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The Flint Assemblages from Sha'ar Efrayim Burial Caves 1–3

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During excavations in Burial Caves 1–3 at Sha'ar Efrayim (see van den Brink, this volume) a considerable amount of flint was collected (N = 967; no flints were found in Caves 4 and 5). Analysis of the tools (see below) revealed the presence of Neolithic, Chalcolithic and Early Bronze Age artifacts, suggesting that these three caves were not used exclusively in the Chalcolithic period.

The flint industry was apparently local, using mainly raw materials found in the immediate vicinity of the site. During preliminary sorting of the flints, it was noticed that some of the artifacts may have derived from a nearby, earlier industry attributed to the late Epipalaeolithic (see Barkai 1998). The small size and amorphous shape of the cores attest to their extreme exploitation. Tools represent only 5.2% of the assemblage and the majority are ad-hoc types. The absence of bifacials, one of the main *fossile directeurs* for Chalcolithic assemblages, is worthy of note, as are a number of Neolithic and Early Bronze Age tools (Table 1).

Raw Material

Five different types of raw materials were identified. The most common in Cave 1 is a gray nodule used to produce most of the ad-hoc tools. However, this material is less frequent in Caves 2 and 3, where a dark brown flint, originating from small pebbles, is dominant, used for the production of 25% of the waste products. Both types of raw material were processed on-site, as evidenced by cores and waste products of these materials. The small flint pebbles, up to 6 cm in size, were extracted mainly from the limestone bedrock, while the gray flint originates in the Meshash Formation, which outcrops in the northern Shephelah. Both types are found in the vicinity of the site. Other

Table 1. Flint Counts

Location / Type	Cave 1	Cave 2	Cave 3	Total	%
Primary elements	94	7	15	116	23.9
Flakes	262	13	27	302	62.4
Blades	53	3	7	63	12.9
CTEs	3	-	1	4	0.8
Total Debitage	*412*	*23*	*50*	*485*	*100.0*
Chips	195	21	32	248	66.7
Chunks	91	6	27	124	33.3
Total Debris	*286*	*27*	*59*	*372*	*100.0*
Tools	35	4	11	50	5.2
Cores	31	9	10	50	5.2
Total Assemblage	*764*	*63*	*130*	*967*	*100.0*

types of flint are present in low frequencies in all three caves. The provenance of a semi-translucent flint is unknown; however, the presence of a few cores and microliths of this type of flint indicates its local exploitation. Most of the Early Bronze Age artifacts were shaped on typical high-quality, dark brown Eocene flint and the few Neolithic tools were fashioned on a fine-grained, beige flint.

Cores

Fifty cores were recovered from the three caves (Table 2; Fig. 1), 62% from Cave 1, the best preserved of the three caves. In general, the cores were used to knap flakes and bladelets. Seven cores were utilized to produce blades and bladelets in secondary reduction sequence. Only one core from Cave 2 clearly produced blades (Fig. 1:3). Given the fact that some cores were used for elaborated bladelets, the possibility that they were originally Epipalaeolithic cores cannot be excluded.

Although the extensive exploitation of cores is well reflected by the high number of removals from each one, almost 92% of the cores bear cortex over 25–50% of their surfaces. By contrast, rejuvenation was not common, as attested by the low number of core-trimming elements.

More than half the cores display one striking platform, while cores with two striking platforms are only present in low frequencies. Amorphous cores are more frequent in Cave 1 than in the other two caves. Technological observations indicate that most of the cores with a single striking platform were used to produce flakes. Reconstruction of core reductions indicates that 10% of the cores became bladelet cores after two sets of flake removals (Fig. 1:4). Thus, the most common core is one that was used exclusively for flake removal (Fig. 1:1, 2).

Waste Products

The presence of a high quantity of waste products of all types is surprising in view of the fact that all three caves were used for burial, rather than domestic purposes. However, the immediate vicinity surrounding the caves was occupied during earlier periods (Epipaleolithic and perhaps PPNB, see above), which could explain the presence of all types of products. In this scenario, most of the artifacts were originally surface material that filtered into the caves during and after their usage. Even though many of the cores bear mostly negatives of bladelet removals in their final stages of exploitation, they were primarily for flake production. This would explain the predominance of flakes among the debitage. Blades were the preferred blanks for the production of tools.

Flakes

Flakes were produced of all the raw material types at the site, similar in frequency to those of the cores, gray and dark brown flint being the most common. Half of the flakes bear no cortex on their dorsal face, suggesting extensive exploitation of the cores. This is further reflected in the relatively small size of the flakes (average 30 mm) and the number of scars on the dorsal face of the flakes.

Table 2. Core Frequencies

Location / Type	Cave 1	Cave 2	Cave 3	Total	%
Flake cores	24	7	7	38	*76*
Blade and bladelet cores	5	1	1	7	*14*
Flake and bladelet cores	2	1	2	5	*10*
Total	*31*	*9*	*10*	*50*	*100*

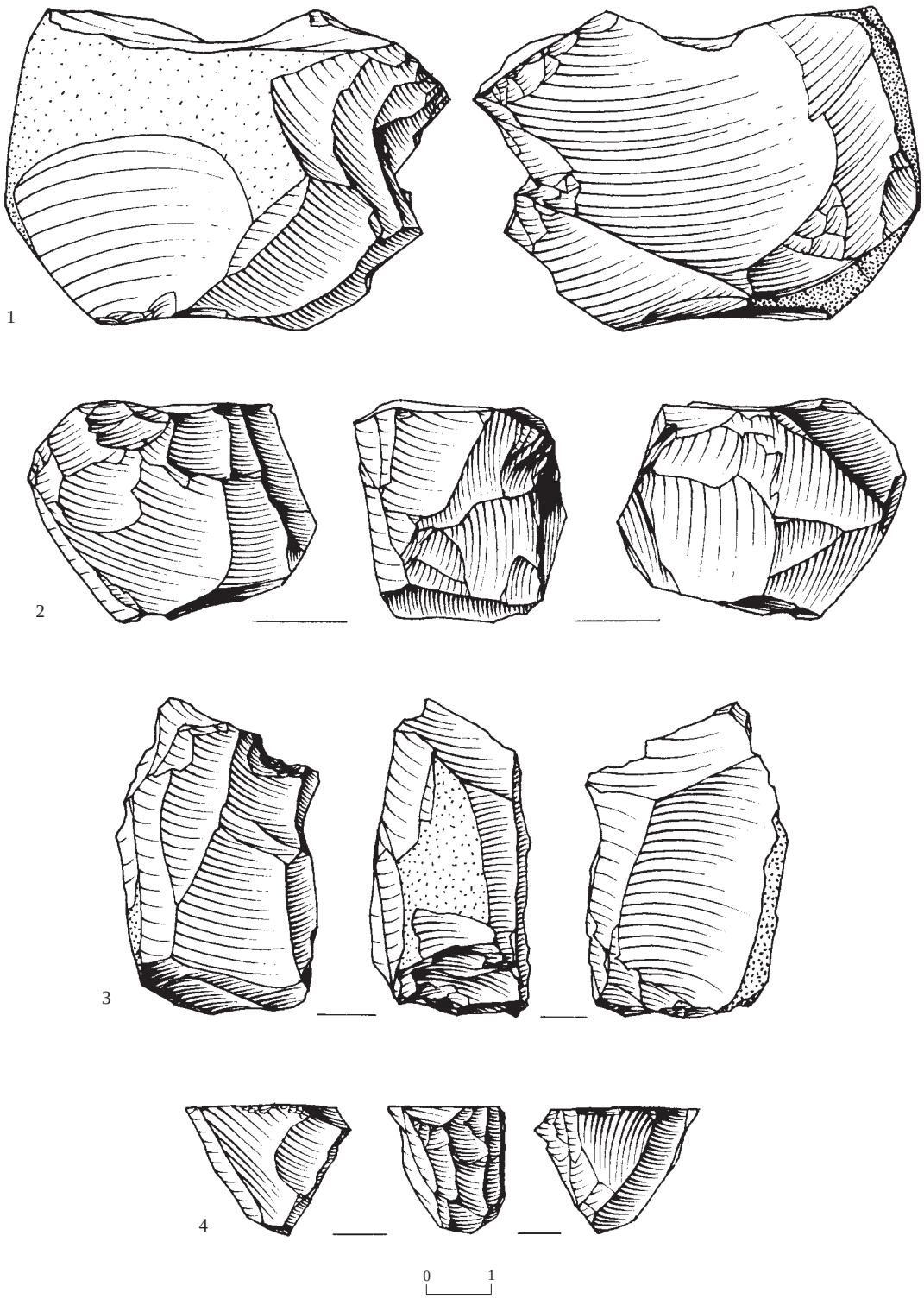

Fig. 1. Chalcolithic cores: (1, 2) flake cores; (3, 4) blade and bladelet cores.

Blades and Bladelets

Blades were present in low frequencies, as reflected in the low number of blade cores (N = 1). Most of the cores produced bladelets in secondary sequence after flakes. Two knapping techniques were used for the production of blades and bladelets, as evidenced by scar patterns. The main technique was from a single-platform core using an indirect soft hammer, thus producing short and relatively concave blanks; 93% of the blades and bladelets are of this type. Blades displaying bidirectional scar patterns are few and comprise deliberate blades produced off-site and used for Neolithic sickle blades. Based on technological observation, it seems that most of the bladelets are earlier in date than the Chalcolithic occupation.

Tool Assemblages

The excavations in Burial Caves 1–3 recovered only 50 tools, most of them ad-hoc, and most of them originating in Cave 1 (Tables 1, 3). However, the presence of a few diagnostic types enables chrono-cultural assignments. The tools are presented typologically according to their cultural assignation.

The Neolithic Period

Three isolated Neolithic tools were identified during sorting, two from Cave 2 and one from Cave 3, set apart by their typology and raw material—all were shaped on high-quality flint unavailable locally. A fragment of a sickle blade from Cave 3 (Fig. 2:3) apparently underwent a dramatic change in texture and color due to heat treatment, a process common during the PPNA (Nadel 1989:65) and PPNB periods. Based on its shape and the bidirectional scars, this artifact is typical of PPNB assemblages, resembling PPNB sickle blades at Munḥata (Gopher 1989), Abu Ghosh (Khalaily, Marder and Bankirer 2003) and Yiftaḥ'el (Garfinkel 1987; Khalaily, Marder and Milevski 2000).

The two small projectile points of the Niẓẓanim type (Gopher 1994:41) from Cave 2 were both intensively shaped, one by pressure flaking (Fig. 2:1), the other by abrupt retouch (Fig. 2:2). Such projectile points are characteristic of Pottery Neolithic assemblages.

The Chalcolithic Period

The majority of the Chalcolithic tools were recovered from Cave 1. Over two-thirds of the ad-hoc tools were fashioned on flakes, the

Table 3. Tool Assemblage According to Cave

Type	Cave 1	Cave 2	Cave 3	*Total*	
				N	*%*
Neolithic arrowheads	-	2	-	*2*	*4*
Neolithic sickle blades	-	-	1	*1*	*2*
Chalcolithic sickle blades	5	-	-	*5*	*10*
Chalcolithic scrapers	6	-	-	*6*	*12*
Chalcolithic notches and denticulates	7	-	3	*10*	*20*
Chalcolithic awls and borers	5	1	2	*8*	*16*
Chalcolithic burins	4	-	-	*4*	*8*
Chalcolithic retouched flakes	4	-	4	*8*	*16*
Chalcolithic retouched blades and bladelets	3	-	-	*3*	*6*
EB sickle blades	1	1	1	*3*	*6*
Total	*35*	*4*	*11*	*50*	*100*

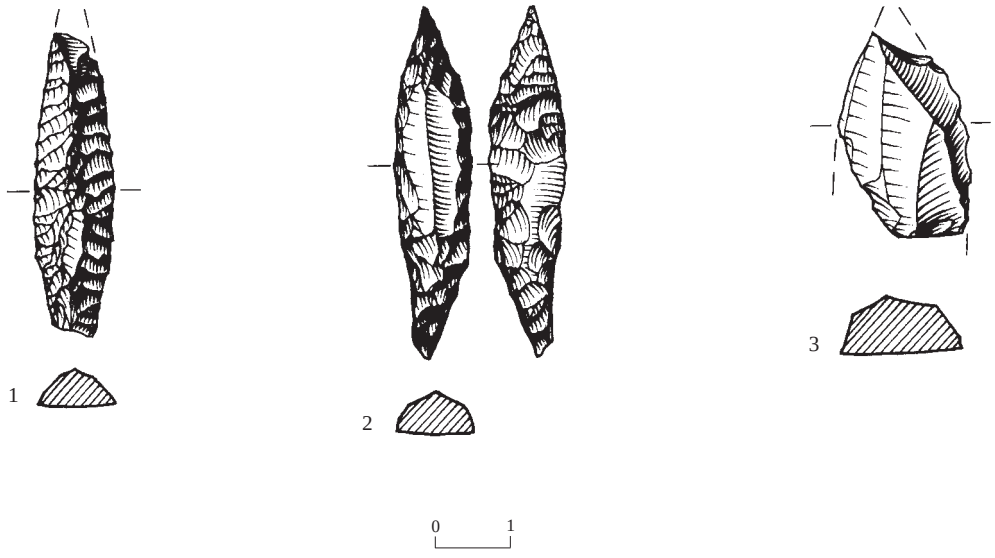

Fig. 2. (1, 2) PN arrowheads; (3) sickle-blade fragment.

remainder on blades, mainly sickle blades, burins and retouched blades. The lack of diagnostic Chalcolithic artifacts, such as tabular scrapers and bifacials, is revealing, and may possibly be explained by use of the caves, not necessarily burial-related, during the Chalcolithic period. Following is a description of the few diagnostic tools that assist in the chronological assignment; the remaining frequencies are presented in Table 3.

Sickle Blades.— Five Chalcolithic sickle blades are present in the tool assemblage (10% of all tools), among them three sickle blades with gloss (e.g., Fig. 3:1, 3) and two without (Fig. 3:2). However, as their morphological attributes are similar to other items with gloss, these two are treated here as sickle blades.

Three types of raw materials were used for their production: two of brown flint, two of gray and one of beige flint. The fact that cores of similar raw material were found at the site may indicate that these sickle blades were manufactured on-site. Three items are straight, narrow, backed blades characteristic of Chalcolithic sickle blades (Fig. 3:1–3). They are broken distally and their proximal ends display no truncation. The working edges exhibit a fine denticulation, probably due to use rather than deliberate retouch, and a visible gloss on both surfaces (Fig. 3:1). The remaining two items were fashioned on bladelets showing minimal modification, with semi-abrupt retouch on the back and no sickle gloss on the working edges (Fig. 3:2).

A high standardization of sickle-blade production is suggested by the fact that all five items were fashioned on narrow blanks with backing and denticulation.

Scrapers.— The six endscrapers, representing 12% of all the tools (Table 3), were produced from most of the various raw materials, with a predominance of gray flint (four scrapers). Three scrapers were produced on small flakes (1–3 cm)—two on primary elements and one on a simple flake. The remaining three were produced on blades—two on regular blades (Fig. 3:6), the third on a ridged blade. The absence of tabular scrapers is notable, as they are usually frequent in burial contexts (Hermon 2003).

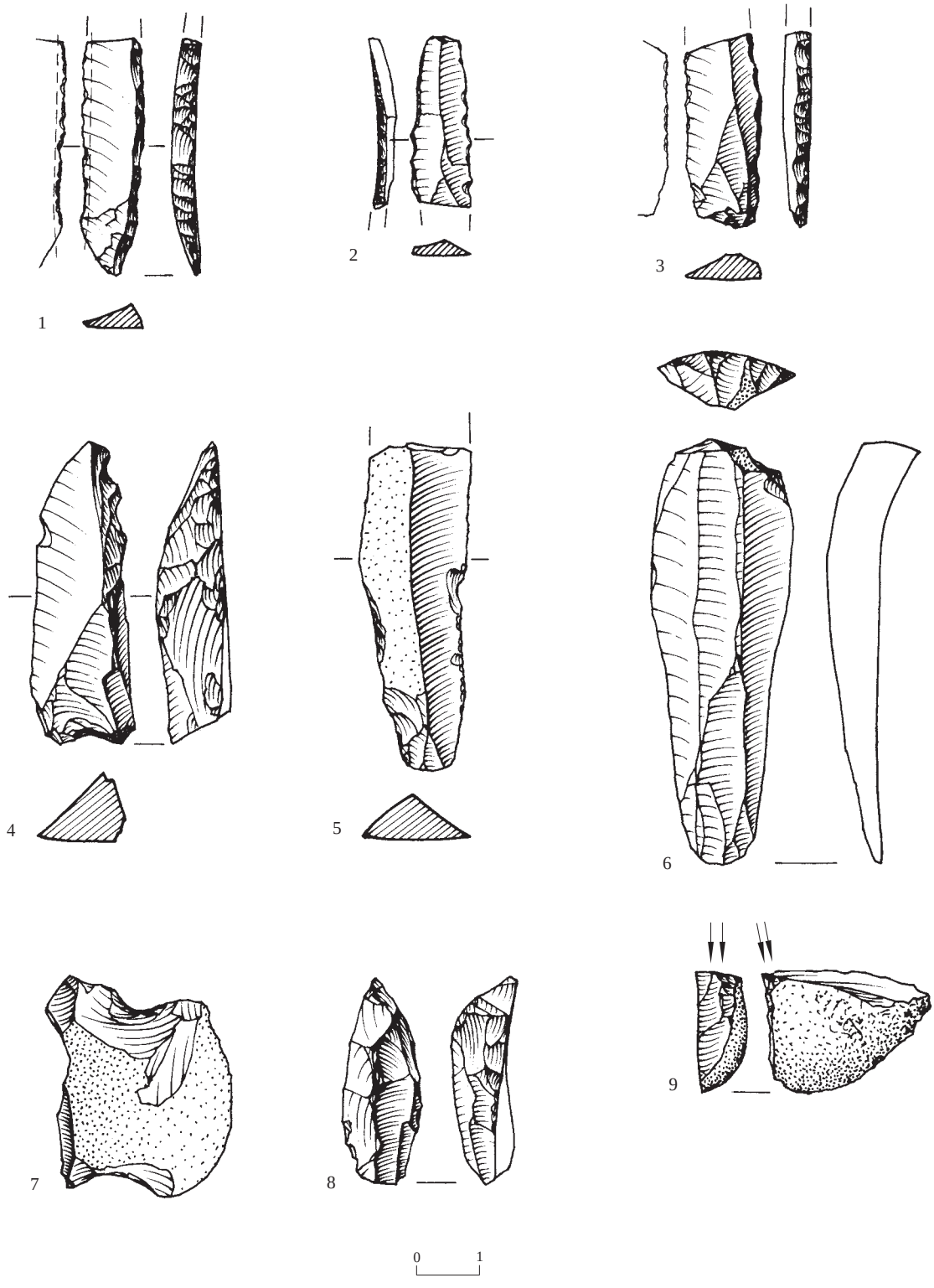

Fig. 3. Chalcolithic tools: (1–3) sickle blades; (4, 5) retouched blades; (6) scraper; (7, 8) perforators; (9) burin.

Notches and Denticulates.— These are the most common tools (20%). Single notches are dominant. Compound notches, usually comprising a number of irregularly spaced notches, were produced mainly on flakes, rarely on blades. Denticulated pieces were made on large flakes, 55–85 mm in length. Irregular denticulation appears along one or two edges. Two artifacts had denticulation along the edges and on the distal end. Both notches and denticulates often exhibit additional retouch along the lateral edges.

Perforators.— Perforators represent 16% of the tools, the second most common tool type together with retouched flakes. Awls make up the majority; all were shaped on flakes of locally available raw material, with two bilateral notches creating a narrow tip emphasizing the awl (Fig. 3:7), either on the distal end or on a lateral side. Borers were usually produced on blades or elongated flakes. Borers defined as drilling points were made on blades with regular retouch extending along most or all of the edges (Fig. 3:8). The variation of raw materials suggests that there was no preference for a particular type of flint for the production of borers.

Burins.— Burins, comprising 8% of the tools, were made on flakes, both primary and retouched. Three of the burins appear on small flakes exhibiting cortex (Fig. 3:9). The burin blows are either natural or on a break. The fourth burin, made on a small fragment with regular uni-polar scars, is dihedral on the distal end.

Retouched Flakes and Blades.— Retouched flakes and blades, representing 22% of the tool assemblage, were produced on various types of raw materials and modified by diverse types of retouch. The retouched flakes differ from other ad-hoc tools in the less standardized size of the blanks. These items show irregular retouch, or just signs of use. On the other hand, the retouched blades were manufactured from similar raw materials as the sickle blades, and show the same morphology of retouch, although the position and extent of the retouch vary greatly (e.g., Fig. 3:4, 5).

The Early Bronze Age

Only three items dating from this period, belonging to the distinctive Canaanean blade industry (Rosen 1997), were recovered, one from each cave. Two of the items are retouched blade fragments, while the third is a sickle blade. The sickle blade, 11.8 cm in length and 3.2 cm width (Fig. 4), was made on a long, wide Canaanean blade of high quality, light brown Eocene flint. It was knapped from a long prismatic core with a facetted platform, by indirect percussion, in the first stages of core reduction as cortex covers half of its dorsal surface. Part of the bulb was removed to reduce thickness. The distal end is missing, the break taking place after use, as evidenced by the gloss

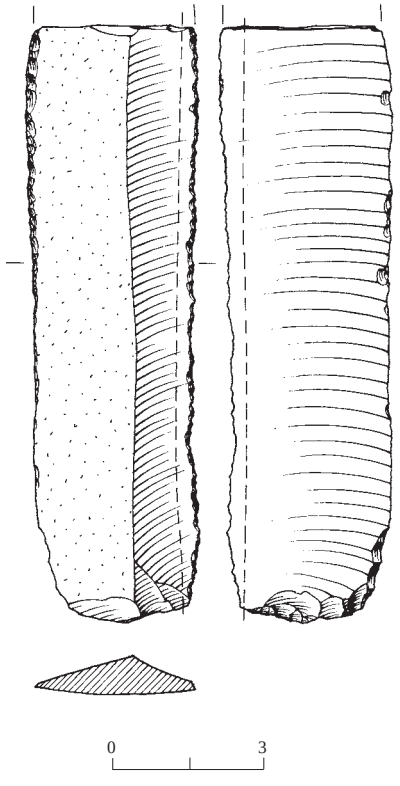

Fig. 4. Canaanean sickle blade.

that extends until the break. The working edge is irregularly denticulated, which could be a result of use rather than deliberate retouch. The opposite edge displays fine retouch. The developed gloss is visible on both dorsal and ventral surfaces, perhaps indicating that this sickle was in use for a long period of time. It would appear that this sickle was used for cutting hard substances, such as wood.

Conclusions

Despite the small number of flint items collected in Sha'ar Efrayim Caves 1–3, the formal tools are sufficient to enable several conclusions and cultural assignations.

A study of the flint artifacts indicates that Caves 1–3 were exploited during a time spanning the Late Neolithic and Chalcolithic periods and the Early Bronze Age, while relative frequencies reveal that the main period of activity was during the Chalcolithic period. The variety of raw materials used in the production of all tool types probably originated from several sources. It is noteworthy that certain *fossile directeur* tools of Chalcolithic assemblages often related with burials are absent, while sickle blades are present. This would seem to indicate—at least from the point of view of the lithic assemblage—that the caves were used for domestic purposes, perhaps in an earlier phase prior to the later burial phase.

Although the items of the Late Pottery Neolithic and Early Bronze Age are few in number, they are diagnostic for these periods and perhaps hint at two short events before and after the main period of activity in Caves 1–3 during the Chalcolithic period.

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