal Oren, and variations in recovery methods from Jericho, undermine Crowfoot Payne's (1983) perceived differences and arguments for an earlier Khiamian and later Sultanian facies of the PPNA. Collectively, these points not only undermine the extent to which El-Khiam and Nahal Oren should be employed as type sites representative of a particular phase in a cultural-historical sequence, but perhaps more importantly, they question the archaeological and interpretive foundation upon which her vision of the Khiamian was based.

In some ways it is rather unnerving to note that one of, if not the, major published foundation for the subdivision of the PPNA into two phases consists of a two page conclusion section published in 1983, based on archaeological research undertaken almost thirty years earlier in which no screening was undertaken (see CROWFOOT PAYNE 1983: 664-665). In this short discussion she addresses the Aceramic Neolithic A of Jericho and its cultural and chronological placement vis-à-vis other PPNA sites, and devotes considerable time reflecting upon the distribution of Khiamian points at different sites, if they were derived, and what the implications were for such patterning vis-à-vis cultural-historical sequences. Drawing heavily upon Echegaray's re-excavation of El-Khiam (ECHEGARAY 1963), in which he labeled the Khiamian points and the industry to which they belong as Khiamian, she attempted to explain why only eight Khiamian points were also found in the PPNA layers of Jericho (CROWFOOT PAYNE 1983: 664). Although accepting the interpretation that the industry at El-Khiam was different from that of PPNA Jericho, she was clearly troubled by the contexts and possibility of mixing of strata at El-Khiam. She remarked (1983: 665): "The complete content of the industry at el-Khiam is still uncertain; the stratigraphy is based on steeply sloping levels, and there must be considerable typological confusion in all the upper levels."

Along similar lines, she was both intrigued by the similarities and differences with the materials from Nahal Oren and at the same time concerned with their contexts. Discussing some of these differences, Crowfoot Payne (1983: 664) noted: "There are more lunates and other microlithic elements than at Jericho; it is possible that these are, in part at least, derived from underlying levels, and it is hoped that further work on the lunate typology of Nahal Oren may be helpful here." Importantly, she also noted that "Nahal Oren is clearly a most important site for the period, but like Mugharet el-Wad and Hayonim, and unlike Jericho, it is stratigraphically very difficult to interpret." This same concern is expressed by other researchers (e.g. NADEL 1997) and concisely stated by Bar-Yosef (1981: 557) in his discussion of Nahal Oren and El-Khiam: "The terrace of El-Khiam has been excavated twice. But in spite of the colluvial nature of the deposits, both excavators hardly considered the possibility of natural mixtures. The presence of microlithics in various older and younger (Neolithic) layers was accepted as a sound fact. This is

quite surprising in view of the Neolithic walls and the fireplace uncovered by Echegaray, which indicate considerable leveling activities. Therefore, the inclusion of microliths (up to 40%) in the Neolithic assemblage must remain open to doubt." As seen above, these researchers raise serious question concerning the context of the Neolithic materials from El-Khiam and Nahal Oren, as it is not possible to demonstrate unequivocally if specific material is associated with an earlier or later occupation.

It is also important to note that Crowfoot Payne's 1983 discussion of Sultanian as a cultural and temporal entity revolved around the low number and percentage of projectile points from Jericho in comparison to El-Khiam, a pattern that can also be linked to sampling issues. She argued that there were several possible explanations for the presence of Khiamian points in the Sultanian of Jericho, albeit in low numbers (1983: 665). First, she noted that it was possible that they were derived from Late Natufian levels. Second, these may have reflected the presence of intruders and neighboring tribes. She dismissed both of these two possibilities, largely on the basis of spatial distribution, and argued that Khiamian points were integral components of the PPNA materials from Jericho, produced and used by local inhabitants, an argument that I think most researchers would agree with today. Citing the relatively low number of projectile points recovered at Jericho compared to El-Khiam, she believed that the Jericho PPNA occupation occurred chronologically after that at El-Khiam. Accepting Echegaray's (1963) labeling of the PPNA material from El-Khiam as Khiamian, she labeled the PPNA from Jericho under the distinctive intellectual umbrella of the Sultanian, which she envisioned as a development from the Khiamian with the gradual addition of core-tools and the disappearance of microlithic elements and ultimately the absence of the Khiamian point. If one accepts, as illustrated by her words, that the intellectual cornerstone of this identification was based, at least partially, on the low number of projectile points at Jericho (with no screening) and high number of lunates and microlithics from El-Khiam (derived from Late Natufian deposits according to BAR-YOSEF 1981), then it follows that archaeologists should as a minimum redefine the sub-division of the PPNA cultural-historical sequence on the basis of other excavated sites/materials, and perhaps even reconsider the suitability of such a cultural-historical scheme for the PPNA.

Table 1. Different descriptive cultural-historical sequences and related issues for PPNA settlements in the Mediterranean areas of the south-central Levant. Note: these models and their elements need not be mutually exclusive.

Chronological Replacement: Khiamian by Sultanian

Late Natufian > Khiamian > Sultanian > PPNB

Issues: (a) Khiamian is currently undated radiometrically; (b) some inconsistencies between model and data (e.g. Gilgal I and Dhra' are radiocarbon-dated to c. 10,000 bp, yet contain no lunates or Hagdud truncations); and (c) problematic nature of existing type sites.

Chronological Replacement: Sultanian by Khiamian

Late Natufian > Sultanian > Khiamian > PPNB

Issues: (a) model is consistent with dating of some sites; (b) Khiamian is currently undated radiometrically; and (c) Technological and typological data seem to be at odds with model.

Contemporaneity and Co-existence

Late Natufian > Khiamian/Sultanian > PPNB

Issues: (a) envisions Khiamian and Sultanian as different and contemporaneous cultural, ethnic, or functional expressions; (b) Khiamian is currently undated radiometrically; (c) implications for group maintenance; and (d) requires an understanding of how these two groups would be defined materially.

Derived Late Natufian "mixed" with PPNA

Late Natufian > PPNA > PPNB

Issues: (a) assumes some technological and typological diagnostic lithics are derived from other deposits; (b) not clear how such a model would accommodate high interassemblage variability for different PPNA sites; and (c) how do archaeologists determine which materials are derived?

Interassemblage Variability

Late Natufian > PPNA > PPNB

Issues: (a) assumes interassemblage variability accounts for some perceived differences between PPNA assemblages; (b) raises the possibility that Khiamian and Sultanian should be subsumed; and (c) assumes typological and technological differences are not due to issues of chronology.

Issues, Concerns, and Archaeological Context

Beyond these problematic dimensions related to the intellectual history, sampling differences, and mixing of lithic materi-

als from the type sites employed for the cultural-historical sequences as articulated by Crowfoot Payne (1983), there are at least two other concerns that, while often mentioned indirectly, have not been directly dealt with by researchers. First, it is of concern that the PPNA components neither from El-Khiam nor Nahal Oren have been dated by radiometric means, and that the radiocarbon dates from the site of Salibiya IX appear to indicate a different period of cultural occupation (SHILOH and BAR-YOSEF 1997). Considering El-Khiam, how are we to argue unequivocally that these PPNA materials predate those of other sites such as Jericho if they are not dated by some absolute means? Recognizing this potential problem, Crowfoot Payne (1983: 665) used the site of Salibiya IX for Khiamian materials from a better context. Although Salibiya IX was excavated by outstanding field archaeologists, we are again faced with the problem that this site is not satisfactorily radiocarbon dated. Specifically, the limited scale of these excavations (9m² sounding), the absence of definable architecture, and radiocarbon dates of 18,500 ± 100 (Pta-3385) and 12,300 ± 470 (Pta-3008), make it difficult to understand the chronological placement of these materials. In the absence of radiometric dating of these deposits and these assemblages, we cannot at the moment, other than through relative means, demonstrably place these remains in a chronological location before the PPNA materials of Jericho as proposed by Crowfoot Payne, nor can we be entirely sure as to the qualitative and quantitative character of their lithic assemblages.

I should be clear in stating that it may well be, as argued by Shiloh and Bar-Yosef (1997), that the lithic assemblage from Salibiya IX is different from that of Jericho and some other sites in the PPNA. The key question is why do the numbers and percentages of specific tool types for sites such as Salibiya IX, and for that matter the PPNA occupations from El-Khiam and Nahal Oren, differ from other assemblages, such as that of Netiv Hagdud, Gilgal I, Jericho, and Dhra'?

Second, a number of relatively recent publications have introduced the serious question of how archaeologists can reconcile the presence/absence of selected diagnostic materials from some radiocarbon-dated early sites (e.g. the "Sultanian" assemblage Netiv Hagdud with lunates), and what technological and typological materials can be used to distinguish different facies. As noted earlier, Crowfoot Payne (1983: 665) interpreted the differences between PPNA Jericho and El-Khiam as a chronological development of the Sultanian from the Khiamian, "... with the gradual addition of core-tools and the disappearance of microlithic elements, and ultimately of the Khiamian point itself." Without specifying the timing for such a transition, this framework assumed that microlithic elements, including lunates, should be present at sites dating to earlier stages of the Aceramic Neolithic, and that they disappear later on. As employed more recently, some defining features of a Khiamian assemblage include a microlithic industry, the appearance of El-Khiam points, the absence of bifaces and polished celts, and the absence of Hagdud truncations. This is in contrast to the Sultanian in Netiv Hagdud, which according to Shiloh and Bar-Yosef (1981: 38-39) contains polished celts, bifaces, Hagdud truncations, Beit Ta'amir knives, and an increased use of blades.

Adopting a different perspective, Nadel (1997: 134) argues that both the Khiamian and Sultanian industries contain microliths, noting that lunates are more frequent than El-Khiam points at Netiv Hagdud. Based on statistical comparisons between other sites, he also argues that there is considerable variability within and among chipped stone assemblages, and that the relative quantity of these two types cannot serve to distinguish between different periods. While acknowledging his overall point that there appears to be considerable variability in assemblages, there are reasonable grounds to argue that we should be concerned about the identification of lunates as being from PPNA contexts at some sites. For example, the mean length of lunates from Salibiya IX is 11.76 mm (range between 9 and 16 mm), a size that is indicative of the placement of these materials at the end of a trend of size reduction that developed during the Natufian. While we cannot resolve how close to the end (either Khiamian or Late Natufian), this does provide us a puzzling perspective on the lunates from Netiv Hagdud. Specifically, the mean length of lunates recovered from Netiv Hagdud is 17 mm (range between 10.2 and 22.7 mm), some 30% greater than those

from Salibiya IX (SHILOH and BAR-YOSEF 1997: 35). Viewed from the recognized typological and technological patterning of mean lunate length from other Natufian sites, these data suggest that at least some of the Netiv Hagdud lunates predate the lunates from Salibiya IX. This indicates that either: 1) some, if not most, of the lunates and trapezes at Netiv Hagdud are intrusive, or 2) the lunates are not intrusive, and therefore, lunates not only continue to be employed throughout the main occupation (c. 9,700-9,600 bp, uncalibrated) but that mean lunate length increases again to a length that is comparable to that of the Late Natufian.

Third, archaeological excavations conducted subsequent to Echegaray and Crowfoot Payne's creation of a dual PPNA cultural-historical interpretive framework demonstrate that the temporal and material expectations for their model do not fit the technological and typological data from some key large PPNA settlements. For example, the archaeological evidence from two (Gilgal I and Dhra') of the four (the others being Jericho and Netiv Hagdud) known major agricultural villages in the Jordan Valley do not fit the cultural-historical model and related material expectations for the subdivision of the Khiamian and Sultanian in the south-central Levant (Table 1). As noted by Bar-Yosef and Gopher (1997: 252), Gilgal I is a PPNA village with multiple uncalibrated radiocarbon dates from contexts with associated architecture and with a lithic assemblage characterized by El-Khiam points and bifacially flaked axes/adzes. As Gopher and Barkai (1997: 17) point out, however, excavations at Gilgal I, with six radiocarbon dates centered around 9,900 uncalibrated years before present, have not produced lunates or Hagdud truncations (see also NOY 1989) but appears to predate Netiv Hagdud. The complex nature of this situation is further illustrated by Nadel's observation (1997: 134) that while bifaces and Hagdud truncations are characteristic of Sultanian sites, some loci at Netiv Hagdud contain no bifaces and very few Hagdud truncations, and could therefore be defined as being Khiamian.

In a roundabout way this brings us back to the title of the *Neo-Lithics* note in which I presented the question "Where are the microlithics?" at Dhra'. Similar to the pattern at Gilgal I, dated to the same period of the PPNA, excavations at Dhra' recovered no lunates or Hagdud truncations. In light of questions raised by Gopher and Barkai (1997) in their *Neo-Lithics* reply, I should reiterate that at Dhra' Area I, all material was sieved through 2 mm mesh, and that 20% of the excavated sediment from Unit One was sieved. Moreover, over 18m³ of PPNA cultural deposits from Dhra' were sieved through 2mm mesh, of which 7m³ were from Unit One and Structure I, radiocarbon-dated to 9,610 ± 170 bp (ISGS-3277), and 11m³ were from Area I, located in contemporaneous and later contexts with radiocarbon dates of 9,960 ± 110 bp (ISGS-2898) and 9,940 ± 180 bp (ISGS-3278) (KUIJT 1996: 8). Despite the volume of sediment screened from radiocarbon-dated contexts in both the earlier and later portions of the PPNA, and excavation with similar field methods employed at Netiv Hagdud and Salibiya IX, not a single lunate or Hagdud truncation was recovered. In light of these facts, the relevant questions become: "How are we to interpret the extremely low proportion of microliths in general, and lunates and Hagdud truncations specifically, from radiocarbon-dated contexts at Gilgal I and Dhra' in comparison with assemblages from other later PPNA villages, such as Netiv Hagdud, in which a greater percentage of microlithic tools, including lunates, were recovered? How do we explain the absence of some dimensions of lithic technology that are generally believed to be crucial in identifying the Khiamian in the early portion of the PPNA, c. 10,000 uncalibrated radiocarbon years?"

Discussion

It is clear at this point, I believe, that we must return to the need to reconsider some of the sources of variability within and among PPNA lithic assemblages in the Mediterranean area of the south-central Levant, and the implications of these patterns in generating cultural-historical sequences. For example, depending upon the typological and technological criteria and data prioritized by researchers, a number of very different possible explanations can be used to model cultural-historical sequences (see Table 1). While researchers may debate these interpretive sequences, I think that many would agree that we need to account for how and why some data are either consistent and inconsistent

with specific models. For my part, I am concerned that the current articulation of the Khiamian as a cultural facies is problematic in view of: 1) the absence of radiocarbon dates associated with materials from primary contexts and architecture; 2) that archaeologists have yet to understand the sources of the high level of interassemblage variability within and among PPNA settlements (GARFINKEL and NADEL 1989; NADEL 1988, 1990); 3) the possibility that the number and presence of some tools, such as bifacial axes, is at least partially the result of where archaeologists excavate within settlements, such as at Netiv Hagdud (NADEL 1997: 134); and 4) that the original conceptualization of the Khiamian and Sultanian by Echegaray (1966) and Crowfoot Payne (1976, 1983) at El-Khiam and Jericho was based upon questionable material perceptions due to mixing of cultural deposits from different periods at El-Khiam, a lack of radiocarbon dates from El-Khiam, and the lack of controlled screening for representative cultural materials from individual occupations. As noted previously (KUIJT 1996: 8), I believe it is important for us to evaluate the theoretical and data foundations of the Khiamian and Sultanian subdivision (CROWFOOT PAYNE 1983) as new research is conducted and more recent data become available. Such a process is not only necessary to account satisfactorily for new data that conflict with existing models, but perhaps just as importantly, such discussion and possible refinement of existing models is a healthy, natural dimension to professional research. These are, despite the subtleties of the words, very different things, for reflection on and reexamination of a phenomenon does not necessarily constitute rejection.

Ultimately, as researchers employing cultural-historical frameworks largely based upon lithic technology, we need to be able to explain why some settlements differ from a normative pattern and how this variation should be conceptualized in our cultural-historical sequences. This, in turn, challenges us to address several crucial, yet very complex, research questions. If we cannot solely explain differences in the PPNA archaeological record as reflecting chronology, then we need to explore other answers. Is it possible, for example, that some of the differences in tool assemblages from Gilgal I, Dhra', Jericho, Netiv Hagdud and Salibiya IX are due to functional tasks? If so, can these differences be linked to the ecological context of settlements (leading to various possible scenarios of the cultural and temporal interface between the Harifian and other communities, and possibly explaining the presence or absence of some tools over others)?

How are we to explain the high degree of interassemblage variation within and among individual settlements? One possibility is that settlements such as Gilgal I, Netiv Hagdud, Dhra' and Salibiya IX were occupied contemporaneously by different cultural groups, rather than sequentially in time. If this is that case, then researchers need to examine how and why different co-existing and presumably interacting early agricultural communities maintained different tool forms that resulted in contemporaneous Khiamian and Sultanian facies, and what are perceived to be the diagnostic materials for such groups. Alternatively, it is possible that the high level of interassemblage variation in PPNA sites is at least partially due to derived materials and archaeological sampling, implying that the PPNA should be treated as one single cultural and chronological entity. In light of these unresolved issues, the earlier call of Bar-Yosef (1981: 556-557) to define cultural-historical sequences on the basis of well-excavated settlements with radiocarbon dates from one-layer or single-component sites, with clear contexts and associated architecture, seems to be as important today as it was more than 15 years ago. I am sure that the future spirited discussion of the relative chronological, cultural, and functional importance of different kinds of material culture will provide the opportunity for Near Eastern prehistorians to support or modify cultural-historical sequences in a manner that can only serve to further our understanding of the Neolithic of the south-central Levant.

Acknowledgments

I thank A. Gopher, R. Barkai, H.G.K. Gebel, G.O. Rollefson, O. Bar-Yosef, M. Chesson, A. Belfer-Cohen and N. Goring-Morris for reading and commenting on this discussion. While not agreeing with all of the opinions expressed in this work, their comments have been very helpful in helping craft the tone, content, and direction of the arguments presented here, although

they should not be held accountable in any way for the resulting paper. Finally, I wish to reiterate to Avi Gopher and Ran Barkai that they are welcome to visit at any time: just in case the pace of discussion slows down a bottle of red wine and olives will be waiting on the table.

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An Apology to Ian Kuijt

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In *Neo-Lithics* 1/97 we published a short reply ("Here are the microliths...") to a paper by Kuijt in *Neo-Lithics* 2/96 ("Where are the microliths..."). We admit that our paper was too vigorously presented, and apologize for the tone and in some cases the wording. We wish to make it very clear and insure all our colleagues that this was by no means an attempt to discredit Dr. Kuijt. We wanted rather to raise the issue of using modified data. We claimed that there is a real danger of "losing" original data through modification, a claim that we hold important and deserving discussion. In our view, modification of data sets, especially published ones, while legitimate in itself, should be carried out in a very explicit way.

We consider Ian Kuijt a friend and a colleague, and we highly value this relationship. This will not, and should not in any way, prevent disagreements between us. We wish him every success and apologize again for the overly harsh tone of our reply.

Editors' Comment

We would like to add our apologies to Dr. Kuijt for our editorial mishandling of the issue. We should have sent the original manuscript of Avi Gopher and Ran Barkai to him for his comments before publishing it. However, we thank Dr. Gopher and Mr. Barkai for their prompt and gracious action.

Hans Georg K. Gebel and Gary O. Rollefson

Pebbles as Artifacts

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The PPNA strata at Hatula (Khiamian and Sultanian) yielded a large quantity of pebbles which had puzzled the excavators from the outset (WINTER and RONEN 1994: 13-15). A patterned distribution is seen only rarely, *e.g.* accumulated in pits or as pavements. As a rule, the pebbles were found dispersed in the 70-100 cm thick PPNA sediments. Many pebbles were broken, some with a typical jigsaw pattern (Fig. 1) of an unknown origin. Most other broken surfaces were planar. Our investigation aims to identify the cause of accumulation and abundance of the pebbles and to explain their presence and form.

Hatula is located on the western foothills of the Judean mountains. The summits around the site are capped by the strongly consolidated Beit Nir Conglomerate of Miocene-Pliocene age (BUCHBINDER 1969, SNEH and BUCHBINDER, 1984), which contains mainly dolomite and limestone pebbles originating in the Upper Cretaceous Judea group.

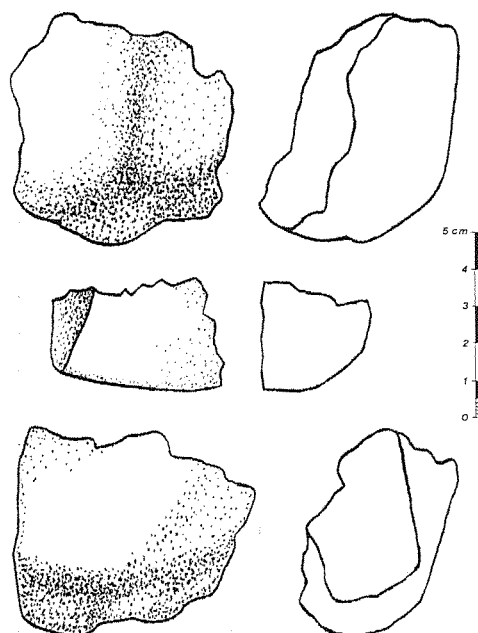


Fig. 1: Pebbles from Hatula with jig-saw break

The area around Hatula is largely affected by landslides (WACHS *et al.* 1986) with vertical displacements reaching up to 100 m. We have noticed that the slope on which Hatula is located has the shape of a stairway due to large blocks of conglomerate that obviously slid downslope. Hatula is located on the lowermost of these semi-horizontal steps, indicating that the major slides preceded the settlement.

Petrographic analysis carried out during the present investigation has revealed that many pebbles were burnt. Heating was not uniform: some pebbles were completely burnt, *i.e.*, they were black to the internal central parts. Others had only thin black carbonized rims or, in the case of dolomite, black rims and red interiors. Many pebbles show heating signs on one side only.

The Hatula pebbles were studied in two sample groups randomly collected in excavation areas A (Khiamian, 134 pebbles) and F (Sultanian, 130 pebbles). The pebbles were recorded by size, lithology, cracking pattern and heating signs (Table 1).

In both excavation areas the pebbles have almost identical average sizes. In both areas pebbles of dolomite and limestone dominate (80-90%), and in both areas some 90% of the pebbles are broken. It is not known why the jig-saw pattern is twice as common in area F as in area A, nor what caused the reversed dolomite: limestone ratios between the two areas.

A control sample of 69 pebbles was randomly collected on the slope opposite the site of Hatula (Table 2). That hill is also

capped by the Bet Nir conglomerate, but the size and composition of the pebbles is very different here from that found at Hatula. Heating hardly exists on this slope. With one half of Hatula pebbles heated, they seem to have been artifacts. It is worth noting that pebbles are completely absent in the Natufian of Hatula (RONEN and LECHEVALLIER 1991). This strongly suggests that the pebbles were not accumulated by natural agencies, but were selectively brought to the site.

Table 1: Statistics of Hatula pebbles.

Factor	Exc. Area A	Exc. Area F	Total
No. of Samples	134	130	264
Size \pm STD			
x (cm)	6.29 \pm 1.53	5.75 \pm 1.63	6.02 \pm 1.60
y (cm)	4.71 \pm 1.37	4.39 \pm 1.10	4.55 \pm 1.25
z (cm)	3.33 \pm 0.98	3.09 \pm 0.91	3.21 \pm 0.96
Lithology (%)			
Dolomite	57.4	31.5	44.6
Limestone	21.6	58.4	39.7
Chalk	3.7	2.3	3.0
Marl	0.7	0.8	0.8
Chert	6.7	1.5	4.2
Nari(Caliche)	9.7	5.4	7.6
Basalt	0.0	0.0	0.0
Cracking (%)			
Cracked Pebbles	79.1	78.4	78.7
Jig Saw Cracking	4.5	10.0	7.2
Cracked surfaces \pm STD	1.62 \pm 1.38	1.60 \pm 1.40	1.61 \pm 1.39
Burning (%)			
Hard	23.1	41.5	32.1
Slight	16.4	17.6	17.0
Sum	39.5	59.1	49.1

Table 2. Statistics of the pebbles from the control area (n = 69).

No. of Samples	Control Area
	69
Size (cm) \pm STD	
x	7.65 \pm 1.56
y	5.23 \pm 1.12
z	3.77 \pm 1.17
Lithology (%)	
Dolomite	8.7
Limestone	59.4
Chalk	7.2
Marl	16.0
Chert	2.9
Nari (Caliche)	5.8
Basalt	0.0
Cracking (%)	
Cracked pebbles	56.5
Jigsaw cracking	0.0
Cracked surfaces (\pm STD)	1.52 \pm 1.67
Burning signs (%)	
Hard	2.9
Slight	4.3
Sum	7.2

For comparison, pebbles from three other sites were studied: 1. Eynan, a large Natufian site (PERROT 1960) located on the west bank of the Syro-African rift valley at the foot of a dolomitic cliff with some limestone outcrops. 2. Munhata, a low mound located near the Jordan River, surrounded by alluvial soils and the Late Pleistocene Lisan Formation (SCHULMAN 1962). Older formations include some basalt flows, oolitic limestone, chalk, marl and gypsum. Munhata was occupied from the 8th to the 5th millennium bc (PERROT 1966), starting with PPNB followed by Pottery Neolithic (Sha'ar-Hagolan) and early Chalcolithic (Wadi-Raba phase). 3. Site 109, a single-level PPNB occupation located amidst drifting sand dunes and loess in the north-western Negev (BURIAN *et al.* 1976). Small outcrops of Eocene nummulitic limestone and chalk are exposed in the vicinity. The pebbles from the Natufian layer of Eynan and the PPNB layers at Munhata were collected by the authors in 1994. The pebbles from Site 109 were kindly provided by Mr. F. Burian.

Table 3: Comparative statistics of pebbles.

No of samples	Eynan 50	Munhata 50	Site 109 47
Size (cm) \pm STD			
x	8.16 \pm 1.46	7.68 \pm 2.29	3.77 \pm 1.10
y	6.53 \pm 1.24	5.29 \pm 1.33	2.86 \pm 0.92
z	4.72 \pm 1.25	3.62 \pm 1.39	1.91 \pm 0.74
Lithology (%)			
Dolomite	64.0	2.0	0.0
Limestone	36.0	10.0	95.7
Chalk	0.0	24.0	2.1
Marl	0.0	4.0	0.0
Chert	0.0	2.0	2.1
Nari (Caliche)	0.0	0.0	0.0
Basalt	0.0	58.0	0.0
Cracking (%)			
Cracked Pebbles	80.0	94.0	95.7
Jig-Saw Cracks	0.0	0.0	2.1
Cracked surfaces \pm STD	1.78 \pm 1.43	2.34 \pm 1.26	N.D.
Burning (%)			
Hard	36.0	12.0	63.8
Slight	24.0	32.0	25.5
Sum	60.0	44.0	89.3

Breakage and heating are abundant in the three sites. The low ratio of heating at Munhata perhaps reflects the difficulty of distinguishing heat signs on basalt. The relatively large gravels at Eynan may be explained by the proximity of the site to the rock outcrop, and consequently the minimal natural transportation of the fragments. The small size gravels in Site 109, on the other hand, possibly indicate a shortage of stones in this loess-and sand-covered area, which required transportation over longer distances than in the other sites and hence a selection for smaller stones. This could also explain the intensive use (*i.e.*, highest heating ratio) of the gravel in Site 109.

Conclusions

It is clear that in each case, the pebbles/gravel were collected in the vicinity of the site, reflecting the local rocks. Hatula exhibits the largest number of rounded pebbles among the sites studied here because of the pebbles released from the Bet Nir conglomerate. We believe that the jig-saw break pattern, practically confined to Hatula, results from the high tension forces formed between sliding and faulting conglomerate blocks. The fact that breakage is so common in all the sites, including the control sample (and it affects a wide range of raw materials) suggests that it is partly natural and partly due to the use to which these stones were put – most probably cooking and heating. This assumption can best explain the disordered presence of the stones everywhere in the sediment.

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Snakes, Lions and Other Animals: The Urfa-Project 1997

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In 1997 a third campaign of excavations at Göbekli Tepe and Gürcütepe, both in the vicinity of the Town of Sanliurfa in southeastern Turkey was undertaken by the Museum of Urfa and the German Archaeological Institute. At Gürcütepe, a group of 4 small mounds (Gürcütepe I-IV) in the Harran Plain, two new trenches were opened in Gürcütepe I, the easternmost hill, which had PN finds on surface. But the PN layer seems to have been destroyed by agricultural activities, so that only LPPNB deposits were found. Excavations were continued at LPPNB Gürcütepe II, and parts of two new pisé buildings (Houses 6 and 7) were exposed. A deep sounding on Gürcütepe II reached virgin soil at a depth of 4.1 m beneath the surface. According to a preliminary analysis, there does not seem to be anything earlier than LPPNB present. If this result is true for all four Gürcütepe mounds, it is evident that the settlements were not contemporaneous with nearby Göbekli Tepe on top of the limestone hills north of the Harran Plain, which is of extraordinary importance.

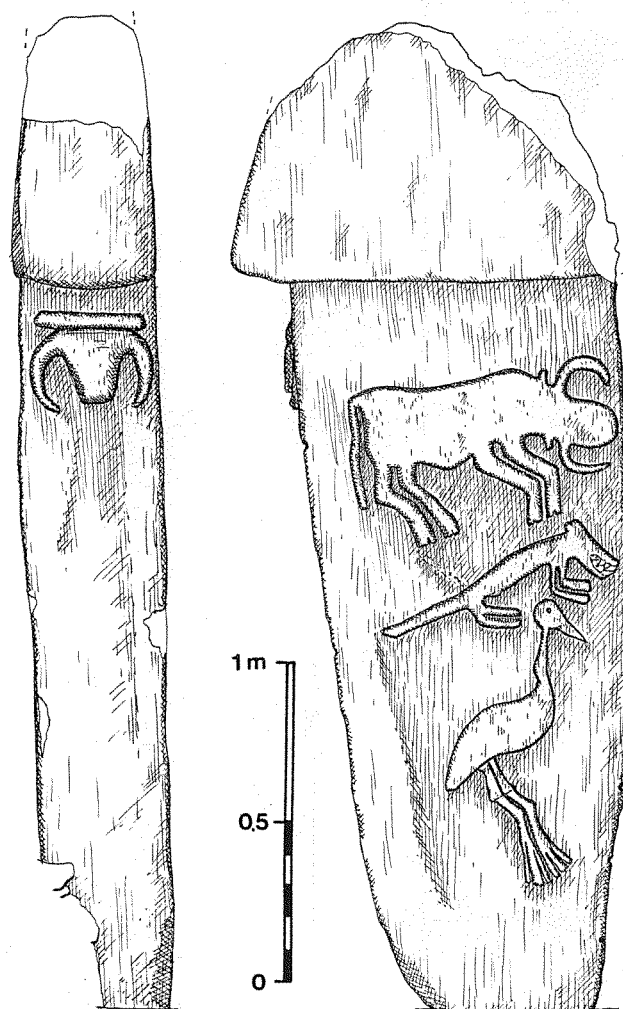


Fig. 1. Göbekli Tepe: Schlangenpfeilergebäude, Pillar 2.

At Göbekli Tepe excavations continued in the area of 1996 excavations, where parts of a large building with *in situ* T-shaped pillars were detected. Due to the presence of several snake reliefs on one of the pillars, the building was named preliminarily as the *Schlangenpfeilergebäude* ("Pillar of Snakes Building"). So far five T-shaped pillars have been found *in situ*, three

of them with reliefs. The two completely excavated Pillars 1 and 2 have a height of 3, 1 m above a limestone bench; the floor of this structure has been not yet uncovered.

Pillar 1: 4 snakes, 1 net-like object with snake-like

heads at top and bottom, ovicaprid

Pillar 2: bovid, canid, bird, bucranium (Fig. 1)

Pillar 3: without reliefs

Pillar 4: no relief visible, but so far only the T-shaped top excavated

Pillar 5: snake

Atop the eastern mound two more trenches were opened. In one rectangular room, with walls standing to 2m, four complete *in situ* pillars appeared. The floor, which is made in terrazzo technique, is covered by stone slabs that seem to be parts of a fallen roof. Whereas the western pillar had no decoration, on the eastern one a lion relief appeared. On the inner face of each pillar at the "T-Head" a male lion with an open mouth starts to jump to the center of the room. The building, whose size is not yet determined, was named preliminarily *Löwenpfeilerg Gebäude* ("Pillar of Lions Building"). Other relief fragments were reused in the walls of this room.

Both buildings are directly under the surface and the rooms have been filled mainly by erosion. No sealed deposits have been reached so far. But at the mound of Göbekli Tepe the lithic industry seems to be not later than MPPNB, since LPPNB or younger periods finds do not occur. Since the fill of the "*Schlängenpfeilerg Gebäude*" includes several PPNA types such as Helwan and Aswad points, a pre-PPNB dating of this complex cannot be excluded; the "*Löwenpfeilerg Gebäude*" at the top of the mound should be of the PPNB period. Radiocarbon dates will hopefully be available soon for both sites.

Including the several animal sculptures from former campaigns (SCHMIDT 1995: Fig. 1a-b, 1997: Fig 4-6) a series of wild animals now exists at Göbekli Tepe which could be explained in an apotropaic or totemic meaning. While some animals are depicted as male, no clear female symbol is visible so far.

The world of animals visible at Göbekli Tepe finds some similarities in the miniature pictures on the incised stones from Jerf el Ahmar (STORDEUR *et al.* 1996), with their snakes, the quadruped, and the reptile-like animal. The bovid from Pillar 2 of the *Schlängenpfeilerg Gebäude* finds parallels in Arabian rock carvings (e.g. HELMS 1981: Fig.9, Pl. 8), the bird at Çatal Höyük (MELLAART 1966: Pl. 62 a-b, 63 a-b). A mysterious language of pictures seems to appear, whose repertoire and syntax is mostly unknown. The understanding of all of these finds clearly needs further investigation. A preliminary statement can stress that the monumental buildings, which can be not later than MPPNB, are far away from the existing model of "Early Village Farming Communities". They give proof to a specific cultural behavior beyond subsistence strategies or adaptation of changed natural resources. The construction of the *Schlängenpfeilerg Gebäude* must have been organized by powerful people using religious imperatives to motivate the community to such enormous efforts. Further investigations in the architecture and iconography of Göbekli Tepe will be of first importance in understanding the development of the early Neolithic cultures.

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Excavations at Domuztepe 1997

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Domuztepe is a large (20ha) 6th and 5th millennium site south of Kahramanmaraş in southeastern Turkey. 1997 was the second full season of excavation by a joint team from the University of Manchester and UCLA under the direction of Elizabeth Carter and the writer. The project takes place in conjunction with Kahramanmaraş Museum. This report is intended as a brief note to describe some of the major results of the season; the accompanying report by Elizabeth Healey describes some of the more specifically lithic highlights. An initial report on the site in *Neo-Lithics* 2/96 included a contour plan of the site.

The main concentration of excavation remained Operation I in late or immediately post-Halaf levels on the summit of the southern mound of the site. The uppermost architecture has now been revealed over almost 400m² and largely consists of a series of narrow rectangular rooms, perhaps joined together to make small clusters, although whether these constitute houses as such remains unknown. Areas of functional variation are now emerging, particularly in the southeast of the area, where two oven bases and a room with a thin plastered floor are significantly different from the rest of the architecture. Underneath this architecture level was a series of plaster-floored tholoi. The completely excavated example was notable for its remarkably thick plaster floor, laid on a foundation of large pebbles, on which lay the collapsed debris from a flat roof.

Under this was a remarkable funerary deposit concentrated in the small pit in the base of a wider scoop, which has still only been excavated over about 60% of its total area. Stones had been placed on the base of the pit and several skulls placed on or by them. The skulls are poorly preserved and would seem to have been already damaged when they were buried; they may have been exposed for a considerable period or have come from other burials. One of the skulls still had the mandible in place, so it cannot have been completely decomposed at the time of burial and represents a rather more contemporary death. Although their damaged nature makes an accurate figure impossible until study has been completed, there were probably between six and nine skulls excavated. Grouped on the north edge of the pit was a group of long bones, but the number of individuals is much less than the number represented by the skulls. Surrounding all the human remains, and securely demonstrating that it was a single phase deposit, was a matrix of ash and burnt brick. Since neither the bones nor the pit was burnt this represents wider funerary activity. It is entirely possible that we are looking at the remains of a ceremony of some scale, with probable importance for community ritual and shared group activity.

A further find of some importance is a possible clay settlement tank in the northeast of Operation I. This is a 50cm wide channel recut on multiple occasions and filled with virtually pure clay. It is surrounded by clay-rich deposits with whitish lenses, interpreted as the result of periodic water-logging. Although this feature is as yet poorly understood (it may relate to any of our prehistoric phases of architecture in this part of the site) and more excavation will be needed, it does offer the potential of a new understanding of the nature, scale and organisation of ceramic production in the mid-5th millennium. Any comperanda would be gratefully received.

Elsewhere on the site, Operations II and III were continued and IV commenced. The last of these demonstrated that the prehistoric occupation extends almost to the highest point on the site - a total prehistoric deposit of c. 12m above plain level. A series of tholoi was excavated, including one in Operation II that contained a square central room. The rather odd nature of this double-wall construction may suggest either a special function (storage using greater insulation, perhaps) or that the outer circular wall was actually never of any great height; more of a boundary wall than a free-standing structure. It was to the south of this building that the knapping debris described by Elizabeth Healey (below) was discovered.

The finds from the site are remarkably rich. In ceramics, this includes not only Halaf pottery from all areas together with bur-

nished and coarser incised vessels, but also a vast range of types of decoration, so far individual to the site, including textile imitation, relief scales, surface manipulation, incision and unusual paint colours and techniques. More seals were discovered, confirming the impression of surprisingly high concentrations at the site. General evidence continued for a broad wealth of material culture, which might be associated with central functions of the site and the presence of high status individuals, although no archaeological features can be associated with them as yet. Included in this category is the variety of very fine stone bowls, including three more fragments of very fine ground and polished obsidian vessels.

Domuztepe: Lithics 1997

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This preliminary note is by way of providing information on two unusual features of the 1997 season in terms of the lithics, and also to seek information on similar finds at other sites.

A Late Halaf Flint Knapping Floor

One of the most interesting finds of the 1997 season was a small concentration of lithic debris from a late Halaf context located in Operation II, which has been interpreted as the debris from a knapping floor.

The pieces had fallen in a discrete, oval shaped area some 18 by 13cm, and though only about 3cm in depth, four layers of artefacts were recorded. It was excavated using a 5cm grid and each level planned at 1:2 scale (Fig.1). The artefacts of measurable dimensions were individually numbered for reconstructive purposes and the smaller pieces attributed to grid squares. Whole earth samples were also collected and will be examined for the minute "dust" particles associated with knapping (FLADMARK 1982).

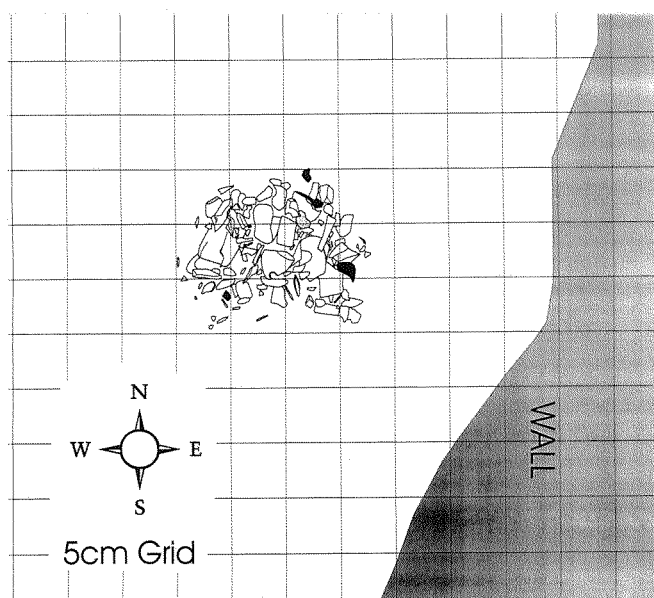


Figure 1: Level 3 of the lithic scatter

The scatter comprises some 850 pieces, including flakes with cortex (3.5%), two core trimming elements, flakes and blade-like pieces and numerous small flakes, fragments and shatter (about 17%); no cores were present. The raw materials suggest that the debitage comes from at least three flint cores and also includes 31 pieces of green obsidian (see below). All the lithics are in a very fresh, sharp condition and would suggest that it is part of an *in situ* knapping floor rather than a dump of debris. Technological study suggests poor knapping skills evidenced particularly by the lack of attention to the core platform edge that resulted in a dish surface of many of the flakes, severe step-fracturing on the core face, hinge terminations and the semi-random direction of the removals.

Such scatters provide a good opportunity to study behavioural aspects of knapping sequences and production targets (CAHEN 1987, CZIESLA *et al.* 1990). Modern flaking experiments suggest that a number of factors influence the size and shape of scatters, including the number and scale of knapping episodes, the height and position of the knapper, the way the core was held, as well as modes of percussion, intended object etc. (NEWCOMER and SIEVEKING 1990). Subsequent external factors such as trampling, erosion/deflation, human and animal activity can also affect the nature of the scatter (BARTON 1992).

The time-consuming search for conjoins within the Domuztepe scatter is only just beginning; already it is clear that several joins can be made within the scatter and we hope to extend this to the surrounding area. From this study we hope not only to examine knapping technology but also to determine steps in the knapping sequence. We have yet to establish whether it is in fact an *in situ* knapping floor or the result of dumping (KARLIN and NEWCOMER 1980). Either way, this scatter provides a vignette of lithic working in late Halaf times.

Obsidian - a Special Role?

The presence of obsidian flakes and chips amongst the knapping debris described above suggests that, in some circumstances at least, obsidian as a raw material was treated by the same people who worked the flint. We also know, however, that obsidian blades were detached by pressure flaking, a technique that has not so far been found amongst the flint blades at Domuztepe. Obsidian was used for arrowheads, cutting edges, scrapers, etc.

Other evidence for its distinctive role comes from its use for decorative items such as beads, lozenge-shaped plaques (both perforated and unperforated), pendants, and bracers, for which substantially more evidence was found in the 1997 excavations (see also CAMPBELL and HEALEY 1996). These forms are paralleled at other Halaf contexts at sites such as Arpachiyah, Tepe Gawra, Banahilk, Halaf, Yarim Tepe etc.

A new use – and one of great curiosity – is the presence of miniature axeheads made of obsidian. Three examples in all have been found, all from immediately post-Halaf contexts in Operation I. One of the axeheads is made on a large thick flake of transparent brownish obsidian (46 x 10 x 5.5mm maximum dimensions). The sides have been carefully shaped by flaking and subsequent grinding. Of the others, one is of green obsidian (41.5 x 14 x 14mm) and the other of black (only the butt half is preserved), again on large flakes that have also been shaped by chipping to a waisted outline and then ground. These can not have been other than non-utilitarian items and perhaps should be considered with the other miniature axeheads of volcanic rock which have also been recovered but they are of rather a different shape.

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The First Season at Tor Sageer (WHNBS-242), an Epipaleolithic Site in the Wadi al-Hasa, Jordan

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The first excavation season at Tor Sageer (WHNBS-242) was conducted during the summer of 1997 (OLSZEWSKI *et al.* n.d.). The site is a small rockshelter 17m above the Khasra channel in the Wadi Khasra, a major tributary drainage to the Wadi al-Hasa. It is situated about 2 km from the confluence of the two drainages, and about 6km from the Pleistocene marsh/lake in the eastern portion of the Hasa drainage.

Two contiguous units (each 1x1m) were placed within the rockshelter and excavated to bedrock (ca. 75cm below surface). The upper 25cm of the deposit was disturbed by more recent cultural and rodent activities; materials recovered included a pottery sherd, a woven fragment, and a Bedouin shepherd's reed recorder, as well as modern and ancient (mineral speckled) faunal remains and ancient lithics. One hearth feature occurred in the upper deposit. Below the disturbed portion of the deposit, cultural materials included more than 4,800 lithic artifacts, as well as vertebrate and invertebrate fauna, two probably human teeth, and charcoal. A hearth feature was recorded in the lower portion of the deposit, about 20-25cm above bedrock. The lithics are analogous to those from the later phases of the Early Epipaleolithic period. The bone assemblage contains several small polished fragments which may be fragments of awls or points, and a possible needle fragment.

Six natural layers were identified. The upper two, as well as the upper portion of Natural Layer III correspond roughly to the disturbed portions of the deposit. These range in composition from a very pale brown, loose silty sand with rootlets and angular clasts to a light yellowish brown silty sand, which includes gravel, roots, twigs, and angular clasts. The second and third natural layers tend to increase in compaction with depth. Natural Layer III also includes ashy spots mixed with charcoal flecks, and includes a high quantity of diagnostic lithics, as well as large-sized debitage. Layer IV is contained within Layer III; it is a very pale brown sediment with a hearth feature, a high density of lithics, ashy material, charcoal, and friable bone fragments. Layers V and VI are a very pale brown, compacted silty sand that includes pebbles and cobbles in Layer V and limestone fleck inclusions in Layer VI.

The main undisturbed Early Epipaleolithic occupation is within Natural Layers III, IV and V. It is likely that these materials document an "occupation zone," and there are indications of spatial differentiation in activities between the two excavated units. These consist of a higher frequency of endscrapers (32% compared to 20%) in Unit C4 and of cores (2.6% compared to 1.3%) and hammerstones in Unit D4.

The tool assemblage from Tor Sageer is dominated by narrow microliths of various types (60%). These include La Mouillah points, and numerous examples of arched backed bladelets and backed and truncated bladelets. There are also a small number of "tanged" microlithic points that we have tentatively named "Sageer points." Many of the microliths were manufactured using the microburin technique. Endscrapers are the second most frequent tool type (12%). Other tools are rare but include burins, backed pieces, notch/ denticulates, retouched pieces, and varia. Of special interest are three tools in the varia class: these resemble small adze or chisel tools reminiscent of larger examples occasionally found in Natufian assemblages, for example at Wadi Hammeh 27 (EDWARDS 1991).

The Early Epipaleolithic occupation at Tor Sageer is interesting for several reasons. First, it lacks an emphasis on the manufacture of microlithic tools, as indicated by the relative scarcity of microburins and bladelet cores, and by the abundant presence of large-sized debitage. Second, there are preliminary indications of spatial differentiation in activities that were probably associated with a hearth. These activities included core reduction (cores, hammerstones, an untested flint nodule, much debitage) in one area and the more frequent use of endscrapers in another area. Third, the narrow backed microliths present in the tool assemblage are slightly more robust than those found in the Early Epipaleolithic occupation at Yutit al-Hasa (OLSZEWSKI *et al.*

1994), perhaps indicating a somewhat later period within the Early Epipaleolithic (following suggestions made by GARRARD *et al.* [1987] for increasing robusticity of microliths with time in the Azraq region). The assemblage also includes a variety of tools not previously documented for Epipaleolithic sites in the Wadi al-Hasa region (e.g., the "adzes" and the "Sageer points"). These may also point to a later phase of the Early Epipaleolithic.

Analysis of the faunal, macrobotanical, and phytolith samples will soon be underway. A second field season is planned for the summer of 1998. Funding for this project was provided by the National Science Foundation (SBR-9618766). This is EHLPP Contribution No. 2.

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Renewed Excavations at Tabaqa (WHS 895), an Early Natufian Site in the Wadi al-Hasa, Jordan

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Tabaqa is an areally extensive Early Natufian site situated on the 30-35m terrace immediately east of the Wadi Ahmar, and just upstream from the confluence of the Wadis al-Hasa and Ahmar. It is about 16km downstream from the Pleistocene marsh/lake in the eastern Hasa Basin. The Early Natufian occupation is buried up to 2.0m below marl sediments. The terrace is heavily dissected and numerous lithics are eroding from the slopes of the marls. The distribution of the lithics suggests that the Early Natufian occupation occurs over at least 1200m². Preliminary testing in 1986 by Byrd revealed a 30cm thick "cultural zone" from which he recovered chipped stone, bone, and macrobotanical remains (BYRD and COLLEDGE 1991). We placed two of our test units (TUs 1 and 2) adjacent to Byrd's section cut. We also placed an additional two test units (TUs 3 and 4) about 20m to the south, where a particularly dense concentration of surface lithics occurs. The sediments of all four units were a very pale brown, silty marl with little internal stratigraphy. The most common change was greater sediment compaction with depth. We also found that the densest concentrations of cultural materials occurred in a "cultural zone" about 30-35cm in thickness.

Test Units 1 and 2 (adjacent to Byrd's section cut) yielded cultural materials between about 50-85cm below modern ground surface. Extensive damage was done to these units by looters, who excavated a large pit (1.45 by 0.85 by about 0.65m deep) through the center of both units. Backdirt from the looters' pit was screened and all artifacts collected. Vandals later also collapsed the upper, sterile portions of the sidewalls of the units. Cultural materials were encountered in the top 30-40cm of the deposits in Test Units 3 and 4, indicating that most of the sterile overburden marl has been removed by erosion in this area of Tabaqa.

A total of 7,246 lithic artifacts was recovered. The lithic assemblages are proportionally similar in each of the tested areas. Tools include Helwan lunates (28%) and other microliths (29%), followed by retouched pieces (ca.13%), notch/ denticulates (12%), endscrapers (10%), and various other tools such as rare burins, backed pieces, truncations, and sidescrapers. Microburin technique is relatively common, being predominantly oriented to the manufacture of Helwan lunates. A few examples of unfinished Helwan lunates (exhibiting microburin scars and remnant notches but no formal finishing retouch), as well as Helwan lu-

nates with remnant microburin scars are present in the assemblage. Other cultural materials were rare but included at least two small marine shells, small amounts of highly fragmented bone, and dispersed fire-affected rock and charcoal flecks.

Geomorphological reconnaissance of the site context at Tabaqa has revealed a number of interesting aspects of the paleoenvironment. The marl deposits in which Tabaqa is situated appear to be part of an ancient oxbow lake formed when a meander of the Ahmar channel was isolated by the incision of a more direct channel. This led to a much lower energy fluvial environment, fluctuations in which resulted in the deposition of fine marl sediments with several strata of dark organic deposits, probably representing ancient marsh environments (OLSZEWSKI *et al.* n.d.). One of these marsh strata is visible in section at approximately the same elevation as the Early Natufian "cultural zone", and this may be an indication of the environment during the occupation of the site.

The fact that the site is buried under low energy alluvial deposits provides confirmation that there was slow moving water at a much higher elevation and a much later date than has been previously suspected for this area (*e.g.*, SCHULDENREIN and CLARK 1994). These deposits suggest that the 30-35m terrace, ubiquitous in the lower portions of the Hasa drainage system, was still an active floodplain in the Early Natufian, and long enough afterward to bury the site under 1 to 2m of alluvial deposits. Such a situation has important implications for models of Pleistocene Lake Hasa and its disappearance (SCHULDENREIN n.d., SCHULDENREIN and CLARK 1994). The marl sediments located along the Wadi al-Hasa, and cited as evidence for the lake extending far down the wadi, may indicate a fluvio/limnic environment (OLSZEWSKI *et al.* n.d.) later than the proposed 15 kyr Lake Hasa breach.

This floodplain and subsequent terrace would have provided an early Holocene land surface extending several hundred meters across the Hasa valley bottom, one that may have existed at least into Neolithic times and have served as an ideal setting for early agriculturalists. This former land surface was subsequently almost completely removed by erosion, leaving only small terrace remnants along the present wadi sides. The removal of this surface may be relevant to the notable lack of documented Neolithic sites in this area.

Analysis of the faunal, macrobotanical, and phytolith samples will soon be underway. Funding for this project was provided by the National Science Foundation (SBR-9618766). This is EHLPP Contribution No. 3.

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Bawwab el-Ghazal: A Temporary Station of Hunting Pastoralists in the Eastern Jordanian Desert

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Introduction

The emergence of nomadic pastoralism has long held the interest of the archaeological community, and for a long time this phenomenon was held to be a relatively recent development, probably first attributable to the Chalcolithic period (5th-4th

millennia) in the Levant (*e.g.*, SHERRAT 1981). In the past few years more intensive attention has been directed to the archaeological evidence of transhumant animal husbandry, and it is largely accepted that pastoralism began as early as the 6th millennium if not in the 7th (cf. BAR-YOSEF and KHAZANOV 1992). But the circumstances of how this change in subsistence economy arose remains a matter of considerable debate in terms of when, where, and under what conditions. Probably the three most cogent hypotheses are those of Byrd (1992), Perrot/Ducos (1993), and Köhler-Rollefson (1992, ROLLEFSON and KÖHLER-ROLLEFSON 1993), and while all three differ fundamentally, all three agree that pastoralism could only be economically effective in the steppe and desert region of the Near East, where grazing and farming would not compete for land and where local resources (vegetation unpalatable to humans) could be converted to meat, milk, and hair/wool to supplement increasing demands in a degraded environment in the agricultural areas of the region.

Byrd placed primacy on the lifestyle of indigenous hunting-gathering groups in the steppe and desert regions as a mechanism that fostered the adoption of nomadic pastoralism: familiar with the arduous local conditions that demanded constant movement from area to area, the "nomadic" element was a pre-adaptation to the acceptance of domesticated species from the agricultural areas to the west; the restructuring of a former hunting-gathering economy was thus easily facilitated, preserving herds for exchange with agricultural groups while they continued to hunt for the majority of their dietary needs for animal protein (BYRD 1992:55, cf. GARRARD *et al.* 1996: 218-219).

Köhler-Rollefson saw the situation differently. Based on her research at 'Ain Ghazal, domestication of herd animals (goats, at least) had already begun as early as the late 8th millennium bc, and after a prolonged period of a combined farming-herding-hunting economy, population growth had led to an accelerated degradation of the ecological system immediately around population centers to the point that hunting was virtually useless as a supplement any longer, and that the agricultural and pastoral segments of the subsistence economy were in constant conflict for farmland and pasturage. Resolution of the conflict demanded either new fields farther from the settlements or relocating the animal herds, at least for critical periods of the crop-growing year. Since animals were more amenable for movement, a period of "tethered" or "incipient" pastoral nomadism emerged in the farming villages of the Levant, where part of the community took the flocks away from the permanent villages/towns for a substantial part of the year (the rainy season, when the steppe and desert had both vegetation and water). They returned to their farming relatives after the harvest in the late spring/early summer, when vegetation in the steppe/desert was parched and water no longer available (KÖHLER-ROLLEFSON 1992). Based on corroborating archaeological evidence at 'Ain Ghazal (architectural variability), the beginning of pastoral nomadism began no later than the early 6th millennium bc, although it was not ruled out that it could have begun in the late 7th millennium (ROLLEFSON & KÖHLER-ROLLEFSON 1993).

The third hypothesis, not well defined but nevertheless well understood, was put forth by Perrot and Ducos, who argued 1) that pastoral nomadism without a reliance on sheep is a highly unlikely economic proposition; 2) that sheep were domesticated first in the northern Levant, probably in northern Syria; and that 3) pastoral nomadism was a concept introduced into the southern Levant by migrating groups of sheep-herders coming originally from the north (DUCOS 1993, PERROT 1993: 9).

For the three hypotheses, one aspect is clear: the critical evidence to support any of them should be found in the steppe and desert areas, yet this has not happened so far. Garrard's research in the eastern steppe and desert of Jordan has shown that while ovicaprids were abundant at early Late Neolithic (6th millennium) sites in Wadi Jilat and the greater Azraq area (GARRARD *et al.* 1996: 217-219, Fig. 11.3), their presence among the faunal remains of one late 7th millennium Neolithic site (Azraq 31) was barely noticeable, and the sample was so small that little could be said of possible presence of sheep. Nevertheless, simply that the animals occurred so far from either of their natural habitats indicated that some form of pastoral nomadism was already being practiced by c. 6,300 bc. An additional element of impor-

tance is the recovery of grain from the sites, particularly at late 8th to early 7th millennium Jilat 7, which indicates a connection of the people at Jilat 7 with the farming communities farther west. Finally, the presence of stone foundations for walls of internally subdivided structures revealed that the inhabitants probably lived in houses for a considerable time whenever they visited the site; it is not clear from the preliminary reports if the several structures they exposed were contemporaneous or sequential (there are differences in construction technique), so it remains uncertain how large the groups were in the steppe and desert.

A new site has been found in the middle of the eastern desert of Jordan that promises to cast considerable light on the processes of pastoral nomadism in the southern Levant as well as the illumination of such important socioeconomic features of nomadic groups such as group size, subsistence economy, scheduling, and contact networks with settled farming towns in the agricultural regions to the west. The site – Bawwab el-Ghazal (“Portals of the Gazelle”) – was shown to the authors in the summer of 1997 by a resident of nearby Azraq Shishan, and the surface artifacts clearly date to the late 7th millennium. It is possible that much earlier deposits lie beneath the surface.

Bawwab el-Ghazal

The small settlement is situated approximately 3km east of the modern settlement of Azraq Shishan in Jordan's eastern desert, which receives less than 50mm precipitation per year. The site is in the middle of a playa (*qa*) that is seasonally flooded as a consequence of the basin's catchment from all of the cardinal directions, although at Bawwab el-Ghazal itself it is clear that surface water does not result from wadi overflow but from supersaturation from subsurface aquifers. In recent times, at least, the surface of the site has been protected from deflation by the formation of salt crusts as surface water evaporated; on the other hand, this has led to minor artifact disturbance, and probably some animal bones in the upper centimeter have been damaged by the repeated saturation, desiccation, and crystallization. The high water table in the immediate vicinity of Bawwab el-Ghazal is attested by the presence of reeds and low tamarisk brush; other low-crowned halophytes are relatively dense in the area.

The distribution of surface archaeological evidence indicates that Bawwab el-Ghazal is small: surface artifacts become very sporadic outside of an area of 90 x 100m. The site appears to be a mini-tell in the sense that a deep midden (at least 50cm thick, witnessed in a hole dug by the local informant) accumulated to this thickness towards the NE of a well-defined series of stone alignments that outline at least one (and perhaps more) structures with internal subdivisions; one or more additional buildings may be immediately adjacent, but this remains uncertain. Several hours of surface survey over several visits to the site did not produce any indications of other structure areas.

The surface of Bawwab el-Ghazal is densely littered with artifacts, all of them attributable to the LPPNB on the basis of projectile point types and the absence of any other culturally diagnostic artifacts. The hole dug by the local informant did not produce any indications on pre-LPPNB occupation in the backdirt or the sections, but MPPNB presence cannot be ruled in the deeper part of the site. The hole, by the way, evidently did not reach sterile soil.

Chipped stone artifacts are heavily dominated by projectile points, indicating that there was a strong emphasis on hunting by the residents of Bawwab el-Ghazal. This superficial interpretation is strongly supported by the surface faunal remains that show the presence of *Bos primigenius*, *Equus* sp., and comparatively numerous remains from birds that span a broad array of sizes. Especially important in terms of faunal material is the abundant presence of ovicaprid bones that, in the hole and immediate backdirt dug by the local informant, appear to be well-preserved beneath the superficial salt crust.

One chipped stone tool class indicates a clear emphasis on butchery: bifacially worked knives made from local (?) tabular flint and thin nodules might be the second most frequent shaped tool after projectile points. Following in third place are borers and drills that appear to be used mostly for bead manufacture, a supposition based thus far on the associated prevalence of “greenstone” beads and resource chunks; it is not certain if this

raw material relates to long-distance contact with the copper-ore areas in the Wadi Dana in southern Jordan, or if (more likely) the greenish stone is “Dhabba Marble”, a greenish limestone with a source as close as the western end of the Wadi Jilat.

Research Design

The focus of the research at Bawwab el-Ghazal is to retrieve as much information as possible concerning the subsistence economy, social structure, and chronological development of the Neolithic group(s) who lived in this temporary camp over what appears to be a considerable period of repeated visits. Despite the concentrated efforts by Garrard and his group (cf. GARRARD *et al.* 1996) and of Betts' long-term projects (e.g., BETTS 1992), these aspects of hunting and herding social units remain dimly illuminated, particularly any relationships these groups might have had with the permanent farming settlements to the west such as 'Ain Ghazal and Wadi Shu'eib.

Several trenches will look for the limits of Bawwab el-Ghazal, but two nearby areas of the site will be the central focus of excavation. The former includes an axial alignment of 1x1m probes to determine the site boundaries, skipping several meters between the test trenches until artifact densities and features drop off significantly. The latter will consist of larger trenches (at least 5x5m each, with one-meter provenience units for general sample collection) centering 1) on the stone alignments in the SW quadrant of the site and 2) on the midden mound, near the site's midpoint.

The sediments at Bawwab el-Ghazal, particularly in the mounded midden area, are dark and possibly rich in organic material; this indicates that flotation could provide valuable information on the plant component of the diet as well as yielding charcoal for dating the deposits. Systematic collection of samples for flotation will be taken from the midden and from inside and around the structure(s).

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Al-Baseet, a New LPPNB Site found in Wadi Musa, Southern Jordan

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The Neolithic settlement of al-Baseet was discovered in October 1996 during a CRM project in the Wadi Musa area near Petra, Jordan ('AMR *et al.* n.d.). Building layers and the importance of the site were recognized when construction activities destroyed part of the site. By chance, the symposium on Central Settlements in Neolithic Jordan was being held at the same time

(cf. *Neo-Lithics* 2/97), and some of the participants (H.G.K. Gebel, G.O. Rollefson and L. Quintero) dated it to LPPNB on the basis of recovered surface artifacts; the site was earlier shown to Gebel, with whom the surface evidences were discussed. The Department of Antiquities of Jordan decided to start excavations at the site on 6 August 1997.

Al-Baseet is a medium-sized village in a classical setting, covering between c. 5-10ha. It is located in Wadi Musa at UTM: 788413.53E; 3358020.85N - 738632.09E; 3357932.09N - 738765.70E; 3358165.70N - 738792.83E; 3357953.87N. Excavations were conducted in three squares and the preliminary evidence indicates many similarities to Basta and 'Ain Jammam as evidenced by arrowheads, naviform blades, axes, grinding stones and burnished plaster floors. The architecture at al-Baseet is not well preserved due to much destruction in later periods in the investigated areas. The excavations at al-Baseet are still in progress, and more details about the LPPNB settlement are forthcoming.

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The 1997 Season at Ba'ja, Southern Jordan¹

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Between June 16 and July 20, 1997, the first season of large-scale excavations was conducted at the LPPNB settlement of Ba'ja in southern Jordan (for the project design cf. GEBEL and BIENERT 1997). It was carried out under the joint directorship of the authors for the German Protestant Institute for Archaeology, Amman Dept. in collaboration with ex oriente e.V., a research association at the Seminar für Vorderasiatische Altertumskunde of the Berlin Free University, and the Deutsches Archäologisches Institut, Orient-Abteilung in Berlin.

Project History and Field Operations

After the existence of a "flint site" in the remote rock formations north of Beidha was reported to H.G.K. Gebel in 1983 by M. Lindner and his team (cf. *Neo-Lithics* 1/97: 9), it was not easy for Gebel to relocate the site in 1984 in the framework of his project: *Palaeoenvironmental Investigations in the Greater Petra Area-Holocene Research* (GEBEL 1988, 1992; GEBEL and STARCK 1985). The location than was recorded properly, and three soundings were carried out, after the site was recognized as one of the major PPNB settlements in the Greater Petra Area, probably succeeding Beidha in the function as a regional center. In the following years, Ba'ja's pro-

tected setting, the difficult access and the magnificent scenery of its nature made it an attractive goal to reach for only a few insiders. In 1996 H.-D. Bienert approached H.G.K. Gebel for an in-field cooperation. Since it had become imperative to contribute to the mega-site discussion by investigating also a smaller regional LPPNB center away from the corridors of that LPPNB large settlement expansion, Gebel proposed Ba'ja for this co-operation, provided that three field seasons will take place in order to achieve the expected basic insights (cf. the goals discussed in GEBEL and BIENERT 1997: 10-11).

As expected, working at the site was a tough enterprise. The site, for example, demands climbing through the gorge (siq) with all the equipment, water and food to approach it, to have no possibilities for personal hygiene, and to have very reduced comfort with respect to shade, permanent stress on one's ankles because of the steepness of the slope, few flat areas to rest, thousands of flies, and the permanent danger of snakes.

The archaeological staff (Fig. 2) consisted of more than 22 persons from Germany, Jordan, United States, England, and Sweden; during the most intensive work periods up to 24 local workman from the al-Amarin, al-Bedul, and al-Sey'idin tribes worked at the excavation. Tasks between the two co-directors were divided: one (Bienert) mainly did the general administration and partly the registration, the other (Gebel) mainly directed the excavations.

Ca. 250 m² (10 5x5m squares; 5 digging teams) were opened in the terraced housing area where the steep slopes of Unit C (one of our topographical site divisions) climbed up to the flat Unit D, forming at this spot a spur-like summit. Two of the squares were found free of any architecture, which is the result of a lively discussed erosional event (see below). Two Test Units were opened, one at the lowermost fringes of Unit C in order to understand the Quaternary stratigraphy on which LPPNB layers rest (TU1, step trench), and one in "Snake Valley" (TU2). The latter was in a small wadi immediately north of the site: yielding LPPNB ashy trash layers preserved in a "sediment trap", it proved that the Neolithic settlers used this wadi and the siq as disposal areas (like e.g. Sounding I- area of 1984 and new evidence).

The archaeological surface reconnaissance, carried out by Bernd Müller-Neuhof, mapped all the Neolithic (and other) wall remains visible on surface, the dense distribution of ground stone materials, and other surface features. In the last days, he

also surveyed the immediate vicinity of the site in order to look for possible outliers of the occupation (There seem to be none). This all was recorded in the topographical map (Fig. 3), which was accomplished for the c. 1.2-1.5ha of the site plus its bordering siq, wadi, and rock formations.

The goal of the excavation itself was to uncover the architectural remains down to the earliest floor of the upper occupation. Sieving was applied whenever *in situ* layers occurred in room fills.

Site Setting and Topography (Figs. 1-3)

The LPPNB village of Ba'ja rests on an intramontane terrace some 10km north of Petra and 5km north of Beidha respectively. The location of Ba'ja, known

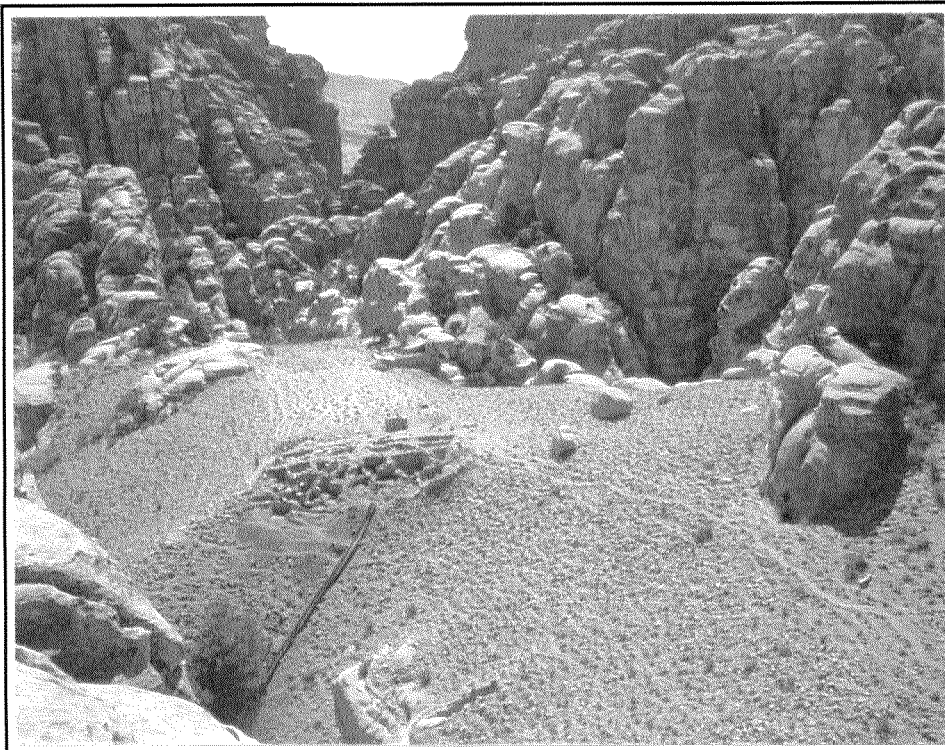


Fig. 1. Intramontane setting of the site with excavation in Topographical Unit C from southeast (photo: Schatz-Haerle) <Note the chutes for the excavated sediments leading down into the siq.>

locally also as "al-Mehmad", is at 35° 27' 45" E / 30° 24' 55" N; the altitudes for the identified cultural layers on the site's area range from 1060 to 1095m according to the surveyors' work and are based on barometric readings. The mean annual precipitation is 200mm in the region. However, this figure does not explain much for the actual hydrology of the immediate site surrounding (GEBEL 1990, 1992).

The Neolithic layers rest on a terrace that can be described as the remaining part of an intramontane *playa*-like fill within a basin. The present-day topographical units (Areas A-I) of the site must have basically developed their shape after the resolution of this catchment (Upper Pleistocene, if compared with other spots in the Petra region), after this fill was partly transported out of the basin while forming a deeply incised *siq* by the coarse-grained material transported down from the limestone plateaus in the east.

The site's (bordered by Siq al-Ba'ja to the S and by vertical rock formation in the N) longitudinal axis is oriented SW-NE and measures c. 290m, its width varies from c. 20m at the western and eastern accesses to about 90 m in the central parts. The area potentially occupied in the LPPNB is 1.2-1.5ha, which means c. 5000m² larger than preserved Beidha.

Site Preservation and Site Survey (Fig. 3)

The walls of the dense terraced housing, probably comparable to that of traditional villages in the area (Tayiba, Dana, Basta, Rajif, etc.), appear well preserved in the excavated squares. Walls reach heights of at least 2.2m. The surface evidence of Neolithic walls concentrates in the upper two-thirds of the site, with highest densities NE and N of the excavated area (Areas D/C). While almost no such evidence comes from the steep areas right above the *siq* (Areas C and F) and the narrow steep western slope (Area A), LPPNB grinding slabs and manos cover all parts of the site in varying densities.

The good wall preservation is explained by the rapid intramural deposition of structures (cf. GEBEL *et al.* 1997) and the succeeding colluvially supported stone pavement, the missing walls in at least lower Area C are explained as the result of aquatic impacts by a post-occupationally blocked *siq*. Actually, we found in Squares C2 and C13 that the rooms were cut sharply at a particular height, and floors that were placed into the fine-grained virgin sediments suddenly stopped in this extreme slope setting (c. 40°). What sort of natural impacts can have caused such a situation? We exclude at present a "sliding-down" of complete rooms or even building parts, since we cannot identify a layer that might have acted as a sliding agent. But any major blocking of the *siq* below the site could have had an immediate influence on the site's morphology. Just below the area in question, the course of the gorge turns twice in right angles in front of rocky barriers; in addition, the *siq* is extremely narrow here. If a damming by fallen rocks happened here only once in post-PPNB times, it could well be that accumulated materials raised the bottom of the *siq* to elevations that were dangerous for the house ruins above, especially in the time of the tremendous winter floods typical for the area. In fact, the morphology of this amphitheater-shaped slope is very much that of a cutbank, suggesting that here the aquatic impact undercut the settlement (cf. also KRÄMER in: GEBEL *et al.* 1997).

Other aspects of site preservation include the interacting influences from field clearances etc. (stone piles, field terrace walls, wall alignments, terracing) in Nabatean times (cf. MÜLLER-NEUHOF in: GEBEL *et al.* 1997) and the densely distributed eroded wall stones that created a natural pavement for the cultural sediments underneath.

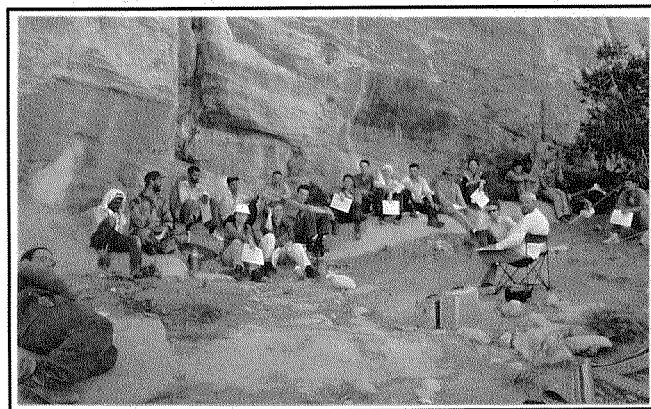
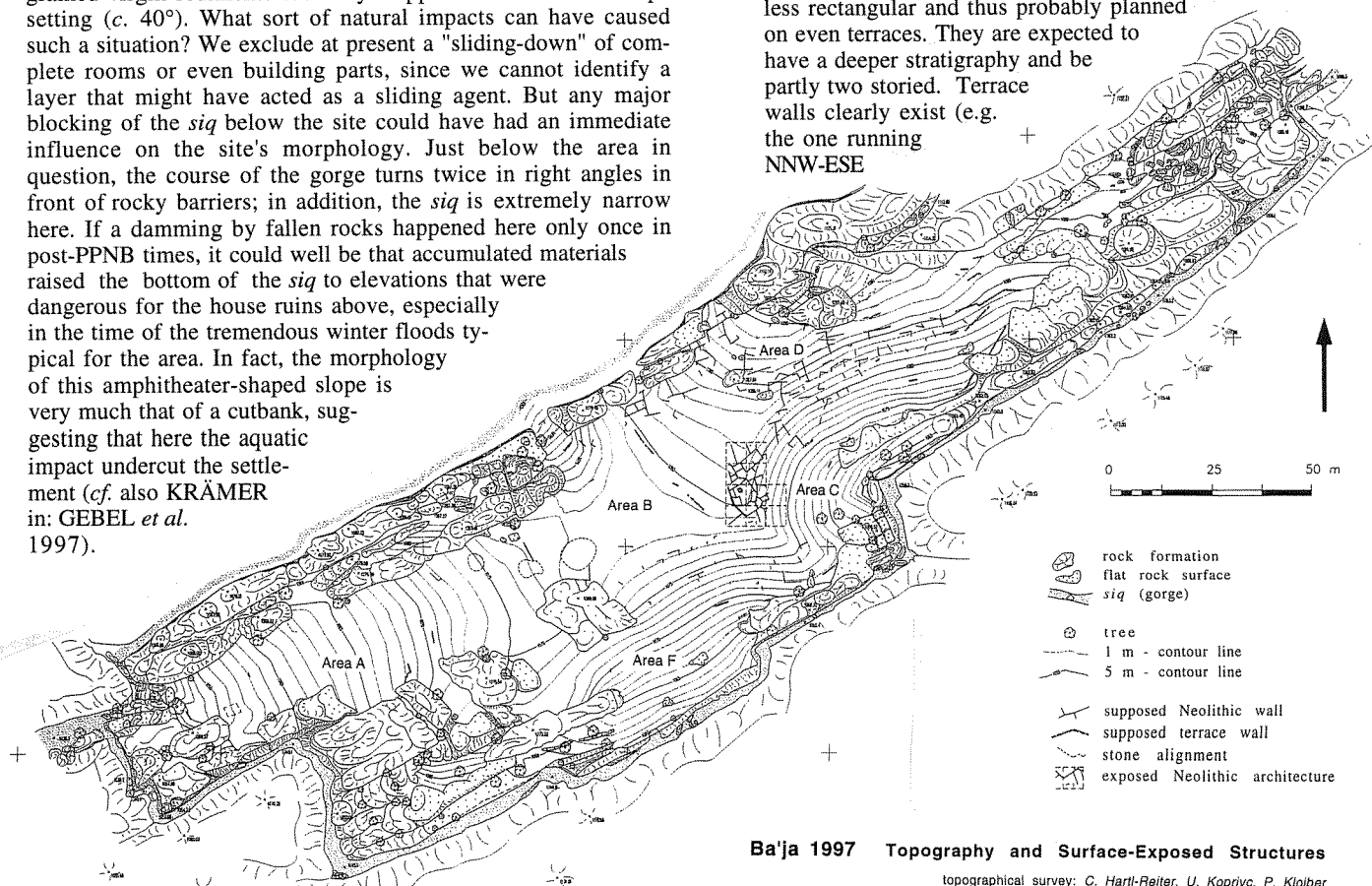


Fig. 2. Excavation team receives information on dig documentation and excavation methods.

Architecture and Stratigraphy (Fig. 5)

As said before, only Squares C1-2, C11-12, C21-22 and C31-32 contained well preserved architecture, of a terraced housing similar to a *pueblo*-type layout with some true two-storied structures (at least in the westernmost rooms of C21). The top of the wall ruins occurred just below the surface or were exposed on surface. The easternmost chain of small rooms in C2 and C12 represent rooms with no second story. Here, the floor plans of rooms tend to be polygonal, which must be an adaptation to the contour lines of the slope in order to establish some sort of structural stability. At least the westernmost rooms seem to have been dug into the sterile layers (near-top traces of carbonization) underneath, on which the floors were made of a cobble bed with superimposed whitish (lime?) plaster. At least at one spot it became clear that walls were (also or generally?) founded on such floors, without any further foundation! The principal rooms in the excavated area are between more or less rectangular and thus probably planned on even terraces. They are expected to have a deeper stratigraphy and be partly two storied. Terrace walls clearly exist (e.g. the one running NNW-ESE



Ba'ja 1997 Topography and Surface-Exposed Structures

topographical survey: C. Hartl-Reiter, U. Koprivc, P. Klobner
archaeological survey: B. Müller-Neuhof cartography: C. Hartl-Reiter

Fig. 3. Site topography and Neolithic architectural surface evidence.

in C11/C1, or the one N-S and somewhat bent in C12/C2). Their structural engineering did not differ much from ordinary walls, although they were somewhat thicker. This might have caused stability problems; for example, the terrace wall in C11/C1 was reinforced by a second wall to the west. Since that action did not seem to provide a reasonable stability for the terrace, two additional buttresses were added, partly built over the first reinforcement wall.

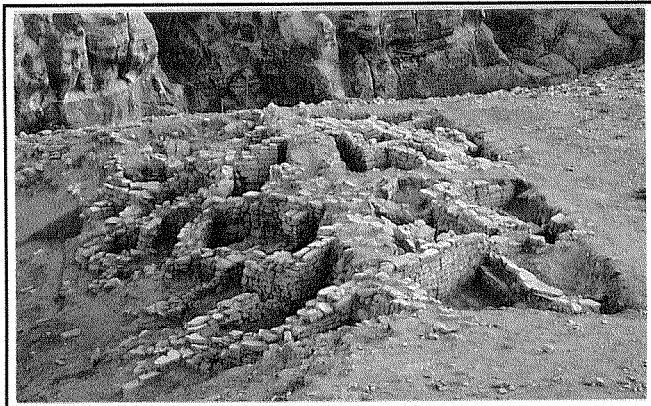


Fig. 4. Excavation in Area C seen from N (photo: Gebel).

The uppermost stratigraphy are room fills of colluvial origin, succeeded by mixed layers built up from collapsed roofs, plaster flows and wall stones that tumbled from the wall tops. Only below that (and sometimes still embedded) we found the first *in situ* layers, much of which represented the activities of dwellers using the ruins as shelters. Below this kind of deposit the first floors of the upper occupation occurred, but they were not reached in all the rooms/squares this season.

As of yet, no detailed information can be given on the deeper stratigraphy in the excavated area. In general, we are dealing in the excavated area with one main building phase so far (Fig. 5), which shows alterations of an original groundplan by added walls and reinforcements, blockings and insertions of wall openings, and the possible adding of another story in C21. These subphases seem to represent locally restricted changes, possibly related to social reasons. The western rooms in C21 so far are a special case: an opening in a lower lying wall was blocked before the height was increased by a superimposed wall, leaving a step between both faces. This step possibly supported the beam of an uppermost floor; its height coincides with the top of a western partition wall, too. The room below had red-stained wall plaster and contained two fallen elongated stones, the possible lintels.

We cannot identify yet functional units. But – with reference to groundplans in Basta and 'Ain Jammam – there are reasons for the assumption that we have two building units in the excavation area that roughly follow the scheme of a central courtyard with adjacent small rooms. These courtyards are probably represented by the large spaces mostly covered by C11 and C21/C32. In C11 we found a sequence of fire places, a stone-lined structure with an inserted grinding slab, many manos (food-processing area), and a large amount of sandstone disks ready to be transformed into stone rings (production of this prestige good on a household-level). Another obvious zone of activities is represented with the chain of small rooms in the east of C2/ C13/ C23: here the sherds of many ovens were found, together with many animal bones and ashes. Most likely the ashes here were disposed downslope, a feature quite common for the *tabun* areas in the fringes of present-day traditional villages in the region. The large space in C21/C32 has not reached depths to identify the character of activities.

We did not find burials in the architecture yet, but most probably we have to expect them eventually. Human remains were encountered among the garbage deposits in Test Unit 2 in the "Snake Valley" north of the site (just 30-40m north of the excavated area).

Openings in the walls served as communication passages and possibly also played a role in climate control in the building. Some were found blocked again (functional changes). It should not be excluded that a lower room, such as in the west of C21, may have had a cellar-like character, protecting its inhabitants

from heat, for example. Other communication may have occurred via the roofs of the terraced housing, which may have represented the "public" spaces of the settlement.

An pre-planned, intentional ground plan seems to be inherent in the architecture. Only topographical adaptation forced alteration of preconceived layout ideas, a feature which is also well attested with 'Ain Jammam's architecture, the closest parallel in that respect to Ba'ja. As suggested by the site survey, the directions of walls did not necessarily follow contour lines; most likely long-used major walls served as stable compound and terrace/ retaining walls for the terraced architecture, and this explains that both social and physical topography were elements of planning and spatial stability.

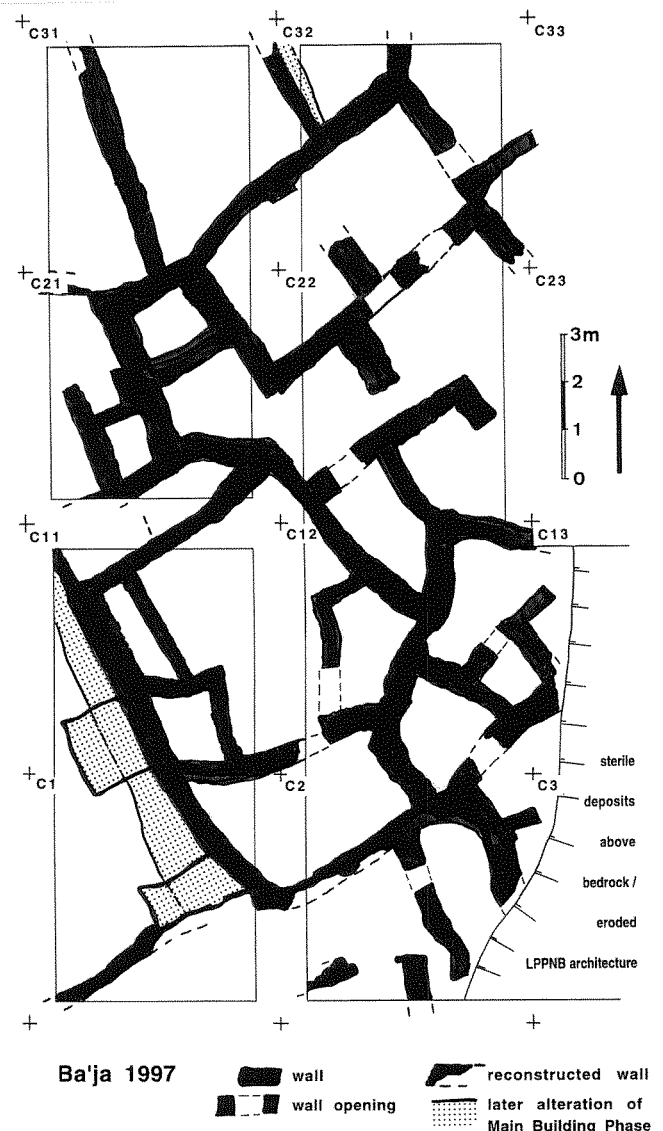


Fig. 5. Architecture of Main Building Phase excavated in Squares C1-3, C11-13, C21-22 and C31-32 (after the top plan of J. Timm).

The walls techniques are the same as attested with other LPPNB sites. Walls were double-faced and made of local tabular (sandstone) slabs that were dressed roughly "if necessary"; the courses were stabilized by "interwedged" smaller stones. The erection of walls and their wall faces was executed with great care, even in most cases to be very "aesthetic". On the other hand, they lacked bonding with joining walls and thus lacked stability, for example; also, they did not contain headers so that the two wall faces could easily fall apart. The latter clearly can be seen in Squares C1 and C2, where the southern walls are just preserved by one face. The "half" wall part in the southwestern corner of C2 gives evidence for walls sliding down the slope, a feature that might support the "sliding-down" option to explain for the site preservation in its lower thirds (see above). Functional reasons and changes, as well as the (non-) employment for specialists, might have been responsible for the variation in wall face quality. All stages of care are attested, "ending" with rough cobble-faced walls as the "poorest" quality.

Squares C3 and C13 had no preserved architecture. The sterile fine-grained layers were found immediately under the colluvial material (see above). A sharp erosional cut through both the sterile layers and the rooms dug into these layers indicates that here and for this level we should reconstruct just the appropriate room, but no more stone architecture existed further to the east/downslope. If architecture existed further downslope at all, it must have been dug into lower levels. This discussion nicely illustrates the instability of architecture in the many slope settings of Ba'ja, and the resulting problems of intra-site extension of land property.

Ground, Chipped Stone and Bone Industries

The typical ground and chipped stone industries of the LPPNB large settlements are well represented in Ba'ja. However, compared with Basta, the tool classes and the stone vessels so far show a less varied inventory.

The primary production of the flint industry does not contain true naviform cores and their typical preparation waste. Instead we have bi-directional cores that recall the intention of the naviform technology, the efficient material- and effort-saving detachment of blades. However, they often show round striking platforms with detachments all around the core's edges. These cores were reduced to the utmost, and blades in Ba'ja on average are shorter than those from the workshop areas in Basta. A contributing factor might be the fact that the tabular flint exploited by the Basta workshops rarely is attested in Ba'ja, and that most of cores have the grayish flint from the wadi pebbles as raw material. Workshops have not been found yet in Ba'ja, as cores are quite rare, too. Aside from the non-naviform bidirectional cores at Ba'ja, there are also unidirectional blade cores in addition to many flake cores.

The tool kit seems somewhat restricted to (also denticulated) arrowheads, borers, adzes, celts, and hammerstones. The latter three classes are quite dominant. Retouched and *ad hoc*-tools are rare. As a preliminary observation, we would interpret the tool kit as representing activities on household levels rather than on an "industrial" surplus scale. Tools used for chiseling/ carving out the sandstone rings have not been identified yet among the chipped lithic implements.

The grinding tools and stone vessel fragments fall within the LPPNB range of types (WRIGHT in: GEBEL *et al.* 1997), which is true for the worked bone industry, too (almost exclusively piercers and spatulae).

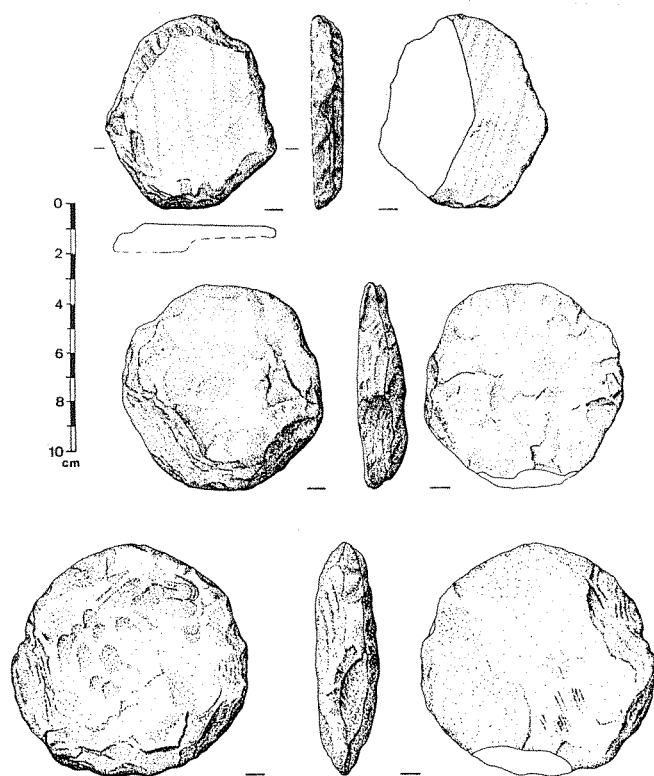


Fig. 6. Examples of flaked sandstone disks, used as blanks for carving and chiseling out the sandstone rings (bangles?) (PIGPA collections 1984, H.G.K. Gebel)

Prestige Goods

Except for the attested sandstone ring production, ornaments were quite rare in 1997. This is explained by the fact that we mainly were digging room fills built up by fallen roofs and walls and had only limited contact to the *in situ* layers and their inventories. So far we have the sewn-on mother-of-pearl objects, tiny rings made of the same material, beads made from Red Sea mollusks, a very few "greenstone" objects, and (other) stone beads.

The most outstanding prestige good is attested by all manufacturing stages for sandstone rings, making it clear that Ba'ja was a production center on a household level or even industrial scale (cf. GEBEL and STARCK 1985). In Ba'ja for the first time all the elements of the sandstone ring (bangles?) production were found on a site, which allows us to reconstruct the complete *chaîne opératoire*: After selection of the locally abundant tabular material, it was flaked bifacially into a disk shape, varying in diameter from 5 to 16 cm (average: 8-9 cm). Then an interior disk was removed from this raw form. Work traces indicate a concentric carving and possibly low-pressure chiseling process from both sides until a raw ring could be removed. While the interior discs may have been transformed into another artifact type (as by-products, perforated and surface-smoothed stone discs of 4-5 cm in diameter were found), the raw torus for the intended sandstone ring underwent several stages of grinding until a final grinding brought it into the known shapes. Bicolor decoration is common and results from the later removal of a blackish stain by grinding it from interior or obverse surfaces.

Subsistence

Exploited animals were wild and domestic goat, domestic sheep, aurochs (*Bos primigenius*), an equid (*Equus africanus*?), wild boar, a small and a large type of gazelle, hedgehog, hyrax, hare, and a small carnivore (fox?) (SÖFFNER 1996 and C. BECKER, pers. comm.).

As for the botanical remains, Reinder Neef identified not much more than what was already known from the poor 1984 samples: Carbonized wild pistachio and fig were found in addition to juniper and pistachio wood; *Triticum dicoccum* is very rarely attested by two glume bases from the Gebels 1984 investigations and an imprint of a spiklet fork from a tabun sherd of 1997 (NEEF, pers. comm.).

Settlement System Questions

Different from the research situation for other LPPNB large settlements, more information is available on the possible LPPNB settlement pattern in the Greater Petra Area (through the surveys by Diana Kirkbride and H.G.K. Gebel). According to first (GEBEL 1988, 1990) and more recent results (surveys around Basta), we can't expect a hierarchical settlement pattern in the sense of that central place theory calls for, at least not in the southern extension of the mega-site episode in the second half of the 7th millennium bc (GEBEL n.d.). The hypothesis is that we are dealing with "anodal" systems, with fast-growing, isolated, and self-sufficient settlements being "central" in the sense of being the regional foci of land-use and for the distribution of exchanged goods. These "centers" may have developed a size and social complexity that deserve an interpretation beyond a village understanding (see contributions and discussions at the Symposium: *Central Settlements in Neolithic in Neolithic Jordan*, published in *Neo-Lithics* 2/97, especially the arguments of Rollefson and Gebel).

Ba'ja possibly came to exist after nearby Beidha was largely abandoned. Possibly two other MPPNB sites were deserted around this time. Occupation then might have concentrated in Ba'ja and possibly in the new site al-Baseet, encountered last summer in the Wadi Musa area (FINO, this issue). However, this at the moment is speculation only.

Summary

- 1) The occupation is by its architecture and associated material culture Late Pre-Pottery Neolithic B (2nd half of the 7th mill. bc); occupational layers within the room fills of fallen roof/ wall materials most likely are related to the end of the same culture, re-presenting the use of the ruins after sedentary habitation came to an end or shifted from the (excavated) area.
- 2) The type of architecture resembles in all respects what has been found in Basta, 'Ain Jammam, Ghwair 1, and as-Sifiya, partly 'Ain Ghazal; it is a multi-roomed association of rectangu-

lar and polygonal rooms without clear open spaces. Connections between the rooms existed through passages via wall-openings and most likely the public spaces of roof tops.

3) Architectural subphases exist that altered a ground plan within the framework of the major terrace walls. Whenever topography required it, the ground plan of the smaller rooms became curvilinear or polygonal. Room sizes may vary from 1.5-15m². Sub-phases can be distinguished by additions onto existing wall tops, blockings or insertions of wall openings as well as additions to the ground plan, e.g. reinforcement buttresses and walls stabilizing a terrace and the rooms behind.

4) The lower third and steepest part of the site – at least in Area C – has been eroded away in post-occupational periods. Currently the explanation is for an aquatic impact through a temporarily raised *siq* base level.

5) Contact zones of the cultural layers with the sterile deposits so far show that the palaeotopography on which the settlement rests was built up in its upper parts by water-laid sandy sediments (*playa*-like deposits) that may represent a once closed intramontane basin-like structure. At certain spots it was obvious that rooms were dug into these sterile layers.

6) Chipped lithic industry: it is striking that the site does not seem to have had specialized naviform workshops. Instead, a non-naviform bidirectional blade technology exists by cores with detachments from all around the (round) platform.

7) The ornament industry so far is not very rich. However, the site certainly was a fabrication center for sandstone rings on at least a household level: all stages of manufacturing this prestige good are attested, and we can expect that it played a major role for the wealth of the settlement (trade).

8) Subsistence elements were emmer wheat, wild pistachio and fig?, and the exploitation of juniper and pistachio as fuel; the diet of animal protein made use of the following species: wild and domestic goat, domestic sheep, aurochs (*Bos primigenius*), an equid (*Equus africanus*?), wild boar, a small and a large type of gazelle, hedgehog, hyrax, hare, and a small carnivore (fox?). Hunting played a major role in Ba'ja, aside from herding.

Acknowledgments

The field work was made possible through the excavation permit granted by the Department of Antiquities, Amman. We gratefully acknowledge the additional support of its director-general during his visit, H.E. Dr. Ghazi Bisheh, without which the successful fieldwork would have been less efficient.

With deep appreciation we thank our excavation team for the splendid work and good spirits under the very hard conditions: Christian Hartl-Reiter and Ute Koprivc (topographical surveyors); Bernd Müller-Neuhof (archaeological surveyor); Tobias Krämer (sedimentologist), Jan Timm (architect); Stephan Fenger and Nina Höffgen (photographers); Philip Rassmann (registrar); Abd al-Nassar Hussein al-Hindawi, Benjamin Jeffs, Muhammad Fadel Khatatbeh, Christiane Meckseper, Sandra Schatz-Härle (square supervisors); Salaheddin al-Abbasi, Annalisa Alvrus, Ulrika Andersson, Jessica Anderson, Brian Conn, and Lena Gebel (assistant square supervisors). In the latter third the project was joined by Reinder Neef, German Archaeological Institute - Eurasien-Abt. (palaeobotanical samplings). Considerable support came also from part-time participants: Patrick Kloiber (topographical surveyor), Johannes Meier and Julia Littmann (dig assistants), and Sonja Striegl (reporter). During the final works we received the well appreciated help of Bo Dahl Hermansen and Ghattas Sayej.

Logistic support was received from the following individuals: Eid Nawafleh and Wendy Botham (Petra Moon Tourism Services), Helge Fischer (CARCIP), and Manfred Lindner, Nürnberg.

Principal funding for the 1997 season was received from the Deutsche Forschungsgemeinschaft (Bonn), the Deutsches Archäologisches Institut, Orient- Abteilung (Berlin), the Evangelische Kirche in Deutschland (EKD), and ex oriente e.V. at Free University of Berlin. In addition, financial and materials support for the project came from: Dr.Dr. Manfred Lindner, Nürnberg; Foto Wegert, Berlin; Konica Deutschland; and Agfa-Gevaert AG, Leverkusen.

on the plant remains; W. Söffner's list of faunal remains (1996) was completed further with information provided by C. Becker, retrieved by her quick on-site checking of samples in July 1997.

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Notes and News

A Wall Stone from Basta, Decorated With a Grid Pattern

(reported by H.-D. Bienert to the
Basta Joint Archaeological Project)

A displaced wall stone was exposed recently from LPPNB layers in Basta, Southern Jordan. It was found during a visit by H.-D. Bienert, and subsequently reported to the Department of Antiquities, Petra Section and to the *Basta Joint Archaeological Project*. The piece shows a now well-known Early Neolithic grid pattern (see e.g. *Neo-Lithics* 2/96: 2: Fig. 2d, 11: Fig. 1) all over one face: parallel short lines are crossed centrally and at right angles by a longer line. (H.G.K.G.)

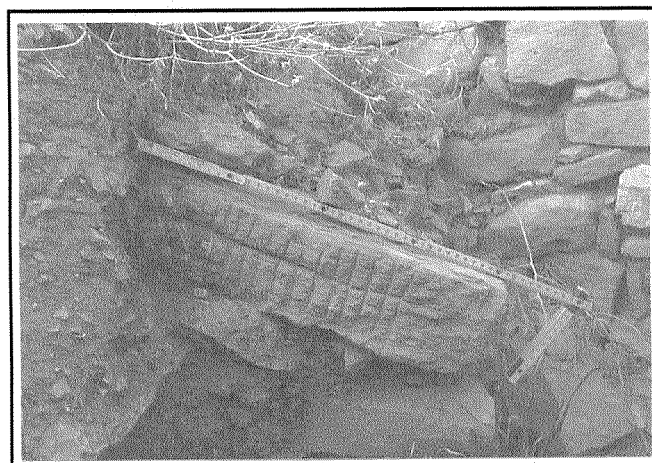


Fig. 1. Wall stone from Basta, southern Jordan, with an engraved grid pattern.

¹ This contribution was written by one of the authors (H.G.K. Gebel). He thankfully acknowledges joint ideas from his discussions with Tobias Krämer and Bernd Müller-Neuhof on site preservation, as well as information from their field reports. Reinder Neef provided the information

An Early Neolithic Human Sculpture in an Uzbek Province Museum ?

(reported by H.G.K. Gebel)

In a study collection of the Ma'naviyatva Ma'arifat Muzeyi (Museum for History and Sciences) in Chiwa, western Uzbekistan I came across the replica of a sculpture labeled as "stone-age sculpture". Locally available information on the piece only revealed that it "must represent an original of Central Asian origin". Further research did not provide more information. It is illustrated here for its general similarities with recent findings from Early Neolithic Göbekli Tepe, SE Turkey.

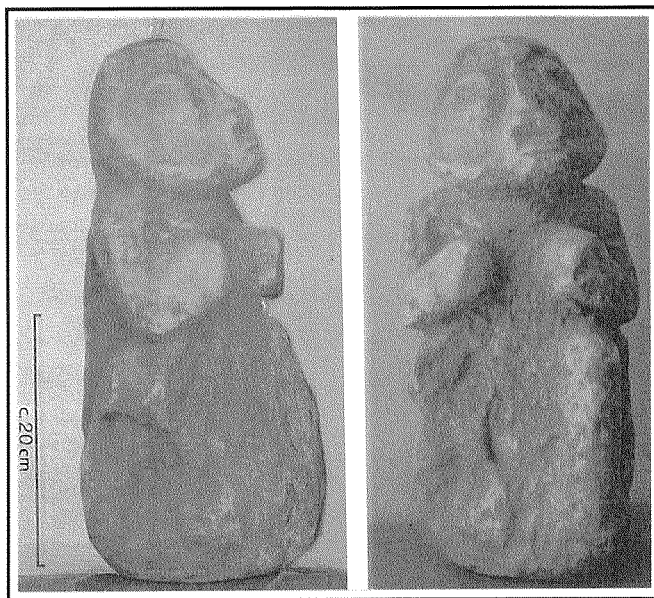


Fig. 1. Human sculpture (replica) found in the Ma'naviyatva Ma'arifat Muzeyi, Chiwa/ Uzbekistan.

Materials Market (Forthcoming)

Beginning with the next issue, we would like to establish a special section in *Neo-Lithics* called the "Materials Market". In this list projects can announce materials offered for analysis or study, and individuals can report materials needed for their project. Information to the editors of *Neo-Lithics* should follow the scheme:

- 1) material / topics offered/required,
- 2) person/institution to contact,
- 3) notes on details/further explanations.

New Dissertations in Progress

Excavated Spaces, Prehistoric Places: Spatial Analysis at Tell Sabi Abyad I, a Neolithic Settlement in Syria

Marc Verhoeven

Faculty of Archaeology, University of Leiden

Tell Sabi Abyad I (not to be confused with the nearby PPNB Tell Sabi Abyad II) is located in the upper Balikh Valley of northern Syria. The site is the focal point of a regionally oriented research project investigating the socio-economic organization of later Neolithic society in the region. Apart from a Middle Assyrian settlement, prehistoric occupation levels have been investigated at Sabi Abyad I. The prehistoric settlements at the tell represent the Later Neolithic period and date c. 5700 to 5000 B.C. (uncalibrated).

My Ph.D. research (VERHOEVEN n.d.) consists of a spatial and functional analysis of one of these Neolithic settlements that was heavily affected by a violent fire, the so-called Burnt Village (dated at c. 5200 B.C.). The village, excavated over an area of c. 950m², consisted of rectangular multi-roomed buildings built of pisé along very regular lines and surrounded by

smaller circular structures. Thousands of finds were recovered *in situ* from the burned structures, including ceramic and stone vessels, flint and obsidian implements, ground stone tools, human and animal figurines, personal ornaments, and hundreds of clay sealings with many with stamp-seal impressions (AKKERMANS and VERHOEVEN 1995, cf. VERHOEVEN and KRANENDONK 1996).

In order to reconstruct the function of spatial units, a specific methodology for spatial analysis at tell settlements has been developed. The method ("from space to place") consists of the following steps: (1) visual inspection; (2) architectural analysis; (3) depositional analysis; (4) determination of the so-called object context; (5) determination of general function; (6) functional analysis; (7) synthesis and interpretation.

Human activities in the Burnt Village have been reconstructed by determining the function of the various areas: activity areas, storage areas and discard areas have been located and the various activities carried out have been designated. It appears that the numerous small rooms in the rectangular buildings were mainly used for storage.

Only a few activity areas were present within the rectangular buildings. Activity areas are mainly to be found in the surrounding open areas and in the circular houses. These areas are marked by architectural features such as ovens and hearths. The majority of activity areas were multi-functional, giving evidence of subsistence as well as manufacturing and maintenance activities.

Recent analysis of the clay sealings at Sabi Abyad I indicates that besides permanent residents, the population related to the Burnt Village most likely also included nomads. This mobile or transhumant component made use of the site, in particular the stored goods in the rectangular storehouses at specific times. Study of the animal bones from Sabi Abyad I seems to confirm the presence of sheep-goat pastoralism.

Using Bourdieu's *Theory of Practice* (which stresses the dialectical relationship between social practice and material culture), my analysis of the settlement structure and function of the various spatial units has furthermore indicated that Sabi Abyad I may be perhaps be seen as a kind of microcosm of the society at large. In this view, the buildings were *structuring structures*, i.e. they were not only the outcome, but also the cause of human action. Apart from being functional units, the central and partitioned rectangular storage buildings (used by nomads) versus the peripheral non-segmented round houses (used by residents) also acted as mnemonic devices, symbolising a community made up of residents and nomads. By living in and moving around the village, one would have been made aware of the apparent social divisions.

It has to be taken into account, however, that the societal partition of nomads and residents may not have been too strongly developed. Pastoralist groups may easily have changed place with sedentary groups and vice versa. The peoples' worldview, then, may have been ambiguous, i.e. marked by circular houses and rectangular storage buildings, nomads and residents, fields and herds, buildings and tents, and village and landscape, all of which were distinguished but at the same time inextricably linked.

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New Dissertations

- Quintero L.A.
1998 *Evolution of Lithic Economies in the Levantine Neolithic: Development and Demise of Naviform*

Core Technology. Riverside, University of California: unpublished doctoral dissertation.

Chapter 1: Introduction; Chapter 2: Cultural Background; Chapter 3: Analytical Methods and Their History; Chapter 4: Research Overview, Implementation, and Data Base; Chapter 5: 'Ain Ghazal Flint Resources and the Wadi Huweijir Flint Mines; Chapter 6: Naviform Core Technology; Chapter 7: Debitage Analysis; Chapter 8: Summary.

New Publications and Forthcoming Books

ROSEN S.A.

1997 *Lithics After the Stone Age: A Handbook of Stone Tools from the Levant*. London, Walnut Creek: Altamira Press. \$49 (hardcover). \$24.95 (paperback).

Forthcoming volumes of SENEPSE

Volumes 3 and 4 had been delayed by the very late submission of some important contributions and considerable editorial work necessary, including that from disobeyed format needs. However, both volumes are now in the status of being prepared for the press, starting with volume 4.

ex oriente now also is enabled to do the cost calculations with the printing houses, and to search for further necessary grants and donations for the printing costs, which in recent times became a problem.

The references for the volumes are:

Stefan K. Kozłowski and Hans Georg K. Gebel (eds.), *Neolithic Chipped Stone Industries of the Fertile Crescent, and their Contemporaries in Adjacent Regions*. Studies in Early Near Eastern Production, Subsistence, and Environment 3, 1996. Berlin, *ex oriente* (appears 1998)

Hans Georg K. Gebel, Zeidan Kafafi, and Gary O. Rollefson (eds.), *The Prehistory of Jordan II: Perspectives from 1997*. Studies in Early Near Eastern Production, Subsistence, and Environment 4, 1997. Berlin, *ex oriente* (appears 1998)

Conferences and Meetings

Non-Formal Tools Working Group Meeting in Amman, 26th July 1997

Gary O. Rollefson
'Ain Ghazal Research Institute, Ober-Ramstadt

An NFT-Group meeting took place on 26th of July, 1997, in the German Protestant Institute for Archaeology at Amman. The meeting concerned policies for future cooperation in PPN Chipped lithics research, as well as the related situation of the NFT group itself (collaborating members, goals already reached and to be reached, development of objectives, etc.). Concern was expressed about fate of the 1998 meeting of the Workshops on PPN Chipped Lithic Industries (still unknown at that time), and H.G.K. Gebel was asked to take initiative for more information. Possibilities of a coming workshop to be held at the University of California-Riverside were discussed, too.

Issues of the Marouatte Approach for a future extended NFT-Group, its structure and modes of cooperation again were raised; it is expected that more discussion during the next main workshop will help to settle issues finally. However, progress for the NFT-Group remains related to actual tests of the established analytical framework for non-formal tools, but recently the group members were under too much pressure from other commitments.

Three new colleagues expressed their interest to join the NFT-Group: Krzysztof Jakubiak (Warsaw University), Ghattas J. Sayej (Palestinian Department of Antiquities), and Philipp M. Rassmann (Washington).

For the rest of the meeting an "NFT-Index", raised by H.G.K. Gebel, was discussed. Despite many objections to be made, he

argued that parameters should be worked out in order to evaluate proportions of non-formal and *ad hoc* tools within the tool kits and their comparisons. The parameters should not only allow for distinctions between and characterization of "household / non-industrial" levels sharing standardized secondary production, but they should also provide interpretive help for the non-specialist in lithics to deal with the socio-technological implications of an hitherto neglected source of information, the NFTs. Using an "NFT-Index" or something similar, communication would be guaranteed and maintained with the colleagues not specialized in lithics, who otherwise would have difficulties to extract such information from jargon-laden analyses.

The group thanks the H.-D. Bienert for providing the facilities of the German Protestant Institute for the meeting.

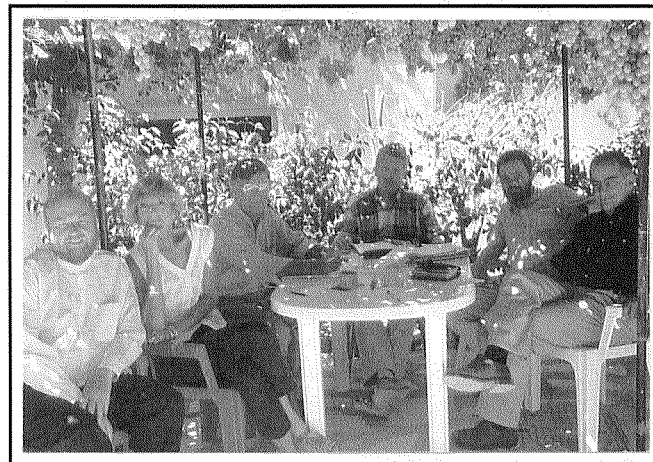


Fig. 1. The NFT-Meeting in Amman on 26th of July, 1997, attended by (from right to left): Ghattas Sayej, Bernd Müller-Neuhof, Phil Wilke, Gary O. Rollefson, Leslie Quintero, and Hans Georg K. Gebel.

Workshops on PPN Chipped Lithic Industries Third General Gathering: Venice, October 1998 First Circular

Dear colleagues,

we are glad to inform you that the 3rd Workshop on PPN Chipped Lithic Industries will be organized by the Universities of Roma "la Sapienza" and Venezia "Ca' Foscari" and hosted by the "Ca' Foscari" University, from 1st-4th of October, 1998 <Note by the editors of *Neo-Lithics*: The date of the Venice meeting meanwhile was changed to: 27th-31st of October, 1997.>

The following title was given to the gathering:

Beyond Tools. Reconsidering Definitions, Counting, and Interpretation of Lithic Assemblages.

The difficulty of comparing data, terminology and methods of analysis in paleoethnological studies has grown in recent years with an increasing number of scholars working on the subject. It is thus suggested that the next meeting's achievement be a common methodological perspective on the definition of the "instrument". It should be agreed on both practical and the theoretical criteria in order to distinguish intentionally obtained objects from knapping waste, preliminary from use retouch, handle modifications from use modifications of the blank, etc. This agreement is preliminary to any reconstruction of activities, characterization of sites, interpretation of their relations, and historical developments.

The second aim, strictly linked to the first, is an agreement on terminology, description and graphical documentation of lithic artifacts. It is proposed that a special section should be devoted to this theme, and the contribution of specialists, such as illustrators, is highly welcome.

The date suggested for the meeting is from the 1st to the 4th of October (Thursday - Sunday). Arrival and registration should be on Wednesday, the 30th of September. The hosting organisation will find and book the most favourable accommodation for the participants, though it is unfortunately unable to cover travel, accommodation and living expenses.

Participants are kindly requested to apply by the 30th of November 1997, giving indications of a title or subject they

intend to present. Although it would be very interesting to know about the progress of excavations, it is strongly suggested that speakers restrict their interventions to an issue related to lithics.

This letter is sent to all the participants of the meeting in Warsaw. All are invited to the extend the invitation to any others who might have become interested in the past two years. However, the workshop character of the meeting should be maintained, thus it is preferred to avoid too big a number of participants.

Looking forward to receiving your supply,

(signed by) Paolo Biagi, Isabella Caneva,
Cristina Lemorini, and Daniela Zampetti.

* * * * *

Workshops on PPN Chipped Lithic Industries
Third General Gathering: Venice, October 1998

Preliminary Registration Form

to be returned to/ correspondence to: Isabella Caneva,
University di Roma "La Sapienza", Sezione di Paleontologia,
Via Palestro 63, I- 00185 Roma, Tel. 0039 6 4454771,
Fax 0039 6 4454603 - 4440403

Name:

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