

SALVAGE EXCAVATIONS AT A PRE-POTTERY NEOLITHIC SITE AT MODI'IN

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In June 1999, a survey was undertaken in the area southwest of Modi'in (the Kaizer Compound), prior to urban development (map ref. NIG 199140-420/645440-660; OIG 149140-420/145440-660).¹ In addition to the numerous stone features mapped, an extensive concentration of flint objects was recorded on a hill and in a nearby field, one kilometer west of Modi'in, on the north bank of Naḥal 'Anaba. On the basis of certain tools, mainly axes and sickle blades, the site was assigned to the early Pre-Pottery Neolithic A (PPNA) period.

Since this hill (henceforth the western hill) is outside the future city of Modi'in, the subsequent salvage excavations² were confined to the adjacent (eastern) hill and to the field between the two hills (Fig. 1).³

THE EXCAVATIONS

The Eastern Hill

This elongated, rather flat hill, 68 × 105 m (Fig. 2) reveals large flint boulders on its surface. Numerous flint pieces were scattered over the hilltop, including tools and cores. Four probes (Areas 1-4), each containing two squares measuring 2 × 2 m, were opened in different parts of the hilltop (Fig. 1).

Area 1.— Within this area, located in the southwestern part of the hill, two soil strata were distinguished: a light brown, loose soil (0.20-0.25 m thick) above a grayish brown, packed soil about 0.35 m thick. Bedrock was exposed at an elevation of 245.60-245.67 m.

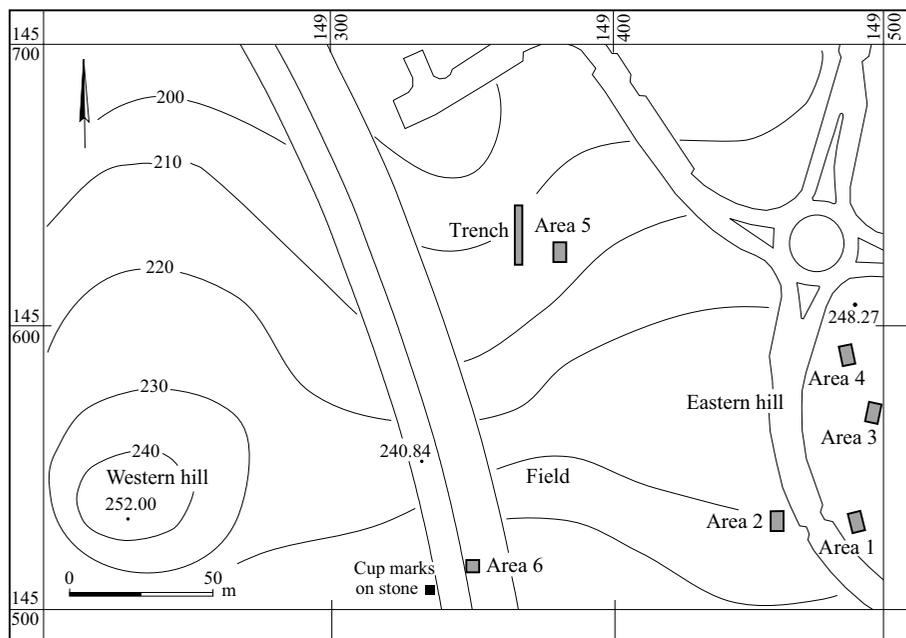


Fig 1. The excavated areas.



Fig. 2. The eastern hill, looking southeast.

Most of the 68 flint objects from this area were retrieved from the upper stratum.

Area 2.— Two squares opened 30 m west of Area 1 showed the same soil stratigraphy. Bedrock (comprising large, cracked blocks of limestone) was exposed at an elevation of 224.25–224.48 m (Fig. 3). About 200 flint artifacts, including three notched tools and two retouched flakes, along with Byzantine sherds, were found within the fills.

Area 3.— In Area 3 (located in the central part of the hill), a layer of grayish brown soil about 0.2 m thick overlay loose (chalk) bedrock. Within the fill 18 flint chunks and a core were recovered.

Area 4.— In this area, located on the northwestern edge of the hill, a dark gray soil layer, 0.15–0.17 m thick, overlay large bedrock blocks bearing traces of plough marks (Fig. 4; Plan 1). Within the fill 24 natural flint chunks, flakes and a large nodule were found.

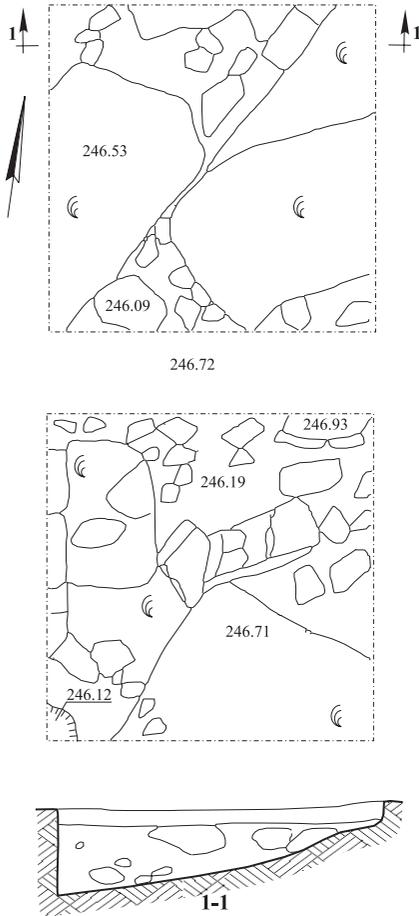
In summary, excavations on the eastern hill revealed no traces of a permanent human presence or activity in prehistoric periods. Of the more than 300 flint objects retrieved in the excavated areas, the overwhelming majority constitute natural chunks and flakes. All the tools ($n = 11$) derived from both the excavation and the surface collection are ad hoc tools (e.g.,



Fig. 3. Area 2, looking south.



Fig. 4. Area 4, looking north.



Plan 1. Area 4: plan and section.

notches and retouched flakes) with unclear chronological attribution.

The Western Hill

The western hill, located 110 m west of the eastern hill, measures 250 m in length and 12 m in height (252 m asl). Its southern slope is steep, its northern slope descends gradually northward (Fig. 5).

Natural terraces (*nari* benches) on the northern slope, 2.5–3.0 m wide, were used for agriculture in historical periods. Their soil cover has been washed away, and flint artifacts (as well as Byzantine sherds) are now visible, scattered over the limestone rock. The northern slope in particular exhibits an enormous density of lithics. A small (0.25 × 0.40 m) randomly-chosen test area produced 165 artifacts, including PPNA tools and waste material (Fig. 6). Some implements (e.g., bifacials and sickle blades) were found at the very top of the hill. Altogether, 565 lithics were collected in the survey, most on the northern slope of the hill.

Outcrops of the raw material (large blocks of Senonian flint of the Meshash formation) were observed on the surface in different parts of the hill, but mainly in its upper section.



Fig. 5. The field and the western hill, looking northwest.



Fig. 6. The western hill: flint artifacts concentrated within a test area.



Fig. 7. The test trench (western face).

The Field

The field, c. 110 × 350 m, is bordered on the west and east by the two above-mentioned hills (see Fig. 1). It is delineated in the south by Nahal 'Anaba and cut by a shallow valley in the north. The field has a northward gradient of 5 m per 110 m.

Numerous flint objects are visible all over the surface, however the systematic collection was confined to a plot of 40 × 100 m in the northern part of the field, bordered by two later stone walls. Altogether, 2101 flint artifacts were collected from this area.

In order to reveal any architectural remains, installations and production areas associated with the PPNA site, and also to clarify the soil stratigraphy, three probes were opened in different parts of the field (Fig. 1).

Test Trench.— This mechanically excavated trench, 1 × 10 m, oriented north–south, was opened in the eastern part of the field. The fill, about 1.5 m thick, consisted of dark brown, homogenous, heavy-packed soil (gromosol). The limestone bedrock was exposed at an elevation of 235 m asl (Fig. 7).

Most of the 68 flint items were retrieved from the upper section of the fill, 0.4 m thick. Some Byzantine sherds were also found.

Area 5.— Two adjacent squares, 2 × 2 m, were excavated 12 m east of the trench. The fill, a dark brown, packed gromosol, contained some natural, medium- to large-sized boulders

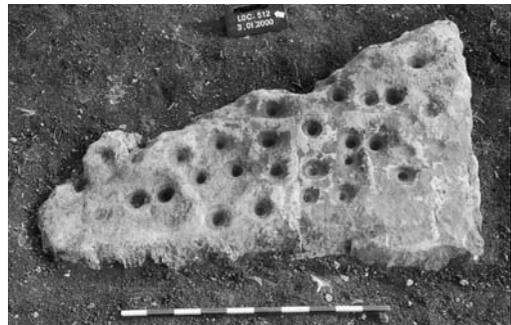


Fig. 8. The cup marks on a stone near Area 6.

exposed at a depth of 0.11–0.27 m below the surface. The fill, about 0.4 m thick, was entirely sieved and 515 flint items were retrieved.

Area 6.— One square, 2 × 2 m, was opened in the southern part of the field, 110 m south of Area 5. It showed the same soil matrix characteristic of the field: a heavy packed, homogenous gromosol, 0.55–0.60 m thick. The bedrock was exposed at elevations 240.31–240.36 m asl. The flint artifacts (n = 69) were retrieved mostly from a depth of 0.2–0.4 m (sieving was conducted).

A large natural stone, 0.20 × 0.65 × 1.65 m, was discovered on the surface, 12 m southwest of Area 6. The flat, slab-like stone bears several rows of cup marks, 7–9 cm in diameter (in total, 30–31 cup marks; Fig. 8).

Discussion

The PPNA site occupied the western hill (mainly its summit and the northern slope)

and the adjacent field, but did not include the eastern hill. It covered an estimated area of 38–39 dunams (110 × 350 m), though several diagnostic PPNA flint tools were collected 250 m to the north, probably having been washed down slope.

No architectural remains or installations dating to the PPNA were uncovered. All probes revealed the same fill: a layer of dark brown, homogenous soil (gromosol), 0.5–1.5 m thick. The flint artifacts were retrieved mainly from the upper 0.3–0.4 m of the fill. A number of these objects had been washed down from the hill and dispersed over the field.

The flint artifacts found in the different parts of the site show no difference in raw material, morphology or technology, and therefore are assessed as deriving from a single unit.

THE FLINT ASSEMBLAGE

Altogether 3318 flint artifacts were found at the site of Modi'in—Kaizer Compound, of which the overwhelming majority (80.3%) derives from surface collection. The remainder originates in excavated Areas 1–6 and from the test trench.

Most of the lithics are made of gray Senonian flint (from the Meshash formation); 7.1% are made of chert with whitish crystalline inclusions; 10.1% bear cortex remains; 4.4% are burnt.

The Waste

The waste materials from the excavated areas and the surface collection are flake-dominated (Table 1). Flakes ($n = 1484$) constitute 88.6%. Among them, 76.3% are small flakes, 1.5–3.0 cm long, and 20.8% are medium-sized, 3.1–5.9 cm long.

The blades ($n = 60$) are mostly irregular and triangular in section. The majority are broken. Of seven complete blades, the largest reaches 5.6 cm in length. The width of 60% of the blades is in the 1.2–1.8 cm range; bladelets, 0.6–0.9 cm wide, constitute 15.3% of the total blades.

Core trimming elements ($n = 8$) are mostly core sections with remains of a striking platform and the scars of three or four blades or flakes. A ridge blade and three core tablets were also found.

Bifacial spalls ($n = 31$) are usually broken. The complete examples vary in length from 3.4 to 4.4 cm, the two largest pieces being 6.5 and 8.0 cm long; 80% of the bifacial spalls have small, regular jags along the break. This natural 'retouch' is characteristic of bifacial working ends. Some spalls (Fig. 14:2) were reutilized as scraping tools.

Burin spalls ($n = 2$), 2.6 and 4.1 cm long and slightly curved, have sub-rectangular sections.

Cores ($N = 196$)

This category includes 195 formal cores and an oval nodule, 5.2 × 8.0 × 13.5 cm, with rhomboidal section. The majority of 151 complete cores (61.6%) are small, 1–3 cm long; about half of these range in length from 1 to 2 cm. The quantity of small cores corresponds well with the predominance of small flakes in the assemblage. Medium-sized cores vary in length from 3.1 to 5.0 cm. Only eight cores are large (5.1–6.8 cm long).

Table 1. The Flint Assemblage (Surface Collection and Excavation)

| Type | N | % |
|-----------------------|-------------|--------------|
| Primary elements | 89 | 5.3 |
| Flakes | 1484 | 88.6 |
| Blades | 60 | 3.6 |
| CTEs | 8 | 0.5 |
| Burin spalls | 2 | 0.1 |
| Bifacial spalls | 31 | 1.9 |
| <i>Total Debitage</i> | <i>1674</i> | <i>100.0</i> |
| Chips | 289 | 62.3 |
| Chunks | 175 | 37.7 |
| <i>Total Debris</i> | <i>464</i> | <i>100.0</i> |
| Debitage | 1674 | 50.5 |
| Debris | 464 | 14.0 |
| Cores | 196 | 5.9 |
| Tools | 984 | 29.6 |
| <i>Total</i> | <i>3318</i> | <i>100.0</i> |

Flake cores (55.9%) and flake/blade cores (28.2%) outnumber blade and bladelet cores, which constitute only 15.9% of the total.

Five core types are distinguished: (1) Single platform cores (48.7%)—irregular or pyramidal (Fig. 9:1); (2) cores with two striking platforms (12.8%), most with perpendicular platforms or acute-angled platforms, five having opposing striking platforms (Fig. 9:2); (3) three-platform cores (Fig. 9:3; $n = 1$; 0.5%); (4) discoidal cores (Fig. 9:4; 2.6%); and (5) amorphous cores (12.8%).

Of the first two types, 23 cores have prepared striking platforms (Fig. 9:1). Forty-four cores (22.6%) are fragmentary and could not be classified.

Tools (Table 2)

The tool category includes 984 objects (29.6% of the entire flint assemblage). Most of these (83.3%) are surface finds. A relatively high frequency of tools is characteristic of the flint assemblages from the excavated areas (25.2%), and the systematic surface collection undertaken in the field (27.5%).

The tool kit is dominated by flake tools (68.5%). Blade tools constitute 17.1%, core tools 13.7%, and tools made on chunks—0.7%.

Retouched Blades (N = 87)

The majority of these are irregular, 1.5–2.4 cm wide, with triangular sections. Six complete tools vary in length from 3.0 to 6.9 cm. Most (c. 72%) have simple retouch on a lateral edge (dorsal surface); seven items are retouched on both dorsal and ventral surfaces.

Sickle Blades (N = 8)

All the sickle blades are fragments, 2.6–6.0 cm long and 2–3 cm wide. These implements have bifacially retouched backs, 0.6–1.0 cm thick (Fig. 10), characteristic of Bet Ta'amir sickle blades. The opposite lateral edge is fashioned in some cases by simple retouch (Fig. 10:2) and shows gloss. Two implements lack gloss (Fig. 10:4) and may be defined as non-utilized sickle blades.

Backed Blade (N = 1)

A distally-broken blade, 2.3 cm wide, has a 0.8 cm thick back fashioned by fine abrupt retouch.

Truncated Blade (N = 1)

A complete, slightly curved blade, 2.4 cm long and 1 cm wide, has an oblique distal truncation fashioned by semi-abrupt retouch.

Notches and Denticulates (N = 327)

Notched tools, the dominant group within the tool kit (Table 2), were made mostly on flakes. Only 5.5% of the total notches are blade tools, and 1.8% were made on chunks. Tools with single notches (77.7%) vary in width from 0.5 to 3.2 cm and were fashioned by simple retouch. Tools with two notches, adjacent or opposite, comprise 19.3%. Only 10 tools have three notches; three of these may be defined as denticulates.

Scrapers (N = 116)

Most of the scrapers are medium or small in size (56% and 28.4% respectively); 77.6% were made on flakes; the remainder are blade tools. The majority of the tools on flakes (73.3%) constitute endscrapers with rounded, slightly protruding, ogival or, in some cases, straight working ends (Fig. 11:1–3). Five are double endscrapers. Sidescrapers comprise 26.7%.

The scrapers on blades usually have narrow, rounded or ogival working ends (Fig. 11:4, 5).

Table 2. Tool Frequencies

| Tool Type | N | % |
|--------------------------|------------|--------------|
| Retouched blades | 87 | 8.8 |
| Sickle blades | 8 | 0.8 |
| Backed blades | 1 | 0.1 |
| Truncated blades | 1 | 0.1 |
| Notches and denticulates | 327 | 33.2 |
| Scrapers | 116 | 11.8 |
| Retouched flakes | 284 | 28.9 |
| Perforators | 36 | 3.7 |
| Burins | 9 | 0.9 |
| Bifacials | 115 | 11.7 |
| <i>Total</i> | <i>984</i> | <i>100.0</i> |

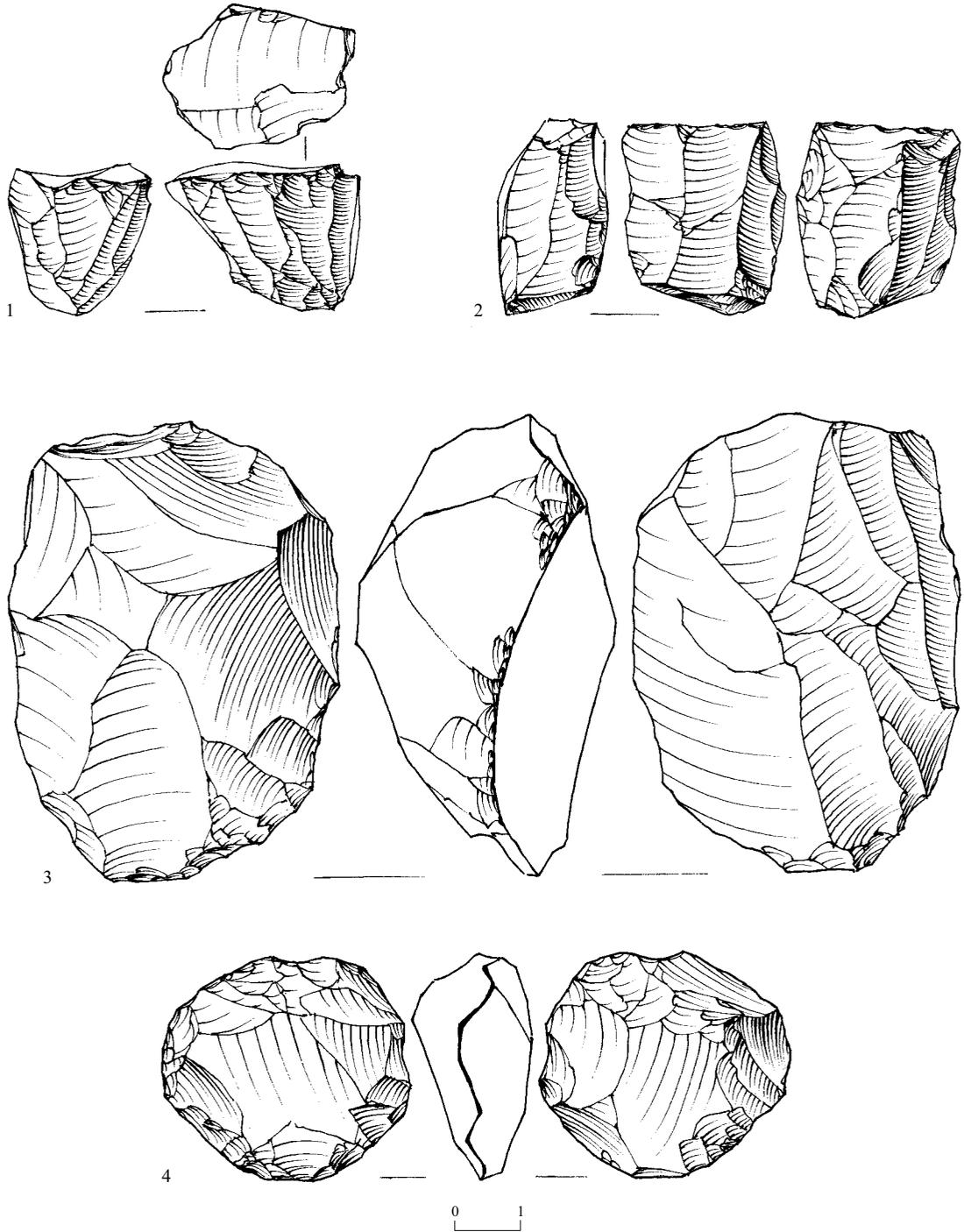


Fig. 9. Cores.

Three are double scrapers (Fig. 11:6). Two scrapers were made on ridge blades (Fig. 11:4). In some cases, scrapers have additional retouch and are combined with notches (Fig. 11:1, 3-5).

Retouched Flakes (N = 284)

Most of the retouched flakes are medium-sized (3.0-5.9 cm long). Smaller tools constitute 25.7% of the total. These tools are usually

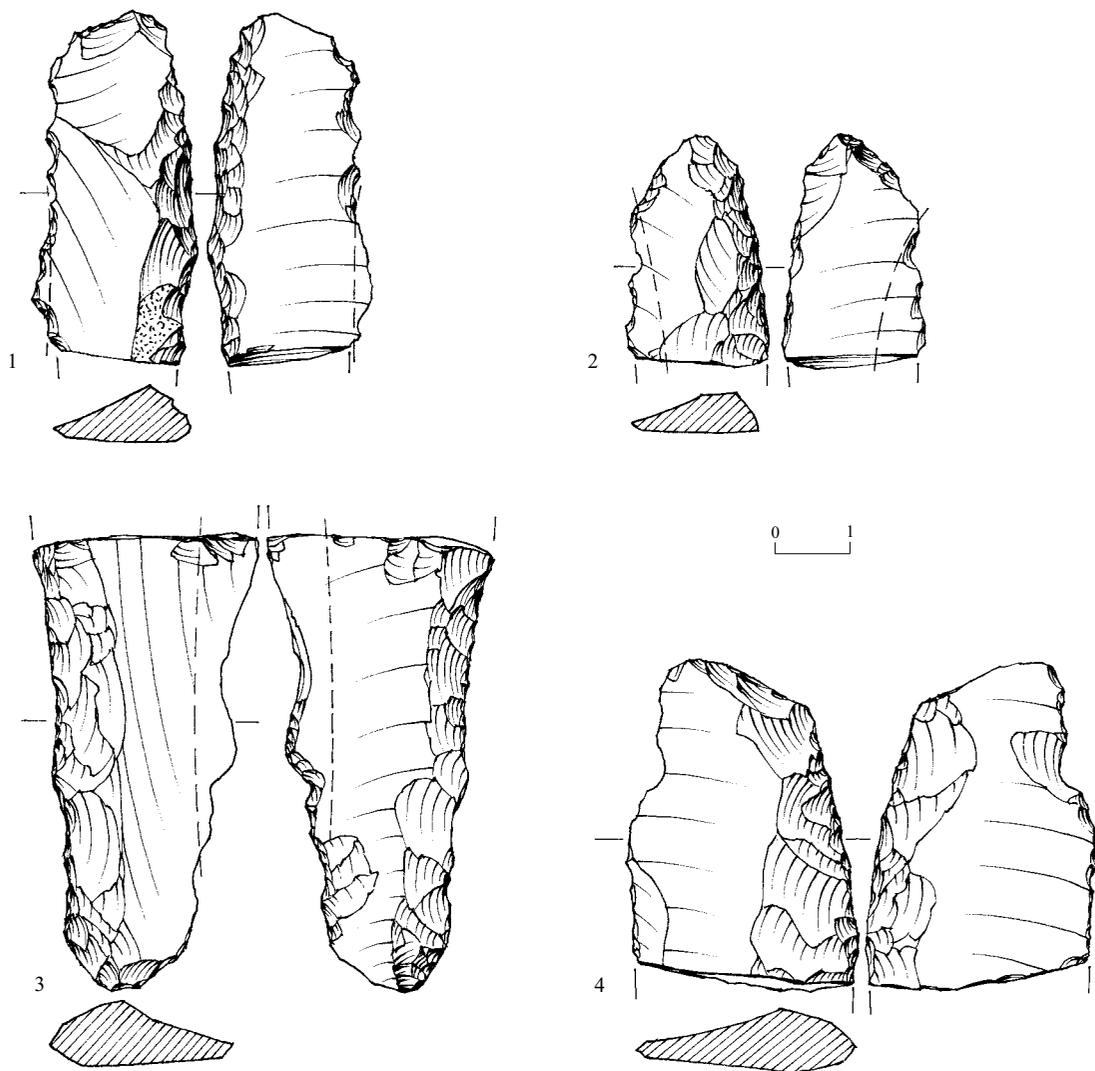


Fig. 10. Sickle blades.

fashioned by simple or semi-abrupt retouch on a section of the edge (dorsal surface).

Perforators (N = 36)

The majority of the perforating tools (44.4%) were made on medium-sized flakes; small tools (less than 3 cm in length) and large tools (6 cm and longer) on flakes constitute 27.8% and 22.2% of the total, respectively. Two complete awls were made on blades, 5.6 and 6.6 cm long.

The perforators are dominated by awls with a short, sharp point (Fig. 12:1), in some cases

modified between two notches. Three awls have horizontal (side) points.

Six perforating tools with a protruding point, 1.5–3.0 cm long (Fig. 12:2), are defined as borers. One of these is considered a blunt perforator.

Burins (N = 9)

Most of these tools were made on medium-sized flakes; a single tool was manufactured on a medially broken blade, 4.4 cm long. Three subtypes were distinguished: burins on a break (n = 4), dihedral burins (n = 4; Fig. 12:3) and a single angle burin.

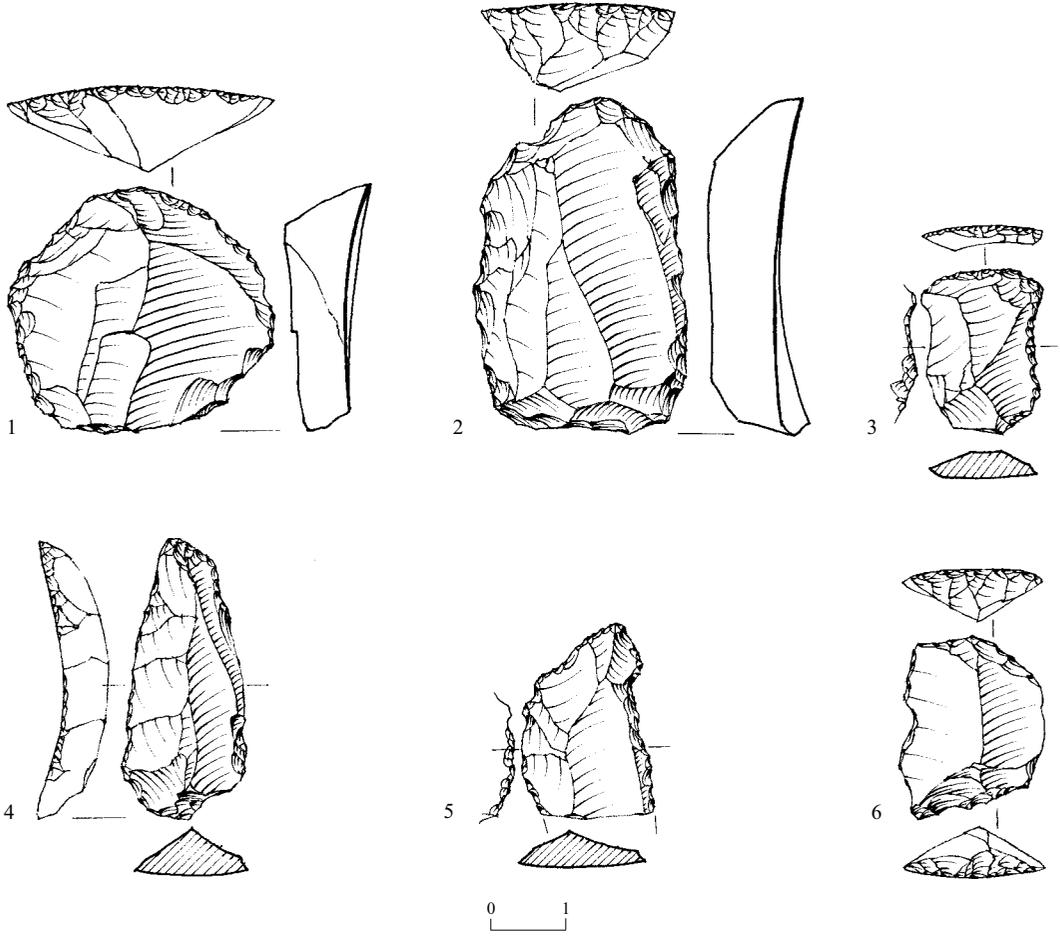


Fig. 11. Scrapers.

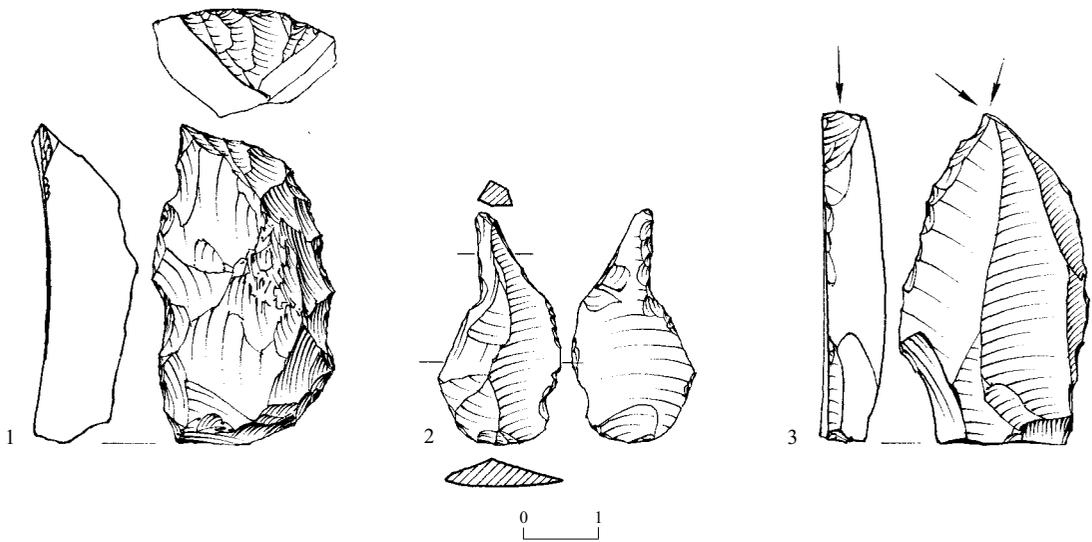


Fig. 12. (1, 2) Perforating tools; (3) burin.

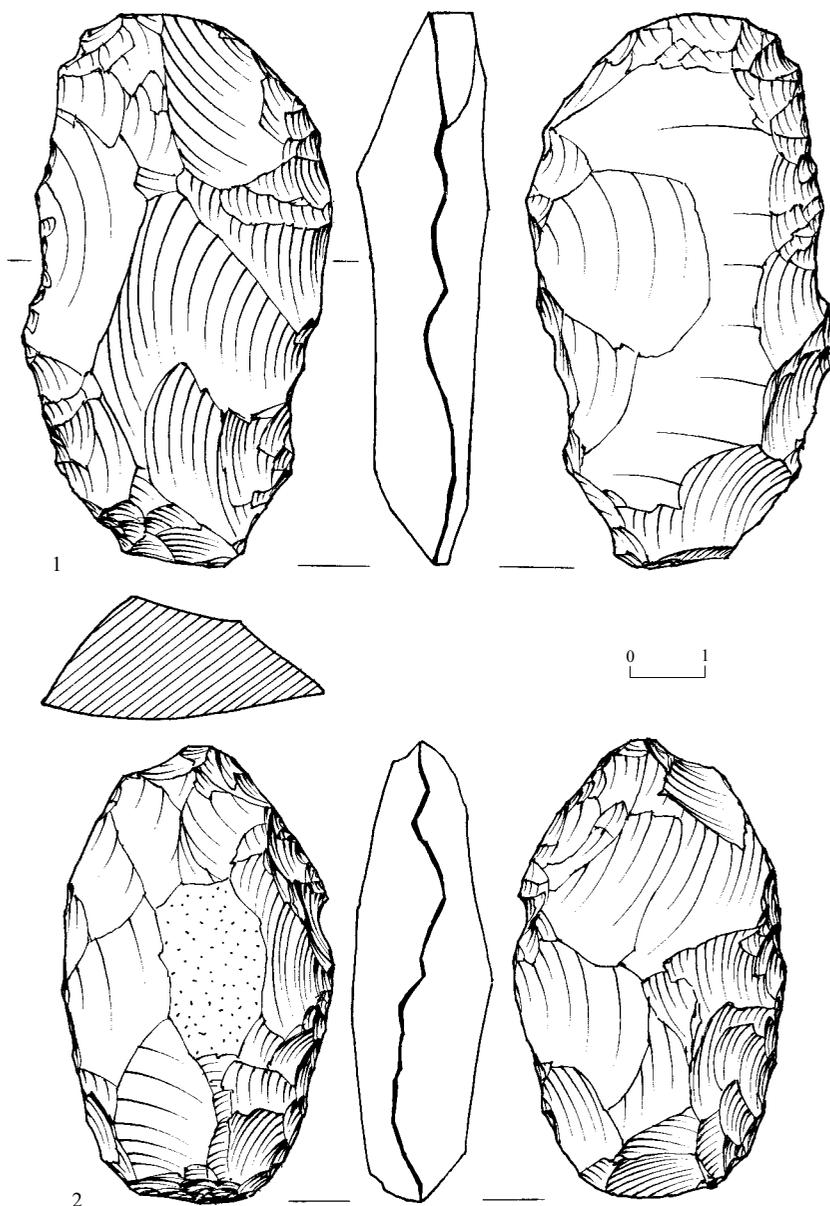


Fig. 13. Bifacials.

Bifacials (N = 115)

The overwhelming majority of the bifacials were found on the surface: 61 objects in the field and 47 on the western hill. Only seven tools derive from the excavation in Area 5. Most are broken. Of 36 complete bifacials, about 50% vary in length from 4.2 to 5.8 cm; the two largest artifacts are 8.6 and 10.3 cm long. Width and thickness of the tools fall mainly in the 2.1–3.0 cm and 1.1–1.5 cm range respectively.

The bifacials are usually trapezoidal or sub-rectangular in shape; some are irregular (see Fig. 15:1). They usually have a rounded or straight working end, which was often fashioned by a transversal blow (37% of the total bifacials). The majority of the bifacial tools were flaked rather coarsely; some bear cortex remains. Nine shaped and flaked bifacials have unmodified (unworked) or roughly fashioned working ends (Fig. 13).

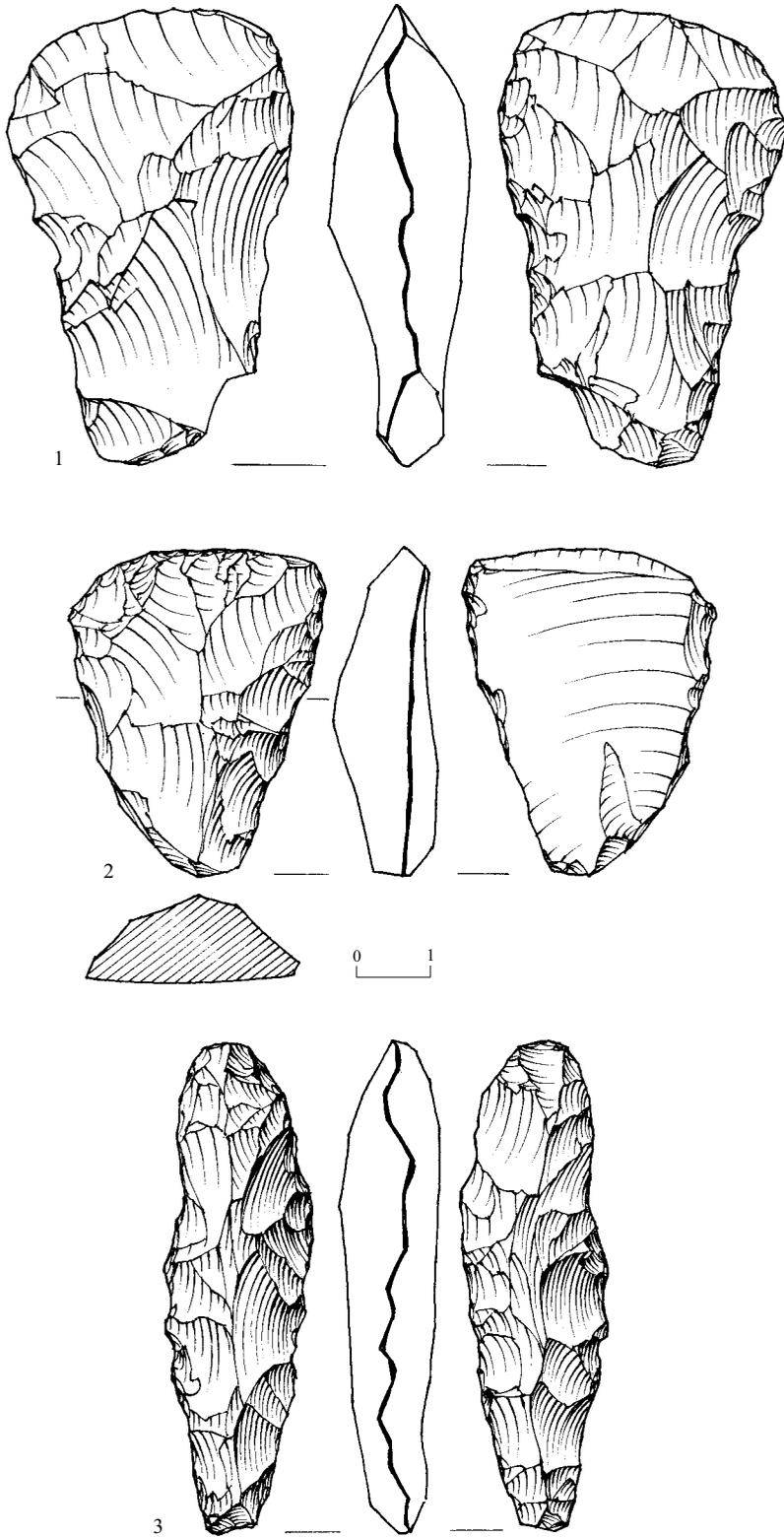


Fig. 14. (1) Axe; (2) adze; (3) chisel.

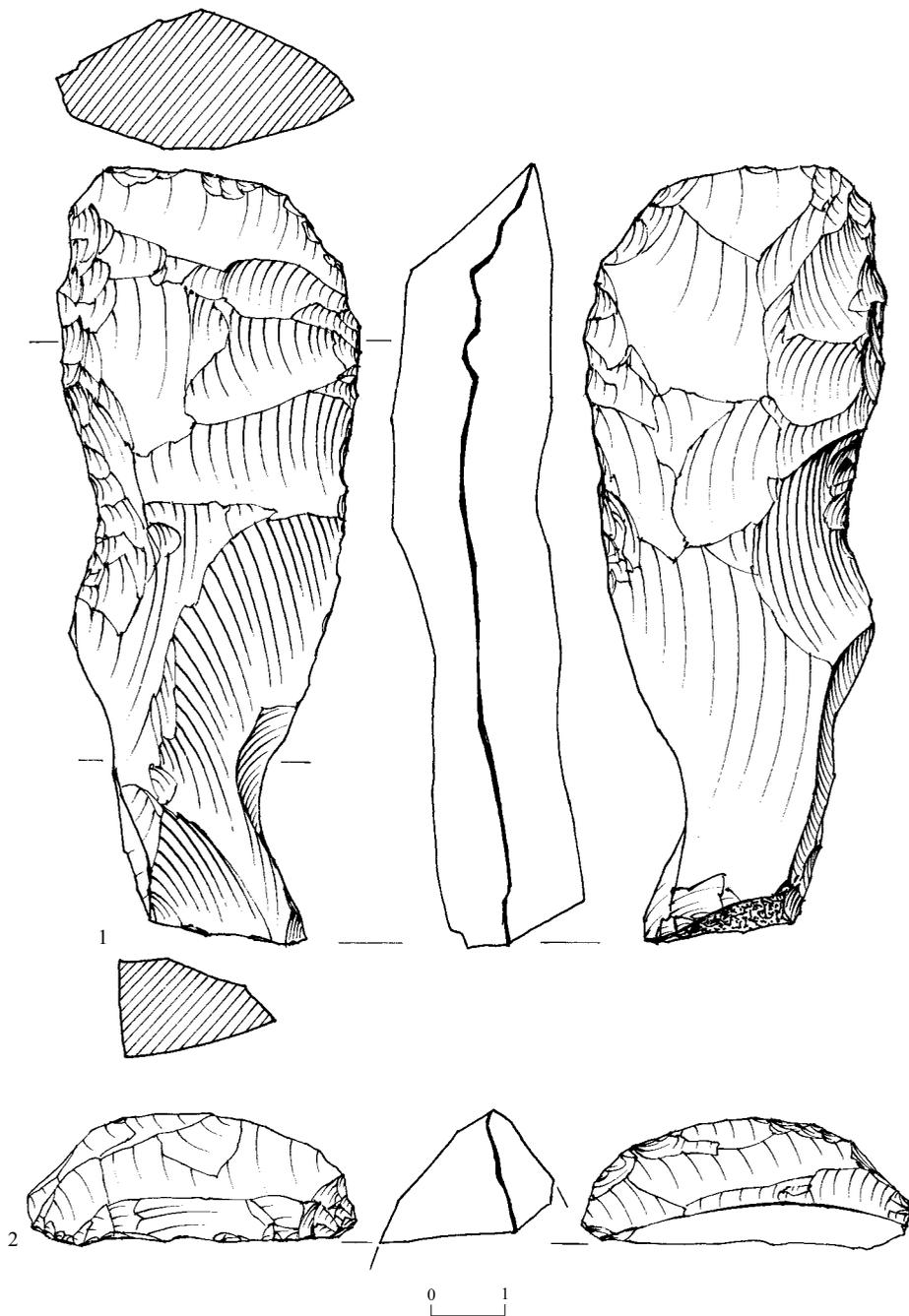


Fig. 15. (1) Axe; (2) axe spall.

Most of the diagnostic bifacial tools are axes (61.4%), characterized by lens-shaped or rhomboidal cross-section and a symmetrical longitudinal section (Figs. 14:1; 15:1). A smaller group (24%) includes adzes with

plano-convex or triangular cross-sections and asymmetrical longitudinal sections (Fig. 14:2). Chisels, with an average size of $1 \times 2 \times 6$ cm, which typologically resemble axes (Fig. 14:3), constitute 14.6% of the total bifacials.

Several broken bifacials were reutilized as notches, scrapers, a burin and a core.

DISCUSSION AND CONCLUSIONS

The Modi'in—Kaizer site is a new link in the chain of PPNA sites recently discovered and studied in the vicinity of Modi'in, namely, the Shimshoni Compound (Lass, in prep.; Zbenovich, in prep.), the Buchman Compound (Golani and Zbenovich 2001; Golani 2005) and others. All these sites, occupying hills at a distance of 1.5–2.5 km from one another, are characterized by their extensive area (30–40 dunams), the absence of architectural remains and the large quantities of flint artifacts, especially bifacials.

Some distinctions can be observed between the flint assemblages of the above-mentioned sites. The majority of cores and flakes from the Kaizer assemblage are small artifacts, while those from the Buchman assemblage are mostly medium sized. Bladelets are relatively rare within the Kaizer assemblage, composing 15.3% of the blade/bladelet category compared to 46.6% in the Shimshoni collection. Bifacials from the Kaizer assemblage are smaller in size

and rather coarsely worked, in comparison to those from the Shimshoni and Buchman assemblages. Nevertheless, the Modi'in—Kaizer flint assemblage shows an obvious similarity to the other Modi'in PPNA assemblages in raw material, repertoire and technological characteristics.

Of interest is the large, slab-like limestone block with numerous small cup marks discovered at Modi'in—Kaizer (see Fig. 8). Although no similar examples were discovered at any of the other Modi'in sites, they are not uncommon at PPNA settlements in the Jordan Valley, eastern Samarian hills and other regions, for example at Gilgal I (Noy 1979), Netiv Ha-Gedud (Bar-Yosef and Gopher 1997:55–60) and 'En Suhun (Nadel, Tsatskin and Zertal 1999). The closest analogy to these cup marks is found at Hātula (about 10 km southeast of Modi'in), where bedrock containing numerous cup marks was exposed 25–30 m from the PPNA houses (Samzun 1994:212–215).

In conclusion, the Modi'in—Kaizer site and the adjacent PPNA sites in the vicinity appear to have been special flint-knapping stations (seasonal work camps?). The abundant local outcrops of Senonian flint provided a rich source of raw material for such activity.

NOTES

¹ The survey was conducted by Mordechai Haiman, Leticia Barda and Vladimir Zbenovich on behalf of the Israel Antiquities Authority.

² The three-week excavation (Permit No. A-3168) was conducted by the author in December 1999 and January 2000 on behalf of the Israel Antiquities Authority. Yair Rahamim was the administrator, photographs were taken by Sandu Mendrea and

the author, and drawings were prepared by Michael Smilanski. I am grateful to Eldad Barzilay for his valuable comments.

³ On the western hill, numerous flint artifacts were collected in an additional survey conducted by Leticia Barda and the author in 2001, including axes and chisels. A natural stone block with cup marks was also discerned.

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