# ṬABAQAT AL-BŪMA: 1990 EXCAVATIONS AT A KEBARAN AND LATE NEOLITHIC SITE IN WĀDĪ ZIQLĀB

by
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## Introduction

From May to July, 1990, the Wādī Ziqlāb Project (Fig. 1) conducted its second season of excavations at site WZ 200, Ṭabaqat al-Būma, a site with Kebaran and late Neolithic components that the project discovered through test excavations in 1987. The goals of the 1990 work were to determine the spatial extent of the site, to discover whether the late Neolithic component consisted of domestic settlement or only funerary remains, to examine the spatial organization of a large portion of the Neolithic remains, and to obtain a better sample of Kebaran material from a more restricted portion of the site.

In addition, a small team was devoted to continuing the programme of subsurface testing, begun in 1986, to prospect for other sites which, like Ṭabaqat al-Būma, are too deeply buried to be visible by surface survey alone.

## Background of the Project

During the last season of the Wādī Ziqlāb Project in 1987 (Banning *et* al. 1989), a 3 m by 0.75 m probe into the WZ200 terrace (Area A) intersected deposits with mixed Neolithic and Kebaran artifacts and some large, flat-lying stone slabs which, when removed, turned out to be the cap stones of a substantial late Neolithic cist grave. While the pottery and ground stone artifacts in this tomb were well preserved, the human bones were fragmentary and scattered. Nonetheless the presence of two left *tali*, differing only in size, indicated that the grave had been occupied by two individuals differing either in gender or in age. The pottery with the interment, which apparently had been clustered around the heads of the extended skeletons, appeared to date from the mid-seventh millennium bp, as subsequent radiocarbon dates suggest (Fig. 2).

A second probe on the terrace, only 1.25 by 1.25 m in extent but almost 2 m deep (Area B), passed through the Neolithic deposits and sampled undisturbed Kebaran ones without reaching culturally sterile soil. Several radiocarbon dates on bone collagen from these deep levels ranged from about 12,000 to about 14,000 bp (Fig. 2).

Problems remaining from the 1987 season included discovering the nature of the Neolithic use of the site — was it only a cemetery or were there domestic remains as well? — and providing a better understanding of the chronological place and spatial distributions of both the Kebaran and the Neolithic components.

## GEOGRAPHICAL, GEOLOGICAL AND ENVIRONMENTAL CONTEXT OF THE 1990 RESEARCH

The 1990 research in Wādī Ziqlāb concentrated on stream terraces in a stretch of the drainage basin, outlined by steep slopes incised by downcutting, between the elevations 200 and 300 m ASL. The primary focus was on the terrace we have named Ṭabaqat al-Būma (WZ 200), where most of the team worked. Other terraces in which a small survey team inserted test trenches lay south of Ṭabaqat al-Būma in Wādī Sofār, downstream of Wādī Summayl (WZ 300-306) and northwest at ʿAyun al-Ḥammām on the uppermost Wādī Ziqlāb (WZ 307 and 308) and about the middle of Wādī ʿAqaba on the lower slopes of al-ʿAqaba (WZ 309) and ad-Dahabir (WZ 310).

A major objective of the 1990 field work was to construct a more detailed and better dated Late Quaternary history of the area around WZ200. Geomorphic field work focused on a small reach of Wādī ʿAqaba and its tributaries 500 m upstream and downstream of WZ200. WZ200 lies on a colluvial slope presently eroded along the slope toe by Wādī ʿAqaba to the north. A tributary at the eastern edge of the site erodes longitudinally

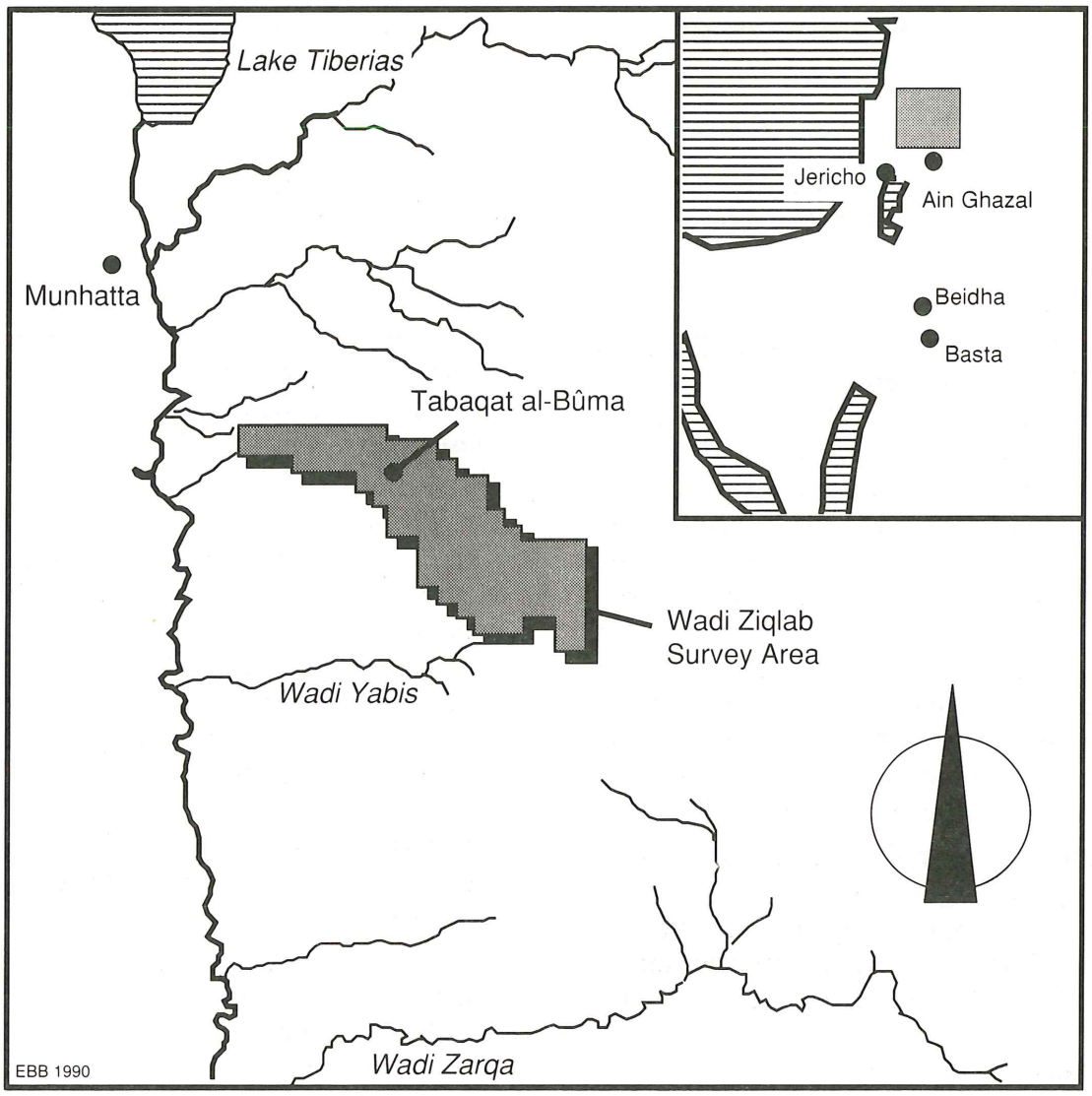


Fig. 1. Location of the Wādī Ziqlāb research area in Jordan (EBB).

across the entire slope. The head of the slope to the south rests against a steeply rising bedrock hillside. Within the limited reach examined around WZ200, six depositional units outcrop in trenches and stream cuts; two of these units contain distinct soil horizons.

**Late Quaternary Stratigraphy**

The major sedimentological and pedogenic (soil) characteristics of each depositional unit are summarized in the following descriptions and Fig. 3.

*Unit 0* occurs in very small isolated lenses at the surface at WZ200. Individual lenses extend laterally for less than five meters. Unit 0 reaches the maximum observed thickness of 14 cm in Trench G-9. Very poor sorting and lack of internal stratification in Unit 0 indicate colluvial deposition by slope wash off of the adjacent hillside. Unit 0 lies above Unit 1a which contains Roman and Byzantine sherds and has a radiocarbon date of AD 225-462 (calibrated, 95.5% confidence intervals). Thus, Unit 0 is less than 1600 years old and is probably much younger as no soil development is present.

*Unit 1* outcrops in every section studied and thins significantly from the head to toe of colluvial slopes, reaching only 30 cm at the slope toe. The top of Unit 1 corresponds with the present land surface except when below Unit 0. The top 30-50 cm (Unit 1a) is a slightly darkened gray A soil horizon. The strength of A horizon development is strongest at the toe of colluvial slopes on nearly flat surfaces. In places A horizon development may result from modern and archaeological human activity.

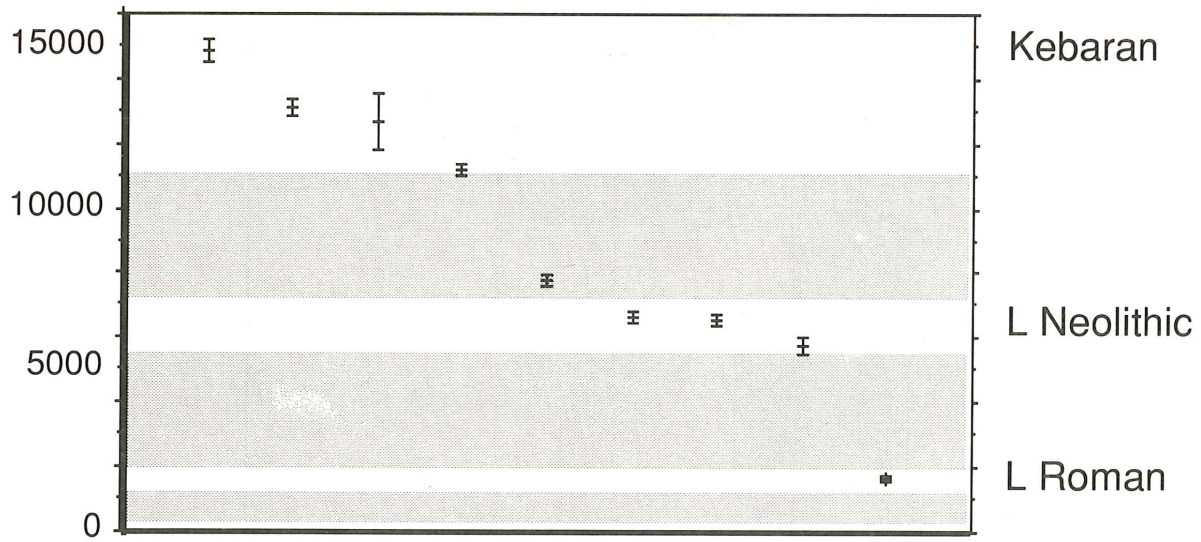


Fig. 2. Distribution of uncalibrated radiocarbon dates from site WZ 200 in years before present (accelerator dates from Isotrace Laboratory, Toronto). Error bars are double the length of the 68.3% confidence limits. The two middle late Neolithic dates and the late Roman date are on charcoal; all others are on bone collagen.

Internal stratification is absent in Unit 1 except for two rock lines found over portions of WZ200. The rock lines found at depths of 23 cm and 67 cm merge into a 45 cm thick lense of gravel downslope from the dense cluster of Neolithic rock walls at WZ200, and are probably rubble from the collapse of walls. The rock lines may represent land surfaces at the beginning of (bottom rock line) and after (top line) Neolithic occupation. If so, previous slopes were similar to today's as the rock lines parallel the present surface.

Except for the rock lines, Unit 1 sediments lack internal stratification, are poorly sorted, and contain angular cobbles. Such characteristics indicate rapid deposition by colluvial slope wash where very little transport does not allow sorting or rounding to take place. In places Unit 1b is almost pure silt and at first appears different from colluvium, but calcareous marls upslope from these areas weather to silt. Changes in bedrock upslope from different colluvial slopes account for the highly variable texture found in Unit 1b.

Unit 1a in general coincides with the zone where Roman and Byzantine sherds occur suggesting the top 30-50 cm of Unit 1 represents roughly 2000 years of deposition (Fig. 3). Unit 1b contains late Neolithic artifacts and structures. Unit 1 deposition began sometime around 7000 BP as the earliest Neolithic structures exposed during the 1990 excavations occur at the base of Unit 1; radiocarbon dates of *ca.* 6600 bp come from Unit 1. After a clearer understanding of occupation phases at the site emerge and more C14 dates are available, questions concerning the deposition of Unit 1 will be answered. For example, did deposition of Unit 1 occur at a slow and constant rate or did the majority of Unit 1 deposition occur in the late Neolithic?

The thickest sections of *Unit 2* occur near the center of the wadi bottom and pinch out towards the head of colluvial slopes. Where Unit 2 pinches out, Unit 1 rests directly on Unit 3. The similarity of Unit 1 and Unit 3 deposits sometimes masks the contact between the two despite a hiatus of 4000 years.

Unit 2 gravels are relatively well sorted and well rounded compared to Unit 1. These characteristics along with its distribution (thickest at the center of the wadi bottom) indicate alluvial deposition by ephemeral flood events originating upstream in the drainage basin.

The base of Unit 2, where exposed, is an erosional surface cutting into Unit 3. This erosion surface observed in three different places appears quite extensive with over 1.5

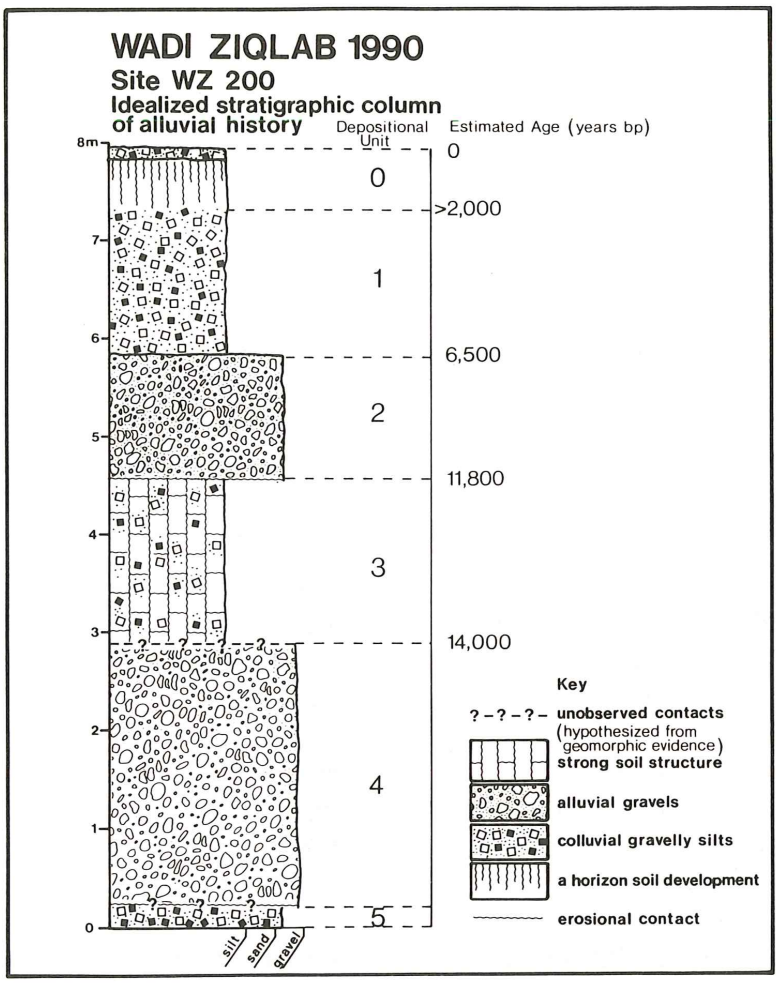


Fig. 3. Idealized stratigraphic column for depositional units outcropping in central Wādī Ziqlāb, near site WZ 200, Ṭabaqat al-Būma (J. Field and E. Hustiu).

m of relief. The erosion surface and Unit 2 gravels date between 6600 and 11,800 bp as determined by radiocarbon dates in Unit 1 and at the top of Unit 3 (Fig. 3). Without dates from within Unit 2, the length of erosion before Unit 2 deposition will remain unknown.

The depositional characteristics of *Unit 3* are similar to those of Unit 1. The poor sorting and lack of internal stratification indicate Unit 3 is a colluvial deposit. Soil development helps distinguish between Unit 1 and Unit 3. Unit 3a has strong subangular to rare prismatic structure and rare occurrences of thin clay cutans. Clay content appears higher than in Unit 1, soil carbonate development is much stronger in Unit 3, showing a whitened band 30-50 cm thick, and soil development below this band gradually weakens. A C soil horizon (Unit 3b) occurs where soil development becomes very weak.

Kebaran artifacts occur throughout Unit 3 at WZ200, but none are visible in the other two outcrops of Unit 3. Radiocarbon dates of bone found in 1987 and 1990 from the top 130 cm of Unit 3 range in age from 11,000-15,000 bp (Fig. 2).

*Unit 4*, like Unit 2, appears relatively well sorted with well rounded cobbles, but is thicker and more extensive than Unit 2. Ephemeral flooding in the wadi deposited Unit 4, which does not pinch out on colluvial slopes, but rests directly on and against bedrock along the wadi edge.

In most places there is no stratigraphic evidence that Unit 4 is different from Unit 2; both units underlie Unit 1, except in Trench E34 where Unit 4 lies below Unit 3. However, several geomorphic observations distinguish these two alluvial units where stratigraphic evidence is absent. First, the top of Unit 4 is topographically higher than the top of Unit 2. Second, stronger soil structure and redder soil color distinguishes Unit 4 from

Unit 2. Clay cutans on ped faces appear in some of the matrix around carbonate coated cobbles of Unit 4. Finally, the average clast size in Unit 4 is greater.

In one exposure 150 m east of WZ200, a section of Unit 4 gravels appear folded into a half syncline. The last major tectonic event in the Jordan Valley, perhaps responsible for this folding, occurred about 17,000 years ago (Horowitz 1979).

*Unit 5* is a heavily cemented silty gravel with angular cobbles. The cementation forms a plugged carbonate horizon; in places carbonate laminations occur at the top of the plugged horizon (Stage IV to V soil carbonate). Beneath the surface Unit 5 rests against the base of the wadi hillside. Unit 5 is also found on the steep wadi hillsides sometimes high above the wadi bottom. Colluvial deposition explains the distribution and characteristics of Unit 5.

Laminar soil carbonate horizons in non-limestone regions form very slowly and usually record Middle Pleistocene soil development. Given the enormous amounts of surrounding limestone bedrock in Wādī Ziqlāb, cementation of alluvial gravels at or near the surface is likely to occur relatively rapidly. Beneath the surface Unit 5 is in contact with Unit 1 so stratigraphic evidence does not help date Unit 5. Similar calcrete horizons in the central Jordan Valley date to 12,000-20,000 BP (Horowitz 1979). Since Unit 5 is the most heavily cemented deposit observed, Unit 5 is likely the oldest deposit at the bottom of Wādī 'Aqaba.

**Paleoenvironment**

An idealized stratigraphic column, based on the observations described above, helps reconstruct the paleoenvironments and paleotopography in Wādī Ziqlāb during the last 14,000 years or more (Fig. 3). Paleoenvironmental reconstructions require two levels of analysis. First, what changes were there in the wadi bottom and second what was the timing and cause of these changes?

Presently at the bottom of Wādī 'Aqaba there is a gravelly ephemeral stream flowing only during heavy or extended winter rains. The stream runs between colluvial slopes on either side and erodes nearly two meters into the toe of the WZ200 colluvial slope. In places the stream has cut into the steep bedrock slopes completely removing colluvial deposits. At present, only minor colluviation occurs at the head of remaining colluvial slopes as Unit 0 demonstrates. In time if the present conditions persist, the stream will eventually remove all colluvial deposits and one wide gravelly stream bed will exist over the entire wadi bottom.

During deposition of Units 1 and 3 extensive colluviation created a wadi bottom landscape different from today. Instead of an ephemeral stream bed cut into colluvial slopes at the wadi bottom, the colluvial slopes extended completely across the wadi bottom creating a gentle swale. Perhaps a grassy bottom existed on the swale adding organic matter to the soil and forming the dark grayish brown A horizon observed in Unit 1a. The Unit 1 surface was nearly two meters above the present wadi bottom as determined by extending the slope of the remnant colluvial surface at WZ200. Given the similarity in Unit 1 and Unit 3 deposits, the wadi bottom landscape probably looked similar during both intervals of colluviation. However, erosion at the base of Unit 2 destroyed the original Unit 3 surface making reconstruction of the land surface at the end of Unit 3 impossible.

The wadi bottom at the time of Unit 2 and Unit 4 deposition looked more like the present. Erosion of colluvium was most extensive during Unit 4 deposition as alluvial gravels extend to the edge of the wadi. During deposition of Unit 4 a gravelly stream bed extended across the entire wadi bottom. Any colluvium deposited between flood events washed away with the next flood or floods. The stream bottom configuration during Unit 2 deposition was intermediate between that of today and during Unit 4 deposition. Near the wadi edges remnants of the Unit 3 colluvial slopes remained at the surface until the onset of Unit 1 deposition.

During the last 14,000 years the wadi bottom underwent three major changes; a major change occurred between each depositional unit. What induced these changes? The underlying factor is a change in stream power

(flow regime) whether caused by tectonics, climate change, or sudden changes in drainage basin size. The latter is unlikely as no evidence exists for stream capture and this cannot explain the recurring changes in landscape. A period of tectonic quiescence over the last 17,000 years in the Jordan Valley rules out tectonic controls on land form changes during Unit 1-3 deposition. Climate changes likely resulted in the observed stratigraphic record of wadi bottom changes.

Accumulation of colluvium in the wadi bottom occurs when flow events in the wadi are not strong enough to carry the colluvium downstream. Extended periods of colluviation of the wadi bottom, during deposition of Units 1 and 3, most likely coincide with an extended period of less intense rainfall (*cf.* Raikes 1966). Less intense rainfall does not imply less precipitation or arid conditions. In fact just the opposite is possible. Greater annual precipitation falling as light soaking rains would promote vegetation growth; additional vegetation would baffle sediment promoting further accumulation of sediment. Only a slight change in rainfall might set up a positive feedback system creating thick accumulations of colluvium. Strong soil development with possible clay accumulation in Unit 3a suggests formation during a climate slightly more humid than today.

Erosional surfaces, like found at the base of Unit 2, form when the flow regime is high enough to carry all sediment downstream. Alluvial gravels accumulate when a flood event begins to weaken. Finally, when the flow event comes to an end, sand and silt carried in suspension also accumulates in the alluvial deposit. Units 2 and 4 contain substantial amounts of sand and silt between cobbles suggesting a rapid waning of flow events typical of flash floods. Preserved erosional surfaces and thick accumulations of gravel represent extended periods of strong flow events. Flash floods occur after brief intense rainfalls typical of arid regions. Loss of vegetation on hillsides coinciding with a period of lower annual precipitation would accelerate the removal of colluvium from hillsides and wadi bottoms.

Unit 4, however, shows strong soil development indicative of a more humid climate. An increase in the slope of the wadi bottom would increase flow regime without any change in precipitation patterns. Steepening of the wadi bottom by tectonic activity may explain the deposition of Unit 4.

By relating the above arguments to the distribution of alluvial and colluvial units the timing of climatic changes is possible. Units 4 and 5 are ignored in this reconstruction, because of poor dating and the uncertainty of tectonic controls on deposition. Unit 3 colluvium indicates that a period of less intense rainfall, possibly during a time slightly more humid than today, occurred between about 14,000 bp and some time after 11,800 bp. Following this but before 6600 bp a period of more intense rainfall, perhaps during an interval slightly more arid than today, resulted in erosion of Unit 3 and deposition of Unit 2. From about 7000 bp to perhaps 1500 bp another period of less intense rainfall resulted in accumulation of Unit 1 deposits; this interval was probably less humid than between 14,000 bp to 11,800 bp. The present climate conditions and wadi landscape began forming sometime after 2000 bp. The present erosional conditions may also relate to deforestation and other anthropogenic activities. The timing of the above climate conditions matches well with other wadi deposits in the Central Jordan Valley (Horowitz 1979). However, comparing alluvial sections in the same drainage basin much less across the Jordan Valley is dangerous with very poorly dated sections. Even more dangerous is relating poorly dated sections to global climatic changes.

**Geoarchaeology**

The distribution of alluvial units also helps sort out questions concerning site preservation and site location. Both the Neolithic and Kebaran components at WZ200 are eroded. A substantial amount of Unit 1 sediment has been removed from the toe of the colluvial slope. Any Neolithic or later artifacts and structures once present at the toe slope no longer exist. More significantly two meters of downcutting along the eastern edge of the site potentially eroded Neolithic and Kebaran material from head to toe on the colluvial slope. Neolithic material extends all

the way to the eastern edge and toe of the remaining colluvial slope, so the site likely extended beyond the present remnant slope.

Unit 3, containing Kebaran artifacts at WZ200, underwent two periods of erosion. First, present day downcutting impacts the Kebaran component as well as the Neolithic. Second, erosion before Unit 2 deposition cut over 1.5m of relief into Unit 3 deposits potentially removing Kebaran artifacts from WZ200. Since Units 1 and 2 bury the erosional surface, the exact extent of alteration to the Kebaran component is unknown.

The potential for deep site burial along the bottom of Wādī Ziqlāb and its tributaries seems high. Remnant colluvial slopes occur upstream and downstream of WZ200. Several test trenches in some colluvial slopes revealed very little cultural material, WZ310 being the major exception (see below). Two of the relatively barren trenches (WZ303 and WZ 200 Area G9) nearly two meters deep contain only Unit 1 deposits. The base of Unit 1 is not visible in these, and Kebaran and Neolithic artifacts could be buried very deeply.

The environmental conditions during Neolithic and Kebaran occupations were more amiable than today. The colluvial deposits housing the two components indicate a period of less intense rainfall. A period of equivalent precipitation with a more evenly distributed rainfall pattern will create a higher water table as the rain has a greater chance of percolating into the groundwater. As a result, a spring 150 m upstream of WZ200, although flowing only intermittently during the last few years, was quite possibly a permanent spring during Neolithic and Kebaran times. Other springs not active today may also flow during periods of a higher water table.

## EXCAVATIONS AT ṬABAQAT AL-BUMA

Ṭabaqat al-Būma itself is a gently sloping colluvial terrace on the southwestern bank of Wādī 'Aqaba, the stretch of the Ziqlāb drainage extending from 'Ayūn Ziqlāb to the confluence of Wudyān Sofār and Ghudrān adh-Dhi'b (see Fig. 9). The site (WZ200) lies right at this confluence (Palestine Grid 170122), some 150 m downstream from an intermittent spring in Wādī Ghudrān adh-Dhi'b. Meandering of the streams through the deeply dissected limestone bedrock has created a sheltered position for the site, with steep slopes some 150 m high, to the north, south and east.

The 1990 excavations at Ṭabaqat al-Būma had three basic components. The first was to place a scatter of 1m×3m trenches on the stream terrace of Ṭabaqat al-Būma to estimate the extent of the late Neolithic remains on the site and to help select the area which would be the most useful target for broader exposure of the Neolithic remains. The second was to carry out broad excavations to study the spatial structure of a portion of the Neolithic site and to determine its character. The third was to excavate more deeply in one or two selected excavation areas to retrieve a larger sample of Kebaran material than was available in our small soundings of 1987.

At Ṭabaqat al-Būma we established a new grid over the entire terrace, anchored to benchmarks on four sides of the site (Fig. 4). The grid consists of 4m×4m squares with coordinates described by letters along one axis and by numbers along the other. We labelled excavation units by the grid coordinate of their western corners.

Within this grid we selected one square (G9) near the extreme northwest edge of the stream terrace, five (K23, H24, I24, J24, J25) near its center, and two (C36, E36) near the southeast periphery, where 1987 soundings had taken place, for initial soundings. Within each of these a crew member excavated a 1m×3m trench either to bedrock, to a thick alluvial gravel, to an apparently sterile soil, or to a depth of two meters.

Subsequently we abandoned work in G9, the central trenches and C36, and broadened excavation in the southeastern portion of the stream terrace by the addition of excavations in D35, D36, E34, E35, E37, F32, F34, F35, F36, G34, G35, H34, I33, I34, J33, and J34. In most of these, the excavated areas consisted of rectangles 3m×3.5m, separated by 50 cm baulks along one axis and 1 m along the other. In a few, the excavated areas were smaller, serving only to link non-contiguous excavation units stratigraphically or architecturally. During the course of excava-

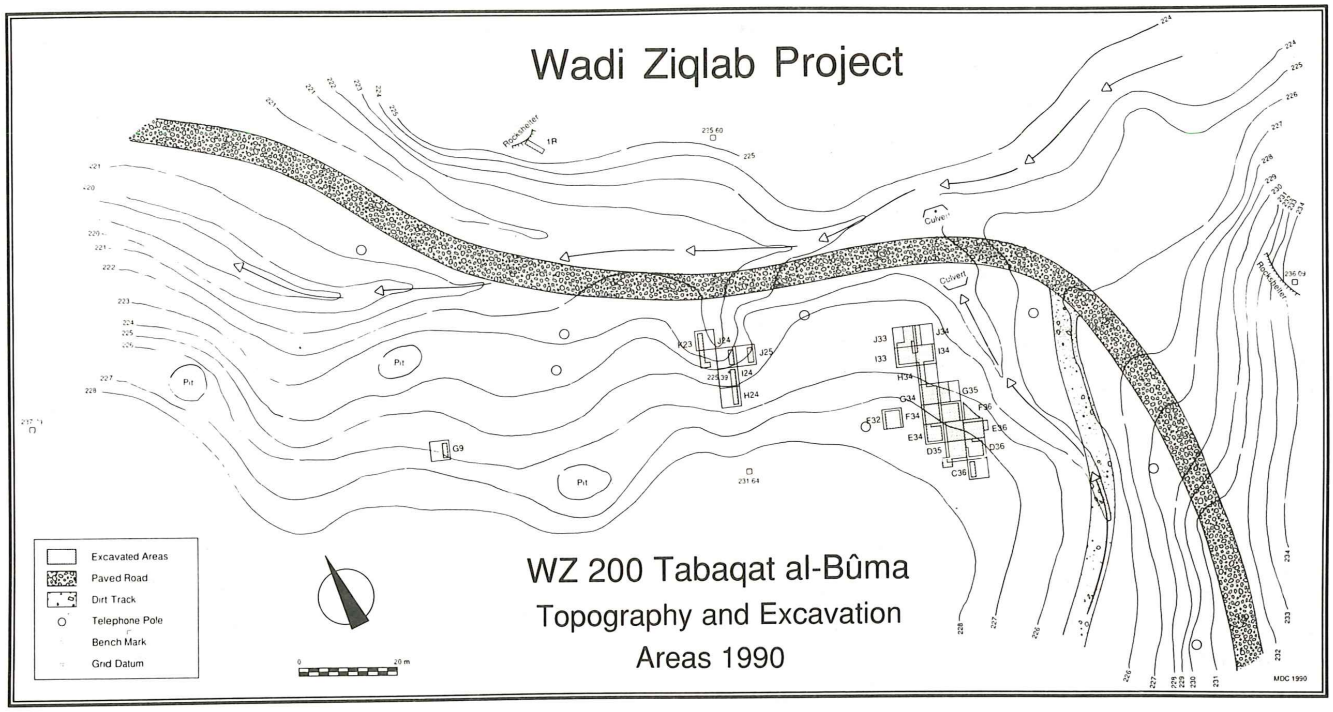


Fig. 4. Topographic map of WZ 200, Tabaqat al-Būma (M. Campbell).

tions, we removed many of the baulks to clarify stratigraphic and architectural connections between excavation units. I34 and J34 intersected Area A of the 1987 excavations, while F34 intersected the northeastern edge of Area B.

Area E34 was the one we selected for deeper excavation into the Kebaran levels of the site. This was because it corresponded with an outdoor area during the Neolithic, so that we could excavate without having to remove Neolithic architecture, and because it lay quite near Area B of the 1987 excavations, where we knew we would find fairly thick Kebaran deposits.

**Cultural Stratigraphy of the Site**

The occupation of Ṭabaqat al-Būma is divisible into five main phases. The uppermost, which we will designate Phase I, consists of the modern use of the terrace by local farmers who camp on it with their families and livestock. Phase II, best represented in Area G9, but occurring in disturbed contexts elsewhere on the terrace, seems to be the use of the terrace as a pastoral campsite during the fourth and fifth centuries AD. Phase III is the Neolithic/Chalcolithic use of the site, probably dating mainly from the middle sixth to middle fifth millennium BC (calibrated), with substantial architecture of what seems to be a farmstead and pottery and lithics reminiscent of, but in some ways different from, Jericho VIII, Wādī Rabah, Teluliot Batashi, Munhata and other sites (Garstang 1936; Kenyon and Holland 1983; Kaplan 1958a; b; Perrot 1968). Phase IV is an earlier use of the site, probably also during the late Neolithic, and is associated with walls built of massive stones, of which we have uncovered very little and which we cannot yet date closely. All of the above belong to geological Unit 1. Phase V includes the Kebaran deposits into which Neolithic builders cut their pits and house floors, and probably represents repeated use of the site, over a long time, by small groups of late Pleistocene foragers. It occurs within geological Unit 3.

**Architectural Remains of the Late Neolithic**

Since the 1990 excavations revealed very little of the Phase IV structures on Ṭabaqat al-Būma, this discussion will concentrate on the remains of Phase III (Fig. 5).

Fig. 5 shows an overview of the plans of structures belonging to Phase III. With probably at least 50% of the Neolithic settlement uncovered, we have revealed only three structures and several walls that appear to represent outdoor terraces and fences belong-

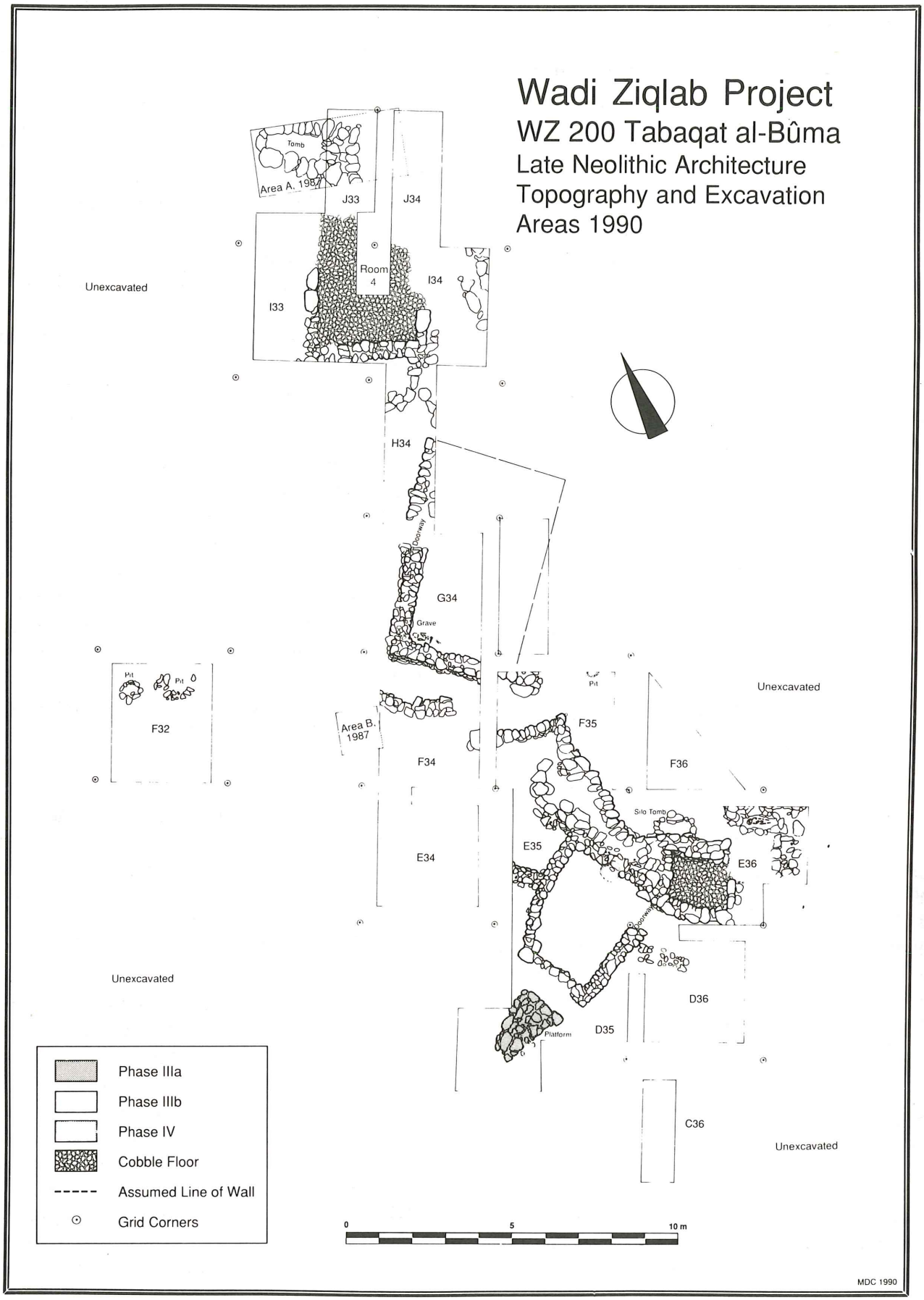


Fig 5. Architectural map of the main excavations at site WZ 200, Ṭabaqat al-Būma (M. Campbell and E. Banning).

ing to this phase. The scale and general layout of the architecture is in keeping with the site's use as a farmstead, rather than as a nucleated village, with about 60% of the excavated area of the site apparently representing open areas, rather than roofed ones. The debris and features found within these structures, including fragments of bone awls and weaving equipment, domestic and storage pottery, storage bins and pits, sickle blades, bones of slaughtered sheep, goats, cattle and pigs, and numerous grinding stones, are also consistent with the buildings' use as a small farming settlement.

The construction of Phase III buildings predominantly involved the erection of rectilinear, double-leaf, stone walls, many of which still stand to a height of about one meter. In one case (Area D35) it appears that the upslope walls may have been erected against the face of a cut into the soils of the hillslope, although evidence for this is still inconclusive, and these walls are only one stone thick instead of having the normal double-leaf construction. On average the walls are constructed of cobbles ranging from 20 to 35 cm in length, although they incorporate occasional stones more than 50 cm across, mainly from pre-existing Phase IV walls, and the stones are arranged predominantly in stretcher fashion. Apart from walls built against cuts into the slope, which would have helped to level the surface and make part of the room semi-subterranean, none of the walls appear to have foundation trenches, but are founded on or very near to the surface that existed at the time of construction, or on the stubs of ruined Phase IV walls. We have no evidence for any posts to support roofing, but the relatively small size of most of the rooms probably made these unnecessary, especially if timber was more readily available in this part of the Ziqlāb drainage than it is today.

The three Phase III structures we exposed entirely or in part during 1990 are small and simple. The northernmost, in Areas I33 and I34, has a very well made cobble floor (Pl. III,1). Although erosion and subsequent digging on the site, at least some of which was associated with the construction of the Area A tomb, badly robbed out this structure, it appears to have been a rectangular room some 4 by 4 m in size. Nearby to the south (G34 and G35), a building which is incompletely exposed, incorporates a relatively large room some 7.3 m long and 3.5 m wide (exterior dimensions), enclosed by walls about 50 cm thick, and with a doorway at the center of its long northwestern wall (Pl. II,2). Whether or not there are other rooms in this structure remains to be determined. The last structure, occupying parts of Areas D35, E35, F35 and E36, has two rooms abutting one another, without any direct communication between them. The largest, which appears to have been built on top of ruined Phase IV walls and against the west corner of the smaller room, is 3 by 4 m and incorporates the clay storage bin (Pl. II,1). Its single doorway opens to the south, flanked by the south wall of the smaller room and a short, pebble-built wall in Area D36. The small room with its cobbled floor is founded considerably lower than the room which abuts it, apparently opening at the eastern corner onto a flagged pavement that incorporated the top of a large ruined wall of Phase IV.

The rooms are floored simply with mud or mud-and-cobble surfaces which built up successive layers over the period of the rooms' use. Our only evidence for lime plaster is a small patch on the surface of a stone next to a grave cist in Area E37, and does not appear to be flooring material. Typically each superimposed floor is scattered with smashed pottery including, in the case of some floors in Area D35, several partially restorable vessels.

During the 1990 excavations, we found very few internal features in the rooms of the structures. The most prominent was a clay-lined, bell-shaped bin or silo in Area E35, against the east wall of the room near the doorway. This bin was later used as a burial place (Pl. I,2). A cluster of upright stones, set set into the floor of this room near the northern wall, possibly served to support a pot or basket of which no traces survive. A possible stone bin occurred at the north end of the small room in Area E36, which also had a stone bench against its south wall in one subphase.

Outdoor surfaces surrounding the Phase

III structures had several pits, many of them stone-lined or stone-filled, one or two stone fences and two terrace walls.

Several terrace walls and a stone platform in Area D35 (Pl. III, 2) represent the most recent subphase of Phase III, when some or all of the structures had fallen down and the site, apparently, was no longer in use as a farmstead.

Our exposures of Phase IV architecture are currently limited to fragments of walls in Areas E35, E37, F35, H34, and I34. These are single-leaf walls built from more massive blocks than most of the stones in Phase III walls — in fact the large blocks in Phase III are usually re-used portions of Phase IV walls — and we as yet have no evidence for the plan of Phase IV buildings except to note that they are rectilinear.

**Artifacts of the Late Neolithic**

The discovery of the substantial stone tomb and its associated artifacts in 1987 led to some interesting problems. One was the nature of the transition from the Neolithic to the Early Chalcolithic, which this material seemed to represent. Another was the character of the site itself, as we had, at the time, no evidence for any domestic activity at the site during the Neolithic. Another important, if in some ways mundane, problem was the place of the artifactual material from WZ 200 in the temporal and spatial frameworks of Jordanian prehistory, as it seemed to differ, in a number of respects, from materials from other fifth- and sixth-millennium sites in the region. Materials of the late Neolithic, particularly those that did not belong to the Yarmoukian culture, were relatively poorly known.

*Ceramics*

The much larger sample of pottery that we obtained during the 1990 excavations puts us in a better position than in 1987 to begin to address some of these questions. To a large extent it has corroborated our previous observations, but it has also demonstrated that the range of forms and wares is much greater on the site than we might have anticipated.

The much wider range of forms leaves little doubt — especially in conjunction with the evidence of stone artifacts, faunal and plant remains (see below) — that the site had a domestic function, probably serving as some kind of farmstead. The repertoire now includes, in addition to the small jars, small saucers and deep, S-profile carinated bowls encountered in 1987, a large variety of pithoi, hole-mouth jars, cups, bowls, pedestalled vessels and spindle-whorls made from sherds (Fig. 6 and below). All of these testify to a wide range of domestic activities, including cooking and consumption of food and drink, storage, and textile production.

The variety of wares probably also reflects, to a certain extent, the functional variety of the vessels. There are heavy coarse wares predominantly associated with probable storage forms, as well as finer wares that sometimes show burnishing and are associated predominantly with the kinds of forms that would be associated with consumption and entertaining, such as cups and small bowls.

Most of the wares are very coarse, with mainly chert inclusions up to 3 mm in size, and are predominantly either salmon-coloured or pale yellow, often with a core that is less oxidized. Broadly some of these wares seem similar to those of late Neolithic sherds from Tell Abū Thawwāb and 'Ayn Raḥūb (Kafafi 1985; pers. com.; Muheisen *et al.* 1988). Most of the Ziqlāb wares, however, are soft and very poorly fired, making them extremely friable and unable to withstand washing in water, while the Thawwāb and Raḥūb sherds, by contrast, seem to have been fired more completely and commonly show the voids of vegetable temper. Although most of the pottery consists of plain wares, a fairly large proportion of the Ziqlāb material has a sloppy red slip, mainly on the exterior and just over the rim, although some are also red-slipped on the interior, the base, or both. A very small proportion of the sherds is represented by yellow-green, dark grey or brown wares, most of which have much finer inclusions, and none of which has a core. Burnishing appears to be virtually exclusive to the grey and black wares, although not all of these are burnished.

An extremely small proportion has in-

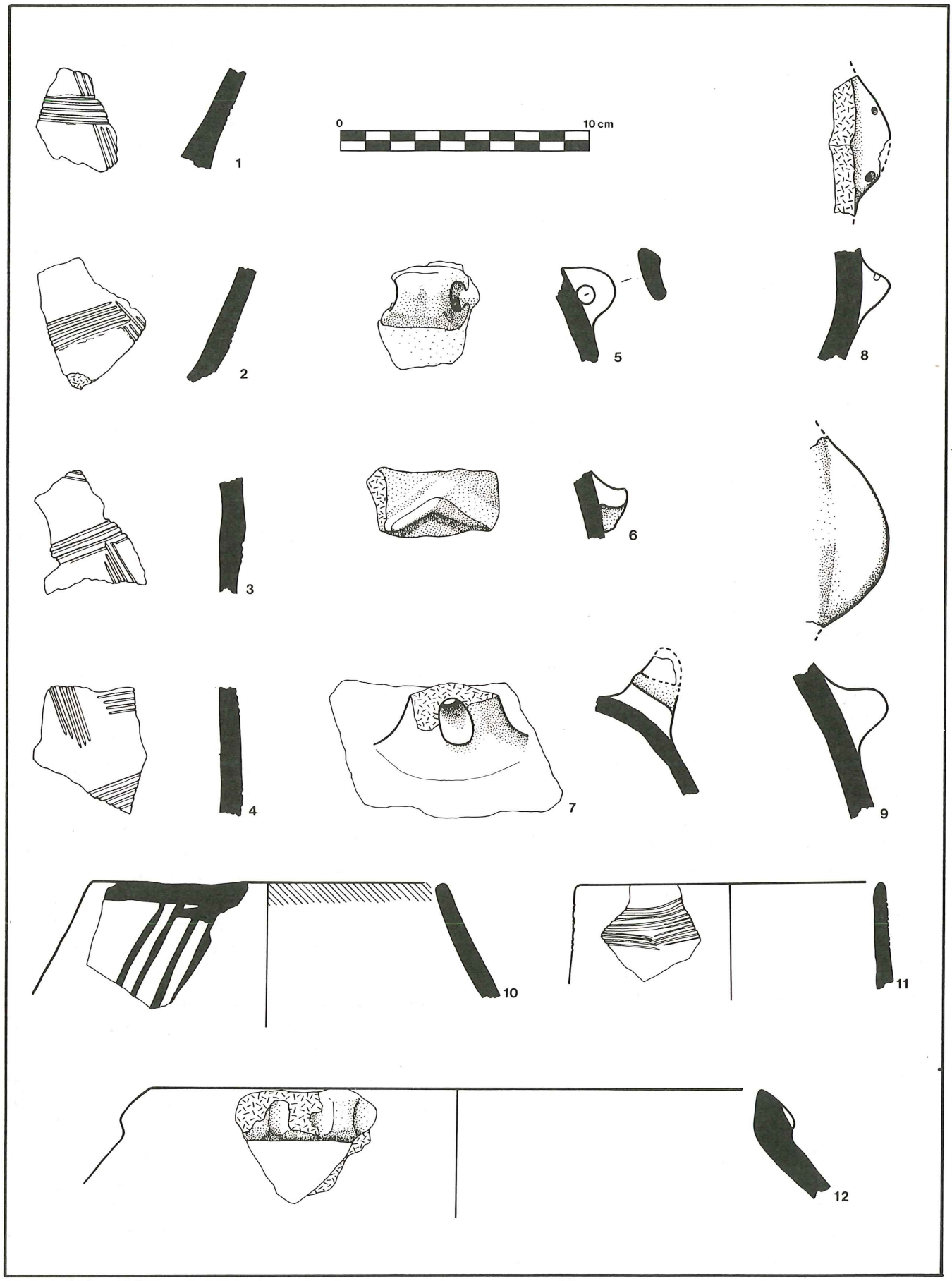


Fig 6. Selected late Neolithic pottery from the 1990 excavations at site WZ 200, Ṭabaqat al-Būma (J. Pfaff).

cised, combed or painted decoration, although removal of the tenacious calcite encrustations from more of the pottery may reveal more painted sherds in future. The incised and combed decoration appears largely limited to horizontal bands and alternating diagonal bands of parallel incisions (Fig. 6: 1-4), very similar to a few examples at Wādī Rabah and Tululiot Batashi (Kaplan 1958a: Fig. 6.13; 1958b: Fig. 10.15). A few sherds (Fig. 6:11) show wavy combing similar to examples at Batashi and the lowest levels of Abu Ḥamid (Kaplan 1958b: Fig. 10.19; G. Dollfus, pers. com.; Dollfus and Kafafi 1986: 99). Only one example shows the herringbone band typical of the Yarmoukian and none the overall chevron incision commonly found in Wādī Rabah material. In addition there is no punctate decoration. Painted decoration is both rare, apart from simple bands or red-brown paint outlining the rim, and very simple. A single rim sherd shows diagonal red-brown lines (Fig. 6:10). A couple of others show a few simple curving strokes or a combination of vertical and horizontal strokes placed sparsely on the body. There are no examples of geometric or cross-hatched painting. Only one sherd shows any raised moulding, and this is directly below the rim. No rope moulding occurs on the necks, shoulders or bodies of any sherds in our sample of several thousand sherds.

By far the majority of the bowls (Fig. 7) analyzed to date from the 1990 season consist of hemispherical or straight-sided open forms, the former grading into more holemouth-like and ultimately into the rarer, carinated, S-profile forms. Of these the most common are broad, relatively shallow bowls with everted, straight or gently incurving sides and round to slightly pointed rims. The next most common are those with a holemouth aspect, that is, a more constricted orifice. These often have thickened, bevelled or slightly outcurving rims that occasionally make them seem similar to the S-profile bowls, but more rarely there is a markedly inverted thickening that accentuates the holemouth profile. By far the majority, however, has a simple, tapering and rounded rim. Simple hemispherical bowls appear to be less common and, except for one case of a squared rim, always have a simple rounded or tapered rim. There are two cases of very simple, handmade, and rather dumpy bowls with fairly flat, thick bases and thick walls. The most distinctive bowls are the S-profile ones. Often the bowls have a solid red slip on the exterior, carrying over the rim and part way down the interior and even covering the base in some cases. The large, open bowls or basins are usually plain, but occasionally have red or red-brown slip all over.

For the purposes of preliminary analysis we arbitrarily classify as cups all bowls with rim diameters less than 12 cm. These display the same range of forms as the large and medium bowls, but for obvious reasons have thinner walls and often finer wares. As in 1987 they included two examples of shallow, saucer-like and thick-walled forms that are possibly lamps. By far the majority, however, consists of simple hemispherical forms with rounded, gently tapering or very slightly outurned rims. A small minority were of the holemouth form while two were of the open, two of the 'dumpy' and one of the carinated type. Most were plain, while others showed red slip on the interior or exterior, carrying a little way over the rim, and two showed a kind of banded coloration ranging from red near the rim, through yellow to black. The latter also showed all-over burnishing.

Most of the jars appear to have been holemouth jars or globular ones with short straight or everted necks, although we did not recover any whole examples this season. Bow-rims are so far lacking in the sub-sample from WZ 200. Although continued inspection of the collection may turn up more of them, it is likely that they are rarer at this site than our glimpse of the pottery repertoire in 1987 led us to believe.

Unfortunately it is impossible in most of our sample to distinguish the bases of different vessel forms, although many of the bases, judging by their thickness relative to their diameter, probably belong to small and medium jars. By far the majority of the bases in our sample are either flat or slightly concave, with only seven showing bag-like rounded or sub-conical bottoms, one or two showing pronounced ring-bases, and a couple with either knob-like bases or pronounced

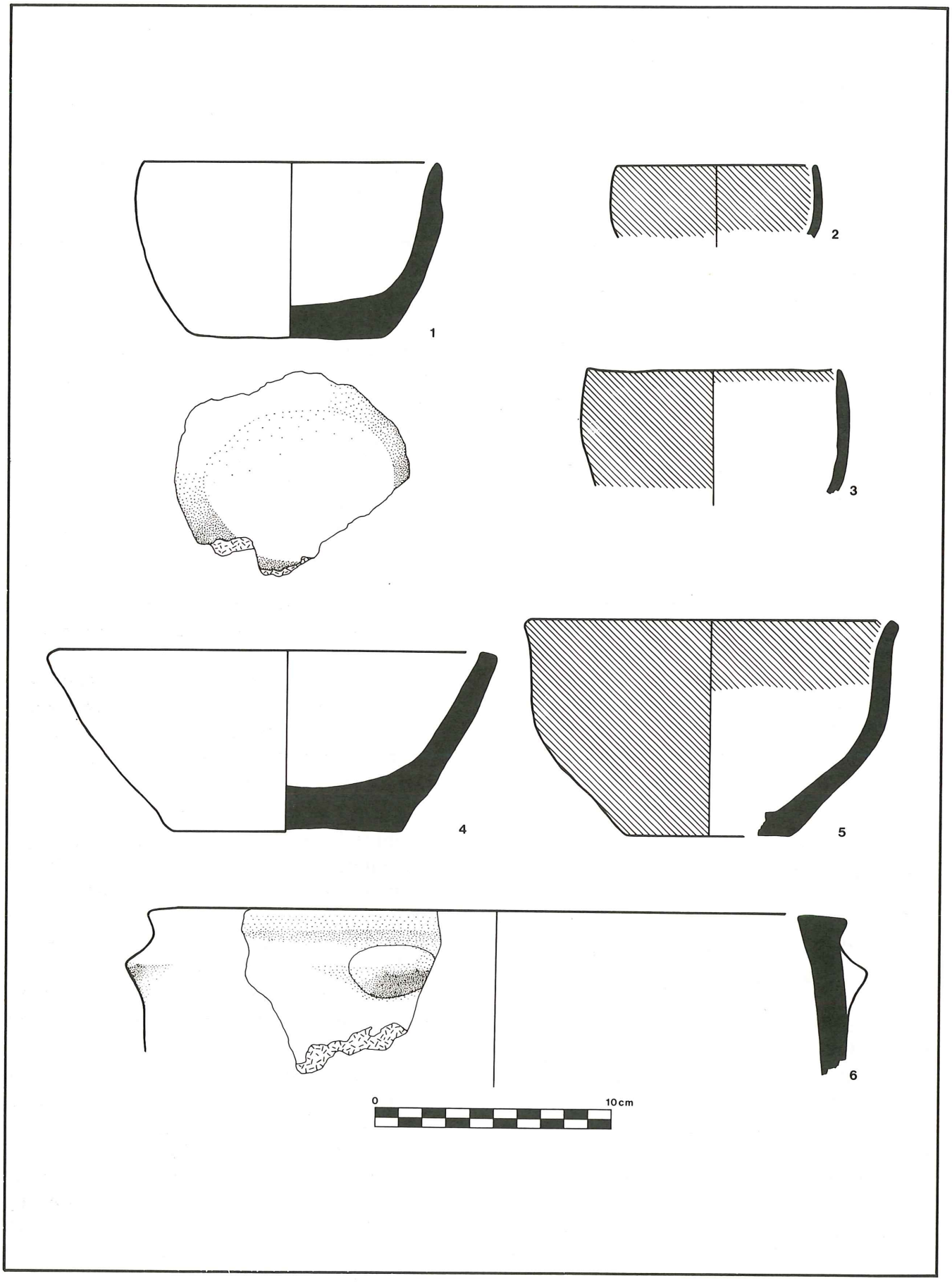


Fig. 7. Selected late Neolithic pottery from the 1990 excavations at site WZ 200, Ṭabaqat al-Būma (J. Pfaff).

concavities. Of that majority, most show a simple, rounded junction of the base with the vessel walls, grading into a sharper angle in the order of 120-130°. The angle and shape of this junction often varies slightly from one part of the vessel's circumference to another. Another group, with straighter or slightly everted vessel walls show a generally sharper junction, angles in the range of 110-130° and base diameters in the range of 7-11 cm (*cf.* Kaplan 1985b: Fig. 11.2). It is likely that most or all of these are the bases of small jars. One of the most distinctive groups probably consists of the bases of small jars and 'S-profile' bowls; this group shows a distinct foot at the junction of base and vessel wall, seen also in complete 'S-profile' jars (A.72.1, A.72.3) and a single complete jar found in 1987 (A.72.4). A single example of a pedestal base (D36. 11.1) (*cf.* Kaplan 1958a: Fig. 5.17; 1958b: Fig. 8.21) and some examples of flat bases with mat impressions (F35.20.18 and J33.1.6) appear to complete the range of basic base forms.

The dominant handles are large loop- and strap-handles, sometimes with flaring attachments, but there are also rare examples of the small, almost cylindrical horizonal handles observed on some of the pottery from the tomb we excavated in 1987 (Banning *et al.* 1989). Ledge handles are fairly common, and are usually very narrow and always very simple in form, apart from one with two decorative punch-marks.

Two sherds discovered in the 1990 excavations are impossible to classify by the above categories. One (D35.4.9) is the rim of an aperture which does not appear to stance vertically and which may represent the spout of a jug (*cf.* PNB Jericho, type X.b, Kenyon and Holland 1983: Fig. 25.12). Another appears at first glance to be the thickened 'T-shaped' rim of a pithos or large jar except that its small diameter (only 4 cm interior) suggests it may instead be some kind of pipe or vessel with an intentionally open bottom (*cf.* Kaplan 1958b: Fig. 10.16).

Currently one of our objectives is to place this pottery in its proper stratigraphic context for the purpose of comparing it with other sites of the fifth and sixth millennia BC in the southern Levant and determining the extent to which the differences are chronological or regional. This is facilitated by the fact that the stratigraphy of WZ 200 is relatively simple, as well as by the availability of stratified material from nearby site WZ 310.

*Lithics*

In conjunction with material found in 1987, the lithic tools and debitage recovered from the 1990 excavations in Wādī 'Aqaba have provided an important preliminary data base for the investigation of a number of critical questions as to the timing, nature, and behavioral processes behind the late Neolithic/early Chalcolithic cultural transition in Syria-Palestine. While preliminary in nature, this study provides a few preliminary indications as to the nature of this transition as typified by selected materials from WZ 200.

Of the 450 recorded formed tools, blades, flakes, and debitage collections from secure loci, the late Neolithic loci are dominated by flake and blade debitage. Recovered formed tools include end scrapers, convex scrapers, burins, awls, a single chisel or adze, various backed blades, knives and sickle blades (Fig. 8). Of the approximately 12 cores recovered from secure loci, the majority are single platform flake cores manufactured on a wide range of raw materials. Despite the clear evidence for blade production, the collection includes surprisingly few blade cores. On the basis of the 1990 excavations, we see no evidence for the *in situ* large scale manufacture of tools on the site. While there is a somewhat homogeneous distribution of debitage in most loci, there is no evidence for large knapping areas or midden deposits of debris typical of Neolithic sites, although future analysis is needed to clarify this observation.

A number of diagnostic formed tools recovered in the excavations are useful as chronological indicators. These include cortical scrapers, denticulate sickle blades (Fig. 8: 6-8, 10, 11; Pl. V,1), and a single chisel or adze. Although there is disagreement as to the chronological placement of denticulate sickle blades in the late Neolithic or early Chalcolithic (Bar-Yosef 1981; Burian and Friedman 1979; Gopher and Orelle 1989; Rosen 1982). A convincing argument can be made for placing some of these tool forms exclusively into *one* cultural period, but such

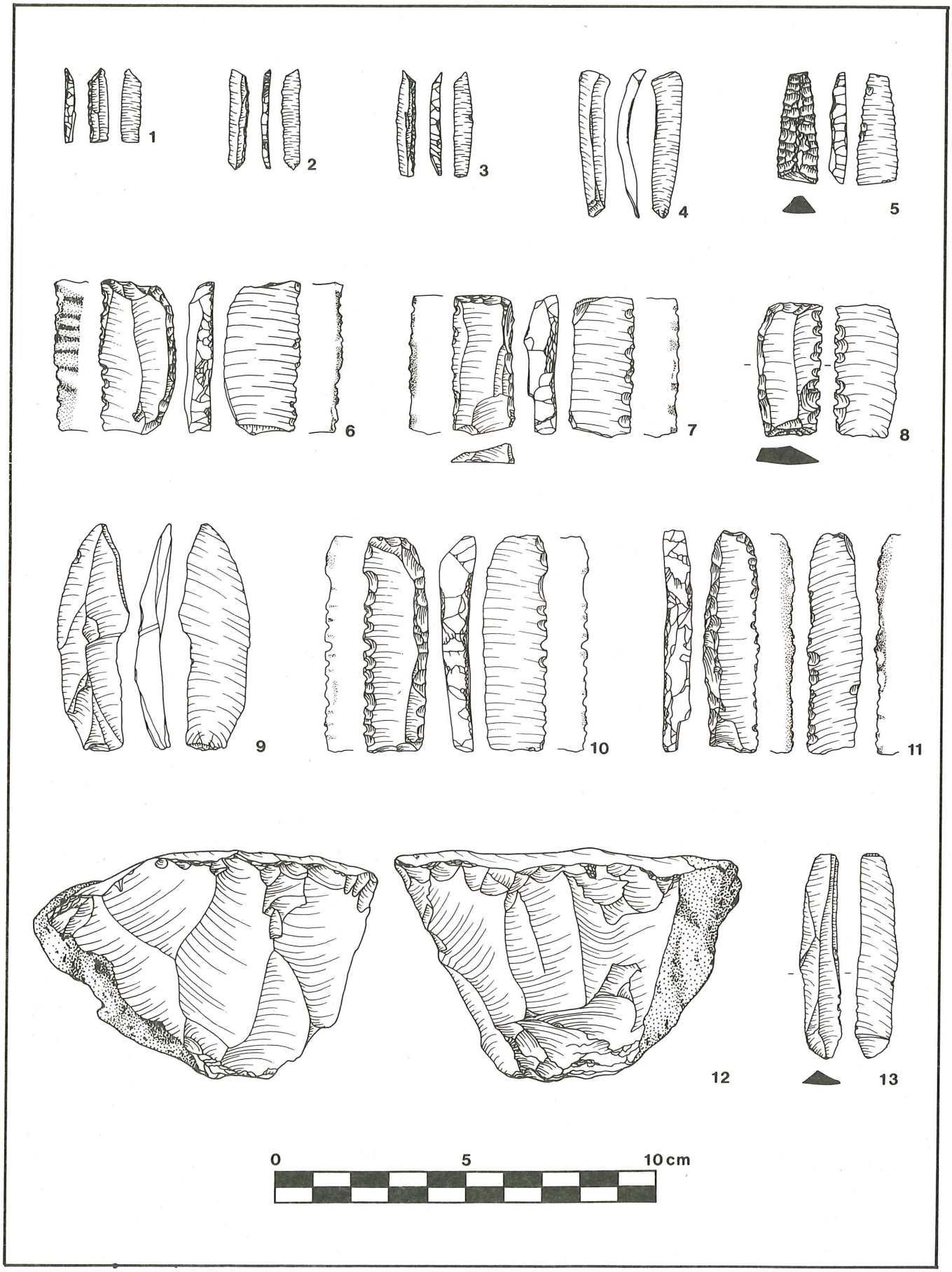


Fig. 8. Selected stone tools from the Kebaran and late Neolithic components of site WZ 200, Ṭabaqat al-Būma (J. Pfaff).

an argument is premature. Ultimately the key issue is not their chronological placement, but the behavioral reasons for interassemblage variability.

An intriguing aspect of assemblage variability at WZ 200 is the high proportion of denticulate sickle blades in contrast to the limited representation of other recognized tool forms. The number of sickle blades in the assemblage is proportionally large compared to other tool forms. To provide a more detailed awareness of typological variability among recovered sickle blades, a judgmental sample of 38 was recorded and analysed. Of these the majority are abruptly or semi-abruptly backed (n=29, [76%]) and are usually bitruncated with either a trapezoidal or rectangular outline morphology. Raw material selection appears to have been variable, but medium to high quality fine-grain material was preferred. Three categories of working edge are recognizable from this sample. These include bifacial denticulate retouch (n=21, [55%]), uni-facial denticulations (n=9, [23%]) and 8 with an unretouched working edge. Sickle gloss is visible at a macro level on the ventral and dorsal surfaces on 24 (63%) of the specimens. The metrical data provide a preliminary illustration of the degree of size variability in the assemblage, possibly suggesting that sickle blades of different dimensions were hafted at defined locations on the sickle itself.

While our analysis is only at a preliminary stage it appears that there are several possible reasons for this. First, this patterning may be associated with site-specific activities, their location within the site, the archaeological sampling methodology, or some combination of these factors. Conversely, it is entirely possible that the differential representation of distinct tool forms and debitage is linked to issues of geographical and temporal variability. These three major forms of explanation, that of site structure, activities occurring on the site, and temporal placement, are all possible factors affecting the presence or absence of specific tools.

Perhaps just as important is the absence of other lithic items characteristic of the late Neolithic and early Chalcolithic periods. The absence of bifacially pressure-flaked projectile points typical of the late Neolithic, the limited blade industry, and the predominance of flake cores, appear to corroborate the placement of excavated items as representative of either or both periods, or being transitional.

A preliminary examination of raw material variability for the late Neolithic components suggests that the formed tools and blades were produced on the finer grained, high quality, flint material, likely from wadi cobbles. In contrast, the general trend with the expedient tools, flakes and cores, is the use of medium to coarse grained raw materials that were readily available in the locality.

The excavations at WZ 200 have produced an instructive range of ground tool forms indicative of three major types of grinding activities. These include large grinding stones, basalt bowls and small limestone mortars. The grinding stones consisted of several large, complete vesicular basalt grinding stones and assorted fragments. Also recovered were numerous small mortars of hard, fine-grained limestone possibly used for grinding herbs, fine seed materials or pastes. The third group of ground stone consists of complete bowls and bowl fragments. Of particular interest are two complete basalt bowls and a single bowl section with a circular perforation at the base.

*Miscellaneous Artifacts*

Other tools which the 1990 excavations uncovered include ceramic and stone perforated disks and plaques, probably spindle whorls, and bone awls and 'spatula' fragments. The disks and plaques were usually made from potsherds, each displaying a biconical perforation near the centre. While circular ones were most common, we have two fragmentary examples of what appear to be perforated square plaques. One large and broken stone example may be too large to have served as a spindle whorl, and may instead be a loomweight. The disks are similar to ones known from 'Ayn al-Jerba and other sites of the period (Kaplan 1969: 25). The few bone tools found in 1990 are mainly fragments of narrow 'spatulas' but there are also the tips of some awl-like tools.

**Burials of the Late Neolithic**

The preservation of human remains discovered in 1987 was disappointing. The tomb of locus 005 in Area A was large enough for the extended burial of an adult and this was our assumption, although the position of the body was not demonstrable by the fragmentary remains. Analysis of these remains now indicates that two individuals were placed in this tomb. This is based on the identification of two left *tali,* which also indicate either sexual dimorphism or a difference in age. Other identifiable fragments from locus 005 included parts of a *cranium*, tempro-mandibular joint, scapula, left *humerus*, left and right *femora*, right *patella*, left and right *tibiae,* left and right *calcanei*, three left metatarsals and one left *phalanx.*

During 1990 excavations at WZ200 four additional burials that occurred in units E35, E36, and E34 were all of children and range from infancy to about ten years of age. It is significant that the best bone preservation to date is in two of the burials excavated in 1990, in E35 and G34. The E35 child had been placed in a flexed position sealed in a well preserved clay-lined storage bin in the wall of a building. The G34 child was flexed, also, but placed in a shallow pit in the soil adjacent to a wall and covered with soil. In both of these cases the skeletons were protected from extensive damage from ground water and thus were in relatively good condition. In E36 the burial in Locus 026 approached the two previous examples, but the one in Locus 016 was poorly preserved. Like the one in locus 026 this one was probably buried fully extended in the cist, possibly a converted stone silo, and capped with stone slabs, appearing much like a smaller version of the 1987 Area A tomb (Pls. I,1;IV,2). Possibly graves of this type collected water each winter which, along with rodents and insects, caused damage to the burials.

Unquestionably the best preserved burial of the 1990 season was the sub-adult burial inside plaster feature 010 of Area E35 (Pls. I, 2; IV, 1). Placed in a tightly flexed position on its right side, the burial had all its major limbs tightly coiled. Although the major bones were intact and *in situ* the entire skeleton had been crushed and distorted through the weight of large stones that had been inserted into the bin on top of the burial. Excavation indicated that there had been severe distortion of some limbs and the cranium including most dramatically the compression of the cranium to a height of less than 3 cm.

Despite the damage to the bones there are several lines of evidence which shed light upon the age and burial practices characteristic of the Levantine Neolithic/Chalcolithic transition. Field observations of the long bones before removal indicate that the epiphyses of the femora and humeri are unfused. Other possible indicators of age, such as fusion of the crania, teeth eruption, and bone development in the pelvic region, are of limited value due to bone distortion and poor preservation. *In situ* measurements of left femur of 34 cm from femur head to distal end, the unfused epiphyses and the small size of the individual, indicate age of between 8-10 years. Other field observations of interest include the identification of three holes in the frontal and temporal regions. These holes are about 2 cm in size, circular and taper down with a wide external opening and smaller internal opening. These holes represent either intentional trephinations or bone reabsorbtion associated with a bone pathology, and are currently under study.

Surprisingly, very little in the way of cultural material was recovered from the burial; no intact or complete ceremonial items were associated with the burial. The only materials associated with the burial were two rim sherds and several pieces of lithic debitage.

Possibly it was also at the end of Phase IIIb that most or all of the burials we have encountered were inserted into the decaying remains of the structures on the site. In Area E35, the burial inside the clay bin had obviously been placed after the bin was no longer useful for storage of grain or other materials. This may also have been the case with the burial in what seems to have been a stone-lined silo near the northwest corner of Area E36. The stone cist grave in Area E36/37 was constructed on top of the cobble floor for the last use of the E36 structure. The

last two grave cists were covered by stone slabs which, in turn, underlay rubble from the collapse of the structure's walls. The burial in the southwest corner of the room in Area G34, meanwhile, was in a shallow pit apparently cut into the clay which lay above the room's floor, which remains largely unexcavated. It directly underlay debris collapsed from wall 014 above it.

**Evidence for the Neolithic Palaeoeconomy**

Although preservation problems continue to affect our evidence for prehistoric diet, seasonality and economy at Ṭabaqat al-Būma, the faunal and plant remains found this year are finally beginning to provide a better data base.

*Faunal Remains*

Preliminary analysis of the more than 2700 bones from WZ 200 has resulted in a tentative species list and some understanding of the distribution of discarded bone at WZ 200.

Bovidae predominate in our sample, with *Capra/Ovis* being the dominant 'genus'. Unfortunately the elements recovered do not lend themselves to a more refined breakdown to the specific species. The one case of a *Capra* identification was based on the single horn core retrieved from WZ 200 Area E35, Locus 001, a highly disturbed modern locus consisting of recent depositions of goat and sheep dung. The present surface of the site has many examples of modern goat and sheep bones as a result of the natural and cultural attrition of the existing herds and flocks and this terrace appears to be in almost constant use for encampments by people from diverse areas. Therefore, this identification has no significance with respect to the Neolithic material. Other bovidae include *Bos taurus,* possibly *Bos primigenius,* and *Gazella* sp.

More recently, examples of *Sus* sp. have been identified in the 1990 samples. *Canis familiaris, Equus* sp., *Testudo Leithii,* and *Aves* sp. are other potentially economically useful elements in the faunal distribution at site WZ 200, while various muridae and molluscs probably do not represent food, but may provide important environmental information.

Distribution of the faunal materials on the WZ 200 site shows concentrations in units associated with residential architecture, in particular in Areas E35, E36, F35 and G34 where there are substantial rooms. The highest concentrations, however, come from loci against exterior walls, which would be expected if the inhabitants were sweeping room interiors.

*Plant Remains*

To retrieve plant remains from site WZ 200 required extensive sampling of many deposits; for this purpose we constructed a small floation tank modelled after the Ankara water separation machine. Water recycled through a gravity feed supplied enough pressure to process material in a 25 gallon drum, and with this machine we processed more than 750 liters of soil from WZ 200 and two other sites.

Throughout the excavation of the upper levels of site WZ 200, excavators extracted flotation samples according to visual criteria (charcoal or apparently charred material noted in the process of excavation) or according to depositional criteria. We sampled all pits, hearths, installations, floor levels, and midden deposits (concentrations of bone and ceramic material), often incrementally over a number of days in an effort to recover ample quantities of charred plant remains. Instead of instituting standardized soil sample sizes, we keep flotation apace with excavation, thus augmenting the sizes of original samples to collect more charred material as necessary and possible. Thus in many cases we submitted entire deposits for flotation.

Unfortunately, few deposits at WZ 200 yielded abundant and well-preserved charred plant remains. Furthermore, evidence for substantial mixing appeared in the first samples sorted: apart from the rodent bones, snails and insects, roots, and excavators' noting animal burrows, modern seeds including pumpkin and sunflower had filtered into Neolithic levels. Nevertheless, a few deposite from WZ 200 yielded assemblages that appear relatively undisturbed with a greater density of charred material.

When viewed in the context of the plant remains from the nearby site WZ 310 (see

below), however, a very preliminary assessment of the charred plant remains from the late Neolithic would suggest that at both sites the occupants processed agricultural products including pulses and cereals. While negative evidence is never conclusive, the lack of cereal culm or weed seeds of any kind supports the interpretation that cereals, notably emmer wheat *(Triticum dicoccum)* and barley (*Hordeum sativum)* may have been harvested by breaking off the heads alone. While this may have occurred when the grain was mature, harvesting of immature heads and parching to release grain would also account for the disproportionately large quantities of glume bases and spikelet forks in the archaeological sites. Certainly the limited plant remains attest to an agricultural harvest in the late Neolithic occupation of Wadi Ziqlab.

**Evidence for the Kebaran Material**

Following the research initiated on the Kebaran occupation in 1987, during 1990 a single deep sounding in Area E34 produced a significant Kebaran component with clearly diagnostic tool and core forms. These included a range of backed bladelet tools produced exclusively on high quality, fine-grained flint from single and multiple form bladelet cores. Of these, the obliquely truncated and backed bladelets predominated, with micro points, retouched bladelets/blades, and utilized bladelets forming the remainder of the diagnostic tools and debitage (Pl.V,2).

Despite the comparatively large volume of sediments, and proximity to the 1987 test excavation, there is a surprising discrepancy in the number of recovered items from the two seasons. Unlike the 1987 soundings, the large 1m×3m sounding was characterized by a comparative paucity of bladelet cores and Kebara points. While adding only a limited supplement to the comparative materials for the Kebaran period loci at WZ 200, the deep sounding does provide an opportunity to define the vertical distribution of the Kebaran materials down to sterile alluvial deposits. What is unclear, however, is the exact nature of the occupational history for the Kebaran at Tabaqat al-Buma, specially, the number of past Kebaran occupations, their vertical and horizontal distribution, and the nature of assemblage variability. All of these will be considered in selecting a research strategy for the 1992 excavations. While aspects of a microlithic component were represented in select loci dating to the late Neolithic period, the deeper loci below two meters in unit E34 contained only Kebaran materials and produced another radiocarbon date consistent with the ones from the 1987 season but with a much larger error (Fig. 2).

## REPORT ON SUBSURFACE SOUNDINGS IN WUDYAN 'AQABA AND SOFĀR

A team normally consisting of two staff members and four or five local labourers excavated test trenches in a large number of stream terraces and in front of a couple of rockshelters both upstream and downstream from Ṭabaqat al-Būma. The first was a 1m × 4m trench in front of the rockshelter, immediately across the road from Ṭabaqat al-Būma, which we designated as Area 1R of site WZ 200. The other localities were given site numbers in the 300 series to distinguish them readily and to emphasize that they were not necessarily the sites of ancient cultural activity. Most of these were dug to a depth of 2m. Seven (WZ 300-306) were placed in different terraces for a 2-km stretch to the south of Ṭabaqat al-Būma, in a segment of Wādī Summayl which the locals call variously Wādī Sofār or Wadi Sokār (Fig. 9). Three (WZ 307 A and B, WZ 308) were placed near one of the main springs of 'Ayūn Ziqlāb, called 'Ayn al-Ḥammām, just prior to the the spring's deep burial by new road construction. Two trenches (WZ 310, Areas A and B) next to a road cut some 400 m northwest of Ṭabaqat al-Būma along the stretch of the Ziqlāb drainage called Wādī 'Aqaba, intersected important deposits of comparable age to those in Ṭabaqat al-Būma's Neolithic levels.

For lack of space, we leave discussion of these test excavations for another article, noting only that the most important of these are those on the valley slope at WZ 310, where there are rich stratified deposits and apparently quite a long sequence of occupation. Excavations at this location proved

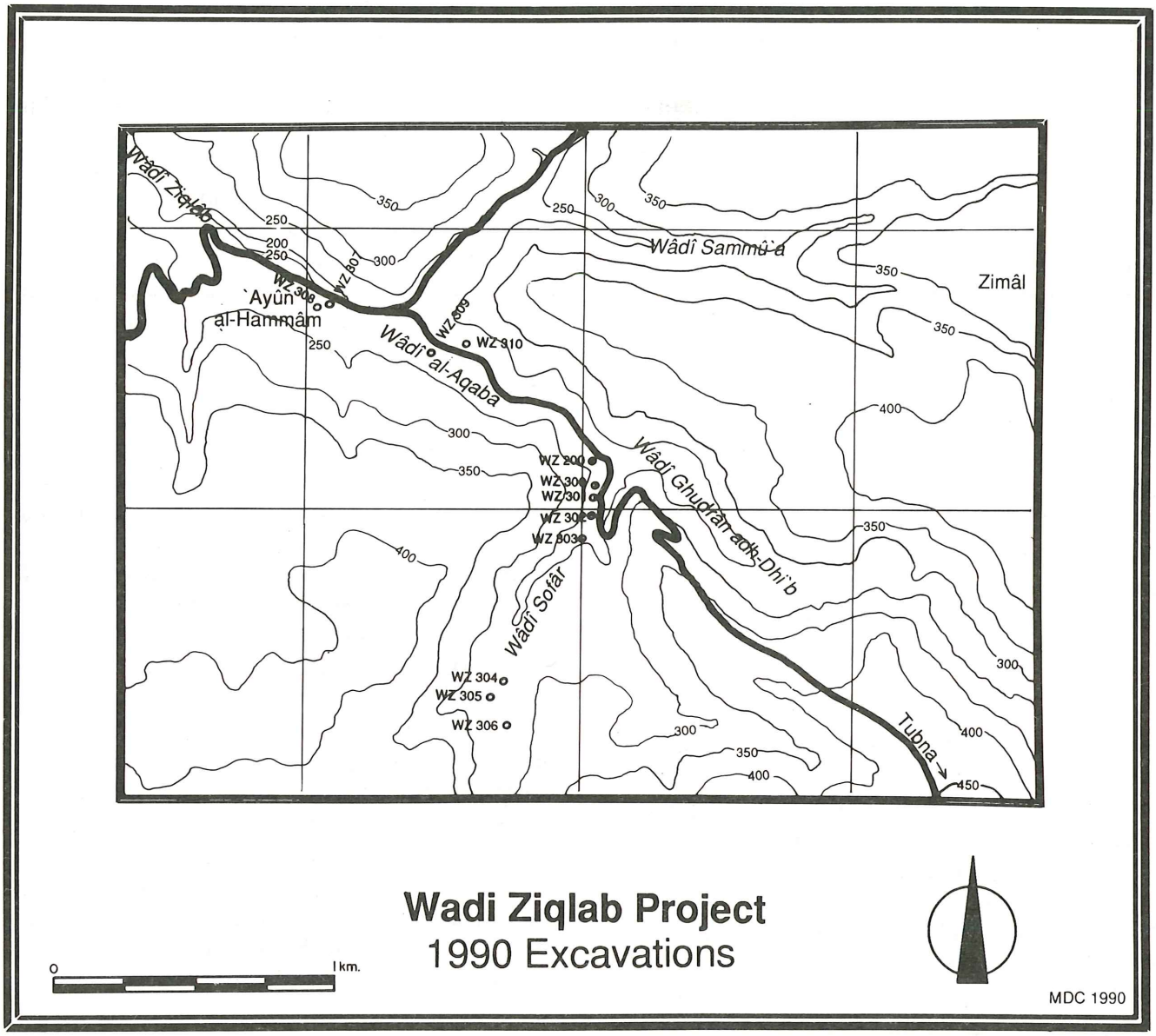


Fig. 9. Map showing the distribution of localities WZ 300 to WZ 310 of the 1990 soundings and their relationship to site WZ 200, Ṭabaqat al-Būma (M. Campbell).

much more productive than at any other terraces sounded during 1990. The first trench, Area A, almost immediately encountered a significant amount of pottery and lithics (loci 001 and 002), including a large ground stone trough or shallow basin, prompting us to add a similar trench, Area B, a few metres to the west. A little farther down, artifactual density was higher still. In the restricted area of two 1m × 3m trenches it was impossible to identify substantive architecture, but cobble areas, large stone concentrations, and apparent walls in the road cut immediately south of the excavated areas suggested that substantial architecture is indeed present.

Ash lenses discovered in the northeast meter and the central-west section (loci 009 and 010) of Area A and locus 007 of Area B proved much more productive of botanical material than comparable deposits in site WZ 200. Both trenches yielded an unanticipated density of charred plant material. Since these deposits produced assemblages essentially identical with the poorer ones from site WZ 200, moreover, the depositional environment, apparently vastly different from that of WZ 200, appears to have little effect on the charred plant remains. An original concern — that the precipitation of calcites in intercellu-

lar spaces in charred material fractured plant remains beyond recognition over time — thus appears unfounded.

The pottery from site WZ 310 also proved extremely interesting. The small sample of diagnostic forms includes bow-rim jars and various Late Neolithic-Chalcolithic forms. Since all of this material appeared only near the close of our excavations, it awaits detailed analysis, which will include petrographic and trace element comparisions with the wares from site WZ 200.

**Acknowledgements**

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We owe a number of people our special appreciation for the assistance they gave us this year. We would like to thank Dr. Ghazi Bisheh, then Director-General of the Department of Antiquities of Jordan, for his support of our research, and Dr. Khairieh 'Amr of the Department for her assistance with obtaining maps and aerial photographs from the Royal Geographic Centre. Nancy Claire Loader, as administrator and artifact registrar, deserves many thanks for her organizational efforts during and after the field season. Our thanks go to Taylor Dabney for the photography, to Julia Pfaff for all of the illustrations of pottery, objects and lithics, and to Mark Campbell for final maps and plans. We much appreciate Ken Russell's generosity in making his Macintosh Plus available to us while transferring files from the laptops and working on the preliminary report, and assistance we received from the baladiya of Deir Abu Sa'id and the governorate of al-Kura. We also appreciate the efforts of Oscar Hieban at ACOR in preparing rented equipment for us at the beginning and packing at the end of our field season, and of Bert De Vries, then ACOR director. Radiocarbon dates were provided by Isotrace Laboratories at University of Toronto. Thanks also go to Dr. Zeidan Kafafi (Yarmouk University, Irbid) and Dr. Genevieve Dollfus (CNRS, Paris), for their comments on pottery from our 1990 season of excavations, and to Dr. Brian Byrd (University of Wisconsin, Madison) and Dr. Deb Olszewski (University of Georgia, Athens) for comments on lithic analysis. Thanks also to Brenda Strickland for helping us out in the field, and to Adèle Tempest and Lance for helping us organize things for storage and shipping at ACOR. And, finally, many thanks to crew members Martin Grosskopf, Sandra Low, Bruce Routledge and Rula Shafiq, to Abd al-Karim Yusef and Maria Reyes, and to our work crew from Tubna, Deir Abu Sa'id and Samma for their tireless efforts.

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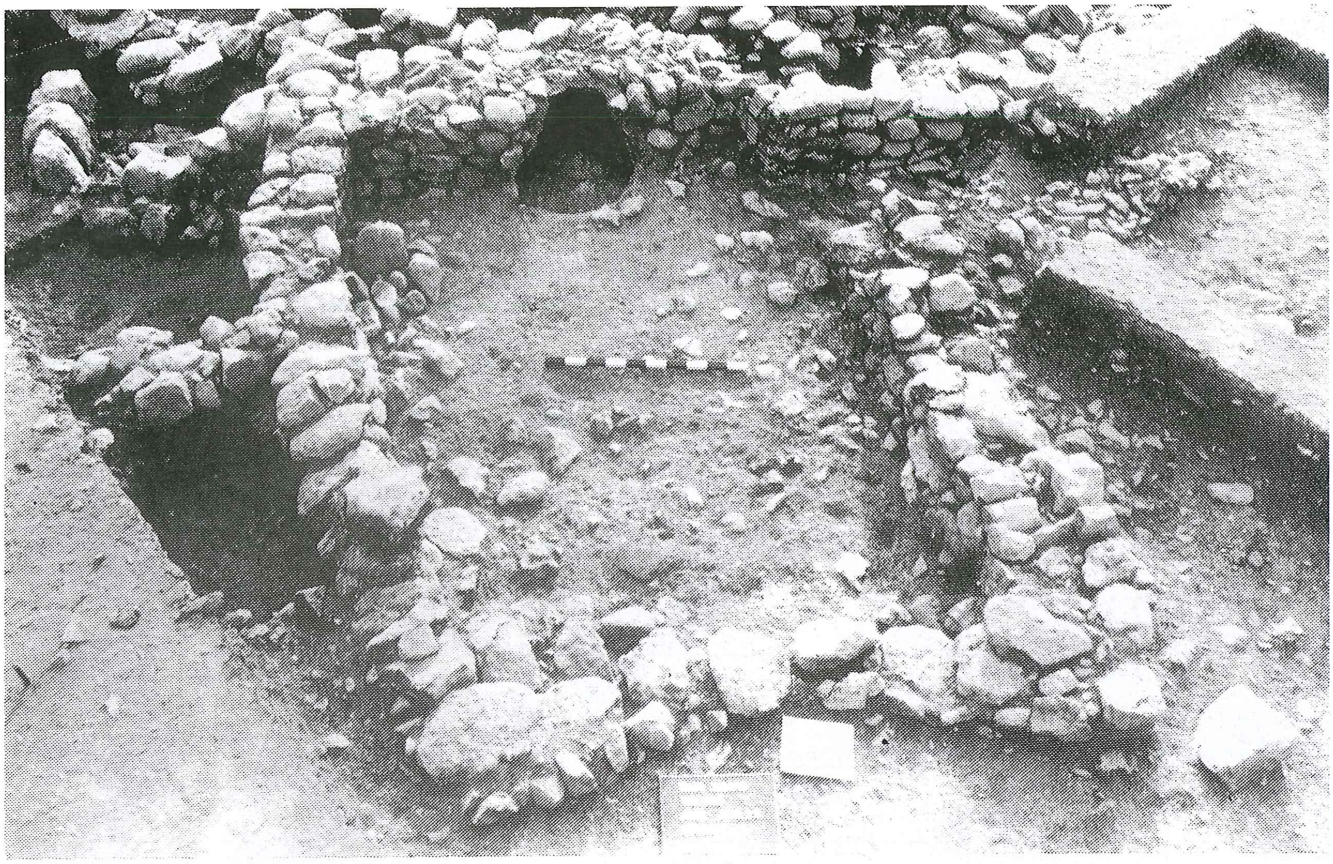
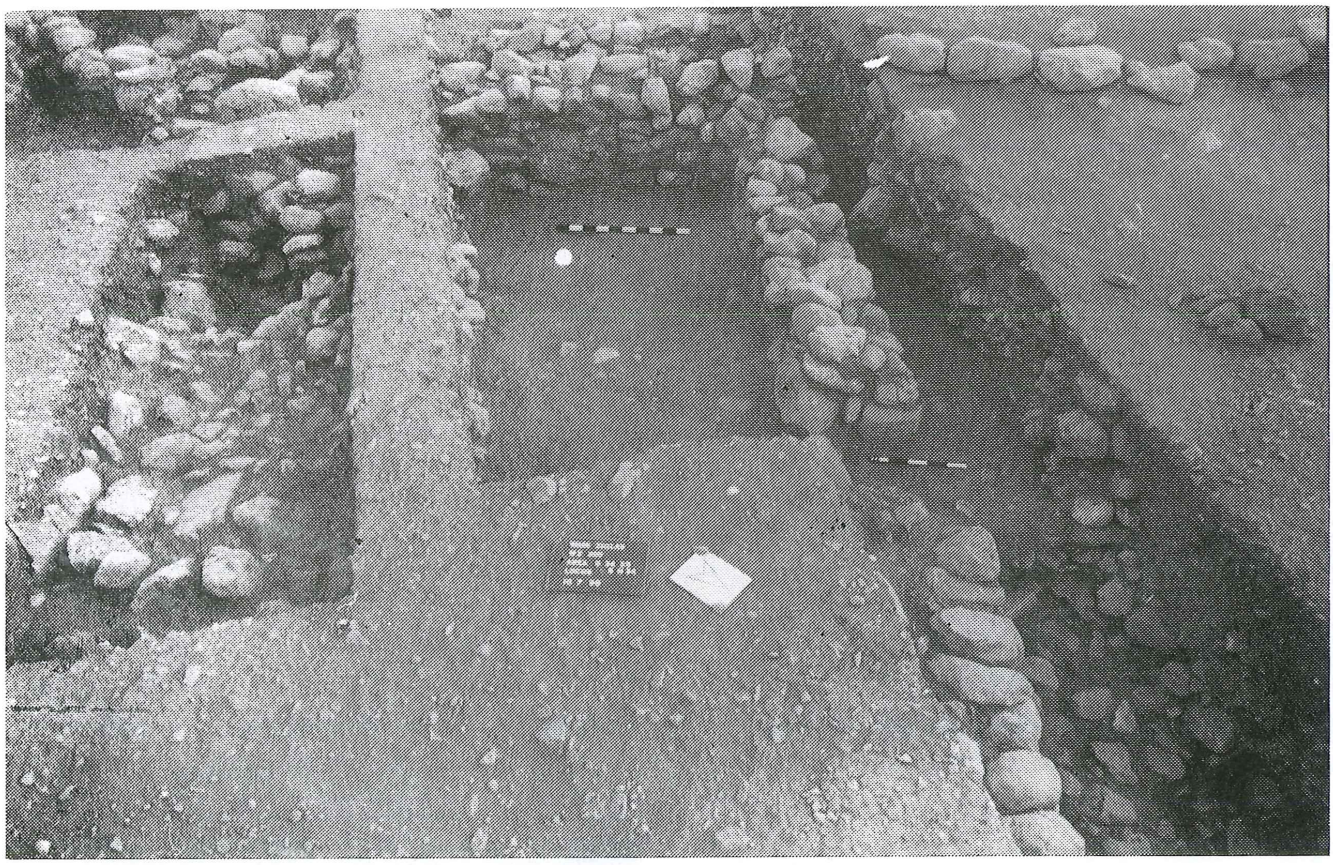
1. Overview of room and two burial cists (the one near the signboard probably a reused silo) in Area E36 of site WZ 200, Tabaqat al-Būma (photo: T. Dabney).

2. View to the south of the two abutting rooms 1 and 2 in Areas D35, E35 and E36 of site WZ 200, Ṭabaqat al-Būma (photo: T. Dabney).



1. View to the east of Room 2 with its clay-lined storage bin in Areas D35 and E35 (photo: T. Dabney)

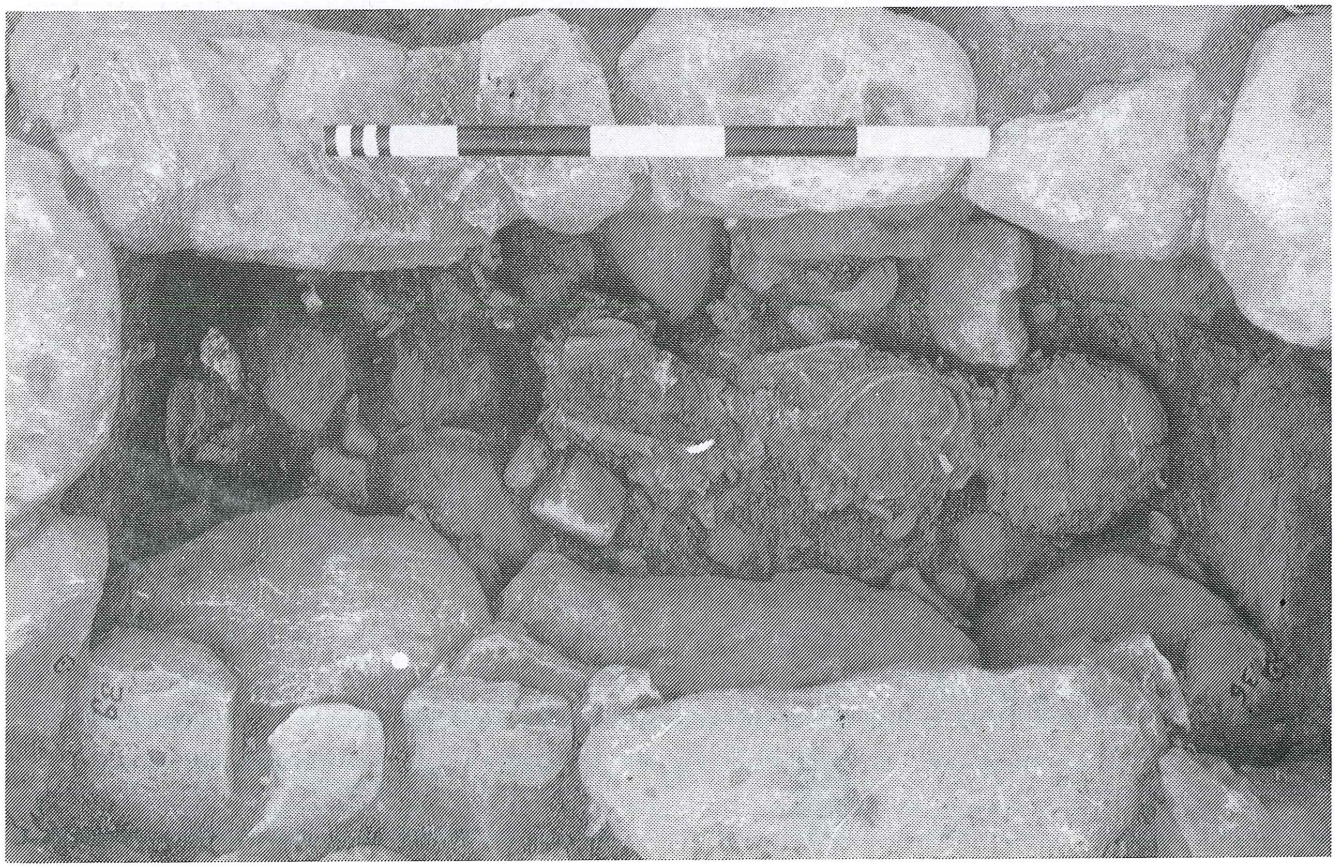


2. View to the west of Room 3 in Area G34 at site WZ 200, Ṭabaqat al-Būma (photo: T. Dabney).

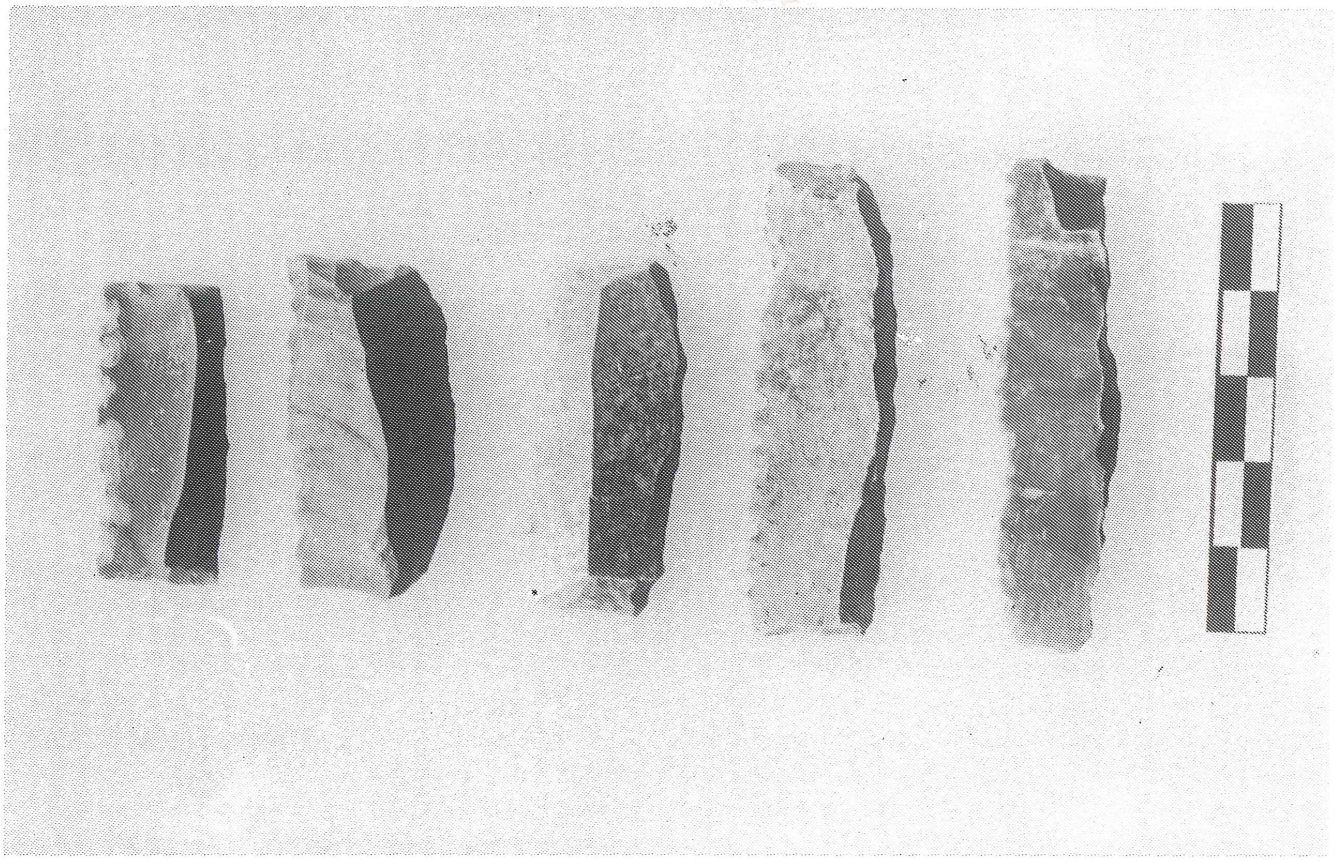

1. View of the cobble floor in the remnants of Room 4 in Areas I33 and I34 of site WZ 200, Ṭabaqat al-Būma (photo: T. Dabney).


2. Stone platform, locus 003, in Area D35 of site WZ 200, Ṭabaqat al-Būma (photo: T. Dabney).

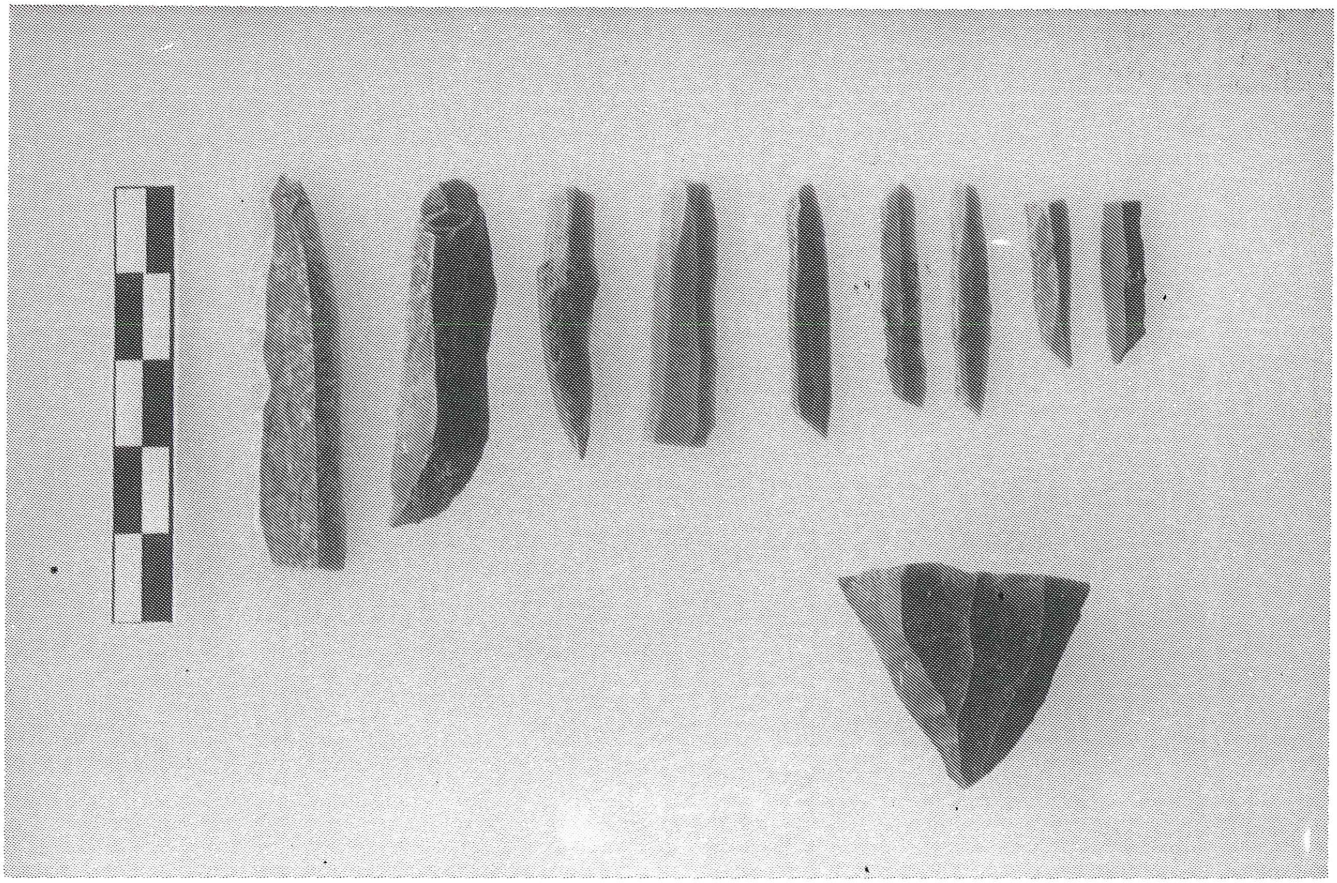
1. View of a human burial (locus 010) within the clay-lined bin in Room 2, Area E35 of site WZ 200, Tabaqat al-Būma (photo: T. Dabney).



2. Infant burial in stone cist (locus 026), after removal of the cap-stones, in Area E36 of site WZ 200, Ṭabaqat al-Būma (photo: T. Dabney).



1. Selected sickle blades from site WZ 200, Ṭabaqat al-Buma (photo: T. Dabney).



2. A selection of Kebaran artifacts, including a bladelet core, from the 1990 excavations at site WZ 200, Ṭabaqat al-Būma (photo: T. Dabney)