Reprint

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A Newsletter of Southwest Asian Lithics Research

map by the *Tübingen Atlas of the Near East*

Excavating Ba'ja, Greater Petra Area, Southern Jordan

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On June 16th investigations will start at the Late PPNB settlement of Ba'ja, which first was explored by one of the authors (H.G.K.G.) in the framework of his project *Tübingen Atlas Palaeoenvironmental Investigations in the Greater Petra Area - Holocene Research* (GEBEL 1986, 1988, 1990, 1992; GEBEL and STARCK 1985) in 1984. The project will be carried out for the German Protestant Institute for Archaeology, Amman Dept. in collaboration with the Deutsches Archäologisches Institut, Orient- Abteilung (Prof. Dr. Ricardo Eichmann) in Berlin, and ex oriente e.V., a research association at the Seminar für Vorderasiatische Altertumskunde of the Free University of Berlin. Funding comes from the Evangelische Kirche in Deutschland (EKD), the Deutsche Forschungsgemeinschaft (Bonn), the Deutsches Archäologisches Institut, Orient- Abteilung (Berlin) and ex oriente (Berlin). The project is co-directed by the authors.

Encountering Ba'ja

The site was originally found in late summer 1983 by mountaineering members of Manfred Lindnerís team who came back with a "conspicuous stone", presented at that time in Nazals' Camp to H.G.K. Gebel. The piece was a typical LPPNB celt, prompting immediately plans to "check" the find spot the following year, described as difficult to access in the midst of the sandstone formations northnortheast of Beidha. More finds, such as Nabatean pottery, were reported from the area. Here, H.G.K. Gebel would like to thank Manfred Lindner and his team for their continuous information ovber years on his prehistoric findings in the area, which always are a substantial source of information for the prehistory of the Greater Petra Area (for Ba'ja area *cf.* also LINDNER 1996).

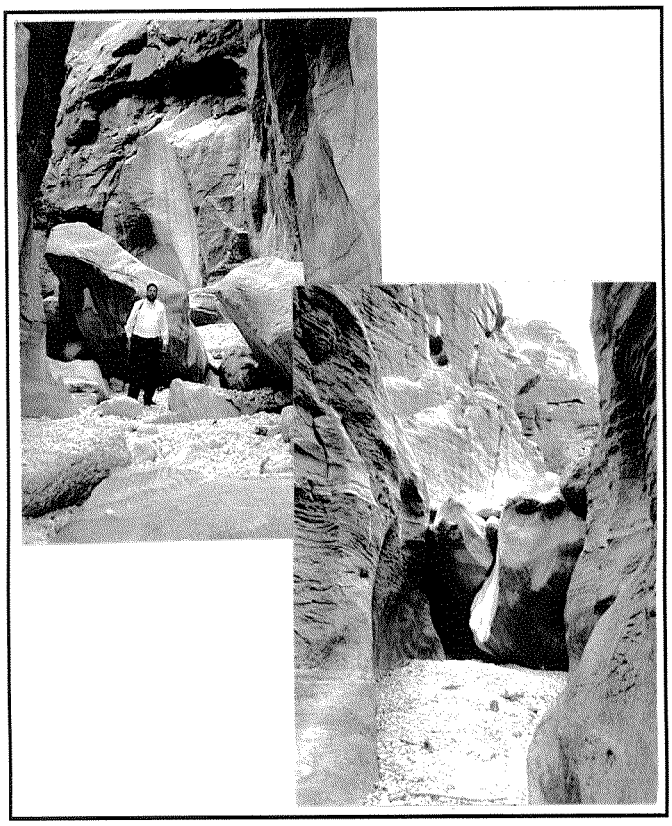

Fig. 1. Views inside the Siq al-Ba'ja (photos: H.-D. Bienert).

It took two forenoons in 1984 to locate the *siq* (gorge) through which the site had been reported to be accessable: in a tangle of sandstone formations dissected by gorges of every size, it was not easy to find the only one east of the Jabu Plain, which leads up to what was -up to then- only a promising spot. Several siqs were climbed unsuccessfully that time: Gebel and his team got stuck in several of the gorges with huge fallen rocks and dense vegetation of juniper and thorny stone oaks blocking the *siqs*. Eventually the access was found, although in this moment of approaching the site there was no trust in that "something could be up there": at three spots in the gorge (up to 70 deep with vertical walls, widths as narrow as 1.5 m!), which reaches the sites' intramontane steep slopes after a bit more than a kilometer, fallen sandstone blocks created barriers of up to 5 m height behind which gravel accumulations raise the *siqs*' bottom levels. Only mountaineering with the help of ropes for the baggage made it possible to cross them. There even would have been the chance to miss the site at this stage, because there was only one spot at which some Neolithic material eroded down from the site into the *siq*; we were lucky that despite exhaustion here attentiveness worked.

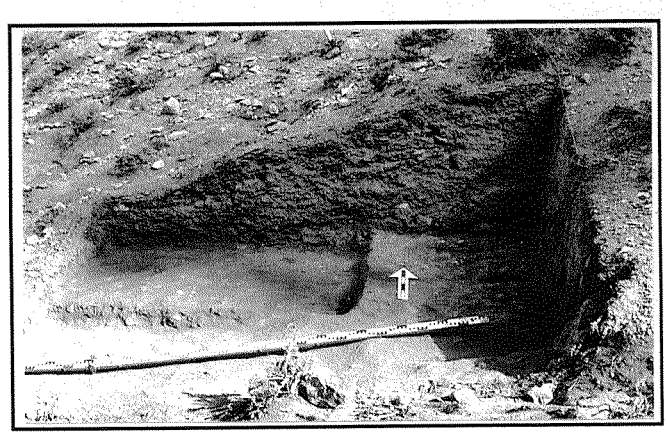

Fig. 2. Ba'ja: Sounding I of 1984 (photo: H.G.K. Gebel).

Following this track, we first found a 20° slope of *ca.* 100 x 15-40 m, littered with shaped wall stones, grinding slabs and manos, LPPNB chipped lithics and a lot of eroding ash layers at its deepest point (here the later Sounding I was excavated). Reaching the summit of this slope, a grand view opened on the central part of the site, which in shape and size is very much like an amphitheatre with slopes of 40-45°. Although the Late PPNB walls with their typical masonary were visible everythere on this shadowless surface of more than 10,000 m², it took days to understand that we really found an extremely large and well preserved settlement with an architecture similar to *pueblos*, densely built on steep-intramontane slopes in a naturally fortified setting. This all makes it quite clear why Diana Kirkbride did not have the chance to find Ba'ja, which on the map is just 6 km "around the corner"; the story also should make us humble about the chances to locate remains of a given period in the area.

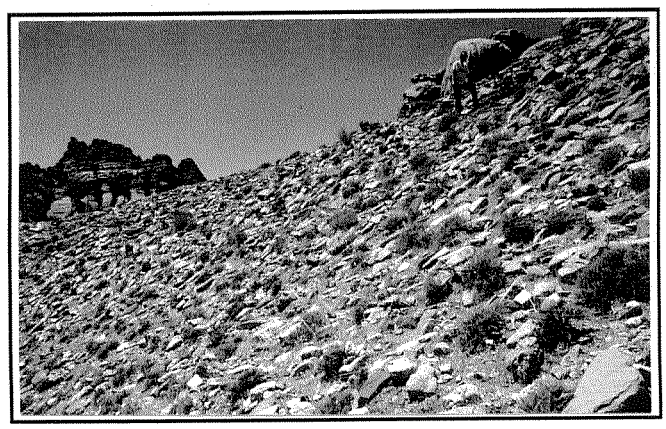

Fig. 3. Ba'ja: Central part of the settlement on the steep slope ("amphitheatre") covered with wall stones (photo: H.G.K. Gebel).

Behind the site, the *siq* continues for kilometers towards the steep slopes from the Arabian Plateau, an unexplored area covered by relict open juniper forests. Many larger and small sediment traps in the immediate site vicinity indicate that we may expect here preserved outliers of the main settlement, if the

Nabateans did not find them in their persistent search for attractive fields ...

In this 1984 exploration and its three soundings and systematic surface samplings the following colleagues participated: Suleiman Farajat, Matthias Starck, Angelika Müller, Eva Gebel-Martinetz, and Bassima Khoury. In 1985 the site was revisited with Hans-Joachim Pachur, Geomorphological Laboratory of the Free University of Berlin. Over the years members of the Basta team took the chance to see this extraordinary site, as well as Gary Rollefson, Karen Wright and Burton MacDonald. In August 1996 both the authors climbed to Ba'ja, and it was decided to present an excavation proposal to the Department of Antiquities, an excavation to be carried out under a joint directorship.

Site Information

Ba'ja is located at 35° 27' 45" E/30° 24' 55" N (1120-1160 a.s.l.; *ca.* 200 mm mean annual precipitation) some 11 km linear distance north of Wadi Musa/ Petra in the lands of the Amarin tribe. The site (300 m x 15-80 m) rests on an intramontane steep slope bordered by the Siq al-Ba'ja and nearly vertical rock formations in an unspoiled environment and a magnificent landscape. The site has no later layers than the LPPNB (late 7th mill.bc), despite Nabatean pottery on its surface.

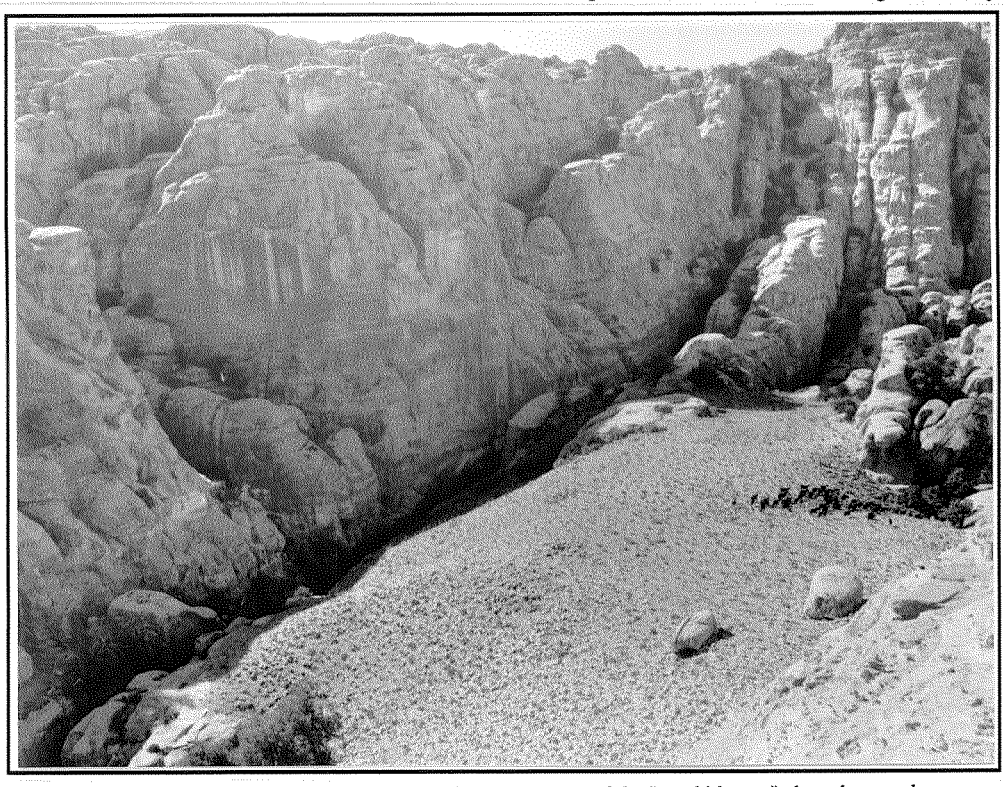

Fig. 4. Ba'ja: View of the settlement core area from ENE. Part of the "amphitheatre"-shaped steep slope can be seen on the left bottom, the *siq* (in the shadow) borders site on its left (photo: H.-D. Bienert).

From the surface (and one sounding) it is obvious that we are dealing with well preserved dense terraced housing, comparable to that of present-day villages in areas of similar settings. Rich cultural layers provide typical LPPNB industries with their evidence of specicialized labour and crafts, devoted to a substantial part to the production of prestige goods and its exchange. Hunted animals were goat/ sheep/ ibex, gazelle, hyrax, hare, wild cattle, an equid, and wild boar; domestic goat and sheep are also attested (Walter Söffner, pers. comm.). Carbonized pistacios were found as well as juniper and pistacio wood as fuel (Reinder Neef, pers. comm.).

Project Logistics

The site can be reached by four-wheel vehicles to the entrance of the Siq al-Ba'ja, but then climbing through the siq is necessary (20-30' with baggage). No other access has yet been found. A dig camp and a base camp have to be maintained in order to create a sufficient infrastructure and to ensure recreation possibilities for the team working under extreme conditions, among which are the shadowless "standing" heat of the intramontane setting, the waterless surroundings, and the permanent stress on oneís ankles. All drinking water has to be brought up for some 30-35 people, litre by litre. The archaeological staff will consist of 22 persons (from Germany, Jordan, United States, England, and Sweden), and the employment of up to 15 local workmen is planned. The first season is scheduled for 15 June until 20 July 1997, ending with an on-site discussion of the findings during a visit of the symposium participants on 24 July 1997 (see "Conferences and Meetings" in this newsletter).

Ca. 250 m² are planned to be opened in the terraced housing area at a spot where the steep slope becomes a more flatttish area at the sites' summit. In addition, this season will concentrate on working out a detailed site topography, recording all the architectural remains visible on surface and other features (distribution of groundstone, rock alterations, etc.).

Research Potential

While the material culture of the Late PPNB is rather well known, the phenomenon of the central settlements east of the Rift Valley ('Ain Ghazal, 'Ain Jammam, Basta, Sifiya, Shu'eib) itself has only become clear in the last decade as an outstanding feature in early Near Eastern sedentism. H.G.K. Gebel has proposes the terms *mega-village* or *mega-komoi horizon* for this phenomenon. However, along with Gary Rollefson, we feel there are justified reasons to discuss features related to this phenomenon as the earliest manifestation of proto-urbanism. We most likely are dealing with a chronologically isolated feature of its own in man's development up to city hierarchies, a failed early attempt at favoured spots in the semi-arid fringes with vast grazing and hunting hinterlands. Ba'ja flourished in this climax period of central settlements along the eastern Rift Valley, but its expansion clearly was limited by the spatial conditions of its protected setting and the natural limits of its catchments (GEBEL1992). Thus Ba'ja is so far the only example among the major central settlements that would allow us to study the conditions of growth and decline for such settlements under purely local conditions. Here, adaptions into extensive pastoralsim were limited, and thus information on the dynamics both for subsistence and demographic developments at the end of the PPNB may be expected to be clearer.

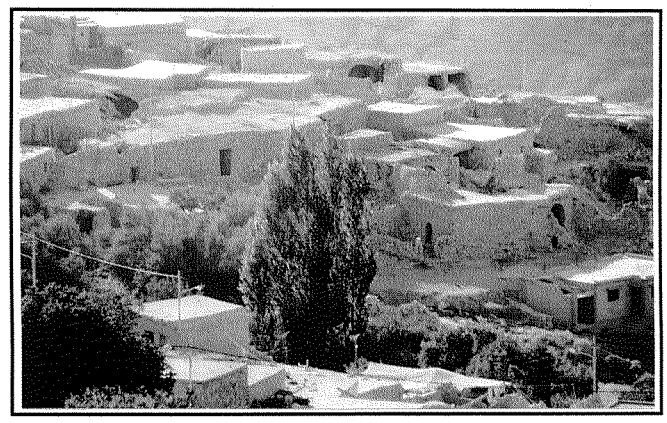

Fig. 5. Dana: Site of a present-day traditional village north of Wadi Musa (photo: H.G.K. Gebel).

Ba'ja may well be the sucessor settlement to nearby Beidha, which most likely was abandoned by the end of the Middle PPNB / Early Late PPNB. Reasons for giving up Beidha might have been the endangerment of the site from a developing western gully and/or the need for a protected setting. (Re-) occupations

in the post-PPNB, contemporary to the PPNC in the north, should not be excluded for both sites, as this is suggested by evidence from Basta and 'Ain Jammam.

Fig. 4. Ba'ja: Outcropping wall of a house (photo: H.-D. Bienert).

The advantage of a single-period site like Ba'ja, which only could grow vertically due to restricted space (well preserved multiple-roomed architecture rests on steep-slope terraces), is that it offers non-distorted insights into the internal settlement organization and its spatial crowding, and thus can give clearer evidence of the social organization of such Late PPNB communities. We expect that the site offers also more information on "core activities" at such settlements because of its limited possibilties of expansion. This may also shed a sharper light on the characteristic and distinct innovation capabilities of the period.

To approach all these questions, the following field work is planned to be carried out:

1) To work out a plan of the internal settlement organization on the basis of the exposed walls on the site surface. It includes the survey for outliers of the settlement in the surrounding rocks.

2) To expose the terraced architecture in an area of *ca.* 250 m^2, down to the first in situ floors.

3) To uncover representative palaeobiological samples in order to describe the subsistence system of the site.

4) To uncover representative samples of all classes of the material culture, including the identification of any possible specialized production of goods at Ba'ja, and/ or their distribution from here.

Acknowledgement: We thank our dear friend and colleague, Gary Rollefson, for editing the English of this contribution.

Fig. 5. Ba'ja: One of the typical grinding slabs with a mano found nearby (photo: H.G.K. Gebel).

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Lithic Industrial Behavior at 'Ain Ghazal: a Study of MPPNB Debitage Loci

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Introduction

An interesting issue for PPNB research is whether naviform core-and-blade assemblages resulted from the work of a few specialists – flintknappers who produced tool blanks for use by other people in the community – or whether household members tended to produce their own cores and blanks for tools. Tool data are not particularly useful for this analysis, since many Neolithic tools are very informal and were constructed on a wide range of blanks, and cores, core-production flakes and spalls, and various forms of blades and blade-production "debris" were selected as tool blanks. Consequently, it is not readily apparent whether individual lithic subassemblages result from the reduction of cores and the creation of tool blanks at primary reduction loci, the curation of blanks for future use at secondary deposition loci, scavenging of tool blanks from ancient deposits, the industrial activities of specialists or nonspecialists, or merely the accumulation of debitage waste that was discarded at a "dumping" locus.

These concerns are addressed here with a comprehensive technological analysis of MPPNB debitage assemblages from 'Ain Ghazal, including individual debitage loci of core production, core reduction, and tool production. Specifically, 169 loci of reduction debitage were evaluated and nine were intensively studied in order to ascertain in what contexts naviform cores actually were produced and reduced at 'Ain Ghazal, and to understand what these and other lithic manufacturing data reveal about the organization of tool production at the townsite.

Pertinent technological attributes of lithic reduction activities will be discussed presently, but it is important to note here that reasonable assessment of these attributes depends initially on experiments in lithic replication. Consequently, replication experiments were conducted on naviform core production and reduction, other types of blade-core and flake-core production and reduction, and tool-production techniques used during 'Ain Ghazal's occupation in order to understand the technological origins of the resulting debitage.

Analytical Procedures and Rationale

For clarification, three sets of tasks structured this analysis. Briefly, these were (1) to identify the nature of the production at a locus, that is, whether it resulted from flake-core or blade-core production or reduction, or from tool production; (2) to differentiate primary production loci from secondary debitage deposits, or disposal areas; and, (3) to distinguish activity areas from workshop loci.

Production Loci. Core-, blank-, and tool-production activities were differentiated by comparisons to technological standards of expected categories of debitage derived from numerous replications. Technological debitage categories for the production of naviform cores and blades that were presented at the Berlin and Warsaw Workshops were used to evaluate the data (WILKE and QUINTERO 1994), as were general technological categories of reduction debitage that were established from experimental replication of a variety of other configurations of blade cores and flake cores. Technological debitage types and quantities were compared to expected normal frequencies of debitage types. Reduction products were inventoried, and missing components, if any, were identified. Loci also were studied for evidence of tool production, maintenance, and retooling. Most importantly, the pattern of