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LATE NEOLITHIC SETTLEMENT IN WADI ZIQLAB, JORDAN: AL-BASATÎN

S. KADOWAKI, K. GIBBS, A. ALLENTUCK and E.B. BANNING

Abstract: *Research in Wadi Ziqlab, Northern Jordan, has focused on the discovery and excavation of Late Neolithic sites in an attempt to understand its regional settlement system in the sixth millennium cal. BC. Previous evidence suggested that small hamlets or farmsteads may have characterized this settlement system, as represented at Tabaqat al-Bûma. Recent excavations at a site downstream, al-Basatîn, have revealed evidence for a settlement that was partly contemporary with Tabaqat al-Bûma and shared much of its material culture, but seems to have been markedly different in character. Whether for seasonal or some other reasons, its architecture as currently understood consisted of stone platforms and possibly tents, rather than the substantial houses found at the other site. Toward the end of the sixth millennium, like Tabaqat al-Bûma, it was abandoned, not to be reoccupied until Early Bronze I.*

Résumé : *Les recherches dans le Wadi Ziqlab (Jordanie) ont porté sur la découverte et la fouille de sites du Néolithique récent afin de comprendre le système régional d'implantation des sites au sixième millénaire cal. av. J.-C. Si les recherches précédentes ont suggéré que de petits hameaux ou fermes caractérisaient ce système, ainsi que l'illustre l'exemple de Tabaqat al-Bûma, les fouilles récentes du site d'al-Basatîn, localisé en aval, ont mis en évidence une occupation partiellement contemporaine de Tabaqat al-Bûma. Malgré les fortes similitudes de la culture matérielle avec celle de ce dernier site, al-Basatîn semble d'un caractère différent. Que ce soit pour des raisons saisonnières ou autres, son architecture, telle qu'elle est actuellement comprise, était constituée de plateformes en pierre et probablement de tentes, plutôt que de maisons véritables, comme celles connues à Tabaqat al-Bûma. Vers la fin du sixième millénaire, le site, à l'instar de Tabaqat al-Bûma, a été abandonné, puis réoccupé à partir du Bronze Ancien I.*

Keywords: *Levant, Jordan, Late Neolithic, Early Chalcolithic, Early Bronze I, Wadi Rabah, Wadi Ziqlab.*
Mots-clés : *Levant, Jordanie, Néolithique récent, Chalcolithique ancien, Bronze Ancien I, Wadi Rabah, Wadi Ziqlab.*

Much research in Wadi Ziqlab, Northern Jordan, has focused on the distribution and character of small Late Neolithic sites dating to the sixth millennium cal. BC.[1] A hypothesis that has influenced this research is that the settlement system for much of this period may have combined isolated farmsteads with small villages and hamlets, organized in a dendritic pattern along watercourses. This contrasts with the large and medium-sized, aggregated villages, which appear on present evidence to have been typical of the Middle and Late PPNB and, perhaps, Yarmoukian periods.[2] However, it has been unclear what relationship, if any, existed among the known Late Neolithic sites in this small region and any others that may still lie undetected. Were they contemporary, or do they result from periodic movement of settlement in response to resource depletion or other factors? If the former, did their inhabitants interact closely within a community, or did they operate more independently?

To answer these questions, we have been investigating Late Neolithic sites in Wadi Ziqlab by conducting systematic regional survey and targeted excavations and analyzing site chronologies. One of the major goals of this long-term investigation is to provide concrete archaeological evidence for the distributional patterns of Late Neolithic sites, the natures of their occupation, and social and economic relations among sites that were likely contemporary. Through their examination, we aim to provide

1. BANNING *et al.*, 1994; FIELD and BANNING, 1998.
2. BANNING, 2001.

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better understanding of the possibility that "dispersed communities" during the Late Neolithic arose, persisted, and transformed themselves through time.

TABAQAT AL-BÛMA

Excavations at one Late Neolithic site in Wadi Ziqlab, Tabaqat al-Bûma (site WZ 200), uncovered the remains of a small settlement that appears to have been occupied by only one or two households in each of its main Late Neolithic phases.[3]

Since this site has been discussed in some detail elsewhere, here we only summarize some of its main features. The earliest Late Neolithic use of the site, phase LN1, was apparently as a cemetery, while the following phase, LN2, probably represents the initial habitation of the site. Later construction activity destroyed most of the architecture belonging to LN2.[4] Phases LN3 to LN5 also represent occupation phases, with LN3 being the first well-preserved phase at the site. On the assumption that the excavations have not missed any substantially built parts of the site,[5] Kadowaki's spatial analysis[6] suggests that two distinct households existed during this phase, although with a shared outdoor activity area. The beginning of LN4 is marked by the abandonment and partial collapse of two of the LN3 structures. Two households may have also existed during LN4 but seemingly with a greater segregation of spaces. LN5 is the final Late Neolithic phase at the site, which involved the construction of two new structures, apparently after a brief episode of abandonment. As in phase LN4, there appear to have been two household groups, each with its own distinct space. A series of radiocarbon determinations suggests dates for these phases (table 1).[7]

Table 1 – *Radiocarbon Determinations from Tabaqat al-Bûma and al-Basatîn.*

Context	Material	Lab No.	Date BP	Comments
Tabaqat al-Bûma				
E33 locus 019	Charcoal	TO-3408	6190 ± 70	LN4
E33 locus 014	Charcoal	TO-3410	6350 ± 70	LN4
D35 locus 016	Charcoal	TO-2114	6590 ± 70	LN4, residual?
G34 locus 018	Charcoal	TO-3412	6380 ± 70	LN3
E33 locus 026	Charcoal	TO-4277	6490 ± 70	LN3
E34 locus 031	Charcoal	TO-2115	6630 ± 80	LN3
F34 locus 017	Charcoal	TO-3411	6670 ± 60	LN3
E33 locus 026	Charcoal	TO-3409	6900 ± 70	LN3, residual
F34 locus 026	Bone	TO-7665	7350 ± 160	LN1
A locus 005	Bone	TO-1407	7800 ± 70	LN1
F34 locus 026	Bone	TO-7666	7830 ± 670	LN1, omitted
al-Basatîn				
P33 locus 022	Charcoal	TO-13123	5340 ± 170	Intrusion
P33 locus 024	Charcoal	TO-13124	5290 ± 60	Intrusion
P34 locus 010	Charcoal	TO-13094	6400 ± 80	
Q33 locus 014	Charcoal	TO-13093	6410 ± 510	
Q37 locus 006	Charcoal	TO-13092	6680 ± 60	
Q41 locus 016	Residue	TO-12151	6710 ± 70	
Q41 locus 016	Residue	TO-12738	6650 ± 140	
R36 locus 006	Charcoal	TO-13091	6550 ± 60	

OTHER LATE NEOLITHIC SITES IN THE VICINITY

Archaeological survey, including subsurface survey by small test trenches, has detected several other small Late Neolithic sites as well as a village site that was occupied during the Late PPNB, Yarmoukian and Chalcolithic, but not conclusively during the mid- to late sixth millennium cal. BC.[8]

This last, the site of Tell Rakan (WZ 120), is on the edge of a broad alluvial terrace in the canyon of Wadi Ziqlab, some 5 km downstream of Tabaqat al-Bûma. Not only are there springs in its vicinity, but even today the stream is perennial here, providing abundant water for irrigation of orchards. Although we have no definitive evidence that the site was occupied at the same time as Tabaqat al-Bûma, it remains the best candidate for a village at that time, if indeed there was one. Our limited

3. BANNING *et al.*, 1994 and n.d.; BLACKHAM, 1997; KADOWAKI, 2007.

4. BLACKHAM, 1997.

5. The wadi channel and a steep slope preclude any further extension of the site to the north, east, or south. A series of test excavations in the northwest extension of the terrace failed to detect any Neolithic occupation, but it is conceivable that they could have missed one or two structures northwest of the main excavation areas.

6. KADOWAKI, 2007.

7. BANNING, 2007.

8. BANNING and NAJJAR, 1999 and 2000; FIELD and BANNING, 1998; MAHER and BANNING, 2002.

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excavations in 1999 exposed only about 30 m^2 below the Late Chalcolithic levels, and it is possible that sixth-millennium occupation did not extend to the edge of the tell where the excavations were located.

Small excavations at al-'Aqaba (WZ 310), only about 600 m away from Tabaqat al-Bûma, revealed artifacts dating to the Late Neolithic and Early Bronze Age.[9] Unfortunately, most of the site appears to have been destroyed during road construction in the 1970s, and the Late Neolithic material found there was redeposited, stratigraphically above some Early Bronze Age pits. The sample of artifacts recovered, however, yields useful comparisons to other Late Neolithic assemblages. The same kinds of artifacts that occur at Tabaqat al-Bûma, including pottery, sickle elements, and pierced disks, are represented here. To the west of al-'Aqaba, on the same terrace, at 'Uyyun al-Hammam (WZ 148), a number of burials occur.[10] While most of these clearly pertain to the Middle Epipalaeolithic deposits there, one secondary burial is stratigraphically later, and perhaps dates to the Late Neolithic. This burial was in a stone-lined and stone-filled pit. A very small number of probable Late Neolithic sherds was found in deposits above the burial.

Geoarchaeological survey of Wadi at-Taiyyiba,[11] immediately north of Wadi Ziqlab, detected a small amount of Late Neolithic artifacts, along with Epipalaeolithic ones, at al-Menakh (WT 4). Here, the site occupies a broad alluvial fan where a small wadi enters Wadi Taiyyiba from the north, with a reliable spring in the canyon at its foot. At present, it is not possible to estimate the extent of occupation of this fan during the Late Neolithic, especially as recent bulldozing of the fan to create new agricultural fields may well have destroyed part of the site.

Undiagnostic flints from a number of other test trenches and surface localities within the drainage basin of Wadi Ziqlab could conceivably be of Late Neolithic date. These include lithics in secondary deposition at site WZ 312,[12] possibly Neolithic lithics at localities WZ 300, WZ 307, WZ 311, probable Neolithic sherds at WZ 300 and WZ 301.[13] In addition, some subset of the surface scatters of lithics, mostly chronologically undiagnostic, at WZ 2, WZ 15, WZ 16, WZ 22, WZ 33, WZ 35, WZ 36, WZ 38, WZ 39, WZ 41, WZ 46, WZ 47, WZ 49, WZ 51, WZ 57, WZ 83, WZ 84, WZ 86, WZ 87, WZ 93, WZ 94, and WZ 95[14] are likely of Late Neolithic date.

This paper presents interim results of excavations at another Late Neolithic site, al-Basatîn, and analyses of its material remains in order to discuss the nature of occupation and the site's significance with regard to the hypothesized settlement system.

THE SITE AND EXCAVATIONS AT AL-BASATÎN

Al-Basatîn, which the Wadi Ziqlab Survey discovered in 2000, had significant occupation not only in the Late Neolithic but also in Early Bronze I.[15] Excavations there in 2002, 2004, and 2006[16] have uncovered features and surfaces associated with artifacts that have apparent affinities to the Wadi Rabah culture in Israel, while radiocarbon evidence dates these surfaces to the sixth millennium cal. BC (table 1).[17] A number of overlying stone-founded structures dating to Early Bronze I have associated radiocarbon dates of the fourth millennium cal. BC, and there was also use of the site, probably as orchards associated with the nearby Classical settlement of Tell Abu Fokhkhar, in the first century cal. BC.

The site occupies a sloping terrace, around 25 m ASL, on the south bank of Wadi Ziqlab, immediately opposite Tell Abu Fokhkhar (fig. 1). A lower terrace to its northwest (WZ 140) also exhibits some Late Neolithic and later remains, but test excavations there in 2002 suggest that these are in secondary deposits, probably with an origin uphill at WZ 135.[18] The site is only about 1 km downstream from Tell Rakan (WZ 120).[19] Because of the numerous springs in this part of the wadi, the stream of Wadi Ziqlab is perennial here, and the intensive modern land use includes pomegranate groves near the wadi channel and olive groves and almonds on and around the site.

At the lower terrace, site WZ 140, we placed test trenches in twelve places along the slope (fig. 2). Most of the Neolithic material came from two deep soundings in Areas J15 and K15, which are low on the slope and close to the test probe, G13, where we first discovered Neolithic artifacts in 2000. Most of the other test units in WZ 140 produced Neolithic artifacts mixed with Epipalaeolithic or later artifacts in colluvium that probably derived from the upper terrace at WZ 135, or from an ancient extension of that terrace to the west, which erosion

9. BANNING, 1996; BANNING *et al*., 1992; FIELD and BANNING, 1998.
10. MAHER, 2006.
11. MAHER and BANNING, 2002.
12. BANNING, 1996: 37-38.
13. *Ibid.*: 35.
14. *Ibid*., 1985: App. A.
15. MAHER and BANNING, 2001 and 2002.
16. BANNING *et al*., 2003, 2004 and 2005; GIBBS *et al*., 2006.
17. BANNING, 2007.
18. BANNING *et al*., 2003 and 2004.
19. BANNING and NAJJAR, 1999 and 2000.

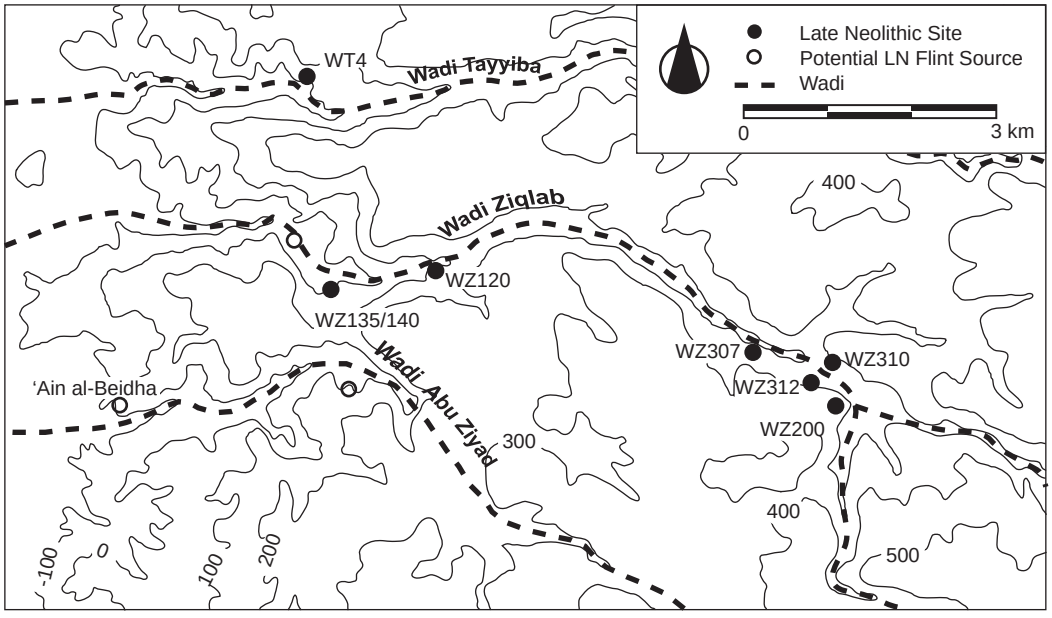

Fig. 1 – *Distribution of Late Neolithic sites in Wadi Ziqlab. WZ 135/140: al-Basatîn; WZ 120: Tell Rakan; WZ 130: al-'Aqaba; WZ 200: Tabaqat al-Bûma.*

has now cut away. It seems possible that the lower part of the slope, in the region of Areas G13, J15 and K15, has some *in situ* Neolithic deposits, but these are more than a meter deep and the possibility of detecting undisturbed architecture without extensive excavation in this part of the site seems remote.

Consequently, most of our fieldwork has concentrated on site WZ 135, the upper terrace, *ca* 100 m^2 of which has so far been excavated (fig. 3).[20] Excavation areas were distributed in an attempt to define the extent of the site and maximize horizontal exposures around architecture. Those north of Q43, although containing some Neolithic material, exhibited signs of an ancient gully with substantial alluvial deposits and appear to be off-site. South (upslope) of areas with Late Neolithic architectural remains and outdoor surfaces, we discovered Early Bronze deposits and architecture overlying Neolithic deposits in Areas P33-P37, Q35-38, R41, and X37.

STRATIGRAPHY AND RADIOCARBON CHRONOLOGY

Stratigraphic analysis, examination of finds, and a suite of radiocarbon dates suggest that there are three main stratigraphic levels at the site in the Late Neolithic (sixth millennium cal. BC), Early Bronze I (fourth millennium cal. BC), and Classical period (at least late Hellenistic, and possibly later). Residual and surface remains indicate, however, that there was some Epipalaeolithic and PPNB activity on or near the site as well.

Radiocarbon assays (table 1) are broadly consistent with the stratigraphy of the material culture. So far, we have eight dates pertaining to the Late Neolithic deposits, but two of them are clearly later and outliers (TO-13125 and TO-13124 in Area P33), probably resulting from the intrusion of later charcoal through bioturbation, such as tree roots or rodent burrows, which were frequently observed during excavations. Two dates come from food residue on the inner surface of sherds, clustering around 6700 BP. The other samples, all small pieces of charcoal, provided determinations ranging from 6680 to 6400 BP. With no constraints on their beginning or end (the next group of dates from the site is much later, in Early Bronze I), these lead to

20. Excavations at the site employed a nominal 3 x 3 m grid, with screening of all archaeological deposits except the uppermost sediment (*i.e.*, plough zone). In most cases, this was 100% screening through a mesh with apertures approximately 3.5 mm. Samples of sediment were saved for pH, flotation, and micromorphological analysis.

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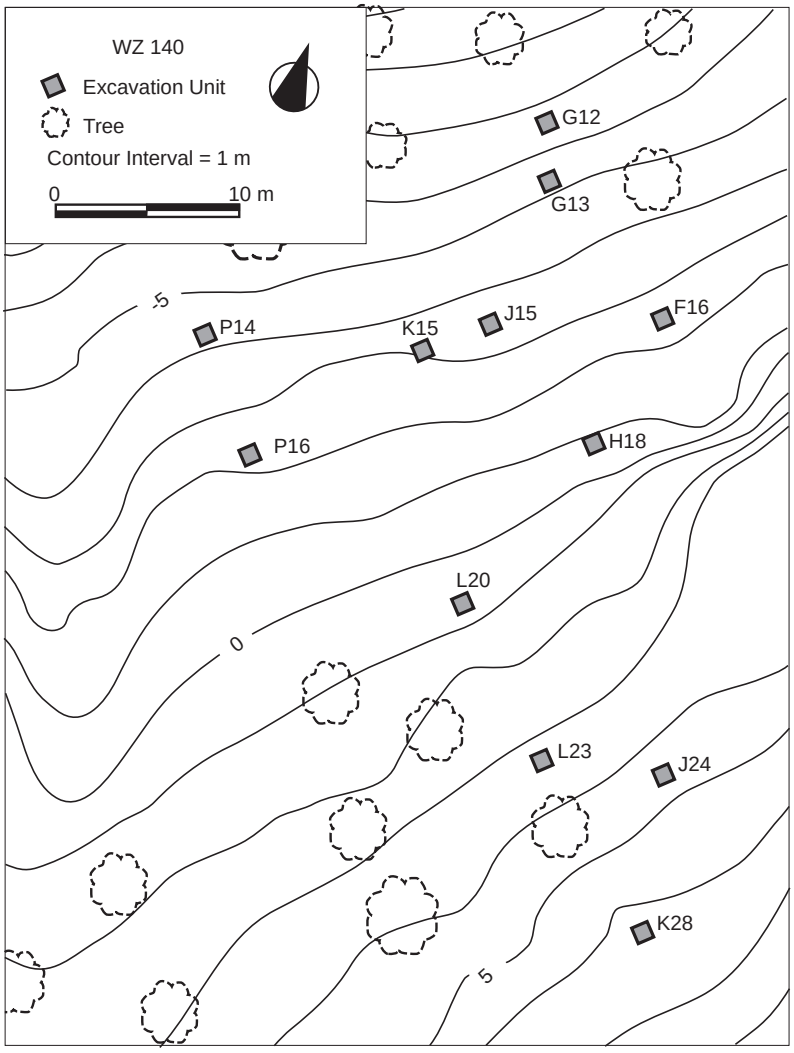

Fig. 2 – *Excavation units at WZ 140.*

the calibrated range of 5731-5572 to 5496-5292 cal. BC (68% confidence). These dates are statistically likely to be contemporary with LN3 or LN4 at Tabaqat al-Bûma, while also falling within the range of Wadi Rabah sites.[21]

ARCHITECTURE AND ACTIVITY AREAS

Neolithic architectural remains were not evident or were poorly preserved in most of the excavated areas, but include stone walls or foundations, cobbled surfaces, and pits.

We have so far discovered five cobble-paved surfaces (figs. 4-6) in the Late Neolithic deposits. Two of them, in Areas N41-42 and P42, have rectilinear edges, but poor preservation makes their overall shape unclear (fig. 4). For example, the northeast corner of the floor in N41 is cut by a later pit. A better preserved pavement in Q41 is circular and composed of fairly flat stones. Stone slabs are also used in some parts of the paved surface in P35-36/Q35-36/R36 (fig. 5). This surface, although not completely revealed, is probably rectangular in shape. Regardless of the shape or degree of preservation, none of these cobbled surfaces is associated with walls. Instead, large boulders are characteristically located in their immediate vicinity, with the exception of the surface in Q41 (figs. 4-5).

21. BANNING, 2007. Calibration and analysis of radiocarbon evidence was with BCal, BUCK *et al.*, 1999.

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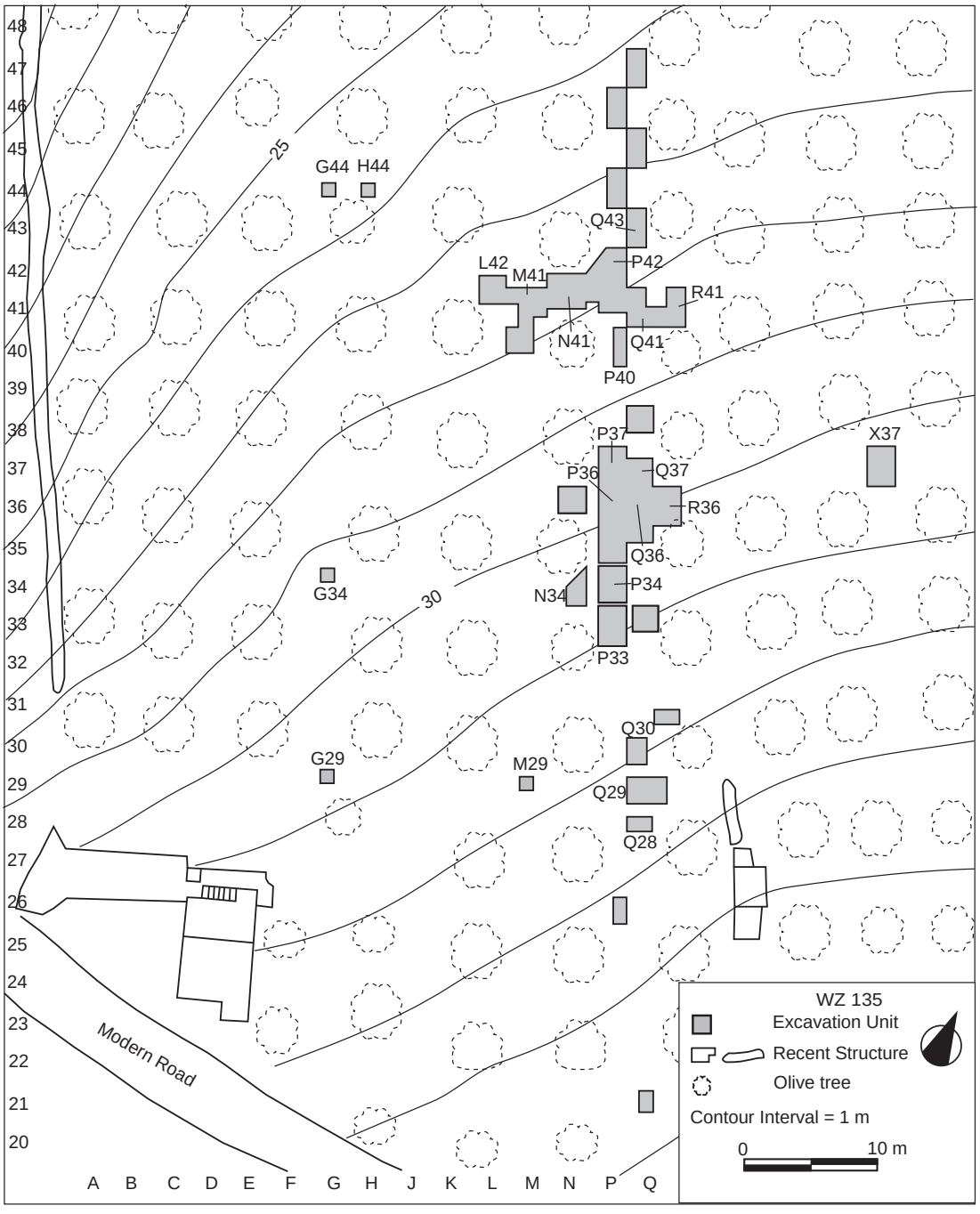

Fig. 3 – *Excavation units at WZ 135.*

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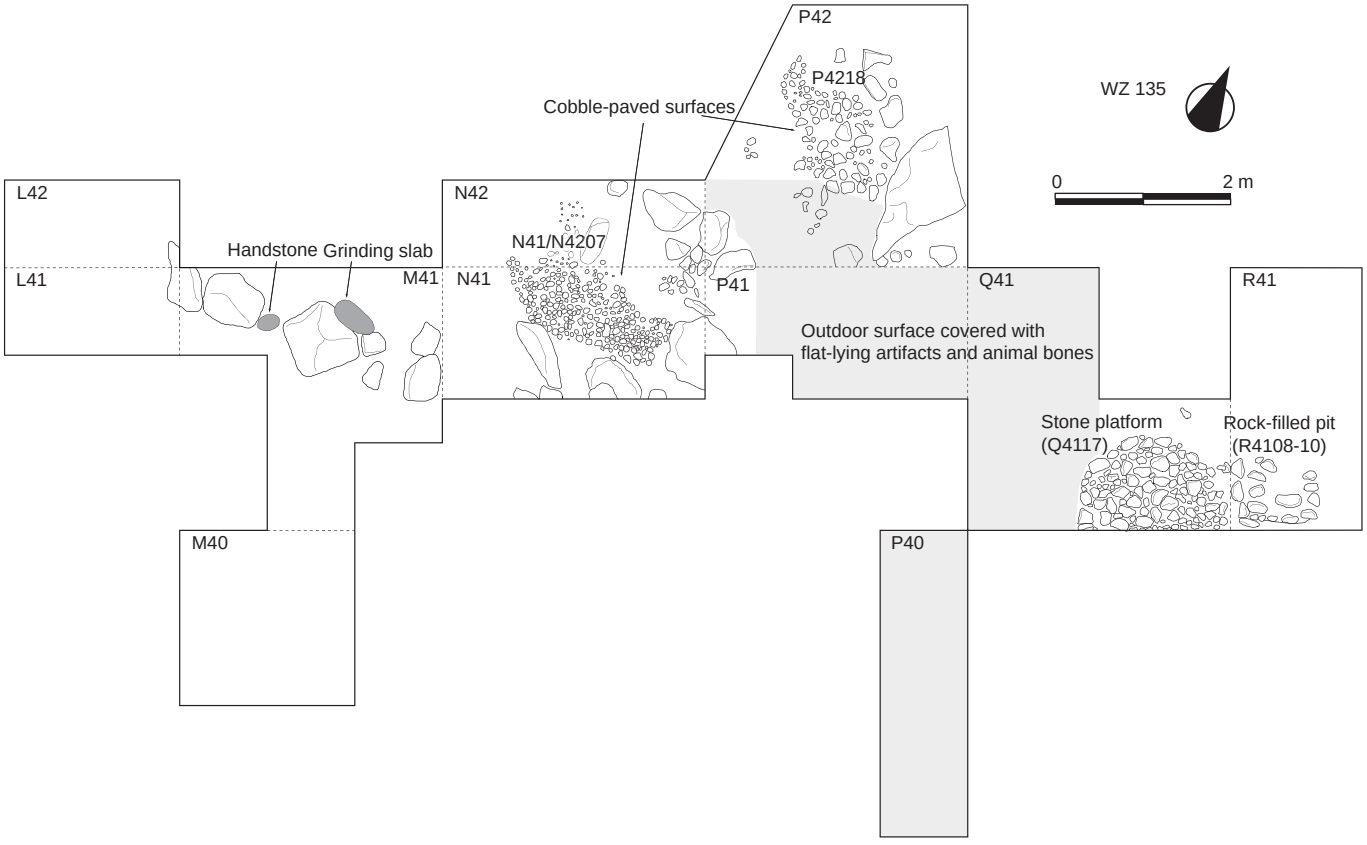

Fig. 4 – *Late Neolithic architecture in the northern part of excavated areas at al-Basatîn.*

The paved surfaces are likely to have served as locations of domestic activities and storage. Although we usually found very few artifacts on the cobbled surfaces, possibly as a result of area maintenance and cleaning, material remains were relatively well preserved on the surface in P35-36/Q35-36/R36, providing some evidence for the range of domestic activities and the daily use of this space (fig. 5). This large cobbled surface (locus 023) extends over an area of at least 10 m^2, and slopes noticeably downward to the northeast. A handstone and concentration of chipped-stone debitage, some of which refits, were found near the eastern end of this cobble surface in Q36 (fig. 5), possibly indicating a knapping area. Another handstone and a pestle were found on a surface less than 5 cm above the cobbled floor in Area Q35 (fig. 5). These tools are also likely to have been left during the occupation of the cobbled surface given that there are some refits between lithic debitage on the floor and those located a few cm above the floor. Lying on the cobbled surface in Q35 were a complete axe, some fragments of a basalt bowl, and a complete flake with invasive retouch. We gridded this floor into 50 x 50 cm units and sampled each unit for flotation, microdebitage, pH, and phytoliths. Although analysis is not yet complete, so far the light fractions from this floor have yielded charcoal fragments, olive-pit fragments, and some unidentifiable seed fragments.[22]

Although the cobbled floors were not associated with walls, walls did occur rarely elsewhere in the Late Neolithic level. In Areas P36-37 and Q36-37, a curved wall of several large stones (locus 022) may be all that remains of a round Late Neolithic structure. In Area Q37, a single stone might conceivably be a continuation of this wall. A thin lens of dark, possibly burned, sediment (locus Q3706) in the southwest corner of Q37 appears to be the remains of a hearth associated with this poorly preserved structure. In P36, a segment of double-leaf stone wall abuts this round structure.

In addition to these stone features, the excavations documented several outdoor surfaces upon which flat-lying artifacts

22. S. Monckton, personal communication.

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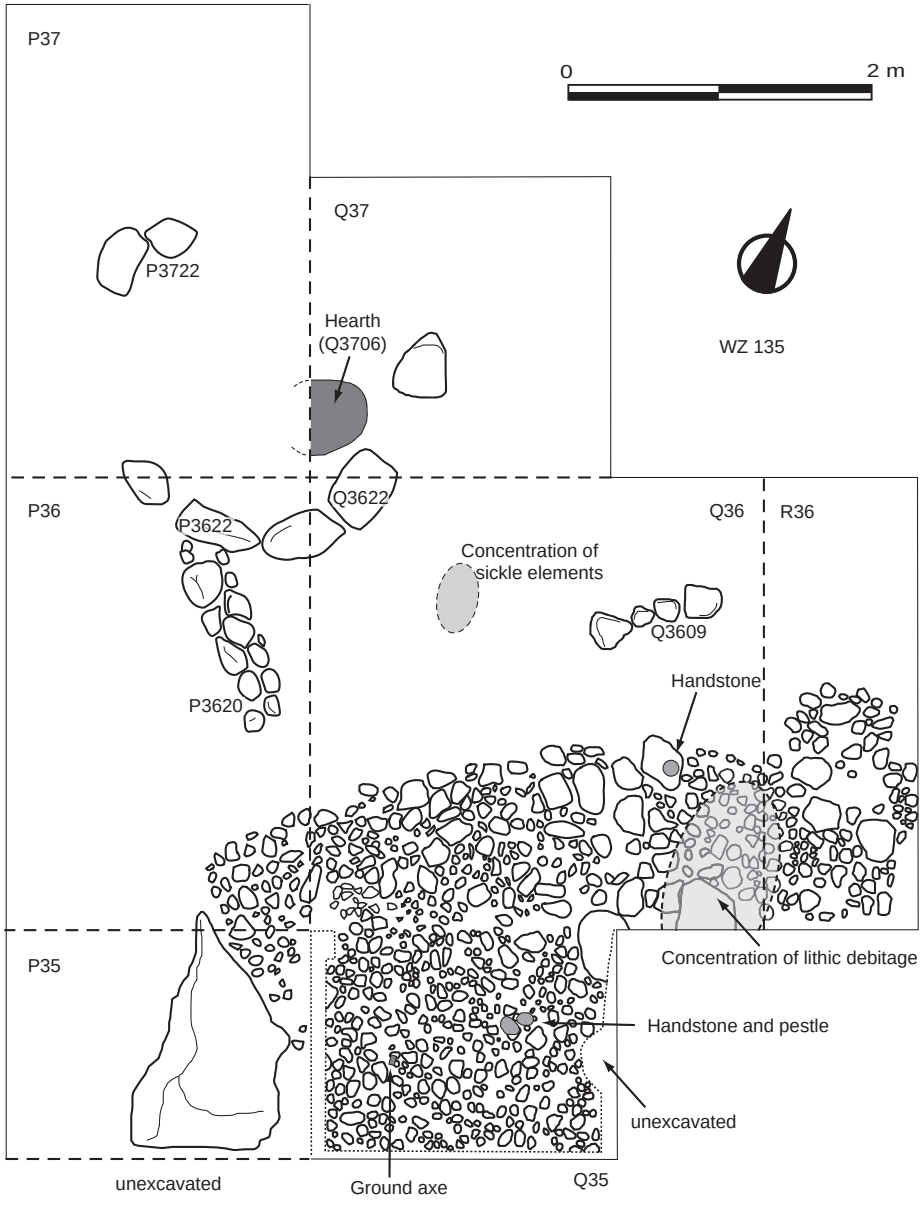

Fig. 5 – *Late Neolithic architecture in the middle part of excavated areas at al-Basatîn.*

and other debris were distributed. We detected such traces of apparent outdoor surfaces in Areas P33, P34, P40-42, Q41, and R41. However, it is still unclear whether deposits in these areas are primary (*de facto*) ones that resulted from cultural activities or represent secondary refuse redeposited by natural or cultural agents. To investigate this issue, we piece-plotted findings on several surfaces in P34, P40-41, and Q41, and did extensive sampling for flotation and microrefuse from one surface in Areas Q41 and P42. These samples will allow us to examine patterns in the distributions of macro- and microrefuse and their spatial distributions, which can then be used to assess influence of various natural and cultural formation processes.

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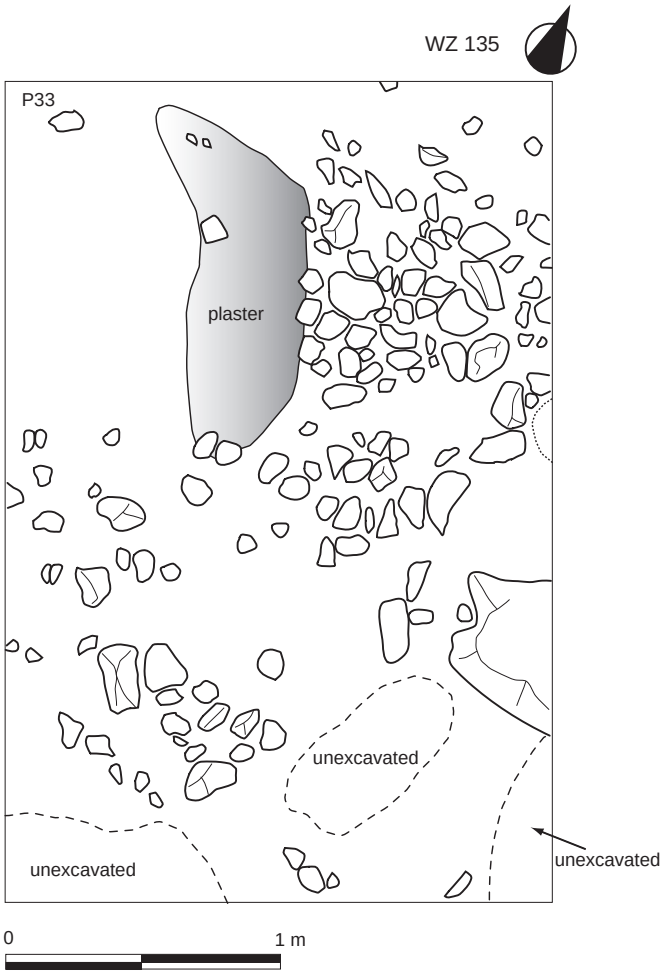

Fig. 6 – *Late Neolithic cobble-paved surface in Area P33 at al-Basatîn.*

LATE NEOLITHIC MATERIAL CULTURE

Deposits of this phase yielded material culture indicative of a wide range of domestic activities, including the production and use of stone tools, food preparation, storage, and consumption, and social display.

Lithics

During excavations and laboratory analyses, we made efforts to define Late Neolithic assemblages with minimal mixture of earlier or later artifacts. Excavations in the 2002, 2004, and 2006 seasons collected more than 50,000 pieces of chipped stone, of which more than 22,000 pieces (*ca* 43%) were recovered in Late Neolithic contexts with very few intrusive materials from later deposits, as confirmed by pottery sherds and radiocarbon dates. Although the Late Neolithic assemblage includes residual PPNB and Epipalaeolithic lithics, they comprise only a small portion (less than 2%) and can easily be distinguished from Late Neolithic pieces by identifying techno-morphological characteristics of the former periods (*e.g.*, naviform blades and regular bladelets). Thus, our analyses focus on the securely defined Late Neolithic assemblage to examine accurately characteristics of raw material exploitation, core-reduction, and the techno-morphology of retouched tools.

Almost all Late Neolithic chipped-stone artifacts were made of flint, and most of its varieties, as indicated by cores and cortical elements, are observable in local sources. For example, flint nodules with limestone cortex or weathered surfaces are available at several outcrops of chalk and limestone about 500 m northwest (downstream) of the site and also at ‘Ain al-Beidha in nearby Wadi Abu Ziyad. These sources provide fine- to medium-grained flint with colours ranging from dark brown to greyish brown, often without lustre. In addition, fine-grained flint of brown to beige colour is available in the form of rolled cobbles in areas a little upstream of ‘Ain al-Beidha. Flint from this spot is often lustrous. Coarse-grained flint of greyish brown is strewn in the immediate vicinity of the site. As clear indication of imported material, two obsidian flakes were found, one in Late Neolithic deposits and another mixed with Hellenistic remains.

The proportional distribution of debitage types (table 2) shows that flakes were major products of core-reduction. Very few occurrences of core-trimming elements indicate that core-reduction rarely involved systematic preparation or rejuvenation of core morphology. However, such a debitage profile does not necessarily mean that core reduction technology was completely “expedient”. Core reduction appears occasionally to have involved intentional blade production by unidirectional flaking. This is suggested by a concentration of more than 200 pieces of lithic debitage on the cobbled surface in Areas Q36 and R36 (fig. 5). These remains are likely primary or *de facto* refuse from core reduction on this spot, as indicated by more than 60 conjoinable pieces (nearly 30% of the lithics there). The material in this context consists of at least 13 types of flint, of which 11 are fine-grained, and is also characterized by a very high ratio of blades to flakes (0.12) in comparison to the ratio (0.01) in the total Late Neolithic assemblage.

Debitage of Tabaqat al-Bûma is also dominated by flakes with very few occurrences of core-trimming elements. However, examinations of retouched tools, debitage, and cores

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Table 2 – *Inventory of chipped stone artifacts from al-Basatîn.*

		n	%	
Retouched tool	Arrowheads	0	0.0	% of tool total
	Sickle elements	68	12.0	
	Unfinished sickles	6	1.1	
	Burins	1	0.2	
	Borers	22	3.9	
	Denticulates	21	3.7	
	Notches	23	4.0	
	Scrapers	96	16.9	
	Truncations	5	0.9	
	Backed pieces	6	1.1	
	Ret. blades	32	5.6	
	Ret. flakes	273	48.0	
	Axes, Adzes, Chisels	4	0.7	
	Bifacial knives	0	0.0	
	Cortical scrapers	3	0.5	
	Chopping tools	1	0.2	
	Tool fragments	8	1.4	
	RETOUCHED TOOL TOTAL	*569*	*2.6*	*% of Late Neolithic total*
Debitage	Blades	191	0.9	% of debitage total
	Flakes	13,476	60.8	
	Obsidian pieces	1	0.0	
	Chips	5,778	26.1	
	Burin spall	0	0.0	
	Chunks	1,922	8.7	
	Core-trimming elements	5	0.0	
	Cores	205	0.9	
	DEBITAGE TOTAL	*21,578*	*97.4*	*% of Late Neolithic total*
Late Neolithic total		22,147	98.1	% of total
Residual PPNB pieces		6	0.0	% of total
Residual Epipalaeolithic pieces		421	1.9	
TOTAL		**22,574**		

suggest that blades were not merely accidental by-products during casual flake production, but their production is characterized by the selective use of fine-grained flint, unidirectional flaking, and the frequent use of blades for some retouched tools, particularly sickle elements.[23] Thus, inhabitants of al-Basatîn, as at Tabaqat al-Bûma, appear to have employed a core-reduction technology in which they primarily manufactured flakes with some degree of blade production.

Retouched tools account for 2.6% (569 pieces) of the Late Neolithic assemblage of al-Basatîn (table 2). Tools are mostly made by marginal retouch on the edges of flakes of various forms. Such informal tools include retouched flakes, scrapers, denticulates, notches, and backed pieces. While a retouched flake is a catch-all category of flakes with irregular marginal retouch, we identified the other tool types according to the forms of retouched edges.[24] Some scrapers are made on cortical flakes and separately reported as cortical scrapers (table 2 and fig. 7: 11). However, they tend to be small and curved in profile in comparison to the generally larger size and flat profiles of tabular scrapers observed in later periods.

Tools with more standardized forms consist of sickle elements, retouched blades, borers, and truncations, which are often made on blades. Among such formal tools, sickle elements are the most abundant (table 2). The elements have a rectangular shape formed by steep retouch at one lateral edge and the truncation of both ends of blades or, occasionally, flakes. The cutting edges of sickle elements have denticulations and often exhibit clear sickle sheen. According to Gopher's

23. KADOWAKI, 2005.

24. See ROSEN, 1997 for examples of these tool types.

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typology of sickle elements,[25] most samples from al-Basatîn can be classified as either Type C/E or D.

These two types are also main constituents of the sickle elements from Tabaqat al-Bûma (table 3). One of the authors presented previously that these two sites in Wadi Ziqlab are more similar to each other than to other sites with Wadi Rabah cultures in the proportional distributions of sickle element types and the frequency of coarsely denticulated cutting edges.[26] However, the production technology of sickle elements appears to have differed somewhat between al-Basatîn and Tabaqat al-Bûma. Sickle elements found at al-Basatîn were more frequently made on blades and tended to receive denticulation on the cutting edge before giving the blank its final shape through truncation and backing. These patterns also appear in the results of more recent analyses, which include additional samples from the 2006 season and which treated the Late Neolithic phases at Tabaqat al-Bûma separately (table 3).

Table 3 – *Proportional distributions of types and blank forms of sickle elements from al-Basatîn and Tabaqat al-Bûma.*

		Tabaqat al-Bûma			al-Basatîn (n = 59)
		Phase 3 (n = 32)	Phase 4 (n = 44)	Phase 5 (n = 53)	
Sickle element types	Type A	3%	5%	2%	2%
	Type B	0%	0%	0%	2%
	Type C/E	22%	33%	36%	51%
	Type D	69%	50%	42%	27%
	Indeterminate	6%	12%	21%	19%
	TOTAL	**100%**	**100%**	**100%**	**100%**
Blank forms	Blade	16%	34%	36%	49%
	Bladelet	0%	2%	2%	2%
	Flake	38%	25%	36%	24%
	Indeterminate	47%	39%	26%	25%
	TOTAL	**100%**	**100%**	**100%**	**100%**

Another characteristic tool type is axes/adzes/chisels. Some axes have been regularly shaped into rectangular or trapezoidal forms either by bifacial flaking or by pecking the sides of tabular flint (fig. 7: 9-10). Both methods, however, involve some grinding at the cutting edges. Axes with similar forms, but with grinding over more extensive areas, were recovered in disturbed contexts with Hellenistic materials and classified as ground-stone tools (fig. 8: 8-10). Both chipped and ground axes are very similar in morphology and production technique. Ground axes, adzes, or chisels are made on flint, and their cutting edges are formed by grinding perpendicular to the long axis of the tool. The sides and proximal end of the axes show traces of pecking and battering, probably employed during shaping of the tool. Several small flake scars at the ground edge may have resulted from use, while extensive flaking of some axes might represent the rejuvenation or modification of the cutting edge.

These techno-morphological characteristics of chipped and ground axes/adzes/chisels are also observable on the specimens from Tabaqat al-Bûma,[27] and thus the two sites appear to have had similar technology for manufacturing and using axes/adze/chisels. One noticeable difference is that at Tabaqat al-Bûma the assemblage includes one basalt axe, which may have had economic and symbolic significance because of the rarity of the sources and production centres of basalt axes.[28]

The Late Neolithic chipped-stone assemblages from al-Basatîn characteristically lack arrowheads, following their decreasing abundance from the Yarmoukian and Jericho IX to the Wadi Rabah period.[29] The absence of arrowheads at Wadi Rabah sites is usually explained by the decline of hunting activities and increasing reliance on domesticated animals.[30] In fact, the faunal assemblage of al-Basatîn is dominated by domestic taxa (sheep and goat, see below). On the other hand, the fauna of Tabaqat al-Bûma include a relatively high proportion of wild animals (*e.g.*, deer). However, no arrowhead was recovered from secure Neolithic contexts at Tabaqat al-Bûma, suggesting either that procurement of wild animals was accomplished without flint arrowheads or that hunting was not practiced as frequently as the faunal record would suggest.

As mentioned earlier, the excavations discovered a number of chipped-stone materials that clearly belong to earlier periods (table 2). The majority of these are Epipalaeolithic artifacts, including retouched and unretouched bladelets and bladelet cores (fig. 7: 15-18). Although some of the bladelet cores appear similar to ones from the Middle Epipalaeolithic, there are no clearly Geometric Kebaran artifacts in the collection, such as trapeze/rectangles. Both narrow and wide bladelets appear, but none of them are retouched in ways that would suggest any particular complex of the Epipalaeolithic. A few artifacts may be from some nearby PPNB occupation, such as the surface finds of a naviform core and an axe in 2004 (fig. 7: 13-14) and, in 2006 excavations, of some broken arrowheads. In all cases, these earlier artifacts were on the surface or mixed

25. GOPHER, 1989; BARKAI and GOPHER, 1999.
26. KADOWAKI, 2005.
27. BANNING and SIGGERS, 1997.
28. ROSENBERG *et al.*, 2008.
29. FINLAYSON *et al.*, 2003; GARFINKEL and MILLER, 2002; GOPHER and GOPHNA, 1993; ROLLEFSON *et al.*, 1992.
30. BARKAI and GOPHER, 1999: 60.

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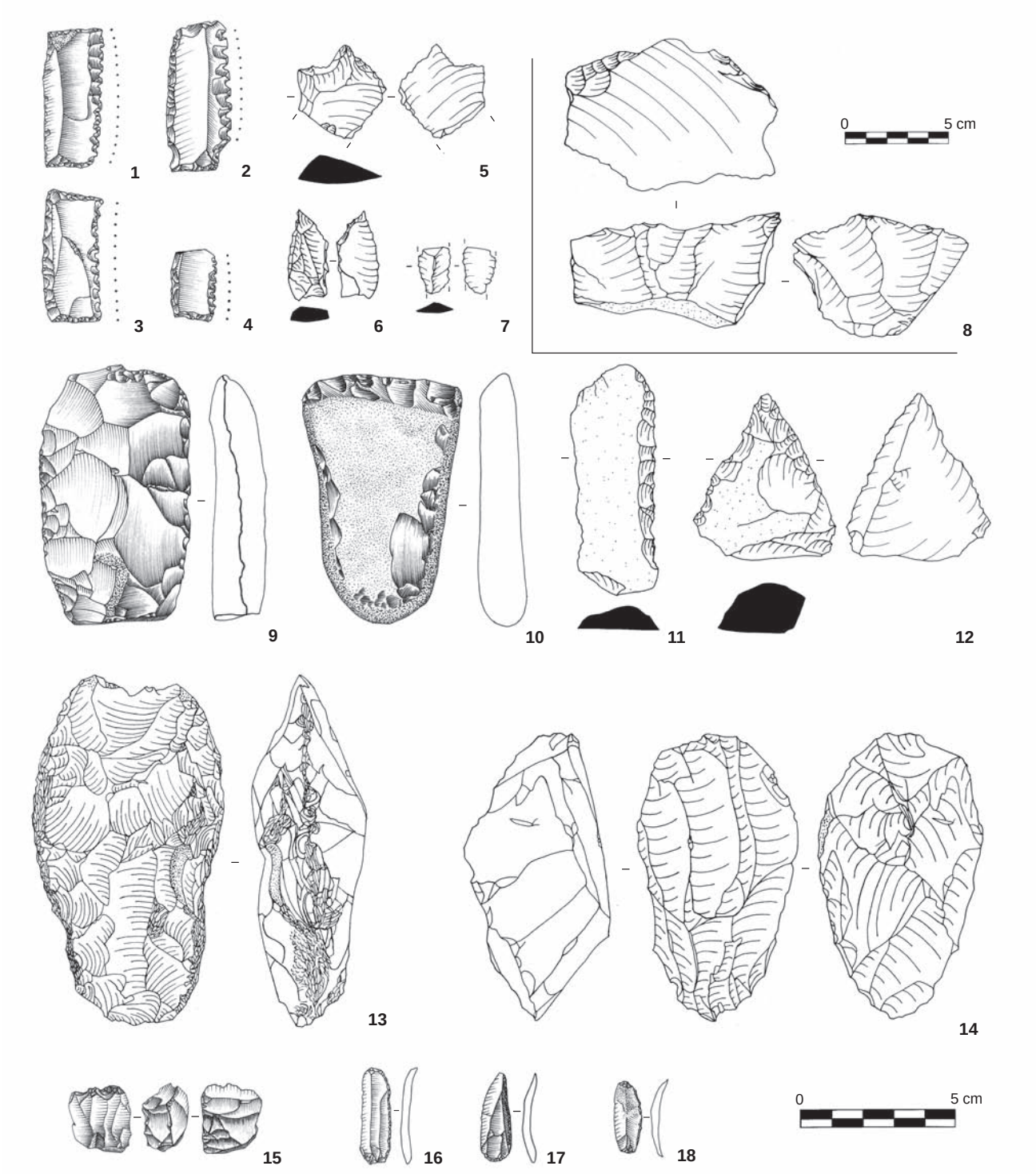

Fig. 7 – *Neolithic and Epipalaeolithic chipped stones at al-Basatîn.* ***1-4****, denticulated sickle elements;* ***5-6****, borers;* ***7****, obsidian bladelet;* ***8****, core;* ***9-10****, partially ground axes;* ***11-12****, scrapers;* ***13****, PPNB axe;* ***14****, naviform core;* ***15****, Epipalaeolithic core;* ***16-18****, Epipalaeolithic retouched bladelets (1-12 are from Late Neolithic contexts; 13-14 are surface finds; 15-18 are residual remains in later contexts.)*

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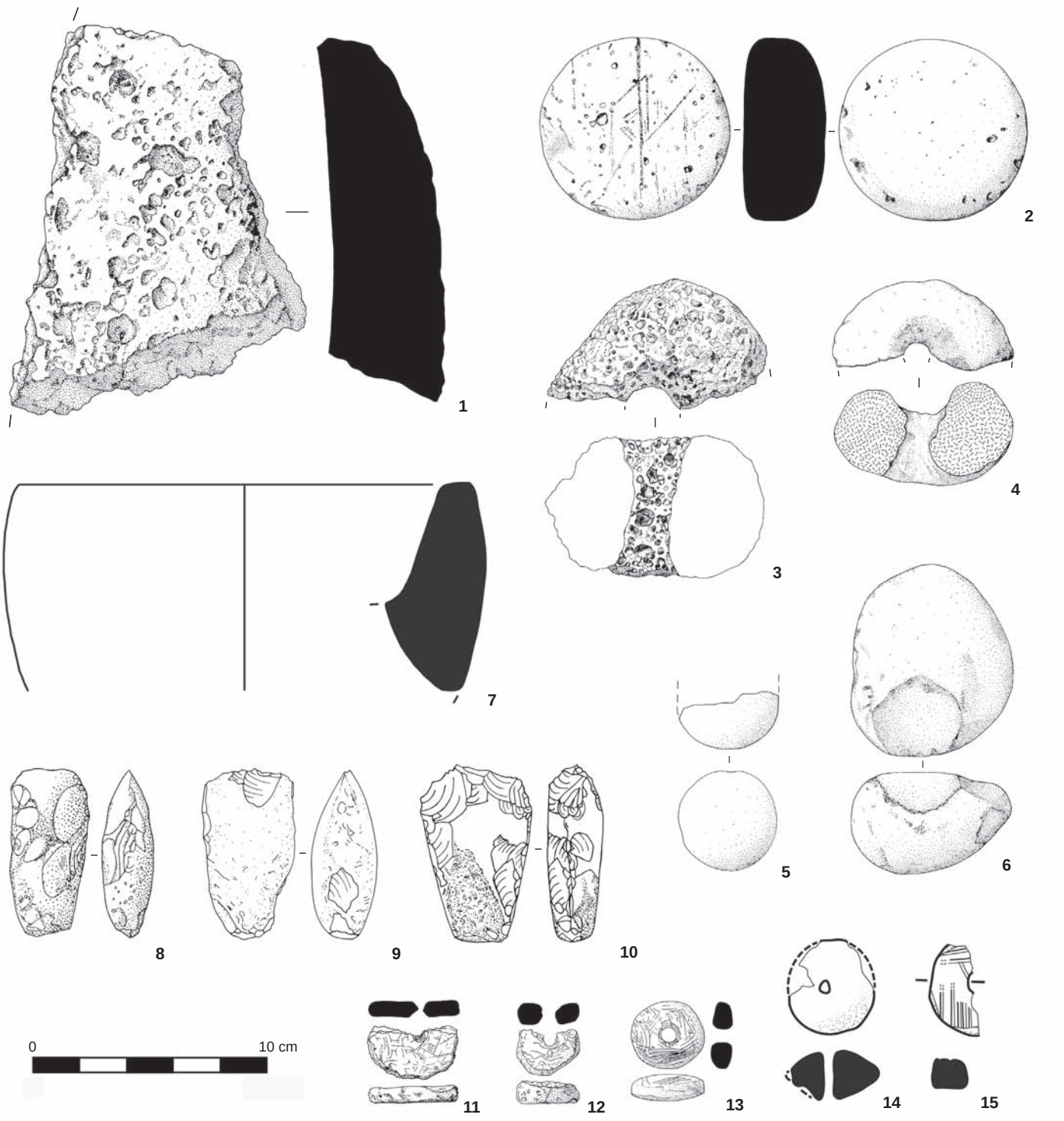

Fig. 8 – *Late Neolithic ground stones and clay objects.* ***1****, grinding slab;* ***2****, handstone;* ***3-4****, perforated stones;* ***5****, pestle;* ***6****, flaked cobble;* ***7****, limestone vessel;* ***8-10****, ground axes;* ***11-13****, limestone spindle whorls;* ***14-15****, clay spindle whorls.*

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with later material and are thus residual, but indicate that some part of the WZ 135 terrace was probably used, even if not intensively, in both Epipalaeolithic and PPNB times.

Excavations of Late Neolithic deposits yielded more than 50 groundstone artifacts. About 30% of them are made of basalt, which would have been imported to the site, probably from the area east of Tell ash-Shûna North. Basalt was often used for probable food-processing tools, such as grinding slabs or querns, handstones, pestles, and stone vessels or mortars (fig. 8: 1-2 and 5). In addition, two large, perforated tools[31] are also made of basalt (fig. 8: 3). The rest of the groundstone tools are of limestone with a few pieces of flint. The limestone artifacts are mostly natural cobbles and pebbles showing some traces of grinding, pecking, or flaking. However, some limestone pieces were modified into formal tools, such as spindle whorls and stone vessels (fig. 8: 7, 11-13).

Late Neolithic groundstone also occurred in later and disturbed deposits. For example, a set of large upper and lower milling stones, made of basalt, was found in a disturbed context in M41. The tools' Neolithic origin is indicated by their morphological resemblance to other Late Neolithic milling stones and their recovery locations close to the Late Neolithic cobbled surface in N41 (fig. 4). In addition, five pieces of ground axes/adzes/chisels, mixed with Hellenistic sherds in M41 and L42 (fig. 4 and 10: 8-10), resemble axes from Late Neolithic contexts (fig. 7: 9-10).

These types of groundstone artifacts and their technomorphological characteristics at al-Basatîn are quite similar to those of Tabaqat al-Bûma.[32] This may not be surprising given their chronological and geographical proximity. On the other hand, the possible difference in the nature of settlements between the two sites, as suggested by architectural records, is not observable in the kinds of food-processing or craft-production activities represented by groundstone artifacts.

Late Neolithic Pottery

Almost 900 diagnostic sherds from al-Basatîn were identified as Late Neolithic. These include rims, bases, handles, body sherds with decoration or other surface treatment, carinated sherds, fragments of jar necks or shoulders, and a small number of pierced disks. Most of these came from Late Neolithic contexts but a few from later strata were identified as residual Late Neolithic sherds on the basis of their fabric or surface treatment.

The Late Neolithic pottery is all handmade, and there is some evidence for coil construction. Although there are some better-made exceptions, in general, the pottery is rather crudely constructed and poorly fired, and is now so fragile that we generally cannot wash it. The fabrics are usually soft and brown, yellow or salmon-pink in colour, often with distinct dark or yellow cores. Limestone and chalk inclusions are common, with smaller amounts of chert, iron oxides, and quartz, while some sherds show evidence of fibrous temper. All the raw materials needed for pottery production are locally available.

The assemblage of Late Neolithic pottery is very fragmented and rims are often too small to stance accurately, but forms appear to include small cups, bowls, holemouth jars, and necked jars. A number of thick, very friable pieces appear similar to *tabun* fragments, but we have been able to refit some of them into portions of coarse vessels. Bowls occur in a range of sizes and forms, including V-shaped ones (fig. 9: 6-8), rounded or hemispherical bowls (fig. 9: 16-22), and bowls with vertical or slightly inverted walls (fig. 9: 9-12) that are sometimes carinated (fig. 9: 10). A small number of rims could derive from everted bowls or perhaps jars with everted necks (fig. 9: 15), while one body sherd (fig. 9: 14) is likely from a small bowl with an S-shaped profile. Jars are primarily holemouths (fig. 9: 1-5). Some of these are rather thick and coarse, while others are finer and occasionally decorated with incisions. No clear examples of necked jars occur in the assemblage, although a small number of sherds seem to represent the junction between a jar's neck and shoulder (fig. 9: 13). Furthermore, because of the fragmented nature of the assemblage, some of the rim sherds identified as bowls may actually derive from necked jars. Bases are mainly flat or disk bases (fig. 10: 15-18), sometimes showing evidence of pebble or mat impressions (fig. 10: 19) or thickened with layers of added clay (fig. 10: 21). Limited evidence suggests the presence of vessels with pedestal bases (fig. 10: 20). Handles include strap or loop handles (fig. 9: 7 and 24; fig. 10: 6), usually with oval cross-sections, and some knobs (fig. 9: 3; fig. 10: 3), small ledge handles (fig. 10: 5), and more protruding, triangular or pointed lug handles (fig. 10: 1). In at least one case, a small ledge handle seems to have been located on the interior of the vessel (fig. 10: 2), while another sherd has two tiny lugs or protrusions located side-by-side (fig. 10: 4).

Surface treatments include a variety of incised and impressed motifs. A fairly common treatment is combing (fig. 10: 9-14). Often this is a very rough combing, apparently to roughen the surface rather than to create a particular pattern, on one or both surfaces. Some sherds display more regular combing, including

31. "Counterpoise weights" according to the typology by WRIGHT, 1992.

32. BANNING and SIGGERS, 1997; KADOWAKI, 2007.

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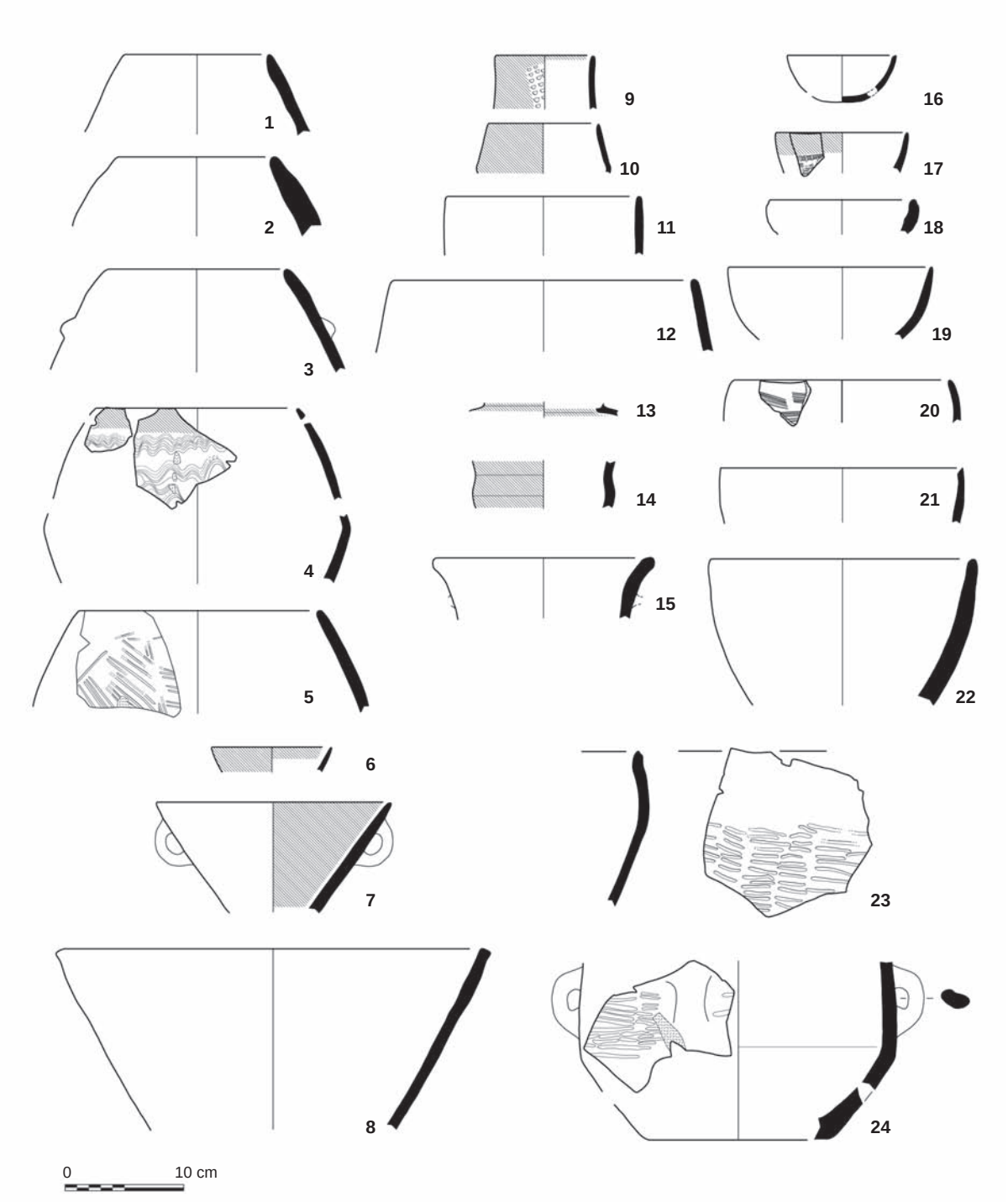

Fig. 9 – *Late Neolithic pottery from al-Basatîn.* ***1-2****, holemouth jars;* ***3****, holemouth jar with applied knob;* ***4****, holemouth jar with red slip, wavy combing, and mending hole;* ***5****, holemouth jar with combed decoration;* ***6-8****, straight sided bowls;* ***9****, small red-slipped bowl or cup with a field of fingernail impressions;* ***10****, carinated bowl;* ***11-12****, vertical or slightly inverted bowls;* ***13****, fragment of a necked jar;* ***14****, fragment of an S-shaped bowl;* ***15****, everted bowl or jar neck with small handle attachment;* ***16-22****, rounded bowls (17 has fingernail impressions over combing; 20 is combed);* ***23-24****, large crudely incised bowls.*

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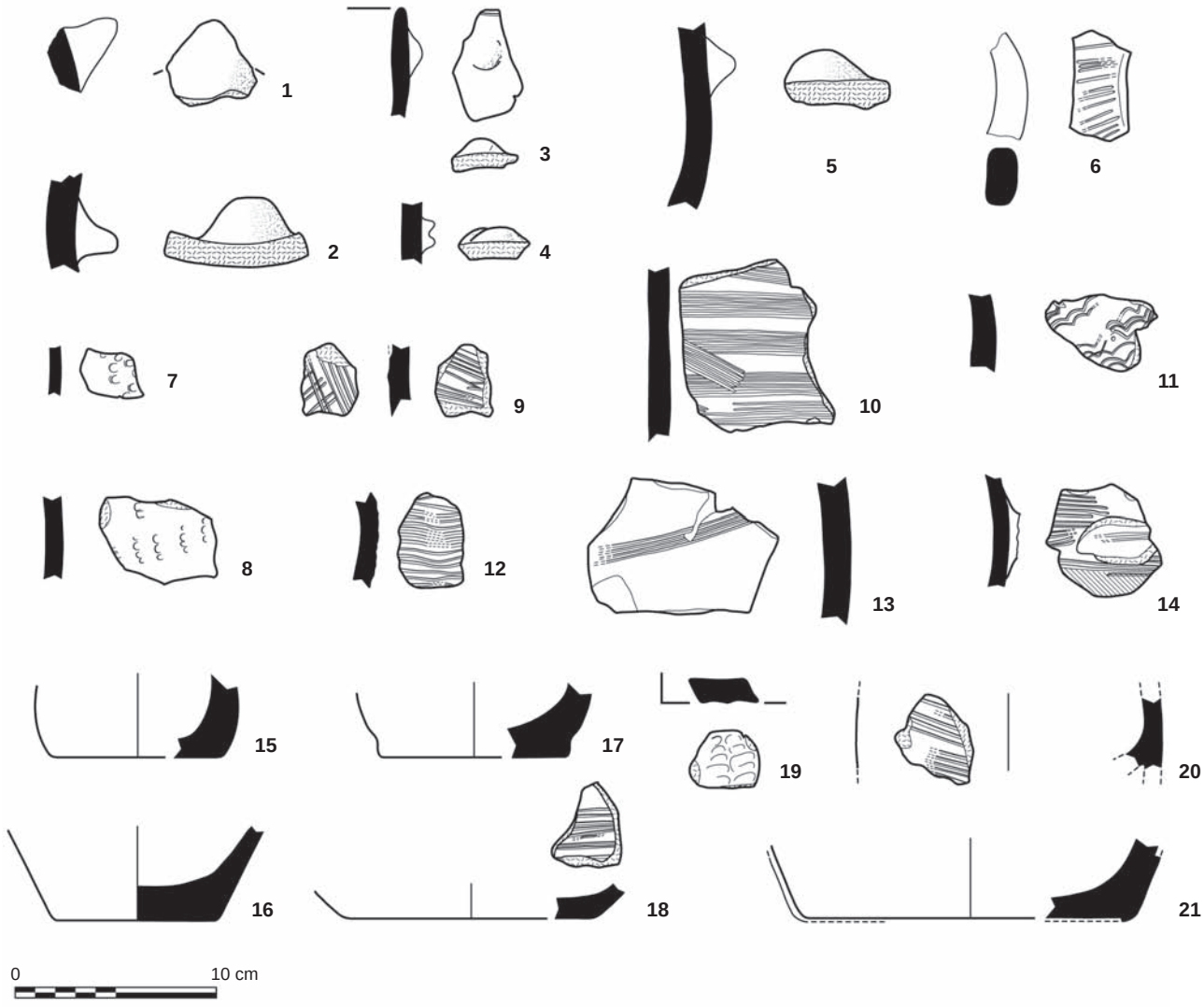

Fig. 10 – *Late Neolithic handles, bases, and decorated pottery from al-Basatîn.* ***1-5****, knob or small ledge handles (4 is doubled);* ***6****, combed strap handle;* ***7-8****, impressed decoration;* ***9-14****, combed decoration (14 has a handle attachment showing combing underneath the handle);* ***15-16****, flat bases;* ***17****, disk base;* ***18****, flat base with combing on interior surface;* ***19****, fragment of matt-impressed base;* ***20****, probably pedestal base with combing on exterior surface;* ***21****, flat base thickened with additional layer of clay.*

wavy combing (fig. 9: 4; fig. 10: 11), bands of horizontal combing (fig. 10: 10), and cross-combing or "weave combing." Combing seems to occur on any part of the vessel including the rim (fig. 9: 20), the interior of the base (fig. 10: 18) and on strap handles (fig. 10: 6). Some vessels have fields of coarse, parallel incisions made with a simple stylus that seem to mimic combing (fig. 9: 23-24). Impressions are made with circular (fig. 10: 7) and semi-circular implements (fig. 9: 9), as well as combs (fig. 10: 8). In a small proportion of sherds there are traces of red slip or perhaps paint, and rarer still are sherds with both slip and burnish. This last group includes both red and black burnished sherds. Surface treatments occasionally occur in combinations, such as impressions (fig. 9: 9) or combing (fig. 9: 4; fig. 10: 4) adjacent to red slip. One bowl with a red-slipped rim has an adjacent field of fingernail impressions over combing (fig. 9: 17).

The Late Neolithic pottery from al-Basatîn is most similar in form, surface treatment, and decoration to assemblages

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attributed to the Wadi Rabah culture.[33] The general absence of evidence for necked jars is a noticeable difference, however. As already mentioned, this is likely due, in part, to the poor preservation of the pottery from al-Basatîn. It is worth noting, however, that no clear evidence of bow-rim jars in particular has been found at any Late Neolithic site in Wadi Ziqlab. The absence of these vessels, which are often considered the most characteristic vessel of Wadi Rabah assemblages,[34] may reflect a local tradition of pottery manufacture, rather than simply poor preservation.

Late Neolithic Fauna from WZ 135[35]

Much like the Neolithic pottery, bones are highly fragmented, friable, and almost all display some structural damage. The degree of fragmentation was noted on all material from the 2006 season and on a sample of material excavated in 2004. An ordinal scale ranging from 1 (complete) to 6 (less than one-eighth) was used to explore the synchronic distribution of bone destruction and its variability over time. The results clearly indicate that the size 6 fragments dominate both the Late Neolithic (74%) and EB I (82%) assemblages (fig. 11). All other size categories are evenly, but only marginally represented. The prevalence of size 6 fragments at al-Basatîn severely influenced the low rate of identification. Weathering, which is marked by shallow surface fissures and exfoliation of outer cortical bone surfaces, is prominent. This condition suggests that discarded bone refuse was not buried rapidly. Diagenesis also contributed to the degradation of the cortical surfaces.

The faunal remains also exhibit ubiquitous concretion by calcium carbonate, which may have mitigated somewhat the diagenetic attrition just mentioned. These mineral deposits could not be removed without undue mechanical force and resultant damage, and thus hindered analysis by masking surface characteristics such as butchery marks, root etching, trampling abrasion, and carnivore and rodent tooth marks.[36]

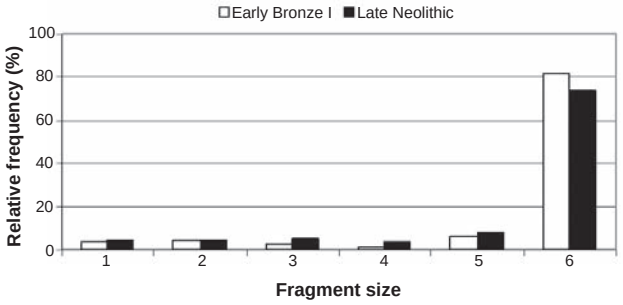

Fig. 11 – *Distribution of faunal remains according to fragment size. Sizes range from 1 (complete) to 6 (less than one eighth of original bone).*

The Late Neolithic levels yielded 2,644 bone specimens, of which 180 were identified to a low taxonomic level.[37] As in most Near Eastern faunal assemblages, the most frequently occurring animal taxa were sheep, goats, pigs and cattle. The most frequently occurring body parts of these major taxa in both periods were teeth. This is likely due to conditions that favour the preservation of enamel-protected teeth as well as the fact that even small tooth fragments carry morphological characteristics that allow easier identification.

In total, 10 fragments were identified as *Bos taurus* (domestic cattle), accounting for about 6% of the Late Neolithic assemblage. An additional 11 fragments were identified as *Bos* sp. (wild or domestic cattle), also representing about 6% (table 4). The domestication of *Bos* was determined by morphological gracility and size. The larger wild cattle (*B. primigenius* or aurochs) are known from other Late Neolithic contexts at Hagoshrim and Munhata.[38] However, this species was not definitively identified in al-Basatîn's assemblage. If the eleven *Bos* sp. specimens derive from *B. taurus*, cattle account for about 12% of the Late Neolithic fauna.

Sus scrofa (pig) is represented by 24 specimens, contributing 13% to the Late Neolithic faunal assemblage. The status of domestication could not be determined as the six recovered teeth were too fragmentary to be measured. Age-at-death estimates were feasible for eight bone and tooth specimens. Of these, three survived beyond the age of 17 months, one was

33. *e.g.*, GARFINKEL, 1992; GARFINKEL and MATSKEVICH, 2002; KAPLAN, 1958, 1959, 1960 and 1969; LOVELL *et al.*, 1997, 2004 and 2007.

34. GARFINKEL, 1999: 133.

35. Preliminary reports on faunal remains were by RHODES, n.d., and LIPOVITCH, n.d., with most recent analysis by ALLENTUCK, n.d.

36. Identifications were conducted with the aid of the University of Toronto Faunal Osteo-Archaeology Collection. Methods of distinguishing elements of closely related species followed BOESSNECK *et al.*, 1964, and PRUMMEL and FRISCH, 1986. Determination of age at death followed the works of GRANT, 1975; PAYNE, 1973; SILVER, 1969. Because the sample sizes are so small, we only report NISP (Number of Identified Specimens per taxon), with a faunal specimen deemed identifiable if it is minimally identified to a taxonomic Family (*i.e.*, *Bovidae* or *Cervidae*). Specimens that could not be identified beyond a taxonomic Class (*i.e.*, *Mammalia* or *Aves*) were classified according to one of four live animal size categories (very small, small, medium or large) based on cortical bone thickness.

37. Fauna from the 2006 season were analysed by one of the authors [A.A.], who also reanalysed a sample from the 2004 season. To check for inter-observer variation, a 17% sample (n = 200) from the Late Neolithic and EB I collections of 2004 was reanalysed. Inter-observer variability was not overwhelming, as 91% of the specimens (n = 182) required no significant change (*i.e.*, taxon or anatomical element).

38. DUCOS, 1968.

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Table 4 – *Identified fauna from al-Basatîn.*

		Late Neolithic		Early Bronze I	
Scientific name	**Common name**	**NISP**	**%**	**NISP**	**%**
Domestic					
Bos taurus	cattle	10	5.6	1	3.4
Capra hircus	goat	3	1.7	–	–
Ovis aries	sheep	10	5.6	–	–
Ovis/Capra	sheep or goat	110	61.1	19	65.5
Wild or Domestic					
Bos sp.	cattle or aurochs	11	6.1	–	–
Bovidae – medium	gazelle, ibex, sheep or goat	1	0.6	1	3.4
Sus scrofa	pig	24	13.3	4	13.8
Canidae	dog, wolf or fox	2	1.1	–	–
Canis sp.	dog or wolf	1	0.6	1	3.4
Felis sp.	small cat	–	–	1	3.4
Wild					
Equus sp.	wild ass or onager	1	0.6	–	–
Gazella sp.	gazelle	5	2.8	–	–
Cervidae	deer	1	0.6	–	–
Vulpes sp.	fox	1	0.6	2	6.9
TOTAL NISP		180	100.0	29	100.0

between 12 and 16 months of age at the time of death, and four were between 6 and 11 months of age.[39]

Ovis aries (sheep) and *Capra hircus* (goat) remains account for the bulk of the Late Neolithic assemblage (68%, n = 123). It was not usually possible to distinguish between the two taxa, with the exception of ten *Ovis* and three *Capra* identifications. The domestication of these taxa is not determinable on the basis of allometric criteria because of the very small sample of the bones and teeth that could be accurately measured. However, they appear to represent domestic sheep and goats, an assessment based on affinities to domestic specimens in the reference skeletons. Only the most general remarks may be made about age structure. Mandibular tooth rows, the body parts by which the most accurate estimates of age at death may be achieved, were scarce. The four recovered sheep/goat mandibles were all from animals that died in adulthood (> 24 months). An additional 33 post-cranial bones could be assigned age estimates based on rates of epiphyseal fusion, which are less useful than mandibular tooth eruption and attrition because of their wide ranges of error. Nonetheless, bone-fusion data indicate that five sheep/goats were culled as juveniles in the first year of life; 13 were *at least* 12 to 23 months of age at death (sub-adulthood); and 11 individuals were at least 24 months (adulthood) when they perished. However, immature animals with relatively thin cortical bone and low bone density are less likely to survive carnivore and diagenetic attrition than the bones of mature animals.

Other taxa represented in the Late Neolithic assemblage, although minimally, are *Cervidae*, *Canidae*, *Gazella* sp., *Canis* sp., *Vulpes* sp., and *Equus* sp. (table 4). Of note is a second phalanx from an *Equus* sp. The small size of this bone relative to those of modern domestic horses in the modern reference skeletons suggests that it may be from the wild *E. hemionus* (onager) or the even smaller *E. africanus* (African wild ass). The *E. hemionus* range extended to the Southern Levant, as this species has been found in Late Neolithic levels at 'Ain Ghazal.[40] This bone was severely degraded by carnivore attrition. The proximal end had been heavily chewed in order to expose the small marrow cavity, and the distal end had been perforated by the canine tooth of a dog-sized carnivore. The second phalanges of equids have marrow cavities so small that they are of low economic utility to humans[41] but apparently contain enough marrow to attract a carnivore's attention.

Late Neolithic Small Finds

Late Neolithic small finds from the site include a small number of pierced ceramic disks that had been recycled from old pots, including one that had combed decoration (fig. 8: 14-15). These are similar in form to a small number of groundstone disks. All of these may have been used as spindle whorls.[42] A single biconical spindle whorl was also recovered (fig. 8: 14). A pierced bivalve shell (fig. 12), perhaps of one of the *Cardiidae* (cardium), likely represents jewelry or was sewn on clothing. It was found on one of the Late Neolithic surfaces in Area P41.

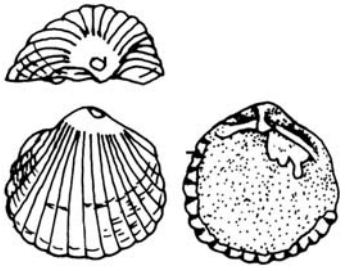

Fig. 12 – *Late Neolithic pierced bivalve shell from al-Basatîn.*

39. SILVER, 1969.

40. DRIESCH (VON DEN) and WODTKE, 1997: 530-531.
41. OUTRAM and ROWLEY-CONWY, 1998: 841.
42. GIBBS, in press.

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AL-BASATÎN'S PLACE IN THE SETTLEMENT SYSTEM

A number of authors have attempted to identify site hierarchies as evidence for regional social integration as early as Pre-Pottery Neolithic A.[43] However, most arguments in favour of such identifications are based on variation in site size over much or all of the Southern Levant rather than evidence for interactions among sites over a smaller region that might constitute the territory of a central place. Still others are based on the presence of an unusual site that could be interpreted as a ritual centre for some larger territory.[44] In both cases, the argument for regional integration of settlements is weakened by the inability of these hypotheses, on the basis of present evidence, to displace others that are arguably more plausible, such as the hypothesis that PPN villages were logistically organized,[45] much like the base camps of the Early Natufian if sometimes on a larger scale, with nothing more than temporary logistic camps in lower tiers of the settlement "hierarchy".

Meanwhile, excavations in other parts of the Southern Levant have, as in Wadi Ziqlab, led to the discovery of Late Neolithic sites whose material remains indicate occupations by relatively small agro-pastoral groups. These include Dhra', 'Ain Waida, Umm Meshrat, Nahal Zehora, Nahal Beset, and ash-Sharaf.[46] Although the scale and general nature of these sites appear to fit the expectations of the hypothesis we propose for Wadi Ziqlab's Late Neolithic settlement system, it is still unclear, for most of these sites, how they were related to other contemporary settlements or what roles they had in regional settlement systems.

By contrast, our research in and around Wadi Ziqlab has the potential for identifying the relationships among closely-knit settlements that may have jointly formed a community. Rather than view "community" as congruent with a single archaeological site or settlement, we follow the view that communities are socially constituted through shared practices and the interpretation of shared symbols. Communities are both institutions that structure the practices of their members and continually emergent products of social interaction. A sense of shared identity emerges through interactions that occur in a particular place, but this shared identity also fosters and directs interaction.[47] Typically, these are daily or at least frequent face-to-face interactions, so that they require physical proximity, such as we would find within a single settlement. However, frequent interactions are also possible, at least with the closest neighbouring settlements, in a small regional network of social actors. We can expect the degree of interaction among the community's constituent elements to have been variable and often intermittent, and something to be tested, rather than assumed.

In this vein, our work investigates the hypothesis that Late Neolithic sites in Wadi Ziqlab, and perhaps adjacent valleys, constituted a dispersed community. To date, we have indeed discovered a number of small Late Neolithic settlements and what are perhaps ephemeral camps, scattered up and down the wadi.[48] If at least some of them were contemporary, there is some reason to believe that they would have interacted closely with one another. First, all of these sites are too small to have been endogamous, so they would have depended on families in other sites to provide potential marriage partners. Second, it is plausible that the dispersed pattern of settlement was a response to risks involved in the relatively novel agropastoral economy.[49] Third, their access to certain kinds of materials and products, such as basalt, obsidian, salt, and shell, would have been through intermediaries who would either have resided in other settlements of the community network or have passed through such settlements.

Maintenance of these important links as well as negotiating actors' positions in the network would likely have involved social occasions, such as feasts or more ordinary meals, and rituals such as initiation rites, marriages and funerals. Since material culture is implicated in such occasions, it can provide clues to the scale of interactions.

Comparison of the assemblage from al-Basatîn with those of Tabaqat al-Bûma and other near-contemporary sites suggests that they all date to a few centuries in the mid- to late sixth millennium cal. BC, while the character of the sites and their distribution provides clues to the cultural landscape in this part of Jordan at that time.

Excavations to date have not uncovered well-preserved domestic architecture similar to that found at Tabaqat al-Bûma, suggesting that al-Basatîn's occupation was of somewhat different character. While there is substantial evidence for the same kinds of domestic activities as found at Tabaqat al-Bûma,

43. BAR-YOSEF and BELFER-COHEN, 1991; KUIJT, 1994; ROLLEFSON, 1987. But see cautions by HOLE, 2000 and VERHOEVEN, 2006.

44. GORING-MORRIS, 2000; SCHMIDT, 2006.

45. BINFORD, 1982.

46. Ash-Sharaf (BIENERT and VIEWEGER, 1999 and 2000); Umm Meshrat (CROPPER *et al.*, 2003); Dhra' (FINLAYSON *et al.*, 2003); Nahal Zehora (GOPHER and ORRELLE, 1991); Nahal Beset (GOPHER *et al.*, 1992); 'Ain Waida (KUIJT and CHESSON, 2002).

47. YAEGER and CANUTO, 2000.

48. BANNING, 1996 and 2001

49. BANNING and SIGGERS, 1997.

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including tool production, food preparation and consumption, and waste disposal, the architectural investment in cobbled surfaces rather than substantial houses and storage features suggests that occupation may have been seasonal rather than year-round. The possibility that at least some of the cobbled surfaces were the floors of tents[50] is intriguing, but does not strongly suggest any particular season of occupation. If the cobbling of tent floors was to counter damp or wet ground, as in the digging of shallow channels around winter Bedouin tents,[51] this might be weak evidence for winter occupation, but the floors could have had a different purpose. Yet it is also possible that more typical houses occur elsewhere at the site; for example, a similar cobbled platform occurs in combination with more conventional Neolithic houses at Tabaqat al-Bûma (LN5) while, at Sha'ar Hagolan, similar platforms seem to be the bases of silos.[52]

Small but important differences in the style and *chaîne opératoire* of lithics and pottery between al-Basatîn and Tabaqat al-Bûma indicate that the former was not simply a temporary camp occupied by the same social group found at the latter. The groups that used the two sites had a broadly similar lithic technology, emphasizing flake manufacture but with a smaller blade component. However, there are also subtle differences. For example, while they manufactured sickle elements with the same basic forms, they apparently employed different production technology to accomplish this, with the flintknappers of al-Basatîn focusing more on blade blanks than did those at Tabaqat al-Bûma.[53]

Similarly, although there are many similarities in form and fabric of pottery between the two sites, there are also distinct differences in the selection of raw materials, decorative motifs and other features. For example, pebble-impressed bases occur at al-Basatîn, while they are not found at all at Tabaqat al-Bûma, where mat-impressed bases occur instead. Combing as a surface treatment is common at al-Basatîn while it is comparatively rare at Tabaqat al-Bûma. Fiber temper occurs regularly at al-Basatîn but is very rare at Tabaqat al-Bûma and al-'Aqaba. Some other fabric groups are fairly common at all the Wadi Ziqlab sites that we have analysed, but they vary substantially in their proportions, even between the nearby sites of al-'Aqaba and Tabaqat al-Bûma. The similarities are strong enough to suggest shared conceptions of what the pottery should look like, but the differences, especially technological ones, indicate that potters in different parts of Wadi Ziqlab made different choices in achieving similar vessel forms.

The Late Neolithic faunal assemblages of al-Basatîn and Tabaqat al-Bûma, furthermore, have some elements that are strikingly different despite their contemporaneity and geographical proximity. At the former site, 87% of the fauna are represented by the major domestic taxa while, at the latter site, only 42% of the assemblage is composed of these domesticates, with the remainder defined by significant numbers of deer and dogs (table 5).[54] This difference is mostly explained by the overwhelming predominance of sheep and goat at al-Basatîn. The focus on a few select domestic animals at al-Basatîn reflects a subsistence regime almost exclusively reliant on animal husbandry with wild animals such as gazelle and fox only marginally represented.

Table 5 – *Comparison of the percentages of animal taxa from Late Neolithic levels at al-Basatîn (NISP = 180) and Tabaqat al-Bûma (NISP = 573).*

	Sheep/goat (%)	Pig (%)	Cattle (%)	Other (%)
al-Basatîn	68.3	13.3	5.6	12.8
Tabaqat al-Bûma	34.0	3.8	4.4	57.8

The proportion of pigs at these two sites also shows marked contrast. The subsistence emphasis on pigs is often regarded as a proxy for human mobility. High relative pig abundance is thought to reflect sedentary settlement because of the difficulty (though not impossibility) of engaging swine in a system of pastoral nomadism.[55] The aggressive disposition of pigs, combined with their propensity for crop and garden destruction, often requires sties for their proper management. Pigs are in greater proportion at al-Basatîn (13.3%) than at Tabaqat al-Bûma (3.8%). Though this distinction may have been driven by local ecological differences, it also suggests that the inhabitants of al-Basatîn were sedentary. In combination with other evidence for a wide range of domestic activities and consumption at the site, this would seem to contradict the architectural evidence that occupation of the site could have been seasonal. On the other hand, the high water requirements of even a small number of pigs would have been met easily at al-Basatîn because of its proximity to the perennial stream there.

50. Plastered floors without true walls at Byblos might also be the floors of tents or tent-like structures, DUNAND, 1973: 14-15; see also CRIBB, 1991: 84-112.

51. BANNING and KÖHLER-ROLLEFSON, 1992; BANNING, 1993: 213.

52. BANNING *et al.*, 1992: 53, 67; GARFINKEL and MILLER, 2002: 60-61.

53. BANNING *et al.*, n.d.; KADOWAKI, 2005 and 2007.

54. BANNING *et al.*, 1994: table 2.

55. FLANNERY, 1983: 183.

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A number of lines of evidence make it unlikely that the similarities and differences we observe among the sites are simply a function of chronological difference. In a number of cluster analyses, the LN3, LN4, and LN5 ceramic assemblages from Tabaqat al-Bûma consistently cluster together, indicating only modest change over an occupation spread over several centuries. The assemblages from al-Basatîn and al-'Aqaba form their own distinct branches in the cluster analysis,[56] while radiocarbon evidence for their contemporaneity would lead us to have expected similarity between al-Basatîn and LN4 or LN5 at Tabaqat al-Bûma. The relatively long duration of Tabaqat al-Bûma, furthermore, makes it rather likely that al-'Aqaba's occupation should have overlapped with at least one of the former's phases, even though we lack radiocarbon evidence to support this. Again, the similarities, in pottery especially, from the three phases at Tabaqat al-Bûma suggests a stability that would make it difficult to attribute al-'Aqaba's assemblage to the same people, despite the sites' proximity.

Overall, comparison of the sites for which we have reasonable samples suggests that the groups responsible for the assemblages participated in the same network of actors, and shared a number of concepts regarding what certain classes of material culture should be like. Thus sickles, axes, and pottery vessels, for example, had similar appearance and, to some extent, expressed characteristics also found at "Wadi Rabah" sites farther west. Presumably the artifacts themselves were actively implicated in the process of community formation and reformation, as residents of one site viewed the pots and tools of other sites' residents during visits, social occasions, and communal work parties. Yet the sometimes subtle differences between them indicate that they made different decisions about how to accomplish these forms and, indeed, which forms to emphasize. This could result in part from incongruity between the social community and the technical communities in which potters and knappers learned their crafts. Alternatively, it could have arisen as producers and users of pots and tools actively negotiated their positions in the community through material culture, sometimes emphasizing links to communities farther west, sometimes local practices or links in other directions. Thus, community was a flexible and negotiable entity with rather fuzzy and mutable boundaries.

56. GIBBS, 2008.

CONCLUSIONS

Fieldwork at al-Basatîn builds on earlier work in Wadi Ziqlab in helping to demonstrate the existence of an extensive Late Neolithic settlement pattern, with several small sites, at least some of which appear to have been farmsteads. However, unless our excavations at this site have simply missed substantial houses of the type discovered at Tabaqat al-Bûma, it would appear that the settlement system was more complex than we originally anticipated. In other words, it may not have consisted simply of closely similar, peer farmsteads and hamlets, possibly associated with one or two small villages. Instead, only some of the smaller sites were farmsteads like Tabaqat al-Bûma. On current evidence, and lacking clear indications of seasonality, it seems unlikely that al-Basatîn was only seasonally occupied. Yet the possibility that it was composed of relatively light structures, or even tents, along with a variety of features and installations used in the management of livestock or the extraction or processing of agropastoral products suggests that it was a different sort of settlement.

Meanwhile, locality WZ 312, very close both to Tabaqat al-Bûma and al-'Aqaba, and perhaps some of the lithic scatters that we cannot assign to the Late Neolithic with certainty, provide evidence for the use of places easily accessible from permanent settlements, and thus "foraging camps" in Binford's terminology,[57] where knappers extracted lithic material and carried out initial core preparation. At WZ 312, a high proportion of amorphous flake cores among lithics found in a colluvium probably represents material transported from flint-extraction areas farther upslope.[58]

It is less certain whether Tell Rakan (WZ 120),[59] quite near al-Basatîn, participated in this settlement system, since we have yet to identify an unambiguously contemporary occupation there. However, given the extremely limited extent of our excavations at Tell Rakan and the clear presence of both Yarmoukian and Chalcolithic deposits of considerable depth, it would not be surprising if the site were continuously occupied over at least part of its area throughout the sixth millennium cal. BC. If so, it would be a likely candidate for the "central" place for which, if it did not serve as a seasonal or logistic camp, al-Basatîn may have been a relatively permanent, satellite settlement.

57. BINFORD, 1982.
58. BANNING, 1996: 37-38.
59. BANNING and NAJJAR, 2000.

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We are not yet able to delineate clearly the circumstances of settlement in Wadi Ziqlab in the sixth millennium cal. BC. We suggest, however, that they took the form of a dispersed community, not necessarily focused on a central site, in which a variety of actors residing at various farmsteads, hamlets, and campsites along the wadi actively negotiated their relationships, in part, through material culture. Through these relationships, they not only formed alliances that allowed them to pool labour, find marriage partners, reduce risk, or acquire various resources, but also forged their identities.

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