

## KHIRBAT UMM EL-‘UMDAN: A PRE-POTTERY NEOLITHIC A SITE

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Two Salvage excavations were carried out in November–December 1998 and in February–March 1999 at the Pre-Pottery Neolithic A Site F3 at Khirbat Umm el-‘Umdan, now within the Ha-Shevaṭim neighborhood in Modi‘in (Buchman compound [south]; Permit Nos. A-2966, A-3020; map ref. NIG 20075–100/64375–400, OIG 15075–100/14375–400; Golani and Zbenovich 2001: Fig. 158).<sup>1</sup> The site, which occupies a hilltop and its northern slope (285–279 m asl; Fig. 1), covered an area of about 200 × 400 m, judging from the dispersion of surface finds. The hilltop is rather flat (Fig. 2); the slope exhibits several stepped rock exposures (*nari* benches) 3–5 m wide, which were utilized as agricultural terraces (Fig. 3). Pottery sherds found on the terraces date mostly to the Byzantine period.



Fig. 1. Location map of Site F3 (a) and location of the excavation areas (b).

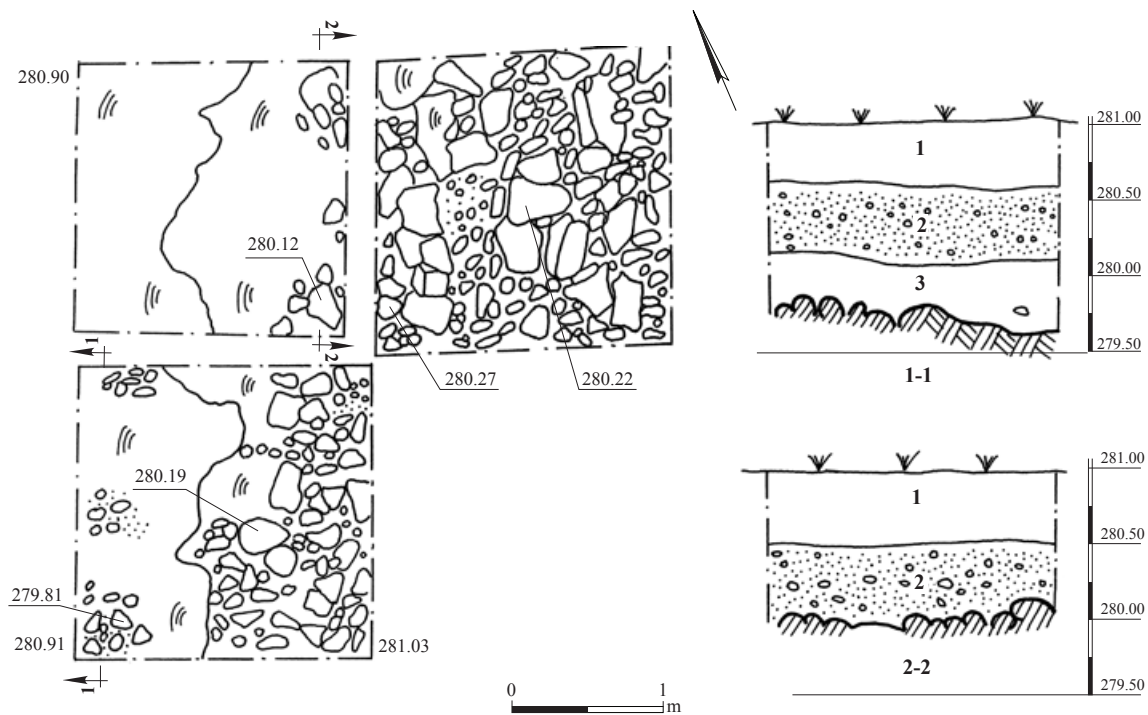


Fig. 2. The site, looking southeast.



Fig. 3. Area 2, Probe 2b, looking east.

The flint items were scattered over the hill, although different areas show different densities of finds. Most of the finds were concentrated on the hilltop and on the upper terraces. A strip running north–south (100 × 300 m) was systematically surveyed, and seven areas (total of 130 sq m) were excavated within this strip, as either squares or probes (see Fig. 1). All the areas produced an essentially common stratigraphy: Up to three layers of fill (e.g., Area 5; Plan 1): (1) a gray to brown/black topsoil (0.1 m thick); (2) a black soil (0.3 m thick); (3) a brownish soil above bedrock (0.30–0.65 m thick). The depth of bedrock varies from 0.14 to 1.2 m below the surface. Hollows in the bedrock were found in Areas 2, 3 and 4 (Fig. 4). Flint blocks were exposed above the bedrock throughout Area 5 (Fig. 5). No remains of installations or buildings that could be attributed to the Pre-Pottery Neolithic period were uncovered. Most of the flint artifacts, which come primarily from the fills, represent a single chronological unit (see below).



Plan 1. Area 5, plan and cross sections.



Fig. 4. Area 3, Probe 3, looking south.

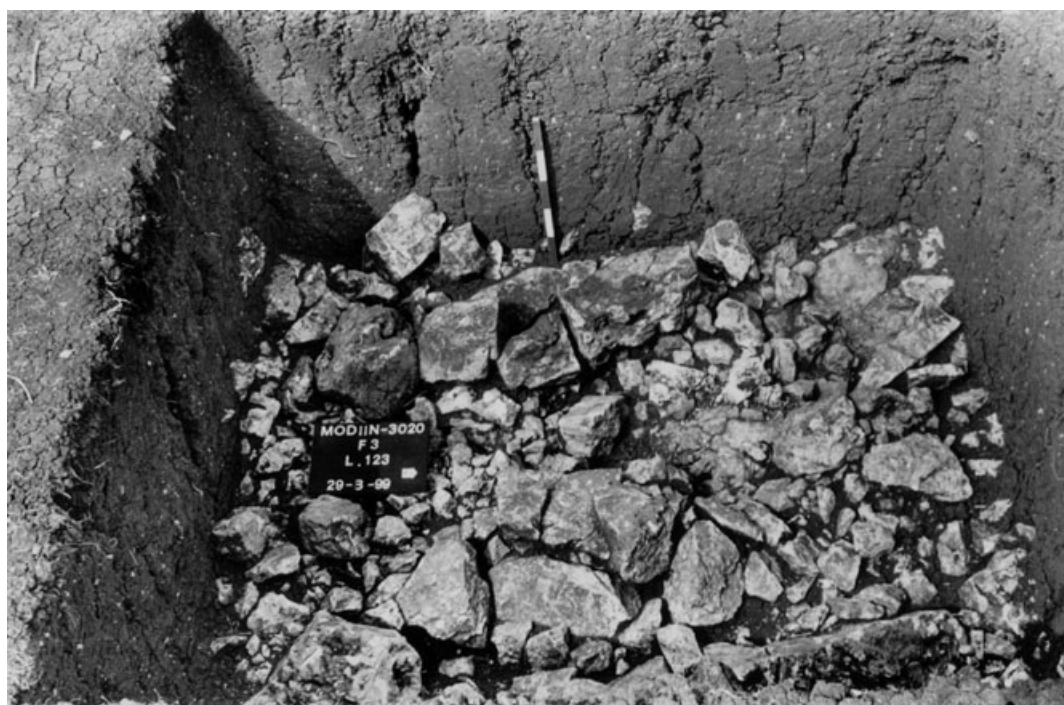


Fig. 5. Area 5, flint pieces in Sq 2.

## THE FLINT ASSEMBLAGE

The flint assemblage consists of 30,809 artifacts, of which 25,708 (83.4%) were retrieved from the excavated areas; 5101 pieces are from surface collection. Geochemical studies of the flint artifacts at the Geological Survey of Israel showed that almost all the archaeological samples originated in the Senonian Mishash Formation. A single artifact originates from the Eocene Zor'a chert clasts (Segal et al. 2005).

*The Waste* (Table 1)

*Debitage*.— Flakes ( $n = 11,853$ ) are dominant among thedebitage (blade/flake ratio of 1:22). Medium-sized flakes, with a length of 3.0 to 5.9 cm, form the majority (59.2% of the total flakes). Large flakes, varying in length from 6 to 9 cm, constitute 6.4% of the total. Small flakes (less than 3 cm in length), retrieved mostly from the excavated areas, constitute 34.4% of the total flakes. The blades ( $n = 530$ ) are mostly irregular, with triangular cross sections. The majority of the blades are broken. The 47 complete blades vary in length from 4.0 to 7.5 cm. Seventy-five percent of the complete blades are 1.2–2.0 cm wide. Ninety-eight bladelets, 0.4–0.9 cm wide, constitute 18.5% of the blades. Core trimming elements ( $n = 45$ ) are predominantly core fragments with the remains of a striking platform and negatives of three to four removed blades or flakes (Fig. 6:1). A core tablet and four ridge-blades represent the remainder of the core trimming elements (Fig. 6:2). Bifacial spalls ( $n = 81$ ) vary in length from 3.1 to 7.0 cm, and are 0.3–1.5 cm thick (Fig. 6:3–5). Most of these show retouch; several examples were reused as notched tools. Burin spalls ( $n = 9$ ), 3–4 cm long, are sub-rectangular in cross section.

**Table 1. The Flint Assemblage**

Type	N	%
Primary elements	913	6.8
Flakes	11853	88.3
Blades	530	3.9
CTE	45	0.3
Bifacial spalls	81	0.6
Burin spalls	9	0.1
<i>Total Debitage</i>	<i>13431</i>	<i>100.0</i>
Chips	11042	75.9
Chunks	3510	24.1
<i>Total Debris</i>	<i>14552</i>	<i>100.0</i>
Debitage	13431	43.6
Debris	14552	47.2
Cores	317	1.0
Tools	2509	8.2
<i>Total</i>	<i>30809</i>	<i>100.0</i>

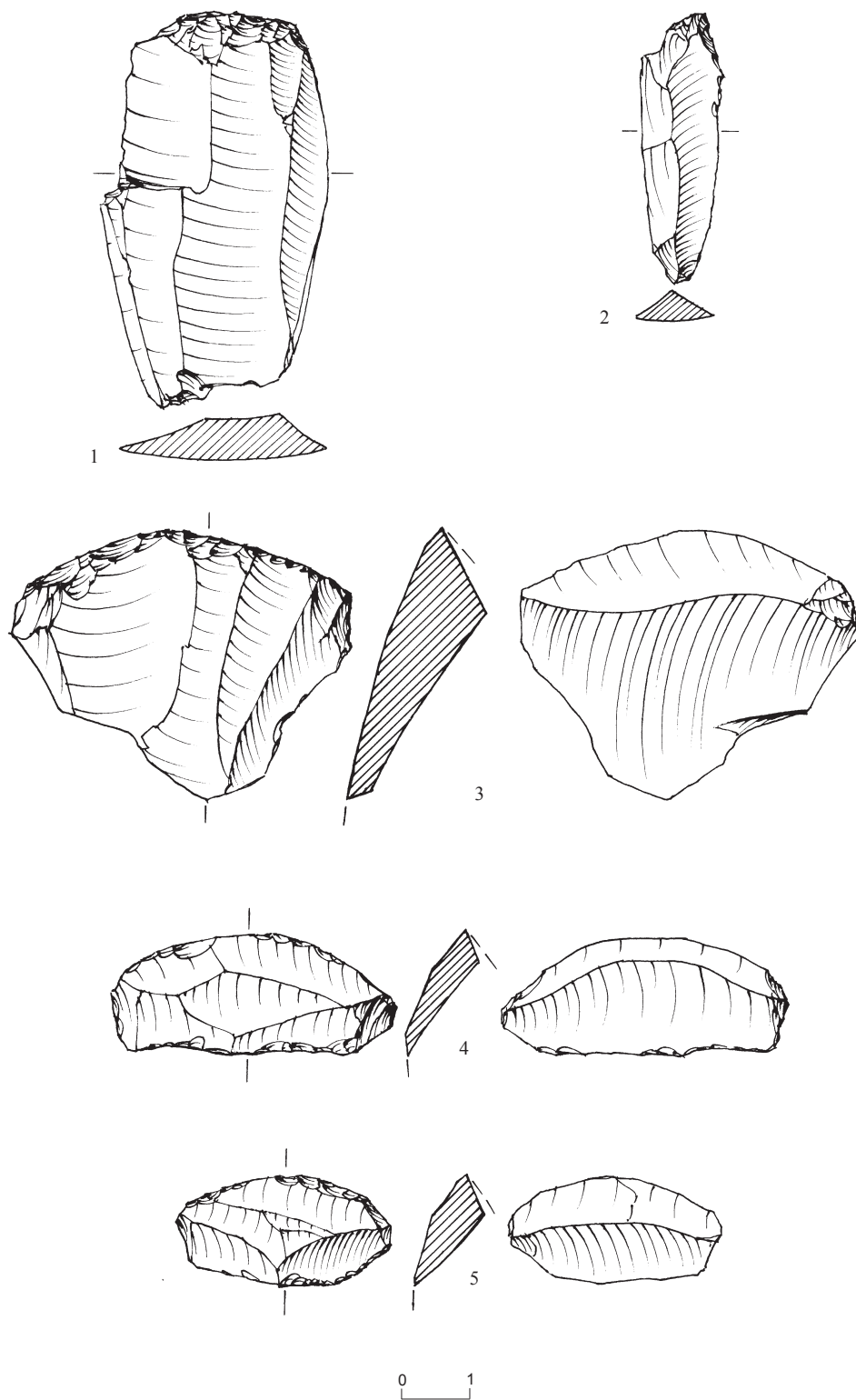


Fig. 6. Core trimming fragment (1); ridge blade (2); bifacial spalls (3–5).

*Debris.*— Chips constitute 75.9% of the debris. Chunks were found mostly within the upper levels of the fills; downward, they decreased in number and in size.

*Cores* (n = 317).— Five groups of cores can be distinguished:

1. Single platform cores (n = 128), irregular or pyramidal in shape (Fig. 7:1).
2. Cores with two striking platforms (n = 49). Most of these have right-angled or acute-angled platforms (Fig. 7:3). Five artifacts have opposed platforms (Fig. 7:2, 4).
3. Multiple platform cores (n = 6; Fig. 8:1).
4. Discoidal cores (n = 15; Fig. 8:2).
5. Amorphous cores (n = 45).

Seventy-four cores, represented by fragments, could not be classified.

Flake cores constitute 45.1% of the total; flake/blade and blade/bladelet cores are represented by the same number (27.45%). One-third of the total cores exhibit prepared (faceted) striking platforms (Fig. 7:4). The largest group of cores (45.5%) is medium sized, varying in length from 3.1 to 5.0 cm. Small cores, 1.0–3.0 long, constitute the next most frequent group (33.1%). Large cores, 5.1–8.0 cm long, constitute 21.4% of the total; some of these have a striking platform 6.5–7.0 cm in diameter.

*Tools* (Table 2)

The entire tool category (n = 2509) constitutes 8.2% of the total flint assemblage, although among the lithics derived from excavated areas, tools number even less (6.5%). Tools made on flakes dominate (67.1% of the tool kit); blade tools and core tools constitute 19.1% and 13.7% respectively. Three tools (0.1%) were made on chunks.

*Sickle Blades* (n = 21).— All these tools, but two, are represented by fragments 1.8–5.0 cm long, and may be divided into two groups:

1. Blades (n = 15), 1.6–2.9 cm wide, and 0.5–0.9 cm thick, usually with a bifacially flaked back (Fig. 9:1, 2). A single, complete sickle blade (Fig. 9:1) is bitruncated. Eleven of the sickle blades have gloss along the lateral edge opposite the back. Such sickles, known as Beit Ta'amir sickle blades (or knives), are the hallmark of the PPNA flint assemblages (Nadel 1997).
2. This group (n = 6) includes regular blades with triangular cross sections (Fig. 9:3). Four of these show gloss along one lateral edge; two sickle blades have bilateral sheen. Some broken sickle blades were reused as retouched blades.

Figure 9:4 represents an intrusive Chalcolithic sickle blade segment (for nearby Chalcolithic sites, see van den Brink 2005; van den Brink 2007a; van den Brink 2007b; Torgë 2010).

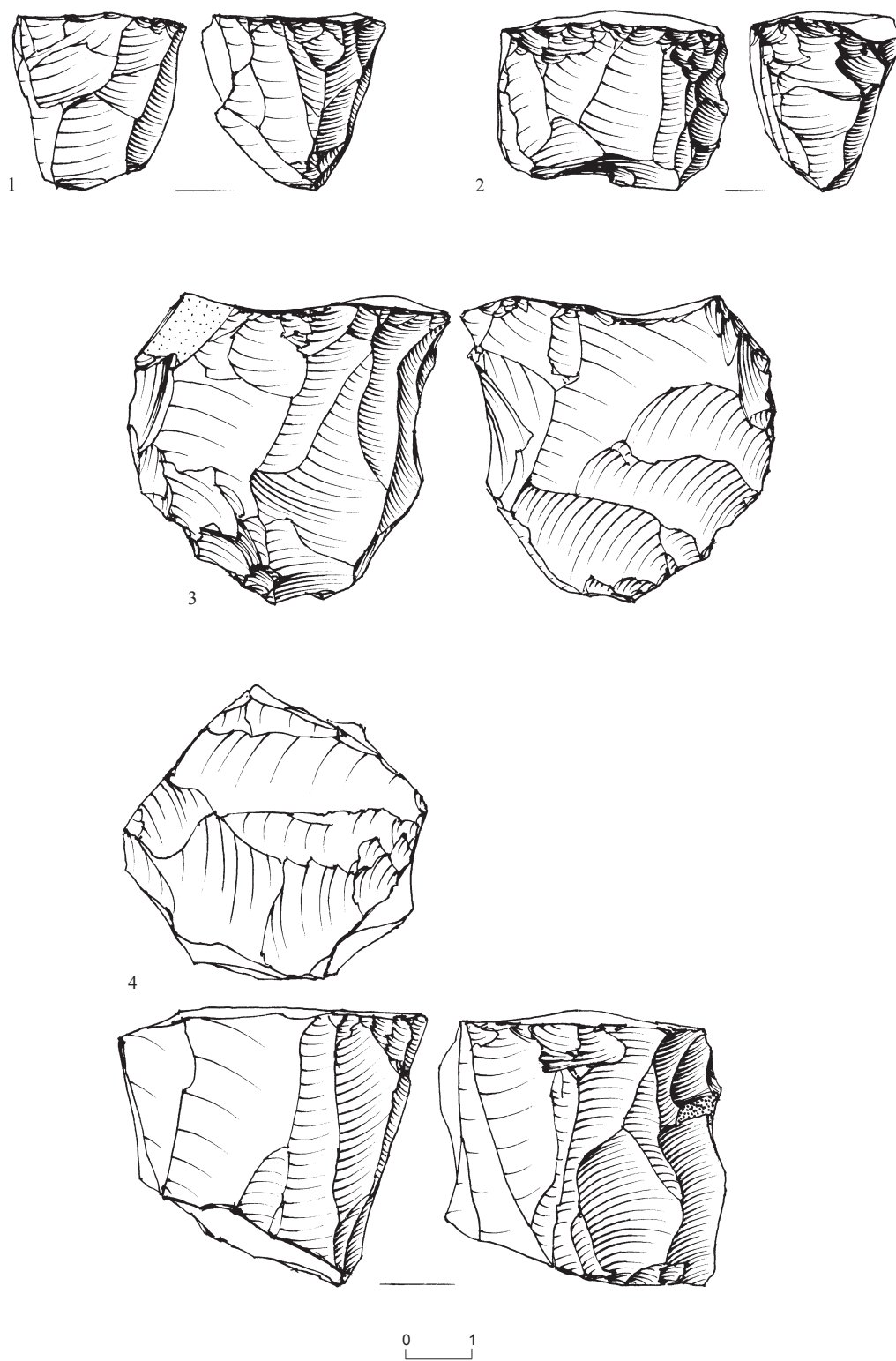


Fig. 7. Cores.

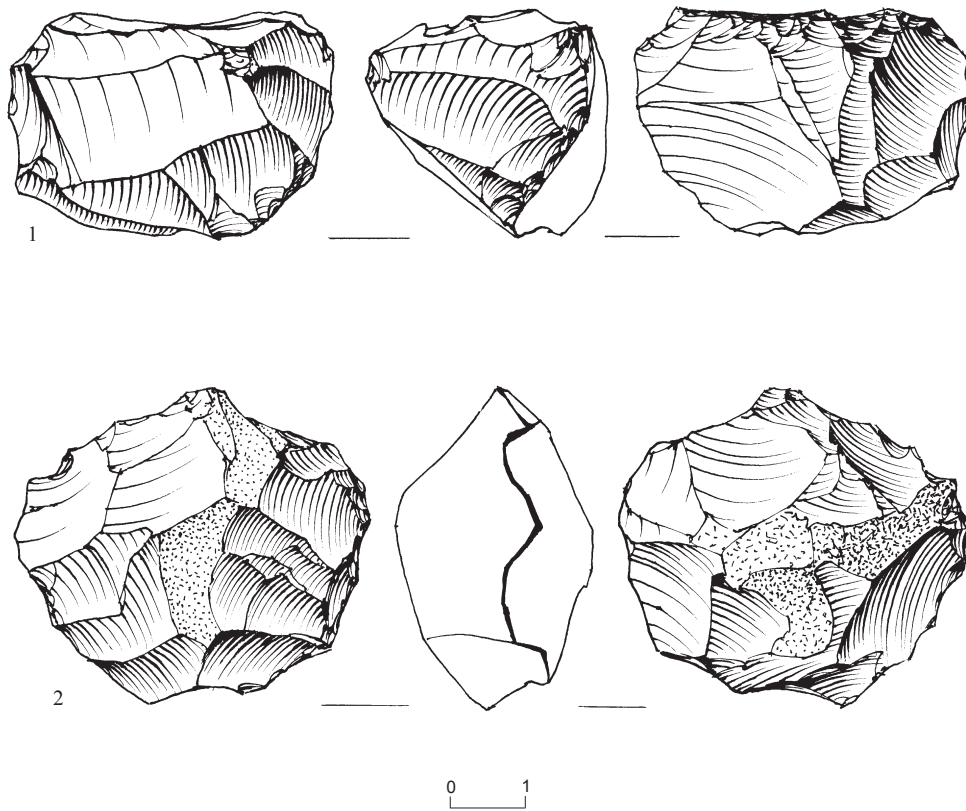


Fig. 8. Cores.

Table 2. Tool Frequencies

Tool	N	%
Sickle blades	21	0.8
Retouched blades	331	13.2
Backed blades	8	0.3
Truncated blades	4	0.2
Scrapers	249	9.9
Notches/denticulates	743	29.6
Retouched flakes	640	25.5
Perforators	151	6.0
Burins	16	0.6
Bifacials	342	13.6
Arrowhead	1	0.04
Varia	3	0.1
<i>Total</i>	<i>2509</i>	<i>~100.0</i>

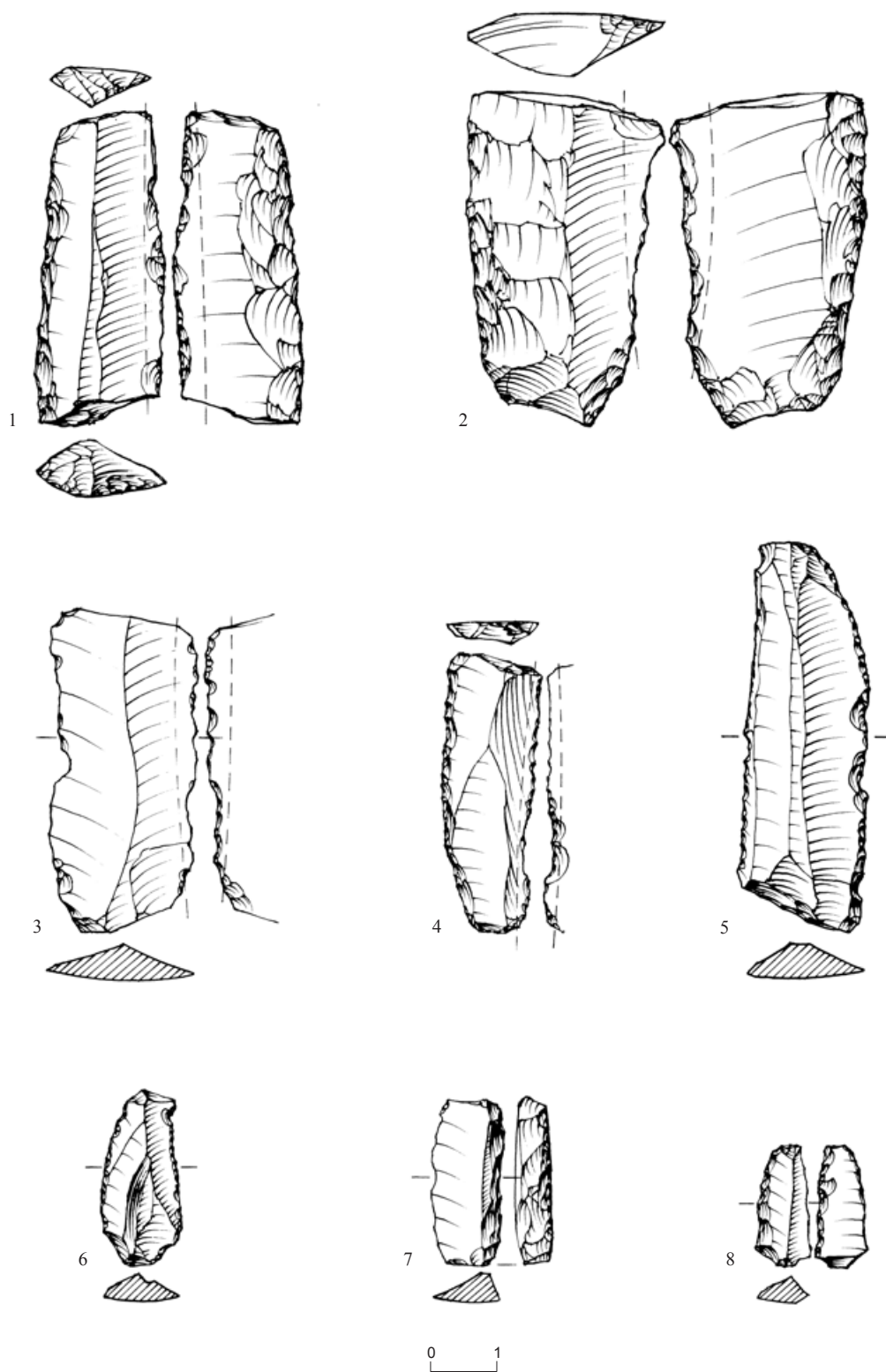


Fig. 9. Sickle blades (1–4); retouched blades (5, 6); backed blades (7, 8).

*Retouched Blades* (n = 331).— Irregular blades with triangular cross sections, unilaterally retouched, predominate. Bilaterally retouched blades form 26.3% of the blades (Fig. 9:5, 6). The 66 complete artifacts vary in length from 2.4 to 9.9 cm; however, two thirds of these are 3.9–5.9 cm long. Half of the retouched blades are 1.5–2.9 cm wide; the width of several of the longest tools is in the 4.0–4.5 cm range. Bladelets (n = 22) vary in width from 0.6 to 0.9 cm.

*Backed Blades* (n = 8).— These tools (Fig. 9:7, 8) vary in length from 2.5 to 4.0 cm; their width is in the 0.7–1.1 cm range. The back, 0.4–0.6 cm thick, was fashioned by abrupt retouch or by large, regular facetting; two artifacts show partial, coarse backing. In two cases, the opposite lateral edge shows coarse retouch.

*Truncated Blades* (n = 4).— Four broken blades exhibit oblique truncation at the distal end; two of these are retouched along the lateral edge.

*Scrapers* (n = 249).— Of the scrapers, the majority (80.3%) were manufactured on medium-sized and large flakes (113 and 51 tools respectively). Thirty-six tools (18%) are scrapers on small flakes, 2.0–2.9 cm long and 1.5–2.4 cm wide. The majority of flake scrapers constitute endscrapers (n = 153; 61.4%) with rounded, slightly protruding or ogival working ends (Fig. 10:1, 2); some have a straight working end. Ten tools have a small working end, 0.3–0.5 cm wide; these may be defined as microscrapers. The second most common group (22.9% of the total flake scrapers) includes side-scrapers made, in some cases, on thick elongated flakes, and fashioned by abrupt retouch (Fig. 10:3). Circular scrapers (n = 4), made on flakes 1.0–1.9 cm thick, vary in length from 4.2 to 4.9 cm, and in width from 5.2 to 5.7 cm. All these tools were fashioned by semi-abrupt retouch (Fig. 10:4).

Scrapers on blades (19.7% of the total scrapers) were mostly 4–6 cm long, judging from 17 complete items. They were fashioned on regular blades, and have rounded, ogival or straight working ends (Fig. 11:1–4). Several scrapers were modified on bladelets. Their lateral edges were fashioned by small, fine retouch.

*Notches and Denticulates* (n = 743).— Notched tools constitute the most numerous group within the tool kit. The majority of notched tools (91.5%) were made on flakes; the remainder are on blades (6.9%) or were fashioned on chunks (1.6%). Most are on medium-sized flakes or blades (56.8%); small notched tools constitute 24.7% of this tool group, and 18.5% are large tools. Most of the tools have one notch, 0.5–4.5 cm wide, fashioned by simple or semi-abrupt retouch, mostly semicircular (Fig. 11:5) or, in some cases, straight or shallow. Two notches, adjacent or opposite, appear on 21.1% of all the notched tools; 3.4% of these artifacts have three notches. Seven tools, with three to four contiguous notches (Fig. 11:6), are defined as denticulates.

*Retouched Flakes* (n = 640).— Most of the tools were fashioned by coarse, simple or semi-abrupt retouch on a short section of an edge (dorsal surface). About 30% of the flakes show dorsal/ventral retouch, and some tools are ventrally retouched.

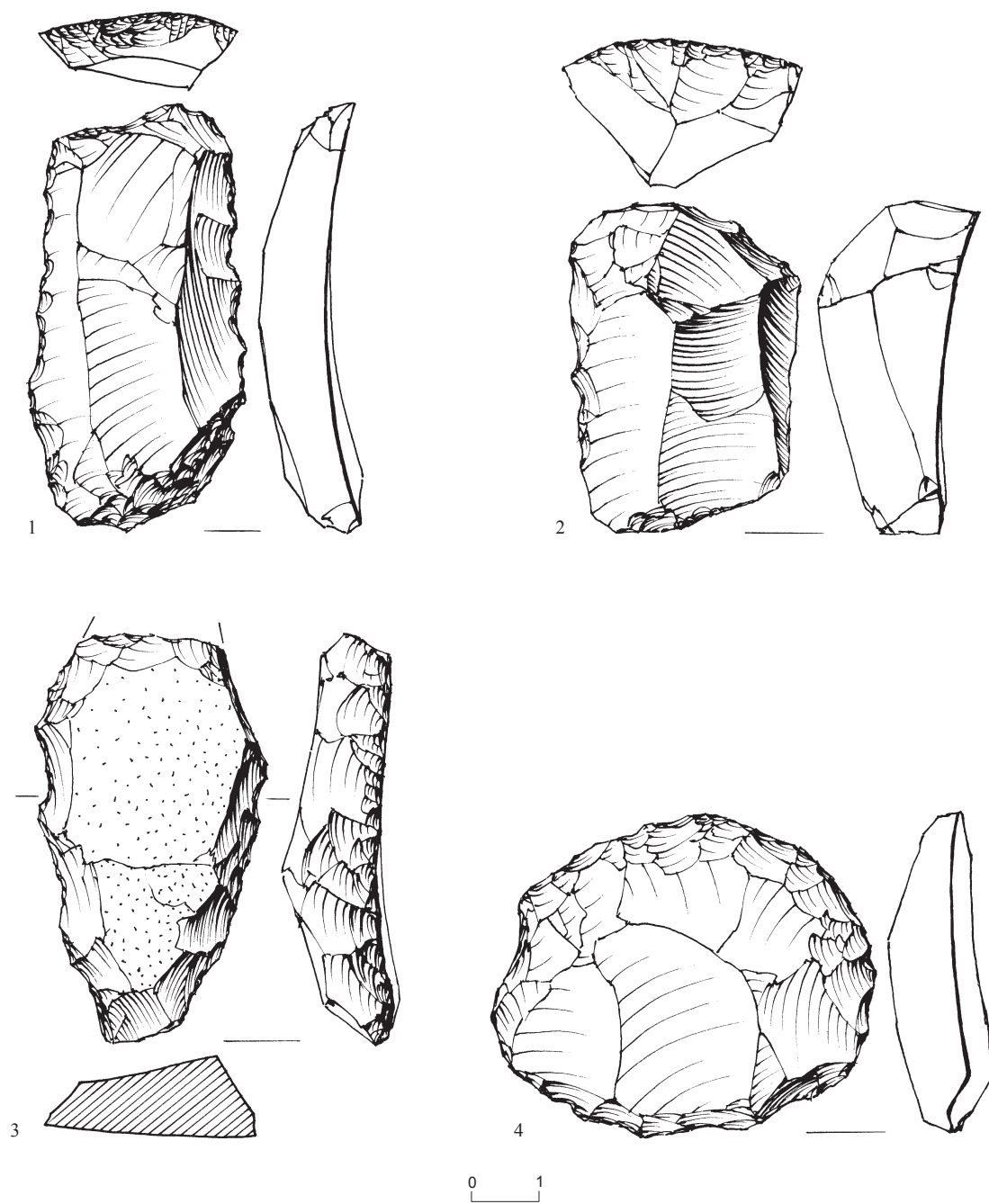


Fig. 10. Scrapers.

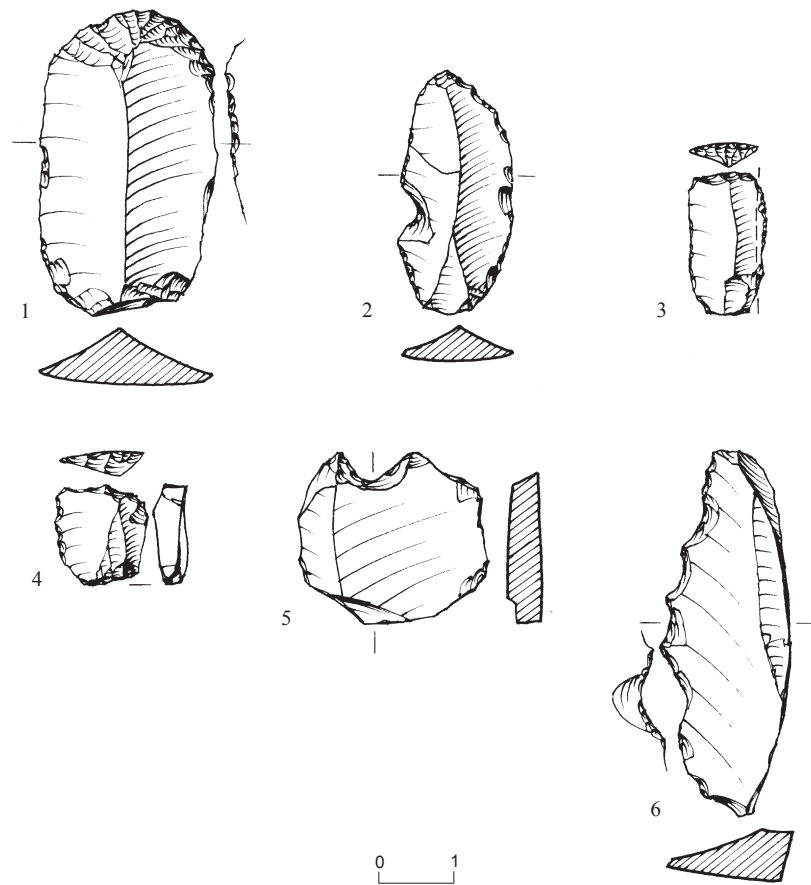


Fig. 11. Scrapers (1–4); notch (5); denticulate (6).

*Perforators* (n = 151).— Slightly over 93% (n = 141) of the perforating tools were manufactured on flakes, mostly of medium size; the rest (n = 10) are on blades. Awls represent 89.3% of the perforators. They are characterized by a sub-triangular upper section, with a symmetric mid-point fashioned by semi-abrupt retouch (Fig. 12:1–3). Eleven artifacts are side-awls on broken flakes or blades (Fig. 12:4). The awls' points are modified, in many cases, by two notches. Four tools have two points (Fig. 12:5). Borers form the second group (c. 10% of the perforators). They comprise 15 artifacts with protruding tips, 0.8–2.0 cm long (Fig. 12:6), and one massive borer (Fig. 12:7).

*Burins* (n = 16).—Thirteen burins were manufactured on flakes, mostly of medium size. Eight tools were made on breaks (Fig. 13:1, 2); four are dihedral burins; and a single artifact (Fig. 13:3) is an angle burin. Three burins are made on blades or bladelets.

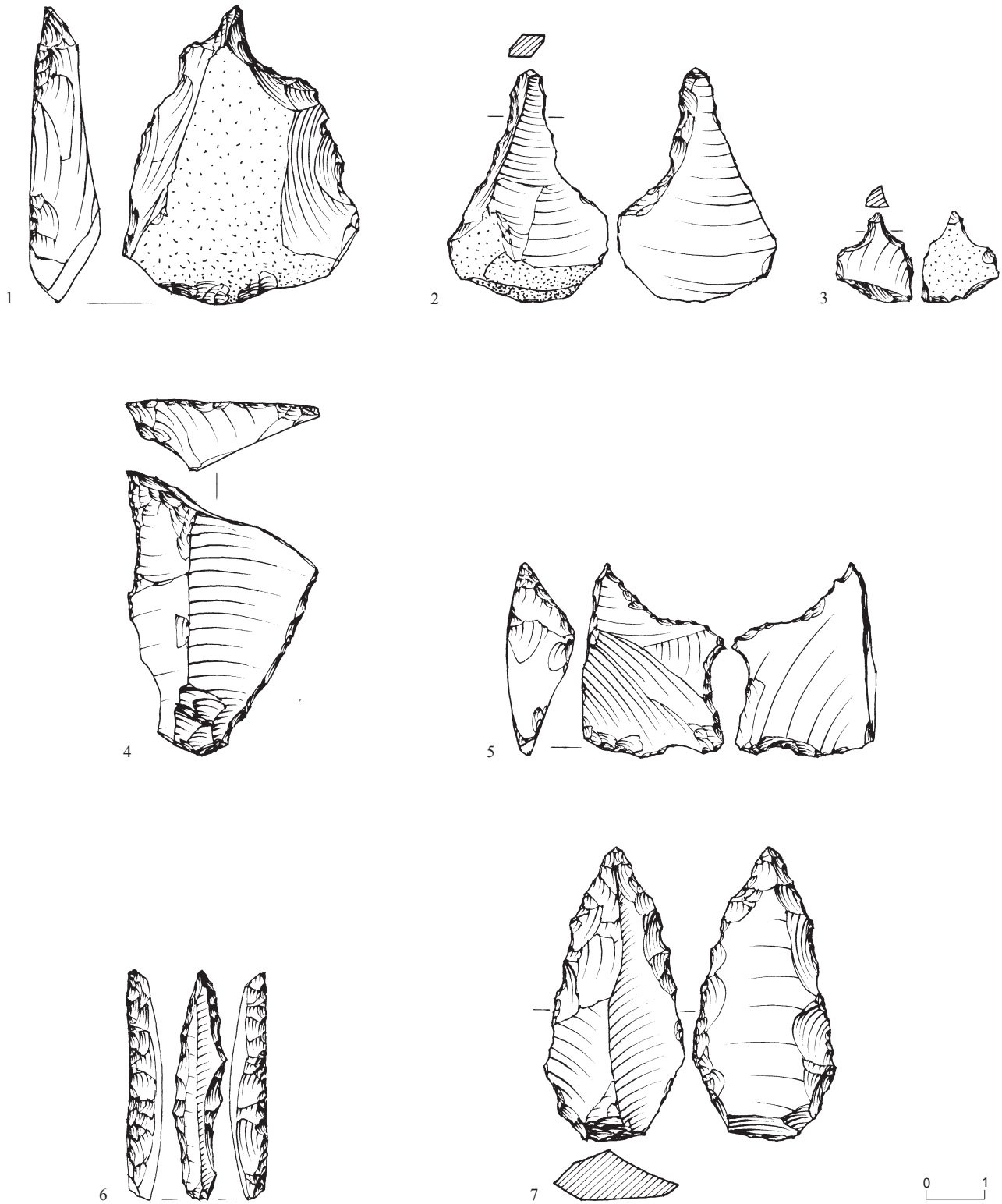


Fig. 12. Awls (1–5); borers (6, 7).

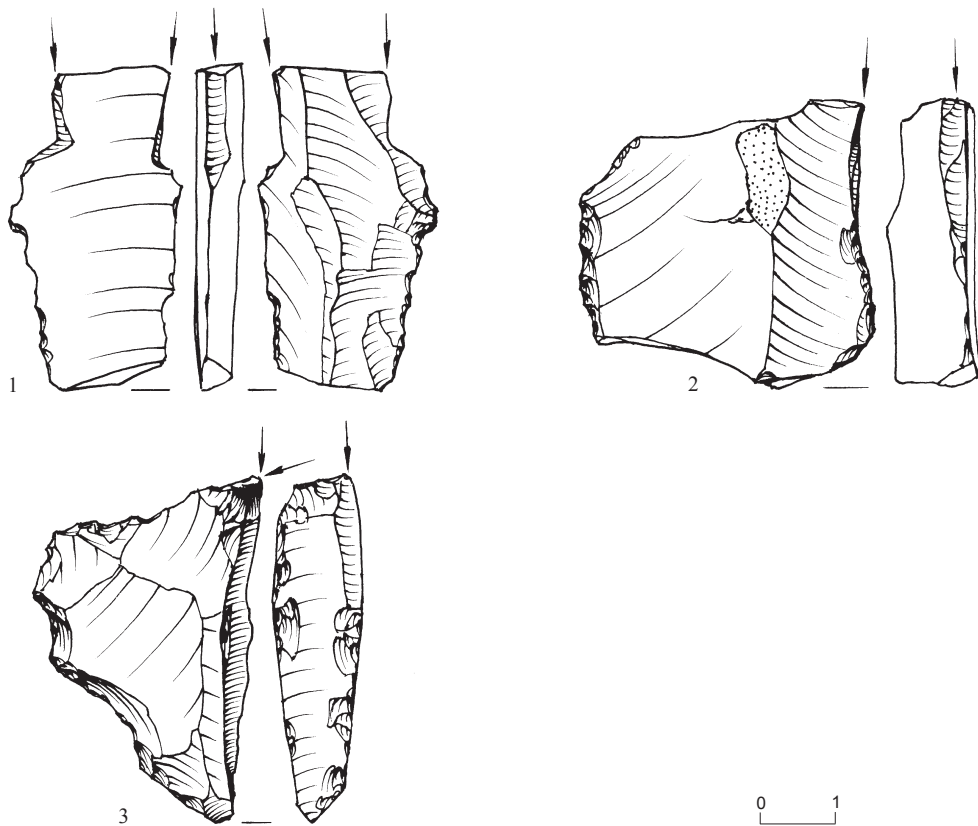


Fig. 13. Burins.

*Bifacials* (n = 342; Figs. 14–16).— Surface collection yielded the bulk of the bifacial tools—78.1%; 21.9% came from the excavated areas. Complete bifacials constitute 33.9% of the total (e.g., Figs. 14:1; 16:2). These vary in length from 3.8 to 9.4 cm; however, the majority are in the 6.0–7.8 cm (length) and 2.1–3.9 cm (width) range. About two-thirds of all the bifacials are broken (e.g., Fig. 16:5) or are represented by small fragments. Two unfinished tools were roughly shaped.

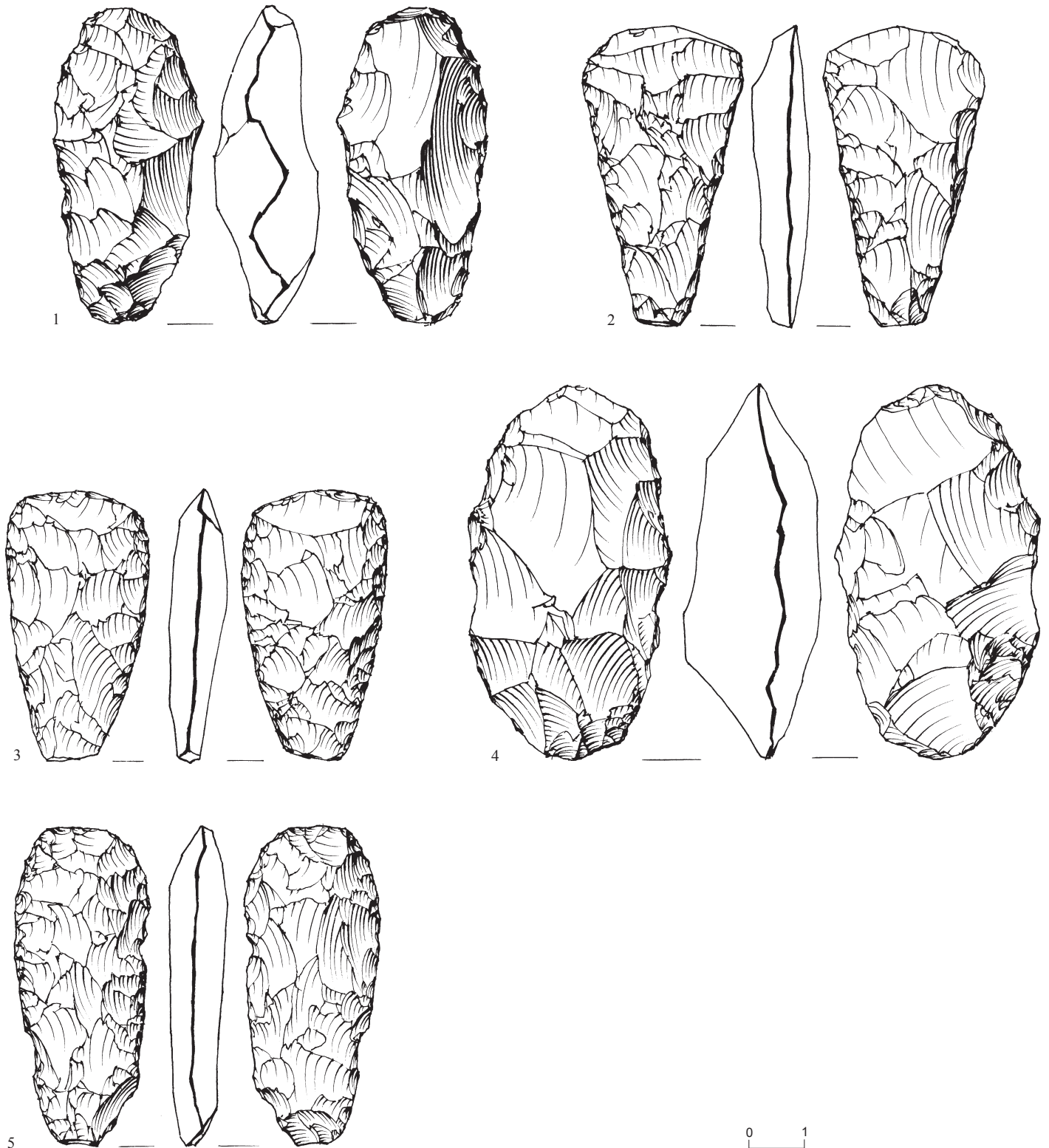


Fig. 14. Axes.

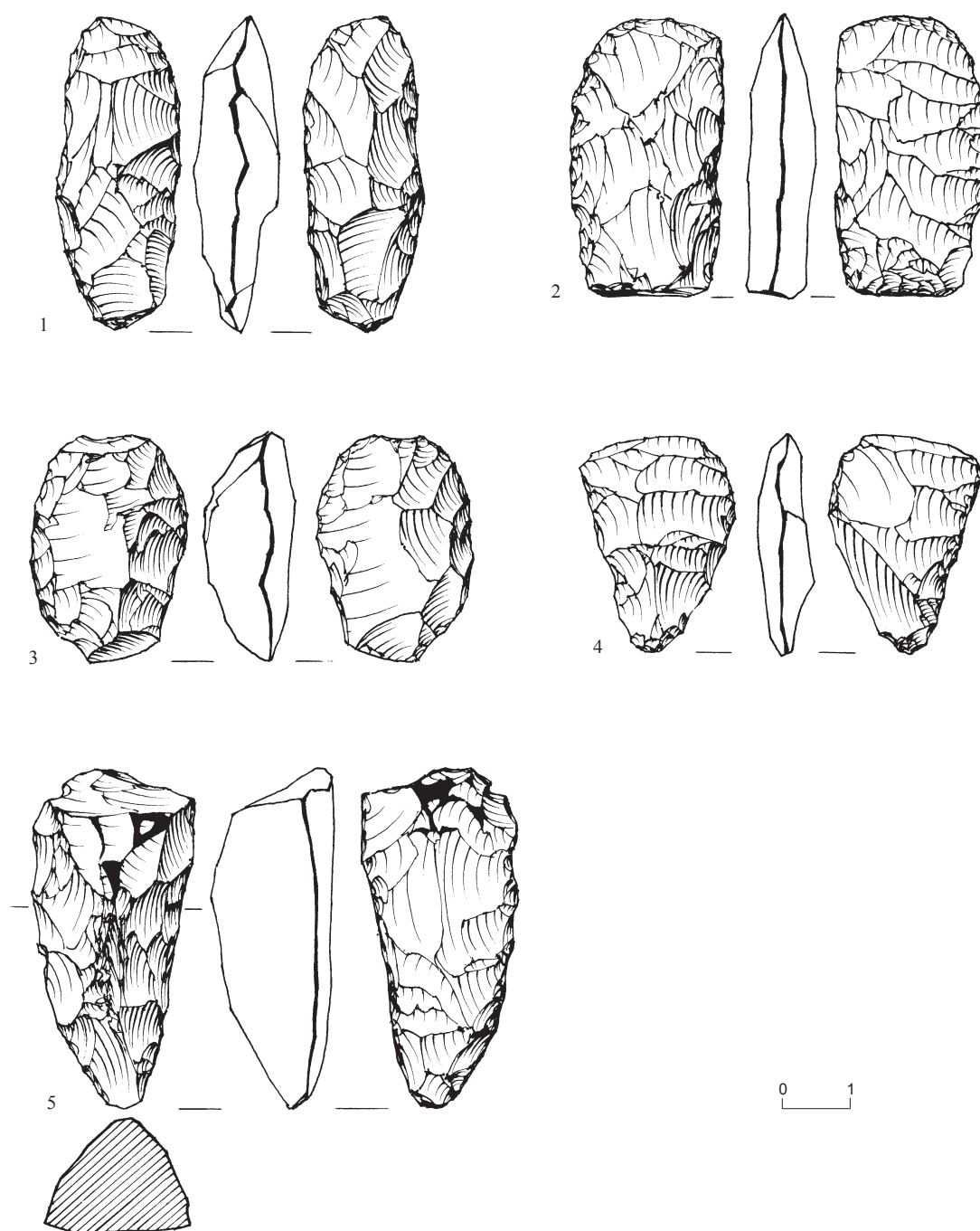


Fig. 15. Axes (1–4); adze (5).

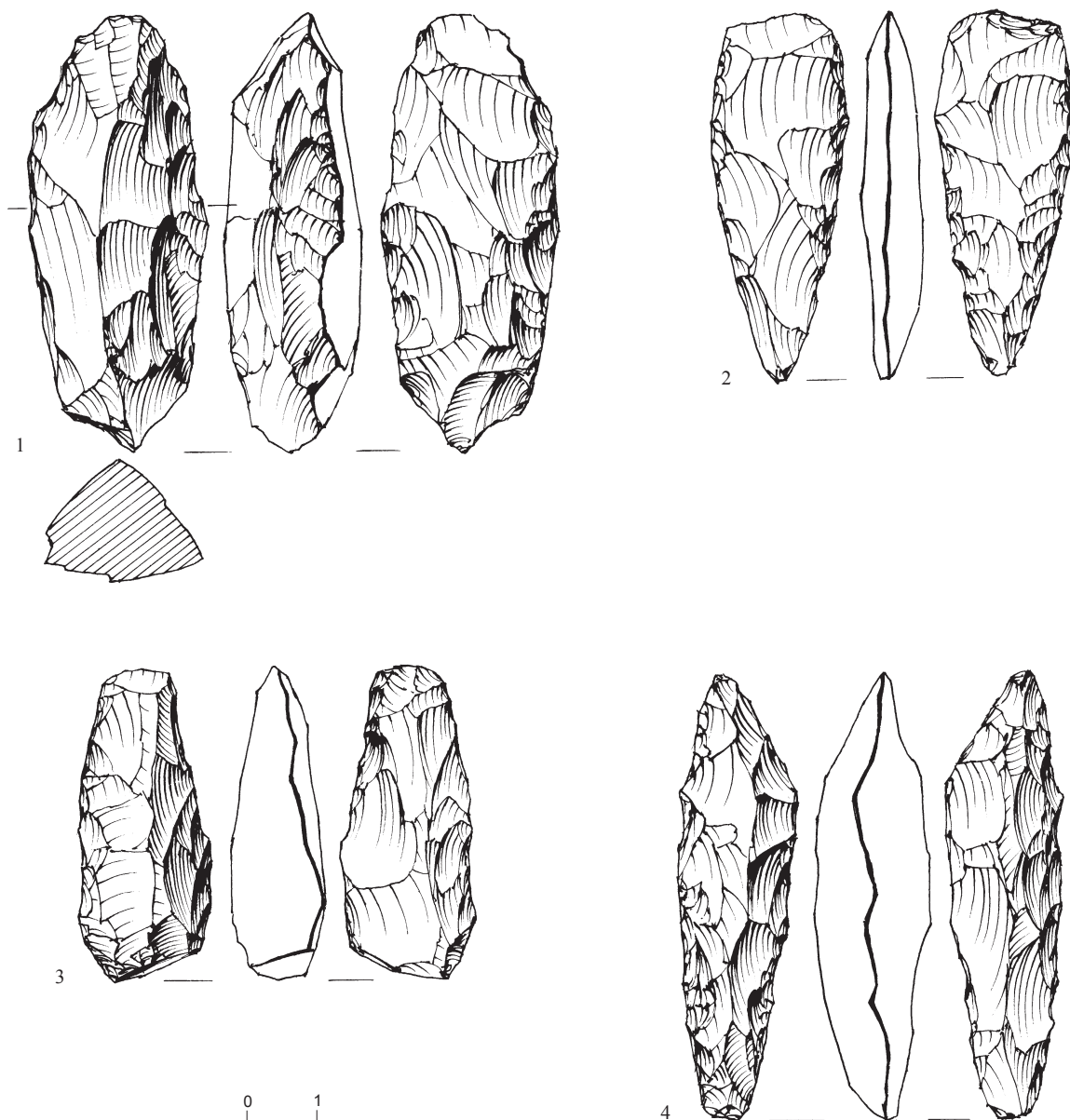


Fig. 16. Axe (1); chisels (2, 3); pick (4).

Most of the diagnostic bifacials are trapezoidal or sub-rectangular in shape, with arched or rounded working ends (e.g., Fig. 14:4) reaching, in some cases, 7 cm in width. The lower section of the tools is usually tapered, with a straight or a rounded butt. Tools with a pointed butt are also uncommon (e.g., Fig. 16:2).

About half of the complete tools show fine flaking all over the surface; the other half are coarsely flaked. Transversal blows modify the working ends of 56% of the bifacials (tranchet bifacials; e.g., Figs. 14:2, 3; 16:1, 2). In some cases, one face of the working end is modified in the “tranchet” technique, while the opposite face

shows small vertical scars. Two bifacials, with the distal ends modified in “tranchet” technique, are adhoc—thick, coarsely worked sub-rectangular flakes (Fig. 15:3, 4).

Axes represent 73.3% of the complete bifacial tools. They have the characteristic lens-shaped or rhomboidal transversal cross sections, and symmetric longitudinal cross sections (Figs. 14; 15:1–4; 16:1). Twenty-one tools (18.1%) with the same characteristics, although smaller and thinner (Fig. 16:2, 3), may be classified as chisels. Adzes ( $n = 9$ ), with plano-convex or triangular transversal cross sections and asymmetric longitudinal cross sections, were all found in fragments. Only one adze (Fig. 15:5), possibly intrusive, bears remnants of polish. Picks are represented by a single complete tool (Fig. 16:4) with a pointed working end.

*Projectile Point* ( $n = 1$ ).— A triangular arrowhead was found in the excavation in Area 5, at a depth of 0.8 to 0.85 m from the surface. The tool (Fig. 17), with a very short (broken?) tang and barbs, was fashioned by bifacial pressure retouch. Typologically, this artifact resembles the Ha-Parsa points (Gopher 1994:150, 264), and, therefore, probably should be attributed to the Late Neolithic.



Fig. 17. Arrowhead.

*Varia* ( $n = 3$ ).—This group comprises artifacts made on sub-rectangular flakes, 4–7 cm long. All have short tangs, 0.5–1.0 cm wide, fashioned by coarse retouch.

*Hammerstones* ( $n = 2$ ).— Two spheroidal, flattened flint concretions, 5 and 7 cm in diameter, the surfaces of which show numerous small scars and dents, were probably utilized as hammerstones.

#### DISCUSSION AND CONCLUSIONS

No architectural remains were discovered during the excavations. Therefore, Site F3 cannot be defined as a settlement. Nevertheless, some aspects of the flint assemblage, namely the dominance of domestic, irregular tools and the presence of utilized sickle blades and reused tools, seem to support the possibility of a short-term, activity-specific site. Thus, it was probably a seasonal working camp for flint processing, based on the rich raw deposits: nodules and blocks of Senonian (Mishash Formation) flint. Judging from the dispersion of the lithics,

the flint working was concentrated on the hilltop. Later agricultural activity resulted in the dispersal of the flints over the slopes of the hill.

The flint knappers' primary specialization was, most likely, the manufacture of bifacial tools. The numerous axes present several stages of production: roughly shaped blanks; shaped and bifacially flaked tools with non-modified working ends; and completed, finely worked artifacts, as well as evidence of tool renewal (axe spalls).

Analogous to Site F3 are the other, recently discovered, PPNA sites in the Modi'in vicinity, such as Modi'in—Kaizer (Zbenovich 2006) and Modi'in—Shimshoni. The latter (Gibson and Lass 2000a; Gibson and Lass 2000b; Zbenovich 2000), despite the limited areas of excavation and surface collection, produced enormous quantities of flint items, including numerous bifacial tools. No dwellings or other features were found at the Modi'in—Shimshoni site.

As a whole, the specialized-activity sites at Modi'in differ markedly from the known PPNA settlements, such as Netiv Ha-Gedud in the Jordan Valley (Bar-Yosef and Gopher 1997) and Ḥatoula in the Judean foothills (Lechevallier, Ronen and Anderson 1994), but conform with the pattern now recognized in the Shephelah (Marder et al. 2007).

#### NOTE

<sup>1</sup> The site was discovered by S. Gibson and was surveyed by S. Gibson, R.Y. Bankirer, I. Milevski and V. Zbenovich. The excavation, on behalf of the Israel Antiquities Authority and part of the Modi'in Archaeological Project, was directed by A. Golani and V. Zbenovich, with the assistance of A. Nagorski and R.Y. Bankirer (area supervisors), I. Uzan and R. Abu Halef (administration) and A. Hajian (surveying). The photographs were taken by A. Golani, O. Marder and V. Zbenovich. The drawings were prepared by M. Smilanski.

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