NEO-LITHICS 2/09

The Newsletter of Southwest Asian Neolithic Research

Contents

Editorial

Blizzards of emails, swarms of deadlines and papers, baskets of applications, paralysis by administrative needs: all of this increasingly characterizes Near Eastern Neolithic research. The share of original research on field work and material is substituted more and more by research made for the stage, reflected by a mass of papers typified by accelerating redundancy and unsupported guess-work. A paradoxical situation is reached: colleagues produce papers without being able to read others' publications to a sufficient extent, nor do they have the time to communicate about mutual research. Big research clusters in some countries absorb energies by (often) misguiding empty keywords (e.g. landscape, space), while it is forgotten that the major progress and innovation in research mostly results from an ideal combination of two or three individuals operating with interdisciplinary cooperating. The personal side of all of this can result in elements of masochism among the more responsible of us, the inability to say "No," which sometimes leads to health problems, helpless floating with the current, and the exclusion of those who do not follow the main trend.

The Near Eastern Neolithic family is still small, and this should foster the opportunity to critically counter these common trends in research and to develop research ethics against Neolithic research deflation. We have to start considering if all the conferences and workshops are necessary, since they are one source of our academic breathlessness. We have to start investing more time in research progress and innovation by simply sitting down and doing the job: working on excavated materials (final publications) rather than publishing more intriguing preliminary ideas with limited material bases. And we have to start working more sustainably: site hopping, neglected conservation and curation measures, attitudes of non-sharing, and failure to raise local competency are some of the dangers we face. Each of us is asked to distinguish wisely and carefully between necessary constraints promoting Neolithic research and constraints produced by following uncontrolled trends in research and research politics. Let us dare to say "No."

For a number of various reasons on our side, issues of Neo-Lithics appear late, for which we ask you to accept our apologies. We would like to announce that the special issue on Rubble Slides (Neo-Lithics 1/09) will appear in Spring 2010, and the one on Water Domestication (now Neo-Lithics 2/10) later in 2010. We warmly welcome the new Neo-Lithics' managing editorial board (beginning with issue 1/09): Dörte and Jan Krumnow and Christoph Purschwitz, while gratefully remembering the work of the previous managing editor, Jürgen Baumgarten. Dörte, Jan, and Christoph will be on your side during the submission and publication process: as ever, we welcome your research, especially from the young colleagues and sites outside the Levant, for publication in Neo-Lithics.

Hans Georg K. Gebel and Gary O. Rollefson

Excavations at Körtik Tepe.
A New Pre-Pottery Neolithic A Site in Southeastern Anatolia

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Introduction

With its location near the point where Batman Çayı and the Tigris River meet, approximately 30 km west of Batman in southeastern Anatolia, Körtik Tepe is situated on the west bank the Tigris near a Pınarbaşı field of the Ağıl Village (Ancolini) within the administrative borders of Bismil district, Diyarbakır (Fig. 1). In the form of a low hill, the mound extends across an area of 100 x 150 m and a height 5.50 m above its surroundings. The mound, also known by its traditional names Kotuk or Kotik, was first detected in surveys carried out in 1989 and evaluated as a late site (Algaze and Rosenberg 1990). Archaeological excavations that began in 2000 continued until 2009. Excavations exposed an area of approximately 2600 m² in 89 trenches of 5.00 x 5.00 m, reaching variable depths between 1.00-5.50 m (Fig. 2). Together with Hallan Çemi, Körtik Tepe is one of the earliest sites in which the transition from hunter-gatherer communities following a nomadic way of life to settled village life is represented.

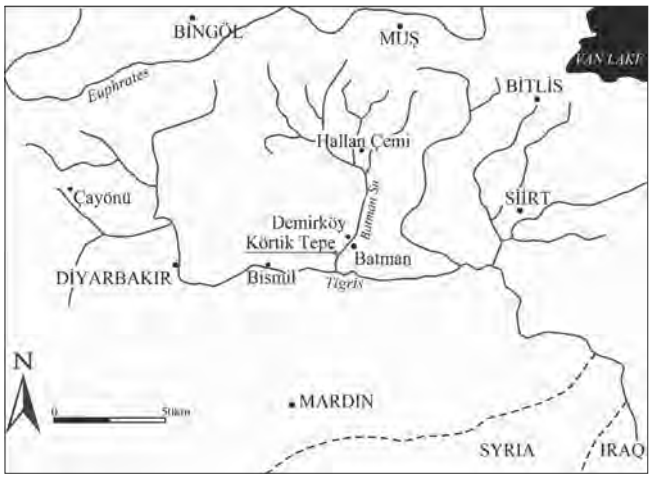

Fig. 1 Location of Körtik Tepe.

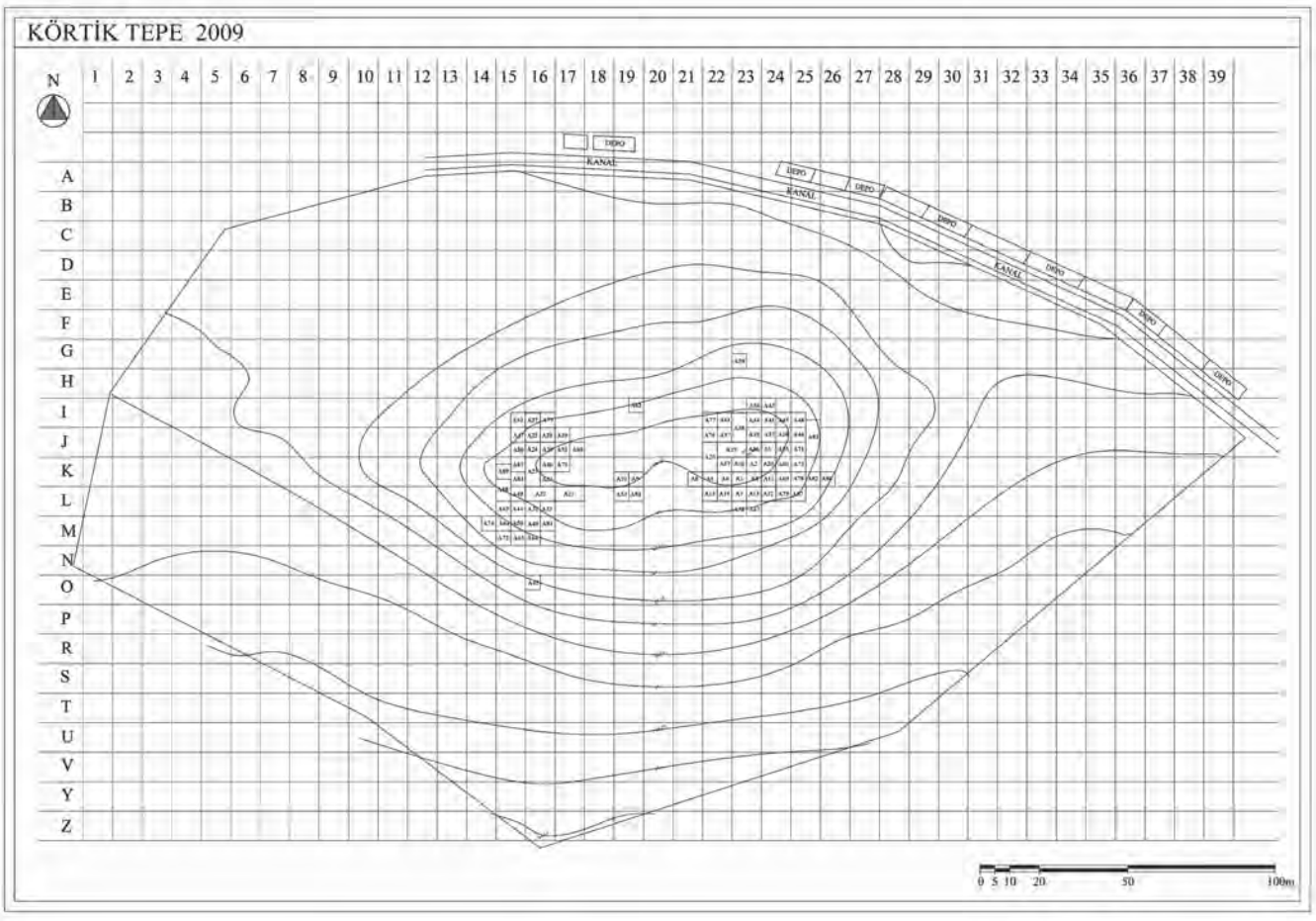

Fig. 2 Topographical plan of site

Fig. 3 Circular structures and intramural tombs

Excavations revealed two main culture phases in the mound: a medieval period represents the later culture phase, while the Pre-Pottery Neolithic, represented mainly by architectural remains, burials, and grave goods, is the earlier one.

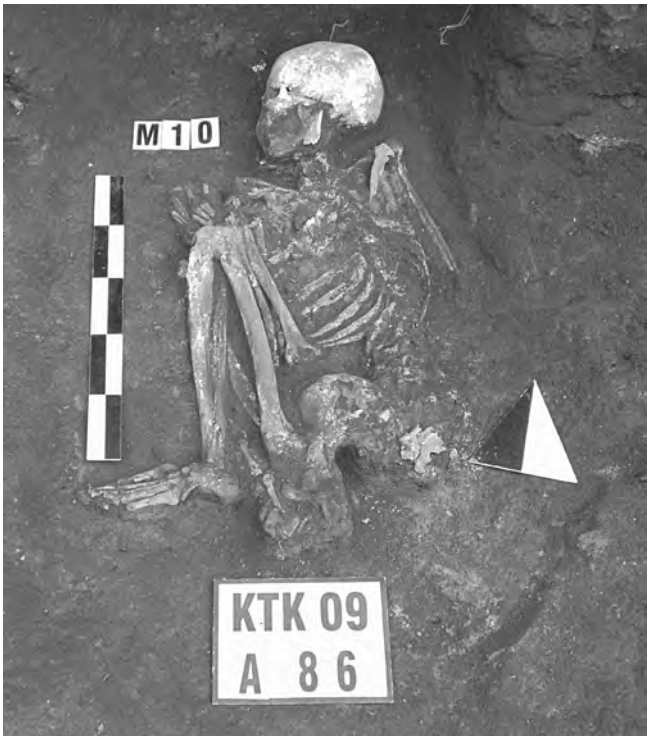

Fig. 5 PPNA tomb

Architecture

The PPN cultural structure of the mound generally reflects important differences, especially in terms of small finds, from other well-known contemporary settlements in the region. All data indicate that Körtik Tepe is a permanent settlement (Özkaya and San 2007). Excavations during 2005-2009 showed that there are at least six separate architectural layers.

It is possible to gather Körtik Tepe structures in three main groups. The first group is composed of 77 round buildings. All houses are round in plan with dirt floors surrounded by single-leaf walls of unworked stones. Walls were badly damaged by construction activity of the medieval phase occupations (Fig. 3). Among these there are many structures that are not walled at all. These structures, varying in size between 2.30-3.00 m, are constructed directly on the ground. The floors of stones pressed into the compact earth. Based on a preliminary judgement, these round buildings from Körtik Tepe, whether with flat or con cave floors, are single-family dwellings characteristic of the earliest Pre-Pottery Neolithic period and similar in nature to Hallan Çemi, Göbekli Tepe, Tell Abr, Jerf el-Ahmar, Sheikh Hassan, Mureybet, Qermez Dere and Nemrik (Aurenche 2007; Kozlowski and Kempisty 1990; Rosenberg and Redding 2000).The second group is composed of 34 buildings that are too small for residences. The sizes of these buildings, which are found in almost all levels in the excavated areas and are also round in plan, vary between 1.10–2.10 m in diameter. Floors of this group are also paved with pebbles (Özkaya 2004; Özkaya and San 2007; Özkaya and Coşkun 2008). These structures must have served as storage units similar to

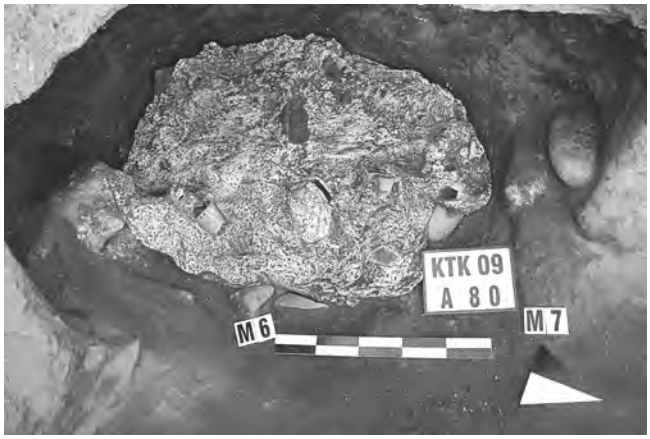

Fig. 4 PPNA tomb

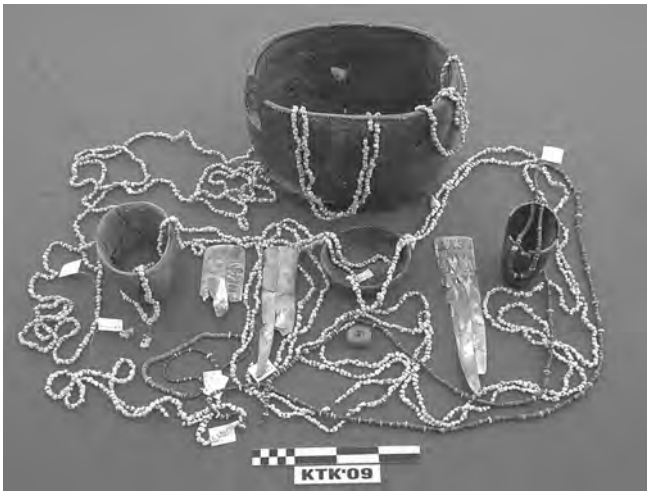

Fig. 6 Tomb contents

those at Hallan Çemi (Rosenberg and Redding 2000; Rosenberg 2007), confirmed by the dense vegetable remains in them.

The last group of structures in our sample (Y3, Y11, Y44, Y35) is completely different in terms of their sizes and floors as well as in their rare numbers. Data are not sufficient to explain functions of these, but we suspect they may have played some special roles, similar in some ways to the public structures at Hallan Çemi (Rosenberg and Redding 2000).

However, despite the architectural similarities with Hallan Çemi, Körtik Tepe stands apart in terms of its small finds. Although there are no direct similarities with Çayönü (Özdoğan-Özdoğan 1989; Schirmer 1990) or Nevalı Çori (Hauptmann 1993), similar structures to the third group are found in other Neolithic settlements of Anatolia. In the Levant region there are comparable structures in such early settlements such as 'Ain Mallaha (Perrot 1966), Jericho (Bar-Josef 1986; Kuijt 1996), and the lower layers of Beidha (Byrd 1994; 2000). Though they include specific differences in terms of features, structure types, finds, and some functions, it is not surprising that the rarity of these buildings are generally considered to be public structures. Therefore, the site of Körtik Tepe shows parallels not only with Anatolia but also with the Levant.

Burials

Graves play an important role in terms of characterizing the social and cultural structure of Körtik Tepe. The majority of skeletons were buried with grave goods, and a large proportion of the burials on the mound were found beneath house floors (Figs. 4-5). The context of a few graves is uncertain as they are near the surface and badly disturbed. Burials inside houses show that the places where people were living were sanctified as well as profane.

Instead of being buried haphazardly, rules of treating the dead included practices before burial as well as interment itself. One specific practice was the partial smearing of skeletons with gypsum plaster (Özbek 2005) (Fig. 4). For many of the plastered skeletons, including skulls, colored parallel bands occur in the upper parts of the bones. In two different samples red and black lines are parallel to each other. Such color traces are also seen on grave goods. All these data show that the dead were defleshed, subsequently partly covered with plaster, and then pigmented. Similar practices in the later PPN period have been noted (Goring Morris 2000), but Körtik Tepe holds a special place in terms of the specific kinds of plastering treatment.

Traditions of burying the dead and the accompanying grave goods help to demonstrate the sociocultural system of the era. It is possible to gain an understanding in such related features as production, technology, labor, and decoration of grave gifts, most of which were of worked stone. Jewelry was made of different stones; decorated and undecorated bone objects and stone figurines were numerous. Other grave goods include stone vessels, axes, pestles, mortars, perforated stones, and cutting-piercing tools (Figs. 6-9). Similarities to tools used in daily life indicate fundamental beliefs among the Körtik Tepe settlers, particularly the concept of a continuation of life after the death.

Fig. 8 PPNA stone vessels

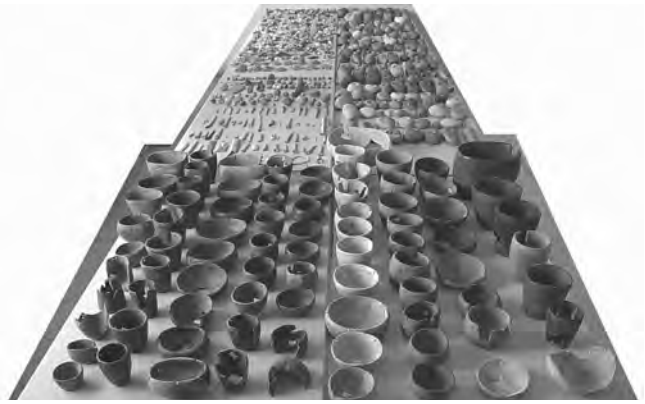

Fig. 7 General view of the Körtik Tepe finds from 2009

Fig. 9 Stone pestles

Fig. 10 Decorated stone with patterned incisions

Chipped and Ground Stone Artifacts

Chipped stone artifacts from Körtik Tepe are chiefly composed of flint. Obsidian tools and debitage are secondary. Furthermore, although rare numerically, quartz raw material was also used. Among tool groups Çayönü tools show up although in small quantities. Notably, although projectile points are numerous, no arrowheads of PPNA or PPNB types common to the classic Levant or Zagros traditions were found. Instead, tool types are more typical of the Epipaleolithic, characterized by microliths and arch-backed blades, generally similar to the inventory from Hallan Çemi. There is nothing among the tool types to to contradict our interpretation that wild plant collecting was the principal means of acquiring plant foods. Some tools still reflect Paleolithic origins, with large scrapers being very important. It is observed that more formal tools were produced from obsidian, and these mostly consist of lunates and other geometric forms.

The obsidian at Körtik Tepe was only obtainable from a great distance, whether through exchange or direct acquisition. As was the case for Hallan Çemi (Rosenberg and Redding 2000; Hauptmann 2002), the green transparent obsidian is likely East Anatolian in origin (Özkaya and San 2007).

Most of the material from the mound consists of ground stone artifacts (Fig. 7), and the majority of these came from burials; a small proportion came from domestic contexts. Except for a few examples that were preserved as complete objects, most finds included as grave goods were broken, including many stone vessels,

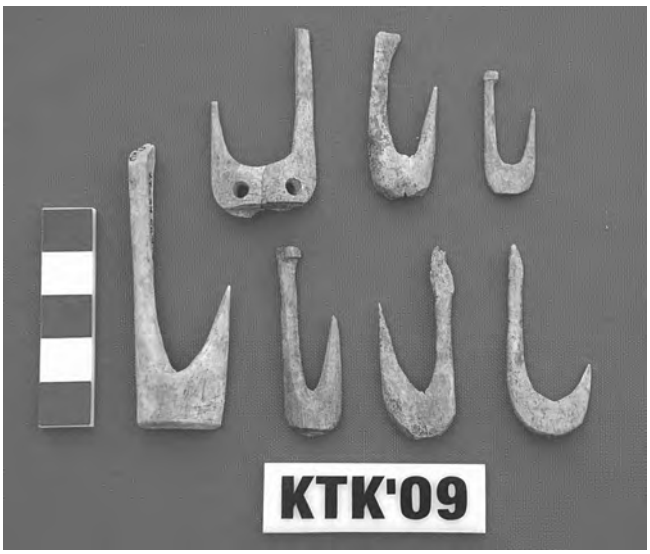

Fig. 11 Bone fish hooks

utilitarian and ceremonial axes in different shapes and sizes, mortars, pestles, and grinding stones, all of which reflect the rich cultural collection in Körtik Tepe. Foremost among the types, stone vessels constitute a special group with their broad formal repertoire and their geometric and natural decoration (Fig. 8). All parts of the stone vessels are covered by engraved animal figures, mostly snakes, wild goats, scorpions, birds, and mixed creatures that likely represent elements of their belief system. Despite their rarity throughout the region, it is clear that such stone vessels are seen in Pre-Pottery Neolithic period communities in Near East.

One type of ground stone object brings relationships among Körtik Tepe and contemporary sites into sharp relief. This is the pestle produced for utilitarian and ceremonial use (Fig. 9). Samples worked from coarse stone include abrasion traces as a result of use, and they generally display rough formal features. Ones that have shiny surfaces are made of more workable chlorite that is also used for stone vessels (Özkaya 2004). Most of the pestles of this type have upper ends finished with stylized wild bird and goat heads and are found as grave goods. Nearly identical pestles also came from Hallan Çemi (Rosenberg 1999) and Çayönü (Davis 1982; Özdoğan 1999) in Anatolia and from Nemrik 9 in Iraq (Kozlowski 1989).

Among the Körtik Tepe finds, stone axes comprise another important group. In addition to some with rough formal features, there are others that were shaped carefully. Axes differ in terms of size based on different stone types; however, they all share similar morphologies. Axes among the grave goods have holes carefully bored in the center. The majority of axes from non-burial contexts are abraded from rough usage (Özkaya and San 2007). In addition to axes included as grave goods, there are also small, carefully fashioned mace heads with compressed circular forms (Özkaya and San 2007).

Chlorite stone figurines included as grave goods made by abrasion and incision are often of undefinable animals, although there is one that is clearly a goat.

Such figurines are not known from contemporary sites in the Near East, and they appear to be expressions of a local belief system. The concentric circles on the shoulders of the figures are also commonly found on decorated stone vessels among the grave goods, adding to the uniqueness of these objects. Another exotic piece that is of unknown use is a stone decorated with patterned incisions (Fig. 10).

Another type of shaped stone object from Körtik Tepe includes small-sized pointed cylinders that reflect close culturtal ties with other early and late Pre-Pottery Neolithic period sites in Anatolia (Özkaya and San 2007). Shaped by means of abrasion, these chlorite objects have simple incised lines; one of them, with deep corrugations has counterparts at Hallan Çemi (Rosenberg 1999) and Demirköy (Rosenberg and İnal 1999).

Bone Artifacts

Bone artifacts make up another basic group at Körtik Tepe. The majority of them were found in burials, although a few were found in other contexts. Considering their formal features and decoration, it is possible to classify bone artifacts in two groups as either decorative or utilitarian (Özkaya and San 2003; 2007). Utilitarian tools consist of awls, hooks, and points (Fig. 11) (Özkaya and San 2007).

Most of them are fragmentary, but definable awls reflect morphological differences with Çayönü samples. Awls with their bigger size and stubby heads differ from points. Close equivalents of small sized bone points that are used as pins are known from Çayönü (Özdoğan 1999). Once again, the bone material from Körtik Tepe shows similarities with bone finds from Hallan Çemi (Rosenberg 1999) and is related to the Zarzian tradition, connected to some degree with traditions known from other sites of the region in form and function.

Personal Ornaments

Different jewelry groups produced from different materials reveal the richness of the collection of grave goods from the mound. Beads are one group placed in burials as gifts next to skeletons or in stone vessels (Fig. 6). Most of the beads were produced from burgundy-colored stone (Özkaya and San 2002), which is easily worked. This kind of ornament is the largest group, but another includes vertebrae of animals such as birds, fish and shell (Özkaya and San 2007). As in other kinds of grave goods, the quantity and quality of beads vary from burial to burial; some graves lack ornaments altogether. Although they are represented by only a few samples, some beads are made of chlorite, the same material the stone vessels are fashioned from. Ornaments were competently made involving decoration of parallel incised lines and carefully drilled holes. Although generally oval in shape, serpentine beads also occur in different forms (Özkaya and San 2002), similar to those from Hallan Çemi (Rosenberg 1993). Although there are some specific differences, the jewelry from Körtik Tepe is similar to that from Çayönü as well (Özdoğan 1999).

The disparity of grave good distributions suggests that those burials with large quantities of beads and other jewelry are of a different social class than those people buried in graves with none or only a few objects. This, in turn, indicates that social complexity had already appeared among the residents of Körtik Tepe by the PPNA period.

Concluding Remarks

The character of the site, similarities to contemporary sites throughout the Upper Tigris Valley, the finds as grave gifts beneath houses and in other burials, faunal remains (Arbuckle and Özkaya 2006), and other evidence all show that Körtik Tepe definitely belongs to the Pre-Pottery Neolithic A period. This fact is confirmed with C14 analysis showing that mound was settled at the beginning of the 10th millennium BC (Özkaya and San 2007; Özkaya and Coşkun 2008). Körtik Tepe is thus one of the oldest known Neolithic sites of Anatolia. In view of the strong Epipaleolithic character demonstrated by the presence of microliths and arch-backed blades that reflect close parallels with Hallan Çemi, there are indications that Körtik Tepe was settled in an even earlier time.

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The 2009 Excavations at the Early Epipaleolithic Site of KPS-75, Kerak Plateau

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Introduction

During the summer of 2009, the Western Highlands Early Epipaleolithic Project (WHEEP) conducted excavations at the site of KPS-75 on the Kerak Plateau just to the north of the Wadi al-Hasa. This site was discovered during survey in 1999, and a small surface collection of lithics from a line of 13 contiguous 1mx 1m units was collected and analyzed (Schurmans 2001), leading to its temporal designation as Early Epipaleolithic. The site consists of a small rockshelter (*ca*. 5 m x 2 m) and a somewhat larger occupation area outside the rockshelter (Fig. 1). The overall dimensions of the site occupation area are *ca.* 10 m x 10 m, including the area under the present rockshelter roof. At some point in the years preceding its discovery in 1999, the interior of the rockshelter was looted, presumably due to the presence of a later period grave or tomb. This resulted in the upper portion of the rockshelter sediments being redeposited on the surface immediately adjacent to the rockshelter.

Excavation

The WHEEP excavations opened one 1 m x 1 m unit (N4) within the rockshelter, eight 1 m x 1 m units (H9, K7, K9, K10, M9, M10, L11, and L12), most of which are contiguous, in the main site area outside the rockshelter, one offsite 1 m x 1 m unit (L22), and two geological section units (L5 in the rockshelter and S11 a few meters to the east of the main occupation area at the site). All excavation within units used 3 cm arbitrary increments within natural strata within 50 cm quads. Bedrock was not reached in any unit or geological section. A total station was used to map the site, provide coordinates for "bucket" shots (all sediment and its contents for each 3 cm increment

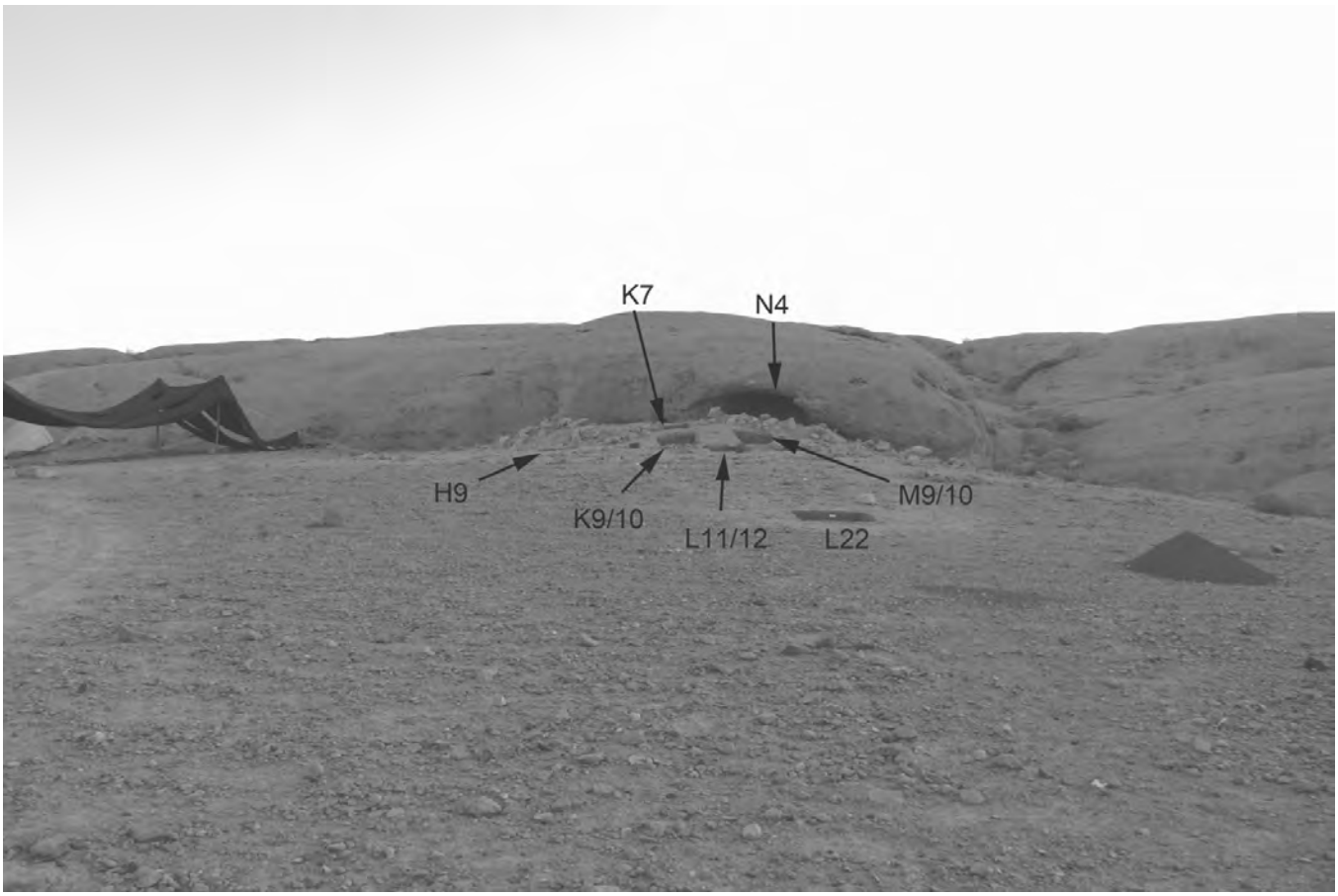

Fig. 1 KPS-75 overview showing excavated units

CLASS/TYPE	LEVELS 4–5		LEVELS 5a–8		N4: LEVELS 1–5	
	N	%	N	%	N	%
Geometric Microlith	[36]		[10]		[13]	
Helwan lunate	-	-	-	-	1	(7.6)
Lunate	10	(27.7)	-	-	-	-
Isosceles triangle	2	(5.6)	-	-	2	(15.4)
Scalene triangle	2	(5.6)	1	(10.0)	4	(30.8)
Scalene triangle elongated	2	(5.6)	1	(10.0)	-	-
Rectangle	11	(30.5)	6	(60.0)	2	(15.4)
Trapeze	8	(22.2)	1	(10.0)	-	-
Microburin trapeze	-	-	1	(10.0)	4	(30.8)
Wide trapeze	1	(2.8)	-	-	-	-
Nongeometric Microlith	[205]		[153]		[143]	
Ouchtata	55	(26.8)	13	(8.5)	6	(4.2)
Qalkhan point	-	-	5	(3.3)	1	(0.7)
Attenuated curved	9	(4.4)	41	(26.8)	72	(50.3)
Curved	10	(4.9)	9	(5.9)	5	(3.5)
La Mouillah	-	-	1	(0.6)	1	(0.7)
Backed and truncated	30	(14.6)	8	(5.2)	11	(7.7)
Truncated	17	(8.3)	13	(8.5)	3	(2.1)
Pointed/spike	11	(5.4)	15	(9.8)	8	(5.6)
Blunt	7	(3.4)	9	(5.9)	7	(4.9)
Shouldered	-	-	1	(0.6)	1	(0.7)
Double backed	3	(1.5)	4	(2.6)	1	(0.7)
Partially backed	6	(2.9)	5	(3.3)	10	(6.9)
fragment	57	(27.8)	29	(18.9)	17	(11.9)
GRAND TOTAL	241		163		153	

Table 1 Preliminary lithic analysis of the Early Epipaleolithic at KPS-75

CLASS/TYPE	LEVELS 4–5		LEVELS 5a–8		N4: LEVELS 1–5	
	N	%	N	%	N	%
Tools	[331]	5.6	[223]	6.7	[202]	5.3
Endscraper	26	(7.8)	12	(5.9)	9	(4.5)
Burin	2	(0.6)	7	(3.0)	5	(2.5)
Backed Piece	2	(0.6)	2	(0.8)	-	-
Perforator	1	(0.3)	1	(0.4)	2	(1.0)
Truncation	4	(1.2)	8	(3.5)	5	(2.5)
Geometric Microlith	36	(10.8)	10	(4.3)	13	(6.5)
Nongeometric Microlith	205	(61.8)	153	(68.3)	143	(70.4)
Special Tool	4	(1.2)	2	(0.8)	4	(2.0)
Notch/Denticulate	14	(4.2)	11	(4.8)	9	(4.5)
Retouched Piece	36	(10.8)	16	(7.1)	11	(5.5)
Multiple Tool	-	-	1	(0.4)	-	(-)
Core Tool	-	-	-	-	1	(0.5)
Varia	1	(0.3)	-	-	-	-
Cores	[339]	5.8	[79]	2.4	[146]	3.8
Blade	35	(10.4)	4	(5.1)	10	(6.9)
Bladelet	101	(29.8)	25	(31.7)	67	(45.9)
Flake	64	(19.0)	11	(13.9)	18	(12.4)
Mixed	80	(23.8)	15	(19.0)	18	(12.3)
Fragment	59	(17.4)	24	(30.4)	33	(22.6)
Debitage	[5220]	88.6	[3013]	90.9	[3491]	90.9
Blade	540	(13.3)	164	(5.4)	353	(10.1)
Bladelet	341	(6.2)	192	(6.0)	339	(9.2)
Flake	701	(13.4)	316	(10.4)	492	(14.1)
Burin Spall	16	(0.3)	12	(0.4)	18	(0.5)
Microburin	45	(0.8)	66	(2.2)	63	(1.8)
Small Bladelets*	808	(15.4)	325	(10.8)	415	(11.9)
Small Flakes *	2200	(42.1)	1547	(51.3)	1459	(41.8)
Shatter	585	(11.2)	403	(13.4)	370	(10.6)
GRAND TOTAL	5890		3315		3839	
* < 20 mm maximum dimension						

Table 2 Preliminary analysis of microliths from the Early Epipaleolithic Phases at KPS-75

within each 50 cm quad) that were screened, and, for four of the units (N4, K10, M9, and L12), also to point provenience all cultural materials (lithics and fauna) larger than 2.5 cm. Samples taken include sediment for flotation, pollen, phytolith, and geochemical analyses.

The majority of the stratigraphic natural levels could be followed across the area excavated outside the rockshelter proper (including the strata identified in the geological section [L5] within the rockshelter). Nine natural levels were recorded. Levels 1–3 represent mixed contexts that include both Early Epipaleolithic (*e.g.*, narrow backed microliths and microburins) and later period materials (such as a Helwan lunate, a fragment of a Helwan point, Neolithic beads, sheep/goat, human bone and teeth likely from the looted burial, *etc*.). The evidence for occupation during the Natufian and Neolithic periods is quite limited and probably represents very ephemeral use of the site. It is presumed that most of this material originally was present inside the rockshelter, but was displaced during the looting event. Although Levels 1–3 vary in depth, extent, and presence from unit to unit, they represent approximately 15–25 cm of deposit, which is thickest near the rockshelter and thinnest in the downslope units (*e.g.*, L11 and L12).

The Lithics Samples

Based on preliminary analysis of a sample of the lithics, the natural levels below this can be divided into two phases of the Early Epipaleolithic. The later phase is in Levels 4–5, which are present in all the units in the occupation area outside the rockshelter. These represent between 20–50 cm of deposit, again with the thickest sediments in the upper portion of the site near the rockshelter (*e.g.*, H9 and K7). Below this is an earlier phase of the Early Epipaleolithic, represented by Levels 6–8 (and possibly 5a) in the area outside the rockshelter, and by Levels 1–5 in unit N4 inside the rockshelter. Level 5a is variably present (on-going lithic analysis will help determine if it should be grouped with the earlier occupation or if it is a spatial extension of Level 5 and thus belongs to the later phase of Epipaleolithic occupation), and Level 8 was reached only in unit L5. The depth of this deposit ranges between 15–40 cm outside the rockshelter and

is about 73 cm thick inside the rockshelter, with depth in all areas of the site constrained by the termination of excavation. In the area outside the rockshelter, Levels 6–8 include a clayish component and are more compact compared to Levels 5a and above. Differences in compaction and clay content between Levels 6, 7, and 8 may ultimately be useful in determining finer environmental and/or cultural divisions within the early phase of Epipaleolithic occupation at KPS-75.

Although KPS-75 is a small site in terms of area, it yielded a large number of lithics. The WHEEP preliminary analysis recorded more than 22,000 lithics, and it is estimated that this represents one-quarter to one-third of the lithic materials recovered during this field season. Tables 1 and 2 show materials from the two Early Epipaleolithic phases at the site, based on the sample analyzed to date. These are skewed toward larger elements, as individual point provenienced lithics were preferentially analyzed during the field season, with only a small number of complete "bucket" lithic samples examined (from both the point provenience and non-point provenienced units). It is thus likely that the representation of microliths and microburins (as well as small bladelets and small flakes) will be considerably higher once all analyses have been completed. Unit N4 is shown separately, although typologically it is part of the earliest phase as represented in Levels 5a–8 outside the rockshelter. All conclusions draw here must be considered preliminary findings, particularly the placement of Level 5a.

Level 4, and to a lesser extent Level 5, is characterized by abundant natural cobbles and boulders. The lithic assemblage from this Early Epipaleolithic phase in these two levels contains numerous examples of lithics with heavy white patination, making this assemblage quite distinctive. The presence of a small, but important, geometric microlith component includes examples of extremely narrow rectangles, trapezes, and triangles (see Table 2). The narrowness of these microliths likely indicates that this assemblage is more closely temporally related to the Early rather than the Middle Epipaleolithic, as quite narrow microlith widths are a widely recognized hallmark feature of the Early Epipaleolithic. The presence of lunates appears mainly to be a function of distal and proximal end treatment that is a variation on the straighter ends of rectangles and trapezes, as these lunates also are very narrow in width, and thus unlike most true Natufian lunates. Within the nongeometric microliths, Ouchtata and backed and truncated bladelets are typical. The greater presence of Ouchtata bladelets in this later phase (compared to the earlier phase at the site) of the Early Epipaleolithic suggests that this microlith type is not particularly chronologically sensitive (i.e., correlated only to the earliest of the Early Epipaleolithic and the Late Upper Paleolithic), as pointed out by al-Nahar (2000) in her extensive treatment of the Epipaleolithic of the inland Levant. Larger tools tend to be either endscrapers or retouched pieces. Blade cores are slightly more prominent in this assemblage, as are cores in general, than during the earlier phase at the site. This is also reflected in the blade debitage. Microburin technique, while present, appears to be less common than in the earlier phase. About 16% of the microburins analyzed are quite large, being in the size range of blades.

The lithic assemblage of Levels 5a–8 (and Levels 1–5 within the rockshelter [unit N4]) is characteristically that of the earlier part of the Early Epipaleolithic (we include Level 5a here for the present because the sample analyzed to date contains only one geometric microlith). It is dominated by nongeometric microliths, mainly the attenuated curved type (a very narrow double arched or double curved backed bladelet), as well as including all of the Qalkhan points found at the site (see Table 2). And, while there are some geometric microliths, these are either intrusive (*e.g.*, the Helwan lunate) or are likely to be so (*e.g.*, the rectangles and triangles); the microburin trapezes are a form in which the distal and proximal ends are microburin scars rather than finished truncations and are known from other Early Epipaleolithic sites in the Wadi al-Hasa a few kilometers to the south. In fact, these microlith features, and the presence of microburin technique, are quite similar to the lithic assemblage from Tor Sageer in the Wadi al-Hasa, which is radiocarbon dated to 25,000–24,000 cal BP (Olszewski in press). However, the early phase of the Early Epipaelolithic at KPS-75 does not appear to include Dufour bladelets, which Tor Sageer does have. This may indicate a slightly later temporal placement for KPS-75, as Dufour bladelets seem to be a feature shared across the Late Upper Paleolithic and the earliest of the Early Epipaleolithic (Olszewski 2003). Among the larger tools, endscrapers are slightly less frequent, while burins are somewhat more abundant, compared to the assemblage found in Levels 4–5. Cores for the production of bladelets are clearly emphasized in the Levels 5a–8 (and Levels 1–5 in unit N4) occupation at the site. Interestingly, there is a similar numerical presence (15% compared to 16% in Levels 4 and 5) of large microburins in the size range of blades. This may suggest that both Epipaleolithic phases at KPS-75 were using microburin technique in the manufacture of larger tools, perhaps analogous to forms such as the "Jilat knife" recorded in the Azraq Basin (Garrard and Byrd 1992), although we do not have any examples of "Jilat knives" at KPS-75.

Raw material use is similar for both phases of the Early Epipaleolithic, with about 80% of the lithics made on fine-grained flints (primarily from nodular sources), 11%–14% on phosphatic flints, 3%–8% on chalcedony (this material being used more frequently in the Levels 5a–8/Levels 1-5 [N4] earliest phase of occupation at the site), 1%–2% on coarse flints, and 0.1%–0.3% on siliceous coquina. This distribution appears to reflect the same pattern reported for the Wadi al-Hasa Early Epipaleolithic (Olszewski and al-Nahar 2006; Olszewski and Schurmans 2007). That is, most flint used is obtained from sources close to the sites. In fact, this is clearly seen by the greater use of phosphatic flint at KPS-75 as this site is situated within

the al-Hisa Phosphorite Formation, while most Wadi al-Hasa sites are at the interface of the Wadi Umm Ghudran and Amman Silicified Limestone Formations. One surprising observation is the modest amount of chaceldony at KPS-75. Use of this raw material in the Wadi al-Hasa was mainly confined to sites with Early Natufian occupations and it was thought that the source for chalcedony was not in the immediate vicinity (Olszewski and al-Nahar 2006). However, examination of the KPS-75 chalcedony indicates that it is derived from both bedded and nodular sources and some pieces include phosphatic indicators, suggesting that its source(s) may be in the near vicinity of KPS-75.

During the time of Early Epipaleolithic occupation of KPS-75, standing water (perhaps as a seasonal lake) characterized the broad and open wadi to the immediate south (Bilal Khrisat, personal communication 2009). This would have created a favorable habitat for both humans and animals during the period of the Last Glacial Maximum and immediately afterwards. Preliminary analysis of a sample of the fauna from Levels 4–5 at the site indicates that hunters here focused on high-ranked resources including aurochs and wild ass, and also exploited smaller game such as gazelle, as well as slow-moving, easy to capture, tortoise (Natalie Munro, personal communication 2009). Analyses of site sediments, pollen, phytoliths, fauna, and lithics are on-going.

Acknowledgements: Funding for WHEEP was provided by grants from the National Science Foundation, the Deanship of Academic Research at Jordan University, and Hashemite University. Project housing was provided by the Jordan Ministry of Education. We also thank all the members of our crew, and staff of ACOR. This is WHEEP Contribution No. 1.

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Bir el-Maksur. A New Pre-Pottery Neolithic A Site in Lower Galilee

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Introduction

In November, 2008, a salvage excavation was conducted at the Pre-Pottery Neolithic A (PPNA) site of Bir el-Maksur, Lower Galilee. The site is topographically located on a hill brow that slopes towards the southeast (226 masl). Geographically, the site is in relatively close proximity to the Pre-Pottery Neolithic B site of Yiftahel (*ca.* 2 km; Khalaily *et al.* 2008), and is about 12 km west of Nazareth and approximately 20 km east of the current seashore (Fig. 1). Bir el-Maksur is also located near excellent flint raw material sources (Timrat formation, Lower and Middle Eocene; Sneh *et al.* 1998).

During excavation, a systematic survey was carried out at the site. This, along with the digging of several probe trenches, exposed a distribution of artifacts that extended *ca.* 2400 m², of which 60 m² was excavated in three areas (Fig. 2). The thickness of the depositional sequence is *ca.* 60 cm and comprises three layers: a disturbed plough-zone topsoil (20-30 cm thick); a layer of clay with minimal finds (10-20 cm thick); and a stony layer (*ca.* 10-20 cm. thick) on bedrock, which included the bulk of the archaeological material. The undulating bedrock surface includes large exfoliated blocks and nodules of dolomite, limestone, and flint of various sizes and morphologies. The flint at Bir el-Maksur was very likely derived from local sources.

In association with the stony layer angular fragments were found. The angular fragments were made of local dolomite, usually homogenous in size, measuring *ca.* 5 cm in length and were possibly modified by fire or, less frequently, by knapping (Fig. 3).

The three excavation areas are distinguished by

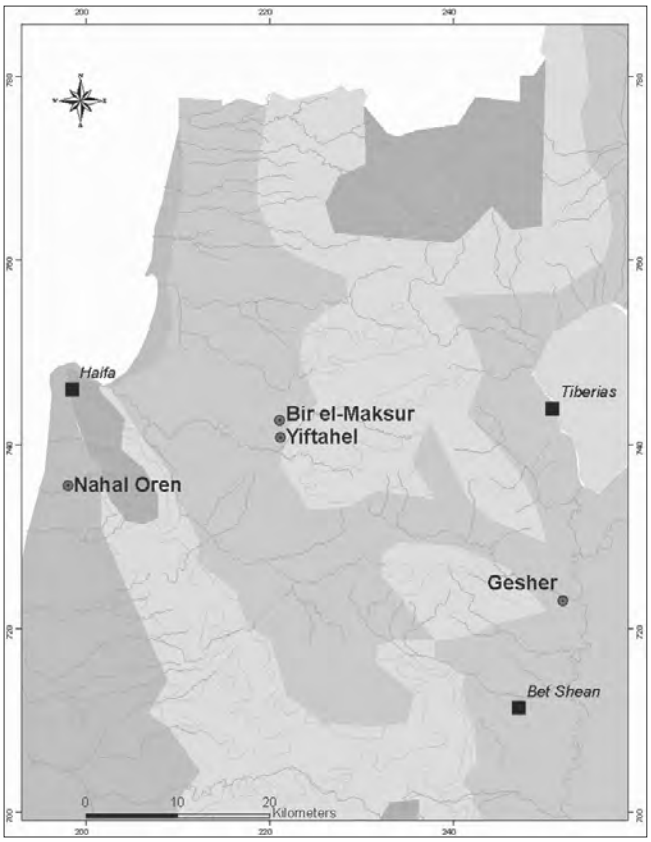

Fig. 1 Location of Bir el-Maksur

Fig. 2 Location of the test trenches

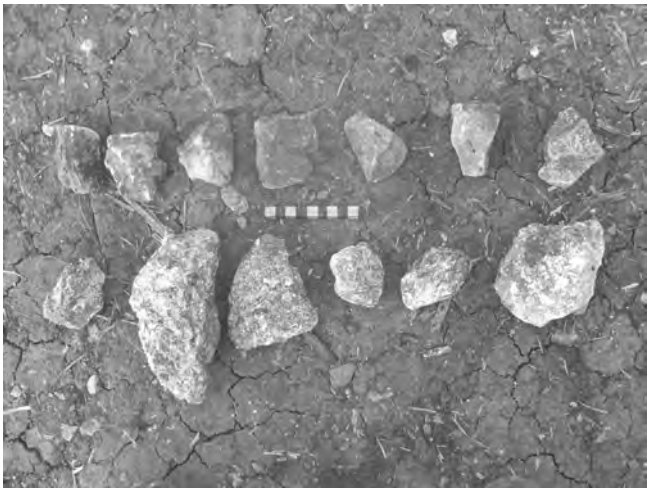

Fig. 3 Angular fragments of local dolomite, Area A

Fig. 4 Horizon of angular fragments, Area A

Fig. 5 Burial, Area A

variations in the accumulation of angular fragments. These accumulations are characterized by differences in both artifact density and spatial configuration. The topographic location of the site, at the brow of the hill, together with the changing nature of artifact accumulations from one area to the next, excludes natural agency as a possible explanation. Instead, three possible explanations, all anthropogenic, are suggested for the four varieties of accumulation types of angular fragments found at Bir el-Maksur.

Stratigraphy and the Different Excavation Areas

Area A

The angular fragments form a continuous horizon exposed over 20 m². The density of the horizon is *ca.* 350 angular fragments per m² with a thickness that approximates that of a single fragment (Fig. 4). This layer is rich in broken ground-stone tools made of basalt. It also includes numerous lumps of clay and a small quantity of faunal remains. The sediment changes in Area A indicate the development of a paleosol within the stony layer. A second concentration of angular fragments was unearthed approximately 3 m from the horizon, wherein a burial was uncovered (Fig. 4).

A large triangular slab found at the bottom of the grave suggests that the deceased was laid within a shallow pit and the angular fragments are in fact part of its fill (Fig. 5). The burial is of an individual in partial articulation. Some bones are complete, while others were broken in situ post-deposition. The burial was found with only the mandible, the skull having been removed in antiquity. Three complete ground-stone tools were found adjacent to the burial. These include a complete pestle and two basalt handstones (Fig. 6). These tools are unique to the burial, as no similar finds were discovered in other areas of the excavation or in the survey. It is suggested then, that these grinding tools served as burial offerings.

Fig. 6 Pestle and handstones from Area A

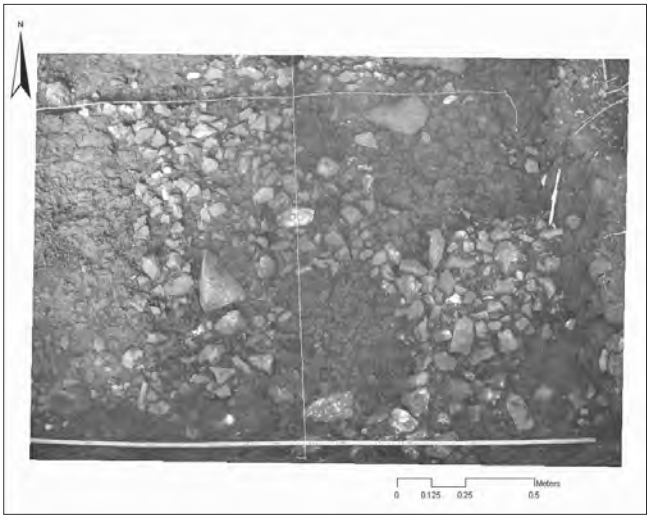

Fig. 7 Area C

Area B

In this area there were no angular fragments. Instead, the clayey layer (*ca.* 20 cm thick) extends to the bedrock. Most of the artifacts originated from the accumulation that lies approximately 10-20 cm above the bedrock.

Area C

In this area the stony layer is manifested in relatively low density patches (*ca.* 150/ m²) without any clear spatial patterning (Fig. 7). Only a few animal bones were found with the angular fragments, as well as lower frequencies of burnt clay and grinding stones. The lumps of clay in Area C are smaller and less compact than those of Area A.

Fig. 8 Lithic finds

Small Finds

The lithic assemblage of Bir el-Maksur, recovered from both the survey and the excavation, is typical of PPNA assemblages. Typologically diagnostic lithics include sickle blades, of which a few are of the Beit Ta'amir knife type, and one el-Khiam point (Fig. 8). The assemblage also contains all the elements of the bifacial reduction sequence, including the distinctive tranchet spalls typical of the PPNA. Ground-stone tools are numerous at the site (*ca.* 300 items, mostly fragments). They are predominately basalt pestles with either a rounded or square section.

The small faunal assemblage recovered at the site includes gazelle and small game species, most probably fox (*Vulpes vulpes*), hare (*Lepus capensis*), and partridge (*Alectoris chukar*). This is in accordance with other PPNA sites in the southern Levant, which are devoid of domesticated livestock and usually rich in hunted gazelle, small mammals and birds (*e.g.*, Clutton-Brock 1979; Davis *et al.* 1994; Marder *et al.* 2007; Tchernov 1994).

Of particular interest is the presence of numerous lumps of clay, which are patterned spatially and in varying sizes. We believe that these might indicate the use of wattle and daub or pisé at the site. This hypothesis will be tested in the future to evaluate whether the clay was burned or manipulated in any other manner.

Conclusions

Bir el-Maksur is one of the few Pre-Pottery Neolithic A sites known in the Galilee. This is in contrast to the proceeding Natufian culture and the abundance of later PPNB sites in the region (Goring-Morris *et al.* 2009). The only other PPNA sites excavated to date that are nearest to Bir el-Maksur are Nahal Oren in the Carmel at a distance of *ca.* 25 km (Stekelis and Yizraeli 1963) and Gesher, in the central Jordan Valley *ca.* 35 km away (Garfinkel and Dag 2006). The PPNA period is characterized by an increase in settlement pattern variability, evident in a hierarchical organization of site types that include villages, camps, hamlets, and task-specific sites (Kuijt and Goring-Morris 2003). The variability in settlement patterns is expressed in the differences between the larger settlements seen in the Jordan Valley and the more ephemeral sites located in the western flanks of the Samarian Hills bordering the central coastal plain (Marder *et al.* 2007).

The preliminary survey at Bir el-Maksur indicates the site resembled the type of localities associated with the coastal plain. This interpretation was based on the site's geographical location above the coastal plain, the fact that it is located adjacent to raw material sources, and due to the dominance of tranchet bifaces. However, during excavation it became clear that the nature of occupation at Bir el-Maksur is more complex than typical coastal plain sites. The lithic assemblage reflects varied activities, including the harvesting and

processing of plant resources suggested by the presence of sickle blades and numerous ground-stone tools. In addition, the discovery of a human burial at the site adds a particularly intriguing dimension to the interpretation of Bir el-Maksur as a site of human activity.

With regard to the lithic evidence, the diverse nature of angular fragment accumulations also points toward the complexity of the site and the lengthy duration of its materials. In Area A, a dense and continuous horizon was uncovered that may have served as "pavement" for open air activities. Another purpose of angular fragments use in Area A was as part of the intentional covering of the burial. Area A and Area C are separated by 7.5 m that are devoid of angular fragments. In area C, the angular fragments appear in lower densities and without clear patterning that may represent the remainder of badly preserved installations.

The variability in angular fragments together with other lines of evidence reviewed here suggests that the occupation at Bir el-Maksur was not ephemeral but rather was for a period of prolonged use. The variable nature of angular fragment accumulations at the site adds an important element to our understanding of its function, and of the unique role these fragment play in the understanding the wider PPNA settlement nature.

Acknowledgments: The excavation at Bir el-Maksur was conducted under the auspices of the Israel Antiquities Authority and financed by Ma'atz. We wish to thank the following people for their work in the field: Ofer Marder, Hamoudi Khalaily and Ianir Milevski (consultant and directing), A. Shapiro (JPS) and R, Ekshtain and Y. Gekcht. Further assistance was extended by T. Horowitz from the IAA northern district; we thank Leticia Barda for preparing figure 1 for publication. We would like to thank Mae Goder, Michal Birkenfeld, Omry Brazilai, and Ofer Marder for reading earlier versions of the paper. We are grateful to Nigel Goring-Morris for his help as well as comments on previous drafts of this paper. Lastly, we thank Alexandra Sumner for her editorial comments.

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Kmlo 2. An Early Holocene Site in Armenia

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A Franco-Armenian mission has conducted investigations in Armenia for the past 10 years, focusing on understanding the entire sequence of prehistory in the lesser Caucasus, including the Neolithization process in this region. The earliest known village-farming communities date to the 6th millennium BC in the Araks and Kura Basins (the so-called Shulaveri-Shomutepe Culture). Recent excavations conducted by the mission at Aratashen and Aknashen-Khatunarkh in the Araks Basin in southwest Armenia have yielded rich information for this culture (*cf*. Badalyan *et al.* 2007). In contrast, sites earlier than the Shulaveri-Shomutepe Culture are not well attested. Two interesting questions for our research are: what cultural entities existed in the early Holocene and how did they transform or relate to the later Shulaveri-Shomutepe Culture? This is a short report on the recent results from Kmlo 2 in northwest Armenia, which contains a culture type previously unknown in the prehistory of this region but which could give new insights into the cultural sequence of the early Holocene in the lesser Caucasus.

Kmlo 2 is a rock shelter located on the west slope of a deep valley formed by the Kasakh River (Figs. 1-2). The rock shelter opens onto a sheer cliff and faces southeast. The sheltered area at one time covered approximately 3 x 6 m, but it has been reduced by the collapse of two large blocks at the mouth of the shelter. The site was discovered in 2002 by the Armenian archaeological survey due to the abundant obsidian artifacts on the surface. It was thought to date to the terminal Pleistocene or early Holocene, periods of Armenian prehistory that are not well understood. The excavations started in 2003 and continued in 2005-2006 and 2009 under the direction of Boris Gasparyan and Christine Chataigner.

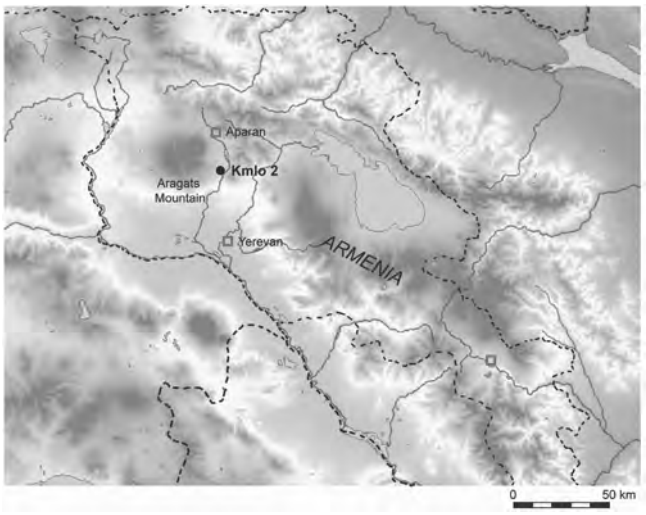

Fig. 1 Location of Kmlo 2

Stratigraphy and 14C Dates

The excavations revealed dark brown sandy deposits, ranging from 40 to 50 cm thick. These deposits were divided into several layers by sediment texture and features. The upper layers include several medieval and Chalcolithic potsherds, while lower layers have almost no ceramics: a few potsherds from the lower layers are probably intrusive from the later occupations. Fireplaces with charcoal and ash were found in several layers, along with abundant obsidian artifacts and animal bone

Nine calibrated 14C dates from the lowest layer are from the 11-10th millennia BC, the 8th millennium BC, and the 6-5th millennia BC (Table 1) and might indicate three different occupational phases. Although the samples were taken from almost the same level, the

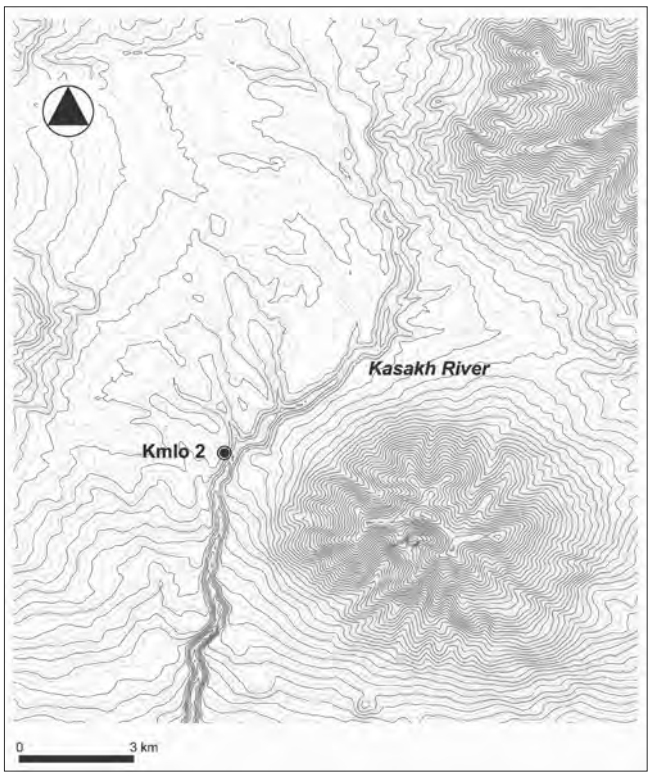

Fig. 2 Location of Kmlo 2

code	uncal. BP	cal. BC (2 sigma)
Poz-20231	10900 ± 50	10979-10873
AA68562	10924 ± 91	9879-9299
AA68563	10184 ± 93	10230-9445
UGAMS-4076	9840 ± 30	9324-9251
Poz-19666	8500 ± 50	7530-7490
Ly-2761		4450-4328
Ly-2762	6640 ± 40	5631-5509
UGAMS-4077	5610 ± 30	4498-4361
Ly-2817	5555 ± 60	4518-4325

Table 1 C14 dates from Kmlo 2

results show a wide range of dates. Judging from the potsherds in the upper layers, Kmlo 2 was probably occupied in the Chalcolithic and then again in the medieval period. The Chalcolithic occupation at Kmlo 2 could date to the 6th or 5th millennium BC based on the C14 dates. Although other C14 dates indicate that the lower Layers at Kmlo 2 may be from two phases (11-10th millennia BC and the 8th millennium BC), it is difficult to divide these layers into two phases based on artifactual data.

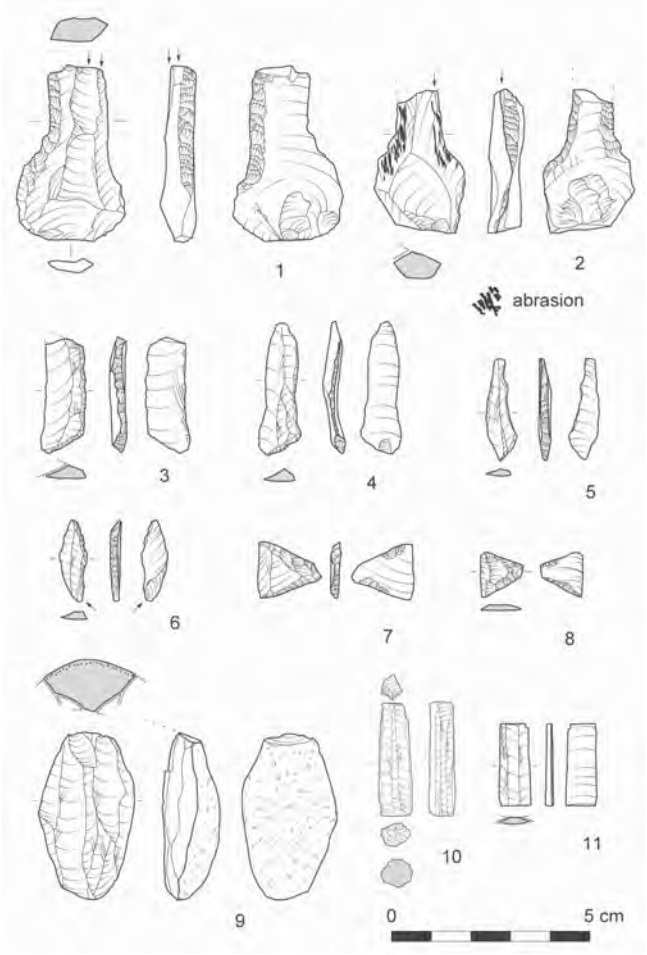

Fig. 3 Obsidian lithics from Kmlo 2

Lithic Industry

Four seasons of excavation yielded numerous lithics made from local obsidian. Other raw material such as dacite and flint were also used, but their numbers are quite limited. Judging from the cortical flakes of obsidian, approximately 10 cm-sized river pebbles were brought to the cave and knapped on site. Such obsidian pebbles are available on the riverbanks of the Kasakh River. These pebbles were brought from the upper large obsidian sources in the Tsaghkunyats range.

The most remarkable finds in Kmlo 2 are obsidian "Kmlo tools," which we named after the site (Chataigner *et al.* 2007). This tool type was previously and could be a marker of a cultural entity (see below). Kmlo tools are characterized by continuous and parallel retouch by pressure flaking of one or both lateral edges (Fig. 3: 1-2). They are usually made on blades but also occasionally on flakes. Other important characteristics of Kmlo tool are specific use-wear and fragmentation. In many cases, linear or heavy abrasion can be seen on the surface along the retouched edge and the lateral (retouched) edge is often removed by burin blow. The ends of the tool are also frequently truncated or snapped.

Abundant microliths are also a noteworthy part of the lithic industry in Kmlo 2 (Fig. 3: 3-8). They include types such as lunates and trapeze-rectangles, but backed bladelets and scalene (straight-backed and obliquely truncated) bladelets are predominant (Fig. 3: 4-6). The presence of microburins and remnants of microburin scars on backed bladelets indicate that the microburin technique was used for their production.

There is no significant change in the lithic industry throughout the layers of Kmlo 2. The industry is blade-oriented, and blade/bladelets are generally knapped from single-platform cores (Fig. 3: 9 or, less frequently, from bi-directional cores. The cores are often formed from pebbles without specific core preparation, corresponding to the very low frequency of ridged flakes and blades. Butt preparation is often done by removing of flakes without abrasion, resulting in butts that are not reduced and are relatively large. In addition, several regularly formed, pressure-flaked bladelets and a small bullet core were found (Fig. 3: 10-11). When compared with blade production in later Neolithic sites of the Shulaveri-Shomutepe Culture, where sophisticated blade production was generally practiced with pressure flaking and punch technique, blade production in Kmlo 2 is fairly rough.

Discussion

How do our data from Kmlo 2 fit into the prehistory in the Lesser Caucasus? Although 14C dates, as noted above, indicate three different phases from 11-10th millennia BC to 6-5th millennia BC, the lithic industry does not show any significant change through these layers. This observation could be explained by the

hypothesis that prehistoric occupations of Kmlo 2 were disturbed by later occupations, including the medieval, which caused such a wide range of C14 dates from the almost same level. Judging from the almost complete absence of pottery found from the lower layers, prehistoric occupations of Kmlo 2 were probably aceramic. However, the dates of the lower aceramic layers remain uncertain even with the 14C dates. Comparing the lithic industry of Kmlo 2 with other sites may be useful in determining the chronological position of the aceramic layers.

Recently, Kmlo tools have been found in several sites in the area surveyed by the mission. At several sites, such as Gegarot and Kuchak in hilly areas in northwestern Armenia, Kmlo tools were collected on the surface or found in archaeological soundings. Typo-technological traits of Kmlo tools observed at Kmlo 2, such as abrasion and fragmentation by burin blow and truncation, are confirmed in collections from these sites. Unfortunately, the sites remain undated but the presence of Kmlo tools implies that they are a marker of a certain cultural entity. It is important to note that no Kmlo tools have been found at sites of the Shulaveri-Shomutepe Culture of the 6th millennium BC.

Furthermore, specimens similar to Kmlo tools seem to be present in the Paluri-Nagutny Culture in Georgia (Kiguradze and Menabde 2004). This culture is not well dated, but it is referred to as the Aceramic Neolithic in Georgia. Georgian specimens are made on both obsidian and flint. Turning to the Western Asia, similar pressure-retouched tools, the so-called "Çayönü tools", are found in Neolithic sites from the 8th to 7th millennia BC in eastern Anatolia and northern Mesopotamia. Some specimens have abraded surfaces along the retouched edge, comparable to Kmlo tools. According to the use-wear analysis of Çayönü tools (Anderson and Formenti 1996), Çayönü tools may have been used for making objects such as stone bowls or bracelets.

Through this short comparison, it seems that specimens similar to Kmlo tools are present in Neolithic cultures in the lesser Caucasus and Western Asia. This may suggest that the one 8th millennium BC 14C date from Kmlo 2 could be acceptable for dating the aceramic layers of the site. On the other hand, the C14 dates of the 11th-10th millennium BC are hard to accept given our present knowledge. In many regions, retouched tools similar to those from Kmlo 2, such as the heavily pressure-retouched tools such as Kmlo tool and transverse arrowheads (Fig. 3: 1-2, 7-8), are characteristic of the Neolithic. However, at present we cannot rule out the possibility that the basement of Kmlo 2 contains occupations of the 11-10 millennium BC.

Although the dating of Kmlo 2 remains uncertain, our results show archaeological evidence of an Early Holocene culture different from the Shulaveri-Shomutepe Culture. We should consider the relationship between Kmlo 2 and the Shulaveri-Shomutepe Culture, we may suggest two possibilities: Kmlo 2 represents either a different cultural facies contemporary with the Shulaveri-Shomutepe Culture or it precedes it.

During the 2009 season, we rechecked the stratigraphy of the site and took additional samples for C14 dating. The study of animal remains is underway and will give important information on the subsistence economy of the site inhabitants. These further studies are expected to solve the chronological problem of Kmlo 2. In addition, it will be necessary to research and excavate other "Kmlo-type" sites. The study on the Neolithization process in the Lesser Caucasus has just begun.

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Flint Bowlets. A Comprehensive Review from Wadi Abu Tulayha, Ma‘an Region

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Introduction

Since Hans Gebel (1999) gave a name and promoted awareness to several examples from Basta and Ba’ja, flint ‘bowlets’ have continued to provide a theme for discussion in the journal of Neo-Lithics. A few scholars joined in the argument, bringing along their own material(s) from el-Hemmeh (Makarewitz and Goodale 2004) and ‘Ayn Jammam (Rollefson 2005). I would also like to participate in the round table involving my own materials from Wadi Abu Tulayha. This paper describes four flint bowlets found at the site and, on this basis, makes a comprehensive review of the artifacts unique to PPN B settlements in southern Jordan.

The Site and Its Setting

The site of Wadi Abu Tulayha is an M-LPPNB agro-pastoral outpost in the northwestern part of the Jafr Basin, a large closed drainage system occupying the vast majority of the Ma’an Plateau in southern Jordan (Fig. 1). It was found for the first time during our 2001-2002 winter season survey (Fujii and Abe 2008) and was continuously excavated over six field seasons since the spring of 2005 until the summer of 2008. The site consisted of the following three components: an elongated settlement occupying the northwestern corner of the site; three stone-built barrages constructed along a side wadi flowing along the southern edge of the site; and a large composite cistern lying *ca.* 100 m upstream of the barrage system. Since we have reported the investigation results elsewhere periodically (Fujii 2006a, 2007a, 2007b, 2008a, n.d.a) and also discussed a few major issues in Neo-Lithics as well (Fujii 2006b,

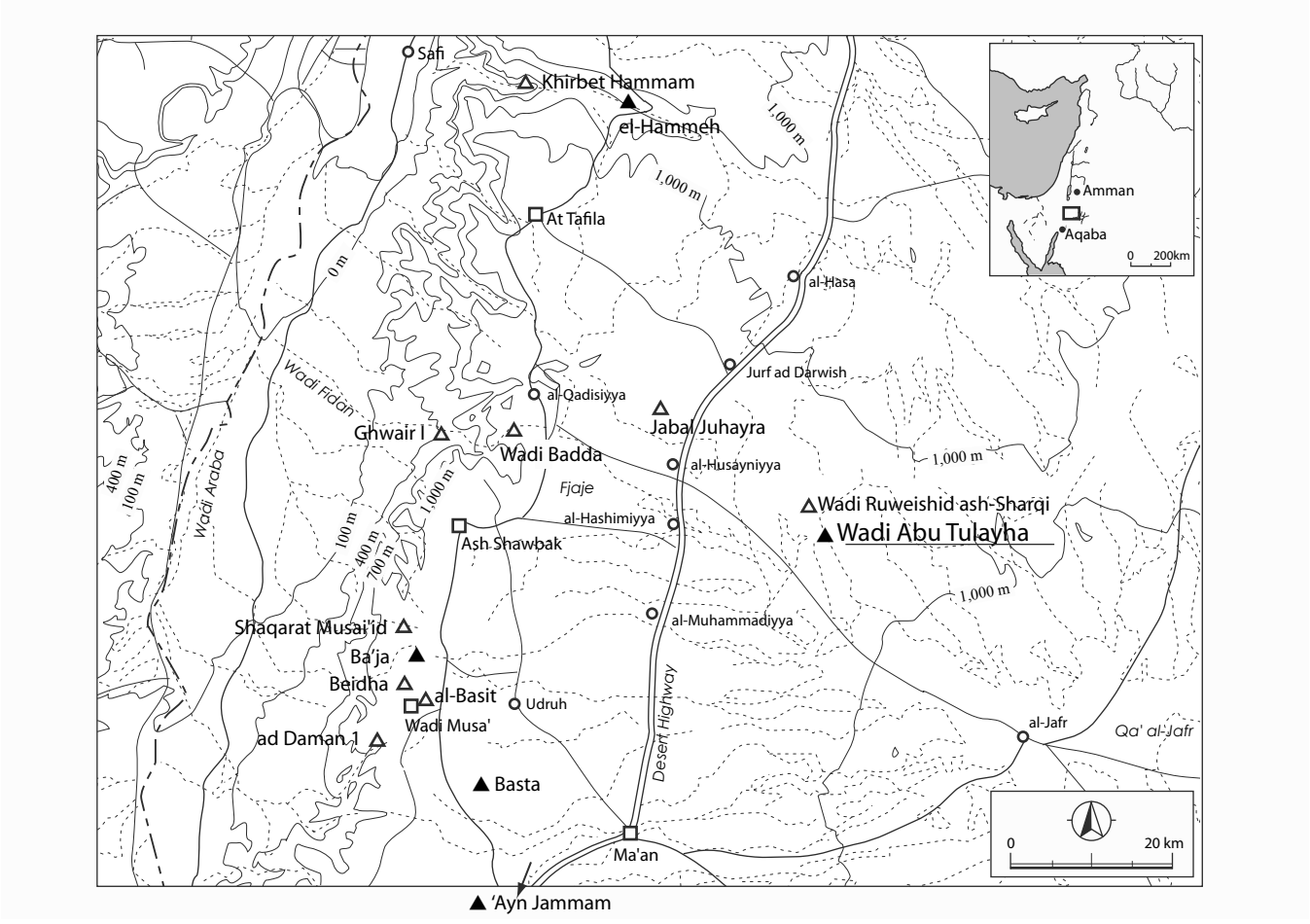

Fig. 1 Five PPNB sites that yielded flint bowlets (▲)

No.	Structure / Locus	Context	Period	Condition	Wt (g)	Db/Dc* (cm)	Ht/Dp (cm)	Cp (cc)	Use wear	Pigment	Reference
1	Unit 42: 42-502.sfl	upper fill layer	MPPNB	complete	406	11.0 /11.0	3.7 / 0.4	20	-	-	Fujii 2009
2	Unit 39: 39-523. Sfl.	middle fill layer	MPPNB	complete	462	9.9 / 6.8	4.2 / 0.8	17	○	-	Fujii 2009
3	Structure B: B3-103	upper fill layer	M/LPPNB	complete	504	11.5 / 9.0	5.3 / 1.9	57	-	-	Fujii 2006a
4	Structure K: F3-103	upper fill layer	LPPNB	halved	89	7.5 / 6.3	2.7 / 0.7	10	○	-	Fujii 2006a

Table 1 Inventory of Flint Bowlets from Wadi Abu Tulayha

2007c, 2008b, n.d.b), no further repetition is needed. The only thing I would like to stress here is that the settlement can be defined as an agro-pastoral outpost used on a seasonal basis and, therefore, is thought to have been closely related to a "mother settlement" area to the west. This perspective provides a useful background for our discussion.

Flint Bowlets from Wadi Abu Tulayha

Four flint bowlets were found in the western half of the M-LPPNB agro-pastoral outpost (Figs. 2-4; Table 1). The following description will be made in a chronological order.

Bowlet 1

Bowlet 1 was found in a complete condition in an upper fill layer of Unit 42, one of the key features of Complex 00 dated to the latter half of th e MPPNB[1] (Fujii n.d.a: Table 1). It is made of a grayish light brown, fine-textured Eocene flint nodule with a thermal-flaked patinated concavity on the upper surface and a few natural fractures on the lateral and basal surfaces. (The same is true for other three examples.) This bowlet is relatively large in dimensions, having a weight of 406 gm, a maximum diameter of 11.0 cm, and a height of 3.7 cm. The natural concavity on the upper surface, 0.4 cm deep, produces a maximum capacity of *ca.* 20 cc[2].

The most important technological feature of this bowlet consists in its unique shaping technique that takes full advantage of the natural concavity on the otherwise flat flint nodule. The concavity has a smooth surface and an ideal curvature, being directly used as a bottom of a shallow vessel. A cortical part around it also remains intact, producing a circular fringe *ca.* 1cm wide. The lateral surface, on the other hand, is extensively retouched by direct percussion. The lateral flaking scars are *ca.* 2-3 cm wide, leaving remarkable negative bulbs and platform shattering immediately below the fringe of the concavity. Nevertheless, the reverse side is less extensively flaked and natural fractures still occupy a significant portion. Neither macroscopic use wear nor ochre-stained spots was confirmed on the concavity. This allows us to define the bowlet as an unused, finished product.

Bowlet 2

This bowlet was found in a complete condition in a middle fill layer of Unit 39, again belonging to Complex 00. It is also relatively large in size, having a weight of 462 gm, a maximum diameter of 9.9 cm, and a height of 4.2 cm. The patinated thermal-flaked concavity on the upper surface measures 6.8 cm across and 0.8 cm deep, producing a preserved capacity of 17 cc. The original capacity would be *ca.* 20 cc or a little more.

This bowlet is much inferior in quality to Bowlet 1, being only crudely trimmed around the concavity. As a result, a few natural fractures still survive on the lateral surface. In addition, a cortical surface around the concavity still remains partly intact. The central part of the natural concavity was pitted with delicate percussion, suggesting that it was put into practical use. However, no ochre-stained spots were recognized

No.	Site	Area / No.	Period	Condition	Wt (g)	Db (cm)*	Ht (cm)*	Cp (cc)	Use wear	Pigment	Reference
5	Basta	-	LPPNB	complete	-	-	-	-	-	-	Gebel 1999
6		-	LPPNB	complete	-	-	-	-	-	-	Nissen *et al*. 1991
7		-	LPPNB	complete	-	-	-	-	-	-	
8	Ba'ja	12026	LPPNB	complete	-	*ca*. 8.5	*ca*. 3.0	-	-	○	Gebel 1999
9		12070	LPPNB	complete	-	*ca*. 5.5	*ca*. 2.5	-	-	-	
10		12033	LPPNB	complete	-	*ca*. 7.0	*ca*. 3.0	-	○	○	
11 12	el-Hammeh	464E / 230N 464E / 230N	LPPNB LPPNB	halved -	- -	- -	- -	- -	○ -	○ -	Makarewicz 2004
13	Ayn Jammam	-	LPPNB	complete	-	*ca*. 7.0	*ca*. 1.5-2.0	-	○	○	Rollefson 2005
* These are estimate values obtained from published illustrations.											

Table 2 Inventory of flint bowlets from the other four PPNB sites

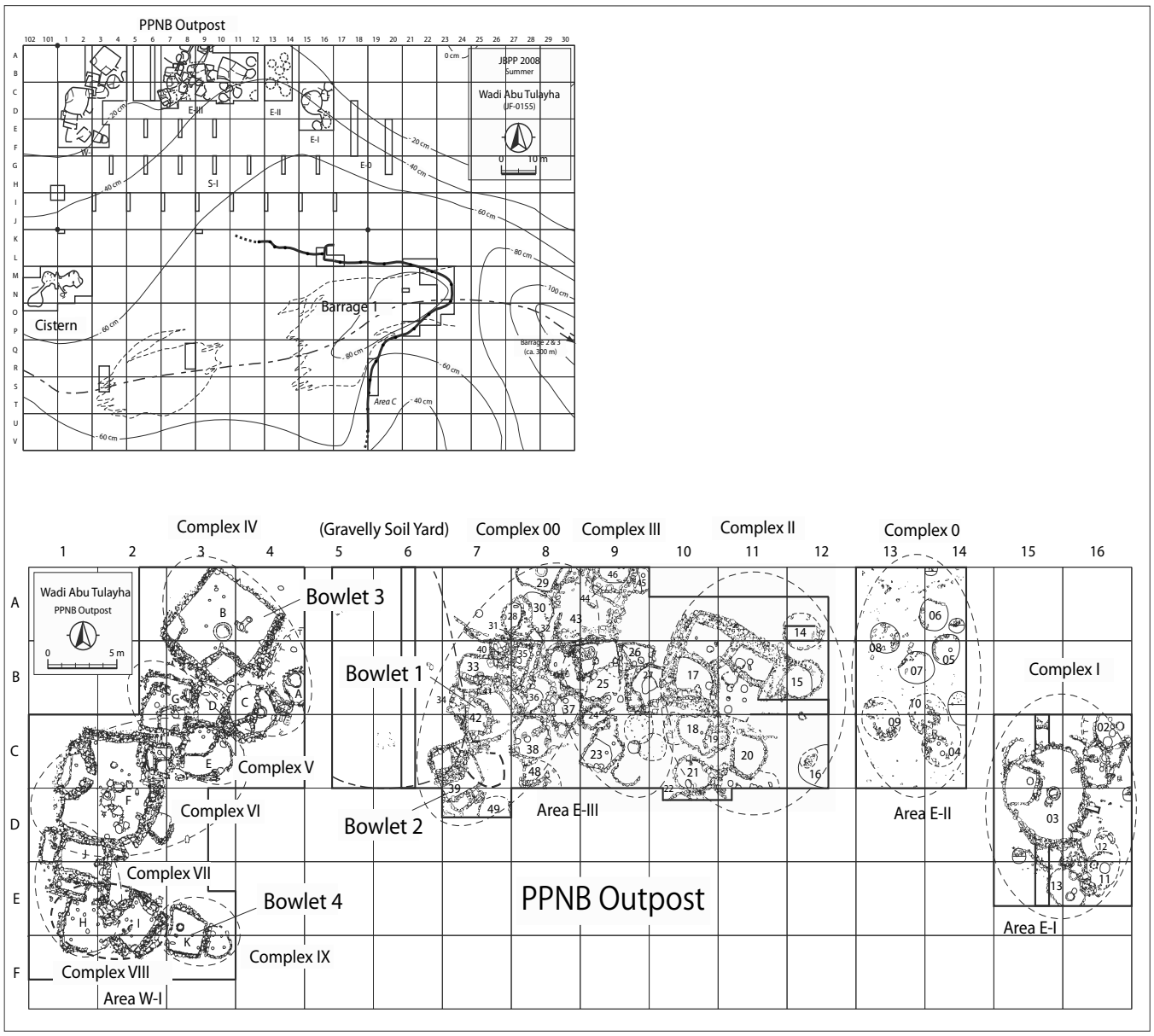

Fig. 2 M-LPPNB outpost at Wadi Abu Tulayha.

in and around them. This bowlet is thought to be a half-finished or a failure product, seeing that a large flaking scar, probably intended to remove the original cortex around the concavity, detracts from the quality of the whole product to a large extent. Thus, it can be regarded as a used but imperfect product.

Bowlet 3

Bowlet 3 occurred in a complete condition from an upper fill layer of Structure B, a key feature of Complex IV dated to a transitional phase between the MPPNB and the LPPNB. This bowlet is again large in size, measuring 504 gm in weight, 11.5 cm in maximum diameter, and 5.3 cm in height. The thermal-flaked central concavity is also relatively large (9.0 cm across and 1.9 cm deep), producing a maximum capacity of 57 cc.

As is the case with Bowlet 2, the natural concavity retains a cortical fringe *ca.* 1-2 cm wide around it. The lateral and basal surfaces are roughly trimmed by direct percussion, but an extensive natural fracture still occupies a substantial portion of the lateral surface. Nevertheless, it appears to represent a finished product in the sense that further modification would only have wasted the original profile and capacity of the concavity. No clear evidence for use wear and pigmentation is recognized and, therefore, this bowlet is defined an unused, finished product.

Bowlet 4

Bowlet 4 was recovered in a halved condition from an upper fill layer of Structure K during the final component of the long-occupied outpost and dated, on the basis of three AMS dates, to the early half of the LPPNB. This bowlet contrasts markedly with the three MPPNB examples in many respects. To begin with, it

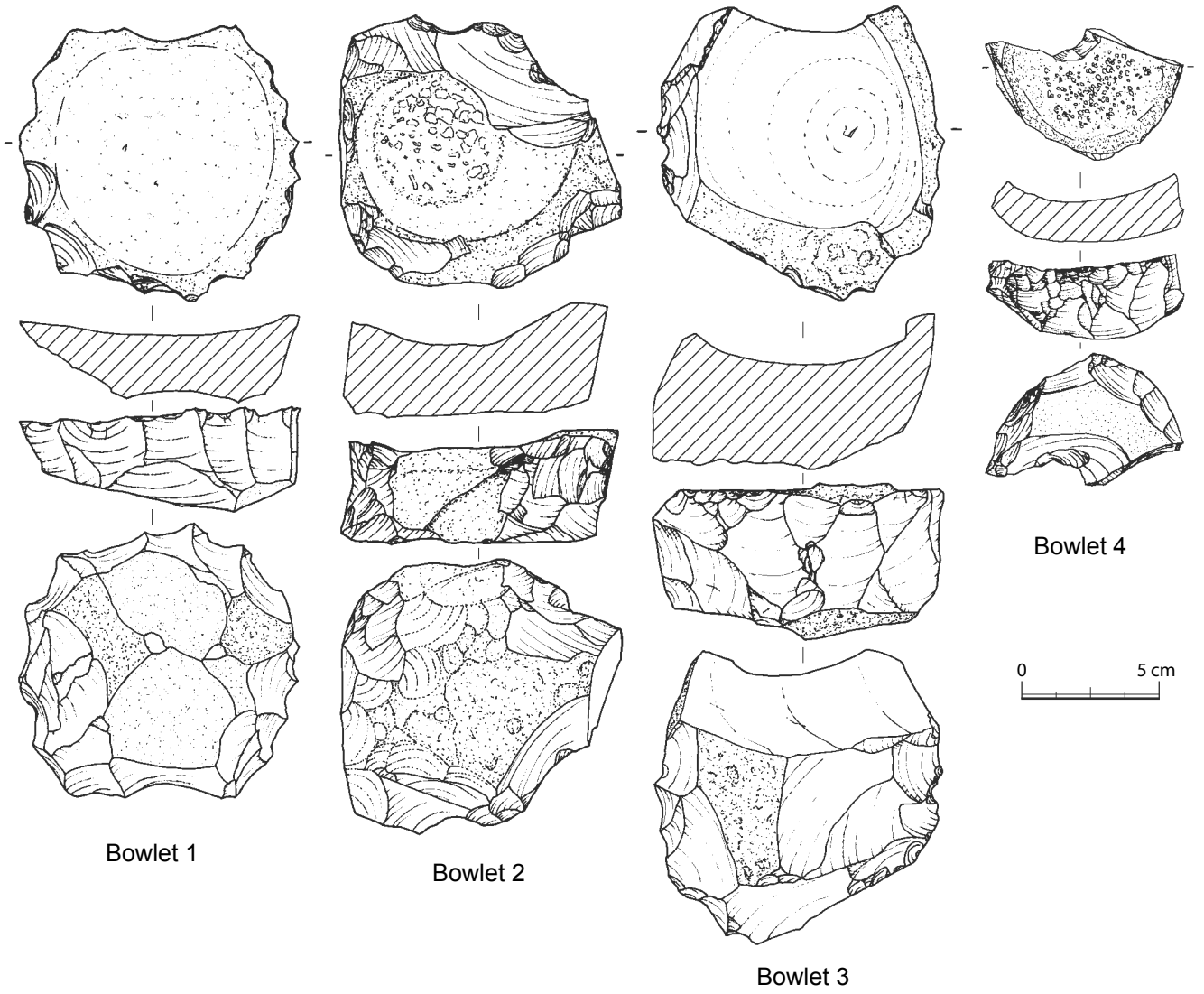

Fig. 3 Flint bowlets from Wadi Abu Tulayha

is much smaller in dimensions, measuring only 89 gm in weight, 7.5 cm in diameter, and 2.7 cm in height. The natural concavity is also smaller, being *ca.* 6.3 cm in diameter, 0.7 cm in depth, with 10 cc in preserved capacity. (The original capacity might have been nearly double, however.)

Another remarkable contrast is the quality of retouch. The lateral surface is not only finished with narrow invasive retouch less than 0.5 cm wide, but it is also accompanied with careful platform chipping. This, coupled with an ideal form of the cortical concavity itself, provides a clean-cut appearance for the bowlet. Seeing that the flaking scars are lustrous as well as invasive, it is possible that the raw material underwent some heat pretreatment. Delicate battering marks were recognized on the bottom of the concavity, although no pigment remained inside them. It follows that this bowlet represents a used, finished product. The reason why it was halved is unknown, but it multiple factors – the delicate profile, structural degradation by the heat pretreatment, and an accidental percussion blow leaving its trace in the center of the concavity – were probably responsible for the happening.

Discussion

Before our investigation, a total of nine flint bowlets had been reported from the following four LPPNB settlements: three from Basta and Ba'ja, respectively, two from el-Hemmeh, and one from 'Ayn Jammam (Table 2). Wadi Abu Tulayha has added another four stratified examples to the collection. The following is a tentative synthesis of these materials.

Distribution

In light of the location of the five sites, the flint bowlet can be regarded as an indicator artifact of the PPNB cultural sphere in southern Jordan or, more precisely, the southern Jordanian highlands. Of significance is the fact that the sites include a seasonal agro-pastoral outpost in arid peripheries as well as (semi-)sedentary farming communities under the Mediterranean climatic regime. It follows that the distribution of flint bowlets covers both the mother settlement area to the west and the outpost area to the east.

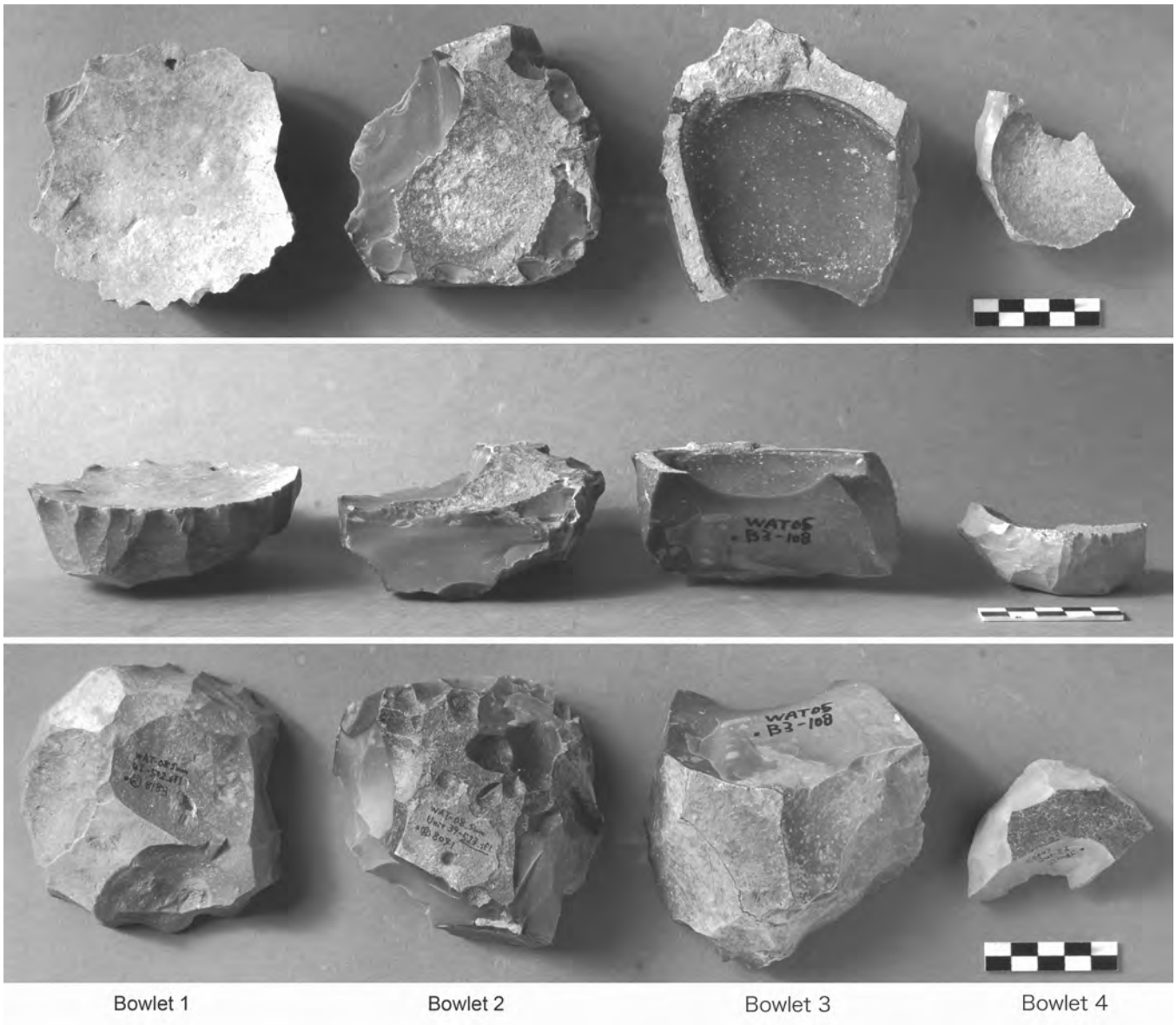

Fig. 4 Flint bowlets from Wadi Abu Tulayha

It is perhaps noteworthy that the small, remote, seasonal outpost of Wadi Abu Tulayha produced the largest number of flint bowlets since the four sites in the "mother settlement" area yielded only three examples at a maximum. A likely explanation for this unexpected phenomenon is that Wadi Abu Tulayha, as a production site, may have supplied finished products to the farming communities to the west. This seems likely, first because thermal-flaked cortical flint nodules or ideal raw material for flint bowlets are (and were) abundantly available around the site, and second because unused, finished products account for two of the four bowlets found at the site. However, such a dual interpretation may be misleading, considering that the Ba'ja bowlets, for example, use a different sort of raw material from the Jafr products. What is important instead is the fact that even Wadi Abu Tulayha, rich in raw material, produced only four bowlets. This fact highlights the peculiar nature of flint bowlets.

Chronology and Technological Sequence

The thirteen flint bowlets thus far known in southern Jordan fall into the following two groups: one is the MPPNB assemblage containing Bowlets 1-3 from Wadi Abu Tulayha; and the other is the LPPNB assemblage consisting of the other eleven materials including Bowlet 4 from Wadi Abu Tulayha. The MPPNB bowlets focus on Wadi Abu Tulayha only and no other contemporary examples have been reported. This possibly implies that the production of flint bowlets was inspired at the remote outpost rich in ideal raw material. If this was the case, it is conceivable that the LPPNB flint bowlets represent later imitation or improved versions of the initial products. This assumption supports the pluralistic perspective of the bowlet production.

The technological sequence of flint bowlets can be followed in the following two aspects. The first key is a remarkable reduction in overall dimensions. The three MPPNB bowlets from Wadi Abu Tulayha average 467

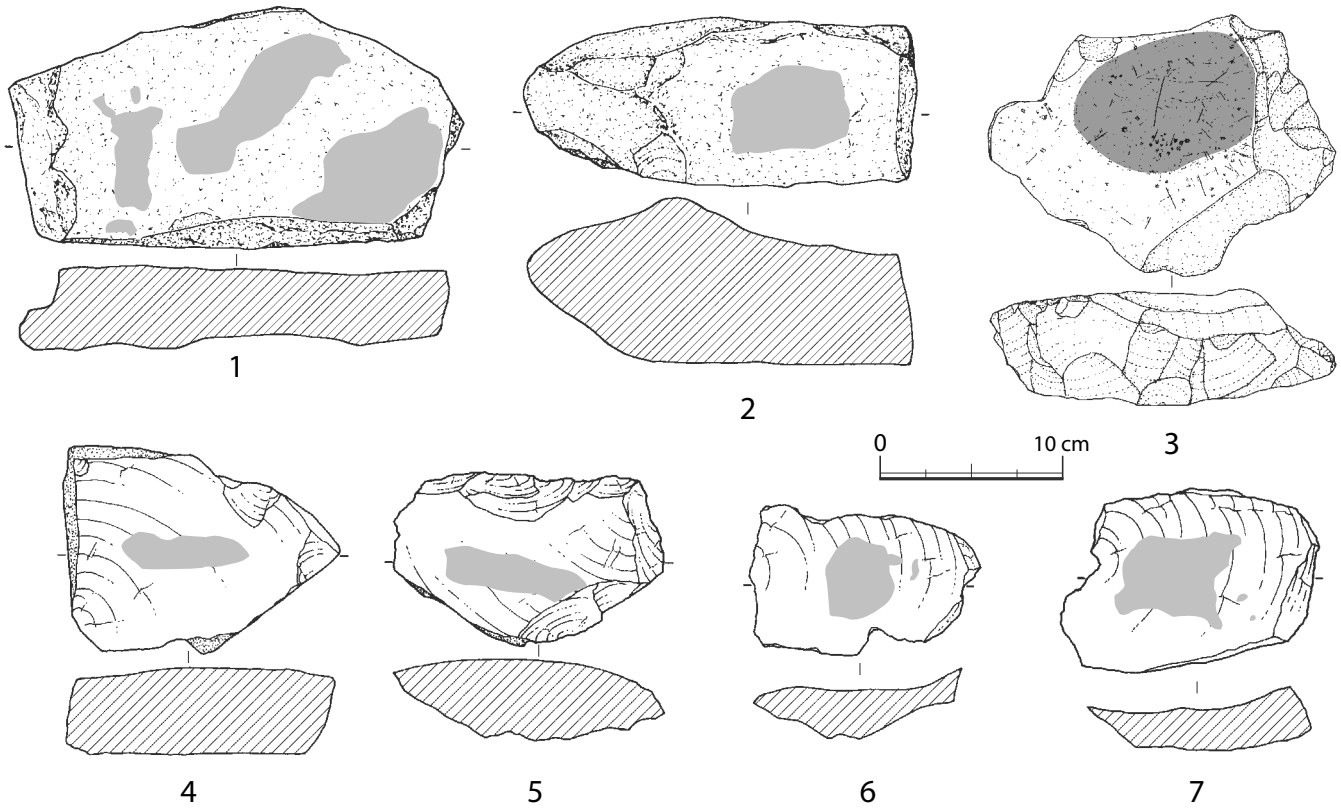

Fig. 5 Limestone pallets from Wadi Abu Tulayha

gm in weight, 10.8 cm in outer diameter, 4.3 cm in height, 8.9 cm in concavity maximum diameter, and 1.0 cm in concavity depth. The eleven LPPNB products, on the other hand, are in general much smaller. Although no precise average values can be worked out due to the deficiency of published morphometric data, Bowlet 4 and other measurable examples indicate that the diameter of *ca.* 7-8 cm and the height of *ca.* 2.5-3 cm was the norm of the LPPNB bowlets. It appears that their weight was also reduced to a fraction of the MPPNB products.

The second key is dramatic refinement of quality of rtouch. While the MPPNB bowlets are coarsely trimmed by direct percussion, the LPPNB examples are finely retouched, probably by indirect percussion. For this reason, the former exhibits an irregular profile, whereas the latter takes on a neat appearance nearer to a precise circle. Also of significance is the difference in treatment of an original cortex around a concavity. While the former group often leaves it intact, the latter usually removes it or even modifies it into a narrow beveled rim (Rollefson 2005: 19). Thus the introduction of a grinding technique might also be included in the LPPNB technological innovations.

Function

In view of their easily portable size and unique production technique taking full advantage of a natural shallow concavity, there is little doubt that the flint bowlets were used as hand-held palettes (Gebel 1999: 13). The question is what material they processed. When Gebel referred to his materials from Basta and Ba'ja, he restricted himself to a statement that they were used to process "unknown materials." This is probably because only two of the six known bowlets retained pigment on their obverse depression. The situation has undergone no serious change since then, but the addition of two ochre-stained bowlets and the increase of pitted examples (five of the thirteen) allow us to tentatively conclude that the flint bowlets were used for processing pigment (Table 2). But what puzzles us instead is the frequency of bowlets pitted yet not infused with pigment. This admits of various interpretations. A likely explanation is that they were used only once and soon discarded. An alternative interpretation is that they were cleaned immediately after use. Nevertheless, no specific evidence to verify these hypotheses is available at the moment. All we can say is that the flint bowlets were special palettes for a non-daily use.

The four bowlets from Wadi Abu Tulayha validate this perspective. To begin with, their unique shaping technique to maintain a thermal-flaked shallow concavity is common to the other examples, corroborating their use as pallets. Although the MPPNB examples are much larger in dimensions, they still fall within the size range of hand-held palettes. Second, although no traces of pigment were confirmed, two of the four bowlets exhibit traces of delicate yet repeated percussion in the center of their concavity. Third, even Wadi Abu Tulayha, rich in raw materials, yielded only four bowlets from more than sixty structures. More

Area / No.	Type	Wt (g)	Ln (cm)	Th (cm)	Concavity (cm)
AREA 1					
01	A	567	16,0	4,5	10,6
02	A	1099	21,1	5,2	8,8
03	A	998	16,5	5,8	9,9
04	A	1026	18,9	4,4	9,2
05	A	1027	20,3	5,8	6,6
06	A	671	17,1	4,8	9,6
07	B	412	18,7	3,6	5,5
08	A	527	14,0	4,6	8,1
09	B	516	16,5	2,9	6,9
10	A	1756	23,5	5,2	12,5
11	B	810	18,3	3,3	9,2
Average	11	855	18,3	4,6	8,8
Type A	8	959	18,4	5,0	9,4
Type B	3	579	17,8	3,3	7,2
Type A/B	0	-	-	-	-
AREA 2					
01	A	1290	20,0	4,5	10,5
02	B	646	19,2	3,5	8,4
03	A	893	15,4	4,0	9,6
04	A	817	15,9	4,3	9,0
05	B	496	13,4	3,9	11,3
06	A/B	357	10,5	3,3	7,2
07	A/B	464	13,3	3,4	6,5
08	A	621	17,8	4,6	9,0
Average	8	698	15,7	3,9	8,9
Type A	4	905	17,3	4,4	9,5
Type B	2	571	16,3	3,7	9,9
Type A/B	2	411	11,9	3,4	6,9
Grand total					
Average	19	788	17,1	4,4	8,8
Type A	**12**	**941**	**18,0**	**4,8**	**9,5**
Type B	**5**	**576**	**17,2**	**3,4**	**8,3**
Type A/B	2	411	11,9	3,4	6,9

Table 3 Inventory of thermal-flaked flint nodules collected around Wadi Abu Tulayha

importantly, they occurred in separate complexes; to put it another way, no complexes yielded more than one bowlet. Even more significantly, they occurred only from a key feature of every complex, despite the fact that they were often accompanied with several minor components. All these items highlight the specific role of the flint bowlets. The coexistence of ad hoc palettes made of limestone flakes and slabs may provide further support for this view (Fig. 5). Unlike the flint bowlets, these items occurred in minor components as well as key features and were usually accompanied with traces of red pigment. The frequency of such daily use commodities is in contrast to the scarcity of the flint bowlets, again underscoring the unique nature of the flint bowlets[3].

Procurement Strategy of Raw material

As repeatedly noted above, the most salient characteristic of flint bowlets consists in their unique raw material accompanied with a thermal-flaked (thus often cortical) concavity on their upper surface[4]. However, little is known about their procurement strategy, to say nothing of the consequent divergence in production technology. In order to scrutinize this issue, we conducted a complementary survey at Wadi Abu Tulayha in the 2009 summer field season (Fujii n.d.c). We set up two 10 x 10 m sq uares along the side wadi where thermal-flaked flint nodules are abundantly available and collected preferable nodules at the two squares for a quarter-hour, respectively. As a result, a total of nineteen nodules, eleven from Area 1 and eight from Area 2, were recovered (Table 3).

Morphometrically, they are divided broadly into Type A and Type B (Fig. 6). Type A nodules are defined as being larger in both overall dimensions and concavity. Type B examples, on the other hand, are characterized by their smaller dimensions. Eight of the eleven nodules from Area 1 and four of the eight nodules from Area 2 fall into Type A. They average 941 gm. in weight, 18.0 cm in maximum length, and 4.8 cm in maximum thickness. Their thermal-flaked concavities measure 9.5 cm in average maximum diameter. These measurements, especially the nodule thickness and the concavity diameter, fall within the size range of the MPPNB bowlets, suggesting that Type A robust flint nodules were material source for the group. The Type B nodules, on the other hand, are much smaller in dimensions, averaging 576 gm. in weight, 17.2 cm in maximum length, and 3.4 cm in thickness. Their natural concavities are 8.3 cm in average maximum diameter. Although no comprehensive metrical data are available about the LPPNB flint bowlets, there is little doubt that Type B slender nodules were related to their production.

Another difference between the two types of raw material is the relative position and profile of a natural concavity. Type A nodules have a larger concavity, which often borders on a thick natural fracture near a lateral surface and, for this reason, often exhibits a slightly oval profile. Type B examples, on the other hand, have a smaller concavity, which usually occupies the central part of a raw material and takes on a nearly precise circle[6]. This contrast again corroborates the correlation between Type A nodules and the MPPNB bowlets, on one hand, and Type B nodules and the LPPNB bowlets, on the other hand.

Both contrasts provide a key to better understanding of technological sequence of flint bowlets. It is probably due to the robust structure of their raw material and the edge-oriented natural concavity that the MPPNB products are roughly trimmed, often leaving an extensive natural fracture on a lateral surface. The opposite is the case of the LPPNB bowlets, which allow for (or require) all-round fine retouch because of the delicate profile of their raw materials and the

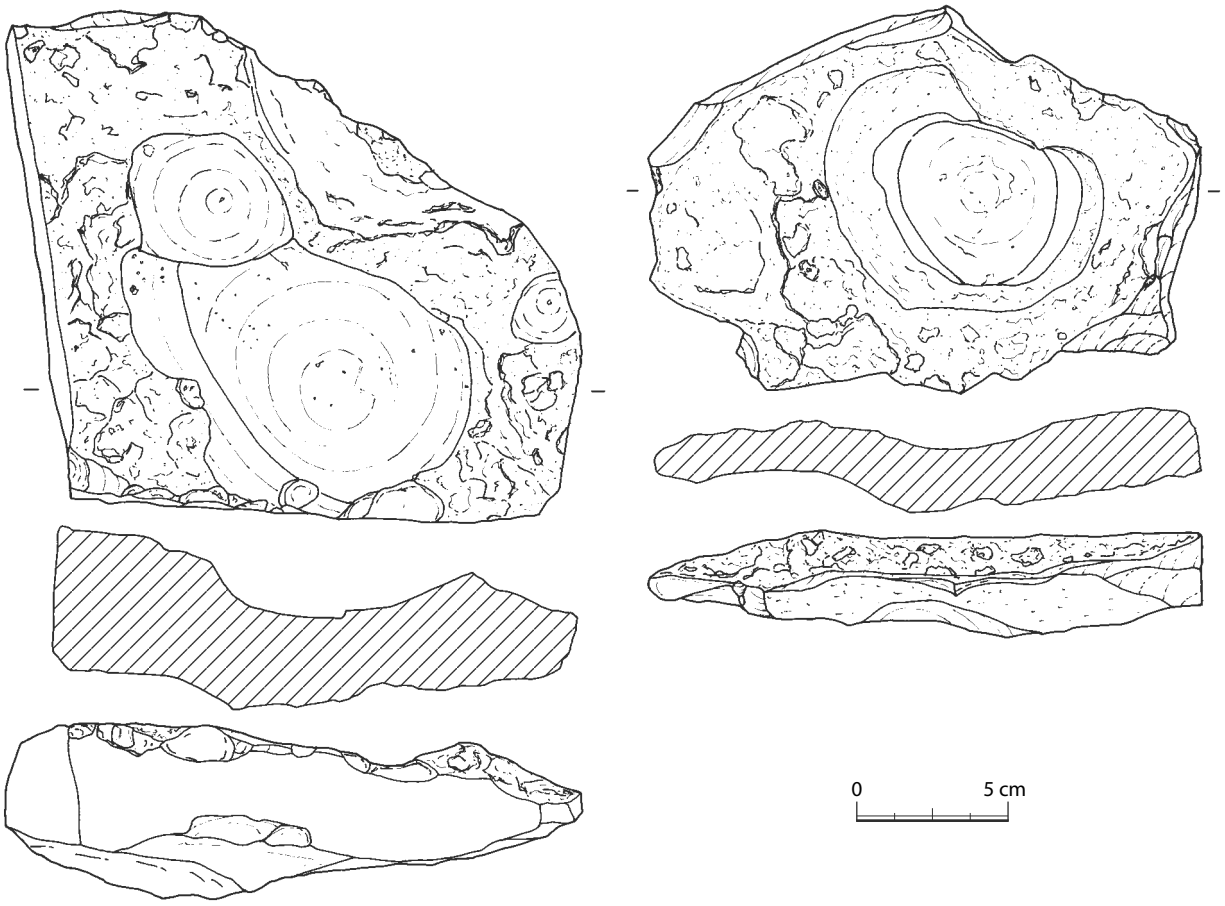

Fig. 6 Thermal-flaked flint nodules collected around Wadi Abu Tulayha

center-oriented concavity. To put it another way, the reason why the MPPNB bowlets chose Type A nodules may be that the bowlet production was still in its infancy and, therefore, irregular products were still acceptable. On the other hand, the reason why LPPNB bowlets focused on Type B nodules seems to be that the production technique was elaborated and users became eager for well-finished products with a profile nearer to a precise circle. Suggestive in this regard is the difference in relative frequency of both types of flint nodules collected at Wadi Abu Tulayha (Table 3), which exemplifies a shift from inferior-quality raw material easier to find to high-quality raw material that was more difficult to procure. The preference for small, flattish flint pebbles at Ba'ja and 'Ain Jammam may also be understood within this context (Gebel 1999: Fig. 1; Rollefson 2005: Fig. 5).

Concluding Remarks

The comprehensive review based on the new materials from Wadi Abu Tulayha showed that the flint bowlets thus far known only from southern Jordan fall into an MPPNB cluster characterized by their larger dimensions and coarse shaping, on one hand, and the LPPNB assemblage marked by their smaller dimensions and finer retouch on the other. It was also suggested that the technological contrast originated from the shift in the procurement strategy of raw material. The review also shed new light on the unique archaeological context of the flint bowlets from Wadi Abu Tulayha and contributed to a better understanding of their nature as prestige items. However, much still remains unclear, including their specific usage. Flint bowlets are expected to continue to be an intriguing subject for our discussion.

Acknowledgements: I am deeply grateful to two colleagues, Dr. Gary Rollefson and Dr. Hans Gebel, for their useful comments and criticism for my first draft. My thanks also go to Kazuyoshi Nagaya and Kae Suzuki, both of whom supported me with drawing.

Notes

[1] Considering that the bowlet came from an upper fill layer, the contextual correlation with the unit is not always indisputable. This is especially the case when it represents a discarded item thrown into surrounding features. It should be added, however, that the surrounding features also fall within the time range of the MPPNB. We should also note that the only LPPNB example (*i.e.*, Bowlet 4) occurred separately from the other three bowlets, at the westernmost part of the outpost, and it is quite different in both dimensions and technology from them. For these reasons, we shall be allowed to follow the supposed contextual correlation for the

moment. The same holds true with the other three bowlets.

[2] The capacity of a complete bowlet was measured by pouring water into its concavity. Taking advantage of the physical property of fresh water, difference in weight before and after the procedure was reduced to capacity. Likewise, the preserved capacity of an incomplete bowlet was measured pasting a small lump of clay along the fracture.

[3] It is noteworthy, however, that all of the four bowlets ocurred as discarded materials from an upper or middle fill layer of a semi-subterranean structure. It is still unknown whether their disposal took place either in a routine context or in a ritual background, but the predominance of complete examples seems to support the latter interpretation. In contrast to them are grinding implements, for example, which are often found in situ on a structure floor (*e.g.* Fujii 2007a: Fig. 25). The issue of ritual disposal of prestige goods such as flint bowlets requires further scrutiny.

[4] Makarewicz and Goodale (2004: 9) describe one of the two bowlets from el-Hemmeh as being "pecked and ground to form the concavity", but the illustration (2004: Fig. 6) seems to suggest that it is a natural depression.

[5] This is probably because thermal-flaking tends to occur at the thickest part where temperature difference between the surface and the core is more likely to emerge. This is the case with a peripheral part of Type A robust nodules and a central part of Type B slender nodules. Needless to say, there are eclectic examples between the two types. For example, robust nodules with a circular concavity at their central part or, conversely, slender nodules with an irregular concavity at their peripheral part fall into the intermediate category. We treated them as Type A/B in Table 3.

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An Incised Stone Object From the PPNA of Tel Bareqet, Ayalon Basin

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Introduction

Tel Bareqet (Khirbet Burnat) is located on the south-eastern flanks of the Ayalon Basin, *ca.* 8 km northeast of the town of Lod. The site is mainly known for its well preserved Early Bronze II fortified town (Paz and Paz 2007), which spreads across *ca.* 4 ha, comprising of a western upper mound (*ca.* 1.5 ha) and a ‚lower town' located on the eastern terrace. This urban settlement of the Early Bronze includes carefully built residential quarters, streets, and public facilities. However, the site also contains a PPNA occupation that has so far only been lightly explored (Rosenberg and Groman-Yaroslavski 2005). A community archaeology project that began in 2006 aimed at uncovering the character of the Early Bronze occupation at the upper mound, where extensive EB remains were detected, revealed additional PPNA finds. In this part of the site the PPNA occupation was much more intense. This is well apparent by the hundreds of rock-cut installations, mostly cup-marks, at the western edge of the upper mound (Fig. 1) and the retrieved flint tools and waste. A small stone object bearing incisions characteristic of the PPNA is the subject of this short report. (Fig. 2)

The presence of a PPNA occupation at Tel Bareqet was described briefly by Rosenberg and Groman-Yaroslavski (2005) who studied the flint assemblage of the salvage excavations at the site focusing on 'the lower town'. In this part of the site the PPNA material was found to be intrusive within the Early Bronze strata. The PPNA finds include small-sized bifacial tools with a transversal blow (tranchet), tranchet removal spalls, and a single 'Beit Ta'amir knife'. All of these lithic types that are characteristic of the PPNA (*e.g.* Barkai 2005; Crowfoot Payne 1983) were found in the upper mound in a higher density during the new excavations. Their presence alongside the numerous cup-marks suggests that this is the center of the PPNA occupation of Tel Bareqet. The stone object discussed below was found close to the southern edge of the site, just above bedrock and below the EBII architectural remains. This stratigraphic location as well as its iconographic character suggests it should be attributed to the PPNA occupation at the site.

The Tel Bareqet Plaque

The small stone ‚plaque' was made of a hard light-blue colored stone, and it has a plano-convex section. Its dimensions are 5.5 x 5.0 x 2.0 cm and its weight is 90 g. The incised patterns can be divided into two registers: The upper register that occupied 2cm of the object's length includes one deep incision (4 cm long) on top with eight perpendicular incisions parallel to each other occupying a total length of 3 cm. The lower register includes a curved incised element that spreads along 2 cm of the length of the plaque. It may reflect a schematic shape of a serpent.

Fig. 1 Cup-marks at the western egdge of the upper mound

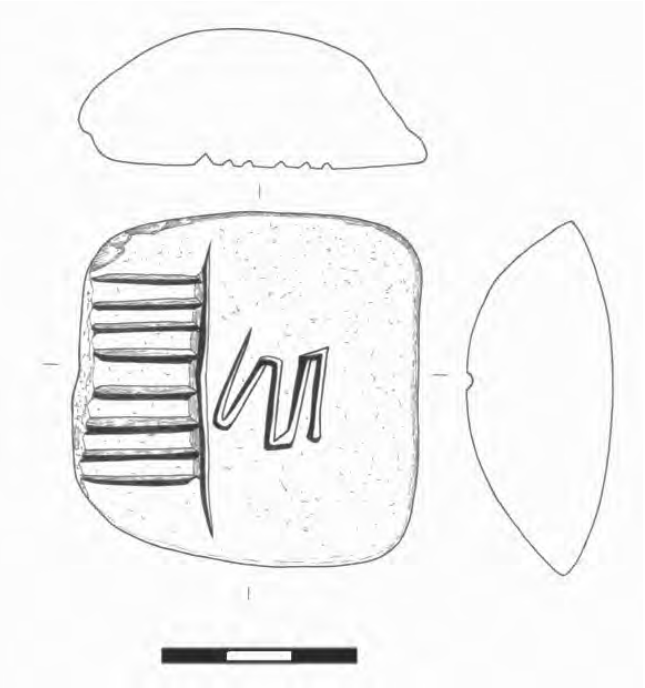

Fig. 2 Tel Bareqet Plaque

Discussion

Several plaques and incised pebbles of similar character have been found at PPNA sites across the Levant. While some of these bear relatively complex designs, such as the ones from Jerf el-Ahmar (Stordeur 1998: 28, Fig. 9) and Mureybet (Cauvin 2000: 49, Fig. 2-3, 6), others bear simpler geometric designs such as at Çayönü (Davis 1982: 110-111, Figs. 3.12-13). It is worth noting that the items retrieved from the southern Levant, including the finds from Netiv Hagdud (Gopher 1997: 170, Fig. 5.18), Zahrat al-Dhra 2 (Edwards 2007: 29, Fig. 3:1-3) and Ein Suhum (Nadel *et al.* 2000), are part of the latter group. One of the common characteristics of this group is the presence of horizontal lines near the upper and/or lower part with an additional incision at the center of the item. The combination of vertical incisions is another characteristic. The item from Tel Bareqet bears these characteristics. The incision in the center of the item from Tel Bareqet also resembles the concept appearing in the "meander" design on the item from Netiv Hagdud (Gopher 1997: 170, Fig. 5.18) and the "zigzag pattern" on the item from Ein Suhum (Nadel *et al.* 2000).

Since so far only a few such items have been found, we hope that the presentation of the stone ‚plaque' retrieved from Tel Bareqet might contribute to understanding the role these unique artifacts played in the PPNA. These items, which are assumed to encode some kind of data (*e.g.* Eirikh-Rose 2004; Edwards 2007) no doubt can shed some light on the rise of the complex societies of the early Neolithic and their ideological sphere.

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Daliyat el-Carmel 3
A Flint Bifacial Tools Workshop on Mount Carmel
Preliminary Account

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Introduction

The site of Daliyat el-Carmel 3 (henceforth DC3) was first discovered during the survey of Mount Carmel, conducted by A. Ronen and J. Olami and listed as site 164 or Daliyat el-Karmil 3, in the comprehensive publication of the survey (Olami 1984: 147). During the original survey, the site, situated today at the western outskirts of the modern town of Daliyat el-Carmel (Fig. 1), was thought to cover *ca.* nine hectares and the surveyor described large blocks of flint, partly embedded in the sediment, and he noted many scatters of flint items and a high density of waste (Olami 1984: 147).

Olami (1984: 147) described bifacial tools resembling handaxes as well as a wealth of other items such as choppers, side scrapers and blades with faceted butts and flakes of various sizes, and he mentioned the presence of Palaeolithic tools. He suggested that tools were produced at the site from the initial stage of production to the final phases, and mentioned that a sample collection gave 400-500 items per square meter, suggesting a high density of finds.

More recently, it was claimed that some localities at the site were used during the Lower-Middle Palaeolithic for mining and quarrying, and even that the most prominent finds at the site were those from these periods (Barkai *et al.* 2006: 25-27). However, this holds true only for parts of the nine hectare site (or sites) and this view probably originated from the lack of excavations or a systematic collection from the entire area (Barkai *et al.* 2006: 27). Furthermore, it seems that a relatively large part of the now disturbed site, specifically its northeastern parts (an area covering *ca.* 0.5 ha) were covered by Neolithic bifacial production waste. While Barkai *et al.* (2006: 27) suggested presence of Lower-Middle Palaeolithic extraction locales and quarry fronts in the area where the Neolithic workshop was noted, no such clear loci were found near this area and the exact

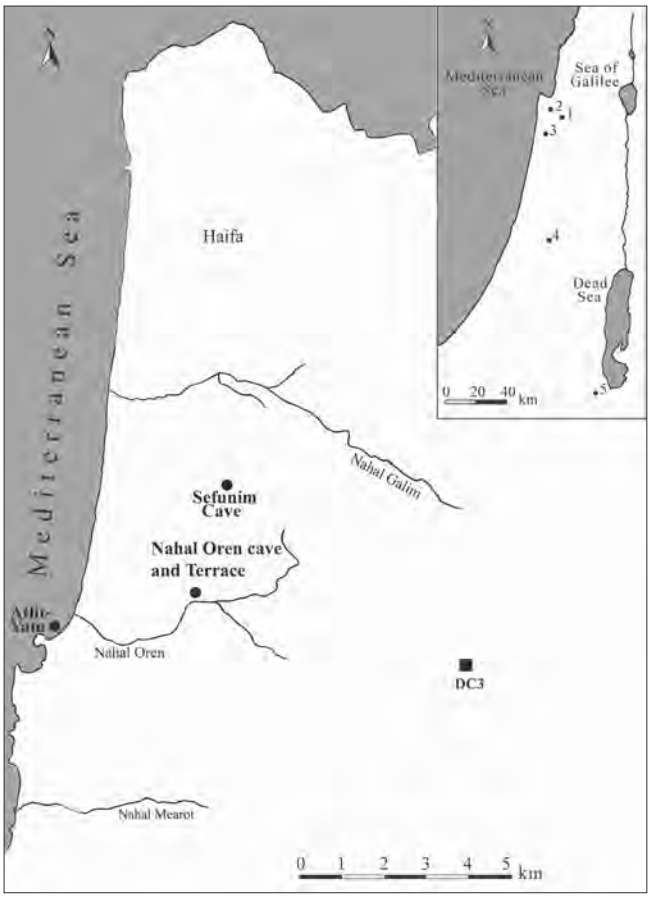

Fig. 1 A map showing the location of DC3 and some of the Neolithic and Chalcolithic bifacial production sites mentioned in the text. (Inset: 1. DC3; 2. Givat Michal/Ahuza 3/4; 3. Point 355 Z; 4. Modi'in; 5. Ramat Tamar/Mezad Mazal)

Fig. 2 A general view of the site from the east (note tractor piles)

Fig. 3 View of the surface of the site (note flint and limestone debris)

locations from which the raw material was extracted is still to be found.

Previous work at the site was limited (Etzion 1999; Olami 1984) and was based primarily on surface collections. A comprehensive study of a surface collections conducted on the northeastern parts of the site during the second half of the 1990s consisted of a systematic collection of all items found on the surface of a single square meter and a selective collection and of the assemblage collected by Olami's survey team, yielded a wealth of chipped lithic material dominated by axe preforms and related production debitage that were attributed to the Pre-Pottery Neolithic B period (Etzion 1999).

Although the site has been known to archaeologists at least since the 1970s, it was left unprotected and badly damaged by construction and development work, including digging and preparation for house construction in the northern part of the site, removing unknown amounts of its upper layer, changing of the former terrain, and piling a large heap of sediments in the middle of the site (Fig. 2). This pile contains dozens of flint bifacial implements, hundreds of debitage items and various tools. Parts of the site were also damaged

Fig. 4 View of the tractor cut (looking east)

Fig. 5 Close-up view of the upper layer of the tractor cut with large amounts of flint tools and debris within the sediments (looking east)

by littering and dumping of construction debris, by agricultural work or forestation and de-forestation. The entire area of the site is covered by thousands of flint items (Fig. 3) that were also observed in the sections and cuts (see below).

Operations in the field were resumed in 2009 with three primary objectives. The first is to maximize documentation of the continuously damaged site before its eventual destruction by the continuing development of Daliyat el-Carmel. The second is to better understand the depositional history of the site and its geological setting and to locate and characterize potential quarrying fronts and production loci.

The third objective is to study the flint knapping industry at the workshop originally noted by Olami (1984) and subsequently studied by Etzion (1999) and to reconstruct the chaîne opératoire of bifacial tool production at the site. Another aspect held for future research is an in-depth comparative technological study that will compare the Neolithic flint bifacial tool industry of the site with that noted at the basalt quarry and Neolithic/Chalcolithic bifacial production site of Giv'at Kipod, situated in the Menashe Hills, only a few kilometers east of DC3 (Rosenberg *et al.* 2008).

During 2009, we returned to DC3 and concentrated on mapping it, studying its geology and environmental settings, as well as reconsidering the surface finds. Additional finds were retrieved from the large pile of disturbed sediments in part of the site area (Fig. 2). This paper presents a short account of the site and its settings and briefly discusses the bifacial tool industry that comprises a dominant component of the chipped lithic material collected from the site's surface.

The Site

DC3 is situated on a hilltop in the southwestern outskirts of the modern city of Daliyat el-Carmel (Fig. 1), 410 masl., overlooking the Mediterranean Sea. The site is bordered in the north a steep wadi (Nahal

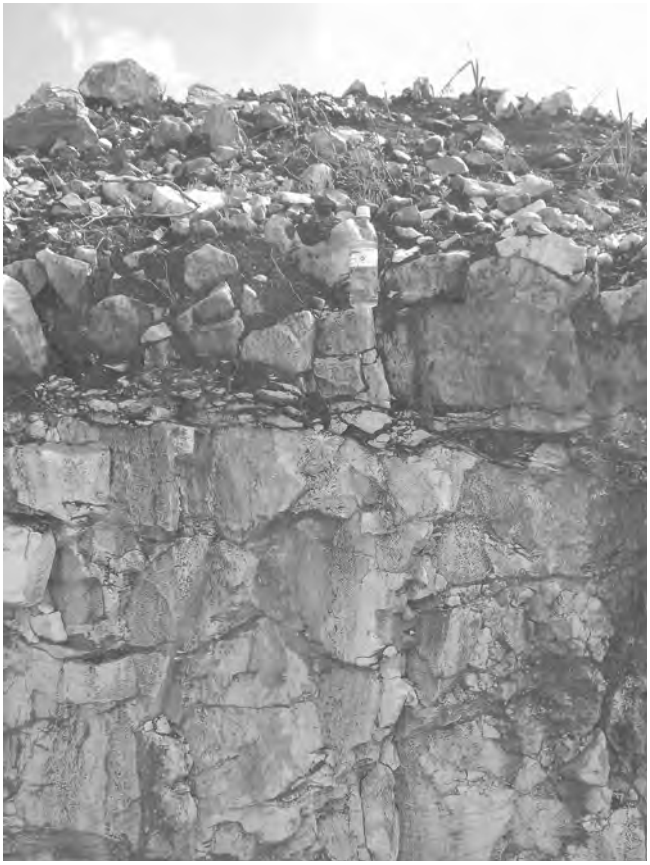

Fig. 6 Close-up view of the tractor cut (looking south)

Bustan) which drains westward, and its western parts are forested. Most of its southern parts are covered by agricultural fields, buildings and construction sites.

Although the site was originally thought to cover nine hectares, after more than three decades of development in the area it is very hard to estimate its true size. However, it is clear that the remains of extensive flint knapping activities, specifically those related to the production of flint bifacial tools, are dispersed over a large area.

The geology of the area is characterized by the Daliya formation, the top parts of which are comprised of limestone while other areas of the formation (mountain) also feature basalt flows (Bein and Sass 1980; Kashai 1966; Sass 1980). The limestone is covered by the archaeological stratum, which is a dark-brown soil between 0.5-1 m in depth containing numerous flint items, bifacial tools, and retouched items as well as limestone debris (Figs. 4-6).

The Flint Assemblage and the Bifacial Tools Industry

The flint assemblage noted on the site's surface, as well as the many items collected in the 1970s and late 1990s, incorporates numerous debitage and debris items including primary elements, cores, core trimming elements, flakes and fragments, as well as relatively rare blades and hammerstones. Tools are found in abundance, the most conspicuous being axe preforms

Fig. 7 Massive flint nodules on the site surface

many curved thinning flakes bearing bifacial scars and straight bases. The final stages of the bifacial production, which probably include the fine finishing and sometimes polishing of the bifacial, are extremely rare. (Polished debitage or tools featuring polish are practically absent.) These terminal stages of preparation and modification apparently took place at the habitation sites.

The bifacial tool assemblage collected from the surface includes nearly 200 items (Figs. 8-10), dominated by axe preforms characterized by their lenticular (Fig. 8: 3), sometimes multi-faceted cross-sections (Figs. 8: 1-2; 9: 1-2). These are mostly elongated (Figs. 8: 1-2; 9: 1-2), although shorter, oval and squat items are found as well (Figs. 8: 3; 9: 3). Items that may be adzes and even fewer chisel preforms are also present but in considerably lower numbers.

The active edges are frequently shaped by multiple blows and most are convex in shape. Pointed or straight active edges are found as well. Only a few of these are broken, and the near absence of the transversal blow technique (tranchet) is of note. The butts are mainly convex or pointed.

The maximum length of preforms ranges between 110 and 160 mm, with very few longer or shorter exceptions. Maximum width ranges between 50 and 80 mm, and thicknesses ranges between 40 and 60

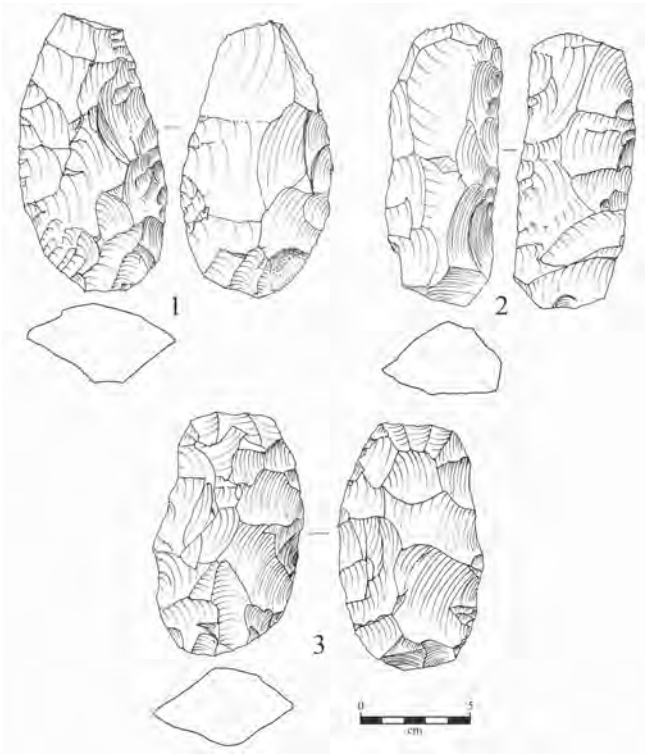

Fig. 8 Flint axe preforms (after Olami 1984)

mm. No statistically significant differences were noted between the size of axes and adzes (Etzion 1999: 13).

Discussion

This preliminary account of DC3, situated on Mount Carmel near Daliyat el-Carmel, presents initial insights into a large scale and extensive flint bifacial tool workshop, aimed mainly at the production of flint axes. Some of the bifacial tools found at DC3 are characterized by their Acheulean handaxe-like form, to the extent that in the initial, 1970s discovery, Olami and Ronen erroneously attributed the site to an Acheulean workshop.

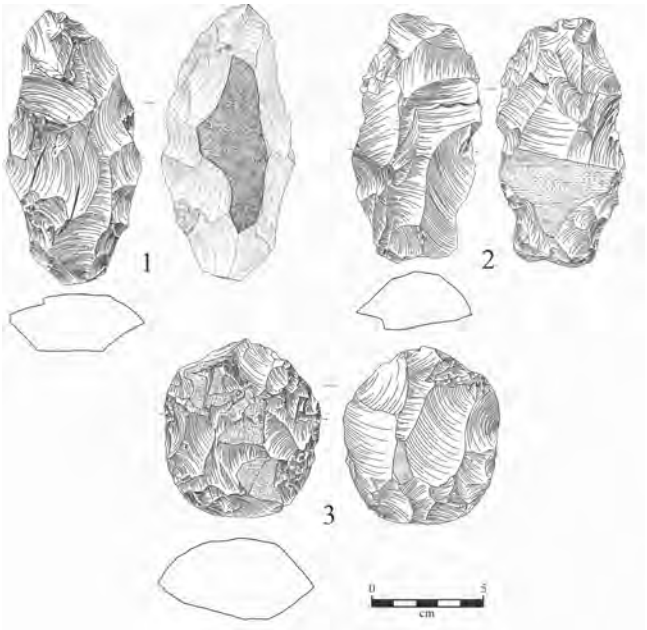

Fig. 9 Flint axe preforms (after Etzion 1999)

Fig. 10 Flint axe preform on the site‘s surface

The size and shape of the preforms and rejects indicate attribution of the site to the later parts of the Pre-Pottery Neolithic B (see also Schyle 2007), a period dominated by relatively larger, thicker and heavier bifacial tools (specifically axes) compared to the axes of the preceding Pre-Pottery Neolithic A (see Barkai 2005 for discussion of the techno-typological differences between the two periods). As in DC3, the flint of most Pre-Pottery Neolithic B bifacial tools is of high quality.

Neolithic and Chalcolithic bifacial tool production sites (see Fig. 1) in the southern Levant have been noted in the past (*e.g.*, Cauvin 1968: 246-253; Roshwalb 1981; Schyle 2007; Taute 1994; Zbenovich 2006), including at least two other sites on Mount Carmel (Ronen and Davis 1970; Wreschner 1963). These sites reflect a long-term continuity of bifacial tool production in the southern Levant since the Pre-Pottery Neolithic A, when these first appear and increase in number, through the Chalcolithic period when axes, adzes and chisels made of metal appear in the area.

The extensive production of bifacial tools documented at DC3 probably reflects the growing need in the Pre-Pottery Neolithic B to clear forests and vegetation for fields to grow crops, the need for

wood used as fuel for lime plaster production, and for construction (Barkai 2005 and references therein). Thus, site DC3 probably signifies the increasing involvement and impact of agriculturists on their surroundings and their utilization of local resources in the Carmel area.

While the study of DC3 is still in its infancy, past studies (Etzion 1999) of the lithic material from the site have shown the potential embedded in such research. This, together with the study of the geology and depositional history of the site and the organization of lithic production at the site, can shed further light on axe production during the Pre-Pottery Neolithic B and, moreover, help in reconstructing the distribution patterns of the final products manufactured at DC3 to other Pre-Pottery Neolithic sites on Mt. Carmel (such as Sefunim and Nahal Oren) and possibly Atlit Yam on the coastal plain. The possible distribution of bifacial tools from DC3 to sites farther north in the Galilee, east in the Samaria hills, and to the south is to be examined in future studies.

Acknowledgments: We would like to thank Mina Weinstein-Evron for her comments on an earlier draft of this paper. We are also thankful to the Zinman Institute of Archaeology, University of Haifa and to the head of the local council Mr. Carmel Nasser a-Din for the help provided. Finally, we acknowledge the volunteers who worked with us in the field and to I. Rosenberg for her help with the graphics.

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Jordan's Prehistory: Past and Future Research. A Brief Report on a Symposium held in Amman

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A new series of conferences on current and planned archaeological projects in Jordan, organized by the Department of Antiquities of Jordan (DoA), started this year with the first meeting on "*Jordan's Prehistory: Past and Future Research.*" The conference took place from May 25 to 28, 2009 at the DoA in Amman and was attended by more than 50 participants among whom 39 papers were presented. The meeting started with a one-day excursion to the PPNB sites of Wadi Shu'eib, Tell Abu Suwwan and 'Ain Ghazal as well as a visit to the museum in Salt. The participation of the excavators of these sites Maysoon al-Nahar, Alan Simmons, Zeidan Kafafi and Gary Rollefson on this tour gave us a good opportunity to get first hand information on the excavations. The following two days were reserved for lectures, spanning the period from the Lower Palaeolithic to the Early Bronze Age in Jordan.

It became clear that current research in the specific periods, mirrored by the participants and their 35 papers (see below), has concentrated on restricted regions in Jordan. The Palaeolithic and Epipaleolithic archaeology focus was mainly in the Azraq and Jafr regions, Neolithic archaeology in the region around Amman and in southern Jordan, and the major regions of current Chalcolithic and Early Bronze Age archaeological research are in south-eastern and north-eastern Jordan.

In addition to reports on excavations and surveys (*cf.* the list below), papers on future perspectives for archaeology in Jordan were presented (an-Nahar and Clark; Garrard; Simmons; Gebel; Peterson; Kerner) and there was also a presentation on the possibilities of incorporating Neolithic sites into tourism under the concept of a "Neolithic Heritage Trail," planned by Finlayson, Thuesen, Gebel, Hoffman, and Simmons. Presentations by Hourani, Ames, Smith, and Pokines addressed issues of paleoclimate and paleoenvironment, Makarewicz's presentation dealt with LPPNB caprine management systems, and Kafafi's paper treated storage facilities in the Late Neolithic and Chalcolithic period.

The final day of the conference focused on current problems confronting the Department of Antiquities as well as future research strategies and their priorities and procedures.

Several themes were raised in these proceedings. One focus was on the current and past situation of Jordanian prehistoric research. The participants of the discussion agreed that archaeological research in Jordan certain prehistoric periods have dominated research while others are badly underrepresented.

The DoA expressed the wish that copies of Ph.D. dissertations and MA theses on relating to archaeological research in Jordan should always be submitted to the library at the DoA in order to establish a database for other researchers; Dr. Fawwaz Khraysheh (Director-General of the Department of Antiquities) also requested that each researcher also submit electronic copies of all publications that concern Jordanian prehistory to assist in distributing information to other archaeologists within Jordan and internationally.

Non-Jordanian participants complained that only a small number of Jordanian students are interested and trained in lithic studies, which makes it difficult to have trained and interested representatives of the

Fig. 1 Part of the symposium's participants are guided through the excavations at Tell Abu Suwwan by Maysoon al-Nahar. (photo: H.G.K. Gebel)

Fig. 2 Zeidan Kafafi, Bill Finlayson, Fawwas al-hraysheh, and Gary Rollefson (from right to left) head the symposium's final discussion. (photo: H.G.K. Gebel)

DoA on excavations of many prehistoric sites. On the other hand, Dr. Maysoon al-Nahar mentioned that a vigorous program of l ithics training is currently being undertaken at her institute at the University of Jordan.

The conservation and presentation of archaeological sites was another major topic of this discussion. Among these areas of interest was the preparation of display collections for museums in Jordan by the excavation teams. Another area of dialogue involved the establishment of a central storage facility for material from prehistoric sites, including study facilities at such (a) depot(s). Additionally the establishment of an international board for formulating and promoting improved standards for prehistoric research in Jordan was discussed.

One topic of crucial importance is the situation of rapid destruction of archaeological sites as commercial and residential development advances speedily throughout the kingdom. In terms of priorities, survey projects were urged to identify those sites that are threatened, and that institutions intending to undertake excavations in Jordan rather should consider focusing on such sites. Calls were also issued to encourage more communication among the various ministries in Jordan's government so that a program of cultural resource management could be more effective.

The organisation of the conference by the DoA was excellent. The idea of gathering colleagues working across the temporal spectrum of prehistory in Jordan in one place to share information and ideas and to plan ways of cooperation is very good and should be continued in the future. In the near future similar conferences centering on the later periods of Jordan's archaeology will be held to examine similar concerns.

Maysoon al-Nahar and Geoffrey A. Clark	The Current Status of Stone Age Archaeology in Jordan
April Nowell	Through the Stones We Reach the Shore: Studies of a Paleolithic Marsh in North Azraq (Jordan)
Carlos E. Cordova	The Paleolithic of Azraq and the Madaba Plateau in the Context of Global Climate Events
Christopher J.H. Ames	Geoarchaeology and Prehistoric Transitions in the Azraq Druze Basin, Jordan: a 4-Dimensional Approach to Landscape Reconstruction
Gary O. Rollefson, Leslie A. Quintero and Philip J. Wilke	The Lower and Middle Exploitation of 'Ayn Sawda in the South Azraq Marshland
James Pokines	Taphonomic and Paleoecological Investigations in the Paleolithic of Northern Jordan
Leslie A. Quintero and Philip J. Wilke	Ayoun Qedim: Middle Pleistocene Occupation at a Box Canyon Oasis in the al-Jafr Basin, Jordan
Michael Bisson	WE-2: The Middle Paleolithic of the Wadi Enoqiyya Revisited
Andrew Garrard	Key Findings of Field Research Undertaken on Later Palaeolithic and Neolithic in the Azraq Basin between 1982-1989
Lisa Maher	Preliminary Results from Recent Excavations at the Epipalaeolithic Site of Kharaneh IV
Tobias Richter	At the Lake Edge: The Final Pleistocene in the Azraq Oasis
B. Finlayson, I. Thuesen, H.G.K. Gebel, C. Hoffman Jenson, S. Dennis and A. H. Simmons	The Neolithic Heritage Trail, Greater Petra Area
Alan H. Simmons	The Neolithic in Jordan and Beyond: Prospects for the 21st Century
B. Finlayson, M. Najjar, and S. Mithen	Site Organisation and Architecture at Wadi Faynan 16
Donald O. Henry	Research at the 9,500 Year Old Early Neolithic Site of 'Ayn Abu Nukhayla, Wadi Rum
Sam Smith	Climate, Water and the Neolithic of the Southern Levant
Hans Georg K. Gebel	Reconsidered Agendas and Strategies for Jordanian LPPNB Research
Sumio Fujii	A Half-Buried Cistern at Wadi Abu Tulayha: A Key to Tracing Pastoral Nomadization in the Jafr Basin, Southern Jordan
Gary O. Rollefson, Philip J. Wilke, and Leslie A. Quintero	Bawwabah al-Ghazal: A Neolithic Pastoralist Hunting Camp in the South Azraq
Cheryl Makarewicz	Dynamic Herders, Innovative Strategies: The Emergence of Complex Caprine Management Systems during the Late PPNB
Adamantios Sampson	New PPN-B site at Wadi Suweif-Hamarash, Ghor es-Safi
Jane Peterson	Thinking Locally: Characterizing the Neolithic Sequence in West-Central Jordan
M. Karasneh	Bone Tool Fabrication at Basta
Fuad Hourani	Environmental Perspectives on Late Prehistoric Settlements in the Jordan Valley
Kevin Gibbs	Late Neolithic Pottery from al-Basat în in Wadi Ziqlab, Northern Jordan
Zeidan Kafafi	Storing and Keeping in Jordan during the Neolithic Period. Examples from 'Ayn Ghazal, Abu Thawwab, and Abu Hamid
Adeib I. Abu Shmais	Wadi Saqra Menhir: A Newly Discovered Upright Stone Structure in Amman
Wael Abu Azizeh	Late Prehistoric Presence in Southern Desert of Jordan: Fifth to Third Millennia Settlement and Country Planning in al-Thulaythuwat Area
Moawiyah M. Ibrahim	Post-Neolithic Sahab
Susanne Kerner	6th and 5th mill. BC Research in Jordan. Problems, Gaps and Promises
Bernd Müller-Neuhof	Late Chalcolithic/Early Bronze Age Mobile Subsistence, Mineral Resources and Communication in the Northern Badia: Some Hypotheses for an Upcoming Research Project
Lutfi Khalil	New Evidence from Prehistoric Aqaba
Yorke Rowan, Alex Wasse, and Gary Rollefson	The Neolithic to Early Bronze Settlement at Maitland's Mesa, Eastern Jordan
Alexander Wasse, Gary Rollefson, and Yorke Rowan	In Loving Memory: The Necropolis at Wisad Pools, Eastern Badia, Jordan
Philip J. Wilke and Leslie A. Quintero	Organizational Aspects of the Cortical-Flake Industry in the Eastern al-Jafr Basin, Jordan

Table 1 Papers presented at the conference "Jordan's Prehistory: Past and Future Research"

Receptions hosted by Dr. Bill Finlayson at CBRL, Dr. Jutta Häser at the German Institute of Archaeology in Amman, and by Dr. Barbara Porter, director of ACOR, offered opportunities for intensive and informal discussions on several topics prompted by the papers, as well as the consideration of ideas for future perspectives and strategies of prehistoric archaeological research in Jordan. In the evening of this last conference day the participants had the honour to be invited by the DoA for dinner in a very nice restaurant in Amman.

Finally, thanks are going to the director of the DoA Dr. Fawwaz al-Khraysheh, to his colleague at the DoA Cathreena Hamarneh and Dr. Maysoon al-Nahar of the University of Jordan for this fruitful and excellently organised meeting.

Interpreting the Late Neolithic of Upper Mesopotamia
Leiden, 24-28 March 2009

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During three days from 24 to 28 March, the National Museum of Antiquities Leiden hosted the conference Interpreting the Late Neolithic of Upper Mesopotamia. Organized jointly with Binghamton University and with Leiden University, this was the first of its kind focusing explicitly on interpreting the wealth of new information on, specifically, the Late Neolithic period of Upper Mesopotamia. We believe the conference was a great success, and we wish to thank all our friends and colleagues for participating. It was exhilarating to have gathered in the same auditorium so many of those who have known each other for years, have seen or heard so much from each other's work, but very rarely had the opportunity for sustained discussions of both the latest research results and interpretations. For us as organizers this was a most stimulating event, and we are sure many of the participants felt the same.

With over forty papers, and more than twenty poster presentations, we had a rather busy – some might say, cramped - program. As expected, the presentations represented a very wide range of methodical approaches, interpretative frameworks, and material specializations. To see so many different alternative perspectives intermingling was enlightening. The diverse audience included participants from countries in the Middle East and Europe, from the United States and Japan, and they presented a broad sweep of institutions. At least three generations participated. There were a few "pioneers", colleagues who already explored the archaeology of the later Neolithic back in the 1960's and 1970's. Specifically, we were happy to have among us Dr. Nikolay Bader, one of the excavators of Yarim Tepe and other famous Sinjar sites. In addition, probably most of those who firmly established the theme as an independent research field during the 1980's and 1990's were there, presenting their latest projects. But significantly, the far majority of participants were starting scholars, post-docs, and graduate students working on PhD theses. This gives us the hope that we may need another conference a few years onward, a conference that takes stock of the viability of new prospects raised at the Leiden gathering.

Subjects discussed included, as expected, new research results from both excavations and surveys, leading to new insights into specific chronological and spatial subsections of the Late Neolithic. However, there was also some debate as to whether the current chronological terminology should be upheld, and in what ways it could be modified. This was linked to an underlying debate about whether we should explore the Late Neolithic through a process of boundary drawing, of categorizing specific time/space entities as internally coherent and externally distinctive „cultures" such as Hassunan, „Transitional Halaf" *etc.* This „cookie-cutter" approach was juxtaposed in some discussions to a „network" paradigm that would focus more on continuities and the enmeshed nature of relations of past peoples across spaces and times. A whole set of papers approached material objects from a new angle, focusing on the „social life of things" rather than their classification via attribute description. Such a practice-oriented approach to objects analyzes their production as a series of steps of labor that is more or less skilled, but includes also their use and consumption. Past worlds of belief and ideas were addressed in a variety of papers, most of which dealt with representational dimensions of Late Neolithic objects. Here again, approaches varied between attempts at distilling main principles of belief through a structural analysis of representations on the one hand, and a set of papers that emphasized more the ambiguous nature of figurines or seals. Finally, an issue that is traditionally at the forefront of interpretive discussions was rarely raised: the assessment of „socio-political complexity." Judging by this conference, researchers with interests in the Late Neolithic have shifted away from a sweeping, teleological framework of an insertion between a Neolithic and an Urban Revolution. The Late Neolithic emerged in these discussions as a field of study of past peoples who deserve to be understood in their own right.

With so much new and diverse work going on it will be difficult to summarize the debate or to outline main themes or research foci. We will certainly make that attempt in the planned publication of the conference! Meanwhile, for abstracts of papers and posters presented, and for contact details of participants:

www.interpretingthelateneolithic.nl.

Barzilai, Omry

2009 *Social Complexity in the Southern Levantine PPNB as Reflected through Lithic Studies: the Bidirectional Blade Industries*
PhD Thesis, Hebrew University of Jerusalem
Supervisor: Prof. Nigel Goring-Morris

Abstract

This research focuses on the subject of social complexity during the Pre-Pottery Neolithic B period (*ca*. 10,500-8,250 *ca*lBP) in the southern Levant. Bidirectional (including naviform) knapping methods to produce standardized blade blanks for tools are among the most characteristic features of the PPNB ‚interaction sphere'. Using chipped stone assemblages two principal issues were investigated: changing patterns of cultural regionalism and the emergence of incipient craft specialization. This was accomplished by conducting comprehensive technological, typological and stylistic analyses of the bidirectional blade components within representative PPNB chipped stone assemblages. The examined samples derive from 28 assemblages in various sites that represent the chronological range of the PPNB from four distinct geographical regions within the southern Levant.

There are several contributions resulting from this work. In the methodological framework, a new techno-typological list for bidirectional blade components was developed for the current research. This list can be used for further research concerned with Neolithic chipped stone studies.

The second contribution concerns the development of a method for calculating bidirectional blade productivity, which was devised in collaboration with the advisor. The significance of this method is that, given sufficient samples of diagnostic elements, it can be employed to estimate and compare relative blade productivities between assemblages and provide indications as to the relative skills of the knappers.

Since bidirectional blade technologies represent the common denominator for all PPNB site types throughout the southern Levant, another contribution is the systematic analysis and synthesis of the local characteristics of this distinctive technology through time and space.

The research results identified three technological variants for producing bidirectional blades: ‚One-on-One', ‚Predetermined-Epsilon' and ‚Single Dominant Platform'. These variants reflect different levels of knapping skills, respectively from high to low.

With respect to the issue of ‚cultural regionalism' patterns, the results of this research accord with the existence of recognizable diachronic and synchronic socio-cultural units during the PPNB in the study area. Two entities, the settled ‚Mediterranean' farmer-hunters and the mobile ‚Negev' foragers were identified for the Early and the Middle PPNB sub-stages. By the Late PPNB these apparently shifted eastwards to form one broad 'Transjordanian' entity. Subsequently, the collapse of settlements in Transjordan towards the end of the Late PPNB likely resulted in population dispersals that were responsible for the appearance of three entities during the Final PPNB, with ‚Northern', ‚Central' and ‚Southern' provinces.

Three types of knapping modes that correlate with geographical zones and settlement patterns were recognized for the bidirectional blade production: (1) 'Individual specialization' for personal consumption by the foragers in the Negev during the Middle PPNB; (2) 'Dispersed specialization' for household use at small seasonal settlements in Middle PPNB south Jordan; and (3) 'Community specialization' for inter and intra-village exchange in large permanent settlements in the Mediterranean (Early and Middle PPNB) and the Transjordan (Late PPNB) regions.

To conclude, the southern Levantine bidirectional blade industries reflect the high degree of social complexity within the PPNB communities in the southern Levant before the rise of early urban civilizations in the Near East.

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Maeda, Osamu

2009 *The Materiality of Obsidian and the Practice of Obsidian Use in the Neolithic Near East*
PhD Thesis, University of Manchester
Supervisor: Dr. Stuart Campbell

Abstract

In this thesis I have investigated the social meaning of obsidian artefacts and their role in mediating people's recognition of social relationships between Neolithic communities. Unlike conventional studies, my aim is neither to study the formal patterns of obsidian exchange nor to clarify the regional and chronological variation of obsidian artefacts. Instead, I have approached the issue, by employing the framework of social practice theory and the concept of materiality, from a perspective that conceives of the use of obsidian as 'material practice' (here it means a process in which social relations are structured through people's day-to-day use of material which is in turn conducted within a framework of that social relations).

The discussion involves the analysis of obsidian artefacts from the Rouj basin and Akarçay Tepe in the north Levant and particularly focuses on the exchange of obsidian and its use for the production of stone tools.

A detailed analysis of obsidian artefacts, involving both the geochemical characterisation and the close examination of their techno-typological features, was carried out. It has been already known that at these sites obsidian blades were frequently produced using characteristic single platform cores. Peculiar types of obsidian tools such as side-blow blade-flakes and corner-thinned blades were locally produced. And projectile points made on thick large bi-directional blades, sometimes with fine pressure-flaking retouch, were used. However, the results of the analysis indicate that the production and the use of these artefacts were not carried out in an arbitrary way but were often practised in the way that was closely connected to the lithic industries at the settlements that were related through the exchange of obsidian.

From this it is argued that the use of obsidian in such a way at these sites encouraged people to identify the commonality in the lithic tradition of themselves and of their exchange partners and thus contributed to the construction of the intimate social relationships between them. And it is at the same time assumed that people in turn used obsidian in a framework of those social relationships and it further affirmed their understanding of those relationships.

In this cycle of process obsidian is assumed to have been recognised by people as a material which embodied their relationships with other communities and thus played a role in mediating both people's recognition of their social relationships and their decisions on how to use it. Social relationships, the meaning of obsidian and people's decisions on how to use obsidian were defined as articulated to each other and constantly reproduced through this cycle.

This suggests that the meaning and the role of obsidian are not intrinsic to it but are defined through an on-going practice of its use and thus may vary according to the context of practice. The use of obsidian at the Rouj sites and Akarçay demonstrates that techno-typologically similar types of artefacts were used at both sites but the contexts of their use, particularly the context of obsidian exchange, were different between them. It thus suggests that the same type of obsidian artefacts played different roles in construction of the social relationships at each site. By paying attention to the way in which past people understood their social world through their engagements with obsidian in individual contexts, rather than to the static data-sets of obsidian distribution patterns or stylistic features of artefacts, the study in this thesis proposes an alternative picture of the social relationships between Neolithic communities.

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The New Platform for the Publication of Epipalaeolithic and Neolithic Dates (PPND)

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The amount of radiocarbon dates from Epipalaeolithic and early Neolithic Near Eastern sites has enormously increased during the last twenty years. There have been several efforts to compile and analyse all the data for some regions (e.g. Bischoff 2006, Sayej 2004, Aurenche 2001, Benz 2000, Bar-Yosef, Kra 1994). However, these tabulations were difficult to use further since they did not allow digital extraction of data.

In cooperation with *ex oriente,* a new **P**latform for the **P**ublication of Epipalaeolithic and **N**eolithic **D**ates (PPND) was created. Technically launched by Christoph Forster (forster@datalino.de). ***PPND*** is a first step to publish open access Near Eastern Neolithic radiocarbon lists so that all colleagues interested in Epipalaeolithic and Neolithic research can extract data for their research needs.

The dates are recorded as BP dates arranged by sites, as well as in Oxcal-files ready for calibration with the open-download oxcal programme allowing further calculations. With the support of Bernhard Weninger, Cologne University, to whom we are very grateful, an online version for calibration of the PPND-database with the CalPal-software-will be published in near future.

References to all radiocarbon dates are given in a separate file. A detailed discussion of the calibrated ^{14}C-dates per site is accessible by clicking on the site's name. The data-compilation, so far, covers all sites that have been analysed by the SIGN Project (www.vorderasien.uni-freiburg.de/sign_benz).

Call for support: All readers are kindly requested to support completion and correction of PPND, and to contribute to the discussion of data. The more colleagues that can provide cooperation, the better PPND will serve chronological work and interpretation. Comments, corrections, and new data should be submitted to Marion Benz (marion.benz@orient.uni-freiburg.de) who is entering them in the PPND-project with the support of Bernhard Weninger.

The link of **P**latform for the **P**ublication of Epipalaeolithic and **N**eolithic **D**ates (PPND) is

www.exoriente.org/ppnd (effective from 15 March, 2010)

Acknowledgements: This data compilation was only possible due to without the support by many colleagues, including Danielle Stordeur, Hans Georg K. Gebel, Ryszard Marzurowski, and Danuta Michczynska who submitted unpublished dates for Tell Aswad, Basta, and Tell Qaramel. We are also very grateful to Irka Hajdas for her kind support. We thank Hans Georg K. Gebel for the opportunity to open this platform on the ex oriente homepage, and Christoph Forster, Berlin for managing the website. The discussion of radiocarbon dates refers also to results of the continued research project financed by the Landesstiftung Baden-Württemberg and the Albert-Ludwigs-University of Freiburg.

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Kissonerga Mylouthkia Online

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The results of excavations at Kissonerga-Mylouthkia were published as:

Peltenburg E., Bolger, Diane R.
2003 The Colonisation and Settlement of Cyprus. Investigations at Kissonerga-Mylouthkia, 1976-1996. (Lemba Archaeological Project, Cyprus III.1: *Studies in Mediterranean Archaeology* 70:4). Åström Verlag, Sävedalen.

We have now put online several databases, archival files, and images which we were unable to include in the volume, together with a downloadable version of the volume.

You will find this at:

http://ads.ahds.ac.uk/catalogue/archive/mylouthkia_ba_2009/

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Neo-Lithics is published and distributed by ex oriente, Berlin. Printing House: dbusiness, Berlin
 - ISSN 1434-6990