Preliminary Report on the Excavations at Shakarat Al-Musay'id, 1999-2004

C.H. Jensen, B.D. Hermansen, M. Bille Petersen, P. Bangsgaard, I. Thuesen, M. Kinzel, M.M. Hald, N. Lynnerup

THE HASHEMITE KINGDOM OF JORDAN

ANNUAL OF THE DEPARTMENT OF ANTIQUITIES OF JORDAN

Volume 49

'AMMAN

2005

PRELIMINARY REPORT ON THE EXCAVATIONS AT SHAKĀRAT AL-MUSAY'ĪD, 1999-2004

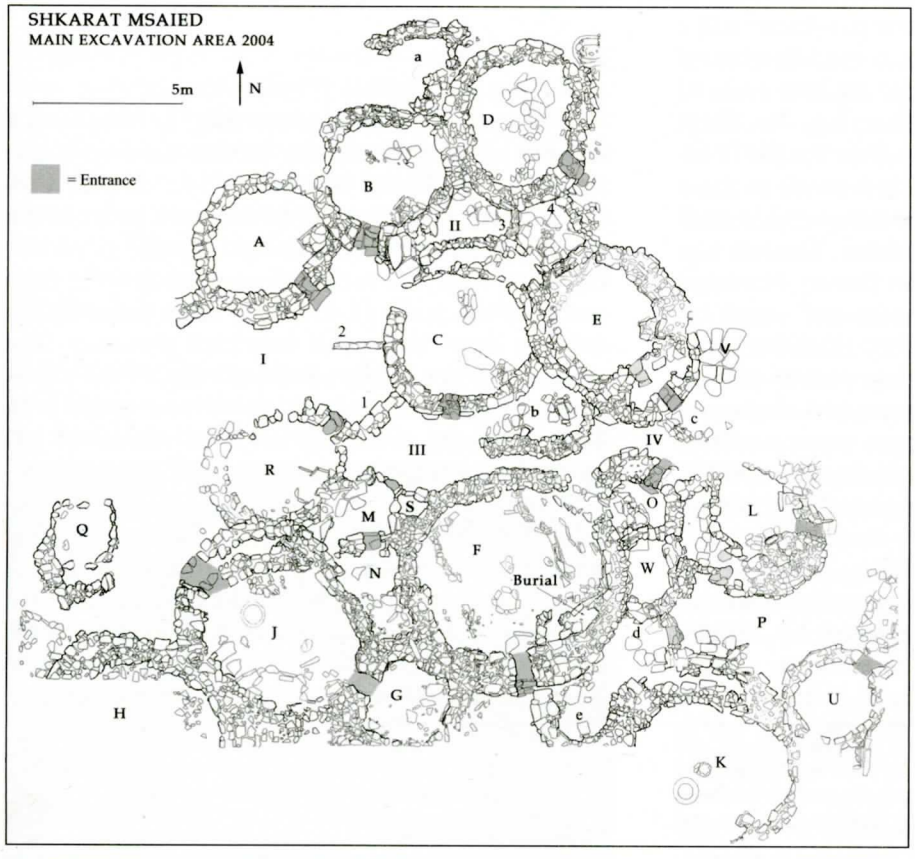
C. H. Jensen, B.D. Hermansen, M. Bille Petersen, M. Kinzel, M.M. Hald, P. Bangsgaard, N. Lynnerup and I. Thuesen.

I. Introduction

The site of Shakārat Musay'īd[1] is situated in the sandstone mountain area some 13km north of Petra ca. 1000m above sea level. The present day vegetation of the area is dominated by stone oak with some juniper and pistachio as well as shrubs and other minor herbs (Gebel 1986). No present day permanent spring is situated within less than two-hours walking distance (Gebel 1988: 81), but during our work at the site, we have observed that water is often close to the surface in the wadi, on the slope of which the site is located. Hence 'harvesting' or 'domestication' of water (Gebel 2004) during the Neolithic cannot be excluded.

Due to erosion of the southern and western edge of the site, as well as to recent construction works, the original size of the settlement is not known. Nevertheless more than 1000m^2 of well-preserved circular architecture is still present of which ca. 600m^2 have been subjected to excavation, so far (**Fig. 1**).

The site was discovered by Diana Kirkbride in



1. Plan of the site.

1. The site name has been written in different versions throughout the publications of Kirkbride (1966), Gebel (1986, 1988; Gebel and Starck 1985) and our team due to a variation in the Arabic spelling as well as in the transcription. With the kind assistance of our Department representative of the 2004 season Mr. Hani Falahat, inspector of the Department of Antiquities of the Ma'ān region, we now expect to have the correct transcription of the name as it is used here. The meaning of the site name is a small plot of land assigned to a poor man by the local land owner.

1964 (Kirkbride 1966: 54). She conducted a survey on the site and made a small sounding in the southern slope. In 1984 Hans Georg K. Gebel made a systematic survey on the site during his work in the Greater Petra Area (Gebel 1986, 1988). He also made a sounding on the south eastern slope, in which architectural remains were found (Gebel 1988: 83). Since 1999 the site has been under excavation by a Danish team (Kaliszan *et al.* 2001; Hermansen 2004; Hermansen and Jensen 2002; Jensen 2002, 2004b, in press; Petersen 2003; Petersen and Hermansen n.d.)[2]. The promising results of the first seasons followed by a short study season in 2002 encouraged us to continue work at the site, and plans were made for three additional years of excavation, of which two have passed at the time of writing. One of the goals of the remaining fieldwork has been to enlarge the excavated area further in order to enable a study of intra-site space use on a broader base.

One major building phase has been identified, conventionally dated to the MPPNB (see more below). At least one building (Unit E) is constructed on earlier walls, also dated to the MPPNB. And in the southeastern part of the site a pavement and a few flimsy structures, represent a modification of the main phase (cf. II.1-2). These include parts of the Units O, L, and P on the plan (**Fig. 1**). They, too, would seem to be datable within the MPPNB, to judge from the inventory of finds made in these structures. But a secure dating is not possible until the finds have been analysed in detail. The site was apparently also in use during the Pottery Neolithic as seen from the chipped stone material, which includes a few arrowheads of Pottery Neolithic types (Ha-Parsa, Nizzanim, and Herzliya points) and indicated by a few flimsy structures, not shown on the plan. Finally, the upper layers were modified through Nabatean reuse of stones from the PPNB architecture, Nabataean terracing, and agricultural activities of Nabataean and more recent date.

The dating of the main building phase to the MPPNB is based on the chipped stone material, showing arrowhead types dominated by Jericho and Jericho/Byblos transitional forms. Additionally, a very small proportion of Helwan points (until 2004 a total of 6 pieces) have been recovered. Five C-14 dates are available; two of which give uncalibrated conventional dates of 9144 ± 55 BP (Wk-15160); and 8977 ± 60 BP (Wk-15159) respectively; and the remainder giving uncalibrated conventional dates of 8880 ± 80 BP (AAR-9335), 9590 ± 90 PB (AAR-9336), and 8885 ± 70 BP (AAR-9337)[3]. Of these samples AAR-9335 is a charcoal sample of *Ephedra* sp., i.e. a shortlived herb, whereas the others are of *Juniperus* (AAR-9336) *Pistacia* (AAR-9337) or unidentified tree species (WK-15160 and Wk-15159). Additional samples are presently being processed for dating, species identification and tree ring analysis. The dates, acquired so far, would seem to place the tested samples in the EPPNB and the early part of the MPPNB. The presence of the few Helwan points (cf. V.1) may also point towards an early dating; as such points dominate in the Early PPNB and continue into the MPPNB (Gopher 1994; Rollefson 2001). In combination, then, these data suggest a date in the first half of the MPPNB for the site of Shakārat Musay'īd.
(CHJ, BDH)

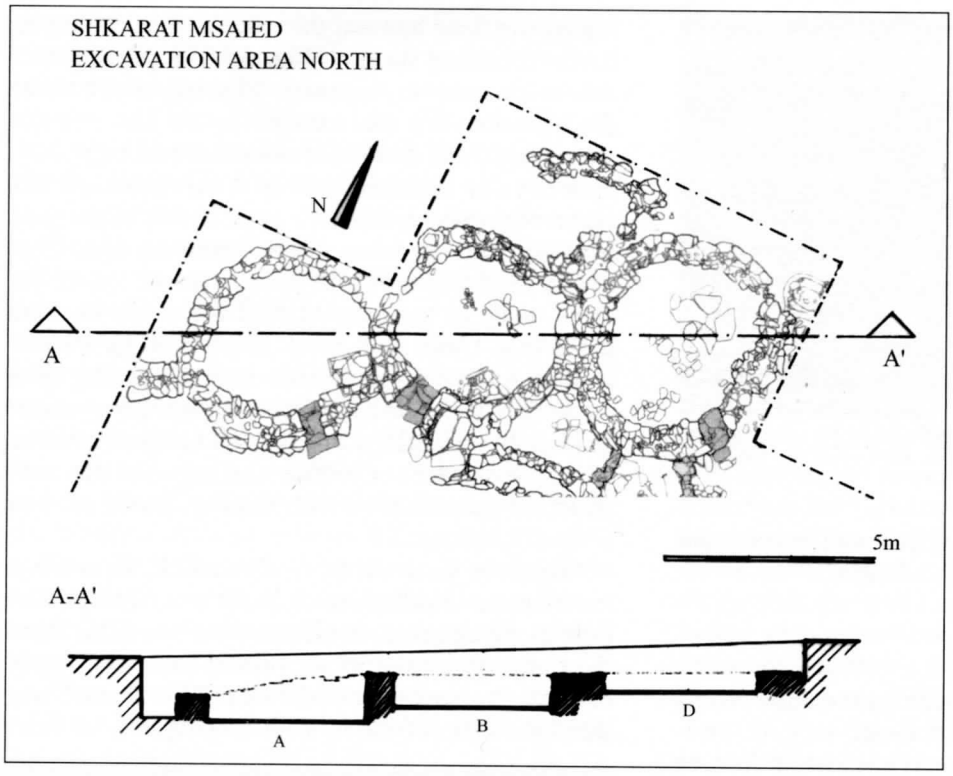
II. Architecture

II.1. Area and Surface Preparations

The excavated architecture (**Fig. 1**) comprises a number of roughly circular architectural units (A-E, F, H-J, K, L and R), arranged in clusters with two or three units in each. In the areas between the circular units smaller rooms are situated (G, M-N, O, S), as well as a series of small enclosures (a-e) and partition walls (1-4) which seem to subdivide outdoor areas into more restricted premises. The original surface of the excavated part of the site is sloping gently towards the west and south with Unit D erected at the highest level within the excavated area (**Fig. 2**). The buildings are not semi-subterranean in the sense of those in Bayḍa (Kirkbride 1966: 18; Byrd 1994: 647). Instead, at least some units, (e.g. B and D), seem to have been constructed on a roughly circular terrace, cut into the slightly sloping surface. Alternately, in cases of rebuilding (Unit E), the earlier walls were leveled and incorporated in the later construction. Surfaces

2. The field work in 1999 was directed by Lea Kaliszan and Charlott Hoffmann Jensen, in 2000 by Susanne Kerner, and in 2001 by Lea Kaliszan. Since 2002, the project has been directed by Ingolf Thuesen, Charlott Hoffmann Jensen and Bo Dahl Hermansen.

3. Two C14 samples have been dated at the Radiocarbon Dating Laboratory at the University of Waikato, New Zealand (WK-15160 and WK15159). The results have been received in August 2004. Three samples have been dated at the AMS Laboratory at the University of Aarhus, Denmark (AAR-9335, AAR-9336, and AAR-9337) received in December 2004. The results are Conventional Age as per Stuiver and Polach 1977, Radiocarbon 19: 355-363 with correction for isotopic fractionation applied. Prior to dating, the Aarhus samples were analyzed by Dr. Claus Malmros for species identification at the National Museum of Copenhagen giving the results mentioned in the text.
The calibrated dates are as follows (95,4% probability):
WK-15160: 8530-8260BC. WK-15159: 8290-7960BC.
AAR-9335: 8300-7750BC. AAR-9336: 9250-8650BC.
AAR-9337: 8250-7760BC. Calibration as per Stuiver *et al.* 1998.



2. Section through the Units A, B and D showing the difference in level on which the housing units have been constructed (By M. Kinzel).

in outdoor areas were sometimes covered with a stone pavement (e.g. Space II and V) or with lime plaster (Part of Space I, Space III-IV), and rose considerably as a result of replastering and possibly repaving (the latter is based on the fact that two layers of stone pavement have been identified in Space II, **Fig. 3**). Earthen surfaces also occur (e.g. most of Space I).
(BDH, CHJ)

II.2. Building Materials

The main materials used in the construction of the buildings consisted of locally available sandstone and limestone. Although the pattern is not without exceptions, it does seem that limestone boulders were preferably used at the base of walls as a sort of support or foundation, whereas the walls were otherwise constructed of sandstone. In addition postholes along the inner face of the walls and charred roof beams, recovered in Unit K, indicate the use of wooden construction that would also have been acquired from locally available arboreal sources which, in prehistoric times in general, would have included the same as today: oak, pistachio and juniper (Gebel 1988: 72). This is also confirmed by two of the charcoal samples from the excavation, mentioned above, which have been identified as *juniperus* and *pistacia* sp. respectively.

3. Pavement in Space II in two layers, looking east.

Plaster was used on the floors of the houses, and replastering has been observed in several cases. In Unit K plaster was, indeed, found preserved on the interior wall to a height of more than 1m, indicating that not only floors but also at least parts of the interior walls of the circular structures were covered by plaster (**Fig. 4**). No analyses have been made on the plaster materials yet, but colour, texture and hardness indicate that lime plaster was frequently used (Lea Kaliszan, pers. comm.). In at least one case (Unit C), it could be shown that a plaster floor had been painted with a red colour, which paled swiftly after exposure to the open air. Finally, we have evidence of mud floors, including

4. Unit K showing plaster floor, postholes in the northern wall and wall plaster still attached to the wall visible in the upper right corner of photo.

a raised floor in Unit F (**Fig. 5**), as well as mud and lime mortar used in roof constructions.

(BDH, CHJ)

II.3. Constructing a House

Interpreting our observations on the units A-F, J and R we suggest that the usual way of constructing a circular house would have been, first, to cut a roughly circular floor bed into the sloping surface of the site, however, future investigations below floors may force us to modify this suggestion. In cases of rebuilding (Unit E), the earlier walls were levelled and a floor bed prepared artificially. Then a circle of wooden posts, each ca. 10cm in diameter, would have been staked in the floor bed, some 20-30cm from the edge, at intervals of ca. 0,45-1,50m. In at least some buildings, this system was apparently organised around a larger pole, supporting the roof construction like in the circular houses in Bayḍa Phase A (Byrd 1994: 607).

Second, mostly double faced walls, ca. 60cm wide or more, were constructed around this skeleton of wooden posts with the interior wall face resting on the floor bed and the exterior face resting on the surrounding surface (**Fig. 6**). The interior face was constructed in segments, adjusted in size to the distance between the wooden posts. The exterior was constructed as an unbroken circle of large, horizontally laid boulders, mainly of sandstone. At this stage, the posts would have been visible in the gaps between wall segments (**Figs. 4 and 6**). Most segments of the inner circle were constructed in the same mode as the exterior wall faces, but in some cases (e.g. Units A, B, and C), parts of the interior wall face were finished with upright standing lime — or sandstone slabs. This was most pronounced in Unit A where the northern wall face consisted of eleven such slabs. Cavities and gaps in the construction were filled in with smaller chunks of sand — and limestone.

Third, in Units A, B, C, D, early E, F, and R a small stone installation, or stone cist, was erected next to the entrance, in all cases but one (Unit R) to the right when entering the house, i.e. unanimously towards the east of the entrance. This feature was most well preserved in Unit A (**Fig. 7**), at least

5. Unit F showing mud floor and stone benches.

6. Site viewed from the north. Note the wall of Unit B resting on a sloping surface in the lower right corner of the photo. Postholes are visible in the walls of Unit B and Unit C in the center of the photo. The Platform of Unit D is situated in the lower left corner of the photo.

7. Stone installation in Unit A seen from the northwest.

when first recovered. Here it was built of upright standing stone slabs, one of which was a very finely worked, blue sandstone slab, which rose above the rest as a monolithic marker of the installation. The fill within consisted of small limestone boulders set in plaster. The stone cist was covered with slabs, which would have provided a fine horizontal surface. A possible purpose and meaning of this installation has been discussed elsewhere (Hermansen and Jensen 2002).

Finally, when the stone cist was finished, a floor of plaster was laid out to cover the base of walls and stone features, at least in Unit K continuing up along the wall face (**Fig. 4**). Thus, if the interior walls were completely covered by plaster, as possibly indicated by the observations in Unit K, the wooden posts as well as the upright standing slabs in the wall construction would no longer have been directly visible. But this cannot be certified in most cases. Replastering was executed several times during the lifetime of the buildings.

After the floors had been plastered, a platform of stone slabs was sometimes (Unit B, C, D) laid out on the northern part of the floor (**Fig. 6**), opposite the doorways, or in one case (Unit D) just inside the door, to the left. These platforms may well have served as working surfaces.

In Unit F we recovered a raised floor constructed by infilling a layer of earth or mud, which was then stamped to reach a considerable compactness. Then a bench with a face of stone slabs was added along the east and west walls of the room (**Fig. 5**). In this way, an almost rectangular plan was effectuated, which may be of interest in the ongoing discussion on the origin of rectangular architecture in the Southern Levant.

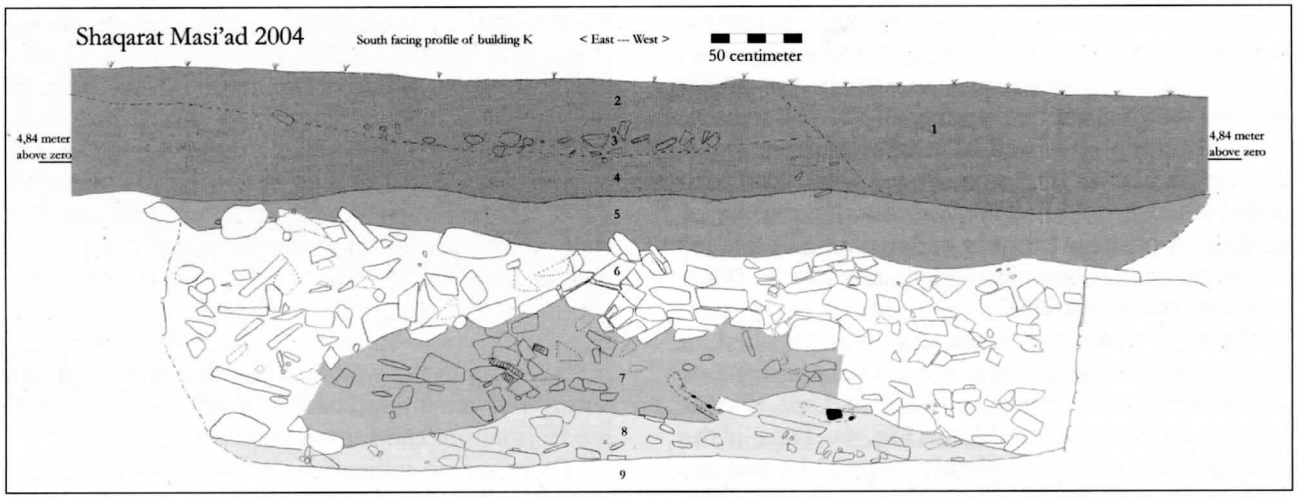
When constructing the houses, except for Unit J, only a single opening was left in the wall-constructions to serve as doorway. These are usually in the south, southwest or southeast. The only exceptions from this, so far, are Unit R, in which the door is in the northeast, and Unit J which has two doorways, a main one in the northwest and a secondary doorway in the southeast which probably originally led to an open space and later to Unit G (A doorway oriented roughly towards the east was identified both in Unit L and U during the spring season of 2005. The results of the 2005 season will be presented elsewhere). With the exception of the northwest door of Unit J, doorways are quite narrow, roughly 60cm in diameter, with thresholds some 20-30cm high. The thresholds consist of horizontally laid slabs, sometimes arranged as a small staircase. Additionally, the doors of Units A, B, C, and late E, were flanked on the exterior face by large upright standing slabs, an architectural feature which, together with the thresholds, would have served, implicitly or explicitly, to signify the boundary conditions, associated with passage from the open space of the exterior to the enclosed space of the interior (Hillier and Hanson 1984: 144ff). Interestingly, such upright standing slabs were also set up at the passage from Unit G to J, and Unit M to N. A special case is that of the entrance from Space III to Unit M, which is also flanked by two upright standing slabs, set perpendicularly to the walls, rather than facing the exterior. For an interpretation of all these features, see Hermansen and Jensen 2002.

There are no indications of windows in this architecture but this could have to do with the state of preservation. The village plan is well preserved, as we have seen, but the fill inside the houses indicate that the walls must have been considerably higher than preserved, in the case of Unit K significantly exceeding the preserved height of 1,40m. So windows can, of course, not be excluded. This leads to the question of what houses may have looked like, and how roofs may have been constructed, which will be discussed in the following paragraph.
(BDH, CHJ)

II.4. Reconstructing a Roof

It has recently been argued by Charlott Hoffmann Jensen (2002, 2004b) and Mikkel Bille Petersen (2003, 2004) that the houses in Shakārat Musay'īd may have had flat substantial roofs, and that these may have served as additional spaces for storage and activities. This suggestion was largely based on extrapolation from the distribution of artifacts recovered in room fill, and on sporadic evidence of roof collapse, i.e. circumstantial evidence. But no solid evidence of roof construction has been systematically identified so far. However, in the campaign of 2004 the authors of this paragraph excavated part of the room fill of Unit K and were able to record an east-west oriented section through this building. A brief report is offered here. The section drawing (**Fig. 8**) indicates our understanding of the observations.

The deposits in question are Stratum 6-9. Reading upwards, Stratum 9 is a well defined plaster floor, upon which Stratum 8 is resting. The latter is a layer of mud mortar, organic soil and large chunks of charred wood, with cobble sized stones embedded. Stratum 7, too, consists of a mixture of charred wood, organic soil, mud mortar and predominantly cobble sized stones. The main difference between the composition of the two strata, be-



8. Southern section of sq. D110 showing cut through the northern part of unit K.

ing that Stratum 8 has a much higher density of mortar and charcoal but hardly any artifacts, whereas Stratum 7 shows a quite high density of artifacts and bones. The charred wood appeared partly as large chunks, with a thickness from ca 5,75 to ca 14cm and a length of 39cm (chunks with a thickness of up to 17cm were found in the spring of 2005), partly as thin extensions of these, and partly as a spread of ashes and charcoal with little articulation. In one case such large chunks were found along an east west axis of more than 2m suggesting that we are dealing with the remains of roof beams. Unfortunately, the larger chunks were mostly embedded in ashes, and hence we fear that in most cases, the outer tree-rings have not been preserved. However, that will have to await proper investigation of the sampled material. Mortar and soil samples have also been collected in order to investigate the composition of the materials employed, as well as a sample of burned stone, found in Stratum 8.

This combination of findings would seem to us to indicate that Unit K had a substantial, flat roof, supported by large beams, branches and wickerwork, and covered by a quite thick layer (30-40cm?) of mortar with cobble sized stones embedded. The reconstruction of the roof will be further discussed in the following paragraph (II.5).

Finally, Stratum 6 would seem to represent the collapse of the walls of the house. As seen from the drawing the collapse of the walls appears to have happened in two tempi, first a collapse from the West (and Southwest), which took that wall down to a height of roughly 1 meter, and then a collapse from the East (and Northeast), which took that part of the wall down to a height of ca. 1,40m. i.e. this house, with its thick walls, must have stood to a height of perhaps 1,60-1,80m or more, and if our interpretation is reasonable, have had a flat, substantial roof.

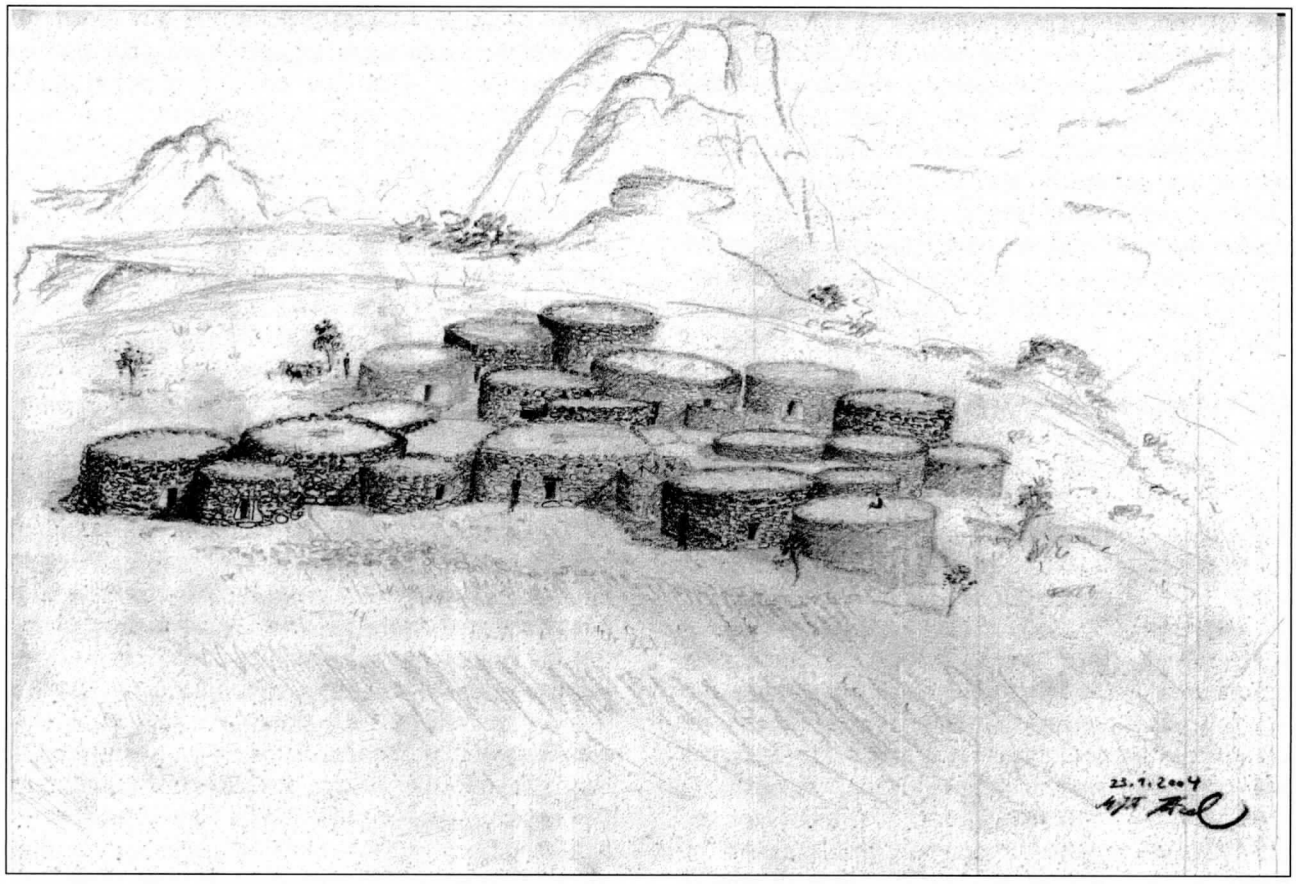
A full horizontal excavation of the remaining and major part of the room fill in Unit K is planned for the next campaign in 2005. And we hope then to be able to add details and perhaps modifications to the interpretation offered here (see Petersen and Hermansen n.d. for information that includes results from the first campaign of 2005).
(BDH and MBP)

II.5. Reconstructing a House

With the results from the last campaigns, especially concerning Unit K and H, we are able to present a preliminary reconstruction of PPNB buildings in Shakārat Musay'īd.

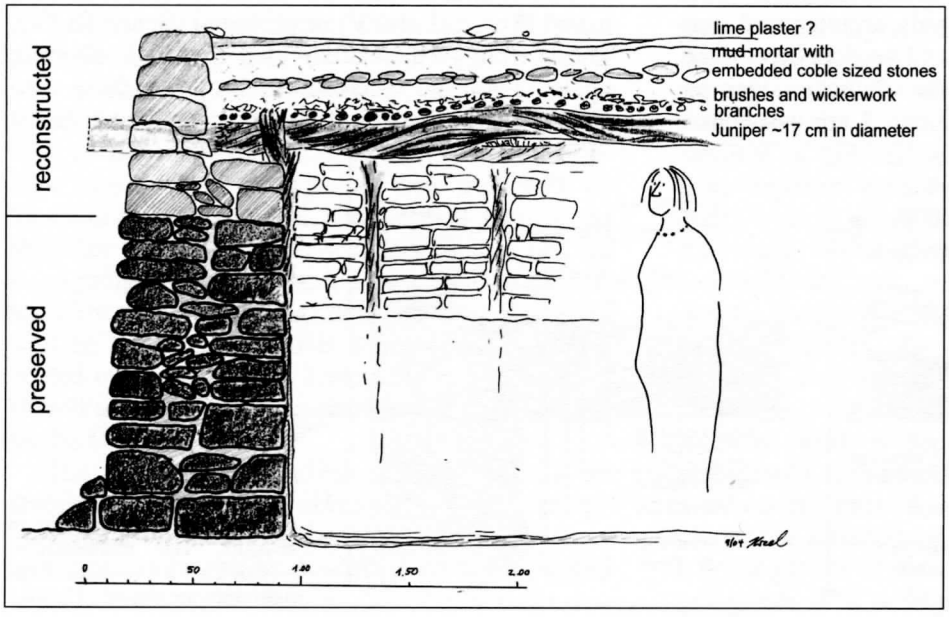
The buildings of Shakārat Musay'īd show various characteristics of the building tradition in semi-arid mountain areas along the 30th degree of latitude (Adam 1981) (**Fig. 9**). This kind of stone architecture, with walls more than 60cm wide, is well adapted to the extreme climate of the mountain setting in the area. Compared to the buildings of the Northern Levant, like in Jafr al-Aḥmar (Stordeur *et al.* 2000), the building construction here is both solid and substantial in order to compensate for the cold winters and hot summers.

Through an analysis and interpretation of the room fill of unit K and H the walls can be reconstructed to a height of up to perhaps 1.80m or more. The height is calculated for the wall interior. To calculate the height the stones from the room fill were collected in an area of 1 x 1 x 0,8m and when piled up, the stones measured some 1x 0,75 x ~ 0,5m. The height of the experimental wall, more than 0,5m, was added to the preserved height of unit K (1,40m) and H (ca. 1,20m) suggesting a comfortable height inside the buildings.



9. Reconstruction drawing by M. Kinzel of the village of Shakārat al-Musay'īd.

In general, the roofs in MPPNB Shakārat Musay'īd are, as mentioned earlier, considered to be flat. **Fig. 10** is a reconstruction of this feature. The beams of the flat roof rested on a scaffold of wooden posts that were placed in wall channels in the interior wall face and in a central posthole. Branches and wickerwork were placed across the beams, covered by thick layers of mud mortar embedded with cobble-sized stones. This material was heavily compressed by roof renewal processes. Finally, on top of the roof construction we may assume a layer of lime plaster. The cross-section re-



10. Reconstruction drawing showing a cross section of Unit K (By M. Kinzel).

constructed for Unit K shows the characteristic cross section of roof constructions in the region as it is seen today in the traditional village of ar-Rājif in Wādī Mūsā area (**Fig. 11**) (Kinzel 2004). How the roof beams were placed around the central post cannot be reconstructed yet. Nevertheless, this MPPNB construction seems to be at the beginning of a long tradition of roof building technology which, transferred to rectangular architecture, continued through the LPPNB until the present.
MK

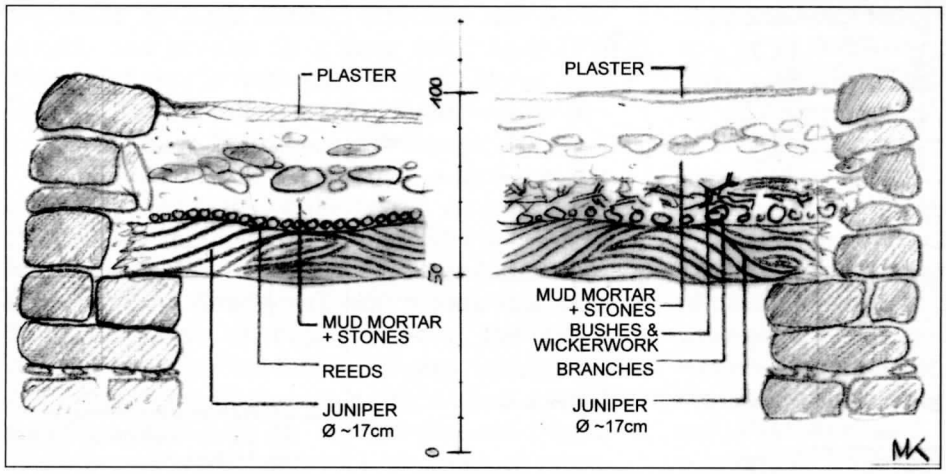
III. Village Plan and Organization

III.1. Village Plan

The plan, as revealed so far is focused on three main clusters of circular architectural units (**Fig. 1**). The two clusters to the north consist of respectively three and two units with floor areas of some 9-11m^2 (Units A, B, D, and early E), ca. 13m^2 (Unit C), and 17m^2 (late Unit E), respectively. Each of these circular units has its own entrance, as mentioned above, mostly from the south, southeast and southwest. By reference to the classifications of Byrd (1994: 646) we interpret these units as domestic houses.

The architecture to the south is more heterogeneous, encompassing one cluster with two or three larger, circular structures: Units F and J which cover some 25 and 17m^2, respectively, and Unit H, which is apparently large but with an unknown floor area because of limited exposure. At least Units F and J are presently interpreted as communal buildings, partly following Byrd (1994: 656f), and partly because of the finds recovered inside them (cf. IV.1-2; VI.6). The entrance of Unit F is roughly towards the south, as in most cases. Unit J, on the other hand, as the only architectural unit at the site excavated so far, has two doorways. One in the northwest and one in the southeast, opening towards Unit G. The units F and J are associated with a series of smaller structures (Units G, M, N, R), which would seem to have been added to an original layout with free passage between these units, and an open space in front. Unit R, ca. 9m^2, apparently belonged to the same category of buildings as A-early E. Concerning the units M and N, it has been suggested elsewhere (Hermansen and Jensen 2002), that these rooms may have been a setting for ritualized activities. Finally, the layout of the units L, O, and P was constructed by paving the area east and southeast of Unit F, leaving the ruined walls of an abandoned circular structure (Unit L), and adding division walls which subdivided the area in small compartments. The presence of another large building, Unit K, to the south of this cluster indicates that the site must have continued in southern direction. This is substantiated by wall remains, identified on the southern slope of the site before excavation started in 1999, which indicate that the Neolithic village continued southwards, beyond the present day slope of the site. Similarly, a test trench, excavated on the eastern slope of the site in 2001, not shown on the plan, indicates that the architecture also continued eastward, beyond the present day slope of the site. In this trench, another house unit (T) was recovered, half eroded away, but apparently originally within the size range of the units A-D. It may, therefore, be suggested that the hypothesized communal buildings were originally located in a focal position on the site, and hence served as a focal area in a changing layout of the domestic housing areas and open spaces that surrounded it. This, of course, needs substantiation through further excavation.

The main architectural clusters were separated by passages and open spaces, some of which were paved (Space II and V) or plastered (Space III-IV). These were further subdivided by small dividing walls (1-4) and enclosures (b-c). of these, enclosure b has some features which indicate that it



11. Two versions of roof construction from the village of ar-Rājif. The reconstructed roof of Unit K is similar to the right drawing (by M. Kinzel).

may have served as a setting for some sort of ritualized activity (see Hermansen and Jensen 2002). (BDH, CHJ, MBP)

III.2. Building Sequence and Changes of Village Plan

Even though no definitive interpretations can be made regarding the sequence of building activity at the site, and hence changes in the site plan, an attempt is made here to present the data and conclude as much as possible on specific parts of the excavated area. Starting from the southwest, it appears that the units in that part of the excavated area, H and J, were constructed simultaneously. This is because they share a wall, or rather; their walls are interlocked in a way, which indicates simultaneous construction. The stratigraphic relationship between Unit J and R is rather straightforward since the walls of the latter abut on the northern wall of Unit J. Thus, Unit R was probably a contemporary or subsequent addition to Unit J. The large Unit F, situated further east, was not originally connected to H, J and R. Its stratigraphic relationship to Units H, J, and R is therefore not clear, as yet.

Moving north on the plan, focus shifts to the units C and E. Unit E features two construction phases of which the later is considerably larger than the earlier construction. The walls of Unit C are abutting on those of late Unit E. But they are also built, partly on the same foundation; and thus, they must have been planned and executed in one operation. It is now clear that the wall of Enclosure b was also constructed on this foundation, indicating that this feature was planned and executed simultaneously with the two circular units.

The houses in the cluster to the north were apparently built in one or two tempi. Units B and D may or may not have been made simultaneously, since they are not sharing walls. But they were built on the same surface, which would tend to favour an interpretation that they were built with no long interval in between. The walls of Unit A, on the other hand, were clearly added to those of Unit B, to judge from the fact that they abut on the latter. However, like Unit C and late Unit E, it may well be that Unit A and B were planned and executed in one operation. Especially since that Unit B wall segment, which is shared with Unit A, rests on the Unit A floor bed.

The above considerations indicate that not all architectural units were necessarily constructed simultaneously. However, both these considerations and the features to be described presently would seem to indicate that they all, or most of them (excepting early E), would have been in simultaneous or overlapping use during the main phase at the site. This is because four flimsy dividing walls (**1-4 on the plan, Fig. 1**) were erected across the open areas between the houses. It is clear that Wall 1 would have separated Space I and III, and that it would have served to orient the doorway of Unit R towards Space I and that of Unit C towards Space III. Wall 2 would have separated Space I into an area in front of Unit R and one in front of the units A and B. Finally, the walls 3 and 4 would have separated Space II and a space to the east of the excavated area and hence, oriented the door of Unit D towards that latter space, leaving Space II in association with the doorways of Units A and B.

We currently interpret this insertion of dividing walls across open areas in the village as a strategy in the negotiation of social boundaries between inhabitants in the excavated area of the site. They would have had the effect of blocking or reducing circulation through the excavated parts of the village and setting up boundaries between premises of various social groups on the site. This process apparently resulted in the subdivision of open, possibly 'public' or 'communal', space into more 'private' premises.

This subdivision of some open areas in the excavated part of the site into individual premises was not the only architectural modifications in the excavated area. The most complex modifications of the plan are actually represented by the units G, M-N and S. These units were added by inserting a series of dividing walls and doorways in the space between the Units J, R and F. In this way, the space between Unit J and F was blocked completely. Unfortunately we cannot say at present how long an interval ensued between the construction of the units F, J, and R and that of M-N. Neither can we say if Unit G was constructed simultaneously with M-N and S, while the latter seems to be constructed in one operation. At any rate, it is clear that, together with the insertion of the partition wall (Wall 1), these modifications would have had the overall effect of creating an enclosed space in front of Unit C with privileged access to Unit M-N and Enclosure b, both of which have some rather unusual features, that have been discussed and interpreted elsewhere (Hermansen and Jensen 2002; cf. III.1).

More work is needed in order to clarify the stratigraphic and architectural situation of the southeastern part of the excavated area which includes the architecture of the units L, O, and P. As a consequence of the considerations offered in this paragraph, it is perhaps reasonable to suggest that

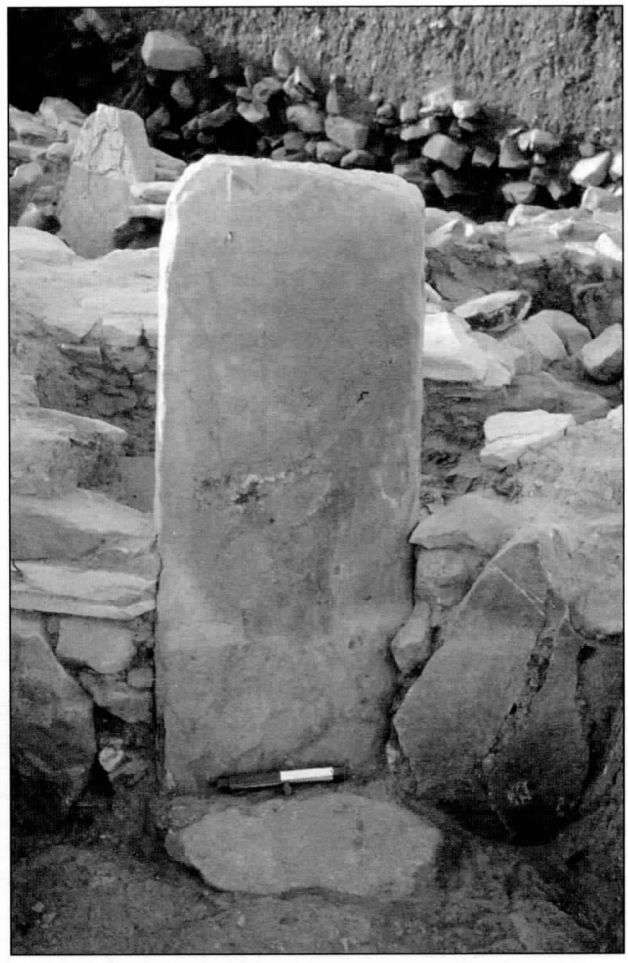
the plan exposed so far would correspond pretty well to the village plan by the end of the PPNB occupation, at least within the excavated area. An impression that is strengthened by the fact that most, or all, entrances appear to have been deliberately blocked as if the inhabitants expected to return to the site (**Fig. 12**). Something that was obviously not to happen in the end.
(BDH, CHJ, MBP)

IV. The Human Burial

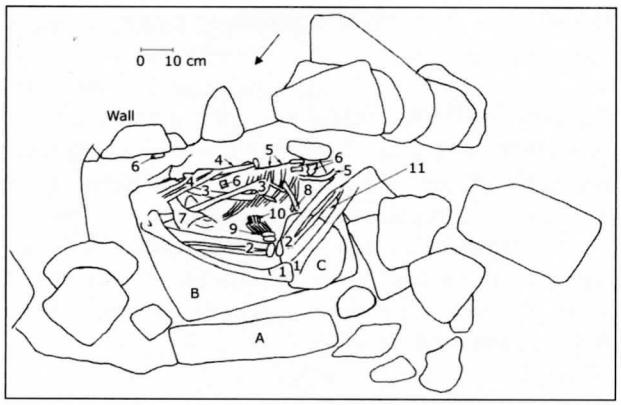
IV.1. The Context

In the southeastern part of Unit F we located the most well preserved stone cist of all the cists identified. As in most cases this was to the right of the entrance when entering, i.e. to the east. Like the building itself, this feature is larger than the other recovered cases. It is constructed of horizontally laid boulders, and demarcated by a large, flat-topped monolith made of orange coloured sandstone, the surface of which has turned gray through the millennia. But the color must have been visible for the people who cut the monolith to shape and placed it in the position where it was found. On the face of this monolith there is a discoloration, which is centered on an area where the surface layer is flaking off (**Fig. 13**). The meaning of this is not yet clear to us. Although there are no direct signs that the discoloration and spalling were artificially induced, this can certainly not be excluded, since the contents of this built-in feature included a human burial. For these reasons a sample has been taken from the surface of the monolith, which is now under closer investigation. This was the only burial, recovered at the site, at the time of writing (See, however, Hermansen and Abu-Laban, in prep. for an additional burial, recovered in the spring of 2005). The buried individual is probably a female (see below) with the skull and jaw removed, and laid down with the arms apparently placed inside the torso, as described in details in paragraph IV.2 (**Fig. 14**). Few artifacts were found in the fill and none, apparently, deliberately placed with the burial (which may of course in itself be considered an artifact), but it was accompanied by four mandibles of sheep/goat, indicating perhaps that the funerary ceremony had included some sort of ritual feasting. The burial was placed on a large stone slab pretty high up in the fill of the feature (Hermansen and Abu-Laban, in prep.). These findings then would seem to indicate that burial practices at Shakārat Musay'īd may have resembled a general pattern of burial costumes in the MPPNB, albeit with a concrete expression specific to this site.
(BDH)

12. Blocked entrance to Unit M.



13. Surface of upright stone in Unit F.



14. Burial behind large upright stone (A). Below the burial is a large flat slab (B). In the lowest level of the burial is a flat stone (C) 1: Left (to the left) and right femur. 2: Right (to the left) and left tibia and fibula, with the foot (9) still attached to the right leg. 3: humerii. Note that they are placed directly on the left ribs (5) and one is inside the hip (7). 4: Radius and ulna. 6: Vertebrae. 8: Clavicula. 10: Phalanxes from the left foot. 11: The four mandibles of sheep/goat were situated below the upper end of the right femur, and the left tibia and fibula.

IV.2. Anthropological Interpretation

The burial was discovered at the end of the season in 2001. Except for a small test excavation in 2002, to check if it was a human burial, excavation did not commence until a physical anthropologist, Dr. Niels Lynnerup, could be present in 2003.

The burial was covered with at least 10cm of very hard mortar-like fill. Beneath that, the skeleton was found embedded in a hard yellowish fill. In addition to the four ovi-caprine jaws, only a few finds were recovered in the fill, including a few animal bones and chipped stones, all in a tertiary context. A large flat stone was placed in the south-eastern end of the burial at the same level as the lowest parts of the skeleton (**Fig. 14**). As mentioned above the skeleton had originally been placed on a large flat slab.

The bones probably belong to an adult female. The identification is based on talus size, general bone size and *incisura ischiadica*. The age of the female was probably 25-35 years, estimated on the basis of possible arthritic changes on ulna.

The bones were ill preserved, and it was difficult to remove them in one piece. Therefore laboratory analyses of the bones have not added information to the data recorded during excavation, although further data may be forthcoming from future stable isotope analyses.

As mentioned earlier the skull and the jaw were missing and probably removed before the body was placed in the burial. The left side ribs were found in anatomically correct position indicating that the rib cage may have been laid down complete. However, the right side ribs were missing, either because they were not preserved or because remnants of them could not be identified during removal of the top hard mortar layer of the burial during the excavation of 2001. The arms were apparently placed longitudinally inside the rib cage and the legs in front of it, as indicated by their respective positions and by the fact that both left and right ulna and radius, as well as left and right tibia and fibula, were found in anatomical relationship. This was also the case with one foot and one hand, while the other foot and hand are missing except for a few bones found out of context. Again, this may be due either to preservation or excavation. It may also have other reasons, however, since several finger bones have been found in the fill of the room in which the burial is situated. There are no cut marks visible on the bone surfaces and no signs of animal activity on the bones.

To conclude, it seems that the body was buried in a partly decomposed state, but still with soft tissue left on the joints. The head was removed from the body. The legs and arms were also removed from the torso before it was interred in the grave. The internal organs must have been removed or been in an advanced state of decomposition at the time of burial, since it was possible to place the arm bones inside the rib cage.
(NL, CHJ)

V. The Chipped Stone Industry

V.1. Introduction

The chipped stone industry from Shakārat Musay'īd has not yet been subjected to a detailed analysis. Except for part of the material excavated in 1999 and 2001, the chipped stone material has been sorted according to a primary classification (**see Table 1**). The sorted material account for close to 70% of the total.

Most of the raw materials are quite similar to the materials used at the site of Bayḍa (Mortensen 1970: 14-15). They include fine-grained to medium coarse grey and beige-brownish flint types as well as various coarser materials including a few ex-

Table 1: Primary production of chipped stone material 1999-2004.

Primary production	N	%
Cores (incl. fragm.)	635	1.9
Core trimming elem.	1911	5.8
Debitage	26854	81.4
Debris	1473	4.5
Tools	2137	6.5
Total sorted (Total excavated	33010 48676)	100.1

amples of fine grained quartz used in flaking. A single piece of obsidian has been found: a small fragment of a blade, which derives from the room fill of Unit F (an additional piece was found in the spring of 2005).
(CHJ)

V.2. Primary Production

Cores account for 1.9% of the investigated material. Only cores from the 2002-2004 seasons have been registered according to type. Here it can be seen that flake cores are quite numerous, accounting for almost 50%. The core-on-flake type is included in the flake core category, here, as these only rarely produce blanks of blade size. Blade cores comprise 41.5%. Of these most are bi-directional/opposed platform cores and only few are unipolar cores. The opposed platform cores show a variety of shapes (**Fig. 15**). Some of these can be termed naviform or semi-naviform, which shows that the standardized naviform core technology was introduced at Shakārat Musay'id, but was not necessarily used consistently. The bi-directional technique is also seen in the rather high amount of crest blades, sometimes with the crest partly removed from the opposite end, as well as in blades, with bidirectional removal scars showing both feathered and pointed distal ends. The small size of many cores and the different types of core trimming elements found in the material show that not only core preparation, but also at least some core rejuvenation was taking place at the site, but unfortunately no workshop for blank production has so far been identified in the material.

For the 2000-2001 seasons flakes are far more represented among the debitage than blades as can be seen from a blade to flake ratio of 1:3.4. A small amount of the debitage could not be assigned more specifically to the blade or flake category due to fragmentation. When turning to the material from the seasons 2002-2004 a different picture is seen. Here the ratio of blades to flakes is very close to 1:1, but with 16% of indeterminable fragments of flakes/blades. This difference may perhaps be explained by a change of the staff doing the flint sorting. The limited study of the 1999 material does not allow a separation into blades and flakes.

The amount of material, which could be identified as tools also varies from one season to the next. Figures from 5.3 to 10.1% are seen, with 6.5% of the total.
(CHJ)

V.3. Retouched Material

Although flakes are more frequent among the debitage than blades, blades are preferred as tool blanks. The chipped stone tools show a predominance of blade related tools, such as arrowheads, knives, etc., with arrowheads being the most dominant tool group, accounting for almost 25% of the tools (**Table 2**). The table does not include material from the 1999 season, since the data from the in-field sorting does not allow a separation into tool types.

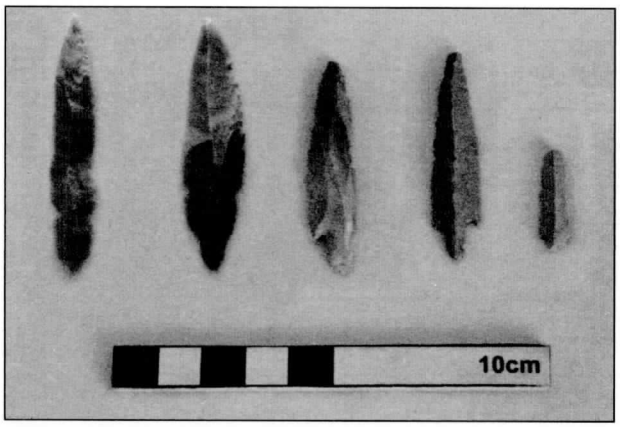
According to a detailed analysis of the arrowheads from the 1999-2002 seasons (Glar 2003) combined with information from the last two seasons the arrowheads consist of mostly Jericho points with almost 70% of the total registered as such (**Fig. 16**). Intermediate Jericho/ Byblos transitional forms, defined as types, which fit the Jericho definition along one lateral side and the Byblos definition on the other, are the second largest group with almost 12%. Byblos points follow closely with almost 10%. Amuq and Byblos/Amuq transitional forms are present as well but only in few numbers (less than 2%).

Of particular interest are the few Helwan points. Until the time of writing six have been identified,

15. Opposed platform blade cores and crest blades from the 2003 season.

Table 2: Chipped stone tool types from seasons 2000-2004.

Tools (2000-2004)	N	%
Arrowheads	446	24.7
Burins	25	1.4
Borers	184	10.2
Scrapers	206	11.4
Knives	399	22.1
Sickle blades	50	2.8
Backed blades	12	0.7
Notches & dent.	159	8.8
Retouched pieces	297	16.5
Heavy duty tools	26	1.4
Total	1804	100.0



16. Arrowheads: Helwan and Jericho types.

1.1% of the arrowhead assemblage, of which one point is a surface find and one comes from a tertiary context above the top of the walls of Unit B. The rest are found in proper architectural contexts: A few centimeters above the plaster floor of Unit F, embedded in the fill layer on which Unit C is constructed, which is below the floor of Enclosure b, but not necessarily predating the construction of Unit C, and in a fill layer in the eastern part of Unit P close to the level of the pavement excavated in the western part of that unit.

Late Neolithic arrowhead types are also represented. They primarily derive from the topsoil and upper fill of the houses, indicating that the site has been used in Late Neolithic times. So far no architectural remains can be dated with certainty to this phase. Further studies will show if circular structures excavated above the entrance to Unit B, above the southern end of Unit R and to the west of Unit J should be dated to the Late Neolithic.

Scrapers are also quite common (11,4%), especially side scrapers made on flakes. Sickle blades with gloss are represented, but are not very common (2,8%), while retouched blades and blades with fine denticulation (both types may have been used as knives), are found in large numbers (16,5% retouched pieces). Denticulates are registered together with notched pieces; therefore the exact percentage of finely denticulated blades is not mentioned, but they account for just less than half of the 8,8% notches and denticulates mentioned in the table.

Especially one tool type has been found in interesting contexts: borers (see below). This tool group, which account for around 10% of the tools, includes a variation of borers and drills. The type, which is most often represented is drills with short drill bits made on small flakes, bladelets and burin spalls. The rest are made on blades.
(CHJ)

V.4. Distribution

Two different deposits, a pit in area I, near the entrance to Unit A, and a small dump north of Unit B, both produced large numbers of borers when excavated. Each of these deposits is interpreted as deriving from a bead workshop. The tools are mostly of the drill type with the short drill bit mentioned above. The workshop material has been presented in detail elsewhere (Jensen 2004a, 2004b).

The other tool types seem to be evenly distributed across the site. This is also the case with the cores and primary elements; therefore no specific flint working areas have been identified so far. Any further details on the distribution of the chipped stone material will have to await a closer study.
(CHJ)

VI. The Small Finds

VI.1. Introduction

The six campaigns on the site have produced around 1000 objects (**Table 3**). The figure includes objects deriving from the surface and layers above the Neolithic architecture, therefore not all are necessarily dated to the PPNB period. The amount of objects may increase when the remaining part of the faunal remains are analyzed by our zooarchaeologist Pernille Bangsgaard, since we have experienced that some fragments of worked bone end up in the bone bags during excavation. The objects are all stored in Jordan; therefore the present manuscript report is based on descriptions in our database, which contains very limited information concerning the finds from the first three seasons.

The raw materials have not been positively identified by specialists. However, field investigations suggest that they include animal bones, various sea shells, mother-of-pearl, clay as well as various stones and minerals. The latter include local materials such as limestone, sandstone, quartzite, basalt, granite and mudstone. But also non-local materials seem to be represented such as turquoise, malachite, and various hard rocks.
(CHJ)

VI.2. Ground Stone Industry

The ground stone industry makes up more than one third of the registered objects. The registration of these follows the typology of Karen Wright (1991). The group includes grinding slabs and hand stones, mortars and pestles, stone vessels, which are all fragmentary, ground heavy-duty stone tools and grooved stones. A number of objects are designated as unidentified ground stone objects due to a lack of information in the database. It is expected that this group includes mostly

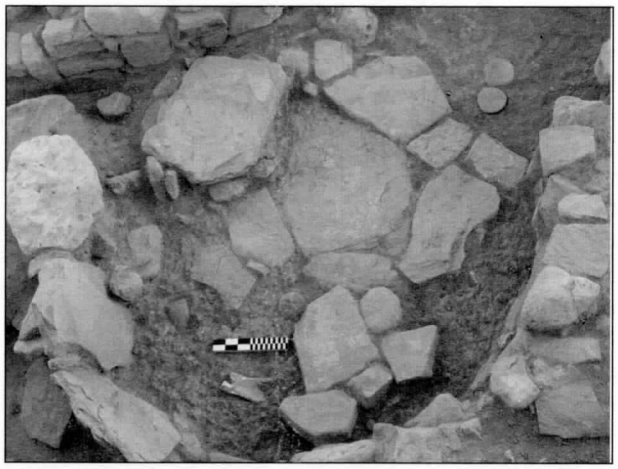
Table 3: Object classes 1999-2004.

Object category	Object type	N	Total
Ground stone industry	Grinding slabs	18	
	Hand stones	122	
	Mortars	6	
	Pestles	93	
	Stone vessels	19	
	Ground stone celts	32	
	Ground stone chisels	1	
	Grooved stones	15	
	Unidentified ground stone objects	42	
Total			348
Other stone objects	Hammer stones	106	
	Polishers	65	
	Whet stones	12	
	Weights	3	
	Tuffa stones	15	
	Fire stones	10	
	Others	15	
	Unidentified stone objects	121	
Total			347
Clay objects			3
Beads	All materials		49
Bone tools	Awls	24	
	Needles	30	
	Spatulas	16	
	Scrapers	9	
	Figurines	1	
	Worked bone	43	
Total			123
Worked shell/ land snails	Cowrie shells with back removed	64	
	Pierced shells	34	
	Unspecified worked shells	5	
Total			103
Mother-of-pearl			3
Others + Unidentified objects			27
Total			1003

grinding slabs, but hand stones must be represented as well. Grooved stones are an interesting category since at least three of the 15 registered examples have incised decoration on the back (**Fig. 17**). The decoration used is a more or less regular cross pattern. They have all been defined as grooved stones, sometimes called "shaft straighteners", on the basis of a centrally made groove often with longitudinal striation marks. At least two examples have a groove on both faces. Except for one specimen of 20 x 20cm size, they are all rather small; the maximum dimension measured on the complete examples is 8.6cm. The usual shape is rather flat with a rectangular, square or oval outline. The use of these is questionable, but the fact that some are decorated indicates not only functional but also symbolic properties.

The most numerous of the ground stone tools are hand stones of which 122 have been registered so far. They have all been ground into a circular to oval shape with the base flattened by use (**Fig. 18**). In some cases more than one face show signs of

17. Grooved stones from the 2003 season with incised decoration on the back.



18. Enclosure e looking north. Hand stones in situ to the north-east of the pavement.

grinding activity. The maximum length and diameter of the registered complete examples is around 17-18cm. But since many were fragmented when found several would originally have exceeded this size.

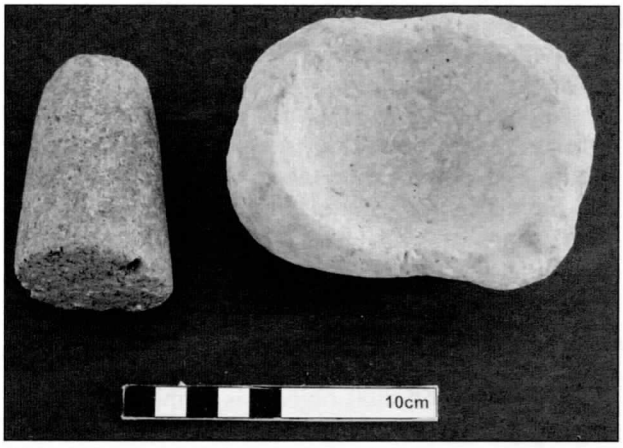
Contrary to hand stones, the lower part of the grinding tools, the grinding slabs often have a rough unworked surface except for the working face which has been shaped by use and sometimes a more or less flat base has been made in order to stabilize the object while in use. The grinding slabs, of which 18 have been registered excluding the possible high number hidden in the unidentified ground stone object category, are often quite large, up to 68cm in length. The depressions created by the grinding process are mostly shallow, but in a few cases the slabs are later reused during which a second and deeper central groove-like depression is created.

Only six objects have been registered as mortars, of which at least two are made on reused grinding slabs. This is a low figure considering the 93 pestles found. Several of the pestles are broken, but since no attempt has been made to check if any of the fragments belong to the same object it is not possible to say if the figure covers a slightly smaller group. The pestles are of various cone or cylindrical shapes with an often circular working face with pounding marks and circular striations showing the different uses of the pestles: either pounding or circular grinding movements (**Fig. 19**).

By far most of the ground heavy-duty tools are celts, 32, while only one is registered as a chisel. Interestingly, the chipped stone heavy-duty tools are almost all picks, which indicates a relation between tool type and material. Most of the celts are made on hard dark grey rock, chipped and ground into shape and polished on both faces near the working edge (**Fig. 20**). Some have damages on the working face, which could have been made either during use or after disposal. The number includes a few very small celts, which may have had a more symbolic significance.
(CHJ)

VI.3. Other Stone Objects

Although most of the hammer stones, recovered at the site, are made on flint they have been registered as objects and not with the chipped stone



19. Pestle and mortar fragment from the 2002 season.

20. Celts from the 2004 season.

industry. In some cases flint cores or even large flakes or tools are re-used as hammer stones, but most of the flint hammer stones are made on unworked nodules. Other materials used include limestone and quartzite. The hammer stone group accounts for 106 specimens so far. A few more may show up in the chipped stone bags when the remainder of these are studied more closely.

A rather large group of objects, 65 examples, have been registered as polishers. They are small naturally shaped stones of quartzite or other hard rocks but with signs of polishing on one or several faces. The rest of the stone objects consist among others of whetstones, tuffa stones, possible weights, beads of various stone types, see also below, and a large group, 121, of unspecified objects. (CHJ)

VI.4. Bone Objects

The most interesting bone object, if not in the entire sample of objects, (see, however, Jensen and Abu-Laban in prep. for a description of two sandstone slabs with incised geometric figures and parallel lines, recovered in the spring of 2005) is a rib bone which has been decorated with a human face, briefly mentioned elsewhere (Jensen, in press) (**Fig. 21**). Unfortunately the exact find spot is not known as it was discovered in the bag with the faunal remains, but it derives from a locus inside Enclosure b.

Most of the bone tools are very fragmented which makes a precise classification rather difficult. Therefore a large group of the tools, 43 pieces, have been registered simply as worked bone. Tool types represented include 24 bone awls, 30 needles, 16 spatulas, 9 scrapers, and 5 beads. (CHJ)

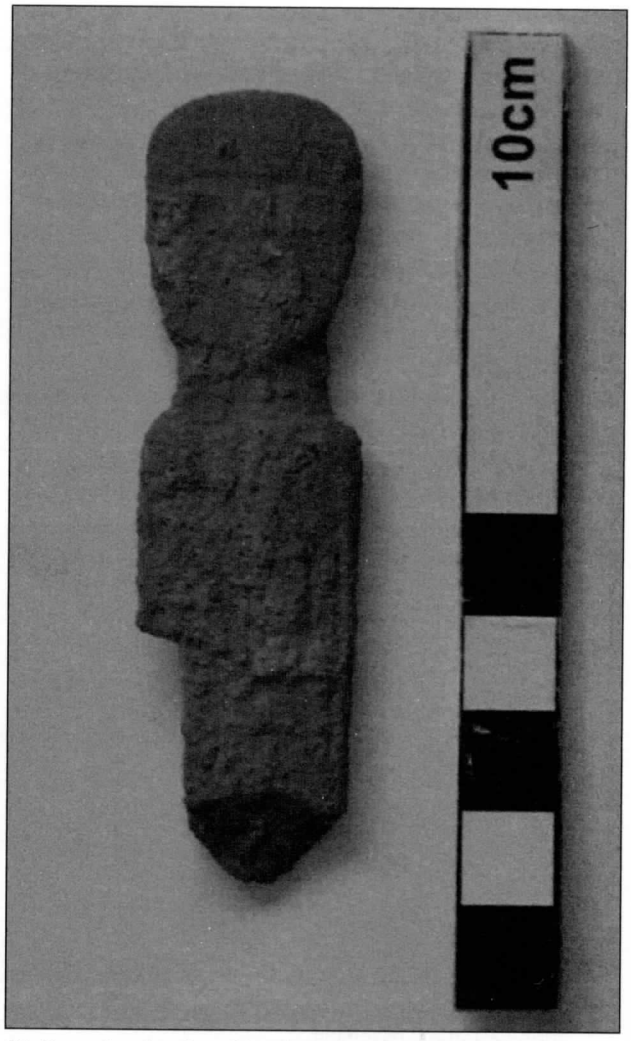
VI.5. Shell and Mother-of-Pearl

The group of shell objects is numerous, mostly because of a rather large number of cowrie shells, 64, which had the back removed deliberately. The rest is registered as pierced shells and beads, except for a small group of 5 shells, which could not be identified more closely than as 'worked'. In addition to cowries, a single *Dentalium* and a few *Nerita* sp. shells are included.

Only few objects of mother-of-pearl have been found during excavation. This includes 3 beads and 3 worked pieces. (CHJ)

VI.6. Distribution

As already mentioned in the presentation of the chipped stone industry, material probably deriving from bead workshops has been found in two different locations. The beads and raw material from the production process found in these contexts all seem to be turquoise or another green stone. However, the material has not yet been investigated by a mineralogist.



21. Bone figurine found in a bone bag from Enclosure b.

In general most of the objects derive from tertiary contexts, but all architectural units contain a small amount of finds, including bone tools, hand stones, pestles etc. However, a few contexts deserve some attention. During the excavation of Unit J in the south-western corner of the excavated area a number of grinding slabs were found. The high amount of grinding tools in the building has already been mentioned elsewhere (Jensen, in press). Seen in connection with the large size of the building, a wide entrance, internal compartments in the southern area of the building, and direct access to Unit G, in which we also found a high content of grinding tools, it would seem reasonable to interpret Unit J as a communal working space for pro-

cessing cereals. Unit F has also been suggested as a communal building. Again, grinding slabs were found *in situ* as well as a number of other internal installations, including a stone cist, which contained the only burial found so far (see above, paragraph IV.1).

One area has provided a particularly high content of *in situ* finds: the paved area to the east and southeast of Unit F. The high content continues into P to the East of the paved area. The finds include among others several hand stones, of which two circular hand stones were found right next to each other (**Fig. 18**), pestles, celts, a grooved stone and a long almost complete bone awl as well as other bone tools.

In some cases, ground stone tools, especially large grinding slabs, were reused in the architectural construction of the houses. This is particularly well documented in the southeastern corner of the excavated area between the units K and L. A number of large grinding slabs have also been found on the eroded slopes of the wadi towards the south and east. It may be that these also came from a context of secondary use in building construction and not necessarily from a primary context.
(CHJ)

VI. The Shakārat Musay'īd Plant Remains: Preliminary Observations

During the 2002 study season at Shakārat Musay'īd, roughly 30 soil samples were taken for archaeobotanical analysis. As no actual excavation was taking place on site, the samples were taken from two types of context: a) already exposed surfaces that clearly contained charred material, and b) every clearly distinguished layer in the baulks that were removed as part of the research strategy of this season. During previous excavation seasons 114 soil samples had also been taken from various contexts and left in storage. During a brief visit on site by the author of this paragraph in 2002, 19 samples of between 0.5 and 40 litres were floated, both recent samples and samples from previous seasons, as described above. All samples were floated by hand, the floats were retained in a 0.3mm sieve and the samples have subsequently been scanned to assess the contents and richness of the botanical material.

All of the samples contained charred botanical material and the overall preservation is variable. Of the 19 samples that were floated, nine samples contained only charcoal and three samples contained a few indeterminate plant remains. The remaining seven samples contained a few large grasses and a larger proportion of wild plant varieties as well as charcoal. The large grasses resemble emmer wheat (*T. diccocum*). A total of only four grains and the lack of chaff means that a determination of the stage of domestication will have to wait until more plant material has been recovered.

Of the wild plants, *Aegilops* sp., *Malva* sp. and the legumes *Medicago* sp. and *Astragalus* sp. are present in many of the samples, as are weeds of the Cyperaceae family. Common for the above species, apart from *Astragalus* sp., is a relatively high water requirement, and their presence therefore suggests that the environment around Shakārat Musay'īd was wetter in the past than it is today.

In addition to the four grains of emmer wheat, there was one possible food plant found in the samples — wild pistachio, *Pistacia* sp. This plant type is relatively common throughout the samples and occurred in very large numbers in trench F95/F100, which is the open area I. It has not yet been possible to determine this *Pistacia* to a species due to the lack of sufficient reference material, but large numbers of *P. atlantica* were found at the nearby, contemporaneous site of Bayḍa (Helbaek 1966), suggesting that one or more species of wild pistachio may have played a significant role in the economy of PPNB sites in this region.

It is hoped that future analysis of the remaining Shakārat Musay'īd archaeobotanical samples will cast a more detailed light on the food economy of the site. A further 62 samples were floated during the 2004 spring season and are awaiting initial examination.
(MMH)

VII. The Faunal Remains from Shakārat Musay'īd

The faunal collection from Shakārat Musay'īd includes a wide variety of species. However, only a part of this collection has been analysed at present. The analysed material includes the majority of the faunal material of the collection from the excavation seasons of 1999 and 2000, which amount to 15923 fragments (weight 41791 grams). The areas of excavation from these two seasons include a variety of units, including open areas, several housing units of varying size and probably also function.

The main part of the material studied consist of goat (*Capra* sp.) and sheep (*Ovis* sp.) fragments, where goat is the dominating element (approximately 6:1) (**Table 4**). The evidence for the status of sheep and goat are not clear at present. However, the measurements would indicate a higher number of smaller animals or females, therefore probably a domesticated population or at least selective killing (see Zeder and Hesse 2000). Wild

Table 4: Faunal material from the 1999 and 2000 seasons of excavation.

Species	NISP	Weight (in g)
Pig, *Sus* sp.	1	4
Onager/wild ass, *Equus* sp.	8	198
Cattle, *Bos* sp.	77	1815
Goat, *Capra* sp.	585	6752
Sheep, *Ovis* sp.	93	930
Goat/sheep, *Capra/ovis* sp.	4380	18647
Gazelle, *Gazella* sp.	32	172
Dog/wolf, *Canis* sp.	2	4
Asiatic jackal, *Canis aureus*	4	13
Fox, *Vulpes* sp.	101	162
Stone marten, *Martes foina*	2	1
Badger, *Meles meles*	2	1
Wild cat, *Felis silvestris*	17	26
Leopard, *Panthera pardus*	4	7
Hyrax, *Procavia capensis*	3	7
Cape hare, *Lepus capensis*	19	9
Rodent, *Rodentia* sp.	1	0
Turtle, *Testudo* sp.	6	4
Bird,	300	173
Shark	1	0
Unidentified	10283	12867
Total	15923	41791

goat (*Capra aegagrus*) was, however, also present at the site, as the presence of 2 horn cores clearly indicate. None of the other possible domesticates, cattle (*Bos* sp.) and pig (*Sus* sp.), reveal evidence suggesting that these were near or fully domesticated. As for the *Canis* sp. fragments, they are too few and fragmented to determine whether they originated from a medium size dog (*Canis familiaris*) or from an Arabian wolf (*Canis l. arabs*).

A number of wild species have been identified at Shakārat Musay'īd; these include a variety of carnivores, such as various foxes (*Vulpes* sp.), where red fox (*Vulpes vulpes*) is the most numerous, leopard (*Panthera pardus*), badger (*Meles meles*), stone marten (*Martes foina*) and wild cat (*Felis silvestris*). Additionally, fragments from cape hare (*Lepus capensis*) and hyrax (*Procavia capensis*) are also present. Apart from a few butchering marks found on fox and hare, these animals appear to have been primarily utilized for their fur, as indicated by some skinning marks and a lack of meat carrying bones. This is especially clear for the two large carnivores badger and leopard, where only metapodiums and phalanges have been found. The wide variety of mammal carnivores could be seen as consistent with the pattern observed at the LPPNB site of Ba'ja (von den Driesch *et al.* in press). And to a certain extent also with that of the MPPNB site of Bayḍa, both sites being located in the Petra region, however, the range of animals utilised at Bayḍa is somewhat more limited especially for the larger carnivores as both badger and leopard are absent (Hecker 1975: 471).

A number of avian fragments were found at Shakārat Musay'īd. This could be seen as consistent with the pattern observed at other PPN sites where a relatively broad spectre of species is utilised, including avian fauna (Tchernov 1993). Of the 300 fragments so far identified at Shakārat Musay'īd 153 were further identified to family, genus or species. Apart from 5 fragments identified as rock pigeon, raven and partridge, all fragments belong to raptors (97% of the identified avifaunal material). These raptors include a number of eagles, vultures, buzzards and kites. The possible use of these animals is indicated by the distribution of skeleton elements, as 90% of the fragments found are from bones in the wing and leg. Although the bones of the skull are often found in lesser number due to poor preservation, this does not hold true for most of the bones in the body and the girdle. The distribution seen here therefore suggests that the raptors were utilised for another purpose than purely nutritional and can be compared to finds at other sites like Netiv Hagdud (Tchernov 1993). Whether this use was of a functional purpose as tools, fanes etc. or whether they served a more symbolic purpose remains to be seen.

The general collection suggest a broad based subsistence pattern where a large number of species were exploited, but with a heavy reliance on especially goat, probably in a domesticated form.
(PB)

Acknowledgements

The excavations have been financially supported by the University of Copenhagen (1999-2001) and the Carlsberg Foundation (2003-2005). We deeply appreciate the kind help of Dr. Hans Georg K. Gebel throughout the years. We also would like to thank Dr. Susanne Kerner for reading an earlier draft of the manuscript and for her assistance in the excavations. However, any mistakes in the text are of course our own.

C. H. Jensen
B. D. Hermansen
M. Bille Petersen
P. Bangsgaard
I. Thuesen
Carsten Niebuhr Department
Institute of Cross-cultural and

Regional Studies
University of Copenhagen
Snorresgade 17-19
2300 Copenhagen S.
Denmark

M. Kinzel
Zinzendorf Strasse 17
10555 Berlin
Germany

M.M. Hald
University of Sheffield, Department of Archaeology
Northgate House
West St.
Sheffield S1 4ET
England

N. Lynnerup
Laboratory of Biological Anthropology

The Panum Institute
University of Copenhagen
Blegdamsvej 3
2200 Copenhagen N
Denmark

Bibliography

Adams, J.
1981 *Wohn- und Siedlungsformen im Süden Marokkos.* München.

Byrd, B.
1994 Public and Private, Domestic and Corporate: The Emergence of the Southwest Asian Village. *AA* 59/4: 639-666.
2000 Households in Transition: Neolithic Social Organization within Southwest Asia. Pp. 63-102 in I. Kuijt (ed.), *Life in Neolithic Farming Communities. Social Organization, identity, and Differentiation.* New York: Kluwer Academic/Plenum Publishers.

Driesch, A. von den, Cartajena, I. and Manhart, H.
n.d. *The late PPNB site of Ba´ja/ Jordan: Faunal remains.* Unpublished manuscript.

Gebel, H.G.
1986 Die Jungsteinzeit im Petra-Gebiet. Pp. 273-308 in M. Lindner (ed.), *Petra. Neue Ausgrabungen und Entdeckungen.* München: Delp Verlag.
1988 Late Epipalaeolithic - Aceramic Neolithic sites in the Petra area. Pp. 67-100 in A. Garrard and H.G. Gebel (eds.), *The Prehistory of Jordan. The State of Research in 1986.* British Archaeological Reports - International Series 396.1. Oxford: B.A.R.
2001 Frühseßhafte verborgen in Felsen. Ba'ja in Süd-Jordanien stellt der Jungsteinzeitforschung neuartige Fragen. *Antike Welt 32,* 3: 275-283.
2004 The Domestication of Water. Evidence from Early Neolithic Ba´ja? Pp. 25-35 in H.D. Bienert and J. Häser (eds.), *Men of Dikes and Canals. The Archaeology of Water in the Middle East.* Orient-Archäologie 13. Rahden: Marie Leidorf-Verlag.

Gebel, H.G.K., Hermansen, B.D. and Jensen, C.H. (eds.)
2002/(2004) *Magic Practices and Ritual in the Near Eastern Neolithic.* Studies in Early Near Eastern Production, Subsistence and Environment 8. Berlin: Ex Oriente.

Gebel, H.G. and Starck, J.H.
1985 Investigations into the Stone Age of the Petra Area (Early Holocene Research) A Preliminary Report on the 1984 Campaigns. *ADAJ* 19: 89-114.

Glar, V.
2003 *An Analysis of the Relations between Arrowhead Groups and larger Wild Animal Species at Shaqarat Masi´ad and other PPNB sites of the Southern Levant.* Unpublished MA thesis.

Gopher, A.
1994 *Arrowheads of the Neolithic Levant.* American Schools of Oriental Research, Dissertation Series 10. Winona Lake: Eisenbrauns.

Hecker, H.M.
1975 *The Faunal Analysis of the Primary Food Animals from the Pre-Pottery Neolithic Beidha (Jordan).* Unpublished Ph.D. thesis from Columbia University.

Helbaek, H.
1966. Pre-Pottery Neolithic Farming at Beidha. *PEQ* 98: 61-66.

Hermansen, B.D.
2004 Supra-Regional Concepts from a Local Perspective. *Neo-Lithics* 1/04: 34-38.

Hermansen, B.D. and Abu-Laban, A.
In prep. *Burials at Shkarat Msaied.* Manuscript in preparation.

Hermansen, B.D. and Jensen, C.H.
2002/(2004) Notes on some features of possible ritual significance at MPPNB Shaqarat Mazyad, Southern Jordan. Pp. 91-101 in H.G.K. Gebel, B.D. Hermansen and C.H. Jensen (eds.), *Magic Practices and Ritual in the Near Eastern Neolithic.* Studies in Early Near Eastern Production, Subsistence and Environment 8. Berlin: Ex Oriente.

Hillier, B. and Hanson, J.
1984 *The Social Logic of Space.* Cambridge: Cambridge University Press.

Jensen, C.H.
2002 Verdens ældste landsby? *Sfinx* 25, 4: 168-71.
2004a Production areas at MPPNB Shkarat Msaied, Southern Jordan. *Neo-Lithics* 2/04: 22-26.
2004b *Workshops and Activity Areas in the PPNB Period: The Excavations at Shaqarat Masi´ad.* Paper read at the Fourth International Congress on the Archaeology of the Ancient Near East, Berlin April 2004.
In press Three Years of Excavation at the PPNB site Shaqarat Masi´ad, Southern Jordan. In J.C. Margueron et al. (eds.), *Proceedings of the Third International Congress on the Archaeology of the Ancient near East,* Paris 2002. Winona Lake: Eisenbrauns.

Jensen, C.H. and Abu-Laban, A.
In prep. *A note on two incised sandstone slabs from MPPNB*

Shkarat Msaied, Southern Jordan. Manuscript in preparation.

Kaliszan L.R., Hermansen, B.D., Jensen, C.H., Skuldbūl, T.B.B., Bille Petersen, M., Bangsgaard, P., Ihr, A., Sūrensen, M.L. and Markussen, B.

2001 Shaqarat Mazyad - The Village on the Edge. *Neo-Lithics* 1/02: 16-19.

Kinzel, M.

2004 Some notes on the Reconstruction of PPNB Architecture. *Neo-Lithics* 2/04: 18-22.

Kirkbride, D,

1966 Five Seasons at the Pre-pottery Neolithic Village of Beidha in Jordan. *PEQ* 98: 5-61.

Mortensen, P.

1970 A preliminary study of the chipped stone industry from Beidha, an early Neolithic village in Southern Jordan. *Acta Archaeologica* 41: 1-55.

Petersen, M.B.

2003 *Social Interaction in a Prehistoric Settlement. A study of Social Interaction from an architectural perspective in the MPPNB society of Shaqarat Masi'ad in Southern Jordan.* Unpublished MA thesis.

2004 *The Spatial Separation of Activities at MPPNB Shaqarat Masi'ad, Jordan.* Paper read at the Fourth International Congress on the Archaeology of the Ancient Near East, Berlin April 2004.

Petersen, M.B. and Hermansen, B.D.

n.d. *Flat, Conical or Pitched Roofs? Reconstructing Early Neolithic Architecture at MPPNB Shkarat Msaied, Southern Jordan.* Manuscript in prep.

Rollefson, G.

2001 The Neolithic Period. Pp. 67-105 in B. MacDonald, R. Adams and P. Bienkowski (eds.), *The Archaeology of Jordan.* Sheffield: Sheffield Academic Press.

Stordeur, D., Brenet, M., Der Aprahamian, G. and Roux, J.-C.

2000 Les Bâtiments Communautaires de Jerf el-Ahmar et Mureybet Horizon PPNA (Syrie). *Paléorient 26.1*: 29-44.

Tchernov, E.

1993 Exploitation of Birds during the Natufian and Early Neolithic of the Southern Levant. *Archaeofauna* 2: 121-143.

Wright, K.

1991 The Origins and Development of Ground Stone Assemblages in Late Pleistocene Southwest Asia. *Paléorient* 17, 1: 19-45.

Zeder, M and Hesse, B.

2000 The Initial Domestication of Goats (Capra Hircus) in the Zagros Mountains 10.000 years ago. *Science* 287, issue 5461: 2254-58.