THE 1992 SEASON OF EXCAVATIONS IN WĀDĪ ZIQLĀB, JORDAN

by

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Abstract

From May to July 1992 the Wādī Ziqlāb Project undertook excavations of Kebaran and Late Neolithic deposits at two sites in the central basin of Wādī Ziqlāb as well as continuing subsurface survey and geological survey of the wadi. The excavations have revealed that there were more Neolithic structures at Ṭabaqat al-Būma (WZ 200) than expected, and have helped to clarify the chronology and distribution of the lithics and ceramics of the Late Neolithic at Ṭabaqat al-Būma and WZ 310. Toward the end of the Late Neolithic these two sites, along with two other sites the project recorded in 1992, may have formed part of a dispersed community stretched along the wadi.

Introduction

The fifth field season of the Wādī Ziqlāb Project took place from early May to early July of 1992. Following on a brief season of surface survey in 1981, small test excavations of selected sites in 1986 and 1987, subsurface survey of wadi terraces from 1986 to 1990, and, in 1990, more substantial excavations of a Late Neolithic site that the subsurface survey discovered in 1987 (Banning and Fawcett 1983; Banning, Dods *et al.* 1989; Banning, Dods *et al.* 1992), the 1992 fieldwork again concentrated on site WZ 200, Ṭabaqat al-Būma. In addition, we continued the subsurface survey of wadi terraces and carried out more substantial excavation at locality WZ 310, which had been the target of two test probes in 1990, to enlarge our sample of pottery and lithics and to try to identify architecture there.

EXCAVATIONS AT WZ 200, ṬABAQAT AL-BŪMA

While removing backfill from most of the excavation areas of 1990, we opened a number of new excavation areas to enlarge our exposure of the Late Neolithic deposits on the site and began intensive excavation of underlying deposits in areas E34 and F34, where we hoped to find primary deposits of Kebaran material (Fig. 1). Previously most of our sample of Kebaran artifacts came from later Neolithic deposits or from small, deep probes in Areas B and E34. These indicated that the most likely area of concentration for the Kebaran material lay in or near Area F34. New excavation areas at WZ 200 included D31, D32, E32, E33, F33, G33, H33, G35, and H35, as well as small test pits C, D and 2R. Excavation continued in areas E34, F34, G34, and H34, and there were minor excavation activities in areas E35, E36 and J33 (formerly Area A) in attempts to clarify stratigraphic issues remaining from the 1990 season.

The major occupational episodes on the site belong to the Kebaran, Late Neolithic, Late Roman-Byzantine and Recent periods.

The Kebaran Deposits

A team of three people spent almost seven weeks excavating in Areas E34 and F34, below the backfill of the 1990 season, to try and expose undisturbed deposits of Kebaran age and map the distribution of artifacts in detail.

After removing and recording some remaining Neolithic deposits in Area F34, they

1. Map of the southern Levant, showing Wādī Ziqlāb in northern Jordan and the locations of some other sites with deposits of PPNB or Late Neolithic date (E. Banning).

began to remove the extremely compact, cemented deposits that lay below in 5 cm spits in an attempt to understand the depositional processes of this very hard colluvium and to identify any stratification. They encountered Kebaran artifacts in low densities throughout, but with random orientations and distributions that suggested that they were not in their original discard locations, but had been transported from another part of the site along with the colluvium that formed their matrix. Morever, sporadic Late Neolithic artifacts were found together with the Kebaran lithics in the colluvial deposits. The presence of these Neolithic artifacts would further suggest that the deposits were mixed. Data from the analysis of the soil from a profile failed to yield any concrete information regarding the nature and number of episodes which the colluvial deposits represent.

While removing compact soil bearing Kebaran artifacts in the eastern portion of Area F34, however, immediately south of Neolithic wall F34.027, they encountered a large feature constructed of stone slabs and most likely dating to the Neolithic period. This feature, locus F34.026, will be described in the next section.

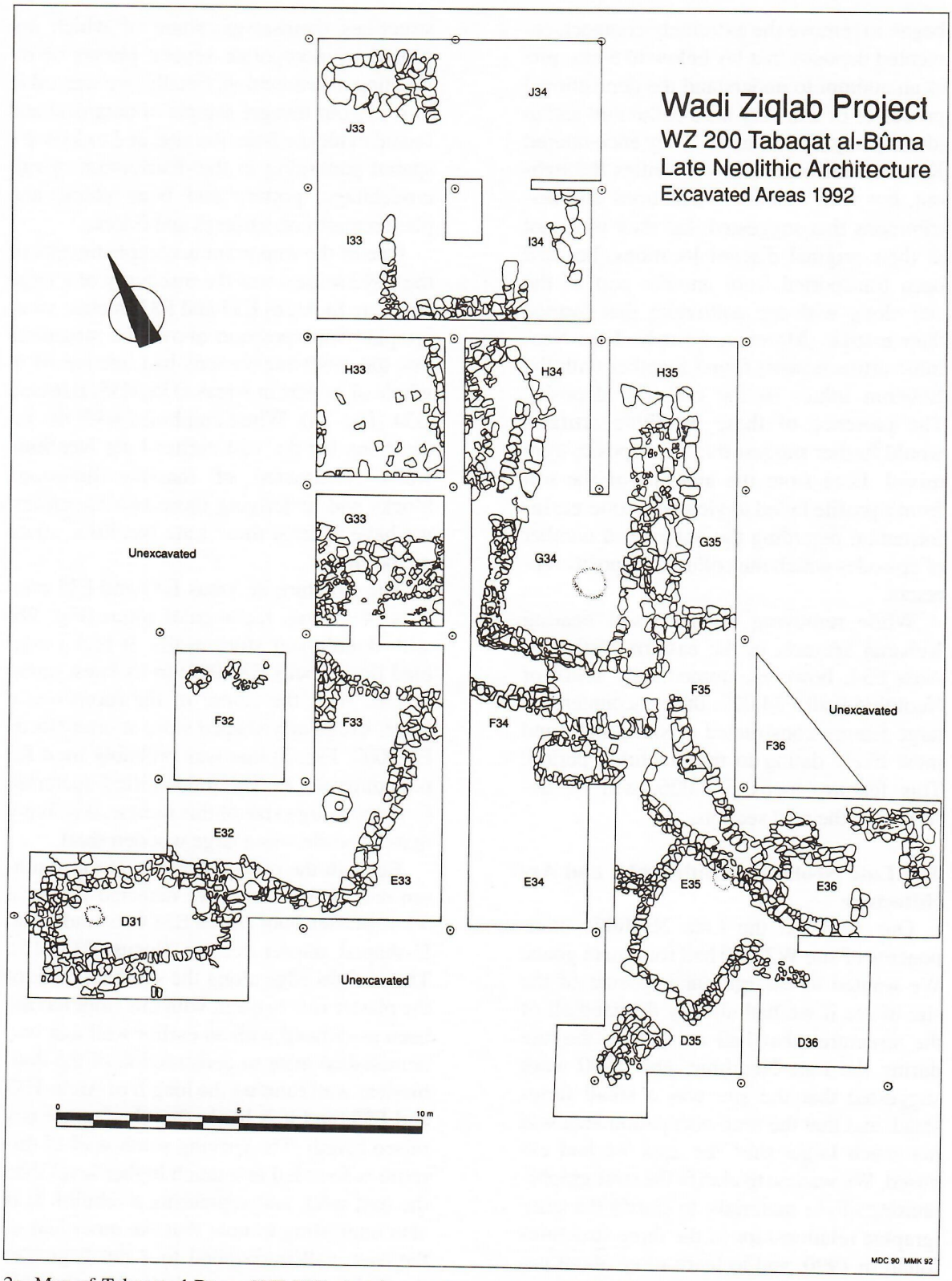
The Late Neolithic Stratigraphy and Architecture

Our work on the Late Neolithic components of site WZ 200 had four main goals. We wanted to enlarge our exposure of the site to see if we had already detected all of the structures that had existed on the site during the Late Neolithic. Our 1990 work suggested that the site was a small farmstead, and that the total occupation area was not much larger than the area we had exposed. We wanted to clarify the stratigraphic phasing of our materials, to clarify the stratigraphic relationships of the three structures found in 1990, and to learn more about underlying structures only slightly exposed. We also wanted to clarify the histories of the structures themselves, some of which appeared to incorporate several phases of rebuilding or renovation. Finally, we wanted to improve our meagre sample of botanical and faunal evidence from the site, and to look for spatial patterning in the distribution of microdebitage, pottery and bone chips, and plant remains on surfaces and floors.

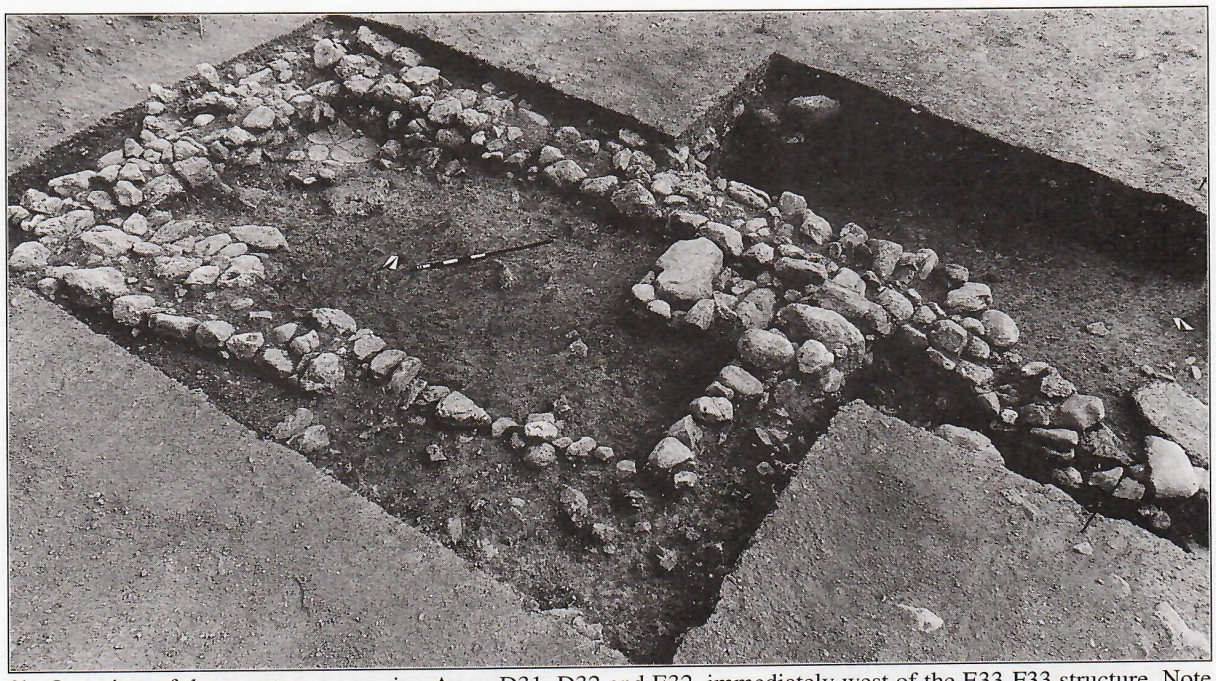
One of the important accomplishments of the 1992 season was the discovery of a large structure in Areas E33 and F33 in clear stratigraphic superposition above the structures that the 1990 excavations had uncovered in whole or in part in Areas D35, E35, E36 and G34 (Fig. 2a). When combined with the indications for the still earlier Late Neolithic walls constructed of massive limestone blocks and underlying those two structures, we have at least three Late Neolithic strata on the site.

The structure in Areas E33 and F33 consists of a long, rectangular room (Fig. 2b) with double-leaf stone walls. It had a cobbled floor (locus E33.006) in its latest phase of use. Near the centre of the room was a large, irregularly shaped stone mortar (locus E33.007, Fig. 3) that was probably used for pounding an as yet unidentified material. Given the large size of this mortar, it is likely that the pestle was a large wooden shaft.

Beneath the cobble flooring at the southern end of this room, we detected part of a white plaster floor (locus E33.016) and a flat, U-shaped plaster feature (locus E33.015). The straight edge along the southeast side of the plaster is consistent with this floor having been associated with an earlier wall that was demolished prior to construction of the double-leaf wall running the length of Areas E33 and F33, and it is likely that the feature is a raised hearth. The curving south wall of this room is founded at a much higher level than the east wall, and represents a rebuild. It is also interesting to note that the inner leaf of the east wall is founded to a much greater depth than the outer one, indicating that this part of the room, at least, was semi-



2a. Map of Ṭabaqat al-Būma (WZ 200) showing architecture from all Neolithic phases that had been exposed by 1992 (M. Campbell and M. Kersel).



2b. Overview of the structure occupying Areas D31, D32 and E32, immediately west of the E33-F33 structure. Note the features in the corners (photo: T. Dabney).

3. View of part of the elongated structure in Areas E33 and F33 at site WZ 200. Note the large mortar left of the metre-stick and U-shaped plastered feature, probably a hearth belonging to an earlier building at this location that had been demolished (photo: T. Dabney).

subterranean.

Excavation of Area E32 to the west of E33 to uncover the rest of the terminal Neolithic room surprised us by revealing, immediately beneath the surface, the corner of yet another structure lying upslope and to the west of the

bulk of the site (Fig. 3). Stratigraphically it is later than the E33-F33 building, but the finds suggest that both were used in about the same period. We excavated small adjoining portions of Areas D32, D31 and E31 (recorded as part of D31) to uncover the rest of this room. It turned out to have a stone bin or platform in its northeast corner, another in its southwest corner, a possible blocked niche in its west wall, and a very interesting paved feature in the north-west corner that incorporated a basalt grinding slab. Like the somewhat lower structure in adjoining Areas E33 and F33, its pottery belongs to a very late phase of the Neolithic, and some of it is harder and better made than in most of the more easterly structures on the site. The room's shallow fill also contained two pierced ceramic disks and some sickle blades.

The 1990 excavation of Area G34 and a portion of H34 had revealed only a portion of a large, well preserved Neolithic structure, and we were only approaching the floor within the structure when excavation was terminated. This season we revealed the rest of the structure by broadening excavation to neighbouring Areas G35 and H35 and gridded and excavated the whole floor of the structure rather than only its southwest corner.

Clearing backfill from G34 and cleaning the underlying deposit very quickly revealed the outlines of a large, circular, plastered feature (locus G34.016, Fig. 4) that appeared to be the central hearth of the structure. We delayed excavation of this feature until after Area G35 could be brought down to the same surface. The feature turned out to have a flat, smoothly plastered bottom and a rim raised about 5 cm that contained ash deposits. Ash and charcoal fragments from this hearth yielded a radiocarbon determination of 6380 ±70 bp (or cal 5413-5239 BC, Table 1).

Area G35, where the eastern wall of the G34 room lay, turned out to be much more complex than we had anticipated. There was also a parallel wall (locus G35.008) farther east built of massive limestone boulders in

4. View of the plastered hearth (locus 016) in Area G34 (photo: T. Dabney).

Table 1. Radiocarbon dates from Ṭabaqat al-Būma, Wādī Ziqlāb. The calibrated date ranges are the 68.3% confidence intervals, some with multiple solutions. The lower five dates are associated with Kebaran artifacts deep in the site, and the upper three with pre-Islamic camps. Determinations were by the Isotrace laboratory, University of Toronto, and usually represent the average of two targets.

Area	Locus	Sample	Material	Uncalibrated Date bp	Calibrated Date BC (AD)
F33	004	TO-4276	Charcoal	1460 ± 60	(550-656)
F33	011	TO-4575	Charcoal	1580 ± 80	(410-596)
G34	002	TO-2117	Charcoal	1680 ± 60	(254-299) (322-421)
A	005	TO-1086	Bone	5740 ± 110	4775-4467
E33	009	TO-3408	Charcoal	6190 ± 70	5236-5193 5184-5060
E33	014	TO-3410	Charcoal	6350 ± 70	5356-5235
G34	018	TO-3412	Ash, charcoal	6380 ± 70	5413-5239
D35	016	TO-2114	Charcoal	6590 ± 70	5562-5475
E34	009	TO-2115	Charcoal	6630 ± 80	5628-5480
F34	017	TO-3411	Charcoal	6670 ± 60	5634-5490
E33	009	TO-3409	Charcoal	6900 ± 70	5831-5649
A	005	TO-1407	Bone	7800 ± 70	6689-6558 6540-6485
B	007	TO-987	Bone	11,170 ± 100	
E34	015	TO-2116	Bone	12,660 ± 430	
F34	030	TO-4592	Charcoal	12,810 ± 480	13955-12465
B	007	TO-989	Bone	13,110 ± 130	
B	007	TO-991	Bone	14,850 ± 160	

two leaves. Both walls had been robbed out over much of their lengths and later walls partially incorporated them. The ruins of the G34 room were also later used as a burial site. A cist-burial (locus G35.003, Fig. 5) of a child about five years of age occupied a place near the middle of the area where boulders had probably been removed from the massive wall G35.008. The poorly preserved remains included little more than a tibia, femur, first permanent maxillary molar, and a few skull fragments. The 1990 excavations had similarly uncovered an intrusive burial (locus G34.009) in the south-west corner of this room, although without a stone cist. This season we discovered yet another burial in the south-east corner (locus G35.018). Like the one in the south-west corner in 1990, the burial appeared to lie directly on clay accumulated on the most recent surface within the room, and was covered with cobbles, probably robbed out of the adjoining walls after the building fell out of use. This one, however, contained two individuals curled up together, one at least 15 years of age and the other about 13 years, and both in a flexed position facing the east wall of the room with their heads to the south. One had its skull resting on its hands as though in sleep. Although there were no associated remains to help us date these burials, it is likely that they are associated with the final Neolithic occupation of the site in the structure in Areas E33 and F33. Radiocarbon determinations on bone collagen will help us test this hypothesis. To the east of wall G35.008, which is more than a metre thick, were two superimposed cobbled floors which may be associated with a rebuilding of a robbed out portion of wall G35.008. Finally, portions of earlier walls were incorporated into the curving wall G35.005 that is founded on sediments that overlie the cobbled surface (locus G35.024).

Renewed excavations in Areas F34 and F35 helped to clarify fragments of structures in Area F35 that had been cut by later construction activity on the site and also revealed a large cist-grave, similar to the one excavated in Area A (J33) in 1987. A low terrace wall that lay immediately south of the south wall of the G34 structure turned out to be built over, at its eastern end, the remnant of a rectangular structure some 3.5m in width and apparently roughly contemporary with the corner of a building that underlies

5. Excavation of a small cist-burial (G35.003) in Area G35 (photo: T. Dabney).

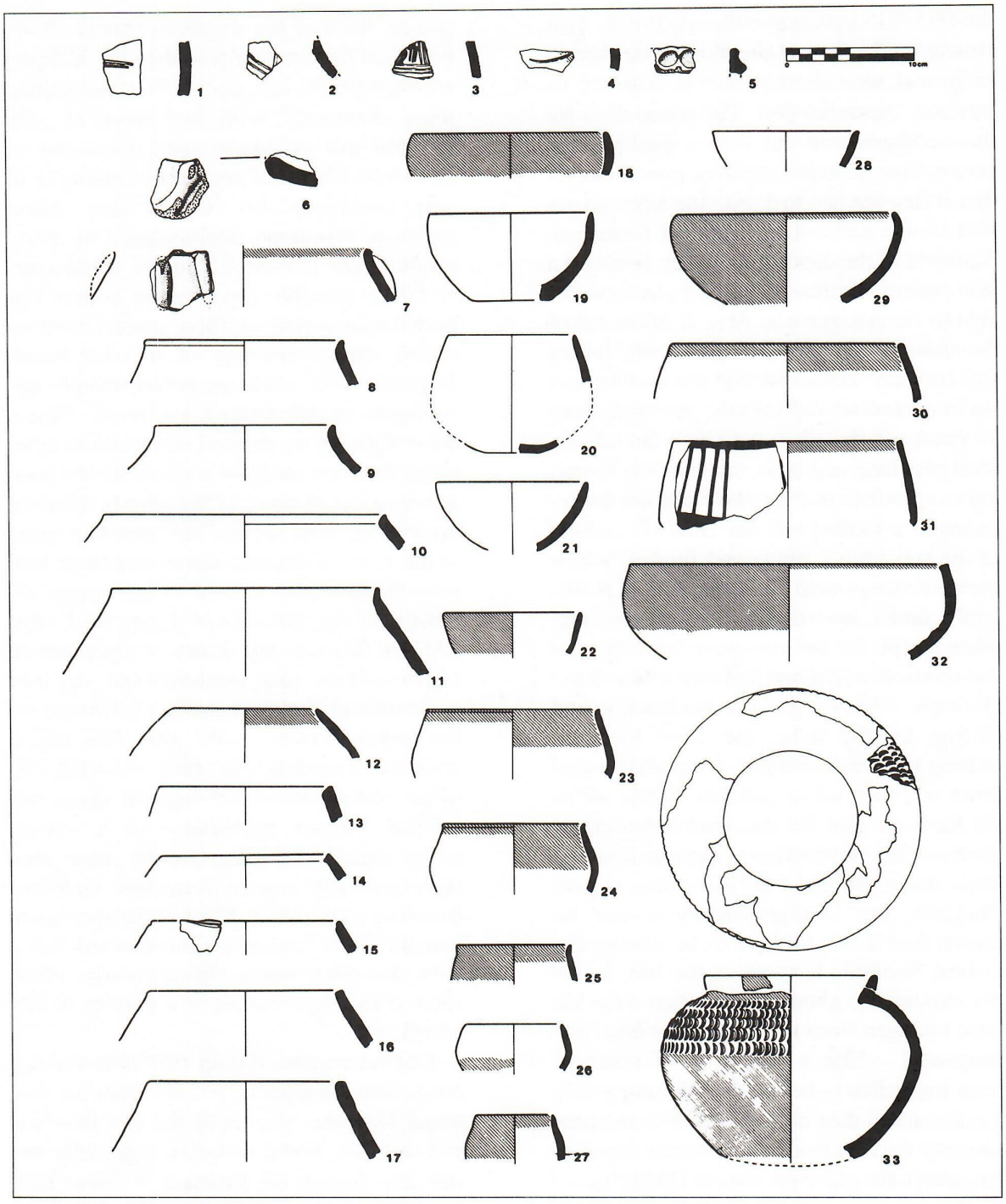
the D35-E35 building to the south-east. This structure, like the last-mentioned one, apparently was semi-subterranean at least on its southern (upslope) end. The foundation for this southern wall cut into a hard-packed, pottery-free deposit extending into Area F34 that at first seemed to date to the Kebaran period on the basis of the lithics it contained. Removal of the deposit, however, revealed a slab-covered feature of similar size and design to the cist-grave in Area A. Removal of the slabs and excavation of the soft, loamy soil beneath confirmed that the feature was the grave for two individuals, one aged about 16 years and the other, wearing a dentalium-shell necklace, about six months. It is tempting to speculate that the skeletons are the remains of a mother and her child. Pathology of the sub-adult's tibiae and fibulae, which showed enlargement and deformation, is currently under investigation. It appears that when the pit for the cist-grave was dug, the soil removed contained Kebaran artifacts exclusively. After the grave's construction and closing by the slabs, the same bladelet-bearing soil was mounded on top and packed down to create a low tumulus. While we as yet have no date for this double-burial, on the basis of construction technique it seems likely that it, like the 1987 cist-grave, is Late Neolithic, but stratigraphically it can be shown that it would have to be among the earliest Neolithic features on the site. So far our attempts to obtain radiocarbon dates on bone collagen from the grave have been unsuccessful, while a fragment of charcoal from immediately below the skeleton yields a radiocarbon date of 12,810 ± 480 and presumably derives from the Kebaran deposits into which the grave pit was cut (Table 1).

The Late Neolithic Pottery and Lithics

Ceramics (Fig. 6)

Our sample of pottery from Ṭabaqat al-Būma was increased by some 10,000 sherds in 1992, including more than 600 that were diagnostic in some way. As in the previous season, most of the sherds in almost all deposits on the site that post-date the Kebaran are very coarse, soft, poorly fired and friable, most commonly with inclusions of sub-rounded grit or coarse sand consisting of limestone, chert and crystalline quartz, or of silty calcareous clay. Others have coarse grains of limestone, accompanied by many foraminifera and fine silt quartz, while a rarer fabric, possibly representing pottery imported from a more northern source, contains coarse sand consisting of rounded basalt fragments. The wares are predominantly salmon-pink or pale yellow, and some of them show signs of an unusual construction technique that may partially account for the poor preservation of most of the sherds. Distinct layering in cross section indicates that some of the vessel walls, and sometimes bases too, were thickened by addition of more paste, almost with the character of a very thick slip, and that this was left to dry in place before addition of the final, generally red, slip that is the almost exclusive surface treatment on the earlier vessels on the site. This added layer has a tendency to crack and spall off, often robbing us of information about the original surface appearance of a vessel, while vessel fragments that do retain this layer generally require immediate attention from our conservator. Most of the sherds for which the exterior surface is preserved, however, are plain wares; the remainder often show a red slip over all or a portion of the vessel.

Our excavations during 1992 uncovered a much better sample of pottery from the terminal Neolithic phases of the site than we had in 1990. Some contexts, especially inside and outside the structure in Areas E33 and F33, contain much finer, harder, thoroughly fired wares in small proportions, most of the assemblage continuing to consist of the friable plain wares. Some of these are bowls with a black or grey burnished surface or, more rarely, burnished red grading into black. There are also well fired holemouth



6. A selection of pottery from the 1992 excavations at Ṭabaqat al-Būma, Wādī Ziqlāb (J. Pfaff).
It includes incised/combed body sherds G35.67.22, F34.46.18, F34.77.1 and G35.67.27 (nos. 1-4); finger-indented rim F34.76.4 (no. 5); applied decoration on F33.24.6 and F33.5.3 (nos. 6 and 7); jar rims E33.10.13, F33.4.4, E33.3.42, E33.32.1, E33.9.10, E33.4.6, F33.12.46, F34.33.15, E33.22.8, F33.4.1 (nos. 8-17); bowls and cups E33.8.2, G35.74.8, E34.66.3 + E33.11.17, F33.6.1, F33.12.5, F34.34.2, F34.34.1, F33.6.4, F34.32.4, F34.36.16, F34.17.2, E33.31.4, F34.17.5, G35.54.3, F33.12.1 (nos. 18-32); and the squat jar with 'thumbnail' impression, G35.67.24 (no. 33). Diagonal hatching represents red slip except for F34.31.16, E33.31.4 and G35.67.24 (all burnished black slip).

jars with a squared or bevelled rim in a yellowish ware, sometimes with blackened interior surface, and usually with limestone and chert inclusions very similar to those in the more poorly fired, early wares. Both these classes of material can be paralleled by almost exactly the same sherds at nearby site WZ 310.

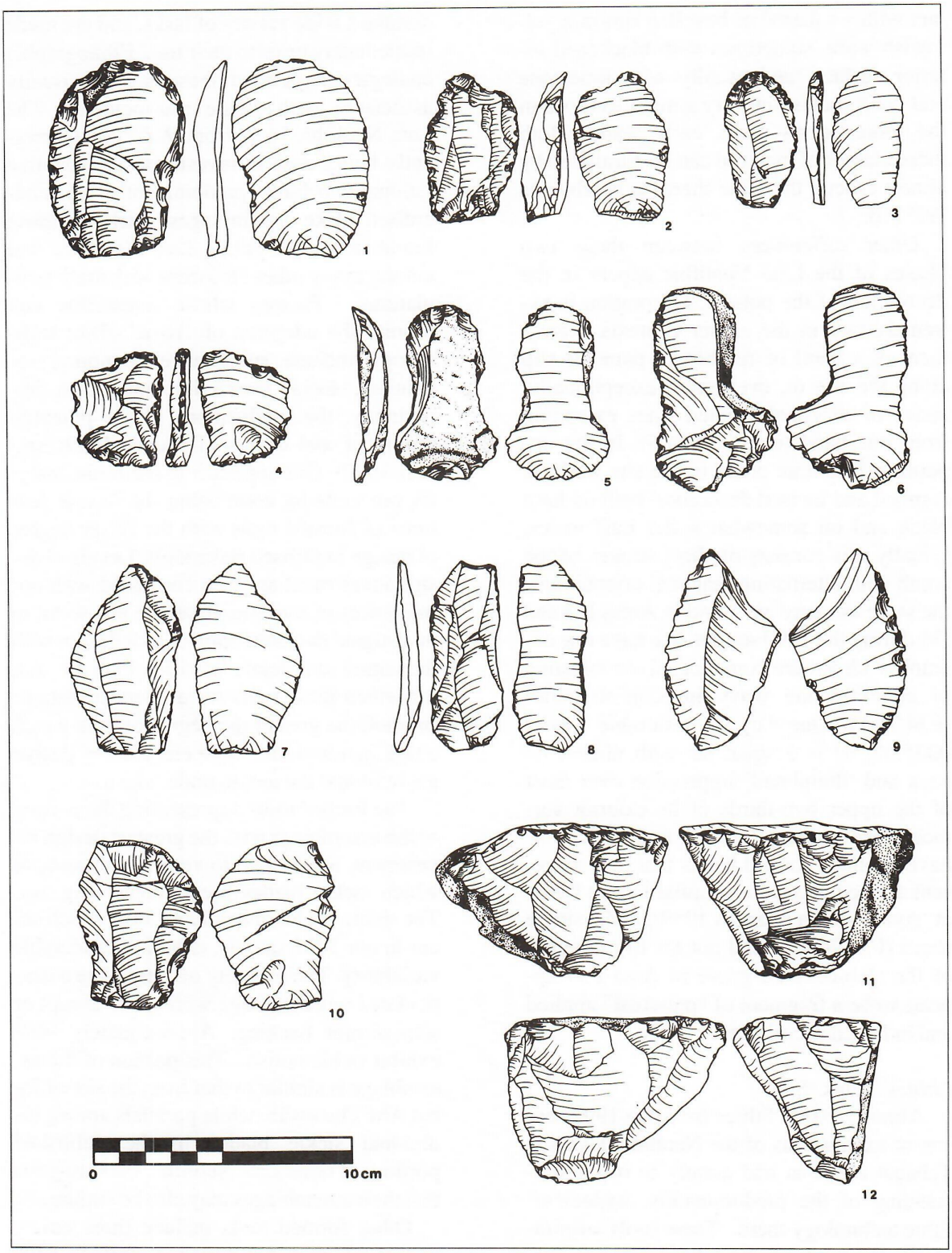
Other differences between these two phases of the Late Neolithic appear in the decoration of the pottery. Decoration is extremely rare in the earlier contexts. Rarely there is a band of red-brown paint or slip along the rim or, even more exceptionally, zones of diagonal painted lines extending from this band (e.g. G35.54.3). In the uppermost Neolithic phase of the site we have combed and incised decoration both on hard black and on somewhat softer buff wares. Usually this consists of short strokes of the comb with alternating diagonal orientations, the same as many we found in Areas I33 and I34 during the 1990 season. We have one example with a more complicated combination of combing and wavy incision in zones (F34.77.1). One largely restorable vessel (G35.67.24) is a squat jar with almost no neck and 'thumbnail' impression over most of the upper two-thirds of its exterior surface. Two sherds (F33.5.3 and F33.24.6) have applied rounded bands that may represent applied decoration similar to that found at 'Ayn al-Jarba (Kaplan 1969), and a single sherd (F34.76.4) found not far from the top of the slab-covered grave in Area F34 appears to be a fragment of "pie-crust" applied and indented decoration.

Lithics (Figs. 7-9)

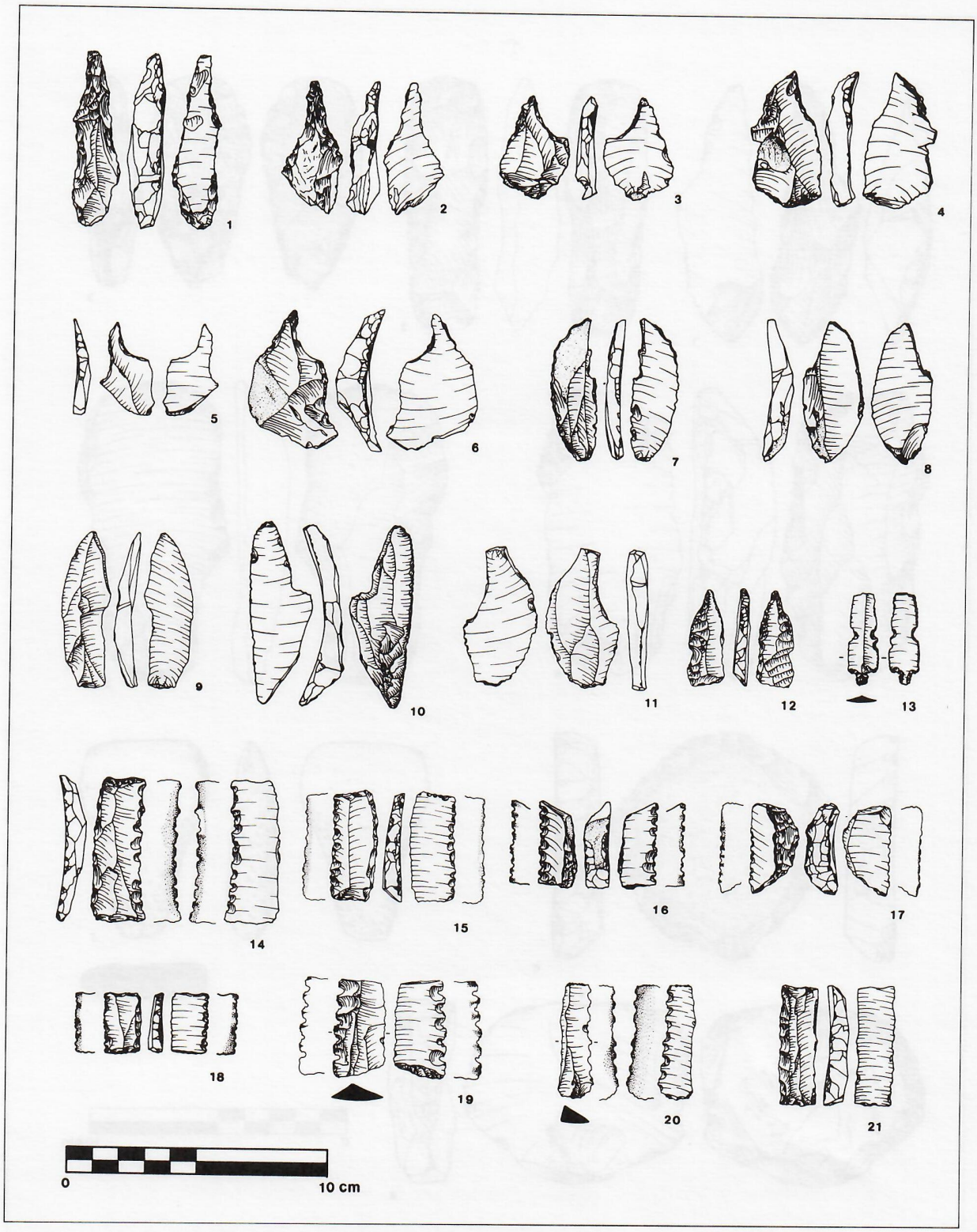
Almost 10,000 lithics from the 1992 season of excavations of the Neolithic levels at Ṭabaqat al-Būma add greatly to our understanding of the predominantly 'expedient' lithic technology there. These tools are simple flakes produced by a hard-hammer percussor and have no or only minimal retouch (Fig. 7). 'Expedient' tools are made to undertake a wide variety of tasks, and are made immediately prior to their use. Ethnographic analogies suggest that these tools are usually associated with single use-incidents. The Late Neolithic tools from WZ 200 are presently being used to investigate the adaptive rationale behind predominantly destandardised flake assemblages, such as those found in the Levantine Late Neolithic and among many other Holocene sedentary populations. Factors whose interaction can prompt the adoption of "basic" flake technology include subsistence economy, sedentism, social interaction and, most importantly, the implications of the potential failure of tool design (Torrence 1989; Siggers 1992). Our approach to the lithic analysis proceeds by contrasting the design features of formed tools with the lesser degree of design in utilised flake tools. Levels of design investment are then compared with our inferences of tool use, based on use-wear, to investigate the interaction of tool design with the nature and degree of risk which the task for which these tools were intended entails. In brief, the greater the degree of risk which a task involves, the more elements of design are built into the tool to undertake it.

The formed tools, representing the portion of the assemblage with the greatest design investment, are limited to very few classes, of which sickle blades predominate (Fig. 8). The sickle blades, more than 150 of which occur in our 1992 sample, exhibit considerable variability. The majority of them have a denticulated working edge with either abrupt or semi-abrupt backing. Approximately 90% exhibit sickle polish. This portion of the assemblage is similar to that from the site of Jabal Abū Thawwāb, while parallels among individual sickle blades in the published portions of other Late Neolithic sites suggests that their assemblages may also be similar.

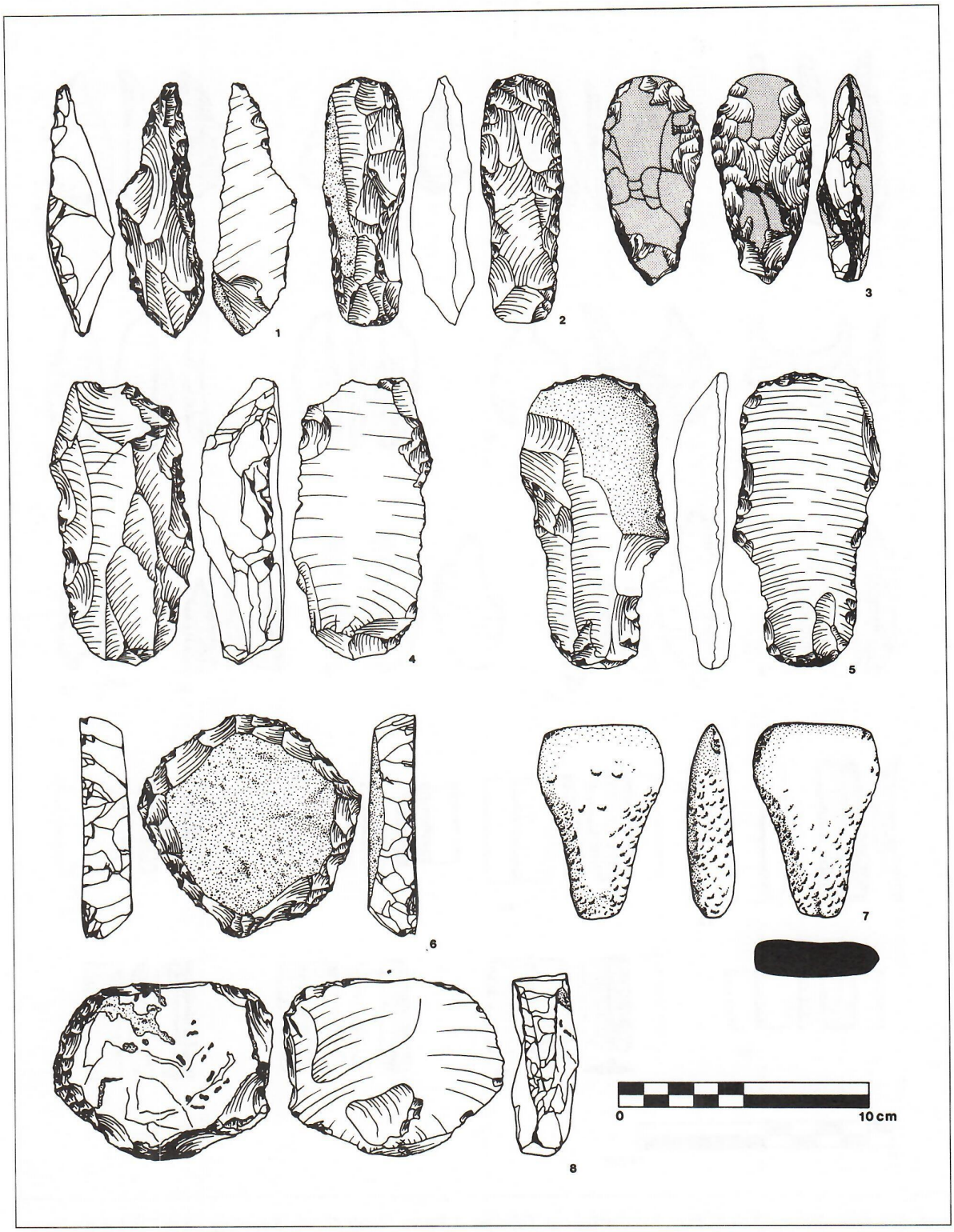
Other formed tools include three adzes, one of which had a polished working edge (Fig. 9), awls, borers, burins, scrapers and retouched and unretouched blades (Fig. 8).



7. Examples of some typical flake and blade technology from Ṭabaqat al-Būma, Wādī Ziqlāb (J. Pfaff). Unifacially retouched flakes (nos. 1, 2, 6, 9, 10), bifacially retouched flake (no. 4), endscrapers (nos. 3 and 5), partially retouched blade (no. 8), unretouched, used flake (no. 7), and flake cores (nos. 11 and 12).



8. A selection of formed tools from excavations at Ṭabaqat al-Būma, Wādī Ziqlāb, Stippling on the sickle blades indicates the extent of sheen (J. Pfaff).
Awls/borers (nos. 1-6), burins (nos. 7-11), a single projectile point (no. 13), and a sample of sickle blades to illustrate the variety present on the site: backed and denticulated (nos. 14-18), denticulated (nos. 19 and 20), and backed and partially retouched (no. 21).



9. A selection of larger formed tools from Ṭabaqat al-Būma, WādīZiqlāb (J. Pfaff).
No. 1: pick (E33.8.20), 2: adze (G34.12.7), 3: partially polished adze (E33.15.56), 4-5: unifacial adzes (F34.30.32 and E36.17.83), 6: tabular scraper (G34.10.3), 7: ground stone implement, possibly a hoe (G33.74.10), and 8: unifacial scraper (G35.48.43).

Retouched blade forms include endscrapers, burins and backed pieces. Unfortunately no complete temporally diagnostic projectile points have, as yet, been found. In fact, it is odd that our large sample from two major seasons of excavation contains only a single identifiable, broken point (Fig. 8). The majority of the formed tools were made on chert of high to medium quality, whereas the 'expedient' flakes were made on material of medium to poor quality. Poor and medium grades of chert are available in the immediate vicinity of the site. Higher grades of lithic raw material can be collected 500 m west of the site, where we now have some evidence for prehistoric use of this source.

Most of the lithic assemblages of the Late Neolithic on the site, of both the earlier and the later phases, indicate an 'expedient' flake tool technology. The earlier phase, however, has a significant blade tool component and, to a lesser degree, a bladelet component. Further technological and use-wear analysis of these assemblages will provide information to help delineate the two tool traditions and associate the various technological lithic components with the tasks in which they may have been used during the Late Neolithic.

Ground Stone

The ground-stone repertoire from the 1992 excavations is fairly small. In 1990 we had some large querns, handstones and small mortars. In 1992 we added some small mortar fragments, one very large limestone mortar or pounder, some basalt pestle fragments and a complete small pestle, several incomplete handstones, and a single pecked basalt adze (G35.74.10). One of the project paleoethnobotanists is sampling the surfaces of some of these ground stone artifacts in the hope of recovering phytoliths from plants that may have been processed with them. We also have small limestone objects that are likely capstones for bow-drills (E33.19.9 and G33.8.1).

Bone Tools

The repertoire of bone tools recovered from the site is very small. In addition to several polished bone fragments that have been recognized to date, there are large parts of several bone awls.

Evidence for the Economy of Late Neolithic Ṭabaqat al-Būma

In addition to evidence from the lithics, pottery and ground stone, animal bones and plant remains from the site will contribute to our understanding of its inhabitants' economy. To date analysis of these materials from the 1992 season is not complete, but we hope that preservation of plant remains from our 1992 soil samples will be better than it was in 1990. The animal bones we have analysed from the 1990 season indicate that sheep or goats, cattle and domesticated pigs were important contributors to subsistence, but there were also significant contributions by red and fallow deer, wild boar and possibly wild cattle (*Bos primegenius*). These suggest, not only that hunting may still have been an important aspect of the economy, but also, in conjunction with fragments of conifer (including pine) charcoal at the site, that some of the area not far from the site was forested. Interestingly, we have not identified very many of the tools at the site as weapons. There is a single broken projectile point and it is conceivable that some of the small blade fragments we have may be portions of others. In addition to the more direct evidence from the bones, a number of bone tools, probable stone weights and pierced ceramic disks that could be small weights or spindle whorls may well be part of the tool kit for spinning wool and weaving on looms.

Post-Neolithic Occupation of Ṭabaqat al-Būma

Site WZ 200 appears to have been abandonned almost completely from about 5000 BC (7000 bp) through to the third century AD. From that time onward, we have some

evidence for two periods of occupation on the site. Pottery, glass and crude arrangements of stones pulled from the Late Neolithic rubble appear to be associated with camping activity, probably by pastoral nomads, on the site sometime between the late third and early fifth centuries AD. A radiocarbon date of 1680 ± 60 bp on charcoal from a context bearing Late Roman pottery from our 1990 excavations unfortunately has more than one likely solution when calibrated, but still fits rather tightly within this period: cal 254-299 AD and cal 322-421 AD (68.3% confidence intervals). Two dates from Area F33, one from the bottom of a bread-making hearth and one from the surface below it, yielded dates of 1460 ± 60 and 1580 ± 80 bp (cal 550-656 and 410-596 AD). In addition, there is abundant evidence for recent occupation of the site by tent dwellers, although we cannot say when this first began. One of the more distinctive features of the recent occupation is the superposition of several thin but distinct layers of packed dung and ash that cap most of the site's deposits. In addition, like the late pre-Islamic occupants of the site, its recent inhabitants have made liberal use of large cobbles that probably were once parts of Neolithic walls in order to construct low terraces or to border their tents. In some cases these are constructed on the tops of ruined Neolithic walls which in effect served as foundations. There is also a recent robber pit centred on the baulk between Areas F33 and G33 that probably was dug in August 1987 after our excavations were terminated on the site that year.

One of the more interesting features we uncovered during the 1992 excavations that pertains to the late pre-Islamic period is a mud-plastered, pebble-filled hearth that was probably used as a bread-oven or *tābūn* (locus F33.007). If we are correct in our interpretation of this feature, its users would have heated the pebbles with a dung fire, dusted off the ash once the pebbles were hot, then thrown bread dough onto the pebbles to bake it, much as people still do in some parts of Jordan today. The feature is associated with Byzantine pottery and it is sealed by dung-floor layers of recent occupation on the site. As we have seen, radiocarbon dates on associated materials date it to the sixth or seventh century AD.

EXCAVATIONS AT WZ 310

During the 1987 field survey, Ian Kuijt observed a few sherds of possible Neolithic date eroding from a road cut about 600 m northwest of Ṭabaqat al-Būma, and the terrace immediately above this cut was one of the localities for subsurface survey in 1990. The two 1990 test probes revealed tantalizing material that appeared to date very near the conventional boundary between the Late Neolithic and Early Chalcolithic in the southern Levant, including grey or black burnished ware and denticulated sickle blades, but our sample was quite small and the probes were too small for us to identify any architecture. During the 1992 season, consequently, we enlarged our sample of the site by excavating an area of 4.5 x 3.5 m.

Stratigraphy and Architecture

Although isolated "grain-wash" body sherds that occur as surface finds on the south side of the road, opposite locality WZ 310, suggested that there may be an EBIB component on some part of the site, continued excavation revealed that Chalcolithic and probable Early Bronze Age material also underlay fairly thick deposits of Late Neolithic material in our excavation of Area A (which includes probe A from 1990). At first Area A appeared to have no occupation later than the terminal Neolithic. The upper 30 or 50 cm consist of grey, marly slopewash with very few diagnostic artifacts, that overlies a surface (locus A.008) with flat-lying sherds that are probably mid-fifth millennium (uncalibrated) in date as well as stone tumble (locus A.007) that seemed to be from col-

lapsed architecture. Beneath the surface was an ashy lens (locus A.010) over a browner fill (loci A.011 and A.012).

Deposits in and below this fill, however, and in pits (loci A.016, A.017 and A.018) below the ashy layer, began to show large numbers of clearly later artifacts, some belonging to the Early Bronze Age. Among these were two large Canaanaean blades. The most likely explanation is that all of the Late Neolithic material in Area A has been redeposited, probably from upslope, even though we did not detect any mixture of more recent material among it. Some of the material is stratigraphically later than a white, marly, laminated layer that the project geologist identifies as the result of ponding, perhaps behind a wall or other obstruction, and this ponding itself seals the late pits. We hope that deposits a little way up the hill may still preserve some relatively undisturbed Neolithic material, although inspection of the surface and small gullies suggests that they do not.

Apart from the pits that contained post-Neolithic material, Area A architecture was limited to only the small remnant of the corner of a building (locus A.013) most of which had been lost in the road cut, and a possible terrace wall or field clearance (locus A.020), poorly constructed from large stones, that may have been the barrier that collected slopewash and Late Neolithic material behind it.

Pottery and Lithics

The most interesting material from WZ 310 pertains to the very end of the Neolithic, but the site also yields artifacts as late as the Early Bronze Age.

From the surface (A.008) down to locus A.012 there were large numbers of artifacts, especially in the north-east corner of the excavation area, that belong to the end of the Neolithic. Principal among these are the grey and black burnished sherds, some showing a gradation from black to red on their external surfaces, and either black or tan sherds with coarsely combed decoration (e.g. A.47.14, A.49.20, A.51.14, A.63.36). In addition there are rare instances of punctate decoration (A.54.6, A.43.3) and red-brown painted decoration. In many instances these closely parallel sherds found in the latest Neolithic deposits at Ṭabaqat al-Būma as well as in Late Neolithic components at Batashi, Jericho, Munhatta and Wādī Rabah (Kaplan 1955; 1958a; 1958b; Perrot 1964; Kaplan 1972; Kenyon and Holland 1983). An unusual ledge handle (A.68.4) in the hard, black-burnished ware, has an almost rectangular plan with slightly concave sides, and may have broken from a large platter-like vessel.

Here there are also sherds with Wadi Rabah parallels that do not occur in our large sample from site WZ 200. Among these are heavy triangular rims (e.g. A.54.1, A.54.2) and well fired, greenish buff, holemouth rims with an angular interior thickening (e.g. A.47.19, A.53.4).

The lithics also point predominantly to a date late in the Late Neolithic. As at Ṭabaqat al-Būma, throughout the Late Neolithic, the bulk of the lithic assemblage represents an expedient technology, with virtually the only "formed tools" being bifacial adzes, chisels, retouched flakes, blade tools, and sickle blades. The sickle blades, in particular, share many similarities with those recovered from WZ 200. Both assemblages are made up of predominantly denticulated and abruptly backed pieces, quite unlike the sickle blades typical of Chalcolithic assemblages. Lithic tools from both sites are made from a similar variety of local cherts. And also as at Ṭabaqat al-Būma, we have as yet identified only one projectile point in the assemblage. As this point is only a fragment, it has limited value as a temporal marker. Two Canaanaean blades occurred in the deepest horizons of the site (locus A.019). Closer examination of the nature of the tools from this locus and ones above it will help clarify

to what extent any of the superimposed deposits may have mixed material.

Subsurface Survey in Wādī Ziqlāb

Because the Neolithic occupation of site WZ 200 turned out to be more extensive than we had anticipated, we only conducted subsurface soundings at three locations along 'Ayūn Ziqlāb as well as three more on the peripheries of site WZ 200 itself. As in 1990, off-site soundings were numbered in the 300-series to make them easily distinguishable from sites where cultural material was known to occur, and those that are not clearly sites of ancient human occupation or activity are termed "localities."

The first of these, WZ 311, was placed on a scarp near the road about 100 m north-west of WZ 200, where the project geologist had noticed some possibly Upper Paleolithic artifacts in an old colluvium. Although the locality did produce some lithics, this sounding was closed after a few days when it became clear that the artifacts had probably been transported from some place farther upslope.

Locality WZ 312 was placed in a terrace opposite site WZ 310. Even on the surface here we were able to find quite a few chert cores, and the sounding indeed yielded 116 sherds, most probably of Roman or Byzantine age, as well as fairly large numbers of lithics, particularly cores. Although at least some of the pottery seemed to represent camping activity on or near the locality, it was fairly clear that the lithics had been transported from upslope – indeed we would expect cores to roll downhill more easily than would flakes – and we sought a source for this material by placing an additional sounding much farther upslope.

We departed from our planned program of soundings by placing a probe, locality WZ 313, well above WZ 312 in an attempt to discover the source of the lithics that we had been finding in the latter locality. It did not turn out to be an undisturbed, primary deposit of prehistoric material culture either. Although there were many lithics here, they were mixed with 19 sherds, again mainly of Byzantine age.

An unexpected bonus of the work at locality 313, however, was the discovery of a likely source for most of the lithic raw material used at site WZ 200. A brecchia that occurs just uphill from (south of) the locality is rich in flint nodules, many of which have the same colour and texture as flint used at Ṭabaqat al-Būma during the Neolithic. It is likely that this wealth of flint of relativly high quality is not only responsible for the abundance of cores downslope from the brecchia, but that this was a source of raw material that WZ 200's Neolithic inhabitants knew well. We are now attempting to characterize or "fingerprint" these flints by their trace elements and microfossils to see if they are indeed the ones most likely used at WZ 200.

At the same time our excavations of Kebaran deposits at site Ṭabaqat al-Būma were indicating that the artifacts were oriented randomly within a colluvium and had probably been transported there along with the soil. Consequently, we also placed some test trenches on the slope above the site, where there were small terraces, to see if we could find the source of this material.

Area C was the first of these trenches above site WZ 200. It was located on the top of a prominent knoll in the slope, where the surface was flat enough to be a possible habitation place. It produced almost no cultural material and we hit bedrock only a few centimetres below the modern surface.

Area D was located farther downslope, where a shelf in the bedrock provided an opportunity for soil to collect and where there seemed to be some possibility of a rockshelter. It also produced very little cultural material and bedrock appeared only a short distance below the surface, in spite of the organic-rich soil found here that seemed likely to be cultural in origin.

We were forced to conclude that the orig-

inal resting place of the Kebaran materials had been eroded away prior to Late Neolithic occupation of the site. This would be consistent with the geological results that indicate a period of erosion some time prior to the mid-eighth millennium bp (Banning *et al.* 1992; Field 1993).

Around site WZ 200, we also cut back a natural scarp north of the site below the rockshelter (Area 2R) where the project geologist had noted some mud brick and a possible hearth. The depth of the mud brick below the modern surface suggested the possibility that it was ancient, but work in Area 2R soon indicated that it was modern, although its deposits still proved interesting. Barbed wire was found next to the section through a low mud brick wall, and this wall soon proved to be the western boundary of a large trench that had been filled with silt during several episodes of flooding. Informants from Tibna told us that this large trench, along with a whole camp, had been destroyed and buried during a major flood of 1975. Some 2 m of deposit above the trench had apparently slumped down in a landslide during this flood, burying this part of the camp quite deeply in a very short time. Although these events are very recent, they are instructive in that they indicate one way in which some of the ancient and prehistoric sites in the valley bottom could have been buried well beyond the reach of most archaeological surveys. The possible hearth or pit filled with stone and ash occurred in a location that is stratigraphically well below the mud brick and the buried trench, and it is indeed possible that it is prehistoric. Since we found no artifacts associated with it in the very small volume of soil we removed in cleaning back the scarp, we are undable to date it at present, but we hope to have a radiocarbon date for it in future.

Geological and Botanical Work in Wādī Ziqlāb

The project geologist, John Field (Western Washington University), spent a good deal of his research time this season studying the landslides that occurred in connection with the previous winter's unusually large snowfall and rainfall, and interviewing local residents about earlier landslides in Wādī Ziqlāb's catchment. More than 150 major landslides, excluding ones that may have been triggered by human activity, had occurred in the central part of the basin during this bad winter, one of which was large enough to dam Wādī Ziqlāb's stream. The magnitude of earth movement during wet winters has important implications for the visibility and spatial integrity of archaeological sites in some stretches of the valley bottom, as we have seen in the case of Area 2R at site WZ 200. A full report on this aspect of our work will appear elsewhere.

In addition, the geological work included describing and explaining soils and other deposits within the excavation areas.

The botanical survey in 1992 was limited to the collection of off-site samples to serve as controls for the phytolith analyses being carried out on excavated contexts. Anita Buehrle (1992) has so far completed analysis of one soil column from the baulk between Areas F33 and F34 (former Area B).

Some of the results of our environmental surveys have been reported elsewhere (Banning 1993; Field 1993).

Acknowledgements

Our research in WādīZiqlāb has been funded by the Social Sciences and Humanities Research Council of Canada in 1986, 1987, 1990 and 1992. Computer equipment for the field came from the research grant portion of a Canada Research Fellowship. The University of Toronto provided computers for post-excavation analysis. The Royal Ontario Museum, through the agency of its director, Dr. John McNeill, provided support for Dan Rahimi's participation in the field season.

We owe a number of people our special appreciation for the assistance they gave us

this year. We would like to thank Dr Safwan Tell, then Director-General of the Department of Antiquities of Jordan, for his support of our research. We would also like to thank Dr Zeidan Kafafi (Yarmouk University) for permitting us to view the collections from excavations at Jabal Abū Thawwāb. We also appreciate the kindesses of Drs Pierre and Patricia Bikai at ACOR. Our thanks go to Taylor Dabney for the photography, to Julia Pfaff for all of the illustrations of pottery, objects and lithics, and to Morag Kersel for final maps and plans. Natalie Rogers kindly carried out analysis of a portion of the faunal remains from the 1992 excavations. Susan Maltby was the project conservator, John Field was the project geologist, Sandra Low and Stephen Monckton did flotation, Rula Shafiq did the field osteology, Anita Buehrle processed phytolith samples, and Julie Acheson was our cook. And, finally, many thanks to crew members Anita Buehrle, Margaret Darmanin, Adam Ford, Claire Loader, Sandra Low, Stephen Monckton, Sally Randell and Rula Shafiq, to Abd al-Karim Yusef, and to our work crew from Tibna, Dayr Abū Sa'īd, Jenin aṣ-Ṣafa and Zimal for their efforts.

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Bibliography

Banning, E. B.
1993 Noble Harvests and Bald Countries: Environmental Archaeology in Wadi Ziqlab, Jordan. Pp. 98-104 in R. Jamieson, S. Abonyi and N. Mirau (eds) *Environment and Archaeology: a Fragile Coexistence: Proceedings of the 24th Annual Chacmool Conference,* Calgary: University of Calgary.

Banning, E. B., Dods, R. R., Field, J. , Kuijt, I. , McCorriston, J. , Siggers, J., Ta'ani, H. and Triggs, J.
1992 Tabaqat al-Buma: 1990 Excavations at a Kebaran and Late Neolithic Site in Wadi Ziqlab. *ADAJ* 36: 43-69.

Banning, E. B., Dods, R. R., Field, J., Maltby, S. L., McCorriston, J. , Monckton, S. , Rubenstein, R. and Sheppard, P.
1989 Wadi Ziqlab Project 1987: A Preliminary Report. *ADAJ* 33: 43-58.

Banning, E. B. and Fawcett, C.
1983 Man-land Relationships in the Ancient Wadi Ziqlab: Report of the 1981 survey. *ADAJ* 27: 291-309.

Buehrle, Anita
1992 *Analysis of Phytolithis and Paleoclimatic Change at Wadi Ziqlab, Jordan.* M.A. thesis, Department of Anthropology, University of Toronto.

Field, John
1993 Rainfall patterns and landscape changes in Wadi Ziqlab, Jordan. Pp. 257-59 in R. Jamieson, S. Abonyi and N. Mirau (eds) *Environment and Archaeology: a Fragile Coexistence: Proceedings of the 24th Annual Chacmool Conference,* Calgary: University of Calgary.

Gero, J. M.
1991 Genderlithics: Women's Roles in Stone Tool Production. Pp. 163-193 in J. M. Gero and M. W. Conkey (ed.) *Engendering Archaeology.* Oxford: Blackwell.

Kaplan, J.
1955 Tuleil Batashi in the Sorek Valley. *IEJ* 5: 273-274.
1958a Excavations at Teluliot Batashi in the Vale of Sorek. *Eretz-Israel* 5: 9-24, 83*-84* (Hebrew with English summary).
1958b Excavations at Wadi Rabah. *IEJ* 8: 149-160.
1969 Ein el Jarba. Chalcolithic remains in the Plain of Esdraelon. *BASOR* 194: 2-31.
1972 The Wadi Rabah culture – twenty years after. *Haaretz Museum Bulletin* 14: 23-30.

Kenyon, K. and Holland T.
1983 *Excavations at Jericho V.* London: British School of Archaeology in Jerusalem.

Perrot, J.
1964 Les deux premières campagnes de fouilles à Munhatta (1962-1963), premiers résultats. *Syria* 41: 323-345.

Siggers, J.
1992 *The Lithic Assemblage from Wādī Ziqlāb: A Late Neolithic Site in Northern Jordan.* Paper presented at the Canadian Archaeological Association, London, Ontario.

Torrence, R.
1989 Retooling: Towards a Behavioral Theory of Stone Tools. Pp. 57-65 in R. Torrence (ed.) *Time, Energy and Stone Tools.* Cambridge: Cambridge University Press.